Final Drainage Report

Eagleview Subdivision
El Paso County, Colorado

Prepared for:
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Please add PCD File # SF-22-42

Project #: 196288000

PCD Filing No.: XXXXX

Prepared: December 23, 2022

Kimley»Horn

CERTIFICATION

DESIGN ENGINEER'S STATEMENT

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

SIGNATURE (Affix Seal): ____
Brice Hammersland, P.E.
Colorado P.E. No. 56012 Date

OWNER/DEVELOPER'S STATEMENT

I, the developer, have read and will comply with all of the requirements specified in this Drainage Report and Plan.

____
PT Eagleview LLC

____
Authorized Signature Date

____
Joseph W. DesJardin

____
Director of Entitlements

____
Address:
1864 Woodmoor Drive
Monument, CO 80132

EL PASO COUNTY

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

______________________________________ ______________________
Josh Palmer, P.E. Date
County Engineer/ ECM Administrator

Conditions:

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INTRODUCTION

PURPOSE AND SCOPE OF STUDY

The purpose of this Final Drainage Report (FDR) is to provide the hydrologic and hydraulic calculations and to document the drainage design methodology in support of the proposed Eagleview Subdivision (“the Project”) for PT Eagleview LLC. The Project is located within the jurisdictional limits of El Paso County (“the County”). Therefore, the hydrologic and hydraulic design is based on the County’s criteria which is described in further detail within the report.

LOCATION

The Project is located approximately 4 miles northwest of Falcon, Colorado within Section 26, Township 12 South, Range 65 West of the 6th Principal Meridian, County of El Paso, State of Colorado (“the Site”). The Site comprises two parcels of land which are bound by Stapleton Estates Filing No. 1 on the west and south, Paint Brush Hills Filing No. 14 (PCD File No. SF2024) to the east, and the Rodgwick Subdivision and MFY Farm Subdivision to the north. A vicinity map has been provided in the **Appendix A** of this report.

The Site is currently owned by PT Eagleview LLC and will be developed by PT Eagleview LLC.

DESCRIPTION OF PROPERTY

The Site is approximately 121 acres consisting of undeveloped land with native vegetation and is classified as “Open Space” per Table 5-4 of the Drainage Criteria Manual of El Paso County. Vegetation within the site is characterized primarily by prairie grasses along with some area of scrub brush and a limited occurrence of small oaks. The Site does not currently provide water quality or detention for the Project area. The existing land use is undeveloped vacant land. There are no existing irrigation ditches on the Site.

The existing topography consists of slopes ranging from 1% to 20%. The west tributary of the Falcon drainage basin runs from the northwest corner of the site to the southeast corner of the Site.

According to NRCS soil mapping data, USCS Type B soils are the primary soil type within the site, indicating high levels of permeability. Soils present at the Site consist mainly of “Pring coarse sandy loam” which represent a moderate hazard for erosion. **Appendix B** contains detailed NRCS soil data.

The development of this site will include 38, 2 ½ acre single family lots, roadway improvements to the site will include mowing, clearing and grubbing, weed control, paved access road construction, roadway grading, one sub regional detention pond, two water quality features, roadside ditches, culverts, drainage swales, native seeding and a proposed channel to convey flows to the detention pond and water quality features.

A Topographic field survey was completed for the Project by Rampart Surveys dated June 24th, 2008 and is the basis for design for the drainage improvements.

DRAINAGE BASINS

MAJOR BASIN DESCRIPTIONS

The Project is located within the West Tributary of the Falcon Drainage Basin. The watershed is generally located in the north central portion of El Paso County. The watershed contains three streams and has an overall area of approximately 10.6 square miles at the confluence of Black Squirrel Creek. The headwaters of the watershed are made up of ponderosa pine forest, grassland on undeveloped land, and 2-to-5-acre rural residential lots. There is no FEMA mapped floodplain on the project site. Refer to **Appendix A** for the Flood Insurance Rate Map (FIRM) number 08041C05350G effective date, December 7, 2018.

EXISTING SUB-BASIN DESCRIPTIONS

Historically the runoff from the Site drains into the West Tributary reach of the Falcon drainage basin. The West Tributary reach bisects the Site from north to south. The Site is located in upper portion of the Falcon drainage basin. The Site was divided into 4 onsite subbasins B1 – B4 and 8 offsite basins OB1 – OB8. Onsite and offsite flows generally flow from north to south overland over vacant and developed land to the West Tributary reach. The off-site basins draining to the site generally encompass rural land with pockets of residential development. Below is a description of the existing sub-basins.

Sub-Basin B1
The on-site sub-basin consists of an area of 5.55 acres, located in the southwest corner of the property. Drainage flows overland from the northwest to the southeast into the West Tributary. The curve number for this basin is 61.00. Runoff during the 5-year and 100-year events are 3.0 cfs and 8.5 cfs respectively.

Sub-Basin B2
The on-site sub-basin consists of an area of 41.43 acres, located on the west side of the property. Drainage flows overland from the northwest to the southeast into the West Tributary. The curve number for this basin is 60.68. Runoff during the 5-year and 100-year events are 15.4 cfs and 48.5 cfs respectively.

Sub-Basin B3
The on-site sub-basin consists of an area of 59.54 acres, located in the central portion of the property. Drainage flows overland from the northwest to the southeast into the West Tributary reach. The curve number for this basin is 60.90. Runoff during the 5-year and 100-year events are 36.4 cfs and 110.0 cfs respectively.

Sub-Basin B4
The on-site sub-basin consists of an area of 14.68 acres, located in the northeast portion of the property. Drainage flows overland from the north to the south into the West Tributary reach. The curve number for this basin is 61.00. Runoff during the 5-year and 100-year events are 5.4 cfs and 18.2 cfs respectively.

Sub-Basin OB1
The off-site sub-basin consists of an area of 10.37 acres, located on the southwest corner of the property. Drainage flows overland from the west to the east onto the property and continues to the southeast and outfalls along the south property line into the West Tributary reach at design

point J1. The curve number for this basin is 63.76. Runoff during the 5-year and 100-year events are 7.1 cfs and 18.8 cfs respectively.

Sub-Basin OB2
The off-site sub-basin consists of an area of 28.06 acres, located on the west side of the property. Drainage flows overland from the west to the east onto the property. Flows enter the site in a well-defined natural channel and continue to the southeast as channelized flow. Where the flows ultimately outfall along the south property line into the West Tributary reach at design point J2. The curve number for this basin is 64.16. Runoff during the 5-year and 100-year events are 20.6 cfs and 52.7 cfs respectively.

Sub-basin OB3
The off-site sub-basin consists of an area of 43.44 acres, located on the west of the property. Drainage flows overland from the northwest to the southeast and enters the site as channelized flow and continue to the southeast as channelized flow. Where the flows ultimately outfall at the south property line into the West Tributary reach at design point J2. The curve number for this basin is 63.62. Runoff during the 5-year and 100-year events are 25.3 cfs and 67.1 cfs respectively.

Sub-basin OB4
The off-site sub-basin consists of an area of 10.50 acres, located on the west side of the property. Drainage flows overland from the northwest to the southeast and enters the site as channelized flow and continues to the southeast as channelized flow. Where the flows ultimately outfall at the south property line into the West Tributary reach at design point J2. The curve number for this basin is 64.71. Runoff during the 5-year and 100-year events are 7.5 cfs and 18.9 cfs respectively.

Sub-basin OB5
The off-site sub-basin consists of an area of 143.82 acres, located on the northwest side of the property. Drainage flows overland from the northwest to the southeast and enters the site as channelized flow and continues to the southeast as channelized flow. Where the flows ultimately outfall into the West Tributary reach on-site at design point J4. The curve number for this basin is 59.98. Runoff during the 5-year and 100-year events are 36.8 cfs and 106.9 cfs respectively.

Sub-basin OB6
The off-site sub-basin consists of an area of 118.40 acres, located north side of the property. Drainage flows overland from the north to the south and enters the site as channelized flow and continues to the south where it outfalls into the West Tributary on-site at design point J4. The curve number for this basin is 61.77. Runoff during the 5-year and 100-year events are 40.8 cfs and 113.2 cfs respectively.

Sub-Basin OB7
The off-site sub-basin consists of an area of 421.20 acres, located on the north side of the property. Drainage flows overland from the north to the south and enters the site as channelized flow within the West Tributary reach. The curve number for this basin is 61.07. Runoff during the 5-year and 100-year events are 101.4 cfs and 284.2 cfs respectively.

Sub-Basin OB8
The offsite sub-basin consists of an area of 33.07 acres, located northeast of the property. Drainage flows overland from the north to the south and enters onto the site as shallow concentrated flow as there is no well-defined natural drainage channel in this area of the site. Flows then continue to the south in a more defined natural channel and outfall into the West

Tributary reach on-site at design point J3. The curve number for this basin is 64.89. Runoff during the 5-year and 100-year events are 19.5 cfs and 51.6 cfs respectively.

Refer to **Appendix E** for the Existing Drainage Conditions Map.

PROPOSED SUB-BASIN DESCRIPTIONS

For the proposed condition, stormwater will generally maintain historic flow patterns from north to south. The proposed roadways will alter some of the existing flow paths. The roadway ditches will capture runoff from the roadways and direct flows back to the existing flow paths, which will ultimately outfall to existing natural drainage channels, sub regional pond, or water quality features. The proposed project has been divided into 15 on-site sub-basins. The off-site basins are fully developed and no changes to the upstream basins are anticipated.

Sub-Basin PB1

The on-site sub-basin consists of 2 residential lots at the southwest corner of the property. The sub-basin has an area of 4.25 acres. The curve number for the sub-basin is 64.35. Runoff during the 5-year and 100-year events are 3.0 cfs and 7.7 cfs respectively. Runoff from this basin will travel across the lots and outfall to the south as it has done historically at design point P1.

Sub-Basin PB2

The on-site sub-basin consists of 1 residential lot at the southwest corner of the property. The sub-basin has an area of 1.08 acres. The curve number for the sub-basin is 65.38. Runoff during the 5-year and 100-year events are 1.0 cfs and 2.4 cfs respectively. Runoff from this basin will travel across the lot and outfall to the south as it has done historically at design point P1. Flows from this sub-basin are not required to be conveyed to a water quality facility according to Appendix I Section 1.7.1.B of El Paso County's Engineering Construction Manual (ECM). The sub-basin is identified as a large lot single family area with an impervious cover under 20 percent under Section 1.7.1.B, number 5. In addition to a small portion of roadway flows that are not required to be conveyed to a water quality facility according to Appendix I Section 1.7.1.C.1.

Sub-Basin PB3

The on-site sub-basin consists of portions of 2 residential lots and the half street of the proposed local roadway at the southwest corner of the property. The sub-basin has an area of 1.38 acres. The curve number for the sub-basin is 67.68. Runoff during the 5-year and 100-year events are 1.5 cfs and 3.3 cfs respectively. Runoff from this basin will travel across the lots and be conveyed to Culvert 1 through a roadside ditch. Flows will then be conveyed through basin PB15 via a natural channel and outfall into Water Quality Feature 1 before out falling into the West Tributary reach at design point P2.

Sub-Basin PB4

The on-site sub-basin consists of 4 residential lots and the half streets of the proposed local roadway at the southwest corner of the property. The sub-basin has an area of 10.54 acres. The curve number for the sub-basin is 64.84. Runoff during the 5-year and 100-year events are 12.6 cfs and 30.2 cfs respectively. Runoff from this basin will travel across the lots and be conveyed by a natural channel to Culvert 2. Where flows will then be conveyed through basin PB15 via a natural channel and outfall into Water Quality Feature 1 before out falling into the West Tributary reach at design point P2.

Sub-Basin PB5

The on-site sub-basin consists of 2 residential lots and the half street of the proposed local roadways at the west side of the property. The sub-basin has an area of 6.18 acres. The curve number for the sub-basin is 64.70. Runoff during the 5-year and 100-year events are 4.2 cfs and 10.4 cfs respectively. Runoff from this basin will travel across the lots and be conveyed by a natural channel to Culvert 7. Where flows will then be conveyed through basin PB4 and PB15 via a natural channel, Culvert 2, and outfall into Water Quality Feature 1 before out falling into the West Tributary reach at design point P2.

Sub-Basin PB6

The on-site sub-basin consists of 3 residential lots and the half street of the proposed local roadway near the central portion of the property. The sub-basin has an area of 11.09 acres. The curve number for the sub-basin is 65.33. Runoff during the 5-year and 100-year events are 8.6 cfs and 20.7 cfs respectively. Runoff from this basin will travel across the lots and roadside ditches to Culvert 3. Where flows will then be conveyed through basin PB15 via a natural channel and outfall into Water Quality Feature 1 before out falling into the West Tributary reach at design point P2.

Sub-Basin PB7

The on-site sub-basin consists of 3 residential lots and portions of the proposed local roadways near the central portion of the property. The sub-basin has an area of 3.46 acres. The curve number for the sub-basin is 66.22. Runoff during the 5-year and 100-year events are 3.2 cfs and 7.4 cfs respectively. Runoff from this basin will travel across the lots and roadside ditches to Culvert 4. Runoff will then be conveyed through a roadside ditch to Culvert 3. From there the runoff will be conveyed through basin PB15 via a natural channel and outfall into Water Quality Feature 1 before out falling into the West Tributary reach.

Sub-Basin PB8

The on-site sub-basin consists of 3 residential lots, a large natural drainage channel and a portion of the sub regional Pond 1 near the northwest corner of the property. The sub-basin has an area of 11.78 acres. The curve number for the sub-basin is 64.13. Runoff during the 5-year and 100-year events are 12.1 cfs and 30.4 cfs respectively. Runoff from this basin will travel across the lots and into the natural channel that outfalls into the sub regional detention Pond 1. Offsite sub-basin OB5 also discharges onto the property and is conveyed to the sub regional detention Pond 1 through sub-basin PB8 via the natural channel.

Sub-Basin PB9

The on-site sub-basin consists of 4 residential lots, a large natural drainage channel and a portion of the sub regional Pond 1 near the northern portion of the property. The sub-basin has an area of 12.80 acres. The curve number for the sub-basin is 64.39. Runoff during the 5-year and 100-year events are 9.8 cfs and 24.8 cfs respectively. Runoff from this basin will travel across the lots and into the natural channel that outfalls into the sub regional detention Pond 1.

Sub-Basin PB10

The on-site sub-basin consists of 4 residential lots and a portion of the sub regional Pond 1 near the northern portion of the property. The sub-basin has an area of 11.53 acres. The curve number for the sub-basin is 64.57. Runoff during the 5-year and 100-year events are 8.2 cfs and 20.4 cfs respectively. Runoff from this basin will travel across the lots and into the natural channel that outfalls into the sub regional detention Pond 1.

Sub-Basin PB11

The on-site sub-basin consists of 6 residential lots and portions of the proposed local roadways near the northeast portion of the property. The sub-basin has an area of 16.11 acres. The curve number for the sub-basin is 64.80. Runoff during the 5-year and 100-year events are 12.1 cfs and 29.8 cfs respectively. Runoff from this basin will travel across the lots utilize roadside ditches and natural drainage channels to convey flows to Culvert 6. From there the runoff will be conveyed through basin PB14 via a natural channel and outfall into Water Quality Feature 2 before out falling into the West Tributary reach.

Sub-Basin PB12

The on-site sub-basin consists of a portion of the proposed local roadways near the east portion of the property. The sub-basin has an area of 0.20 acres. The curve number for the sub-basin is 76.50. Runoff during the 5-year and 100-year events are 0.5 cfs and 0.9 cfs respectively. Runoff from this basin will utilize a roadside ditch to convey flows to Culvert 5. From there the runoff will be conveyed through basin PB14 via a natural channel and outfall into Water Quality Feature 2 before out falling into the West Tributary reach.

Sub-Basin PB13

The on-site sub-basin consists of a portion of the proposed local roadways near the east portion of the property. The sub-basin has an area of 3.87 acres. The curve number for the sub-basin is 64.51. Runoff during the 5-year and 100-year events are 4.5 cfs and 10.9 cfs respectively. Runoff from this basin will sheet flow into the West Tributary reach. From there the runoff will be conveyed to Culvert 8 and through basin PB14 via the West Tributary reach and outfall to design point P3. Flows from this sub-basin are not required to be conveyed to a water quality facility according to Appendix I Section 1.7.1.B of El Paso County's Engineering Construction Manual (ECM). The sub-basin is identified as a large lot single family area with an impervious cover under 20 percent under Section 1.7.1.B, number 5. In addition to a small portion of roadway flows that are not required to be conveyed to a water quality facility according to Appendix I Section 1.7.1.C.1.

Sub-Basin PB14

The on-site sub-basin consists of 4 residential lots a portion of the proposed local roadways near the southeast portion of the property. The sub-basin has an area of 17.28 acres. The curve number for the sub-basin is 63.64. Runoff during the 5-year and 100-year events are 18.9 cfs and 46.3 cfs respectively. Runoff from this basin will sheet flow into the West Tributary reach and outfall to design point P3. Flows from this sub-basin are not required to be conveyed to a water quality facility according to Appendix I Section 1.7.1.B of El Paso County's Engineering Construction Manual (ECM). The sub-basin is identified as a large lot single family area with an impervious cover under 20 percent under Section 1.7.1.B, number 5. In addition to a small portion of roadway flows that are not required to be conveyed to a water quality facility according to Appendix I Section 1.7.1.C.1.

Sub-Basin PB15

The on-site sub-basin consists of 5 residential lots and portions of the proposed local roadways near the northeast portion of the property. The sub-basin has an area of 9.63 acres. The curve number for the sub-basin is 61.65. Runoff during the 5-year and 100-year events are 11.0 cfs and 26.3 cfs respectively. Runoff from this basin will travel across the lots utilize roadside ditches and natural drainage channels to convey flows to Water Quality Feature 1 out falling into the West Tributary reach at design point P2.

Sub-Basins OB1 – OB8

The offsite sub basins are fully built out per the DBPS and are anticipated to maintain historic flows and drainage patterns.

DRAINAGE DESIGN CRITERIA

DEVELOPMENT CRITERIA REFERENCE

The proposed storm facilities are designed to be in compliance with the El Paso County “Engineering Criteria Manual”, Volumes 1 and 2 and the City of Colorado Springs May 2014 Drainage Criteria Manual, Volume 1, (“the DCM”).

Site drainage is not significantly impacted by such constraints as utilities or existing development.

A Falcon Drainage Basin Planning Study prepared by Matrix Design Group, September 2015 (DBPS) was completed and includes the Eagleview subdivision. This planning study was used for reference to assist with drainage design for the proposed subdivision. The proposed release rate for sub regional pond is proposed to be less than or equal to what was determined in the DBPS. As part West Tributary reach analysis, stream improvements were identified and conceptually designed for the entire reach. Refer to **Appendix D** for excerpts from the DBPS.

HYDROLOGIC CRITERIA

The 5-year and 100-year design storm events were used in determining rainfall and runoff for the proposed drainage analysis per the Engineering Manual. The model utilizes the NRCS Type II rainfall distribution, the cumulative depth for the 5-year storm 2.7 inches and the cumulative depth for the 100-year storm is 4.6 inches. Per the DCM both Frontal and Thunderstorms were evaluated to determine the higher design flow. The comparative analysis between the two storms shows that the Frontal Storm produces a significantly higher flow rates therefore, this storm was used for the drainage design. The rainfall distribution for the Frontal Storm was selected as the dominant storm-type for this project. See **Table 1** below for the rainfall values.

Table 1: ***Colorado Springs Rainfall Depths***

	Duration (HRS)	
Storm Event	**1 HR**	**24 HR**
5 Year	1.5	2.7
100 Year	2.52	4.6

It should be noted that the DBPS used a slightly lower cumulative depth for the 5-yr (2.6 inches) and used the same cumulative depth for the 100-year of (4.6 inches) because the DBPS used an aerial reduction of 2% to the rainfall depths as the Falcon Watershed is slightly larger than 10 square miles. This aerial reduction was not applied to the rainfall depths for this Site as the drainage area analyzed was smaller and didn't require an aerial reduction. Refer to Tables 6-2 and 6-4 in Chapter 6 of the DCM for the frontal rainfall distribution curve and Colorado Springs rainfall depths data for the 5-year and 100-year design storm events utilized for the project. The project model was compared to the DBPS model, and it generally reflects lower flows for the project site area. This is mainly due to using the Type II rainfall distribution curve versus the Type IIa rainfall distribution curve that the DBPS model used. Design point JWT080 in the DBPS model and design points J4 and P7 in the project models were used as critical points to compare the existing and proposed condition models.

Design runoff was calculated using the NRCS curve number method as established in the DCM. This aligns with what was completed in the Falcon Drainage Basin Planning Study (DBPS). The NRCS curve number method was used for existing conditions and proposed conditions due to the on-site and off-site basins containing more than 130 acres. Existing and future land uses were obtained from the County GIS department. Where possible, runoff curve numbers established in the DBPS were utilized since these were more conservative than equivalents found in the DCM. For all other areas, curve numbers were developed by using Table 6-10 (ARCII) in the DCM. The CN values calculated for basins in this analysis align closely with those found in the DBPS, with a weighted average of 61.5. **Table 2** below shows all CN values utilized for this report and their source. Calculations for the composite curve numbers are included in the **Appendix B**.

A combination of aerial imagery and available public GIS data were used to calculate weighted impervious values. However, the DBPS was found to underestimate imperviousness of the basins; the impervious values in the DBPS ranged between 1% and 4% with most basins having an impervious value of 2%, while this study identified an impervious value of 8.2% for the area tributary to Sub-Regional Pond 1. Calculations for impervious values are included in the **Appendix B**.

Table 2: ***CN Values***

		Soil Type			
Cover Description	**% Imp**	**A**	**B**	**C**	**D**
Open Space	---	39	61	74	80
Gravel	---	76	85	89	91
Paved	---	98	98	98	98
5 Acre Rural Residential (Woods Landuse) *	---	33	58	73	80
5 Acre Rural Residential (Rangeland Landuse) *	---	40	62	75	81
½ Acre Residential*	25	55	71	81	86

		Soil Type			
Cover Description	**% Imp**	**A**	**B**	**C**	**D**
2 ½ Acre Rural Residential*	11	45	64	76	81

*Values from the Falcon Drainage Basin Planning Study (DBPS) completed in 2015.

The Manning's n values used to calculate the channelized flow regime for the time of concentration were developed by comparison with the DBPS HEC-HMS and HEC-RAS models and through physical confirmation at the site. The Manning's n values used to calculate the overland flow regime for the time of concentration were taken from Table 6-11 in the DCM and can be found in Table 2 below.

Table 3: Manning's n Roughness Coefficients

Surface Description	n Value
Short Grass Prairie	0.15
Woods – Light underbrush	0.4

The time of concentration was calculated following the guidance provided in TR-55 by summing the travel time for overland flow, sheet flow, and channelized flow segments along the longest flow path and a factor of 0.6 was then applied to generate the lag time, per Ch. 6 Section 4.6 of the DCM eated to match the drainage patterns in each sub f concentration calculations for each basin can be f

Describe the natural channel and road side ditch/(native grass) permissible velocity parameters and the source (MHFD).

Describe the mitigation being used (TRM) when it exceeds the natural channel or roadside ditch permissible velocity.

Routing nageways for the project site, was done using the y El Paso County. Routing of channelized flow was all reaches for the existing and proposed model. T in the DBPS models.

Small ex ypical section using FlowMaster that has the following characteristics: a longitudinal slope of 0.025, side slopes of 1.3 (H:V), a Manning's n value of 0.030, and a normal depth of 2 feet. Similarly, proposed roadside ditches were modeled in FlowMaster with a typical section that has the following characteristics: a longitudinal slope of 0.025, side slopes of 4.0 (H:V), a Manning's n value of 0.030, and a normal depth of 18 inches. Calculated discharge for the typical channel and typical ditch are approximately 35 cfs and 57 cfs, respectively. See the FlowMaster worksheet in **Appendix C** for further details on the typical channel and typical ditch. The larger main tributary channel was modeled based on an averaging of cross sections within the DBPS HEC-RAS model for the subject reaches. The longest of these, R-PB13, has the following characteristics: a longitudinal slope of 0.02, side slopes of 3:1 (H:V), and a Manning's n value of 0.03. Bank stability will be analyzed using HEC-RAS and will be included in a subsequential submittal to the Final Drainage Report.

There are no additional provisions selected or deviations from the criteria.

Kimley»Horn

HYDRAULIC CRITERIA

Applicable design methods were utilized to size the proposed detention pond, water quality features, culverts, drainage channels, erosion protection, which include the use of Mile High Flood Districts UD-Detention spreadsheet, UD-Culvert spreadsheet, and FlowMaster. The Site is providing one sub regional detention pond which will include water quality capture volume (WQCV), excess urban runoff volume (EURV), and 100-year detention per the DBPS. The site is also providing two additional water quality features. The Site is not significantly increasing the imperviousness of the Site and the Project is maintaining the historic drainage patterns as much as possible and not significantly increasing developed flows. Proposed drainage features on-site have been analyzed and sized for the Major Storm, 100-year design storm event.

DETENTION AND WATER QUALITY POND

The full spectrum detention pond design was completed utilizing Mile High Flood District's UD-Detention spreadsheet to design the pond outlet structure. Due to limitations present in the UD-Detention spreadsheet when large tributary areas are analyzed, the flows and volume entering the pond tend to be greater than those reported in the HEC-HMS model when analyzing similar storm events. However, in this report the HEC-HMS analyzed the 100-yr, 24-hr storm event vs the UD-detention spreadsheet which can only analyze the 100-yr, 2-hr storm event. The HEC-HMS model results show a lower peak inflow and a higher peak inflow volume to the detention pond than the UD-detention spreadsheet. To compensate for this, the UD-Detention spreadsheet was calibrated, based on area, to show a similar 100-year flow entering the pond which resulted in a lower inflow volume being shown in UD-detention. The following steps were completed for the UD-Detention spreadsheet calibration:

1. A UD-Detention spreadsheet was created which reflects the total area tributary to the pond. This spreadsheet produced 100-year flows exceeding those in the HEC-HMS model. This spreadsheet produced the required water quality capture volume and excess urban rainfall volume (EURV) for the pond.

2. A second UD-Detention spreadsheet was created for the pond with a reduced area. The area was reduced until the resulting peak flows matched those in the HEC-HMS model. All other parameters were held constant.

3. Volumetric results between the second UD-Detention spreadsheet and the HEC-HMS were compared. Since the UD-Detention runoff volume was less than the HEC-HMS runoff volume, an additional check was then done to ensure the pond sizing would be adequate. This step analyzed the HEC-HMS inflow hydrograph that was being conveyed to the pond and then reducing it by 20% to reach a pre vs post ratio of 0.8. The outflow hydrograph of the pond would result in the peak flow being reduced to 80% of inflow hydrograph to the pond. Which is within the allowable recommended pre vs post peak flow ratio. This analysis determined a volume difference of 20.79 ac-ft which, results in the approximate pond volume required to reduce the peak outflow to 80% of the peak inflow. The difference in volume was then used to initially grade the detention pond and ensure the pond outlet structure was designed to account for the higher volume being conveyed to the pond in the HEC-HMS model. The pond and outlet structure design was then iterative process to optimize the pond size and outlet structure design.

4. The water quality capture volume and excess urban runoff volume from step one was manually entered into the second UD-Detention spreadsheet and the outlet structure design then became an iterative process to ensure the UD-detention peak outflow

results and HEC-HMS pond outflow results were both lower than the 0.9(predevelopmentQ100).

5. The pond discharge curve values from UD-Detention were then input into the HEC-HMS model to match the outflow hydrographs.

After calibration, the Sub-Regional pond is estimated to have a volume of 17.2 ac-ft which is larger than the 11.03 ac-ft pond shown in the DBPS. The reason for this discrepancy is the difference in impervious values between the DBPS and this PDR. The DBPS identified values of between 1% and 4% for the subject basins while, after a more detailed analysis, an average imperviousness of 8.2% was found in this study. The water quality capture volume is determined using an empirical formula based on percent impervious. Incorporating this larger volume causes a 6.17 ac-ft increase in the pond size.

The sub regional detention pond and water quality are being proposed for the site. A total of one sub regional, non-jurisdictional detention pond which has been designed for WQCV, EURV, and 100-year detention and two water quality features. The detention pond has been designed per the DBPS and restricts flow to be less than the historic flow to 388 cfs. It should be noted that this flow is less than the flow of 510 cfs identified in the DBPS. Maintenance of the public sub regional pond will be through El Paso County as public drainage easements are provided around the facility. Water Quality Features 1 and 2 will provide water quality control volumes of 0.11 ac-ft and 0.038 ac-ft, respectively and will be privately owned and maintained. Flows in excess of the water quality control volume will be routed through the spillways of the water quality features.

Pond	Proposed Volume (ac-ft)	100-yr Inflow (Developed) [cfs]	Flow Exiting Pond (Developed) [cfs]	Flow Ratio (Developed vs Historic)	100-yr Flows Detained
SR1	17.2 ac-ft	490.6	388	0.80	Yes
WQF1	0.11 ac-ft	181	181	-	No
WQF2	0.038 ac-ft	79	79	-	No

HEC-HMS results and UD-detention Pond calculations are provided in **Appendix B** and **Appendix C**.

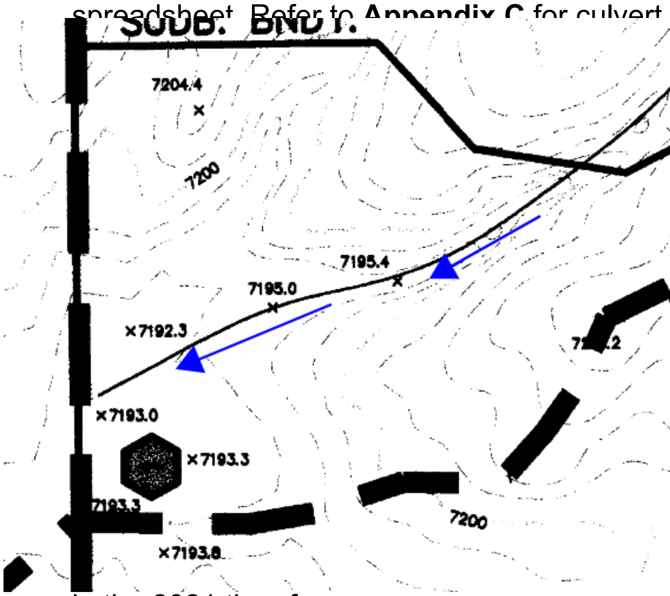
The sub regional detention pond has three rock chutes proposed with a downstream stilling basin to dissipate the energy of the flow being conveyed into the pond through the rock chutes. The stilling basin for each rock chute will have dual purpose. The first purpose will be to assist in dissipating the energy before out falling into the pond bottom and second purpose is to serve as a forebay structure. The concrete line trickle channels will convey flows to the outlet structure micro pool. The outlet structure is designed to provide full spectrum characteristics. The 100-year storm volume will be released via 2-72" RCPs. An emergency spillway is proposed and designed to convey the 100-year flow with a depth of 1.2'. The emergency spillway has been designed to provide a minimum of 1' of freeboard. A 15' wide access road is proposed from top of the pond to the bottom of the pond for maintenance. The pond reduces proposed flows at the outfall below historic levels relative to the existing conditions analysis results.

Water Quality feature 1 has two rock chutes proposed with a downstream stilling basin for each to dissipate the energy of the flow being conveyed into the water quality pond through the rock chutes. The stilling basin for each rock chute will have dual purpose. The first purpose will be to assist in dissipating the energy before out falling into the pond bottom and second purpose is to serve as a forebay structure. The concrete line trickle channel will convey flows to the outlet structure micro pool. The outlet structure is designed to provide water quality treatment only. The water quality flows will be released through a 24" RCP. Once a volume greater than the water quality volume is reached the flows will be conveyed through a combination of the outlet structure and spillway. The spillway has been designed to convey the 100-year flow of 181 cfs. The spillway has been designed to provide a minimum of 1' of freeboard. A 15" wide access road is proposed to the bottom of the pond for maintenance.

Water Quality feature 2 has one rock chute proposed with a downstream stilling basin to dissipate the energy of the flow being conveyed into the water quality pond through the rock chute. The stilling basin for each rock chute will have dual purpose. The first purpose will be to assist in dissipating the energy before out falling into the pond bottom and second purpose is to serve as a forebay structure. The concrete line trickle channel will convey flows to the outlet structure micro pool. The outlet structure is designed to provide water quality treatment only. The water quality flows will be released through a 18" RCP. Once a volume greater than the water quality volume is reached the flows will be conveyed through a combination of the outlet structure and spillway. The spillway has been designed to convey the 100-year flow of 79 cfs. The spillway has been designed to provide a minimum of 1' of freeboard. A 15" wide access road is proposed to the bottom of the pond for maintenance.

CULVERT SIZING

The proposed culverts for the site were designed utilizing Mile High Flood Districts UD-Culvert spreadsheet. Refer to **Appendix C** for culvert sizing and erosion protection calculations.



the need for channel stabilization improvements
the construction of 24 small drop structures within
for drop structure locations based on preliminary
sign is ongoing and will be submitted as separate
lic memorandum and channel construction plans.
channel slope that will be required to maintain
boulder drop structures and 5 riffles drop structures
for the process to obtain reimbursement or credit.

Unclear why this statement is made. In looking at the PBH Fil 12 drainage report the existing topography shows the path matches the path of the spillway.

etention Pond C w... ted
ately 2004. Pond ... to
y spillway flows wi... No 14
in the 2021 time frame.

The new spillway associated with redesigned Detention Pond C ... runoff straight to the west via a 3:1 rip-rap slope at the property line. T... runoff does not match historic and should not have been approved by the County. Nonetheless, we recommend an additional 107 CY of 12" rip-rap be placed at the toe of slope. The additional rip-rap toe protection will allow the spillway runoff to turn 90 degrees south and return to the historic ... e chance of building

Please provide narrative that address lots that require engineered site plan and call out the required culverts pipe sizes and grading layout.

21. The following lots will require engineered site plans for the construction design of driveway culverts in the event driveways are proposed to cross the drainage easements: Lots 4, 5, 9, 19, 20, 25-30, 34-36, and 38.

in the path of the emergency spillway.

DRAINAGE FACILITY DESIGN

GENERAL CONCEPT

The Eagleview subdivision is a low-density residential development with 2 ½ acre lot sizes. The proposed drainage patterns will match the historic patterns as much as possible and not significantly increasing developed flows. To maintain historic flows, one sub regional detention pond (SR1) is being proposed and will capture and control a portion of the onsite and upstream offsite flows as outlined in the DBPS. The runoff from the proposed roads will be treated before releasing it into the West Tributary reach or on to the downstream properties at the historic discharge points.

Provided in the **Appendix B** are hydrologic calculations utilizing the NRCS/HEC-HMS method for the proposed conditions. Provided in **Appendix C** are the calculations for the proposed sub regional pond, water quality features, culvert, and channels. As previously mentioned, the existing and proposed drainage maps can be found in **Appendix E**.

SPECIFIC DETAILS

The existing site is undeveloped land consisting of mostly grassland. The existing conditions of the Site have flows being conveyed from the northwest to the southeast and discharging into the West Tributary reach of the Falcon drainage basin. The site is undeveloped and runoff conditions for the Site were modeled within this study using HEC-HMS. The proposed development looks to preserve the natural drainageways and drainage patterns as much as possible. Culverts have been sized using UD-Culvert and the calculations can be found in **Appendix C**..

The results from the HEC-HMS model for existing conditions show 515.5 cfs leaving the project site for the 100-year storm event and for the proposed conditions 405.1 cfs is leaving the project site at the south side. It is not anticipated that the development will negatively impact the drainageways and related facilities downstream of the development.

A Proposed Drainage Conditions Map is included **Appendix E** of this report for reference.

The U.S. Army Corps of Engineers (USACE) provided an approved jurisdictional determination (AJD) for the wetlands present within the Eagleview site. The USACE AJD found that the wetlands within the site were isolated and not Waters of the U.S. (WOTUS); therefore impacts to these wetlands will not require permitting under Section 404 of the Clean Water Act. Furthermore, the wetlands onsite are unregulated and shall not incur any additional permitting requirements beyond the scope of El Paso County.

The Site will disturb more than 1 acre and will require a Colorado Discharge Permit System (CDPS) General Permit for Stormwater Discharge Associated with Construction Activities from the Colorado Department of Public Health and Environment (CDPHE). The proposed sub-regional detention pond will be non-jurisdictional and will therefore require the submission of a Non-Jurisdictional Water Impoundment Structure application form as a part of the platting process.

EXISTING MAJOR DRAINAGE CHANNELS

The DBPS has identified that stream improvements are need on the West Tributary reach specific to the project Site. The design of the identified improvements within the Site are currently ongoing and will be submitted as a separate submittal from this Final Drainage Report. The design will look to meet the goals from the DBPS but also minimize the on-site stream mitigation measures needed to the West Tributary reach.

THE FOUR STEP PROCESS

The Project was designed in accordance with the four-step process to minimize adverse impacts of urbanization, as outlined in the El Paso County Engineering Manual for BMP selection as noted below:

Step 1. **Employ Runoff Reduction Practices** – The project is proposing a low-density residential development that will be designed to minimize the impact to the current existing terrain. The Site's proposed paved roadways will increase the Site's impervious area, however, roadside ditches and channels will be constructed to slow down the runoff velocity and reduce runoff peaks. The sub regional detention pond and two water quality features will be used to capture stormwater, provide water quality treatment, and maintain flows discharging off site at or below historic levels.

Step 2. Implement BMPs That Provide a Water Quality Capture Volume with Slow Release – Permanent water quality measures and detention facilities will be necessary for the Project. Temporary water quality and erosion control measures will be provided during construction to prevent sediment laden water from discharging from the Site. Water quality measures are being used for all stormwater that contacts roadways, excluding 0.39 acres which cannot practicably be treated. Per ECM Appendix I Section 1.7.C.A., 20% of the development site or less than 1 acre can be excluded from providing water quality. As mentioned, 0.39 acres of impervious area will not be able to be treated which is less than 1 acre of the overall site. Per ECM Appendix I Section 1.7.1.B, in development areas of low-density housing, water quality is required for all roads, but is not required for the entirety of the large-lots. Due to the Project consisting of single family large-lots, lot imperviousness shall be limited to 10 percent or less. Refer to **Appendix E** for PBMP Tributary Areas map.

Step 3 Stabilize Drainageways– Stabilizing proposed roadside ditches, swales, and channels by designing them with slopes that control the flow rates. Placement of riprap upstream and downstream of culverts to help reduce erosion of the roadside ditches. Check dams will be used in areas with steeper grades to slow the runoff. We anticipate this will minimize erosion. Existing drainage ways will be graded to reduce the velocity of the water to minimize erosion.

Step 4. Implement Site Specific and Other Source Control BMPs – The erosion control construction BMPs of the Project were designed to reduce contamination. Source control BMPs include the use of vehicle tracking control, culvert protection, stockpile management, and stabilized staging areas.

DRAINAGE FEES AND REIMBURSABLE COSTS

FEES

The project is within the Falcon Drainage Basin (CHWS1400) which is a part of the El Paso County Drainage Basin Fee Program, which is based on the total amount of impervious acres for the Site. Based on impervious calculations in the Appendix, there are 16.95 impervious acres for the proposed project. Current rates are for the 2022 calendar year. See the detailed breakdown below.

- Drainage Fee/Acre = $34,117 x 121.2 acres x 13.86% x 75% Imp = $429,831
- Bridge Fee/Acre = $4,687 x 121.2 acres x 13.86% Imp = $78,734

Total = $508,565

IMPROVEMENTS AND REIMBURSABLE COSTS

The Falcon Drainage Basin Study identifies two types improvements for the Site, County Costs or Developer Costs. Items identified as Developer Costs (those incurred by the Developer) are eligible for reimbursement. County Costs are not eligible for reimbursement. Each reach and feature was classified in the DBPS as follows:

Reach/Feature	Description	Type of Cost	Reimbursable
RWT094	South of SR1	Developer Cost	Yes
SR1	Sub-Regional Pond	County Cost	No
RWT080	Northwest of SR1	County Cost	No
RWT092	Northeast of SR1	County Cost	No

The developer intends to amend the DBPS to allow for the costs on reaches RWT080 and RWT092 and Sub-Regional Pond SR1 to become reimbursable by following the process outlined below:

1. Drainage reimbursement request application with PCD.
2. Amendment to the DBPS Memorandum requesting RWT080, RWT092 and Pond SR1 changed from a County Cost to Developer Cost
    - Amendment request hearing to the Drainage Board and Board of County Commissioners
3. The subsequent Final Drainage Report associated with the Final Plat application will include the following:
    - Channel analysis to determine the number of drop structures and locations needed to stabilize the channel/meet criteria.
    - Provide cost estimates for the reimbursable improvements.
    - Drainage fee section would reference the BoCC resolution (if approved).
4. Once construction of the reimbursable facilities is completed, procedures for Drainage Improvement Credits and Reimbursements outlined in Chapter 3 of the Drainage Criteria Manual will be in effect.

An Engineering Opinion of Probable Cost for all the stormwater improvements is provided for in the Appendix. See **Appendix F** for an Opinion of Probable Construction Cost (OPCC).

If this is DBPS estimates then bring it to present values based on percent increases to the drainage fees through the years.

Per the costs ... ded in DBPS were scaled to the site to determine an estimate of im... n below.

DBPS Reach	UNIT	QUANITITY	UNIT COST	COST
RWT-094	LF	2,010	$ 687.51	$ 1,381,895
RWT-080	LF	1680	$ 671.19	$ 1,127,599
RWT-092	LF	626	$ 662.04	$ 414,437
RWT-054	LF	784	$ 566.49	$ 444,128
Sub Regional Detention Pond SR1	LS	1	$ 405,769	$ 405,769
Engineering/Administration/Contingency	%	35%		$ 1,320,840
			TOTAL:	$ 5,094,668

Following the Drainage reimbursement request application approval, the Drainage Fees will be as follows based on DBPS cost estimates:

- Drainage Fees= $429,831
- Improvement Costs= $5,094,668
- Reimbursable Costs = $1,474,717 (Reach RWT-094)
- Reimbursement Credit= $1,044,886

Fees are deferred at plat recordation due to reimbursement expenses being greater than the required drainage fees.

SUMMARY

This report has been prepared in accordance with El Paso County stormwater criteria. It outlines the Site design for the 5-year and 100-year storm events drainage system. The drainage design presented within this report conforms to the criteria presented in the MANUAL Additionally, the Site runoff and storm drain facilities will not adversely affect the downstream and surrounding developments.

Provide itemized cost estimate to construct the regional pond, wq ponds, and drop structures that are being installed.
These estimates should be reflected in the Financial Estimate Form.

Provide brief discussion on the maintenance of the drainage easements by Metro/HOA, County, and private owners

REFERENCES

1. City of Colorado Springs “Drainage Criteria Manual (DCM) Volume 1”, dated May 2014
2. El Paso County “Engineering Criteria Manual” Volumes 1 & 2, dated October 31, 2018
3. Natural Resources Conservation Service, Web Soil Survey, dated October 5, 2021.
4. Urban Drainage and Flood Control District Drainage Criteria Manuals (UDFCDCM), (Volumes 1, 2 and 3), prepared by Wright-McLaughlin Engineers, June 2001, with latest revisions.
5. Flood Insurance Rate Map, El Paso County, Colorado and Incorporated Areas, Map Number 08041C0507F and 08041C0530F, Effective Date March 17, 1997, prepared by the Federal Emergency Management Agency (FEMA).
6. Falcon Drainage Basin Planning Study Selected Plan Report (DBPS), prepared by Matrix Design Group, September 2015. PCD File No. MP132.
7. Paintbrush Hills Fil. 14 FDR. (PCD File No. SF2024)
8. Eagleview Subdivision Preliminary Drainage Report (PDR), prepared by Kimley-Horn, October 28, 2022. PCD File No. SP216

APPENDIX

APPENDIX A: FIGURES

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the **North American Vertical Datum of 1988 (NAVD88)**. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, MD 20910-3282

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242 or visit its website at http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by El Paso County, Colorado Springs Utilities, and Anderson Consulting Engineers, Inc. These data are current as of 2008.

This map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map. The profile baselines depicted on this map represent the hydraulic modeling baselines that match the flood profiles and Floodway Data Tables if applicable, in the FIS report. As a result, the profile baselines may deviate significantly from the new base map channel representation and may appear outside of the floodplain.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

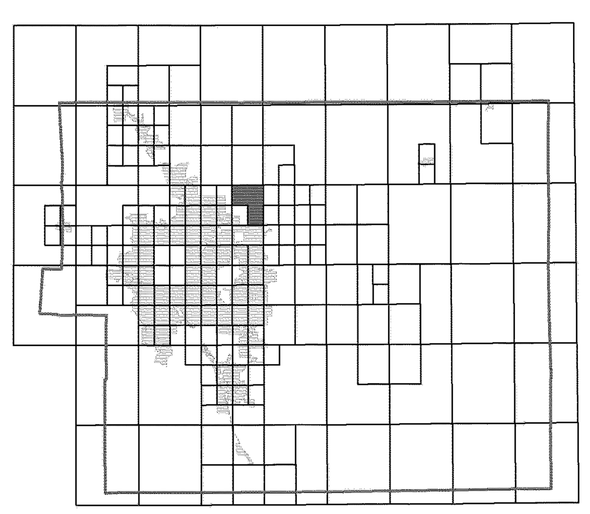
Contact **FEMA Map Service Center** (MSC) via the FEMA Map Information eXchange (FMIX) 1-877-336-2627 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The MSC may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip.

El Paso County Vertical Datum Offset Table

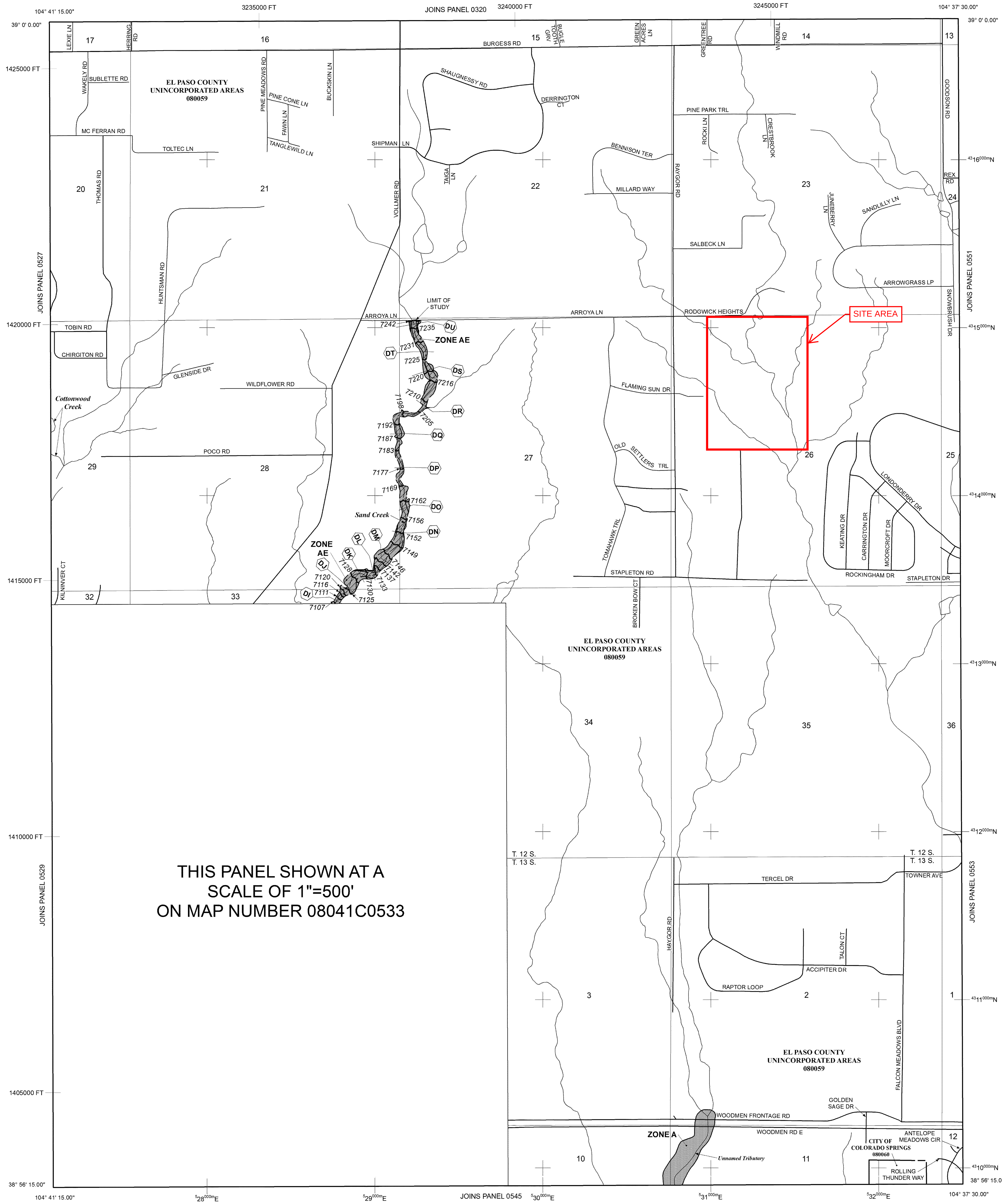
Flooding Source	Vertical Datum Offset (ft)
REFER TO SECTION 3.3 OF THE EL PASO COUNTY FLOOD INSURANCE STUDY FOR STREAM BY STREAM VERTICAL DATUM CONVERSION INFORMATION	

Panel Location Map



This Digital Flood Insurance Rate Map (DFIRM) was produced through a Cooperating Technical Partner (CTP) agreement between the State of Colorado Water Conservation Board (CWCB) and the Federal Emergency Management Agency (FEMA).

Additional Flood Hazard information and resources are available from local communities and the Colorado Water Conservation Board.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 12 SOUTH, RANGE 65 WEST, AND TOWNSHIP 13 SOUTH, RANGE 65 WEST.

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAS) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area Formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D Boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988 (NAVD 88)

A ——— A	Cross section line
23 - - - - 23	Transect line
97° 07' 30.00" 32° 22' 30.00"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
$^{42}75^{000m}$N	1000-meter Universal Transverse Mercator grid ticks, zone 13
6000000 FT	5000-foot grid ticks: Colorado State Plane coordinate system, central zone (FIPSZONE 0502), Lambert Conformal Conic Projection
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
MARCH 17, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
DECEMBER 7, 2018 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History Table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0535G

FIRM
FLOOD INSURANCE RATE MAP
EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 535 OF 1300

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

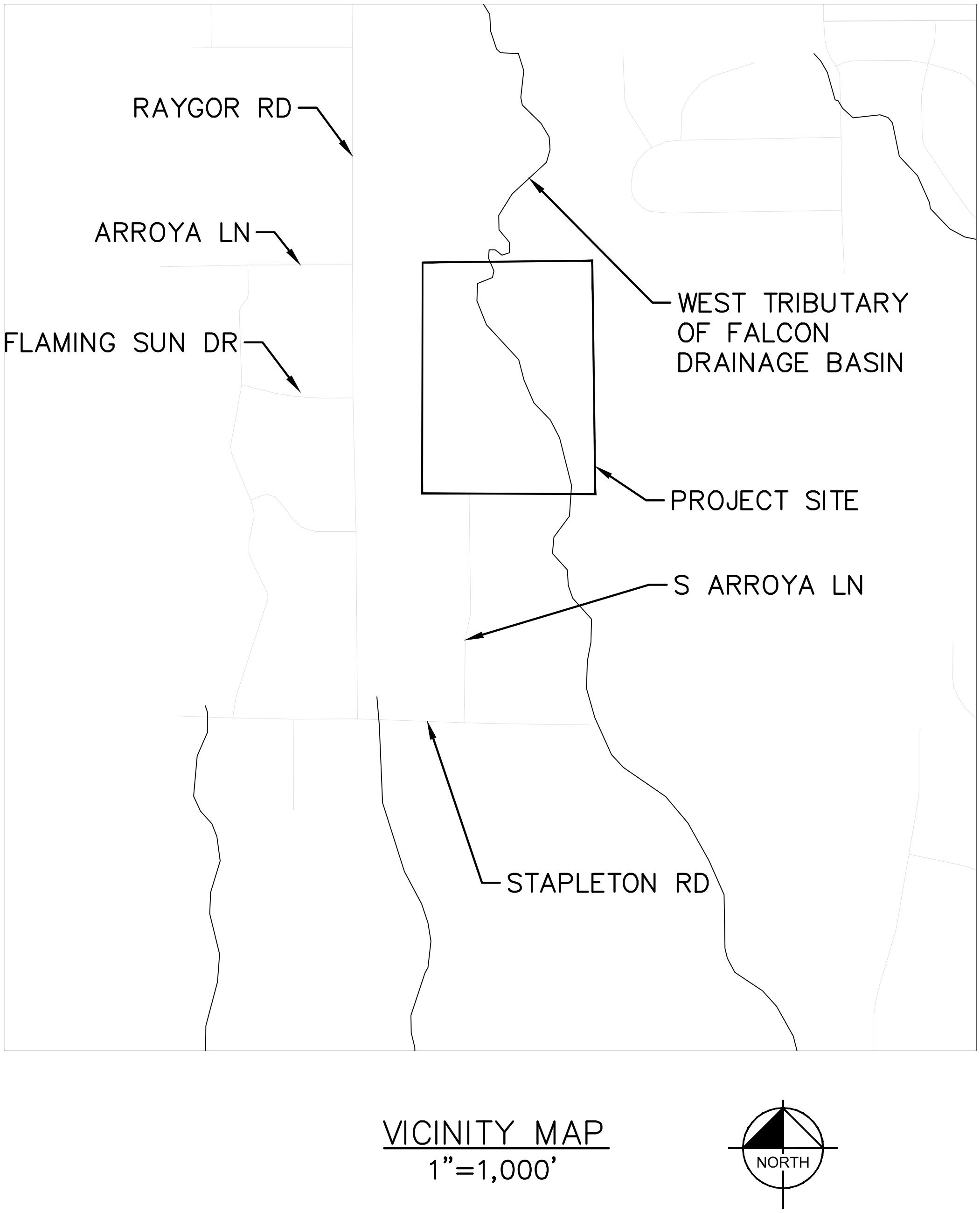
COMMUNITY	NUMBER	PANEL	SUFFIX
COLORADO SPRINGS, CITY OF	080060	0535	G
EL PASO COUNTY	080059	0535	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
08041C0535G

MAP REVISED
DECEMBER 7, 2018

Federal Emergency Management Agency



VICINITY MAP
1"=1,000'

APPENDIX B: HYDROLOGY

United States Department of Agriculture

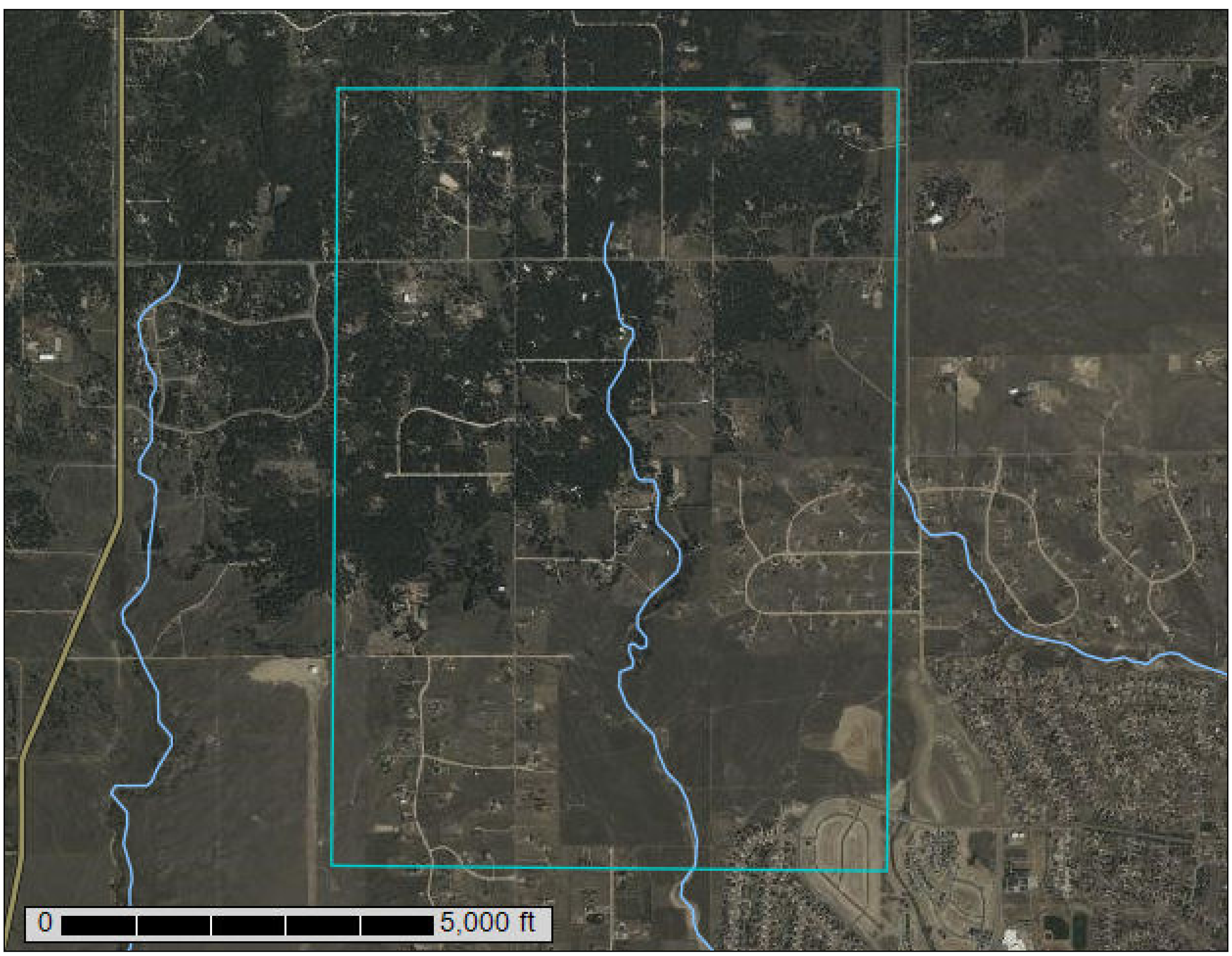
Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

El Paso County Area, Colorado

Eagleview



October 5, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:18,700 if printed on A portrait (8.5" x 11") sheet.

Meters: 0, 250, 500, 1000, 1500

Feet: 0, 500, 1000, 2000, 3000

N

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2018—Oct 20, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
19	Columbine gravelly sandy loam, 0 to 3 percent slopes	5.2	0.3%
40	Kettle gravelly loamy sand, 3 to 8 percent slopes	506.7	28.0%
41	Kettle gravelly loamy sand, 8 to 40 percent slopes	205.0	11.3%
71	Pring coarse sandy loam, 3 to 8 percent slopes	1,092.9	60.4%
Totals for Area of Interest		**1,809.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

El Paso County Area, Colorado

19—Columbine gravelly sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367p
Elevation: 6,500 to 7,300 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Columbine and similar soils: 97 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Columbine

Setting

Landform: Flood plains, fan terraces, fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 14 inches: gravelly sandy loam
C - 14 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XY214CO - Gravelly Foothill
Hydric soil rating: No

Minor Components

Fluvaquentic haplaquolls

Percent of map unit: 1 percent
Landform: Swales
Hydric soil rating: Yes

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

40—Kettle gravelly loamy sand, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 368g
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

E - 0 to 16 inches: gravelly loamy sand
Bt - 16 to 40 inches: gravelly sandy loam
C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: F048AY908CO - Mixed Conifer

Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

41—Kettle gravelly loamy sand, 8 to 40 percent slopes

Map Unit Setting

National map unit symbol: 368h
Elevation: 7,000 to 7,700 feet
Farmland classification: Not prime farmland

Map Unit Composition

Kettle and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kettle

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

E - 0 to 16 inches: gravelly loamy sand
Bt - 16 to 40 inches: gravelly sandy loam
C - 40 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 8 to 40 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F048AY908CO - Mixed Conifer
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

71—Pring coarse sandy loam, 3 to 8 percent slopes

Map Unit Setting

National map unit symbol: 369k
Elevation: 6,800 to 7,600 feet
Farmland classification: Not prime farmland

Map Unit Composition

Pring and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pring

Setting

Landform: Hills
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock

Typical profile

A - 0 to 14 inches: coarse sandy loam
C - 14 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: R048AY222CO - Loamy Park
Hydric soil rating: No

Minor Components

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

Other soils

Percent of map unit:
Hydric soil rating: No

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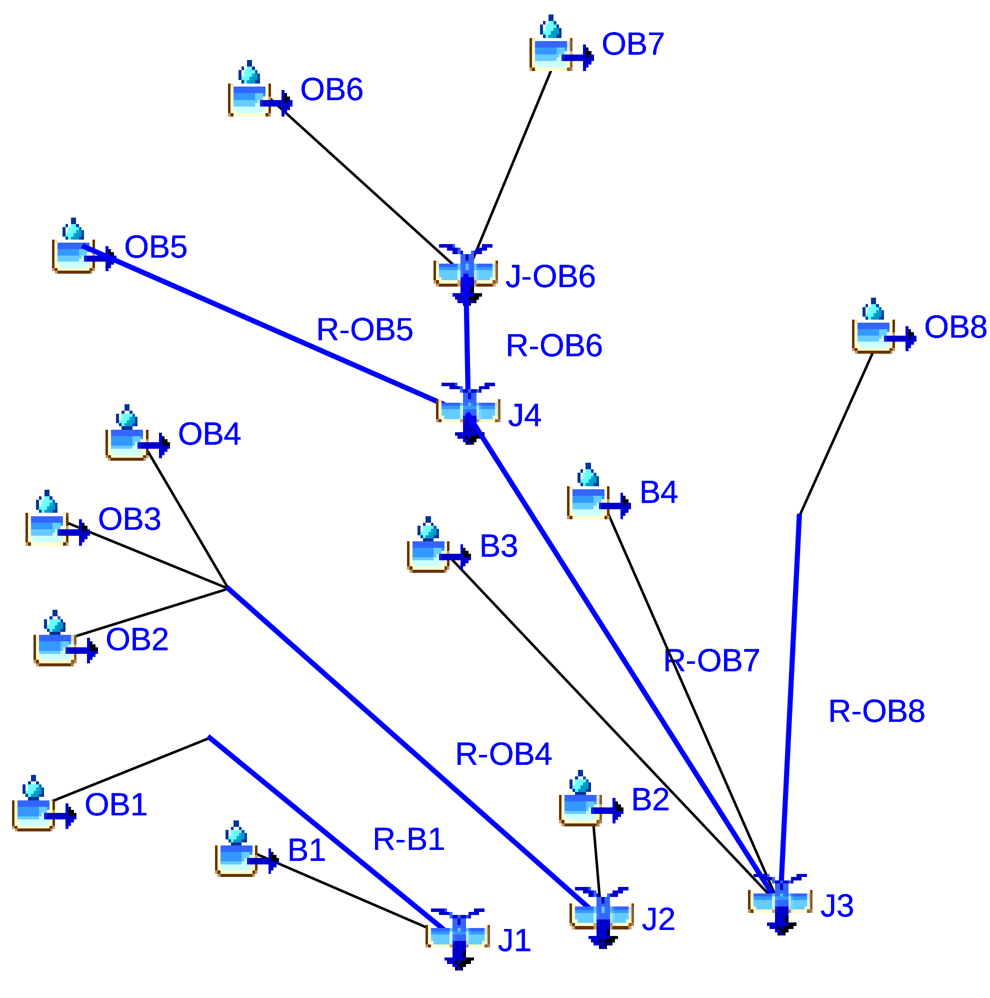
HEC-HMS

Project : Eagleview_Subdivision

Basin Model : Eagleview_Existing

Mar 11 13:21:39 MST 2022



El Paso County Chapter 5: Table 5-2 SCS 24-hr Type II Distribution for TR-20 Input				
Hour	Minutes			
	15	30	45	60
1	0.002	0.005	0.008	0.01
2	0.014	0.017	0.020	0.02
3	0.026	0.029	0.032	0.04
4	0.038	0.041	0.044	0.05
5	0.052	0.056	0.060	0.06
6	0.068	0.072	0.076	0.08
7	0.085	0.090	0.095	0.1
8	0.105	0.110	0.115	0.12
9	0.126	0.133	0.140	0.15
10	0.155	0.163	0.172	0.18
11	0.191	0.203	0.218	0.24
12	0.257	0.283	0.387	0.66
13	0.707	0.735	0.758	0.78
14	0.791	0.804	0.815	0.83
15	0.834	0.842	0.849	0.86
16	0.863	0.869	0.875	0.88
17	0.887	0.893	0.898	0.9
18	0.908	0.913	0.918	0.92
19	0.926	0.930	0.934	0.94
20	0.942	0.946	0.950	0.95
21	0.956	0.959	0.962	0.97
22	0.968	0.971	0.974	0.98
23	0.980	0.983	0.986	0.99
24	0.992	0.995	0.998	1

Table 6-2. 24hr Rainfall Depths for Colorado Springs	
Return Period	Depths
2-yr	2.1
5-yr	2.7
10-yr	3.2
25-yr	3.6
50-yr	4.2
100-yr	4.6

Design Strom Hyetograph Table								
	Time (mins)	Fraction of 1-hr Rainfall Depth	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
	0	0	0	0	0	0	0	0
	15	0.002	0.0042	0.0054	0.0064	0.0072	0.0084	0.0092
	30	0.005	0.0105	0.0135	0.016	0.018	0.021	0.023
	45	0.008	0.0168	0.0216	0.0256	0.0288	0.0336	0.0368
1	60	0.011	0.0231	0.0297	0.0352	0.0396	0.0462	0.0506
	75	0.014	0.0294	0.0378	0.0448	0.0504	0.0588	0.0644
	90	0.017	0.0357	0.0459	0.0544	0.0612	0.0714	0.0782
	105	0.02	0.042	0.054	0.064	0.072	0.084	0.092
2	120	0.023	0.0483	0.0621	0.0736	0.0828	0.0966	0.1058
	135	0.026	0.0546	0.0702	0.0832	0.0936	0.1092	0.1196
	150	0.029	0.0609	0.0783	0.0928	0.1044	0.1218	0.1334
	165	0.032	0.0672	0.0864	0.1024	0.1152	0.1344	0.1472
3	180	0.035	0.0735	0.0945	0.112	0.126	0.147	0.161
	195	0.038	0.0798	0.1026	0.1216	0.1368	0.1596	0.1748
	210	0.041	0.0861	0.1107	0.1312	0.1476	0.1722	0.1886
	225	0.044	0.0924	0.1188	0.1408	0.1584	0.1848	0.2024
4	240	0.048	0.1008	0.1296	0.1536	0.1728	0.2016	0.2208
	255	0.052	0.1092	0.1404	0.1664	0.1872	0.2184	0.2392
	270	0.056	0.1176	0.1512	0.1792	0.2016	0.2352	0.2576
	285	0.06	0.126	0.162	0.192	0.216	0.252	0.276
5	300	0.0604	0.12684	0.16308	0.19328	0.21744	0.25368	0.27784
	315	0.068	0.1428	0.1836	0.2176	0.2448	0.2856	0.3128
	330	0.072	0.1512	0.1944	0.2304	0.2592	0.3024	0.3312
	345	0.076	0.1596	0.2052	0.2432	0.2736	0.3192	0.3496
6	360	0.08	0.168	0.216	0.256	0.288	0.336	0.368
	375	0.085	0.1785	0.2295	0.272	0.306	0.357	0.391
	390	0.09	0.189	0.243	0.288	0.324	0.378	0.414
	405	0.095	0.1995	0.2565	0.304	0.342	0.399	0.437
7	420	0.1	0.21	0.27	0.32	0.36	0.42	0.46
	435	0.105	0.2205	0.2835	0.336	0.378	0.441	0.483
	450	0.11	0.231	0.297	0.352	0.396	0.462	0.506
	465	0.115	0.2415	0.3105	0.368	0.414	0.483	0.529
8	480	0.12	0.252	0.324	0.384	0.432	0.504	0.552
	495	0.126	0.2646	0.3402	0.4032	0.4536	0.5292	0.5796
	510	0.133	0.2793	0.3591	0.4256	0.4788	0.5586	0.6118
	525	0.14	0.294	0.378	0.448	0.504	0.588	0.644
9	540	0.147	0.3087	0.3969	0.4704	0.5292	0.6174	0.6762
	555	0.155	0.3255	0.4185	0.496	0.558	0.651	0.713
	570	0.163	0.3423	0.4401	0.5216	0.5868	0.6846	0.7498
	585	0.172	0.3612	0.4644	0.5504	0.6192	0.7224	0.7912
10	600	0.181	0.3801	0.4887	0.5792	0.6516	0.7602	0.8326
	615	0.191	0.4011	0.5157	0.6112	0.6876	0.8022	0.8786
	630	0.203	0.4263	0.5481	0.6496	0.7308	0.8526	0.9338
	645	0.218	0.4578	0.5886	0.6976	0.7848	0.9156	1.0028
11	660	0.236	0.4956	0.6372	0.7552	0.8496	0.9912	1.0856
	675	0.257	0.5397	0.6939	0.8224	0.9252	1.0794	1.1822
	690	0.283	0.5943	0.7641	0.9056	1.0188	1.1886	1.3018
	705	0.387	0.8127	1.0449	1.2384	1.3932	1.6254	1.7802
12	720	0.663	1.3923	1.7901	2.1216	2.3868	2.7846	3.0498
	735	0.707	1.4847	1.9089	2.2624	2.5452	2.9694	3.2522
	750	0.735	1.5435	1.9845	2.352	2.646	3.087	3.381
	765	0.758	1.5918	2.0466	2.4256	2.7288	3.1836	3.4868
13	780	0.776	1.6296	2.0952	2.4832	2.7936	3.2592	3.5696
	795	0.791	1.6611	2.1357	2.5312	2.8476	3.3222	3.6386
	810	0.804	1.6884	2.1708	2.5728	2.8944	3.3768	3.6984
	825	0.815	1.7115	2.2005	2.608	2.934	3.423	3.749

14	840	0.825	1.7325	2.2275	2.64	2.97	3.465	3.795
	855	0.834	1.7514	2.2518	2.6688	3.0024	3.5028	3.8364
	870	0.842	1.7682	2.2734	2.6944	3.0312	3.5364	3.8732
	885	0.849	1.7829	2.2923	2.7168	3.0564	3.5658	3.9054
15	900	0.856	1.7976	2.3112	2.7392	3.0816	3.5952	3.9376
	915	0.863	1.8123	2.3301	2.7616	3.1068	3.6246	3.9698
	930	0.869	1.8249	2.3463	2.7808	3.1284	3.6498	3.9974
	945	0.875	1.8375	2.3625	2.8	3.15	3.675	4.025
16	960	0.881	1.8501	2.3787	2.8192	3.1716	3.7002	4.0526
	975	0.887	1.8627	2.3949	2.8384	3.1932	3.7254	4.0802
	990	0.893	1.8753	2.4111	2.8576	3.2148	3.7506	4.1078
	1005	0.898	1.8858	2.4246	2.8736	3.2328	3.7716	4.1308
17	1020	0.903	1.8963	2.4381	2.8896	3.2508	3.7926	4.1538
	1035	0.908	1.9068	2.4516	2.9056	3.2688	3.8136	4.1768
	1050	0.913	1.9173	2.4651	2.9216	3.2868	3.8346	4.1998
	1065	0.918	1.9278	2.4786	2.9376	3.3048	3.8556	4.2228
18	1080	0.922	1.9362	2.4894	2.9504	3.3192	3.8724	4.2412
	1095	0.926	1.9446	2.5002	2.9632	3.3336	3.8892	4.2596
	1110	0.93	1.953	2.511	2.976	3.348	3.906	4.278
	1125	0.934	1.9614	2.5218	2.9888	3.3624	3.9228	4.2964
19	1140	0.938	1.9698	2.5326	3.0016	3.3768	3.9396	4.3148
	1155	0.942	1.9782	2.5434	3.0144	3.3912	3.9564	4.3332
	1170	0.946	1.9866	2.5542	3.0272	3.4056	3.9732	4.3516
	1185	0.95	1.995	2.565	3.04	3.42	3.99	4.37
20	1200	0.953	2.0013	2.5731	3.0496	3.4308	4.0026	4.3838
	1215	0.956	2.0076	2.5812	3.0592	3.4416	4.0152	4.3976
	1230	0.959	2.0139	2.5893	3.0688	3.4524	4.0278	4.4114
	1245	0.962	2.0202	2.5974	3.0784	3.4632	4.0404	4.4252
21	1260	0.965	2.0265	2.6055	3.088	3.474	4.053	4.439
	1275	0.968	2.0328	2.6136	3.0976	3.4848	4.0656	4.4528
	1290	0.971	2.0391	2.6217	3.1072	3.4956	4.0782	4.4666
	1305	0.974	2.0454	2.6298	3.1168	3.5064	4.0908	4.4804
22	1320	0.977	2.0517	2.6379	3.1264	3.5172	4.1034	4.4942
	1335	0.98	2.058	2.646	3.136	3.528	4.116	4.508
	1350	0.983	2.0643	2.6541	3.1456	3.5388	4.1286	4.5218
	1365	0.986	2.0706	2.6622	3.1552	3.5496	4.1412	4.5356
23	1380	0.989	2.0769	2.6703	3.1648	3.5604	4.1538	4.5494
	1395	0.992	2.0832	2.6784	3.1744	3.5712	4.1664	4.5632
	1410	0.995	2.0895	2.6865	3.184	3.582	4.179	4.577
	1425	0.998	2.0958	2.6946	3.1936	3.5928	4.1916	4.5908
24	1440	1	2.1	2.7	3.2	3.6	4.2	4.6

IMPERVIOUS FACTOR CALCULATION TABLE - EXISTING CONDITIONS

	Basin	Area (Acre)	Open Space (2%)	Buildings (100%)	Paved Roadway (100%)	Gravel Roadway (80%)	Total % Check	Weighted Impervious
Onsite	B1	5.55	93%	0%	0%	6%	99%	7%
	B2	41.43	100%	0%	0%	0%	100%	2%
	B3	59.54	100%	0%	0%	0%	100%	2%
	B4	14.68	100%	0%	0%	0%	100%	2%
Offsite	OB1	10.37	93%	2%	4%	2%	100%	9%
	OB2	28.06	90%	3%	3%	5%	100%	11%
	OB3	43.44	92%	2%	2%	4%	100%	9%
	OB4	10.50	87%	4%	5%	4%	100%	13%
	OB5	143.82	94%	2%	1%	3%	100%	7%
	OB6	118.40	93%	1%	2%	4%	100%	8%
	OB7	421.43	93%	2%	1%	4%	100%	8%
	OB8	33.08	93%	2%	1%	5%	100%	8%
Total		930.30						10.6%

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Pre Runoff Analysis
Time of Concentration

Project Information

Project Name: Eagleview
KHA Project #: 196288000
Designed by: DCM Date: 3/17/2022
Revised by: Date:
Checked by: BAH Date: 3/17/2022

Minimum Time of Concentration 5.0 minutes
2YR-24HR Rainfall, P2 2.10

Pre-Development
Drainage Area: OB1

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.073	0.15	2.10						17.35	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	1118.00	0.038			U				3.14	5.93	
							Pre-Development Time of Concentration, OB1				23.28	13.97

Pre-Development
Drainage Area: OB2

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.063	0.15	2.10						18.41	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	554.00	0.046			U				3.45	2.67	
CHANNEL	T2 CHANNEL FLOW	841.00	0.029	0.05		U	9.50	6.60	1.44	6.45	2.17	
							Pre-Development Time of Concentration, OB2				23.26	13.95

Pre-Development
Drainage Area: OB3

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.074	0.15	2.10						17.26	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	2436.00	0.034			U				2.97	13.65	
							Pre-Development Time of Concentration, OB3				30.91	18.55

Pre-Development
Drainage Area: OB4

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.042	0.15	2.10						21.65	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	783.00	0.038			U				3.16	4.13	
CHANNEL	T2 CHANNEL FLOW	577.00	0.028	0.05		U	9.50	6.60	1.44	6.36	1.51	
							Pre-Development Time of Concentration, OB4				27.29	16.38

Pre-Development
Drainage Area: OB5

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.037	0.40	2.10						49.91	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	3838.00	0.033			U				2.93	21.83	
CHANNEL	T2 CHANNEL FLOW	1407.00	0.024	0.04		U	9.50	6.60	1.44	7.36	3.19	
							Pre-Development Time of Concentration, OB5				74.93	44.96

Pre-Development
Drainage Area: OB6

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.064	0.40	2.10						40.09	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	2569.00	0.038			U				3.14	13.62	
CHANNEL	T2 CHANNEL FLOW	2110.00	0.027	0.04		U	9.50	6.60	1.44	7.73	4.55	
							Pre-Development Time of Concentration, OB6				58.25	34.95

Pre-Development
Drainage Area: OB7

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.028	0.40	2.10						55.80	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	2068.00	0.036			U				3.06	11.26	
CHANNEL	T3 CHANNEL FLOW	6198.00	0.03	0.04		U	12.00	22.00	0.55	4.09	25.29	
							Pre-Development Time of Concentration, OB7				92.35	55.41

Pre-Development
Drainage Area: OB8

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.029	0.15	2.10						25.10	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	1117.00	0.043			U				3.34	5.57	
CHANNEL	T2 CHANNEL FLOW	762.00	0.033	0.03		U	9.50	6.60	1.44	11.43	1.11	
							Pre-Development Time of Concentration, OB8				31.78	19.07

Pre-Development
Drainage Area: B1

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.027	0.15	2.10						25.83	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	368.00	0.033			U				2.91	2.11	
CHANNEL	T2 CHANNEL FLOW	210.00	0.034	0.03		U	9.50	6.60	1.44	11.68	0.30	
							Pre-Development Time of Concentration, B1				28.24	16.94

Pre-Development
Drainage Area: B2

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.022	0.15	2.10						28.04	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	737.00	0.025			U				2.55	4.82	
CHANNEL	T3 CHANNEL FLOW	1086.00	0.02	0.03		U	9.50	6.60	1.44	9.18	1.97	
							Pre-Development Time of Concentration, B2				34.83	20.90

Pre-Development
Drainage Area: B3

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
CHANNEL	T3 CHANNEL FLOW	2985.00	0.02	0.03		U	14.00	34.00	0.41	3.58	13.88	
							Pre-Development Time of Concentration, B3				13.88	8.33

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Pre Runoff Analysis
Time of Concentration

Project Information

Project Name: Eagleview
KHA Project #: 196288000
Designed by: DCM Date: 3/17/2022
Revised by: Date:
Checked by: BAH Date: 3/17/2022

Minimum Time of Concentration 5.0 minutes
2YR-24HR Rainfall, P2 2.10

Pre-Development

Drainage Area: B4

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.020	0.15	2.10						29.13	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	181.00	0.044			U				3.37	0.90	
CHANNEL	T2 CHANNEL FLOW	1548.00	0.033	0.03		U	9.50	6.60	1.44	11.50	2.24	
							Pre-Development Time of Concentration, B4				32.27	19.36

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Pre Runoff Analysis

Composite CN

Project Name:	Eagleview		
KHA Project #:	196288000		
Designed by:	DCM	Date:	3/17/2022
Revised by:		Date:	
Revised by:		Date:	
Checked by:	BAH	Date:	3/17/2022

Pre-Development					
***Drainage Area:** OB1*					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	9.79	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	0.38	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	0.20	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB1		**63.76**		10.37	0.569

Pre-Development					
***Drainage Area:** OB2*					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	25.92	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	0.86	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	1.28	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB2		**64.16**		28.06	0.559

Pre-Development					
***Drainage Area:** OB3*					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	40.88	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	0.89	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	1.67	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB3		**63.62**		43.44	0.572

Pre-Development					
***Drainage Area:** OB4*					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	9.55	0.00
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	0.52	0.55
IMPERVIOUS	Gravel (including right of way)	B	85.00	0.43	9.95
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB4		**64.71**		10.50	0.545

Pre-Development					
***Drainage Area:** OB5*					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	28.58	--
RESIDENTIAL	RR-5 (Woods Landuse)	B	58.00	109.48	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	1.12	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	4.64	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB5		**59.98**		143.82	0.667

Pre-Development					
***Drainage Area:** OB6*					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	60.64	--
RESIDENTIAL	RR-5 (Woods Landuse)	B	58.00	51.19	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	2.04	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	4.53	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB6		**61.77**		118.40	0.619

Kimley»Horn

Pre Runoff Analysis
Composite CN

Project Name: Eagleview
KHA Project #: 196288000
Designed by: DCM Date: 3/17/2022
Revised by: Date:
Revised by: Date:
Checked by: BAH Date: 3/17/2022

Pre-Development					
Drainage Area: OB7					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	122.08	--
RESIDENTIAL	RR-5 (Woods Landuse)	B	58.00	259.48	--
RESIDENTIAL	2.5 acre	B	64.00	16.02	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	5.46	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	18.17	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB7		61.07		421.20	0.637

Pre-Development					
Drainage Area: OB8					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	8.71	--
RESIDENTIAL	2.5 acre	B	64.00	21.76	--
RESIDENTIAL	1/2 acre (25% imp.)	B	71.00	0.79	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	0.24	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	1.57	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB8		64.89		33.07	0.541

Pre-Development					
Drainage Area: B1					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
OPEN_SPACE	Good condition (grass cover >75%)	B	61.00	5.55	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - B1		61.00		5.55	0.639

Pre-Development					
Drainage Area: B2					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
OPEN_SPACE	Good condition (grass cover >75%)	A	39.00	0.61	--
OPEN_SPACE	Good condition (grass cover >75%)	B	61.00	40.82	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - B2		60.68		41.43	0.648

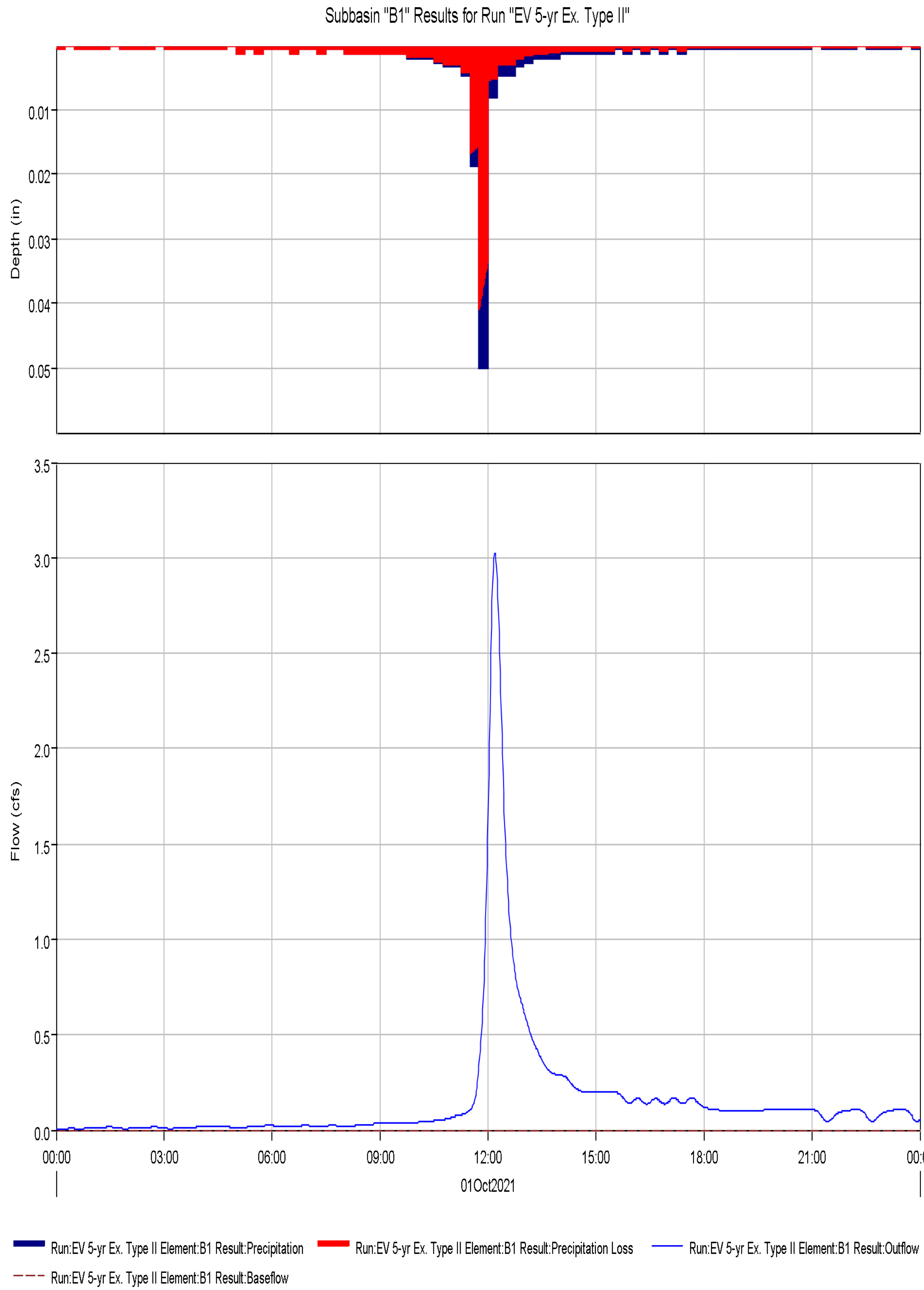
Pre-Development					
Drainage Area: B3					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
OPEN_SPACE	Good condition (grass cover >75%)	A	39.00	0.28	--
OPEN_SPACE	Good condition (grass cover >75%)	B	61.00	59.27	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - B3		60.90		59.54	0.642

Pre-Development					
Drainage Area: B4					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
OPEN_SPACE	Good condition (grass cover >75%)	B	61.00	14.68	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - B4		61.00		14.68	0.639

Project: Eagleview_Subdivision Simulation Run: EV 5-yr Ex. Type II

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
B1	0.0091800	3.0	01Oct2021, 12:11	0.3
B2	0.0647266	15.4	01Oct2021, 12:16	1.8
B3	0.0930359	36.4	01Oct2021, 12:04	2.7
B4	0.0229422	5.8	01Oct2021, 12:14	0.7
J1	0.0253831	10.1	01Oct2021, 12:11	1.0
J2	0.1928516	67.5	01Oct2021, 12:15	7.3
J3	1.2354980	183.1	01Oct2021, 12:47	42.8
J4	1.0678500	169.2	01Oct2021, 12:46	37.4
J-OB6	0.8431300	132.4	01Oct2021, 12:45	30.1
OB1	0.0162031	7.1	01Oct2021, 12:08	0.7
OB2	0.0438438	20.6	01Oct2021, 12:08	1.9
OB3	0.0678750	25.3	01Oct2021, 12:13	2.8
OB4	0.0164062	7.5	01Oct2021, 12:10	0.8
OB5	0.2247200	36.8	01Oct2021, 12:42	7.4
OB6	0.1850100	40.8	01Oct2021, 12:30	6.8
OB7	0.6581200	101.4	01Oct2021, 12:53	23.3
OB8	0.0516699	19.5	01Oct2021, 12:13	2.1
R-B1	0.0162031	7.1	01Oct2021, 12:11	0.7
R-OB4	0.1281250	52.2	01Oct2021, 12:14	5.4
R-OB5	0.2247200	36.8	01Oct2021, 12:45	7.4
R-OB6	0.8431300	132.4	01Oct2021, 12:46	30.0
R-OB7	1.0678500	169.2	01Oct2021, 12:49	37.3
R-OB8	0.0516699	19.4	01Oct2021, 12:17	2.1



Subbasin "B1" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.01
0.02
0.03
0.04
0.05
Flow (cfs)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:B1 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:B1 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:B1 Result:Outflow
Run:EV 5-yr Ex. Type II Element:B1 Result:Baseflow

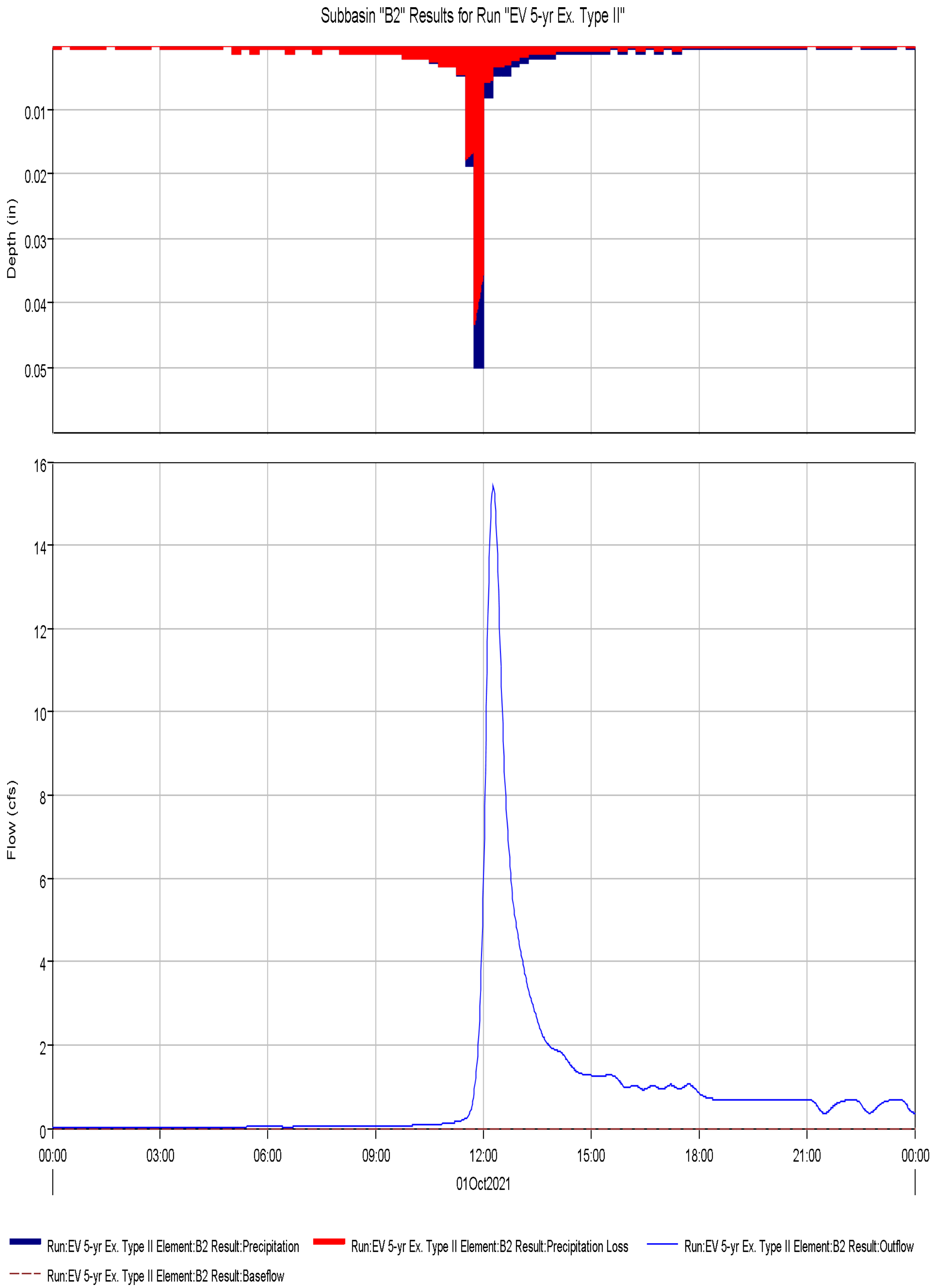
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: B1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	3.0 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:11
Total Precipitation :	1.3 (AC-FT)	Total Direct Runoff :	0.3 (AC-FT)
Total Loss :	1.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.3 (AC-FT)	Discharge :	0.3 (AC-FT)



Subbasin "B2" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.01
0.02
0.03
0.04
0.05
Flow (cfs)
16
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:B2 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:B2 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:B2 Result:Outflow
Run:EV 5-yr Ex. Type II Element:B2 Result:Baseflow

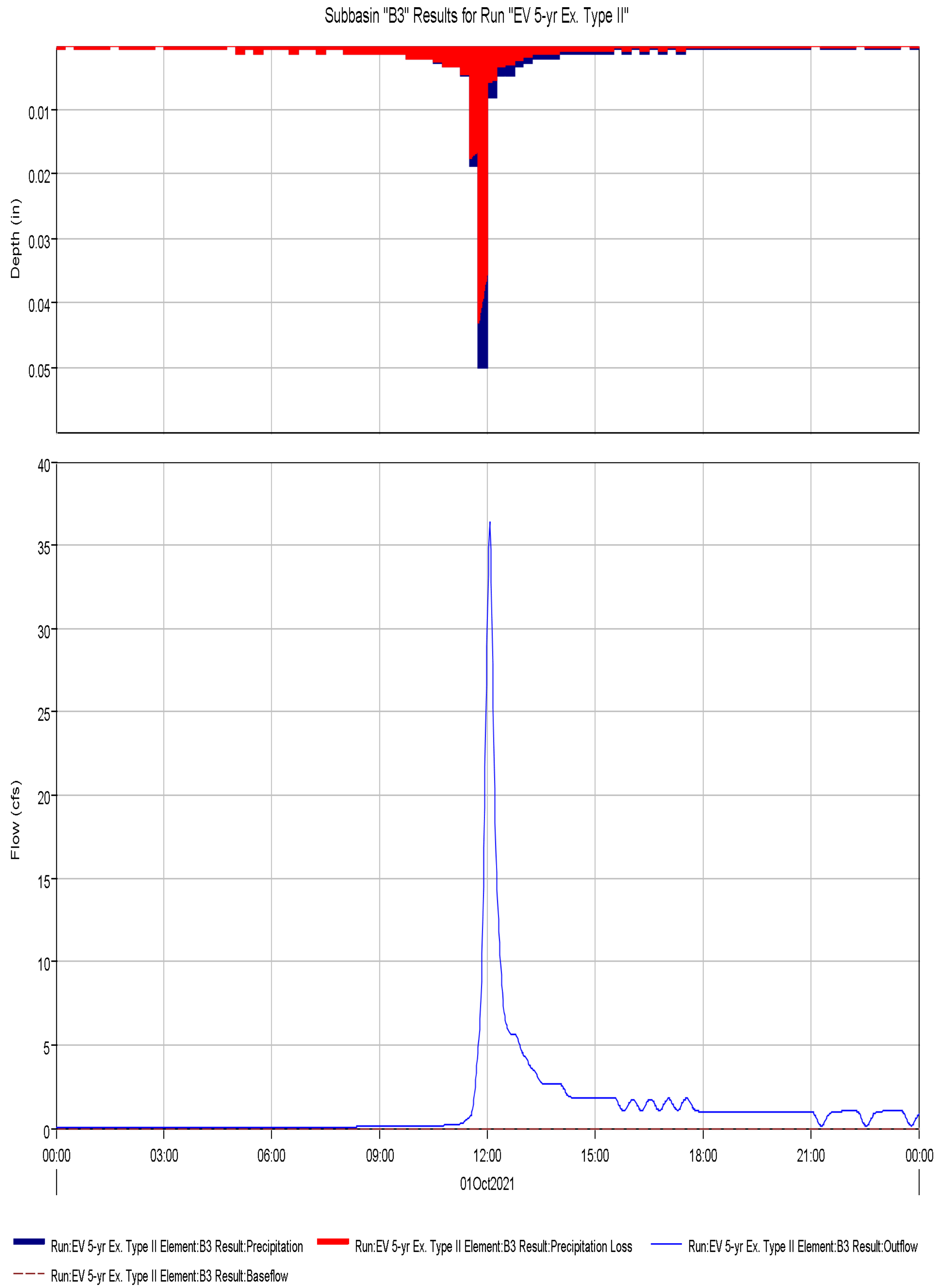
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: B2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	15.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:16
Total Precipitation :	9.3 (AC-FT)	Total Direct Runoff :	1.8 (AC-FT)
Total Loss :	7.5 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.9 (AC-FT)	Discharge :	1.8 (AC-FT)


Subbasin "B3" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.01
0.02
0.03
0.04
0.05
Flow (cfs)
40
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:B3 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:B3 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:B3 Result:Outflow
Run:EV 5-yr Ex. Type II Element:B3 Result:Baseflow

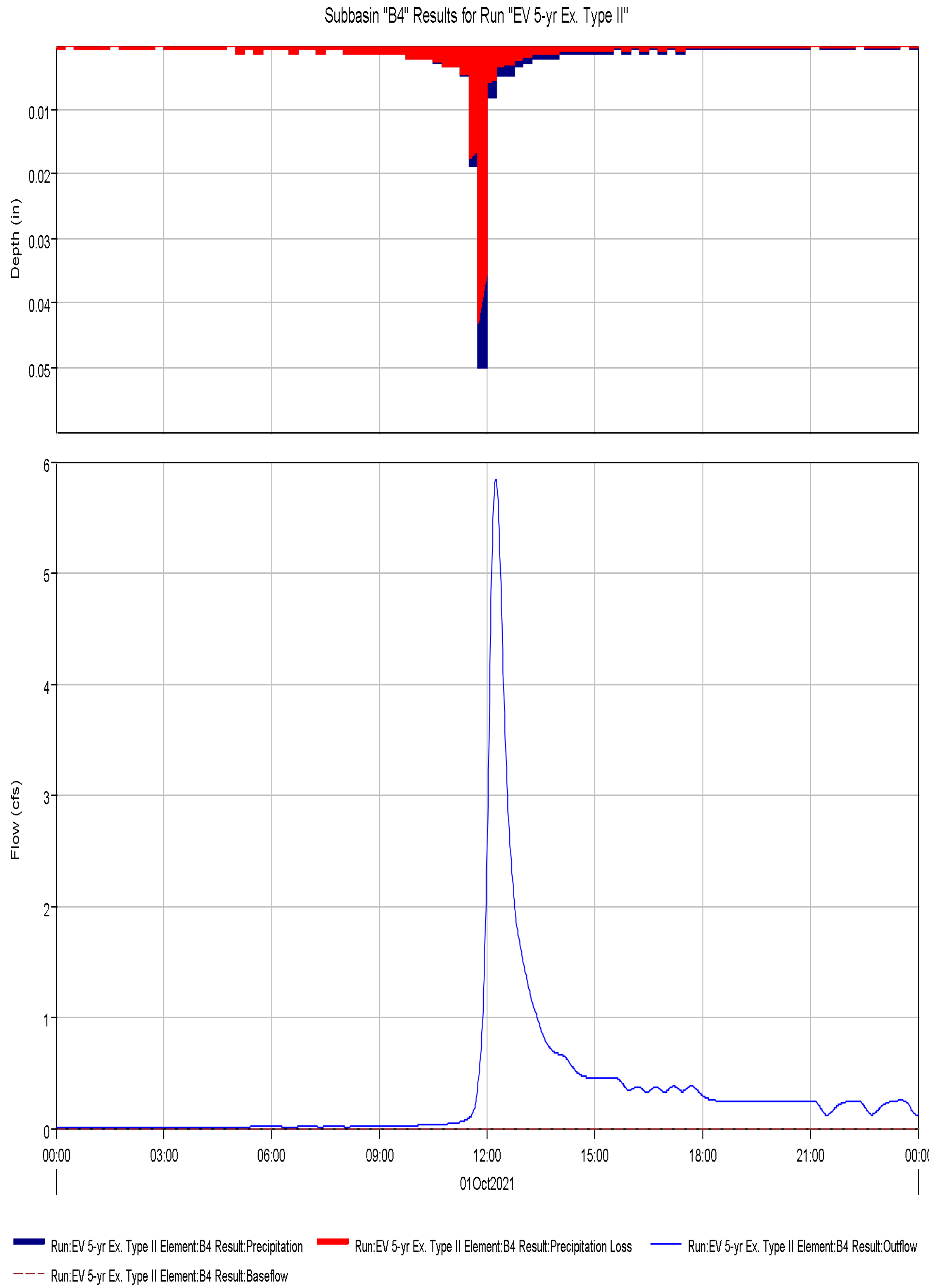
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: B3

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	36.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:04
Total Precipitation :	13.4 (AC-FT)	Total Direct Runoff :	2.7 (AC-FT)
Total Loss :	10.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.7 (AC-FT)	Discharge :	2.7 (AC-FT)


Subbasin "B4" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.01
0.02
0.03
0.04
0.05
Flow (cfs)
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:B4 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:B4 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:B4 Result:Outflow
Run:EV 5-yr Ex. Type II Element:B4 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: B4

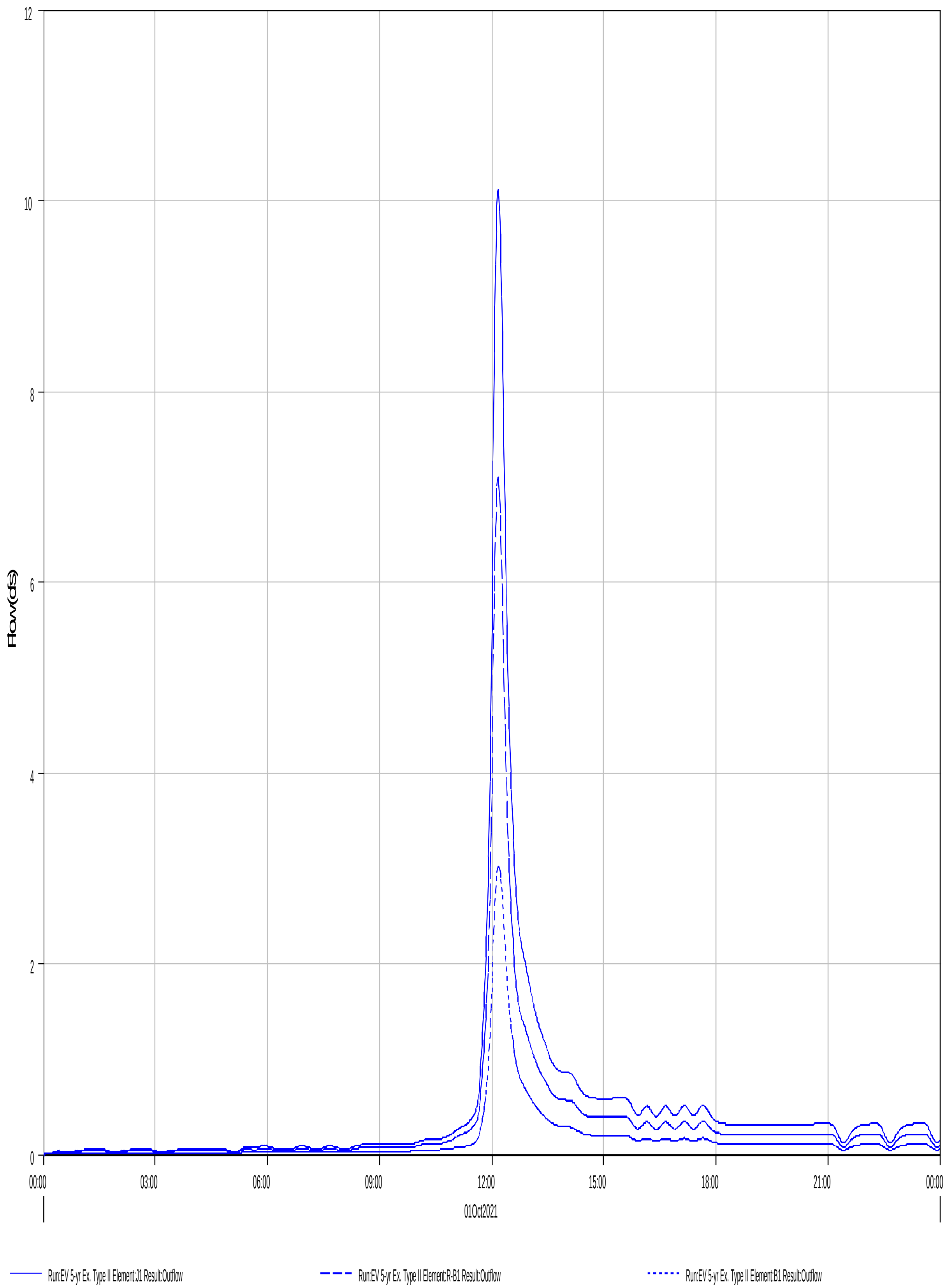
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	5.8 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:14
Total Precipitation :	3.3 (AC-FT)	Total Direct Runoff :	0.7 (AC-FT)
Total Loss :	2.6 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.7 (AC-FT)	Discharge :	0.7 (AC-FT)

Junction "J1" Results for Run "EV 5-yr Ex. Type II"



Project:	Eagleview_Subdivision
Simulation Run:	EV 5-yr Ex. Type II Junction: J1

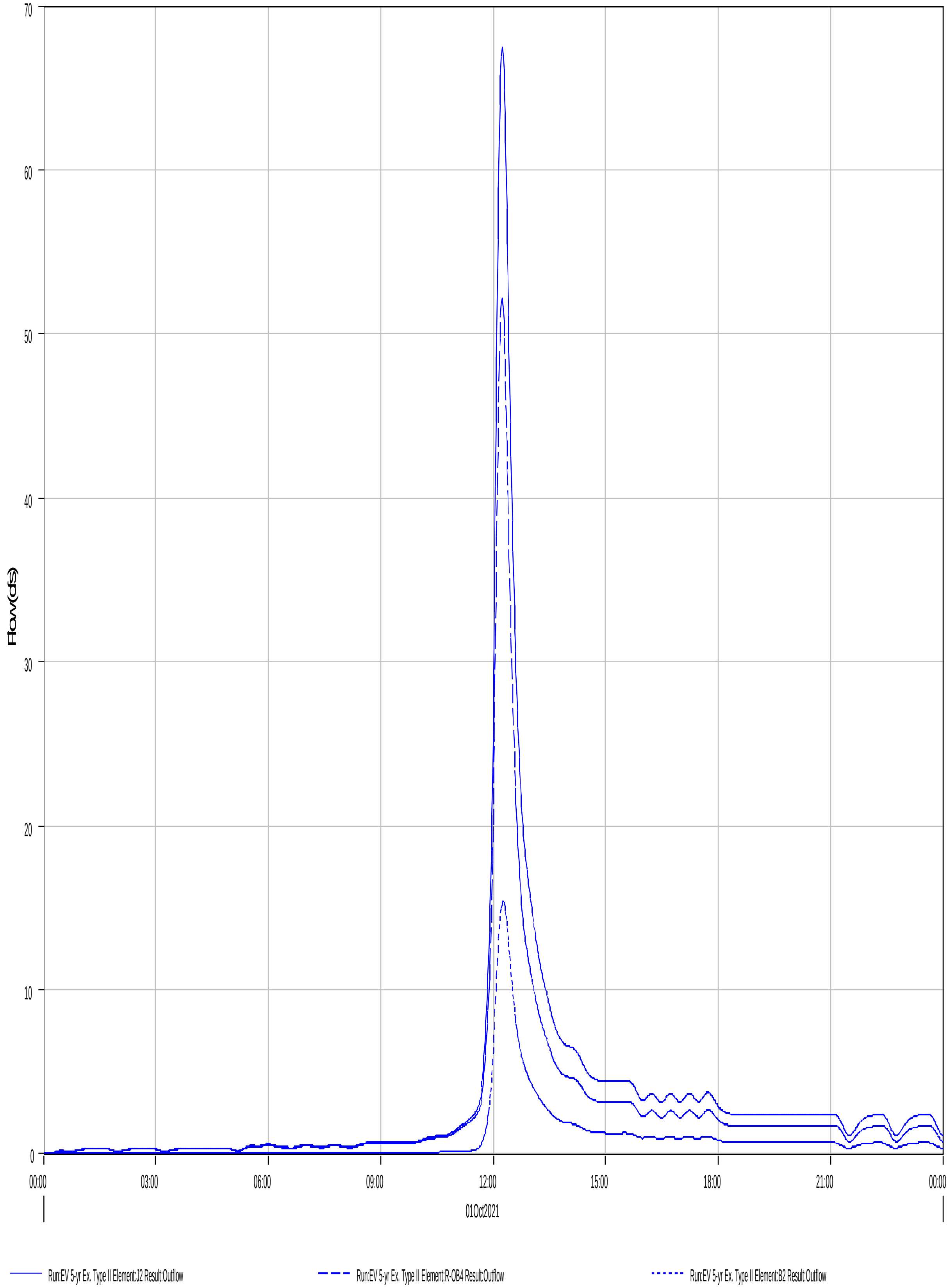
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	10.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:11
Total Outflow :	1.0 (AC-FT)		

Junction "J2" Results for Run "EV 5-yr Ex. Type II"



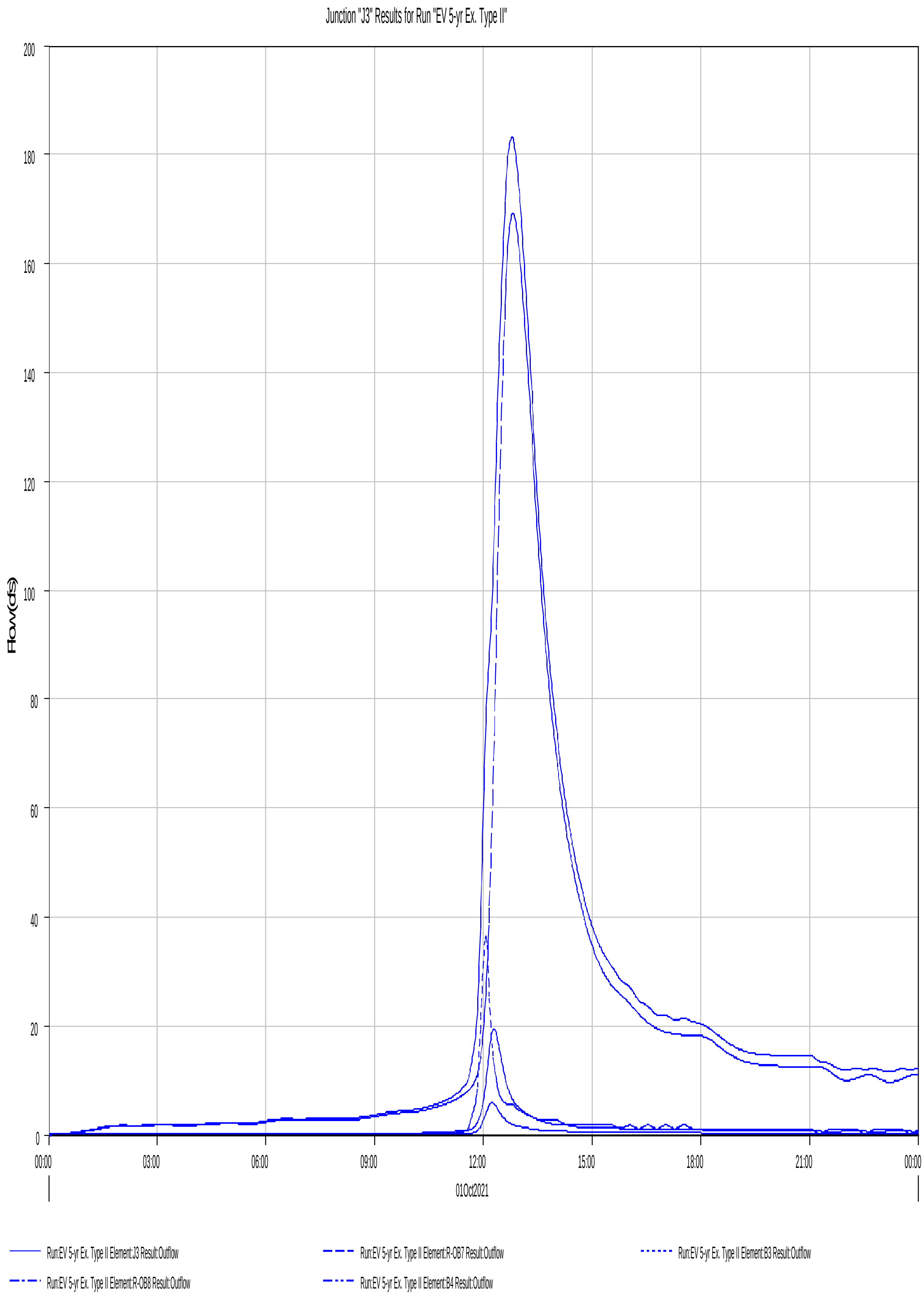
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Junction: J2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	67.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:15
Total Outflow :	7.3 (AC-FT)		



Junction "J3" Results for Run "EV 5-yr Ex. Type II"
Flow (cfs)
200
180
160
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:J3 Result:Outflow
Run:EV 5-yr Ex. Type II Element:R-OB7 Result:Outflow
Run:EV 5-yr Ex. Type II Element:B3 Result:Outflow
Run:EV 5-yr Ex. Type II Element:R-OB8 Result:Outflow
Run:EV 5-yr Ex. Type II Element:B4 Result:Outflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Junction: J3

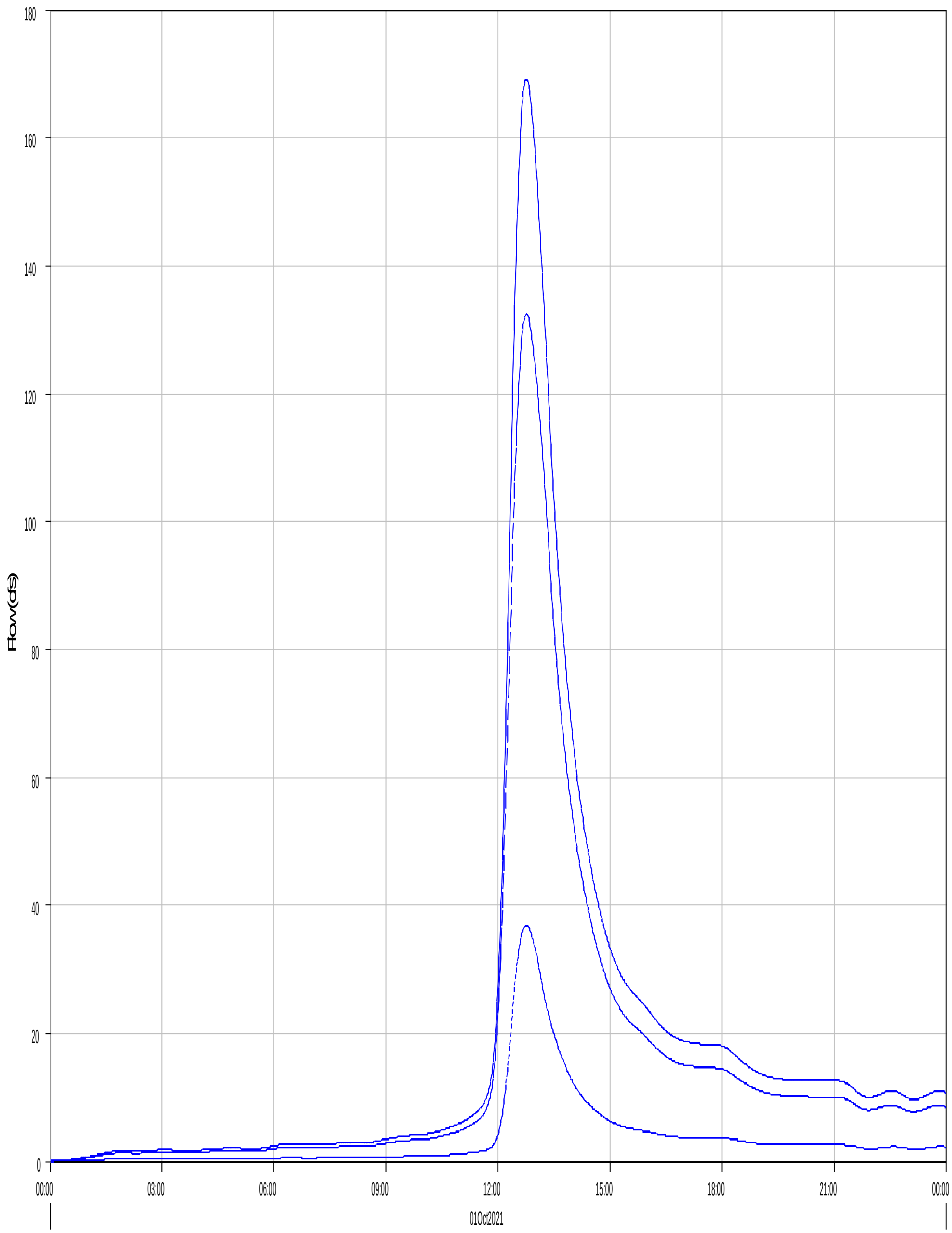
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	183.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:47
Total Outflow :	42.8 (AC-FT)		

Junction "J4" Results for Run "EV 5-yr Ex. Type II"



Run:EV 5-yr Ex. Type II Element:J4 Result:Outflow
Run:EV 5-yr Ex. Type II Element:R-OB6 Result:Outflow
Run:EV 5-yr Ex. Type II Element:R-OB5 Result:Outflow

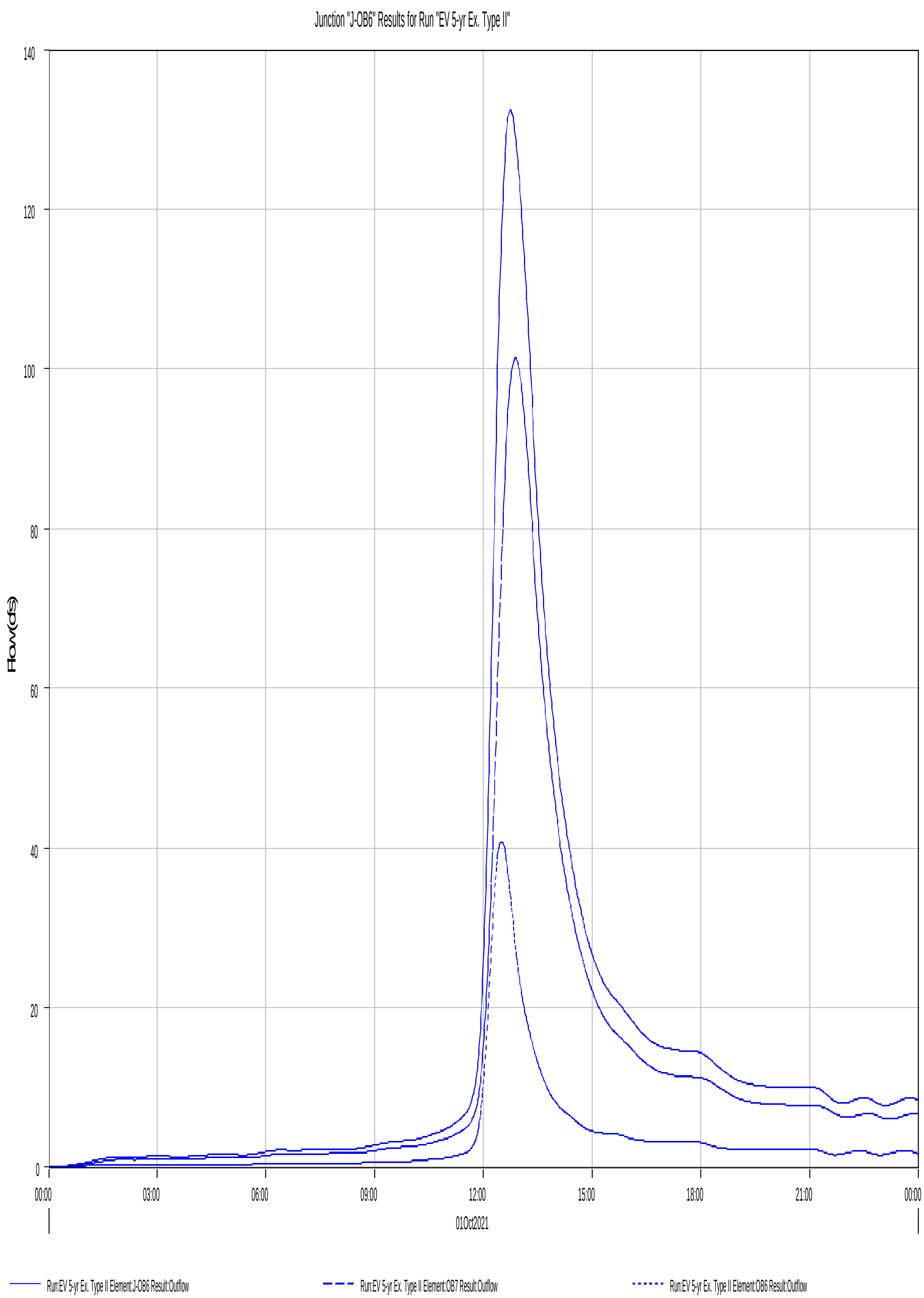
Project:	Eagleview_Subdivision
Simulation Run:	EV 5-yr Ex. Type II
Junction:	J4

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	169.2 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:46
Total Outflow :	37.4 (AC-FT)		



Junction "J-OB6" Results for Run "EV 5-yr Ex. Type II"
Flow (cfs)
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:J-OB6 Result:Outflow
Run:EV 5-yr Ex. Type II Element:OB7 Result:Outflow
Run:EV 5-yr Ex. Type II Element:OB6 Result:Outflow

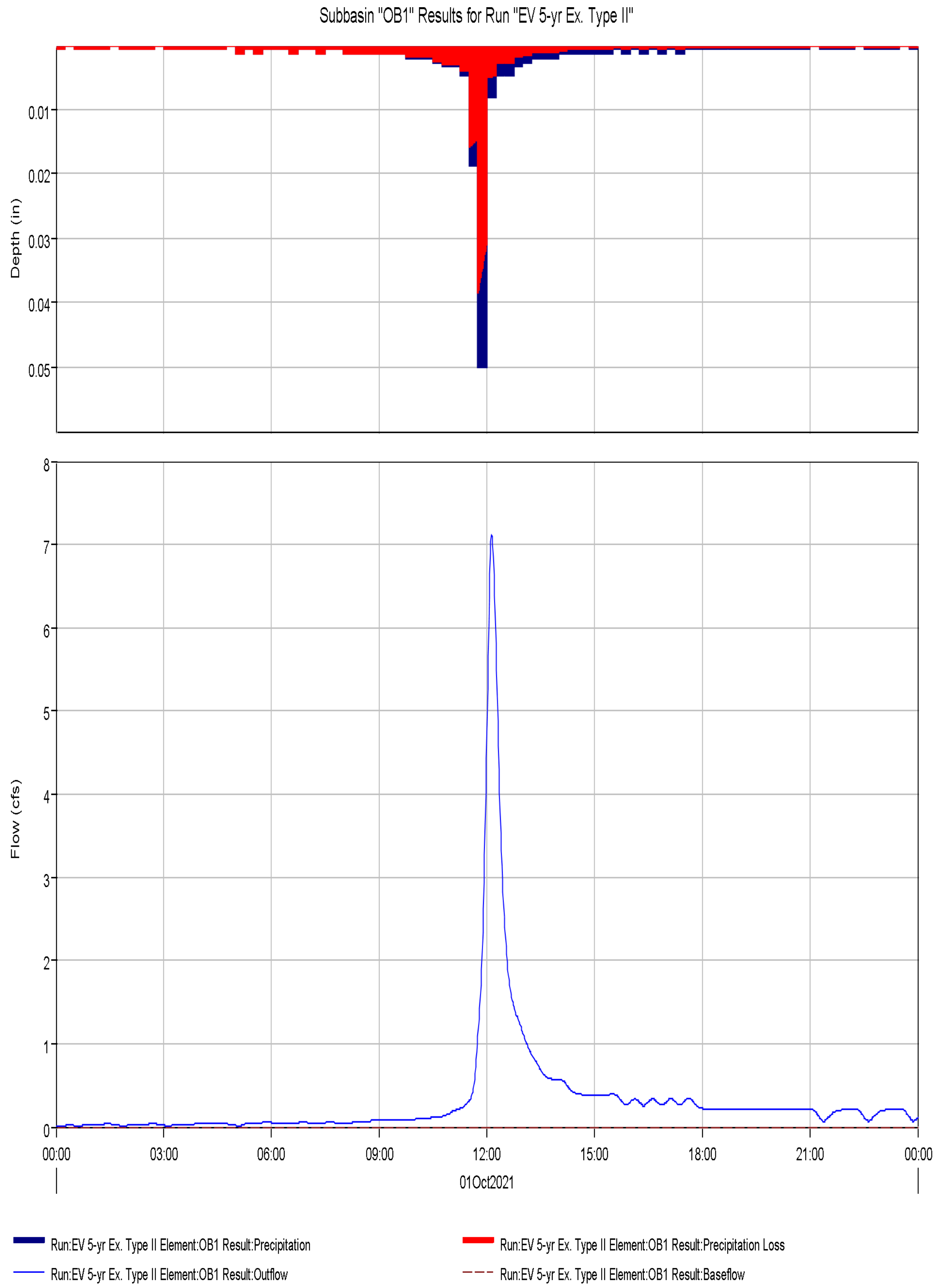
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Junction: J-OB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	132.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:45
Total Outflow :	30.1 (AC-FT)		



Subbasin "OB1" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.01
0.02
0.03
0.04
0.05
Flow (cfs)
0
1
2
3
4
5
6
7
8
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:OB1 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:OB1 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:OB1 Result:Outflow
Run:EV 5-yr Ex. Type II Element:OB1 Result:Baseflow

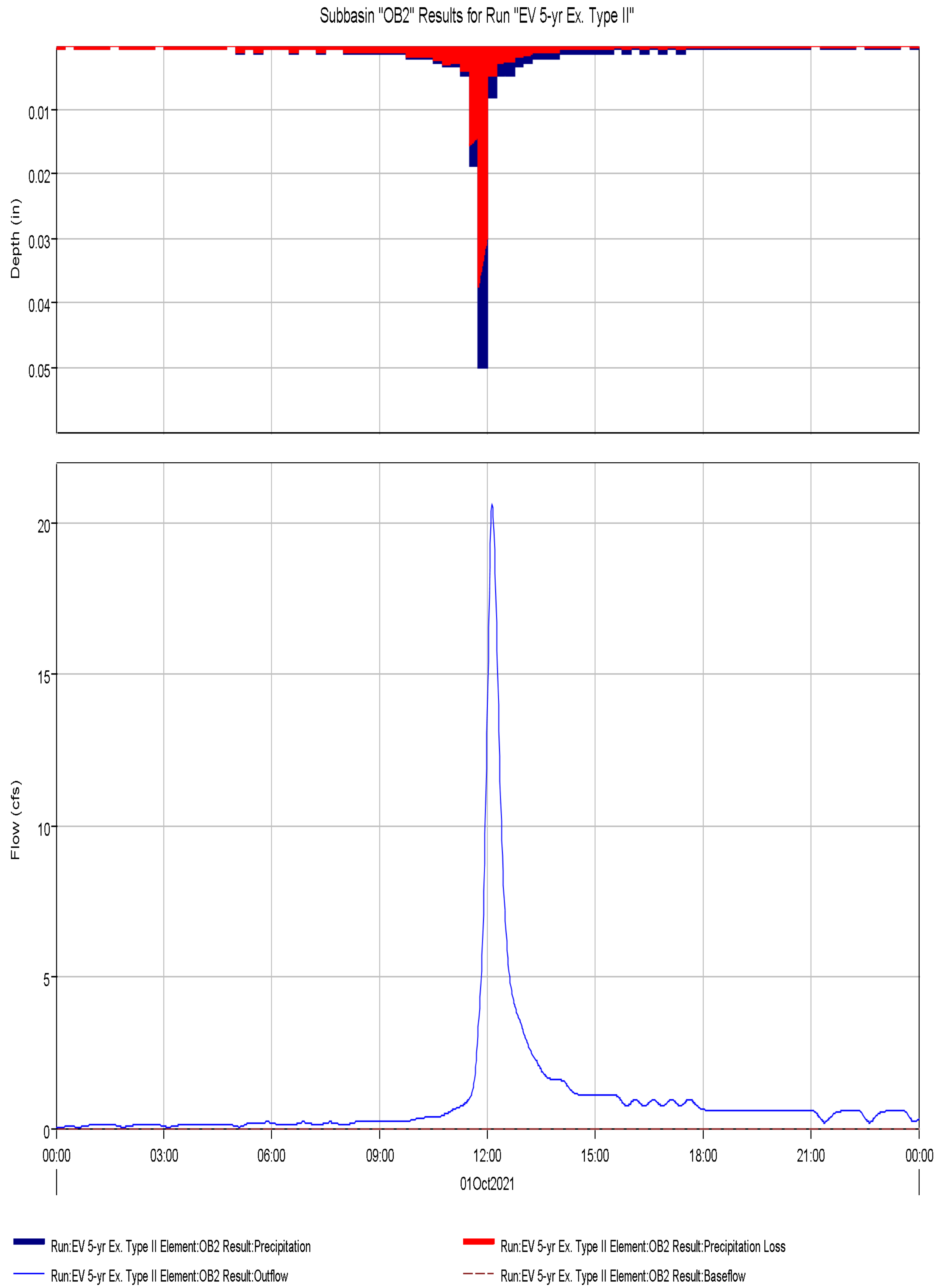
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: OB1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	7.1 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	2.3 (AC-FT)	Total Direct Runoff :	0.7 (AC-FT)
Total Loss :	1.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.7 (AC-FT)	Discharge :	0.7 (AC-FT)



Subbasin "OB2" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.01
0.02
0.03
0.04
0.05
Flow (cfs)
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:OB2 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:OB2 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:OB2 Result:Outflow
Run:EV 5-yr Ex. Type II Element:OB2 Result:Baseflow

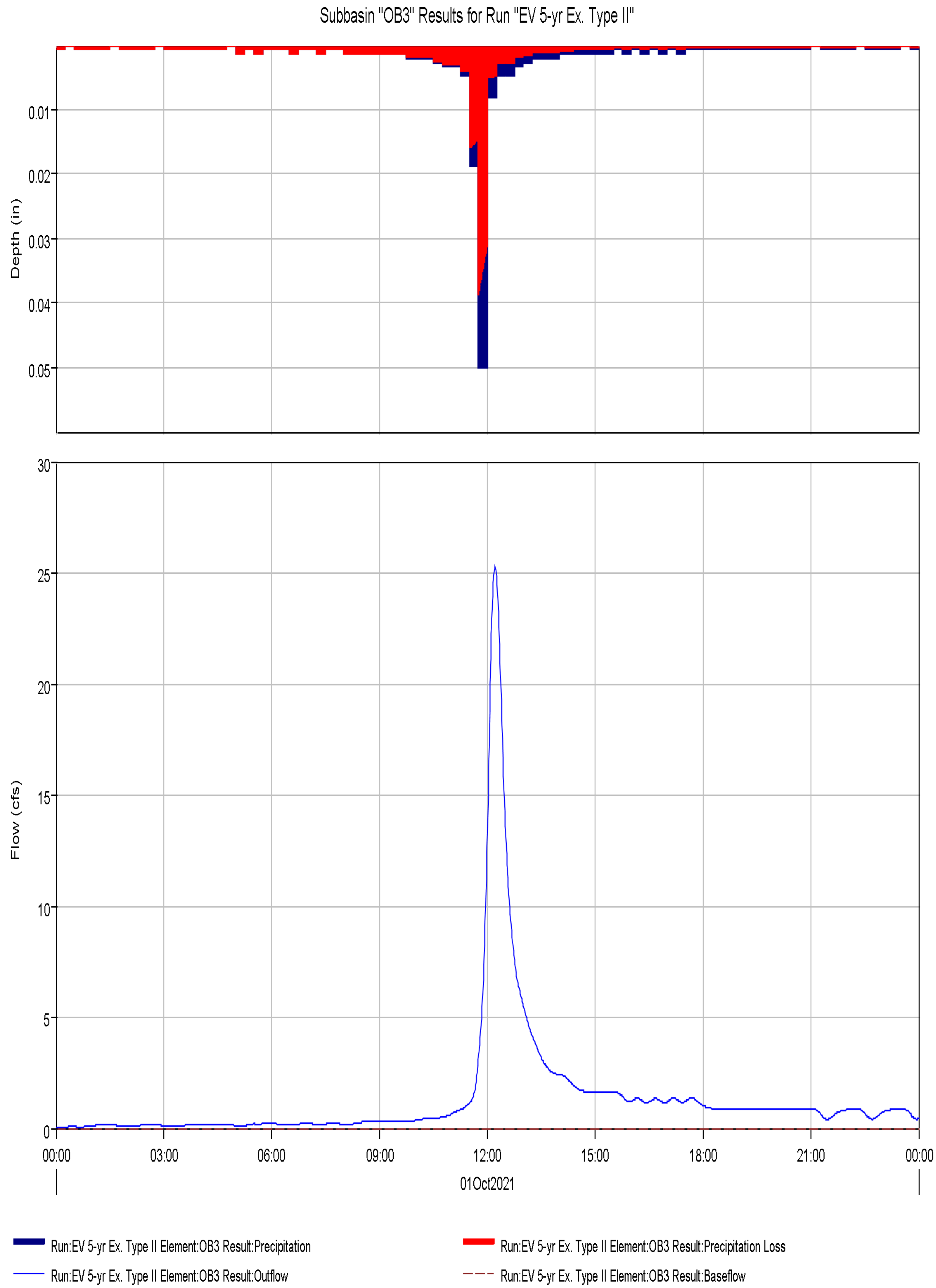
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: OB2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	20.6 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	6.3 (AC-FT)	Total Direct Runoff :	1.9 (AC-FT)
Total Loss :	4.4 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.9 (AC-FT)	Discharge :	1.9 (AC-FT)


Subbasin "OB3" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.01
0.02
0.03
0.04
0.05
Flow (cfs)
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:OB3 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:OB3 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:OB3 Result:Outflow
Run:EV 5-yr Ex. Type II Element:OB3 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: OB3

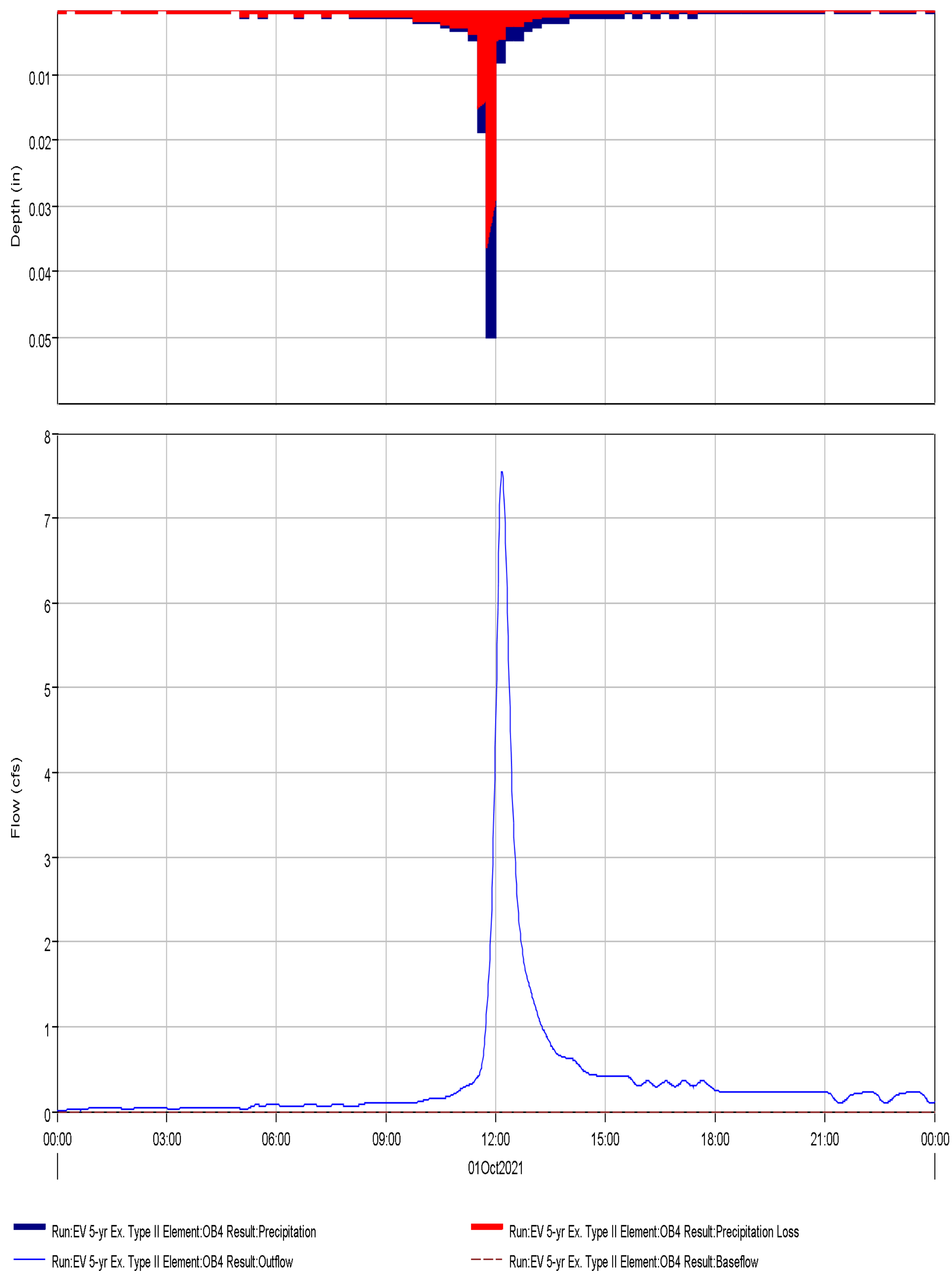
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	25.3 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:13
Total Precipitation :	9.8 (AC-FT)	Total Direct Runoff :	2.8 (AC-FT)
Total Loss :	7.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.8 (AC-FT)	Discharge :	2.8 (AC-FT)

Subbasin "OB4" Results for Run "EV 5-yr Ex. Type II"



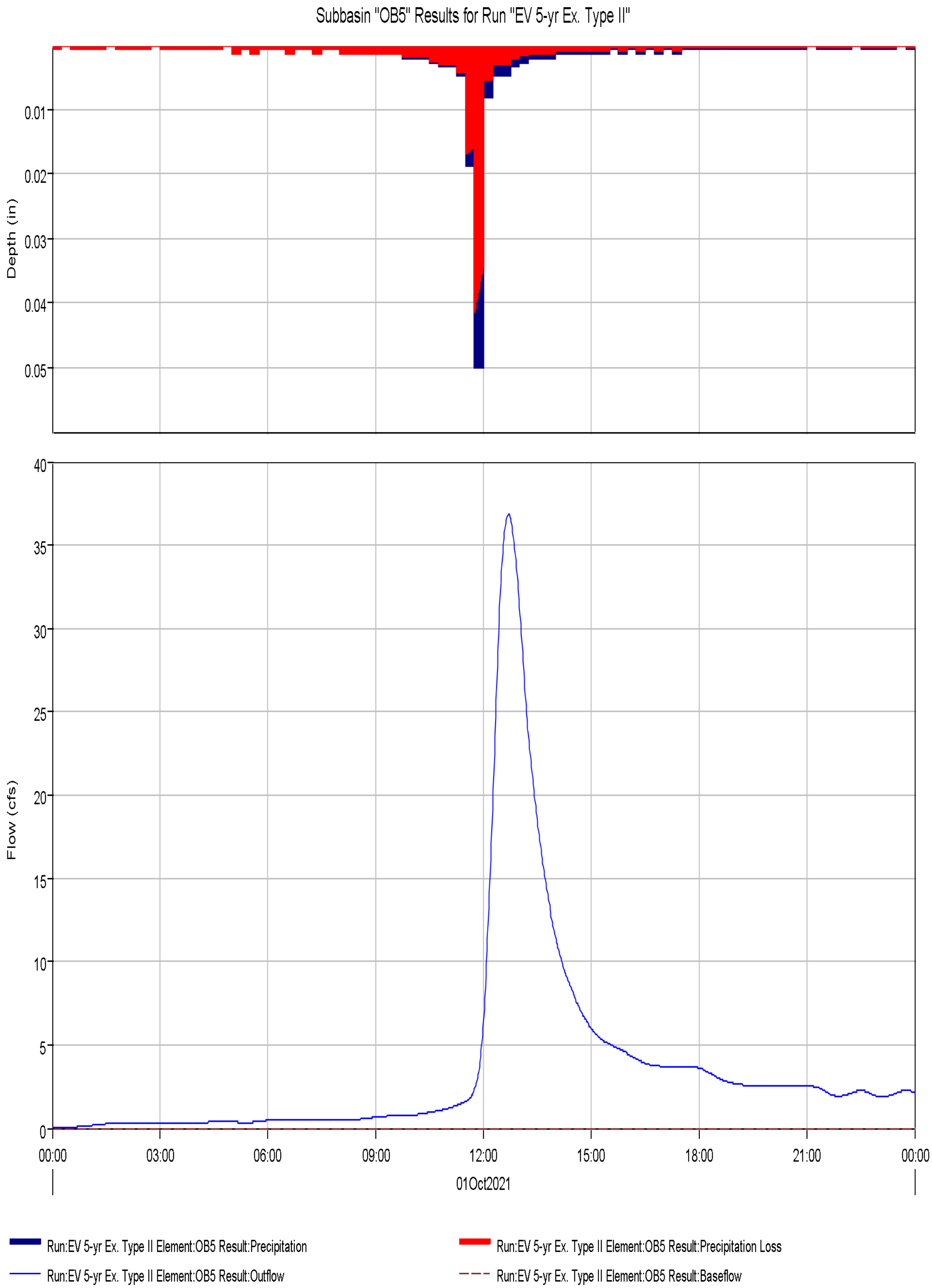
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: OB4

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	7.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:10
Total Precipitation :	2.4 (AC-FT)	Total Direct Runoff :	0.8 (AC-FT)
Total Loss :	1.6 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.8 (AC-FT)	Discharge :	0.8 (AC-FT)



Subbasin "OB5" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.01
0.02
0.03
0.04
0.05
Flow (cfs)
40
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:OB5 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:OB5 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:OB5 Result:Outflow
Run:EV 5-yr Ex. Type II Element:OB5 Result:Baseflow

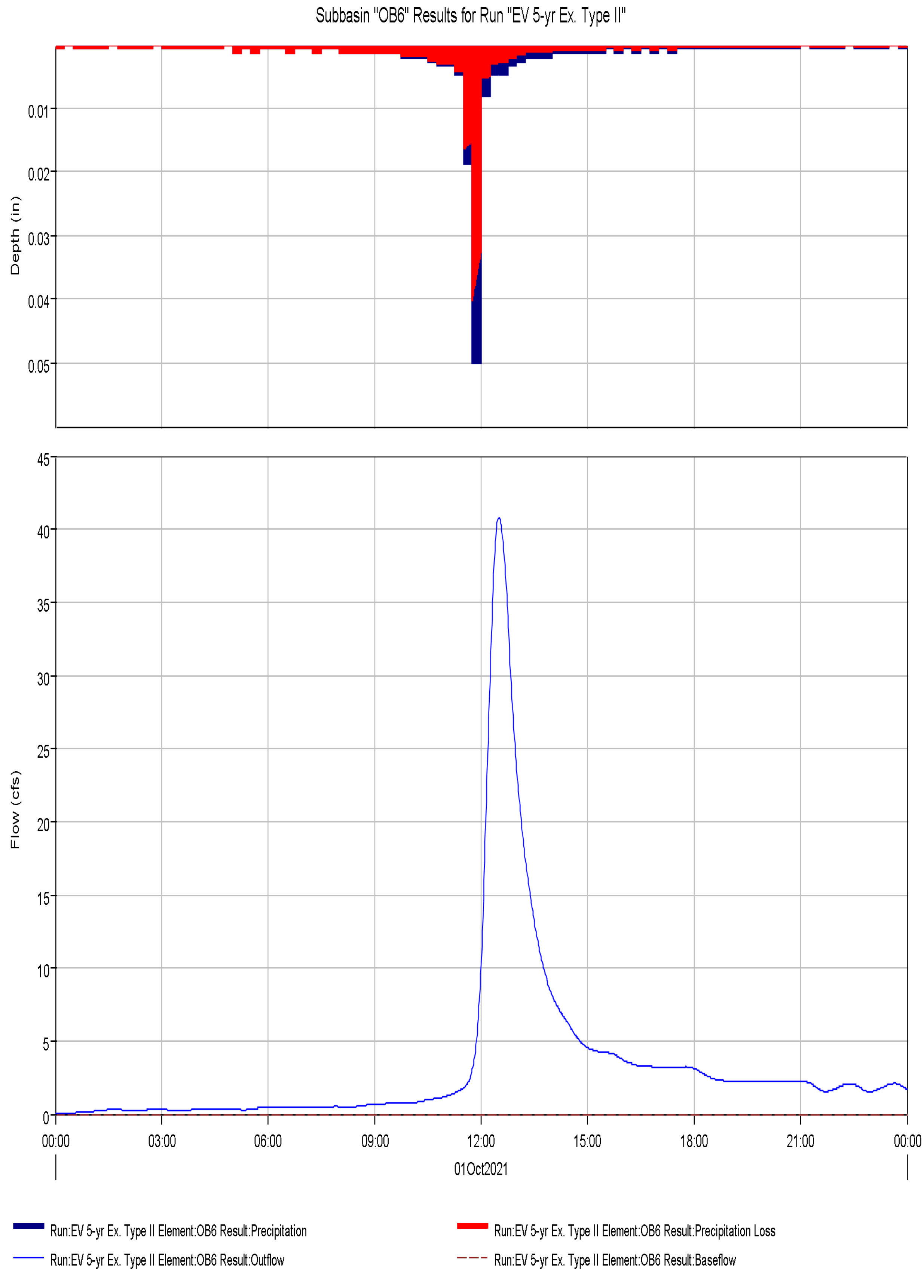
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: OB5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	36.8 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:42
Total Precipitation :	32.4 (AC-FT)	Total Direct Runoff :	7.4 (AC-FT)
Total Loss :	24.8 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	7.6 (AC-FT)	Discharge :	7.4 (AC-FT)



Subbasin "OB6" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.01
0.02
0.03
0.04
0.05
Flow (cfs)
45
40
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:OB6 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:OB6 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:OB6 Result:Outflow
Run:EV 5-yr Ex. Type II Element:OB6 Result:Baseflow

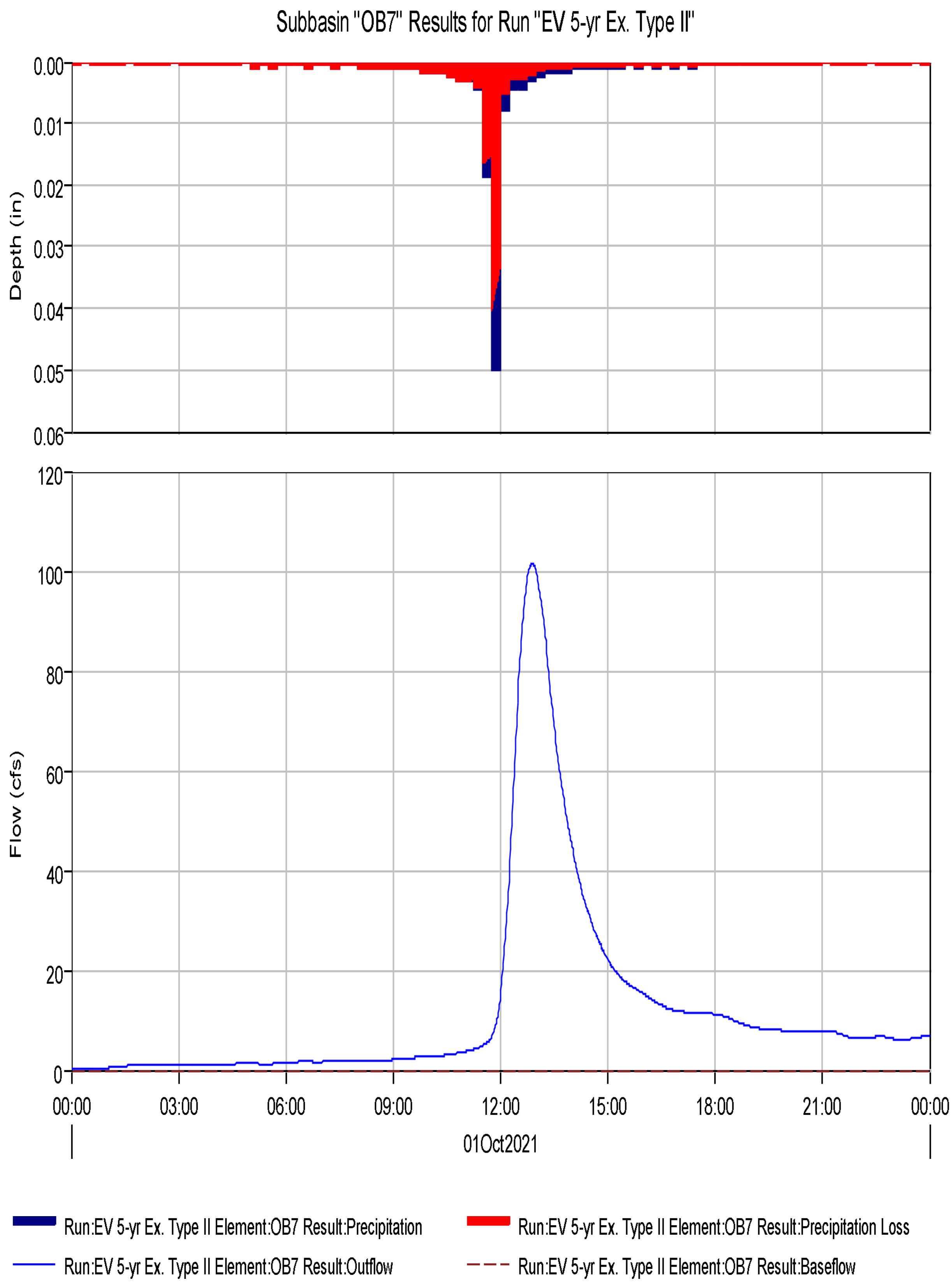
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: OB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	40.8 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:30
Total Precipitation :	26.6 (AC-FT)	Total Direct Runoff :	6.8 (AC-FT)
Total Loss :	19.8 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	6.9 (AC-FT)	Discharge :	6.8 (AC-FT)



Subbasin "OB7" Results for Run "EV 5-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:OB7 Result:Precipitation
Run:EV 5-yr Ex. Type II Element:OB7 Result:Precipitation Loss
Run:EV 5-yr Ex. Type II Element:OB7 Result:Outflow
Run:EV 5-yr Ex. Type II Element:OB7 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: OB7

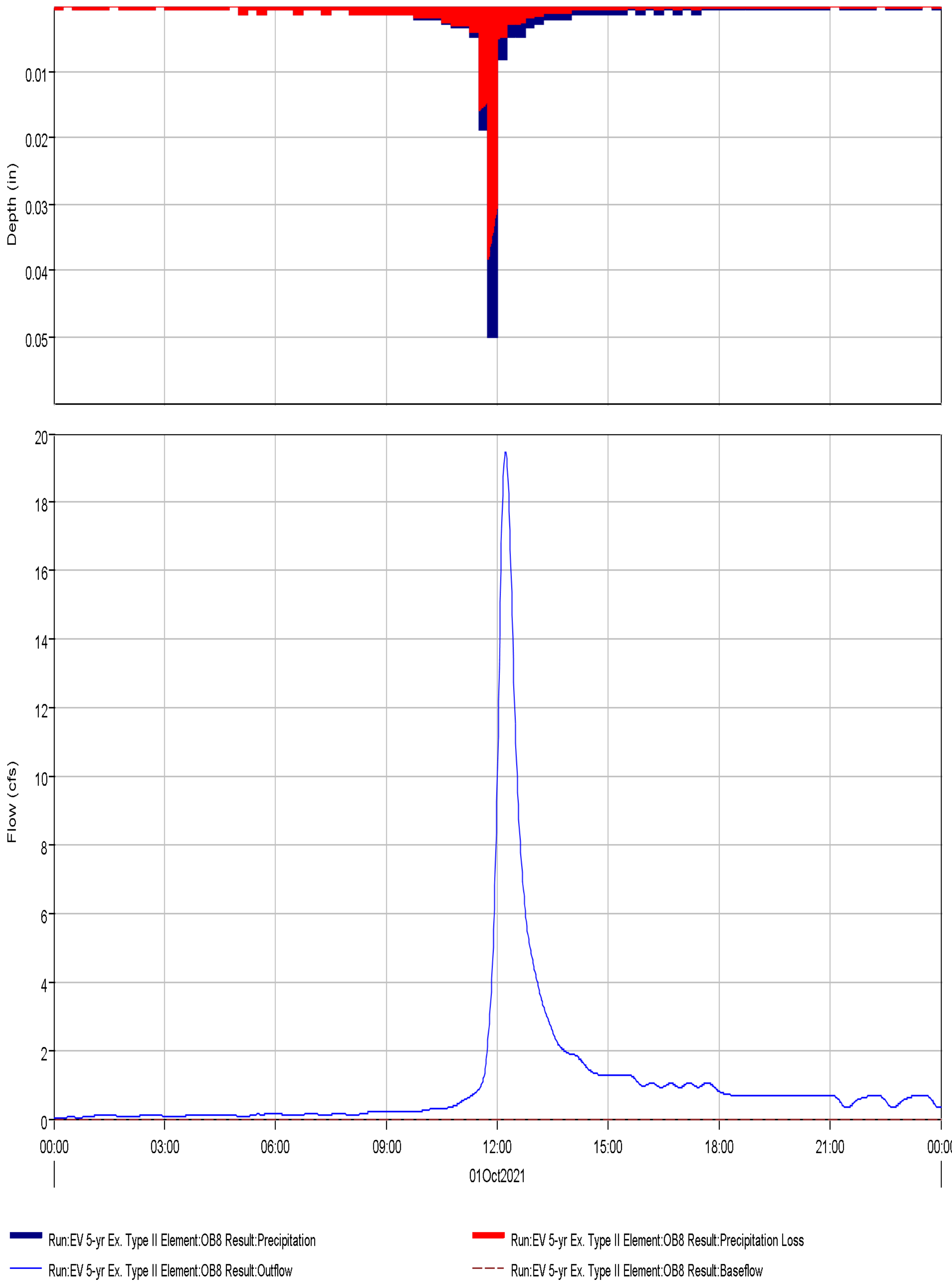
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	101.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:53
Total Precipitation :	94.8 (AC-FT)	Total Direct Runoff :	23.3 (AC-FT)
Total Loss :	70.9 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	23.9 (AC-FT)	Discharge :	23.3 (AC-FT)

Subbasin "OB8" Results for Run "EV 5-yr Ex. Type II"



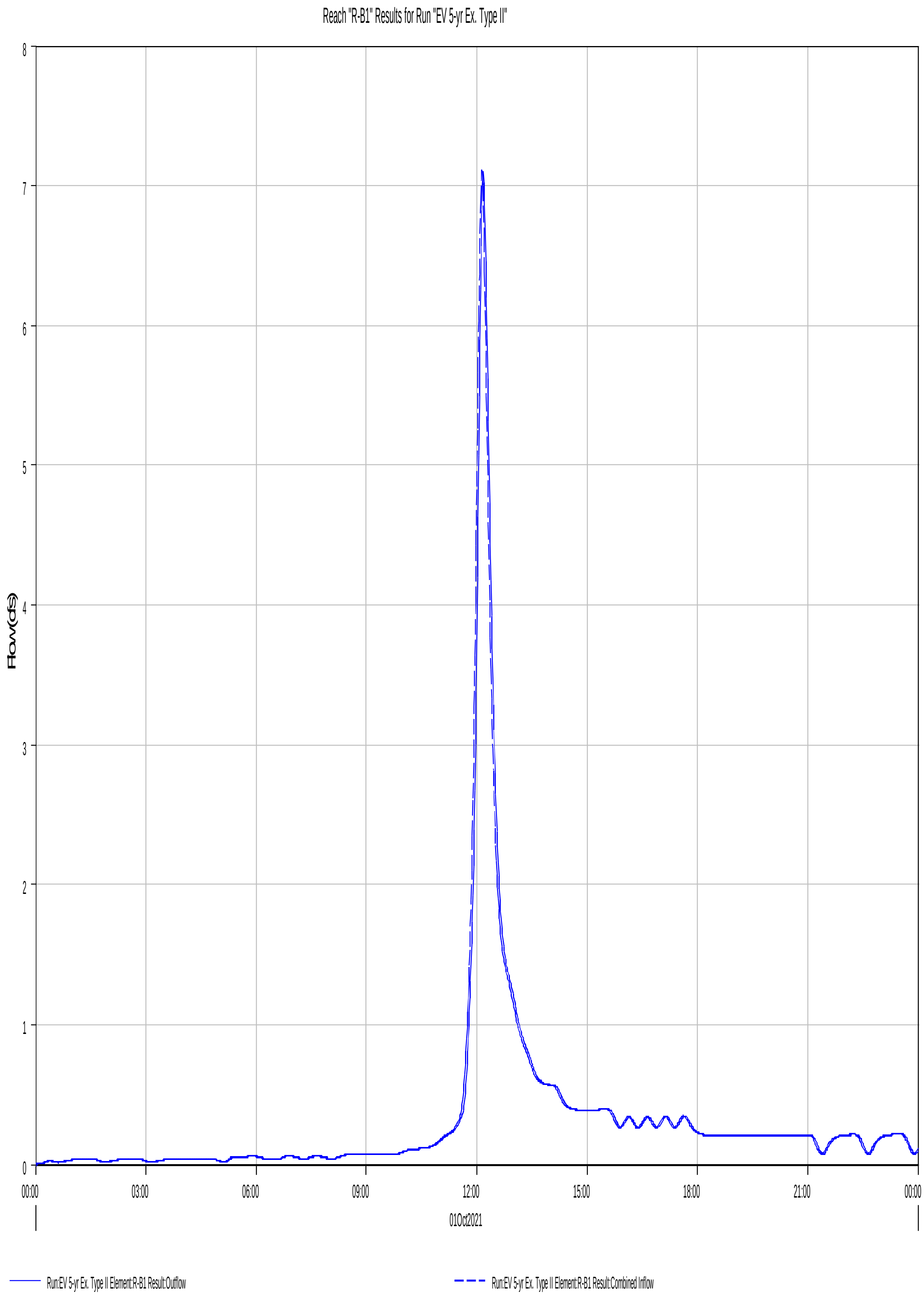
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Subbasin: OB8

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	19.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:13
Total Precipitation :	7.4 (AC-FT)	Total Direct Runoff :	2.1 (AC-FT)
Total Loss :	5.3 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.2 (AC-FT)	Discharge :	2.1 (AC-FT)



Reach "R-B1" Results for Run "EV 5-yr Ex. Type II"
Flow (cfs)
0
1
2
3
4
5
6
7
8
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:R-B1 Result:Outflow
Run:EV 5-yr Ex. Type II Element:R-B1 Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Reach: R-B1

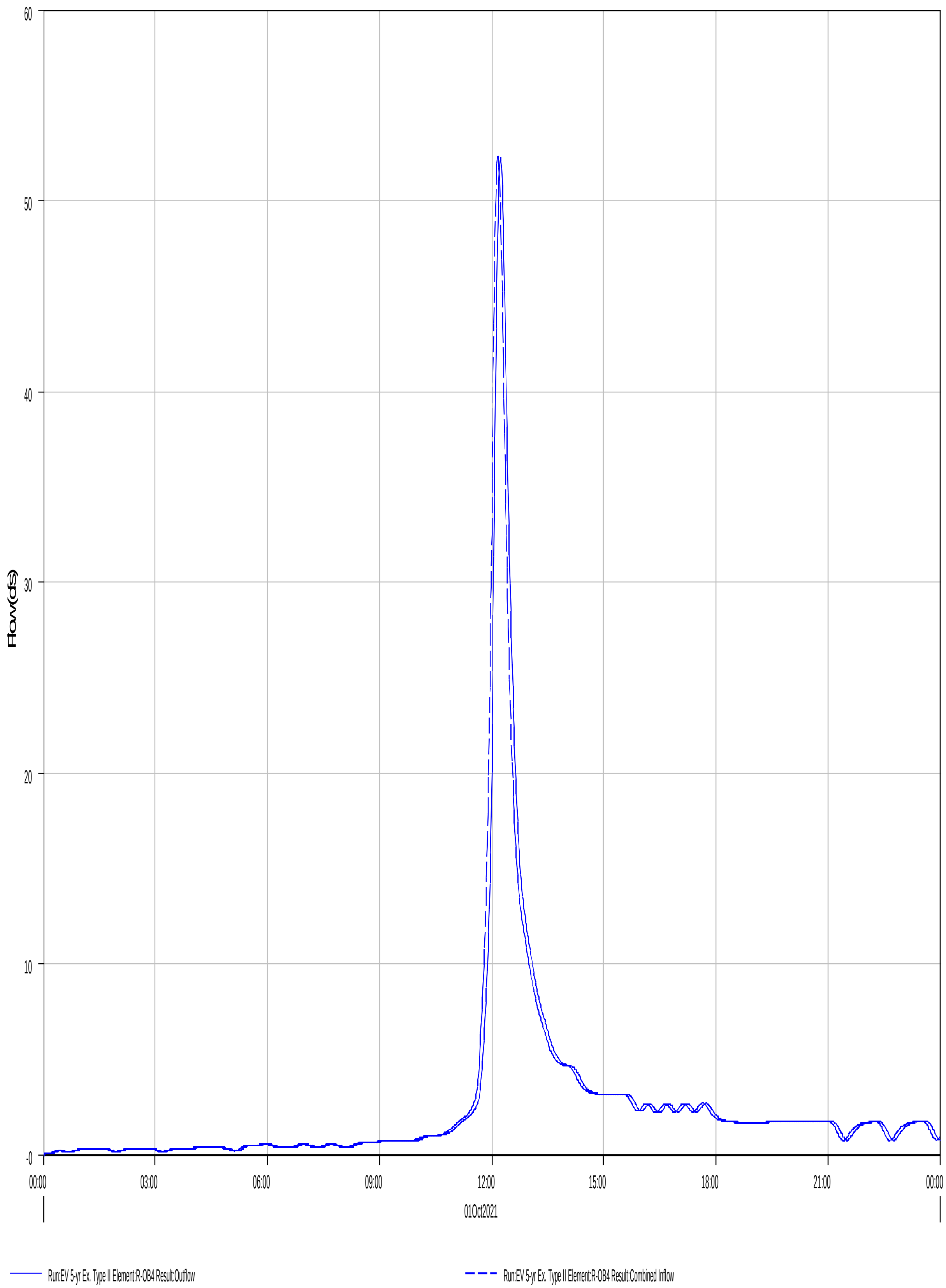
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	7.1 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	7.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:11
Total Inflow :	0.7 (AC-FT)	Total Outflow :	0.7 (AC-FT)

Reach "R-OB4" Results for Run "EV 5-yr Ex. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Reach: R-OB4

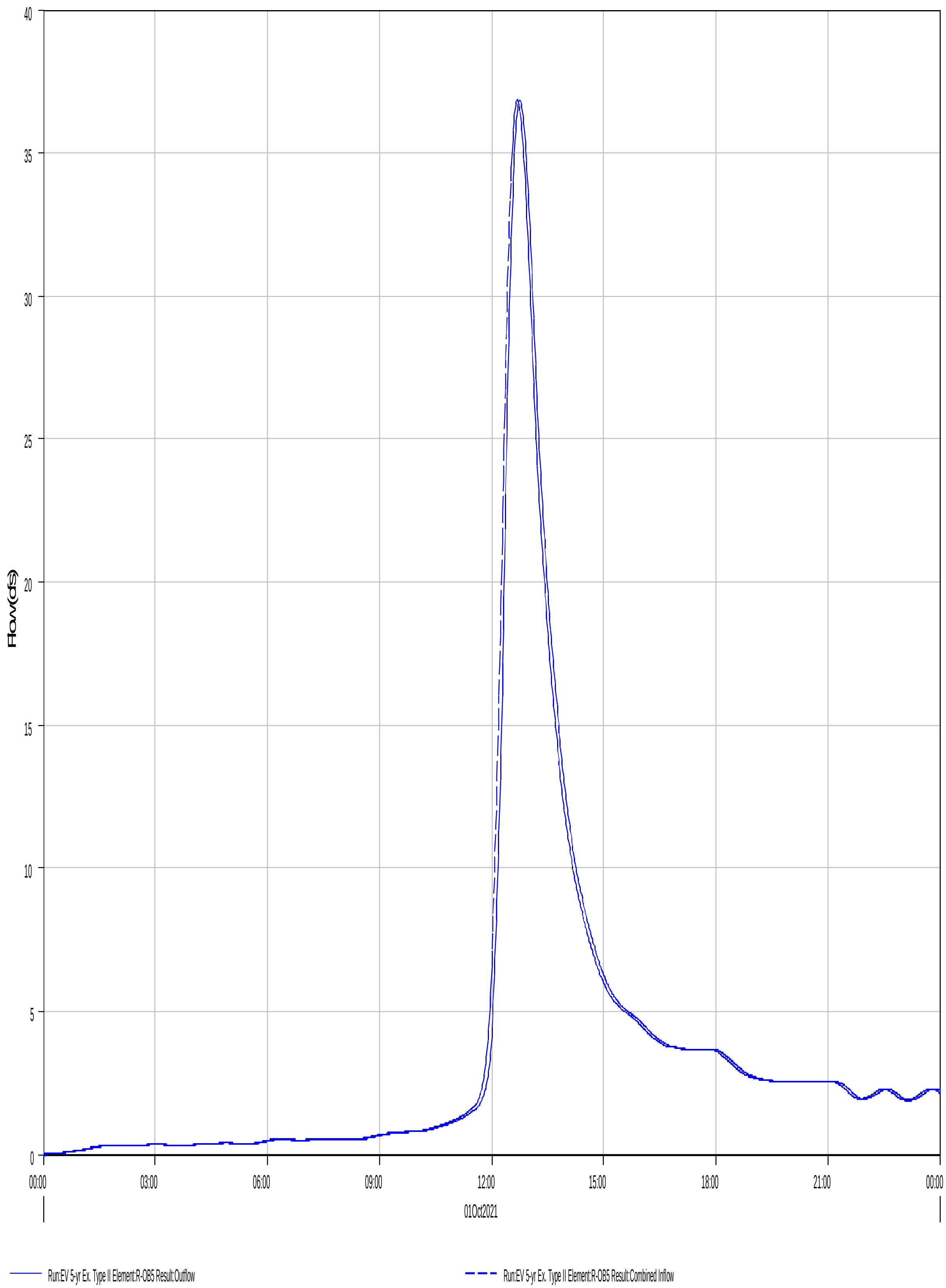
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	52.3 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:10
Peak Outflow :	52.2 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:14
Total Inflow :	5.4 (AC-FT)	Total Outflow :	5.4 (AC-FT)

Reach "R-OB5" Results for Run "EV 5-yr Ex. Type II"



Project: Eagleview_Subdivision

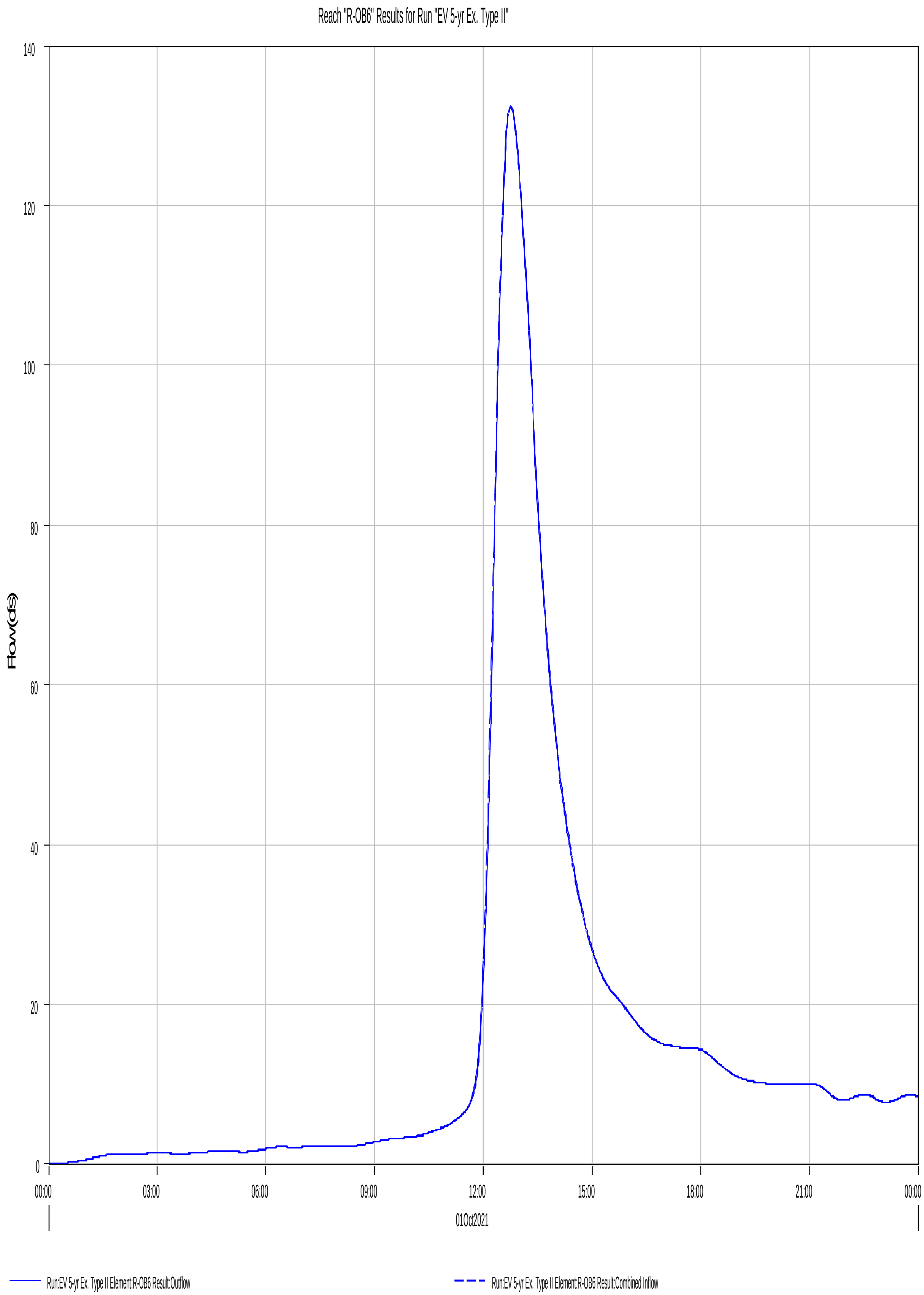
Simulation Run: EV 5-yr Ex. Type II Reach: R-OB5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	36.8 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:42
Peak Outflow :	36.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:45
Total Inflow :	7.4 (AC-FT)	Total Outflow :	7.4 (AC-FT)



Reach "R-OB6" Results for Run "EV 5-yr Ex. Type II"
Flow(cfs)
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:R-OB6 Result:Outflow
Run:EV 5-yr Ex. Type II Element:R-OB6 Result:Combined Inflow

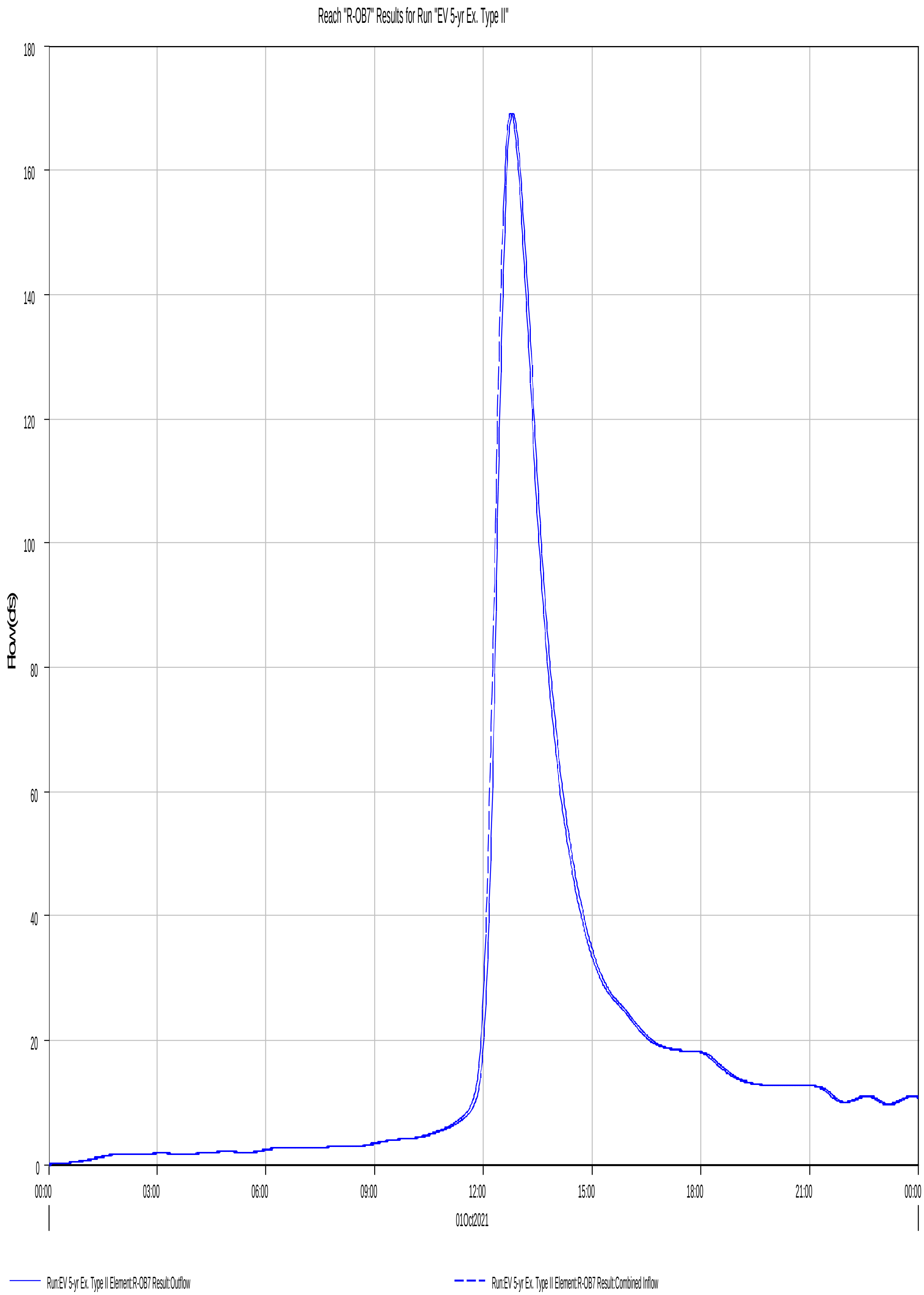
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Reach: R-OB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	132.4 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:45
Peak Outflow :	132.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:46
Total Inflow :	30.1 (AC-FT)	Total Outflow :	30.0 (AC-FT)



Reach "R-OB7" Results for Run "EV 5-yr Ex. Type II"
Flow(cfs)
180
160
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Ex. Type II Element:R-OB7 Result:Outflow
Run:EV 5-yr Ex. Type II Element:R-OB7 Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Reach: R-OB7

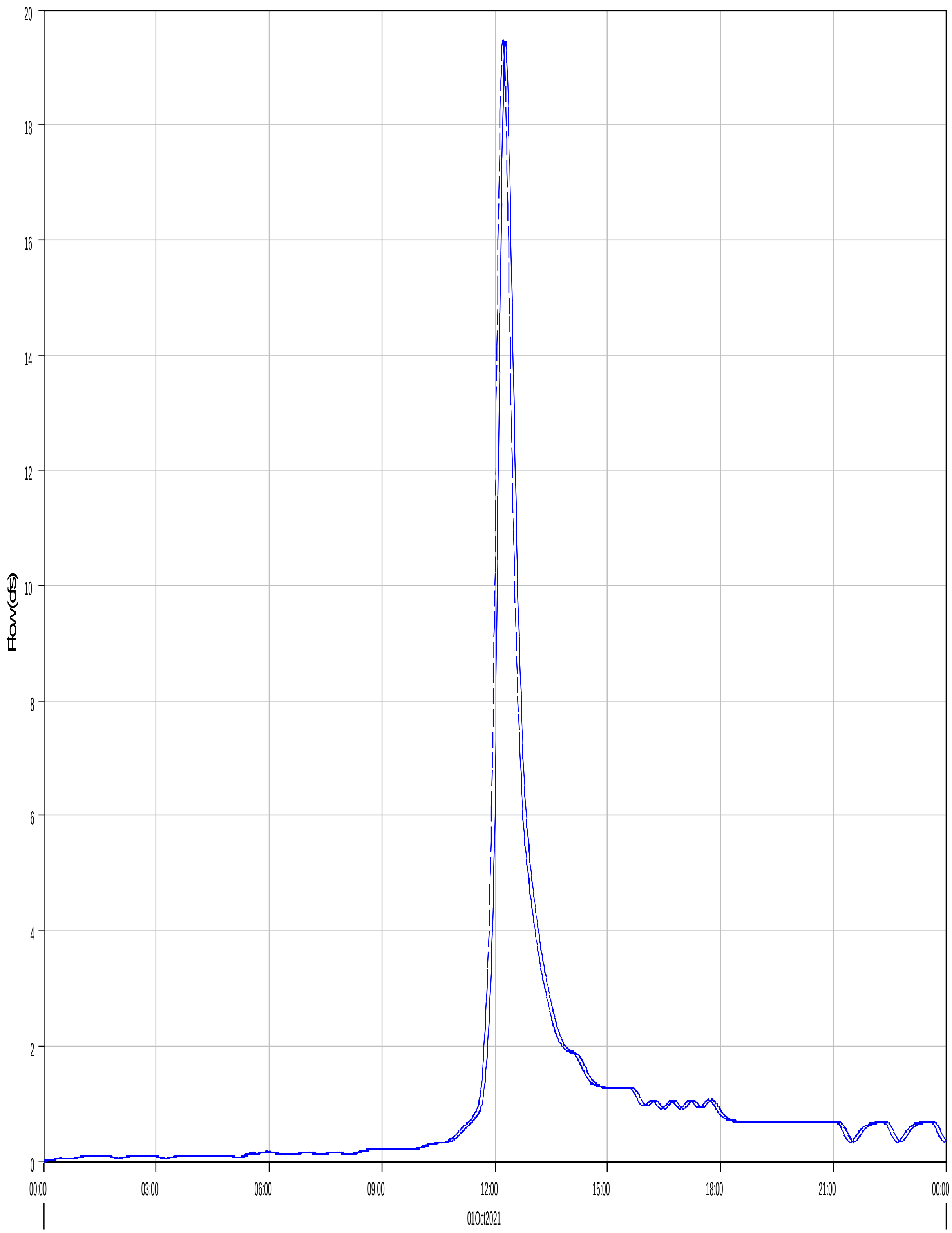
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	169.2 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:46
Peak Outflow :	169.2 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:49
Total Inflow :	37.4 (AC-FT)	Total Outflow :	37.3 (AC-FT)

Reach "R-OB8" Results for Run "EV 5-yr Ex. Type II"



Run:EV 5-yr Ex. Type II Element:R-OB8 Result:Outflow

Run:EV 5-yr Ex. Type II Element:R-OB8 Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Ex. Type II Reach: R-OB8

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	11Mar2022, 14:50:40	Control Specifications:	24-hr Storm

Volume Units: AC-FT

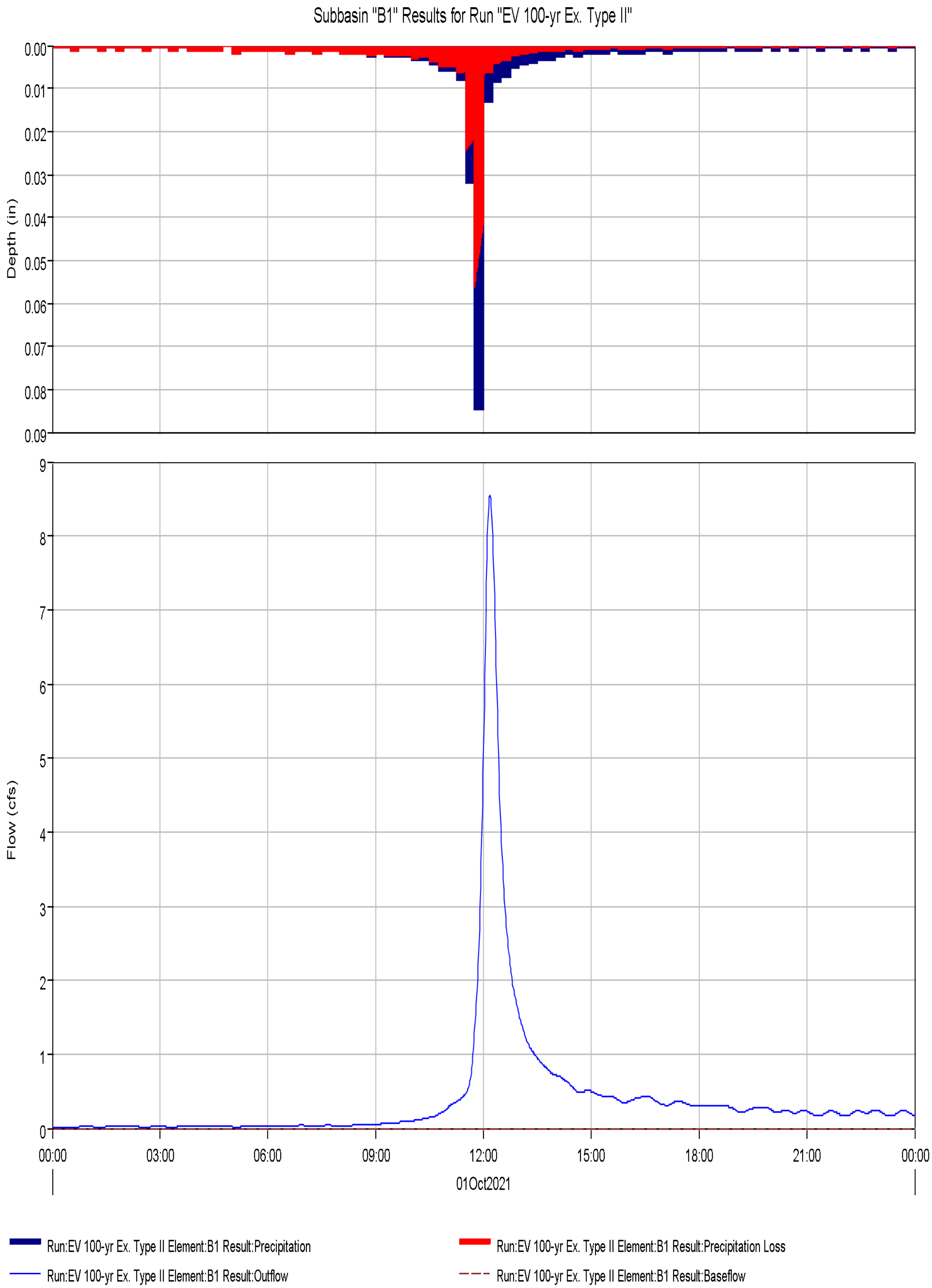
Computed Results

Peak Inflow :	19.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	19.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:17
Total Inflow :	2.1 (AC-FT)	Total Outflow :	2.1 (AC-FT)

Project: Eagleview_Subdivision Simulation Run: EV 100-yr Ex. Type II

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
B1	0.0091800	8.5	01Oct2021, 12:11	0.8
B2	0.0647266	48.5	01Oct2021, 12:15	5.3
B3	0.0930359	110.0	01Oct2021, 12:04	7.8
B4	0.0229422	18.2	01Oct2021, 12:13	1.9
J1	0.0253831	27.3	01Oct2021, 12:10	2.5
J2	0.1928516	183.8	01Oct2021, 12:13	18.8
J3	1.2354980	515.5	01Oct2021, 12:44	112.7
J4	1.0678500	478.0	01Oct2021, 12:44	97.8
J-OB6	0.8431300	371.3	01Oct2021, 12:43	78.1
OB1	0.0162031	18.8	01Oct2021, 12:08	1.7
OB2	0.0438438	52.7	01Oct2021, 12:08	4.7
OB3	0.0678750	67.1	01Oct2021, 12:12	6.9
OB4	0.0164062	18.9	01Oct2021, 12:10	1.8
OB5	0.2247200	106.9	01Oct2021, 12:40	19.7
OB6	0.1850100	113.2	01Oct2021, 12:29	17.5
OB7	0.6581200	284.2	01Oct2021, 12:52	60.6
OB8	0.0516699	51.6	01Oct2021, 12:13	5.4
R-B1	0.0162031	18.7	01Oct2021, 12:10	1.7
R-OB4	0.1281250	135.8	01Oct2021, 12:13	13.4
R-OB5	0.2247200	106.8	01Oct2021, 12:43	19.7
R-OB6	0.8431300	371.3	01Oct2021, 12:44	78.1
R-OB7	1.0678500	477.9	01Oct2021, 12:46	97.7
R-OB8	0.0516699	51.5	01Oct2021, 12:16	5.4


Subbasin "B1" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
9
8
7
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:B1 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:B1 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:B1 Result:Outflow
Run:EV 100-yr Ex. Type II Element:B1 Result:Baseflow

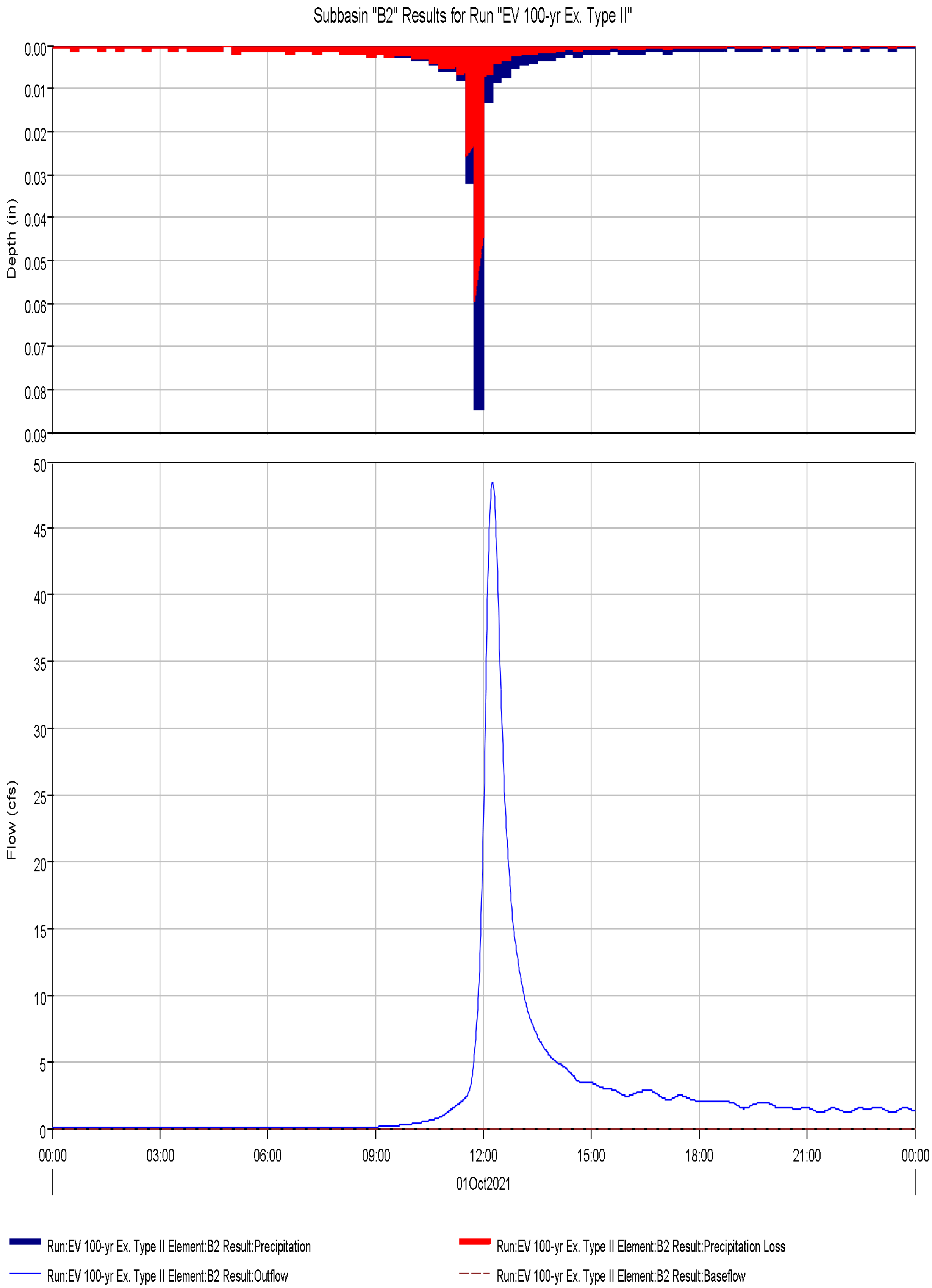
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: B1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	8.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:11
Total Precipitation :	2.3 (AC-FT)	Total Direct Runoff :	0.8 (AC-FT)
Total Loss :	1.4 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.8 (AC-FT)	Discharge :	0.8 (AC-FT)



Subbasin "B2" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
50
45
40
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:B2 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:B2 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:B2 Result:Outflow
Run:EV 100-yr Ex. Type II Element:B2 Result:Baseflow

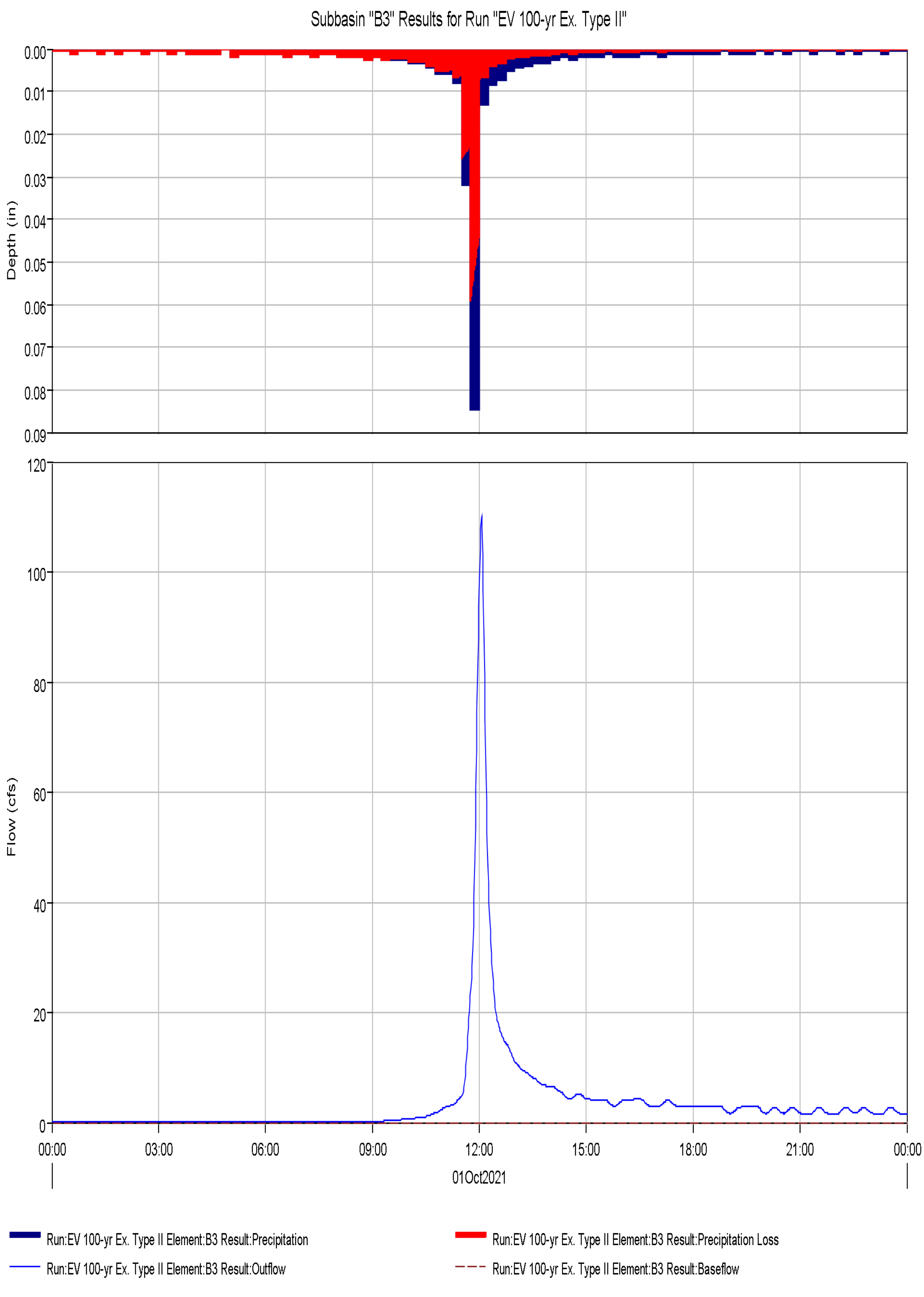
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: B2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	48.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:15
Total Precipitation :	15.9 (AC-FT)	Total Direct Runoff :	5.3 (AC-FT)
Total Loss :	10.5 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	5.4 (AC-FT)	Discharge :	5.3 (AC-FT)



Subbasin "B3" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:B3 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:B3 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:B3 Result:Outflow
Run:EV 100-yr Ex. Type II Element:B3 Result:Baseflow

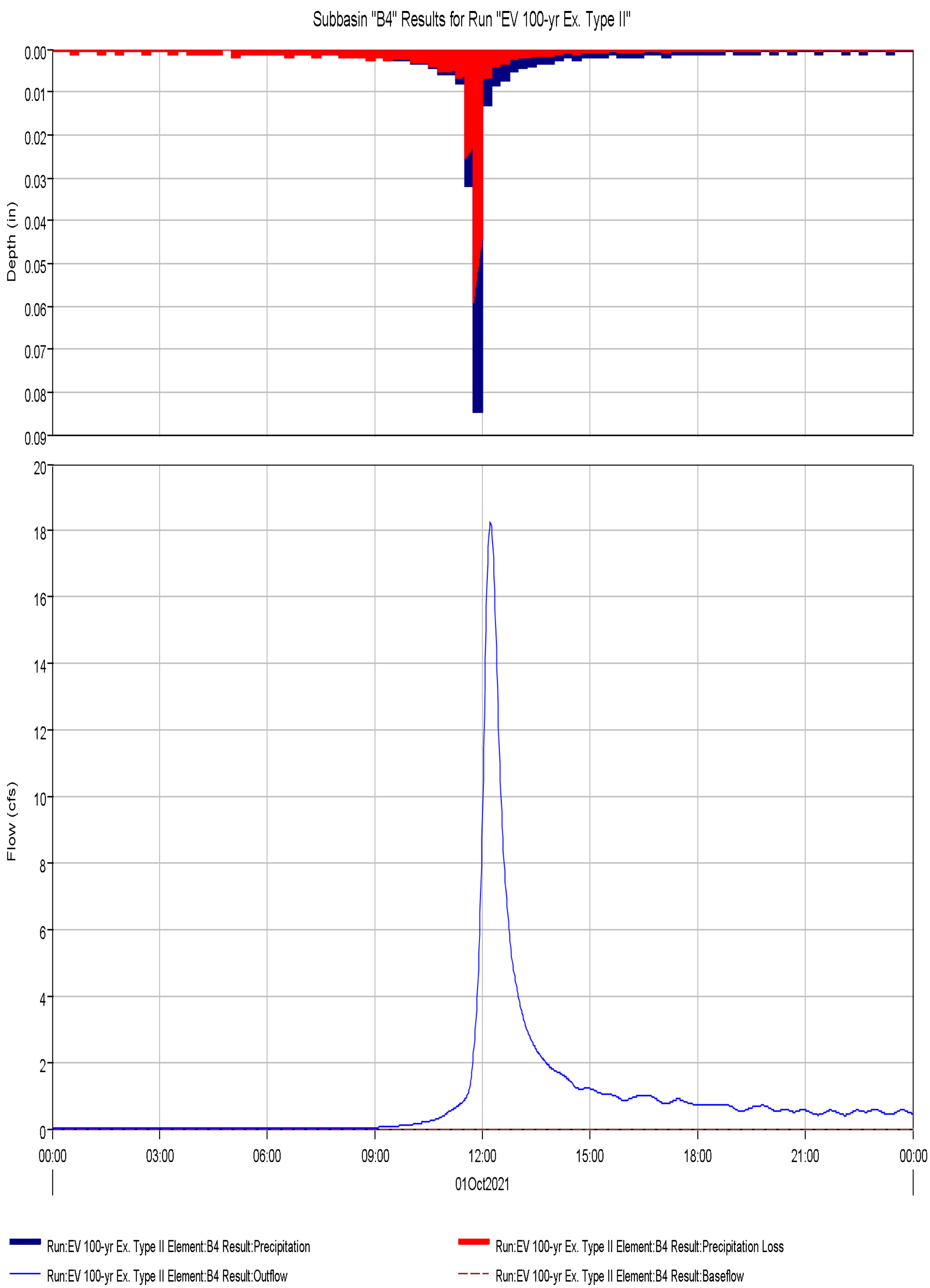
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: B3

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	110.0 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:04
Total Precipitation :	22.8 (AC-FT)	Total Direct Runoff :	7.8 (AC-FT)
Total Loss :	15.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	7.8 (AC-FT)	Discharge :	7.8 (AC-FT)



Subbasin "B4" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
20
18
16
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:B4 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:B4 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:B4 Result:Outflow
Run:EV 100-yr Ex. Type II Element:B4 Result:Baseflow

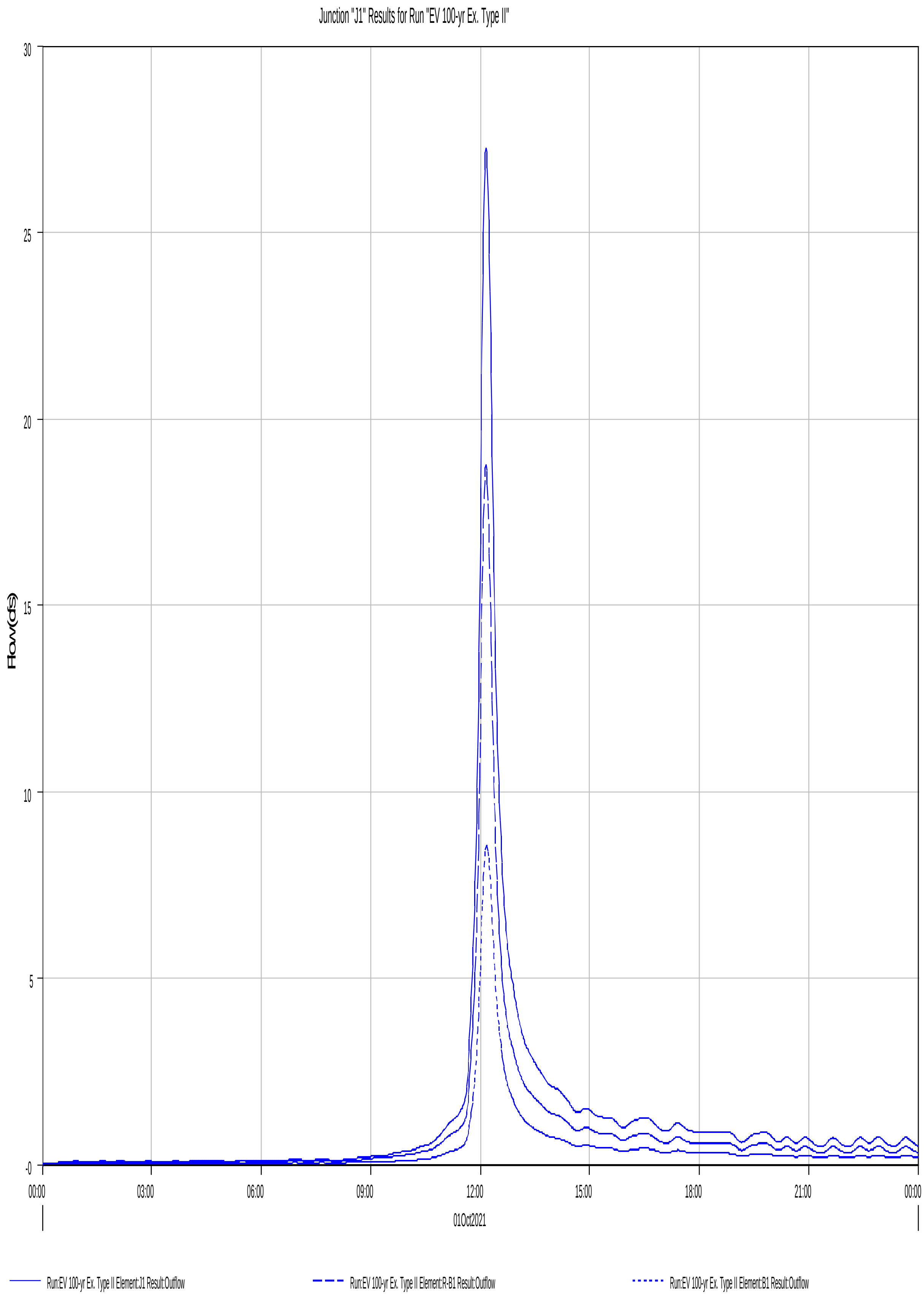
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: B4

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	18.2 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:13
Total Precipitation :	5.6 (AC-FT)	Total Direct Runoff :	1.9 (AC-FT)
Total Loss :	3.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.9 (AC-FT)	Discharge :	1.9 (AC-FT)



Junction "J1" Results for Run "EV 100-yr Ex. Type II"
Flow(cfs)
30
25
20
15
10
5
-0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:J1 Result:Outflow
Run:EV 100-yr Ex. Type II Element:R-B1 Result:Outflow
Run:EV 100-yr Ex. Type II Element:B1 Result:Outflow

Project: Eagleview_Subdivision

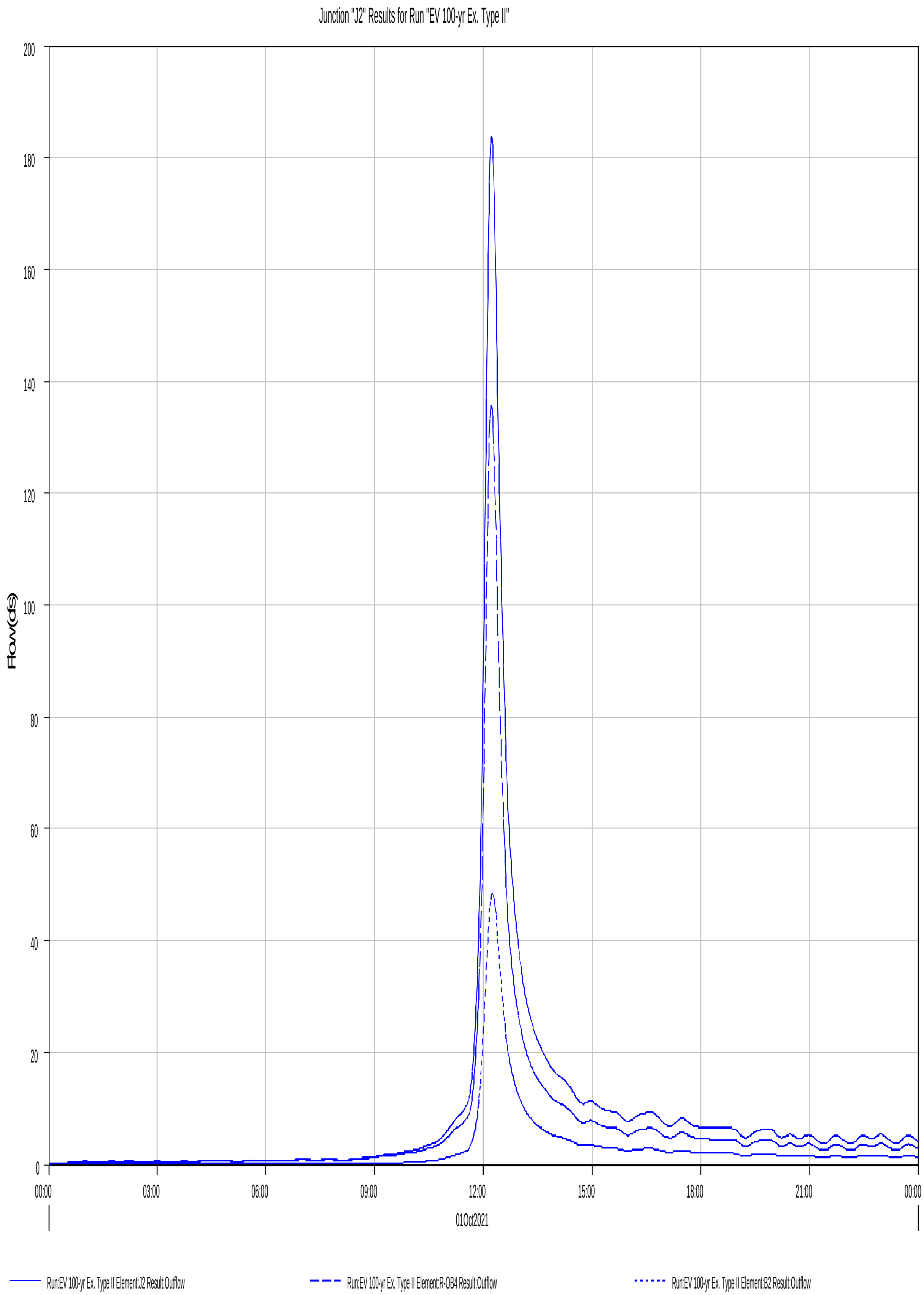
Simulation Run: EV 100-yr Ex. Type II Junction: J1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	27.3 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:10
Total Outflow :	2.5 (AC-FT)		


Junction "J2" Results for Run "EV 100-yr Ex. Type II"
Flow (cfs)
200
180
160
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:J2 Result:Outflow
Run:EV 100-yr Ex. Type II Element:R-OB4 Result:Outflow
Run:EV 100-yr Ex. Type II Element:B2 Result:Outflow

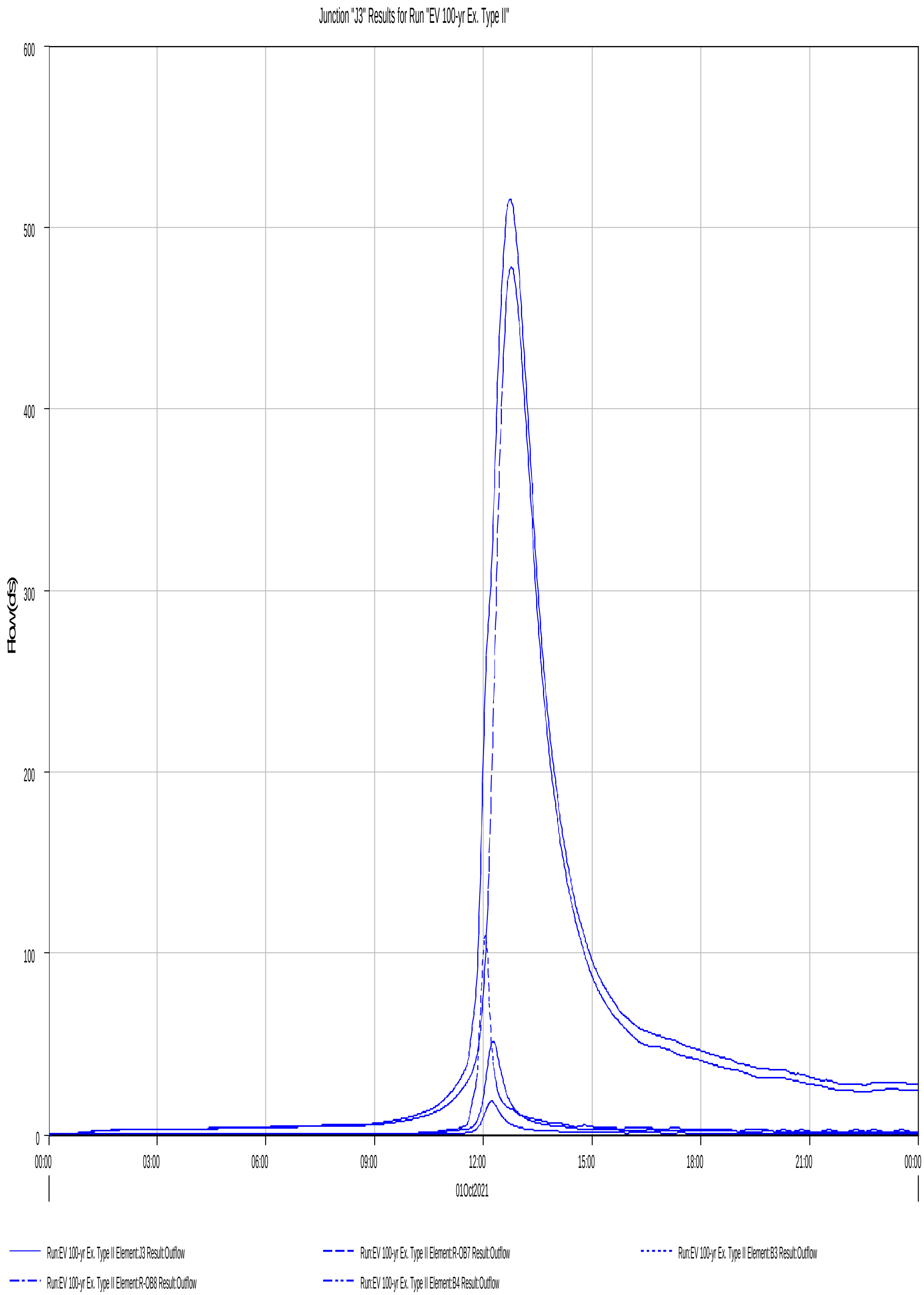
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Junction: J2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	183.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Outflow :	18.8 (AC-FT)		


Junction "J3" Results for Run "EV 100-yr Ex. Type II"
Flow (cfs)
600
500
400
300
200
100
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:J3 Result:Outflow
Run:EV 100-yr Ex. Type II Element:R-OB7 Result:Outflow
Run:EV 100-yr Ex. Type II Element:B3 Result:Outflow
Run:EV 100-yr Ex. Type II Element:R-OB8 Result:Outflow
Run:EV 100-yr Ex. Type II Element:B4 Result:Outflow

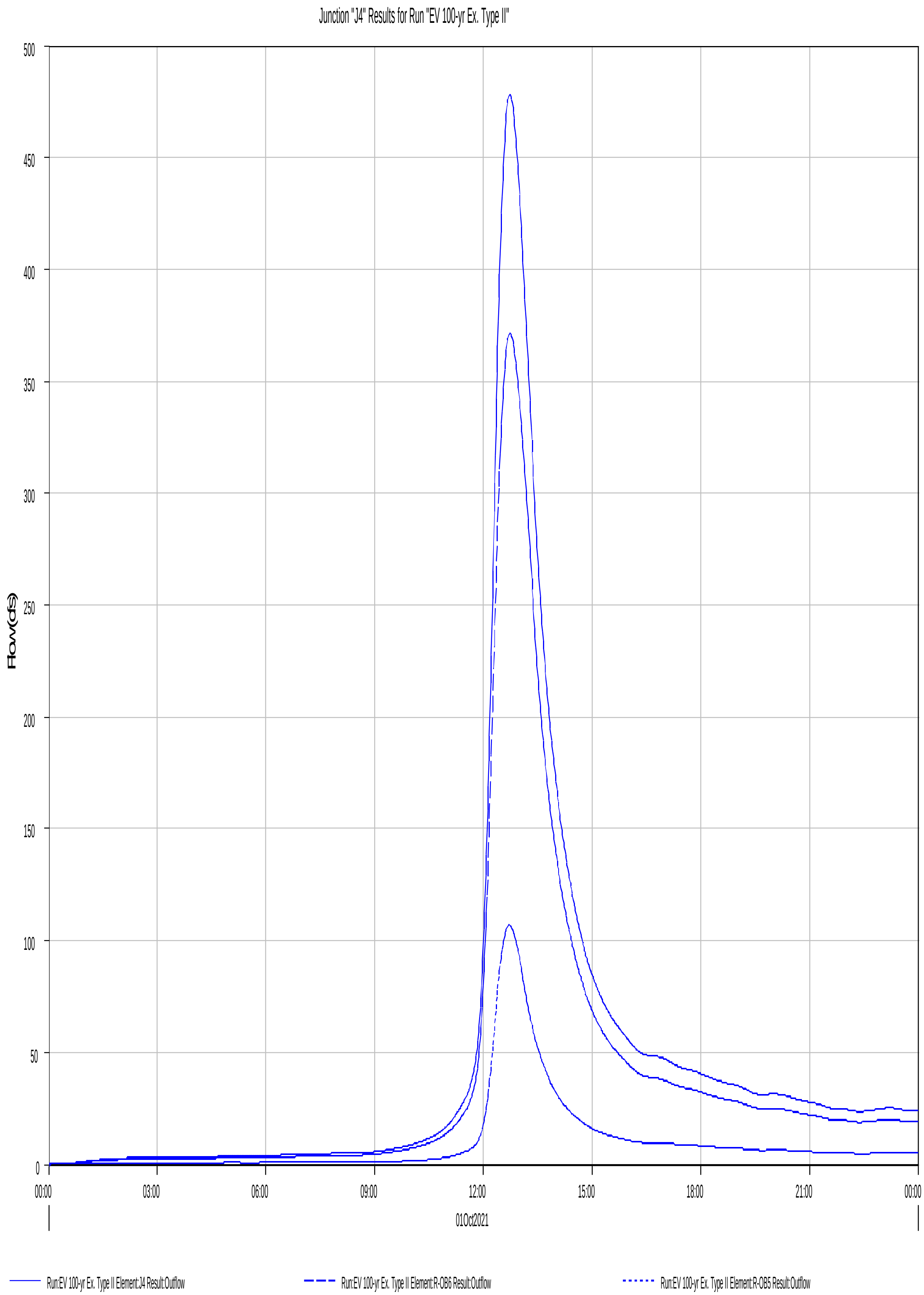
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Junction: J3

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	515.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:44
Total Outflow :	112.7 (AC-FT)		


Junction "J4" Results for Run "EV 100-yr Ex. Type II"
Flow (cfs)
500
450
400
350
300
250
200
150
100
50
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:J4 Result:Outflow
Run:EV 100-yr Ex. Type II Element:R-OB6 Result:Outflow
Run:EV 100-yr Ex. Type II Element:R-OB5 Result:Outflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Junction: J4

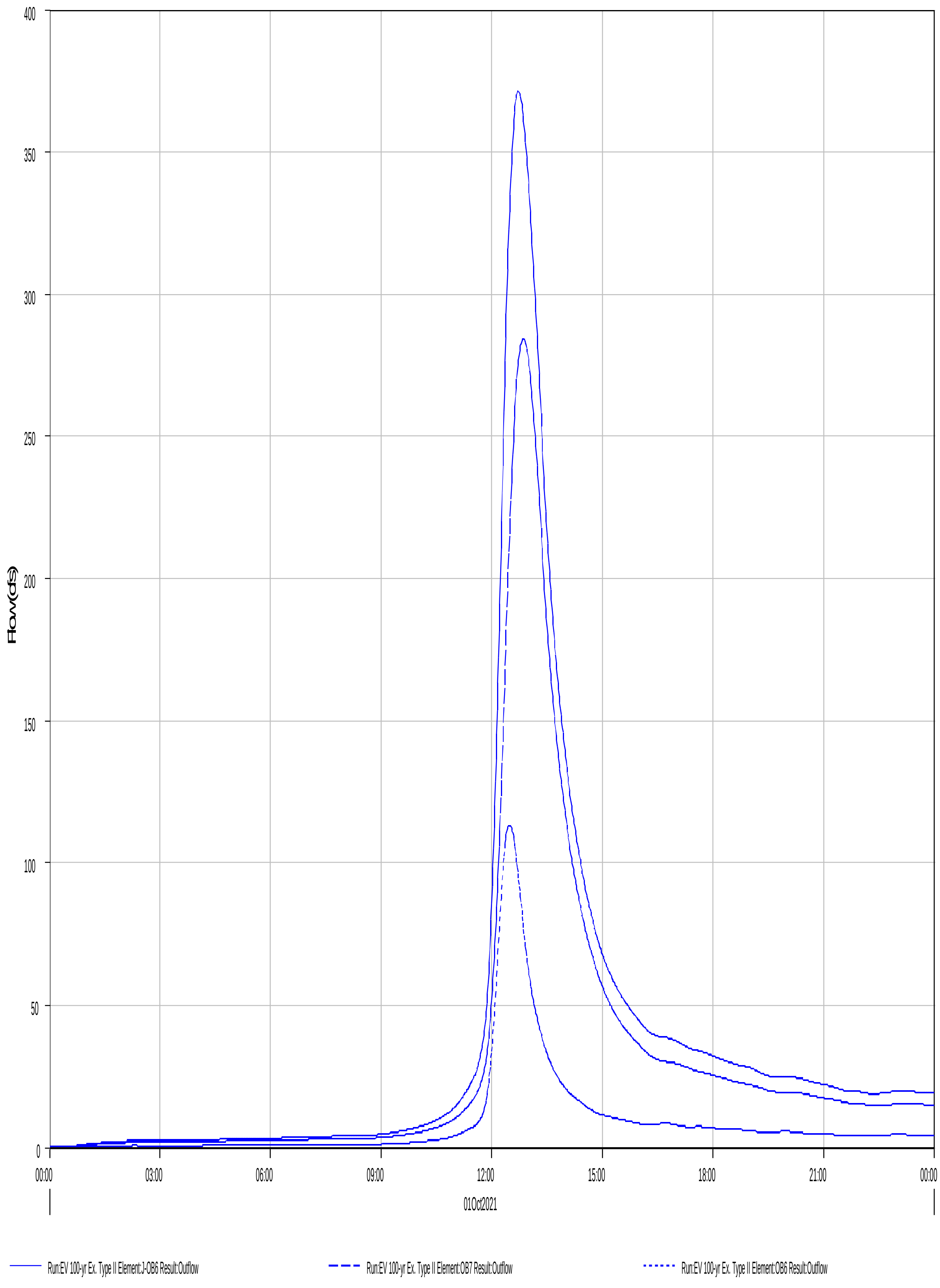
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: IN

Computed Results

Peak Outflow :	478.0 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:44
Total Outflow :	1.72 (IN)		

Junction "J-OB6" Results for Run "EV 100-yr Ex. Type II"



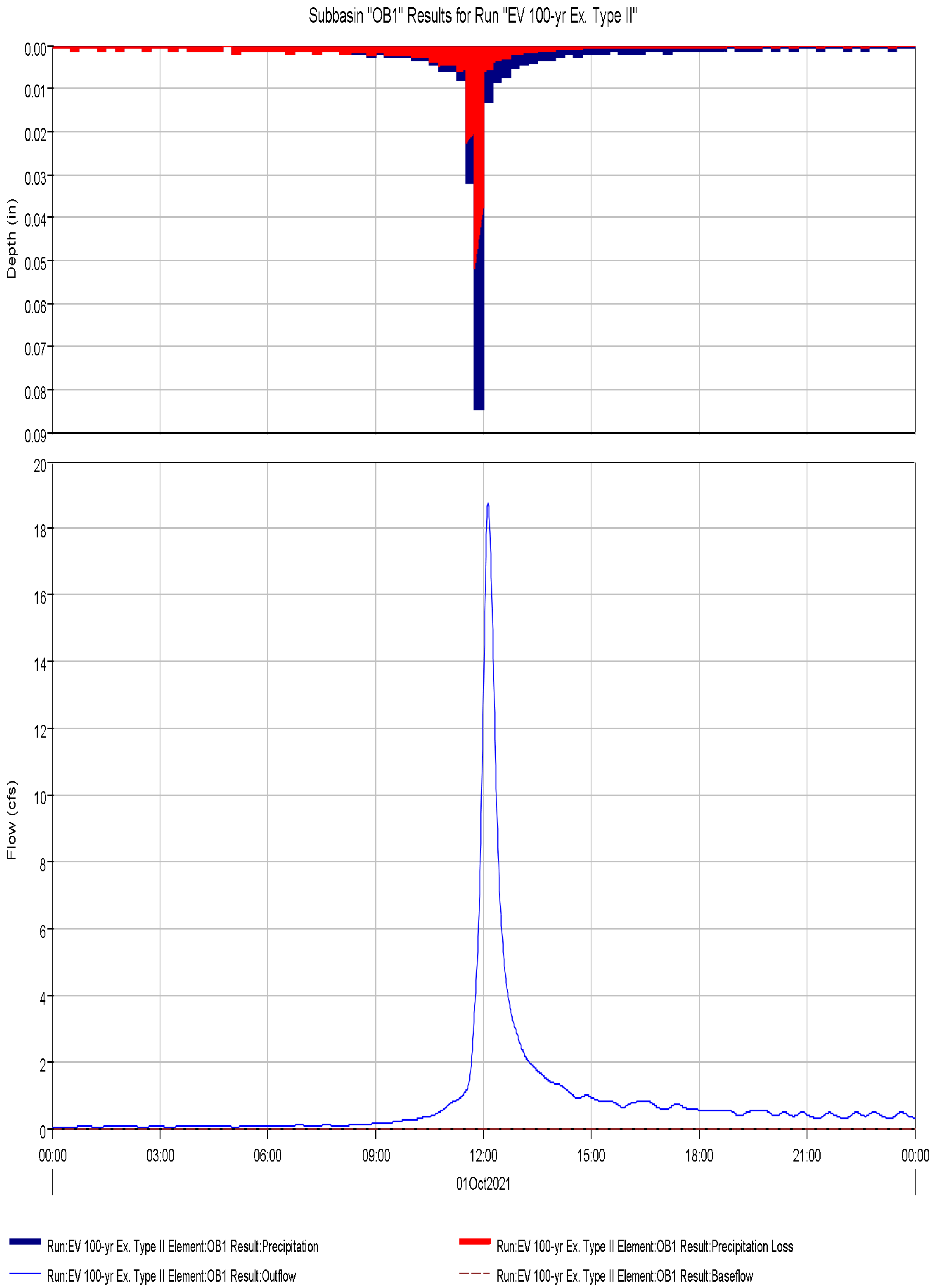
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Junction: J-OB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	371.3 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:43
Total Outflow :	78.1 (AC-FT)		


Subbasin "OB1" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
20
18
16
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:OB1 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:OB1 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:OB1 Result:Outflow
Run:EV 100-yr Ex. Type II Element:OB1 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: OB1

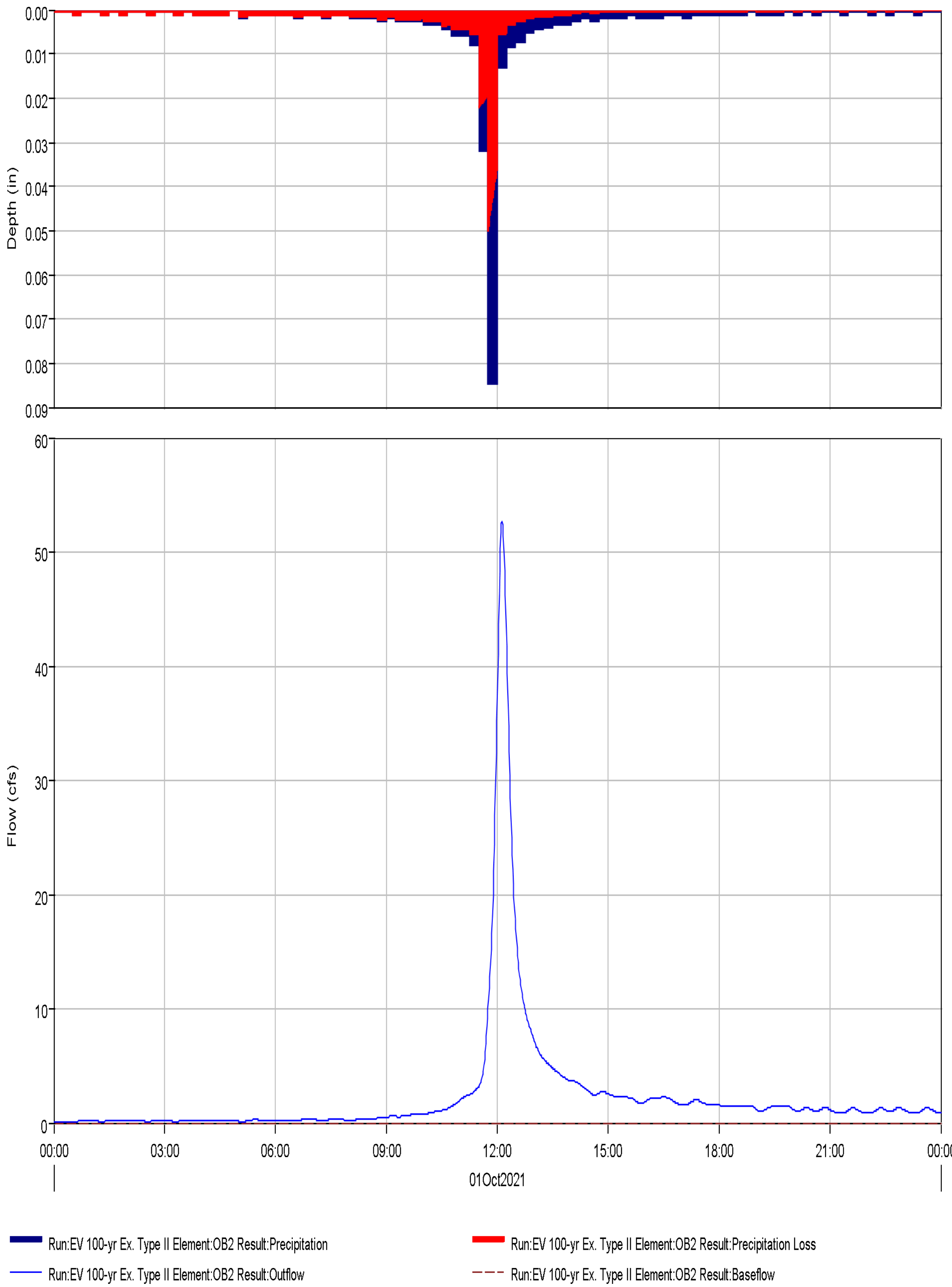
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	18.8 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	4.0 (AC-FT)	Total Direct Runoff :	1.7 (AC-FT)
Total Loss :	2.3 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.7 (AC-FT)	Discharge :	1.7 (AC-FT)

Subbasin "OB2" Results for Run "EV 100-yr Ex. Type II"



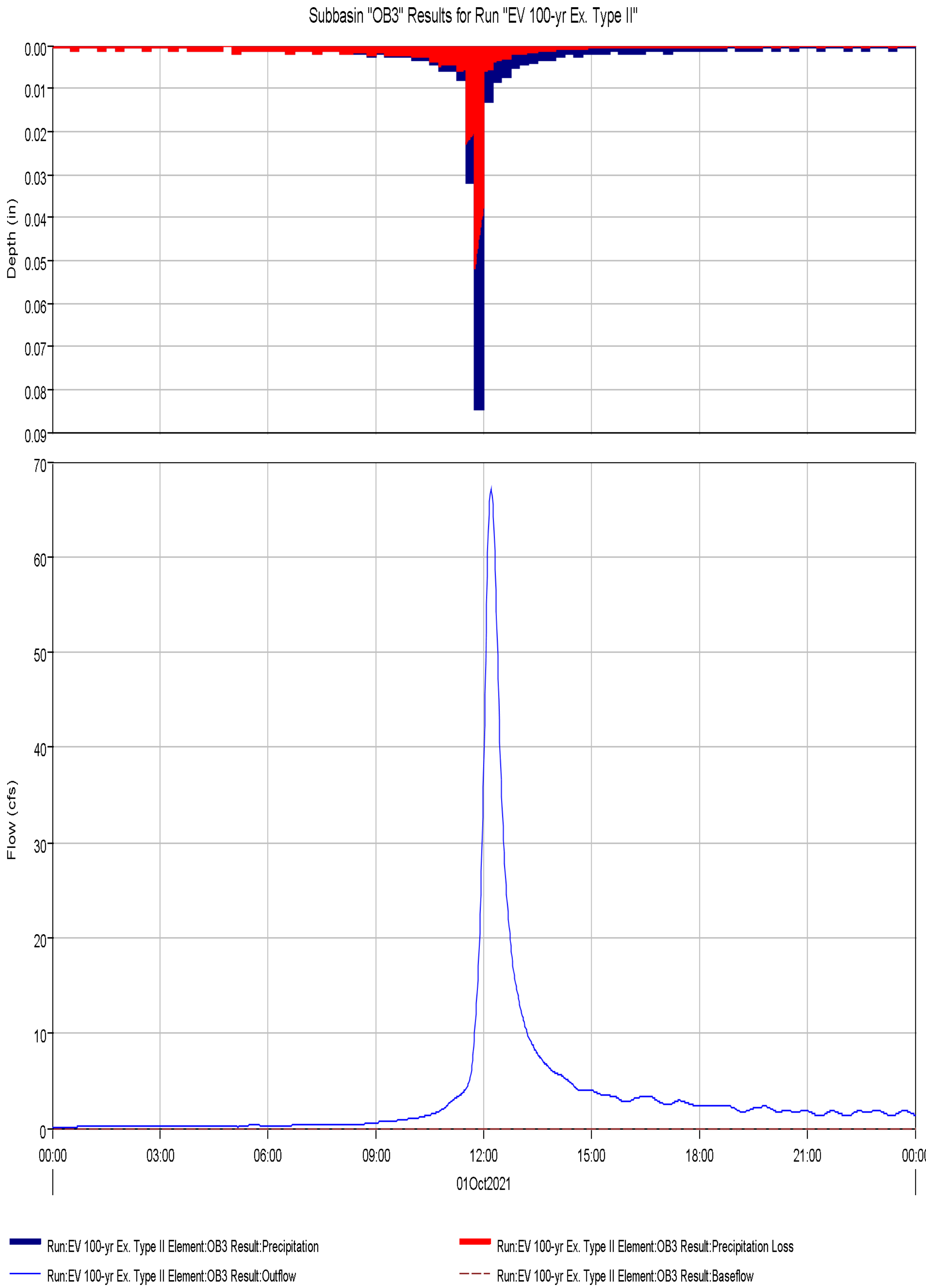
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: OB2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	52.7 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	10.8 (AC-FT)	Total Direct Runoff :	4.7 (AC-FT)
Total Loss :	6.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	4.7 (AC-FT)	Discharge :	4.7 (AC-FT)



Subbasin "OB3" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:OB3 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:OB3 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:OB3 Result:Outflow
Run:EV 100-yr Ex. Type II Element:OB3 Result:Baseflow

Project: Eagleview_Subdivision

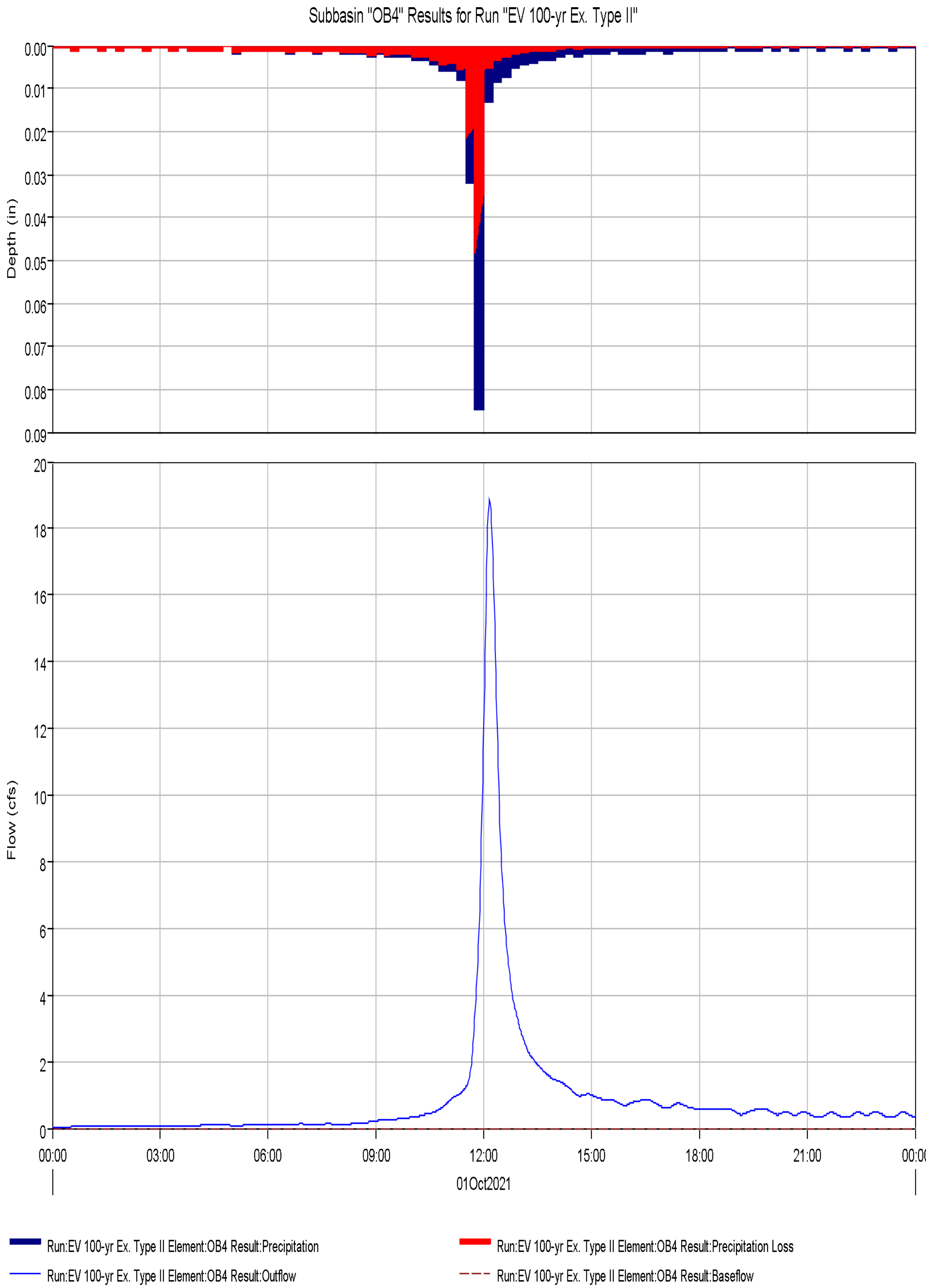
Simulation Run: EV 100-yr Ex. Type II Subbasin: OB3

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	67.1 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:12
Total Precipitation :	16.7 (AC-FT)	Total Direct Runoff :	6.9 (AC-FT)
Total Loss :	9.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	7.0 (AC-FT)	Discharge :	6.9 (AC-FT)



Subbasin "OB4" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
20
18
16
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:OB4 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:OB4 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:OB4 Result:Outflow
Run:EV 100-yr Ex. Type II Element:OB4 Result:Baseflow

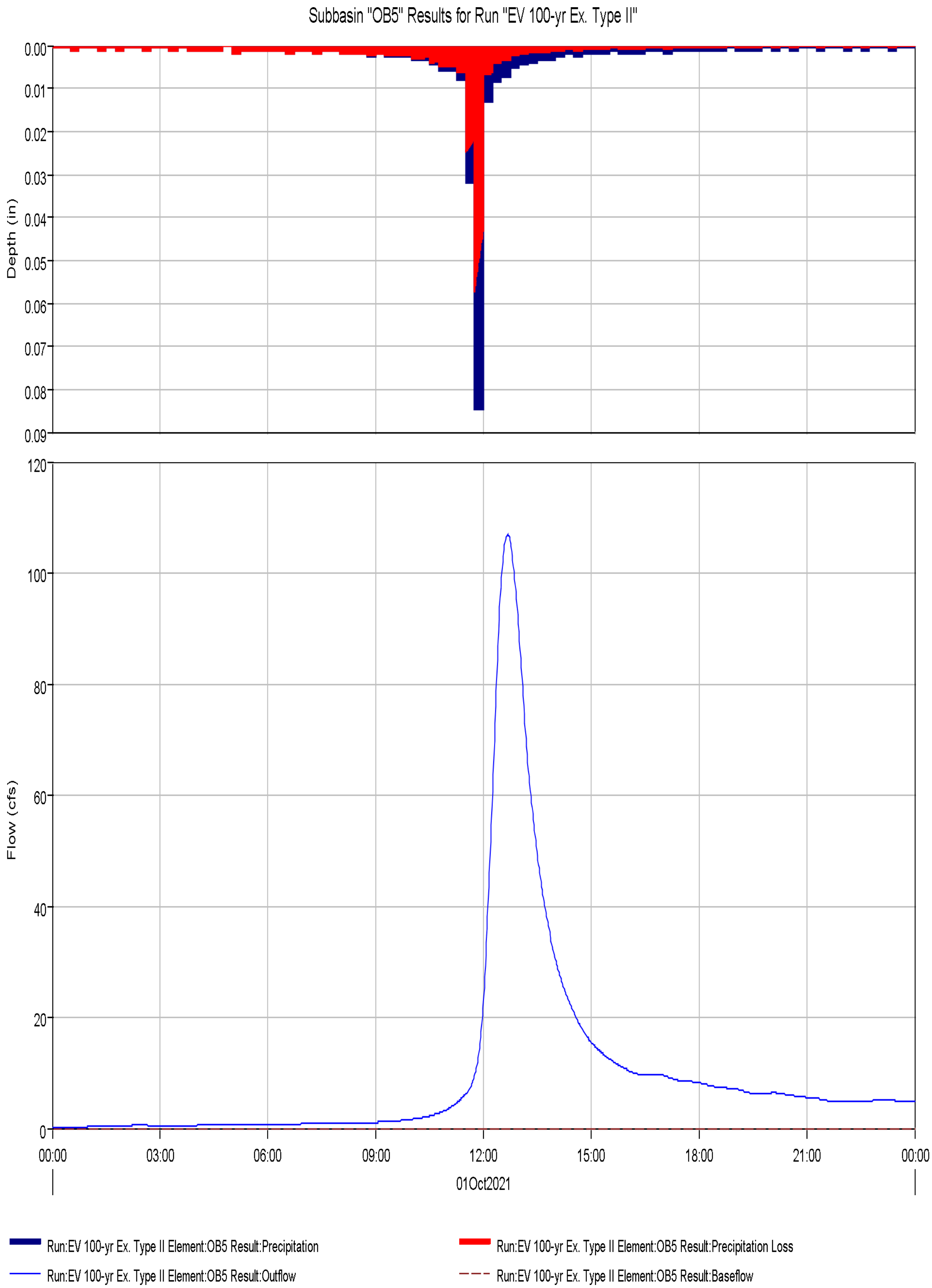
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: OB4

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	18.9 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:10
Total Precipitation :	4.0 (AC-FT)	Total Direct Runoff :	1.8 (AC-FT)
Total Loss :	2.2 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.8 (AC-FT)	Discharge :	1.8 (AC-FT)


Subbasin "OB5" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:OB5 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:OB5 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:OB5 Result:Outflow
Run:EV 100-yr Ex. Type II Element:OB5 Result:Baseflow

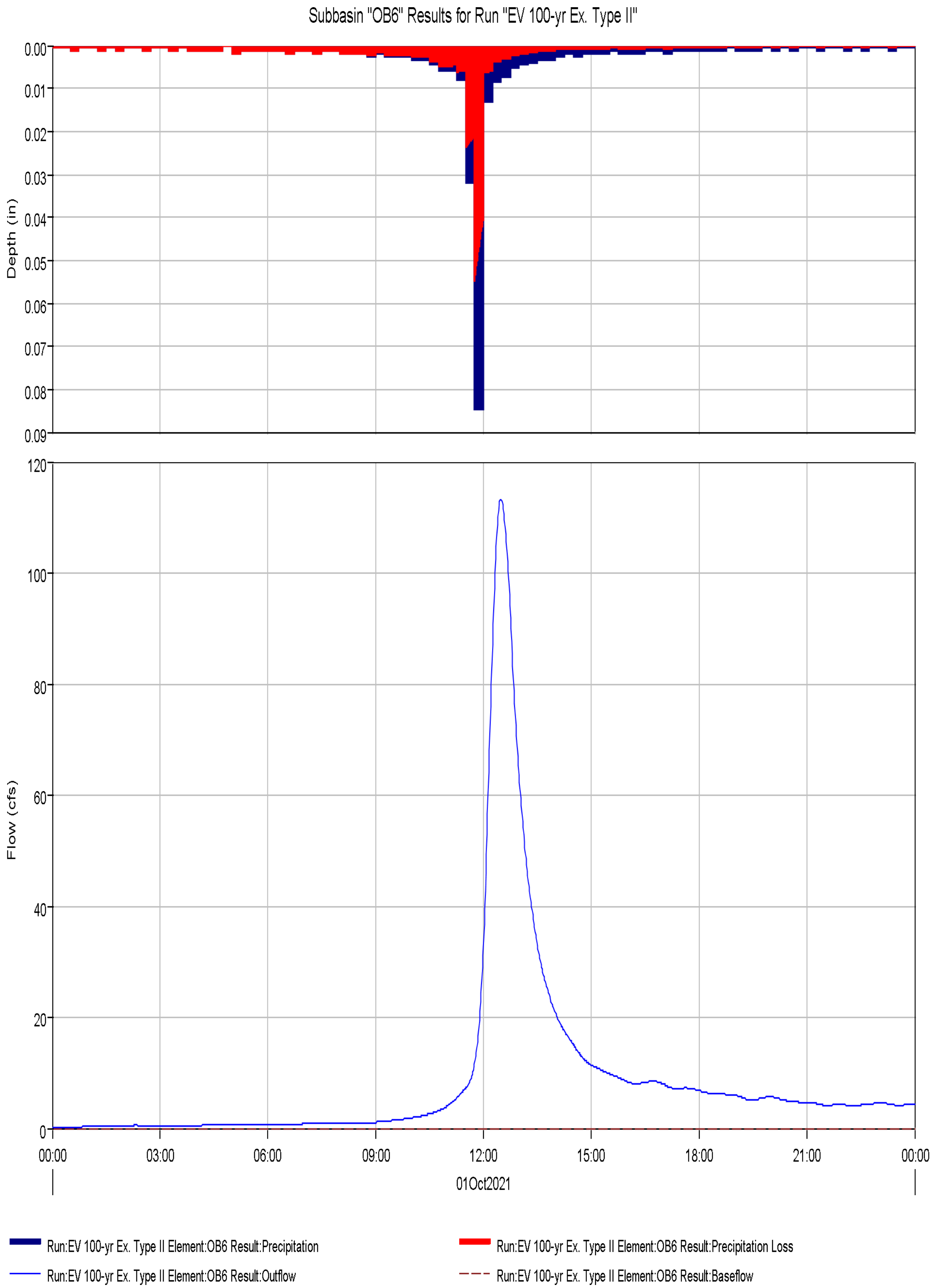
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: OB5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	106.9 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:40
Total Precipitation :	55.1 (AC-FT)	Total Direct Runoff :	19.7 (AC-FT)
Total Loss :	35.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	20.1 (AC-FT)	Discharge :	19.7 (AC-FT)



Subbasin "OB6" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:OB6 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:OB6 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:OB6 Result:Outflow
Run:EV 100-yr Ex. Type II Element:OB6 Result:Baseflow

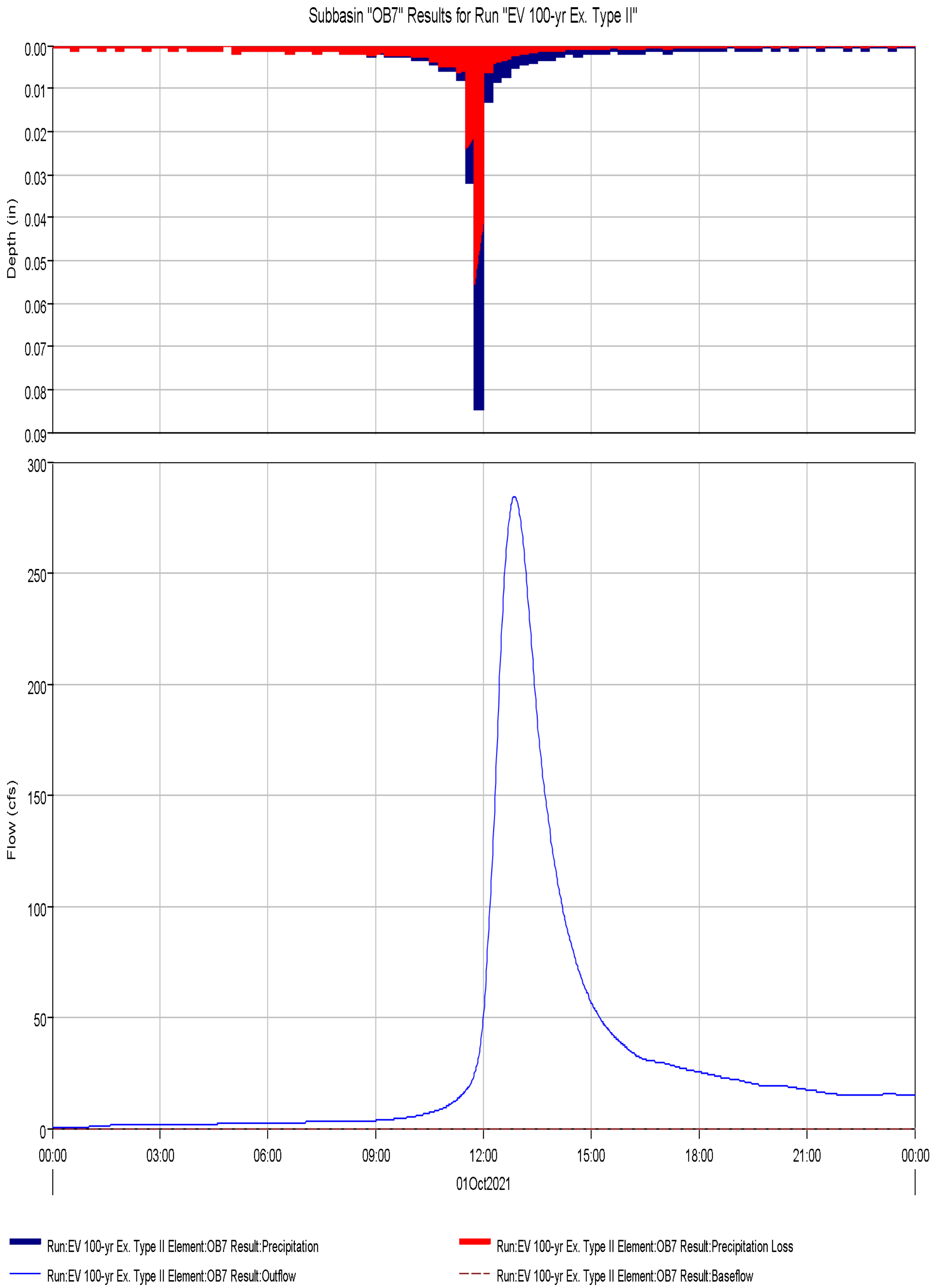
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: OB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	113.2 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:29
Total Precipitation :	45.4 (AC-FT)	Total Direct Runoff :	17.5 (AC-FT)
Total Loss :	27.6 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	17.8 (AC-FT)	Discharge :	17.5 (AC-FT)


Subbasin "OB7" Results for Run "EV 100-yr Ex. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
300
250
200
150
100
50
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:OB7 Result:Precipitation
Run:EV 100-yr Ex. Type II Element:OB7 Result:Precipitation Loss
Run:EV 100-yr Ex. Type II Element:OB7 Result:Outflow
Run:EV 100-yr Ex. Type II Element:OB7 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: OB7

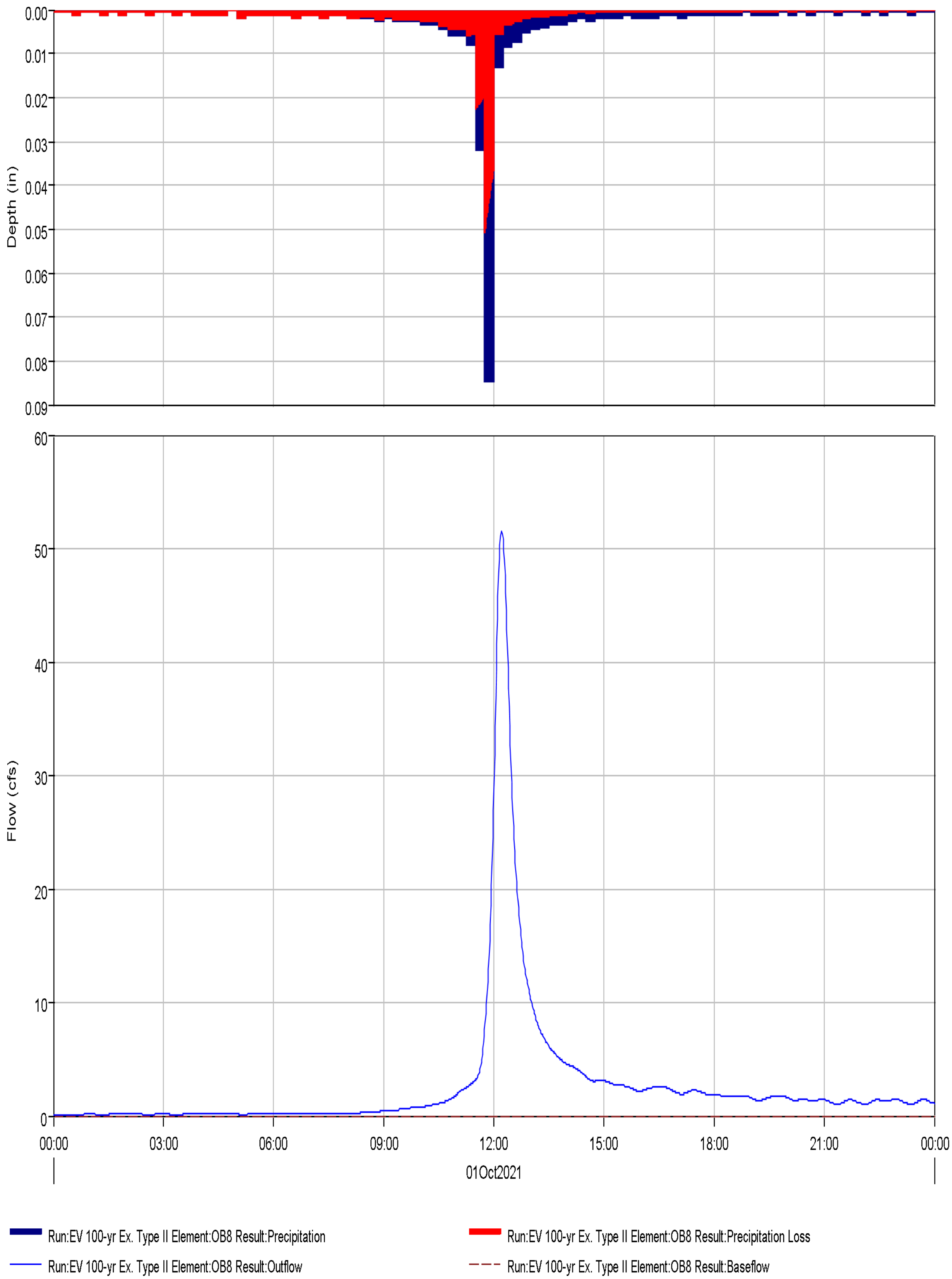
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	284.2 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:52
Total Precipitation :	161.5 (AC-FT)	Total Direct Runoff :	60.6 (AC-FT)
Total Loss :	99.5 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	62.0 (AC-FT)	Discharge :	60.6 (AC-FT)

Subbasin "OB8" Results for Run "EV 100-yr Ex. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Subbasin: OB8

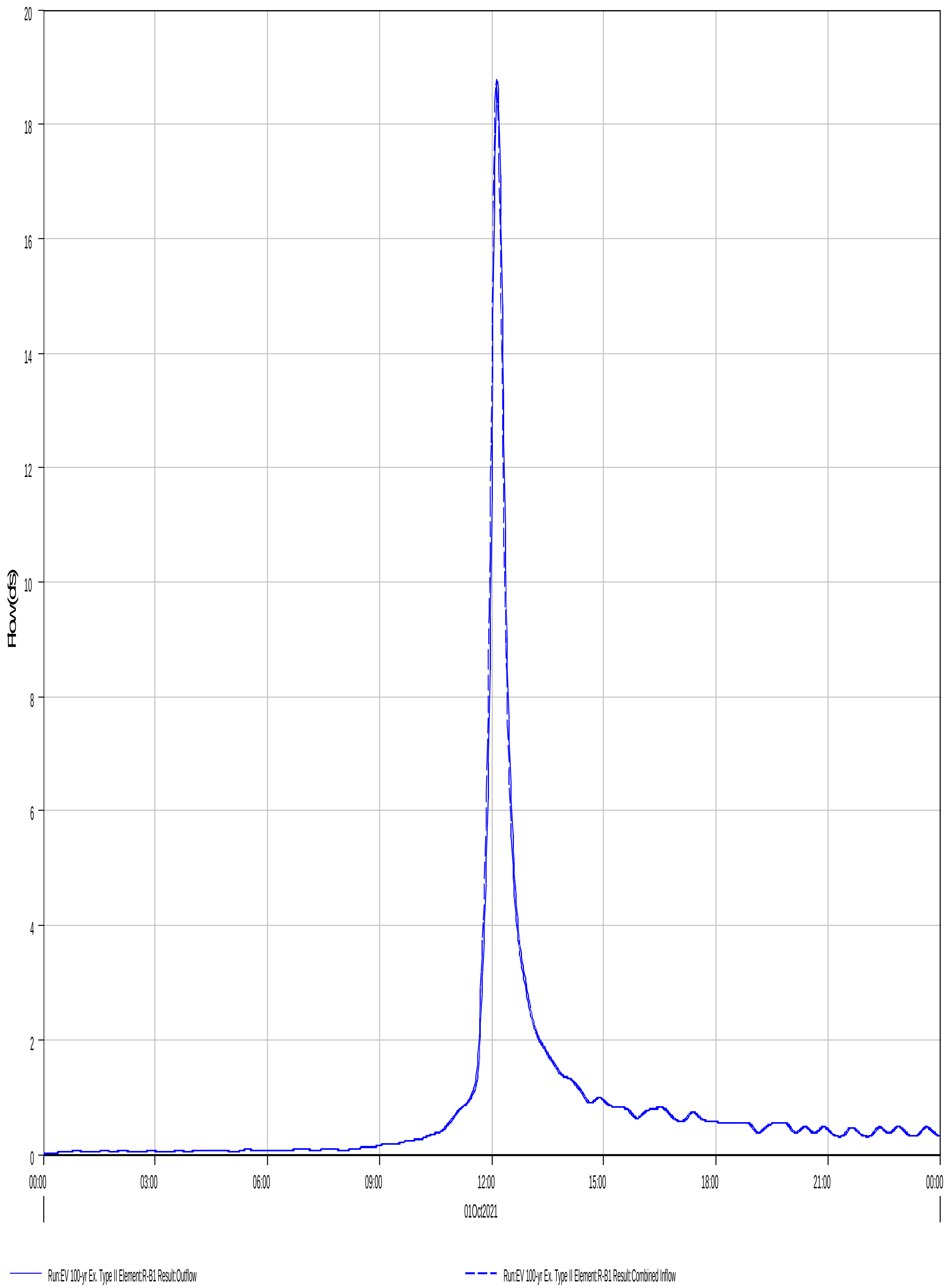
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	51.6 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:13
Total Precipitation :	12.7 (AC-FT)	Total Direct Runoff :	5.4 (AC-FT)
Total Loss :	7.3 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	5.4 (AC-FT)	Discharge :	5.4 (AC-FT)

Reach "R-B1" Results for Run "EV 100-yr Ex. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Reach: R-B1

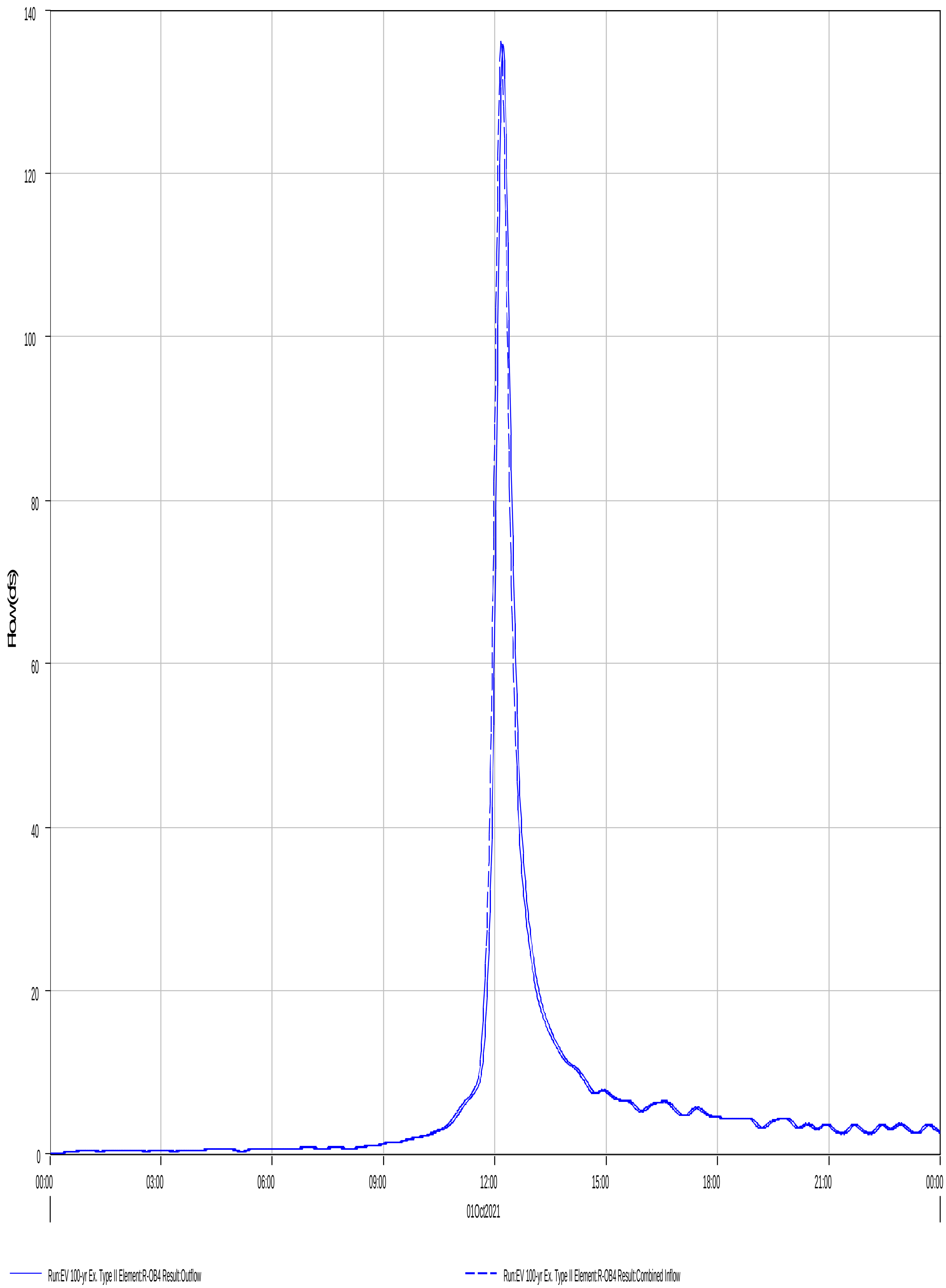
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	18.8 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	18.7 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:10
Total Inflow :	1.7 (AC-FT)	Total Outflow :	1.7 (AC-FT)

Reach "R-OB4" Results for Run "EV 100-yr Ex. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Reach: R-OB4

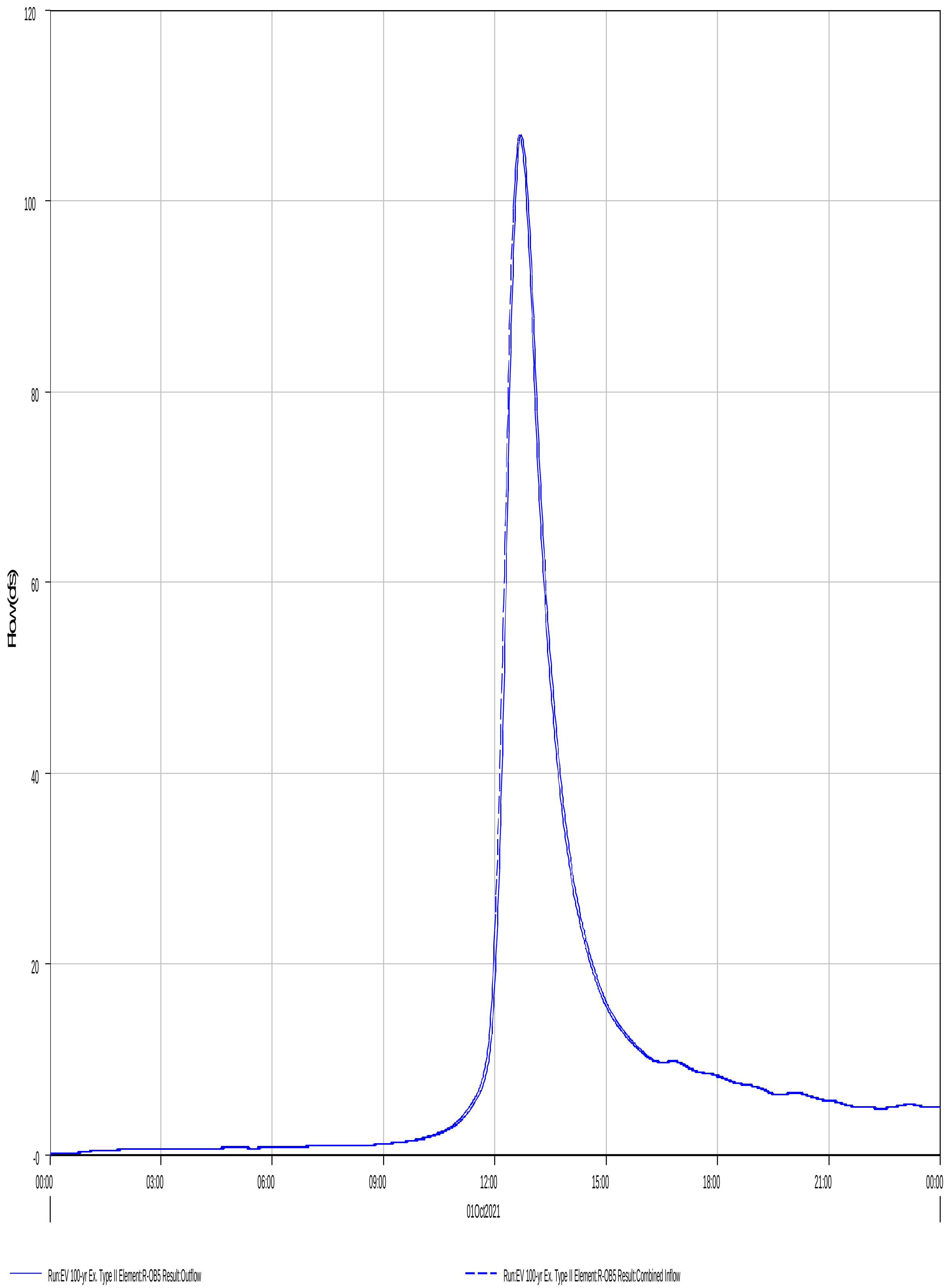
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	136.1 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:10
Peak Outflow :	135.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Inflow :	13.5 (AC-FT)	Total Outflow :	13.4 (AC-FT)

Reach "R-OB5" Results for Run "EV 100-yr Ex. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Reach: R-OB5

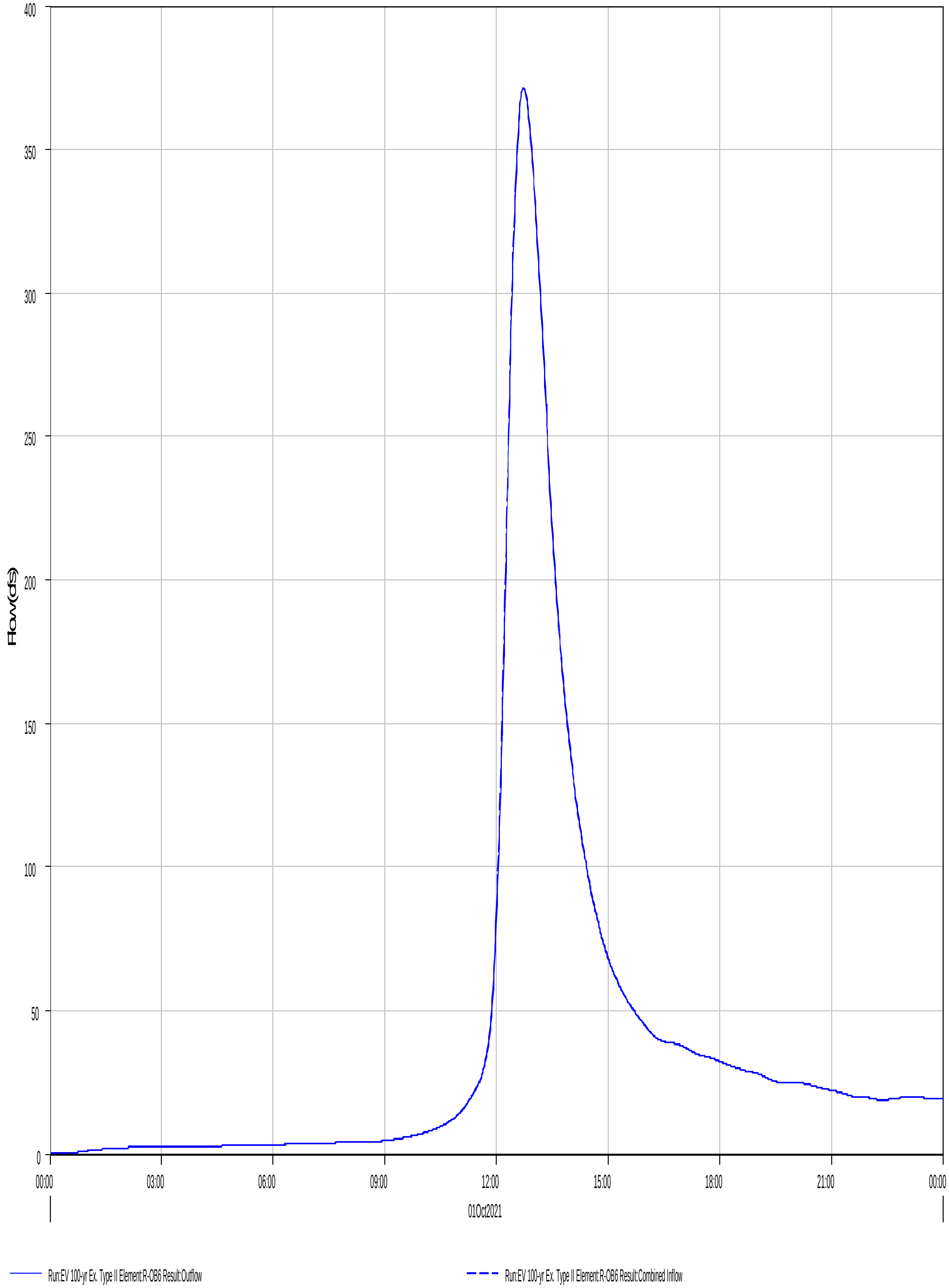
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	106.9 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:40
Peak Outflow :	106.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:43
Total Inflow :	19.7 (AC-FT)	Total Outflow :	19.7 (AC-FT)

Reach "R-OB6" Results for Run "EV 100-yr Ex. Type II"



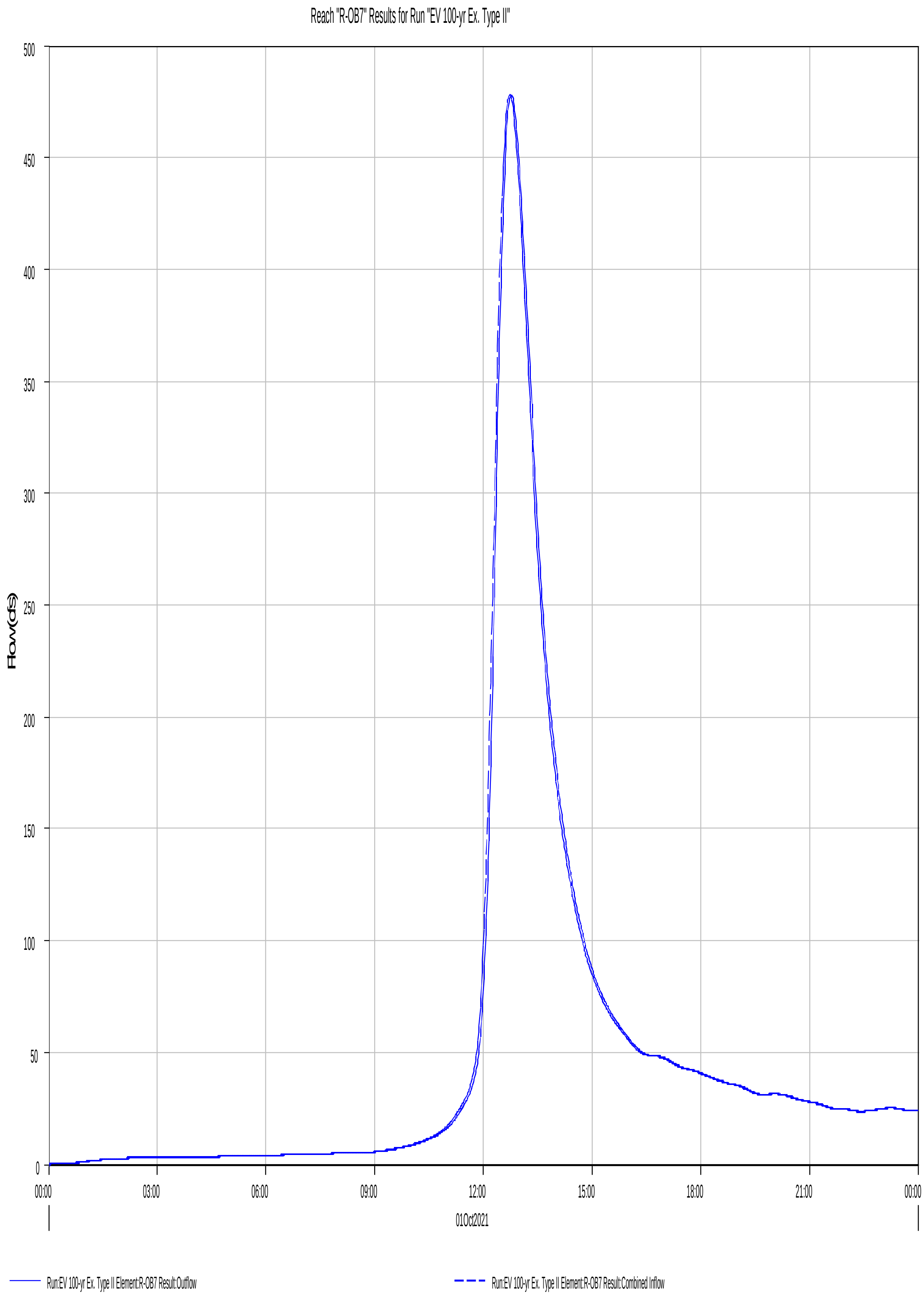
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Reach: R-OB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	371.3 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:43
Peak Outflow :	371.3 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:44
Total Inflow :	78.1 (AC-FT)	Total Outflow :	78.1 (AC-FT)



Reach "R-OB7" Results for Run "EV 100-yr Ex. Type II"
Flow(cfs)
500
450
400
350
300
250
200
150
100
50
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Ex. Type II Element:R-OB7 Result:Outflow
Run:EV 100-yr Ex. Type II Element:R-OB7 Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Reach: R-OB7

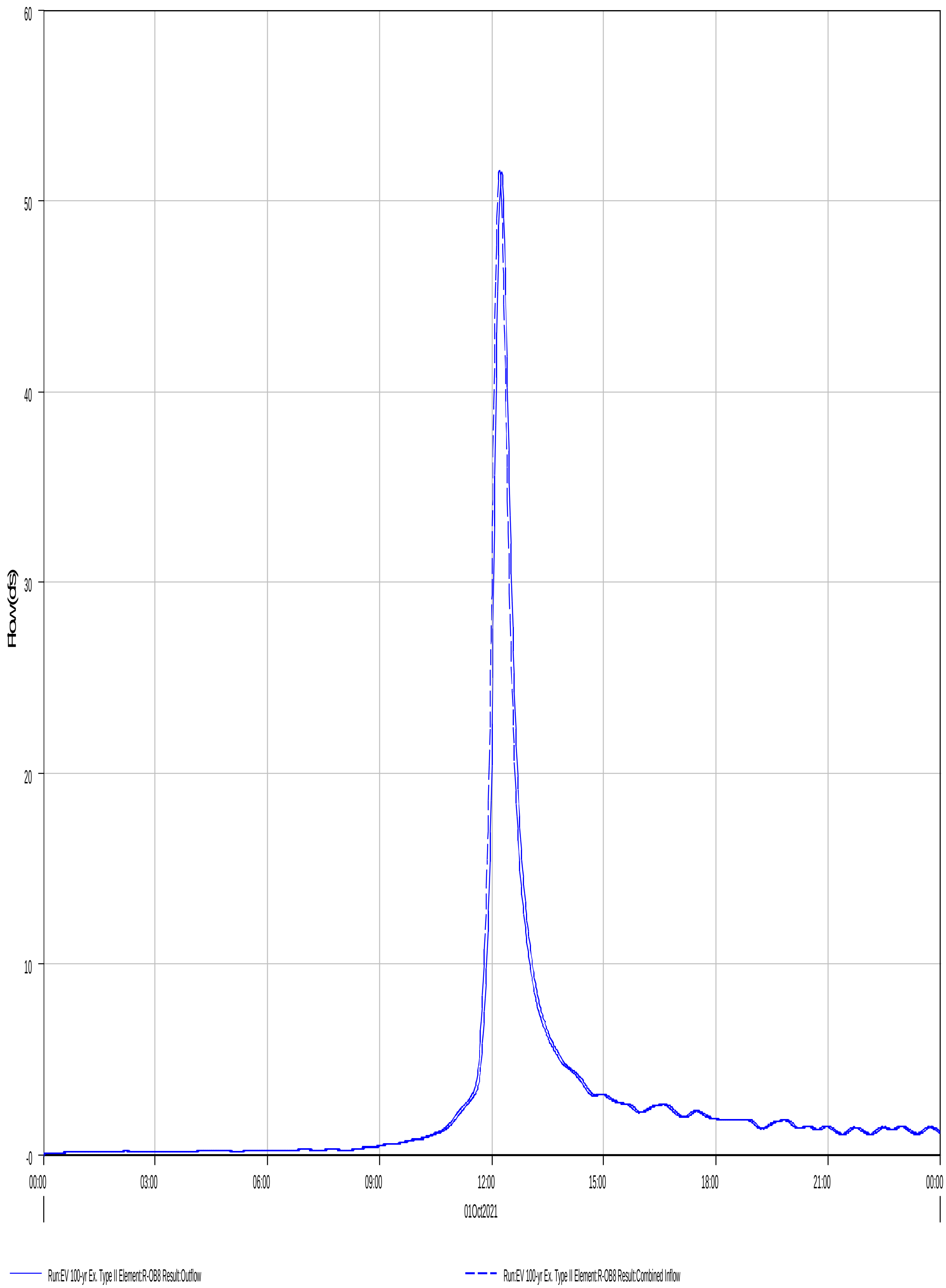
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	478.0 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:44
Peak Outflow :	477.9 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:46
Total Inflow :	97.8 (AC-FT)	Total Outflow :	97.7 (AC-FT)

Reach "R-OB8" Results for Run "EV 100-yr Ex. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Ex. Type II Reach: R-OB8

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Existing
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	11Mar2022, 10:12:01	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

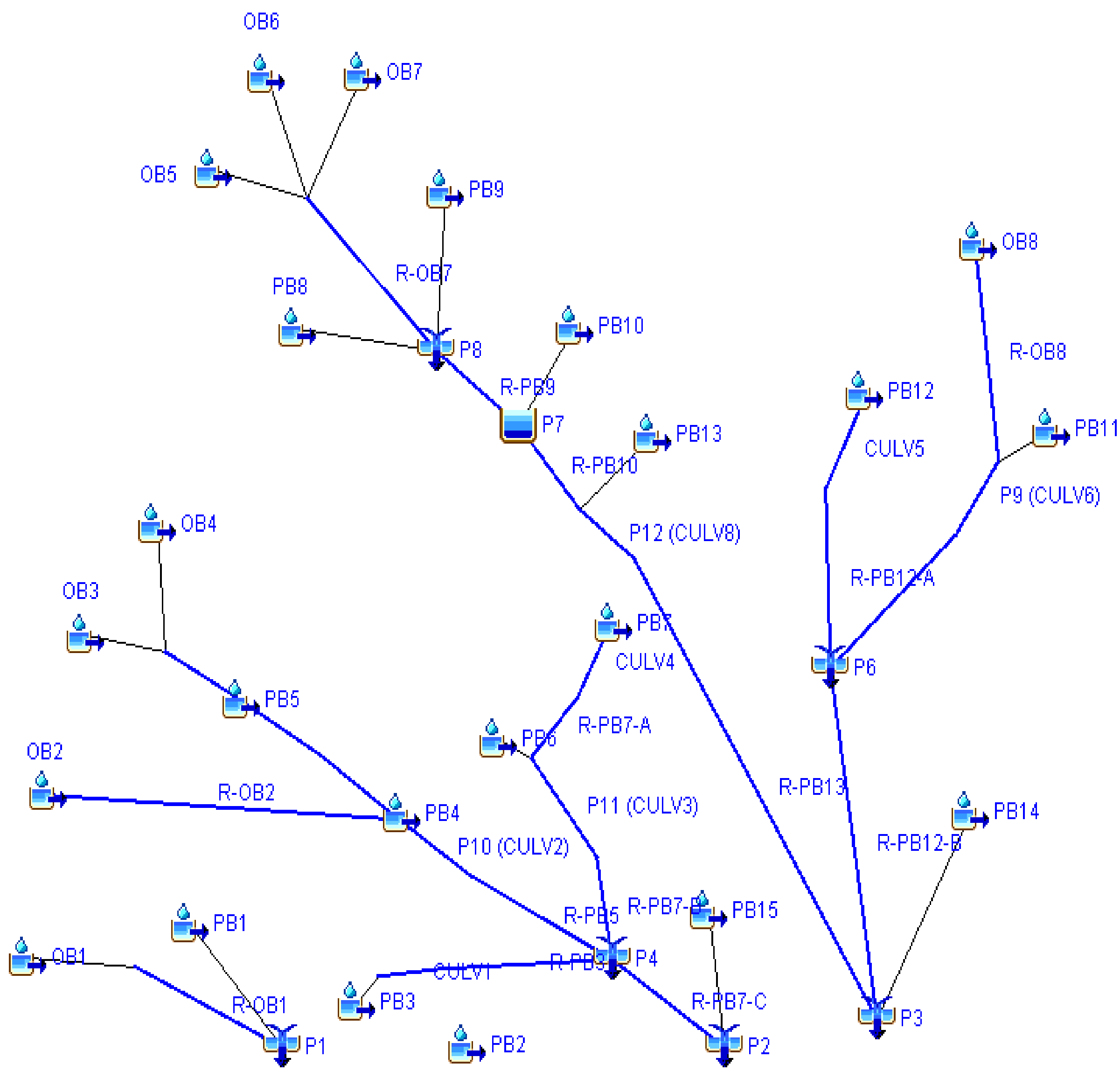
Peak Inflow :	51.6 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	51.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:16
Total Inflow :	5.4 (AC-FT)	Total Outflow :	5.4 (AC-FT)

HEC-HMS

Project : Eagleview_Subdivision

Basin Model : Eagleview_Proposed

Mar 16 08:36:57 MDT 2022



IMPERVIOUS FACTOR CALCULATION TABLE - PROPOSED CONDITIONS

	Basin	Area (Acre)	Open Space (2%)	2.5 Acre Lot (11%)	Buildings (90%)	Paved Roadway (100%)	Gravel Roadway (80%)	Total % Check	Weighted Impervious
Onsite	PB1	4.25	0%	99%	0%	1%	0%	100%	12%
	PB2	1.08	0%	94%	0%	6%	0%	100%	16%
	PB3	1.38	0%	85%	0%	15%	0%	100%	24%
	PB4	10.54	0%	97%	0%	3%	0%	100%	14%
	PB5	6.18	0%	97%	0%	3%	0%	100%	13%
	PB6	11.09	0%	95%	0%	5%	0%	100%	16%
	PB7	3.46	0%	91%	0%	9%	0%	100%	19%
	PB8	11.78	0%	99%	0%	1%	0%	100%	11%
	PB9	12.80	0%	98%	0%	2%	0%	100%	12%
	PB10	11.53	0%	98%	0%	2%	0%	100%	13%
	PB11	16.11	0%	97%	0%	3%	0%	100%	14%
	PB12	0.20	0%	50%	0%	50%	0%	100%	55%
	PB13	3.87	0%	98%	0%	2%	0%	100%	13%
	PB14	17.28	0%	97%	0%	3%	0%	100%	13%
	PB15	9.63	0%	93%	0%	7%	0%	100%	17%
Offsite	OB1	10.37	93%	0%	2%	4%	2%	100%	9%
	OB2	28.06	90%	0%	3%	4%	3%	100%	11%
	OB3	43.44	92%	0%	2%	2%	4%	100%	9%
	OB4	10.50	87%	0%	4%	5%	4%	100%	13%
	OB5	143.82	94%	0%	2%	1%	3%	100%	7%
	OB6	118.40	93%	0%	1%	2%	4%	100%	8%
	OB7	421.43	93%	0%	2%	1%	4%	100%	8%
	OB8	33.08	93%	0%	2%	1%	5%	100%	8%
Total		930.30							12.2%

Kimley»Horn

Post Runoff Analysis
Time of Concentration

Project Information

Project Name:	Eagleview		
KHA Project #:	196288000		
Designed by:	DCM	Date:	12/13/2022
Revised by:		Date:	
Checked by:	BAH	Date:	12/13/2022

Minimum Time of Concentration 5.0 minutes
2YR-24HR Rainfall, P2 2.10

Post-Development
Drainage Area: OB1

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.073	0.15	2.10						17.35	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	1118.00	0.038			U				3.14	5.93	
							Post-Development Time of Concentration, OB1				23.28	13.97

Post-Development
Drainage Area: OB2

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.063	0.15	2.10						18.41	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	554.00	0.046			U				3.45	2.67	
CHANNEL	T2 CHANNEL FLOW	841.00	0.029	0.05		U	9.50	6.60	1.44	6.45	2.17	
							Post-Development Time of Concentration, OB2				23.26	13.95

Post-Development
Drainage Area: OB3

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.074	0.15	2.10						17.26	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	2436.00	0.034			U				2.97	13.65	
							Post-Development Time of Concentration, OB3				30.91	18.55

Post-Development
Drainage Area: OB4

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.042	0.15	2.10						21.65	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	783.00	0.038			U				3.16	4.13	
CHANNEL	T2 CHANNEL FLOW	577.00	0.028	0.05		U	9.50	6.60	1.44	6.36	1.51	
							Post-Development Time of Concentration, OB4				27.29	16.38

Post-Development
Drainage Area: OB5

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.037	0.40	2.10						49.91	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	3838.00	0.033			U				2.93	21.83	
CHANNEL	T2 CHANNEL FLOW	1407.00	0.024	0.04		U	9.50	6.60	1.44	7.36	3.19	
							Post-Development Time of Concentration, OB5				74.93	44.96

Post-Development
Drainage Area: OB6

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.064	0.40	2.10						40.09	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	2569.00	0.038			U				3.14	13.62	
CHANNEL	T2 CHANNEL FLOW	2110.00	0.027	0.04		U	9.50	6.60	1.44	7.73	4.55	
							Post-Development Time of Concentration, OB6				58.25	34.95

Post-Development
Drainage Area: OB7

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.028	0.40	2.10						55.80	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	2068.00	0.036			U				3.06	11.26	
CHANNEL	T3 CHANNEL FLOW	6198.00	0.03	0.04		U	12.00	22.00	0.55	4.09	25.29	
							Post-Development Time of Concentration, OB7				92.35	55.41

Post-Development
Drainage Area: OB8

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.029	0.15	2.10						25.10	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	1117.00	0.043			U				3.34	5.57	
CHANNEL	T2 CHANNEL FLOW	762.00	0.033	0.03		U	9.50	6.60	1.44	11.43	1.11	
							Post-Development Time of Concentration, OB8				31.78	19.07

Post-Development
Drainage Area: PB1

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.033	0.15	2.10						23.84	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	400.00	0.041			U				3.27	2.04	
							Post-Development Time of Concentration, PB1				25.88	15.53

Post-Development
Drainage Area: PB2

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	227.00	0.033	0.15	2.10						19.07	
							Post-Development Time of Concentration, PB2				19.07	11.44

Post-Development
Drainage Area: PB3

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T3 SHEET FLOW	313.00	0.05	0.15	2.10						21.59	
CHANNEL	T3 CHANNEL FLOW	315.00	0.02	0.03		U	9.00	12.40	0.73	6.08	0.86	
							Post-Development Time of Concentration, PB3				22.46	13.47

Post-Development
Drainage Area: PB4

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
MINIMUM TC	T2 MINIMUM TC FLOW										5.00	
							Post-Development Time of Concentration, PB4				5.00	3.00

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Post Runoff Analysis
Time of Concentration

Project Information

Project Name: Eagleview
KHA Project #: 196288000
Designed by: DCM Date: 12/13/2022
Revised by: Date:
Checked by: BAH Date: 12/13/2022

Minimum Time of Concentration 5.0 minutes
2YR-24HR Rainfall, P2 2.10

Post-Development
Drainage Area: PB5

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.021	0.15	2.10						28.56	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	292.00	0.024			U				2.50	1.95	
CHANNEL	T2 CHANNEL FLOW	44.00	0.032	0.03		U	9.50	6.60	1.44	11.33	0.06	
							Post-Development Time of Concentration, PB5				30.58	18.35

Post-Development
Drainage Area: PB6

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.034	0.15	2.10						23.56	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	650.00	0.036			U				3.06	3.54	
CHANNEL	T2 CHANNEL FLOW	66.00	0.001	0.03		U	9.00	12.40	0.73	1.27	0.87	
							Post-Development Time of Concentration, PB6				27.96	16.78

Post-Development
Drainage Area: PB7

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.043	0.15	2.10						21.44	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	235.00	0.051			U				3.64	1.08	
CHANNEL	T2 CHANNEL FLOW	539.00	0.035	0.03		U	9.00	12.40	0.73	7.50	1.20	
							Post-Development Time of Concentration, PB7				23.72	14.23

Post-Development
Drainage Area: PB8

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	17.00	0.018	0.15	2.10						3.06	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	136.00	0.110			U				5.35	0.42	
CHANNEL	T2 CHANNEL FLOW	1445.00	0.031	0.03		U	14.00	34.00	0.41	4.84	4.98	
							Post-Development Time of Concentration, PB8				8.46	5.07

Post-Development
Drainage Area: PB9

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.060	0.15	2.10						18.77	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	171.00	0.072			U				4.33	0.66	
CHANNEL	T2 CHANNEL FLOW	873.00	0.028	0.03		U	14.00	34.00	0.41	4.60	3.16	
							Post-Development Time of Concentration, PB9				22.59	13.56

Post-Development
Drainage Area: PB10

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.035	0.15	2.10						23.29	
SHALLOW CONCENTRATED	T2 SHALLOW CONCENTRATED FLOW	395.00	0.034			U				2.97	2.21	
CHANNEL	T2 CHANNEL FLOW	771.00	0.042	0.03		U	14.00	34.00	0.41	5.63	2.28	
							Post-Development Time of Concentration, PB10				27.78	16.67

Post-Development
Drainage Area: PB11

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	300.00	0.031	0.15	2.10						24.44	
CHANNEL	T2 CHANNEL FLOW	1252.00	0.025	0.03		U	9.50	6.60	1.44	10.01	2.08	
							Post-Development Time of Concentration, PB11				26.53	15.92

Post-Development
Drainage Area: PB12

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
MINIMUM TC	T2 MINIMUM TC FLOW										5.00	
							Post-Development Time of Concentration, PB12				5.00	3.00

Post-Development
Drainage Area: PB13

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
MINIMUM TC	T2 MINIMUM TC FLOW										5.00	
							Post-Development Time of Concentration, PB13				5.00	3.00

Post-Development
Drainage Area: PB14

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
SHEET	T1 SHEET FLOW	40.00	0.085	0.013	2.10						0.46	
CHANNEL	T2 CHANNEL FLOW	244.00	0.060	0.03		U	9.00	12.40	0.73	9.82	0.41	
CHANNEL	T2 CHANNEL FLOW	1123.00	0.014	0.03		U	14.00	34.00	0.41	3.25	5.76	
							Post-Development Time of Concentration, PB14				6.63	3.98

Post-Development
Drainage Area: PB15

		Flow Length, L (ft)	Slope, s (ft/ft)	Manning's Roughness Coefficient, n	Two-year, 24-hr rainfall, P2 (in)	Paved or Unpaved	Cross Sectional Area of Flow, A (ft^2)	Wetted Perimeter, pw (ft)	Hydraulic radius, r (ft)	Average Velocity, V (ft/s)**	Travel Time, Tt (min)	Lag Time (min)
MINIMUM TC	T2 MINIMUM TC FLOW										5.00	
							Post-Development Time of Concentration, PB15				5.00	3.00

Kimley»Horn

Post Runoff Analysis
Composite CN

Project Name: Eagleview
KHA Project #: 196288000
Designed by: DCM Date: 12/13/2022
Revised by: Date:
Revised by: Date:
Checked by: BAH Date: 12/13/2022

Post-Development					
Drainage Area: OB1					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	9.79	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	0.38	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	0.20	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB1		63.76		10.37	0.568

Post-Development					
Drainage Area: OB2					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	26.11	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	1.15	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	0.81	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB2		64.13		28.06	0.559

Post-Development					
Drainage Area: OB3					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	40.80	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	0.97	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	1.67	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB3		63.69		43.44	0.570

Post-Development					
Drainage Area: OB4					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	9.56	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	0.52	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	0.42	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB4		64.72		10.50	0.545

Post-Development					
Drainage Area: OB5					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	28.40	--
RESIDENTIAL	RR-5 (Woods Landuse)	B	58.00	109.48	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	1.55	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	4.39	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB5		60.05		143.82	0.665

Post-Development					
Drainage Area: OB6					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	60.58	--
RESIDENTIAL	RR-5 (Woods Landuse)	B	58.00	51.19	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	2.10	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	4.53	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB6		61.79		118.40	0.618

Kimley»Horn

Post Runoff Analysis
Composite CN

Project Name: Eagleview
KHA Project #: 196288000
Designed by: DCM Date: 12/13/2022
Revised by: Date:
Revised by: Date:
Checked by: BAH Date: 12/13/2022

Post-Development					
Drainage Area: OB7					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	122.08	--
RESIDENTIAL	RR-5 (Woods Landuse)	B	58.00	259.48	--
RESIDENTIAL	2.5 acre	B	64.00	16.02	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	5.46	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	18.17	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB7		61.07		421.20	0.637

Post-Development					
Drainage Area: OB8					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	RR-5 (Rangeland Landuse)	B	62.00	8.71	--
RESIDENTIAL	2.5 acre	B	64.00	21.76	--
RESIDENTIAL	1/2 acre (25% imp.)	B	71.00	0.79	--
IMPERVIOUS	Paved; curbs and storm sewers (excluding right-of-way)	B	98.00	0.24	--
IMPERVIOUS	Gravel (including right of way)	B	85.00	1.57	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - OB8		64.89		33.07	0.541

Post-Development					
Drainage Area: PB1					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	4.19	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.06	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB1		64.35		4.25	0.554

Post-Development					
Drainage Area: PB2					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	1.02	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.06	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB2		65.38		1.08	0.530

Post-Development					
Drainage Area: PB3					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	1.18	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.20	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB3		67.68		1.38	0.478

Post-Development					
Drainage Area: PB4					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	10.18	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.35	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB4		64.84		10.54	0.542

Post-Development					
Drainage Area: PB5					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	6.01	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.17	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB5		64.70		6.18	0.546

Kimley»Horn

Post Runoff Analysis

Composite CN

Project Name: Eagleview
KHA Project #: 196288000
Designed by: DCM Date: 12/13/2022
Revised by: Date:
Revised by: Date:
Checked by: BAH Date: 12/13/2022

Post-Development					
Drainage Area: PB6					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	10.50	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.59	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB6		65.33		11.09	0.531

Post-Development					
Drainage Area: PB7					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	3.15	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.31	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB7		66.22		3.46	0.510

Post-Development					
Drainage Area: PB8					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	11.72	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.06	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB8		64.13		11.78	0.559

Post-Development					
Drainage Area: PB9					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	12.60	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.20	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB9		64.39		12.80	0.553

Post-Development					
Drainage Area: PB10					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	11.27	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.26	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB10		64.57		11.53	0.549

Post-Development					
Drainage Area: PB11					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	15.60	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.51	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB11		64.80		16.11	0.543

Post-Development					
Drainage Area: PB12					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	0.10	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.10	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB12		76.50		0.20	0.307

Kimley»Horn

Post Runoff Analysis

Composite CN

Project Name: Eagleview
KHA Project #: 196288000
Designed by: DCM   Date: 12/13/2022
Revised by: Date:
Revised by: Date:
Checked by: BAH   Date: 12/13/2022

Post-Development					
Drainage Area: PB13					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	B	64.00	3.79	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.08	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB13		64.51		3.87	0.550

Post-Development					
Drainage Area: PB14					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	A	45.00	0.28	--
RESIDENTIAL	2.5 acre	B	64.00	16.54	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.46	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB14		63.64		17.28	0.571

Post-Development					
Drainage Area: PB15					
COVER DESCRIPTION	HYDROLOGIC CONDITION OR COVER TYPE	HYDROLOGIC SOIL GROUP	SCS CURVE NUMBER (CN)	AREA, A (ac.)	INITIAL ABSTRACTION, IA
RESIDENTIAL	2.5 acre	A	45.00	0.61	--
RESIDENTIAL	2.5 acre	B	64.00	8.38	--
IMPERVIOUS	Paved; open ditches (including right-of-way)	B	89.00	0.65	--
CUTSOM					
COMPOSITE SCS CURVE NUMBER - PB15		61.65		9.63	0.622

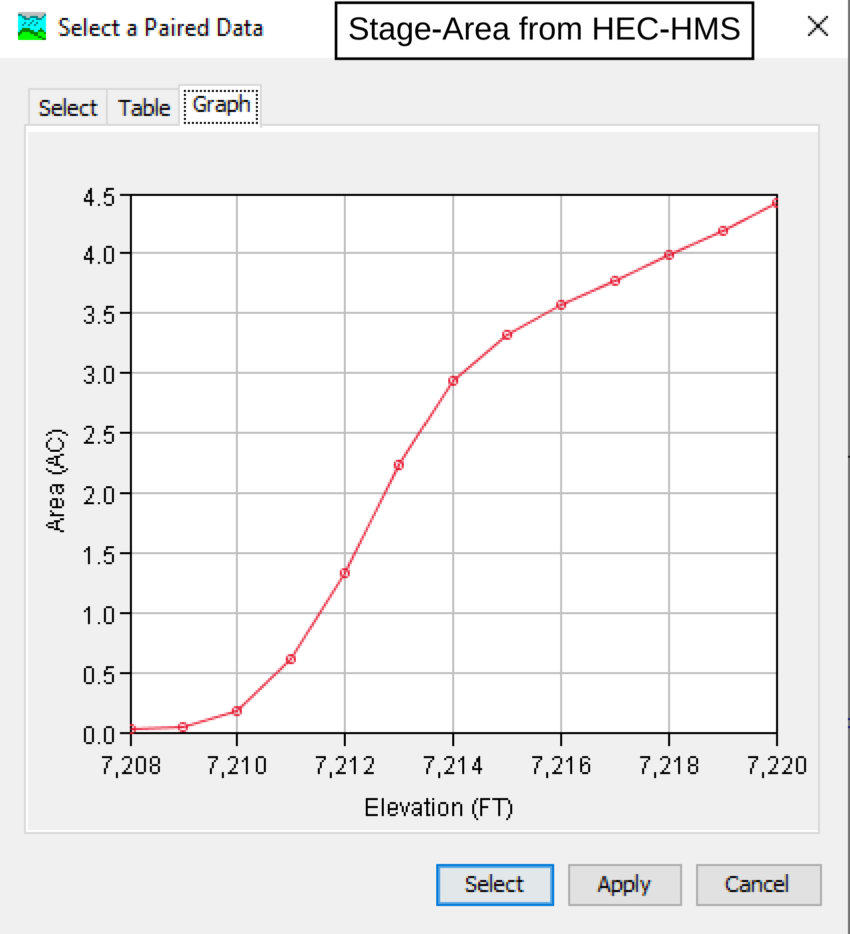
Select a Paired Data

Stage-Area from HEC-HMS

Select | Table | Graph

Elevation (FT)	Area (AC)
7208.0	0.026
7209.0	0.048
7210.0	0.170
7211.0	0.605
7212.0	1.329
7213.0	2.227
7214.0	2.930
7215.0	3.319
7216.0	3.570
7217.0	3.778
7218.0	3.983
7219.0	4.185
7220.0	4.427

Select | Apply | Cancel


Select a Paired Data
Stage-Area from HEC-HMS
Select
Table
Graph
Area (AC)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
7,208
7,210
7,212
7,214
7,216
7,218
7,220
Elevation (FT)
Select
Apply
Cancel

Stage-Area from UD-Detention

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft ^{2}]	Area [acres]	Volume [ft ^{3}]	Volume [ac-ft]	Total Outflow [cfs]
7208	0.00	1,131	0.026	0	0.000	0.00
	1.00	2,102	0.048	1,616	0.037	0.25
7210	2.00	7,401	0.170	6,368	0.146	0.42
	3.00	26,360	0.605	23,249	0.534	0.74
7212	4.00	57,884	1.329	65,371	1.501	1.04
	5.00	97,021	2.227	142,823	3.279	1.42
7214	6.00	127,623	2.930	255,145	5.857	4.42
	7.00	144,596	3.319	391,254	8.982	114.53
7216	8.00	155,516	3.570	541,310	12.427	318.76
	8.25	157,783	3.622	580,472	13.326	357.48
	8.50	160,049	3.674	620,201	14.238	364.85
	8.75	162,316	3.726	660,497	15.163	372.07
	9.00	164,583	3.778	701,359	16.101	379.16
	9.25	166,816	3.830	742,784	17.052	386.12
	9.50	169,050	3.881	784,768	18.016	392.95
	9.75	171,283	3.932	827,309	18.992	450.97
7218	10.00	173,517	3.983	870,409	19.982	552.22
	10.25	175,717	4.034	914,063	20.984	682.46
	10.50	177,918	4.084	958,268	21.999	836.78
	10.75	180,119	4.135	1,003,022	23.026	1,012.45
	11.00	182,319	4.185	1,048,327	24.066	1,207.69
7220	12.00	192,855	4.427	1,235,914	28.373	2,163.32

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

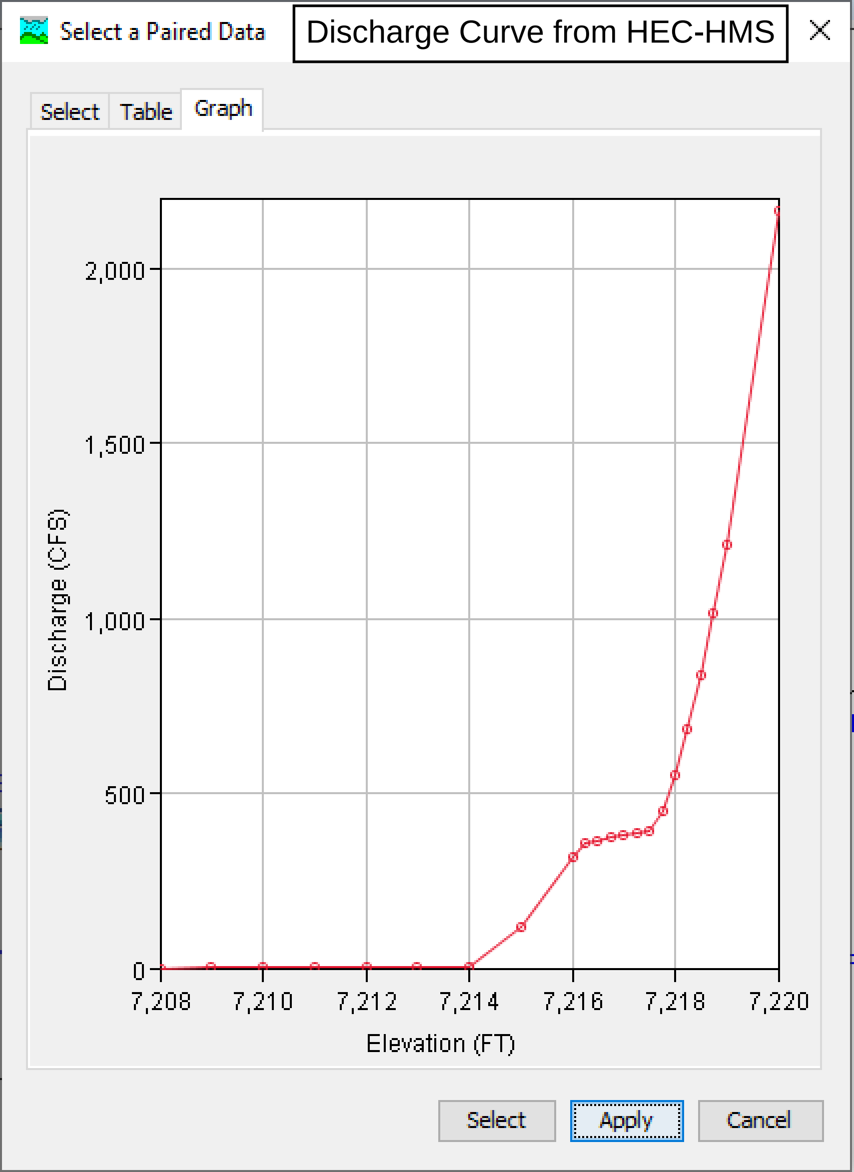
Select a Paired Data

Discharge Curve from HEC-HMS

Select | Table | Graph

Elevation (FT)	Discharge (CFS)
7208.00	0.00
7209.00	0.25
7210.00	0.42
7211.00	0.74
7212.00	1.04
7213.00	1.42
7214.00	4.42
7215.00	114.53
7216.00	318.76
7216.25	357.48
7216.50	364.85
7216.75	372.07
7217.00	379.16
7217.25	386.12
7217.50	392.95
7217.75	450.97
7218.00	552.22
7218.25	682.46
7218.50	836.78
7218.75	1012.45
7219.00	1207.69
7220.00	2163.32

Select | Apply | Cancel



Select a Paired Data
Discharge Curve from HEC-HMS
Select
Table
Graph
2,000
1,500
1,000
500
0
Discharge (CFS)
7,208
7,210
7,212
7,214
7,216
7,218
7,220
Elevation (FT)
Select
Apply
Cancel

Discharge Curve from UD-Detention

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft ^{2}]	Area [acres]	Volume [ft ^{3}]	Volume [ac-ft]	Total Outflow [cfs]
	0.00	1,131	0.026	0	0.000	0.00
	1.00	2,102	0.048	1,616	0.037	0.25
	2.00	7,401	0.170	6,368	0.146	0.42
	3.00	26,360	0.605	23,249	0.534	0.74
	4.00	57,884	1.329	65,371	1.501	1.04
	5.00	97,021	2.227	142,823	3.279	1.42
	6.00	127,623	2.930	255,145	5.857	4.42
	7.00	144,596	3.319	391,254	8.982	114.53
	8.00	155,516	3.570	541,310	12.427	318.76
	8.25	157,783	3.622	580,472	13.326	357.48
	8.50	160,049	3.674	620,201	14.238	364.85
	8.75	162,316	3.726	660,497	15.163	372.07
	9.00	164,583	3.778	701,359	16.101	379.16
	9.25	166,816	3.830	742,784	17.052	386.12
	9.50	169,050	3.881	784,768	18.016	392.95
	9.75	171,283	3.932	827,309	18.992	450.97
	10.00	173,517	3.983	870,409	19.982	552.22
	10.25	175,717	4.034	914,063	20.984	682.46
	10.50	177,918	4.084	958,268	21.999	836.78
	10.75	180,119	4.135	1,003,022	23.026	1,012.45
	11.00	182,319	4.185	1,048,327	24.066	1,207.69
	12.00	192,855	4.427	1,235,914	28.373	2,163.32

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

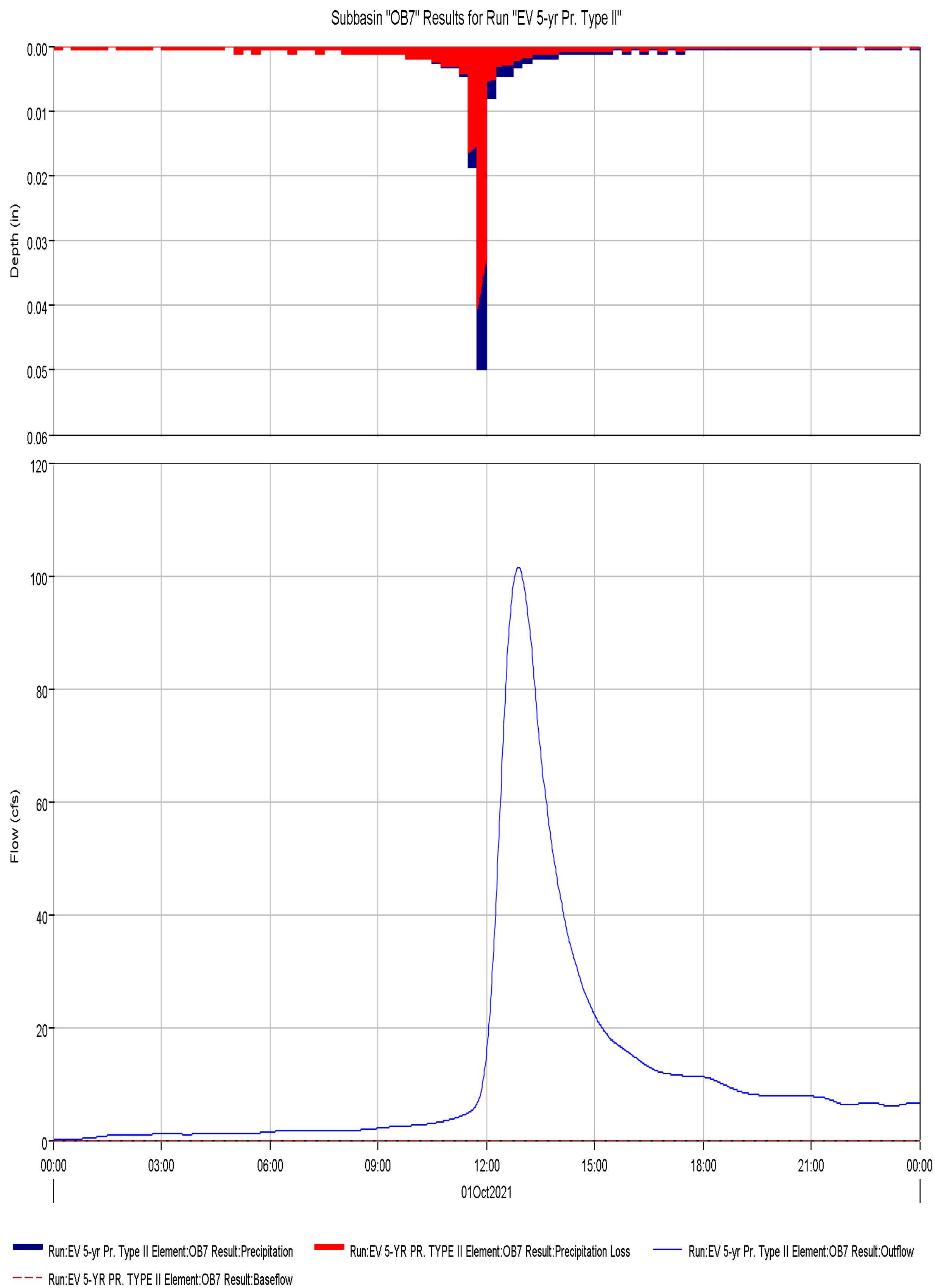
Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

Project: Eagleview_Subdivision Simulation Run: EV 5-yr Pr. Type II

Start of Run: 01Oct2021, 00:00 Basin Model: Eagleview_Proposed
End of Run: 02Oct2021, 00:00 Meteorologic Model: 5-yr Type II
Compute Time: 21Dec2022, 12:41:54 Control Specifications: 24-hr Storm

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
CULV1	0.0021625	1.5	01Oct2021, 12:08	0.1
CULV4	0.0054094	3.2	01Oct2021, 12:08	0.3
CULV5	.000315625	0.5	01Oct2021, 12:00	0.0
OB1	0.0162031	7.1	01Oct2021, 12:08	0.7
OB2	0.0438438	20.5	01Oct2021, 12:08	1.9
OB3	0.0678750	25.4	01Oct2021, 12:13	2.8
OB4	0.0164062	7.5	01Oct2021, 12:10	0.8
OB5	0.22472	37.0	01Oct2021, 12:42	7.4
OB6	0.18501	40.8	01Oct2021, 12:30	6.8
OB7	0.65812	101.4	01Oct2021, 12:53	23.3
OB8	0.0516742	19.5	01Oct2021, 12:13	2.1
P1	0.0228484	10.1	01Oct2021, 12:10	1.0
P10 (CULV2)	0.15425	58.0	01Oct2021, 12:13	6.7
P11 (CULV3)	0.0227406	11.7	01Oct2021, 12:11	1.2
P12 (CULV8)	1.1303	151.0	01Oct2021, 13:08	34.3
P2	0.19421	72.7	01Oct2021, 12:15	8.7
P3	1.2345	158.4	01Oct2021, 13:09	38.8
P4	0.17916	70.8	01Oct2021, 12:14	8.0
P5 (CULV7)	0.0939437	36.9	01Oct2021, 12:13	4.0
P6	0.0771664	30.4	01Oct2021, 12:15	3.4
P7	1.1243	150.7	01Oct2021, 13:08	34.0
P8	1.1062	172.5	01Oct2021, 12:46	39.1
P9 (CULV6)	0.0768508	30.4	01Oct2021, 12:14	3.3
PB1	0.0066453	3.0	01Oct2021, 12:10	0.3
PB10	0.0180156	8.2	01Oct2021, 12:11	0.8
PB11	0.0251766	12.1	01Oct2021, 12:10	1.2

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
PB12	.000315625	0.5	01Oct2021, 12:00	0.0
PB13	0.0060438	4.5	01Oct2021, 12:00	0.3
PB14	0.0270031	18.9	01Oct2021, 12:01	1.2
PB15	0.0150500	11.0	01Oct2021, 12:00	0.7
PB2	0.0016935	1.0	01Oct2021, 12:06	0.1
PB3	0.0021625	1.5	01Oct2021, 12:07	0.1
PB4	0.0164672	12.6	01Oct2021, 12:00	0.8
PB5	0.0096625	4.2	01Oct2021, 12:12	0.5
PB6	0.0173312	8.6	01Oct2021, 12:11	0.9
PB7	0.0054094	3.2	01Oct2021, 12:08	0.3
PB8	0.0184000	12.1	01Oct2021, 12:01	0.8
PB9	0.0199984	9.8	01Oct2021, 12:08	0.9
R-OB1	0.0162031	7.1	01Oct2021, 12:10	0.7
R-OB2	0.0438438	20.5	01Oct2021, 12:10	1.9
R-OB4-A	0.0842812	32.7	01Oct2021, 12:13	3.5
R-OB4-B	0.0939437	36.8	01Oct2021, 12:15	4.0
R-OB7	1.0678	169.2	01Oct2021, 12:46	37.4
R-OB8	0.0516742	19.5	01Oct2021, 12:16	2.1
R-PB10	1.1243	150.7	01Oct2021, 13:08	34.0
R-PB11	0.0768508	30.3	01Oct2021, 12:15	3.3
R-PB12-A	.000315625	0.5	01Oct2021, 12:02	0.0
R-PB12-B	0.0771664	30.4	01Oct2021, 12:17	3.4
R-PB13	1.1303	151.0	01Oct2021, 13:10	34.2
R-PB3	0.0021625	1.5	01Oct2021, 12:09	0.1
R-PB5	0.15425	58.0	01Oct2021, 12:14	6.7
R-PB7-A	0.0054094	3.2	01Oct2021, 12:10	0.3
R-PB7-B	0.0227406	11.7	01Oct2021, 12:12	1.2
R-PB7-C	0.17916	70.7	01Oct2021, 12:15	8.0
R-PB9	1.1062	172.5	01Oct2021, 12:47	39.1



Subbasin "OB7" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:OB7 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:OB7 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:OB7 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:OB7 Result:Baseflow

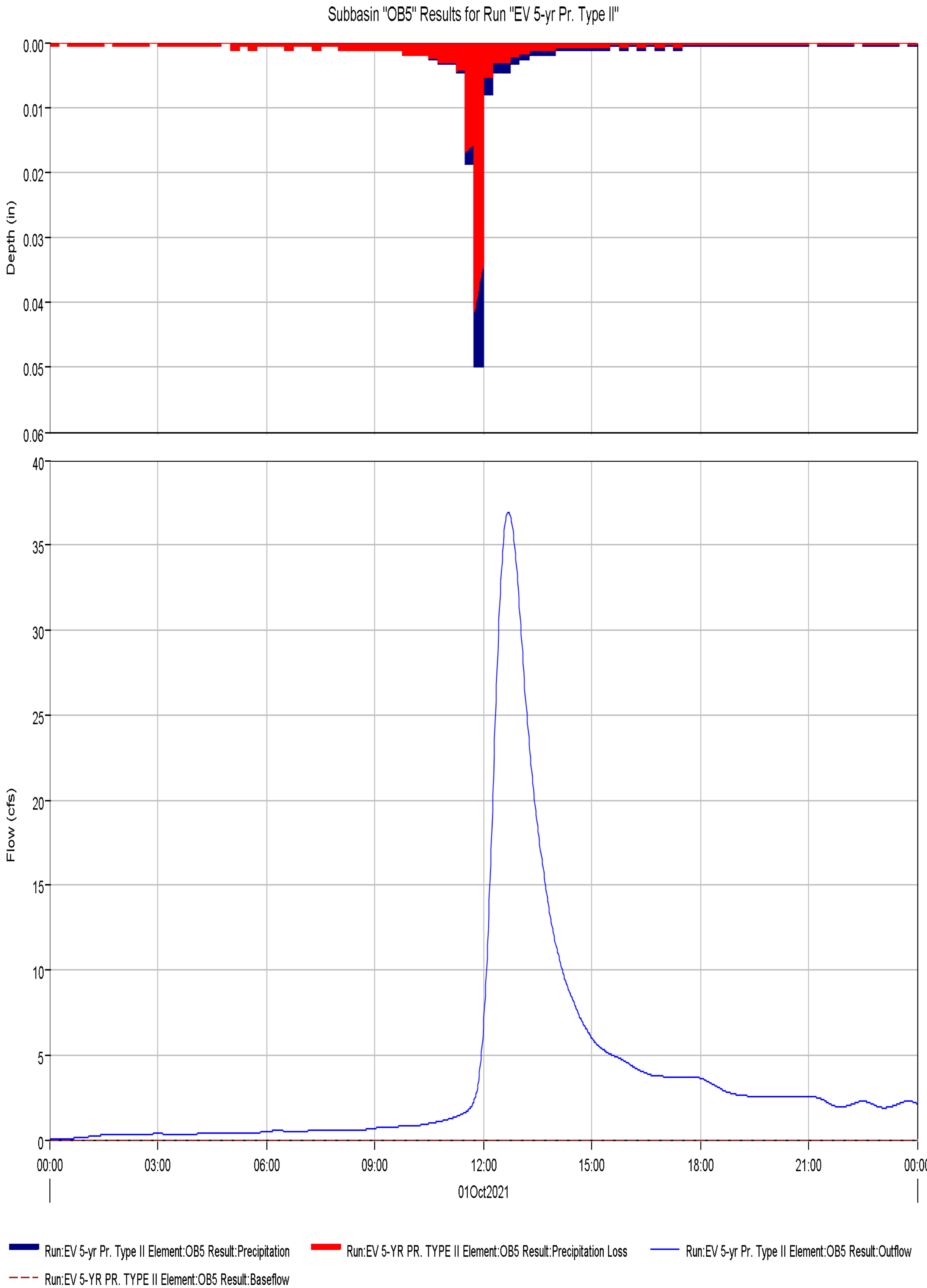
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: OB7

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

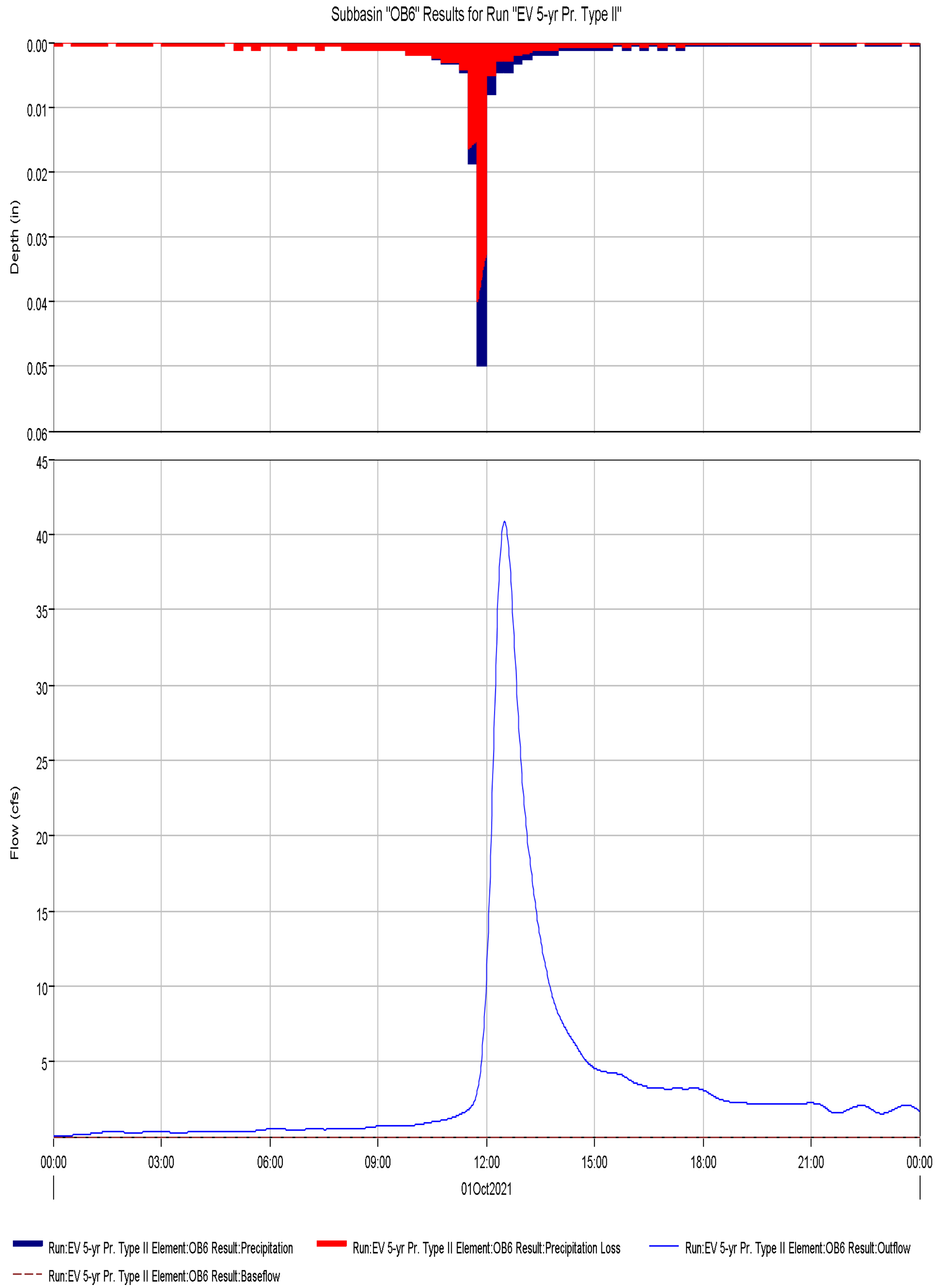
Volume Units: AC-FT

Computed Results

Peak Discharge :	101.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:53
Total Precipitation :	94.8 (AC-FT)	Total Direct Runoff :	23.3 (AC-FT)
Total Loss :	70.9 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	23.9 (AC-FT)	Discharge :	23.3 (AC-FT)



Subbasin "OB5" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
40
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:OB5 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:OB5 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:OB5 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:OB5 Result:Baseflow



Subbasin "OB6" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
45
40
35
30
25
20
15
10
5
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:OB6 Result:Precipitation
Run:EV 5-yr Pr. Type II Element:OB6 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:OB6 Result:Outflow
Run:EV 5-yr Pr. Type II Element:OB6 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: OB5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	37.0 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:42
Total Precipitation :	32.4 (AC-FT)	Total Direct Runoff :	7.4 (AC-FT)
Total Loss :	24.8 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	7.6 (AC-FT)	Discharge :	7.4 (AC-FT)

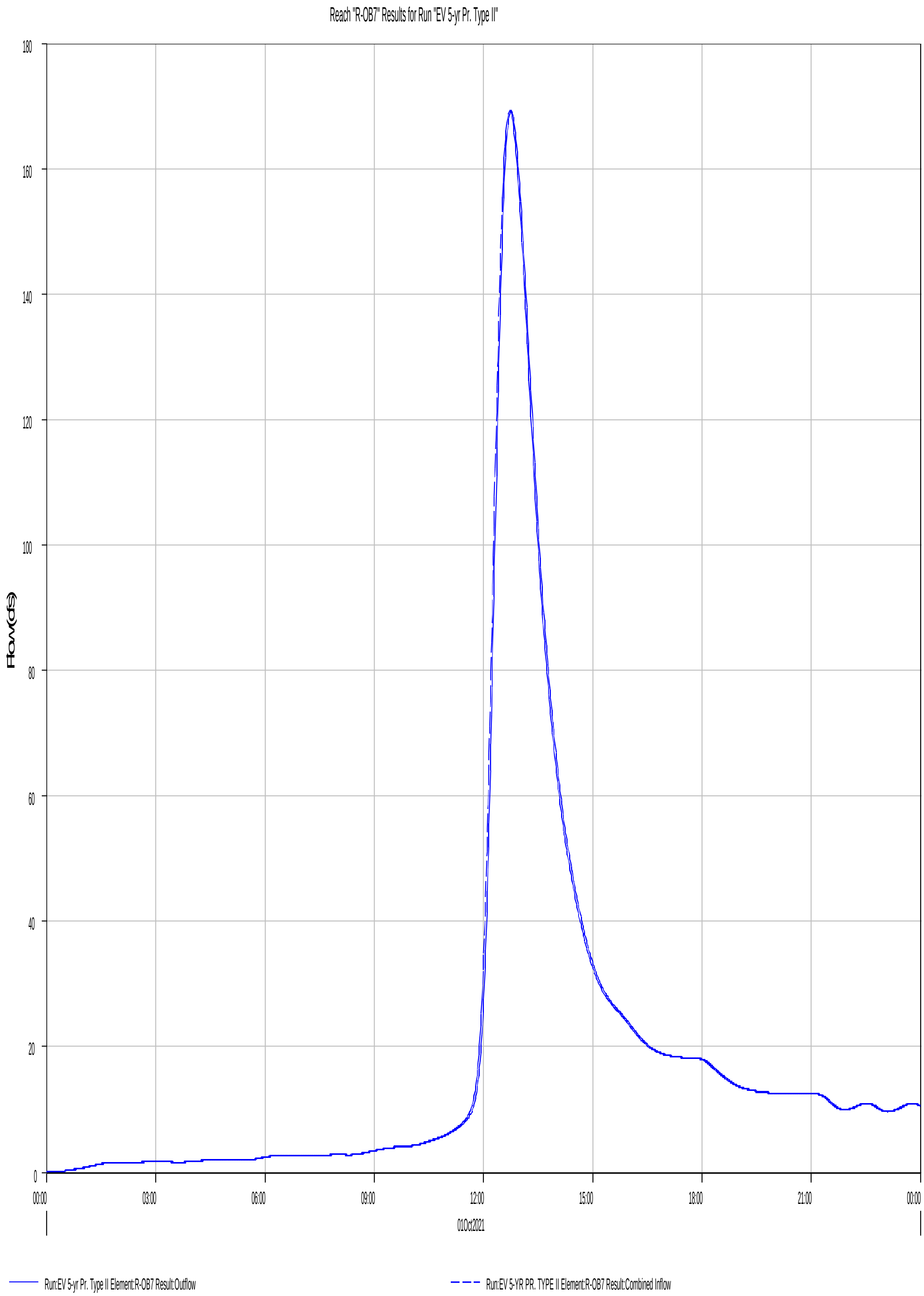
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: OB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	40.8 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:30
Total Precipitation :	26.6 (AC-FT)	Total Direct Runoff :	6.8 (AC-FT)
Total Loss :	19.8 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	6.9 (AC-FT)	Discharge :	6.8 (AC-FT)



Reach "R-OB7" Results for Run "EV 5-yr Pr. Type II"
180
160
140
120
100
80
60
40
20
0
Flow (cfs)
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-OB7 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-OB7 Result:Combined Inflow

Project: Eagleview_Subdivision

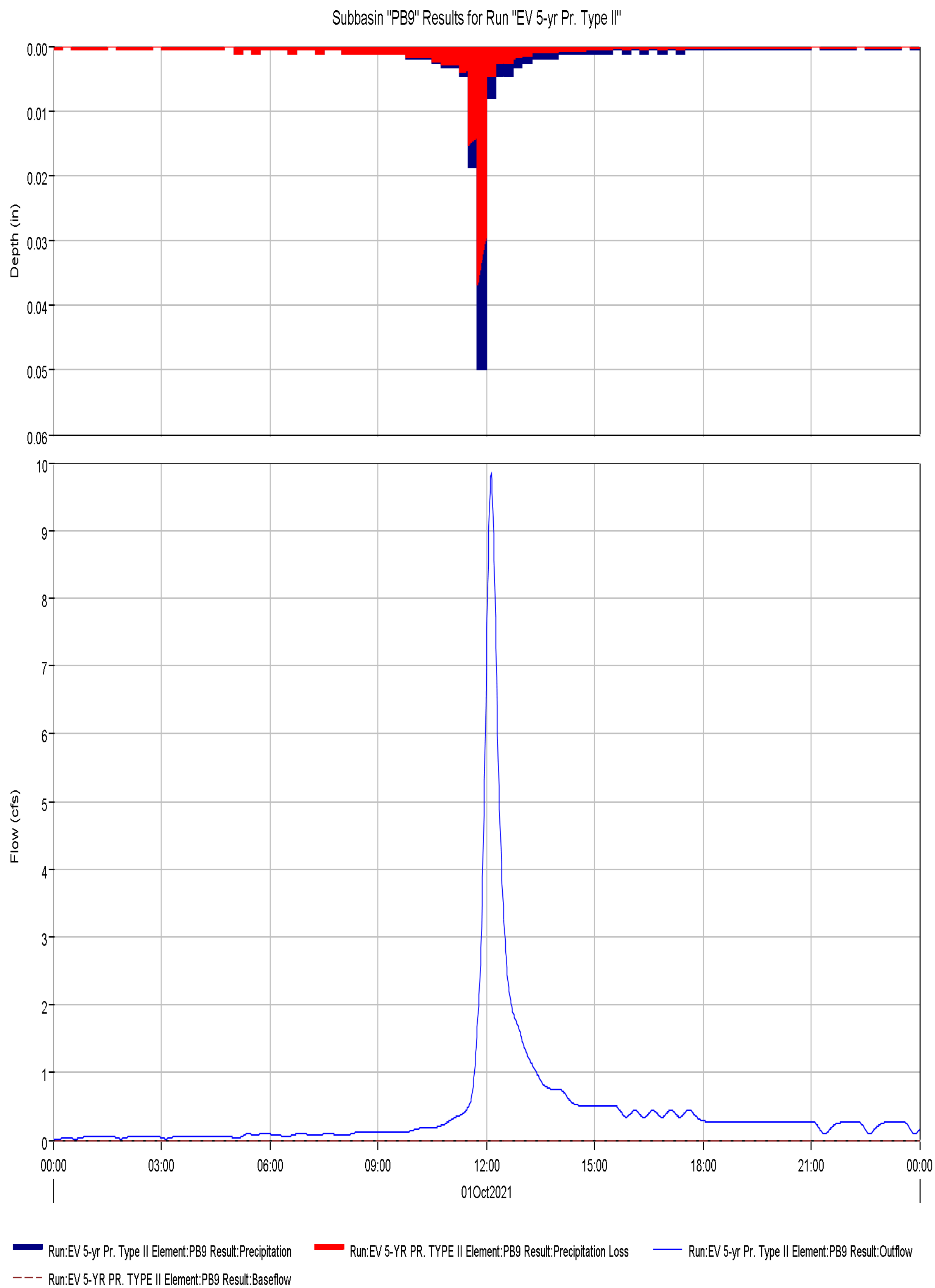
Simulation Run: EV 5-yr Pr. Type II Reach: R-OB7

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	169.3 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:44
Peak Outflow :	169.2 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:46
Total Inflow :	37.5 (AC-FT)	Total Outflow :	37.4 (AC-FT)


Subbasin "PB9" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
10
9
8
7
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB9 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB9 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB9 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB9 Result:Baseflow

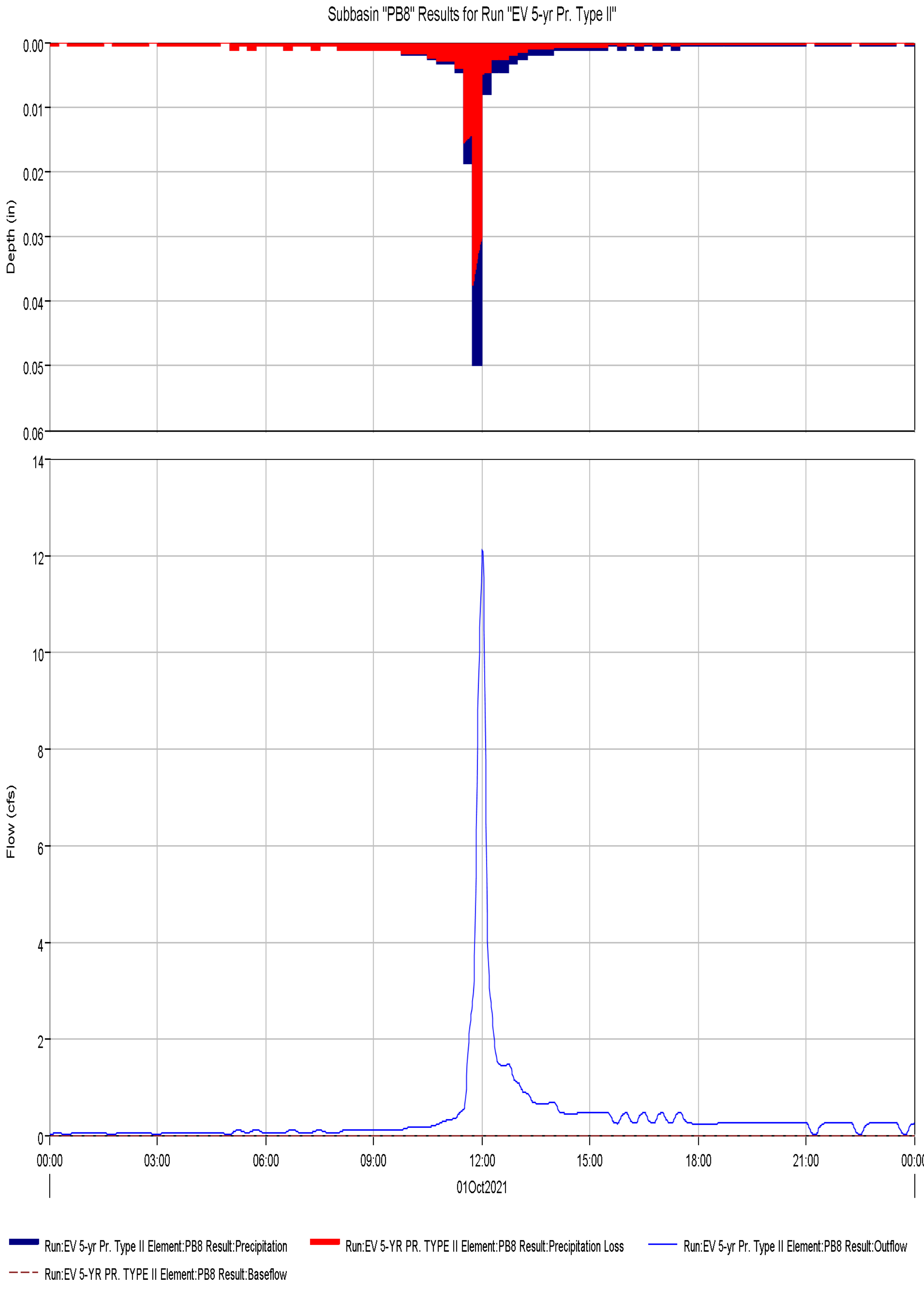
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB9

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	9.8 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	2.9 (AC-FT)	Total Direct Runoff :	0.9 (AC-FT)
Total Loss :	2.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.9 (AC-FT)	Discharge :	0.9 (AC-FT)


Subbasin "PB8" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB8 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB8 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB8 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB8 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB8

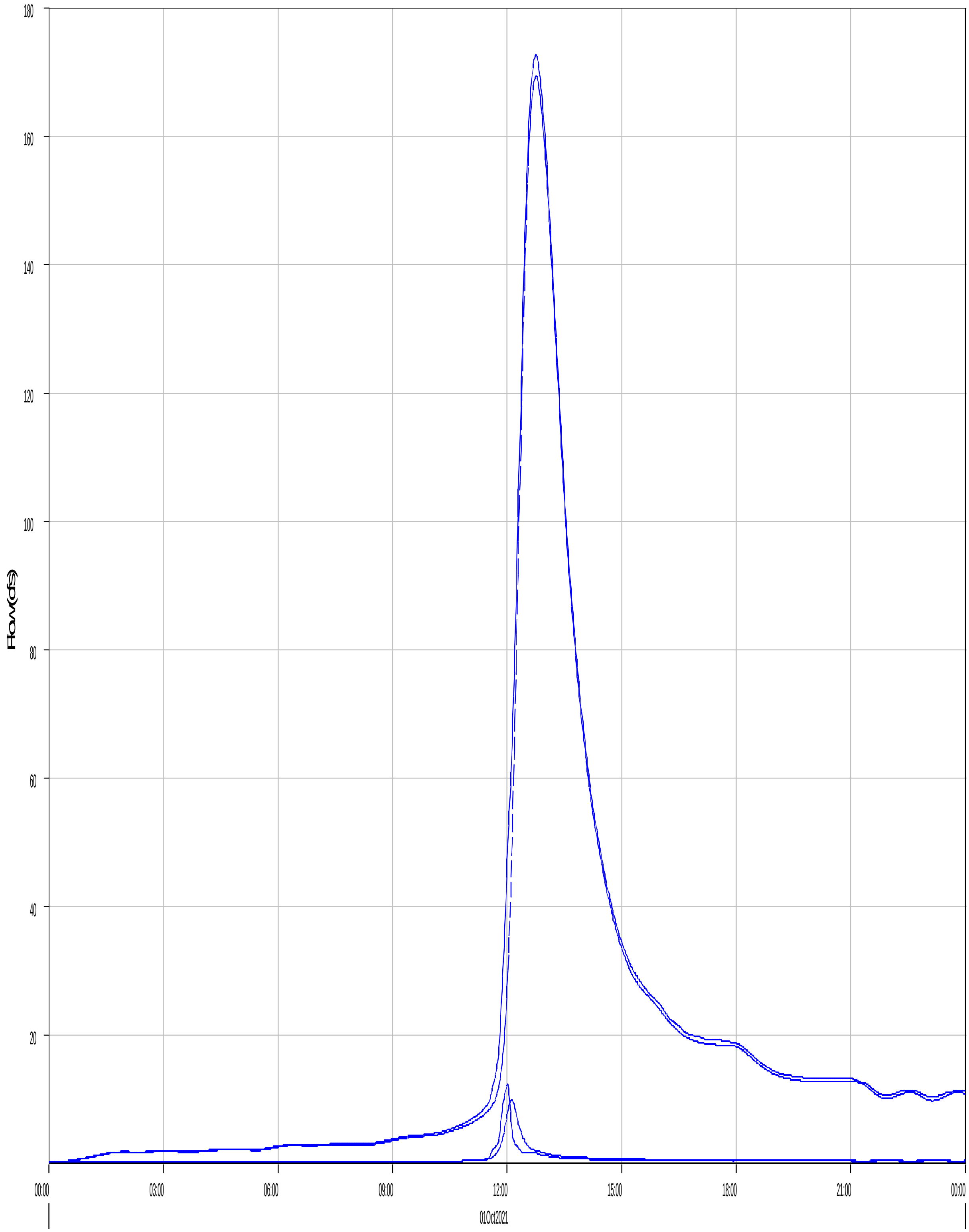
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	12.1 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:01
Total Precipitation :	2.6 (AC-FT)	Total Direct Runoff :	0.8 (AC-FT)
Total Loss :	1.8 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.8 (AC-FT)	Discharge :	0.8 (AC-FT)

Junction "P8" Results for Run "EV 5-yr Pr. Type II"



Run:EV 5-yr Pr. Type II Element:P8 Result:Outflow
Run:EV 5-yr Pr. Type II Element:R-OB7 Result:Outflow
Run:EV 5-yr Pr. Type II Element:PB9 Result:Outflow
Run:EV 5-yr Pr. Type II Element:PB8 Result:Outflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Junction: P8

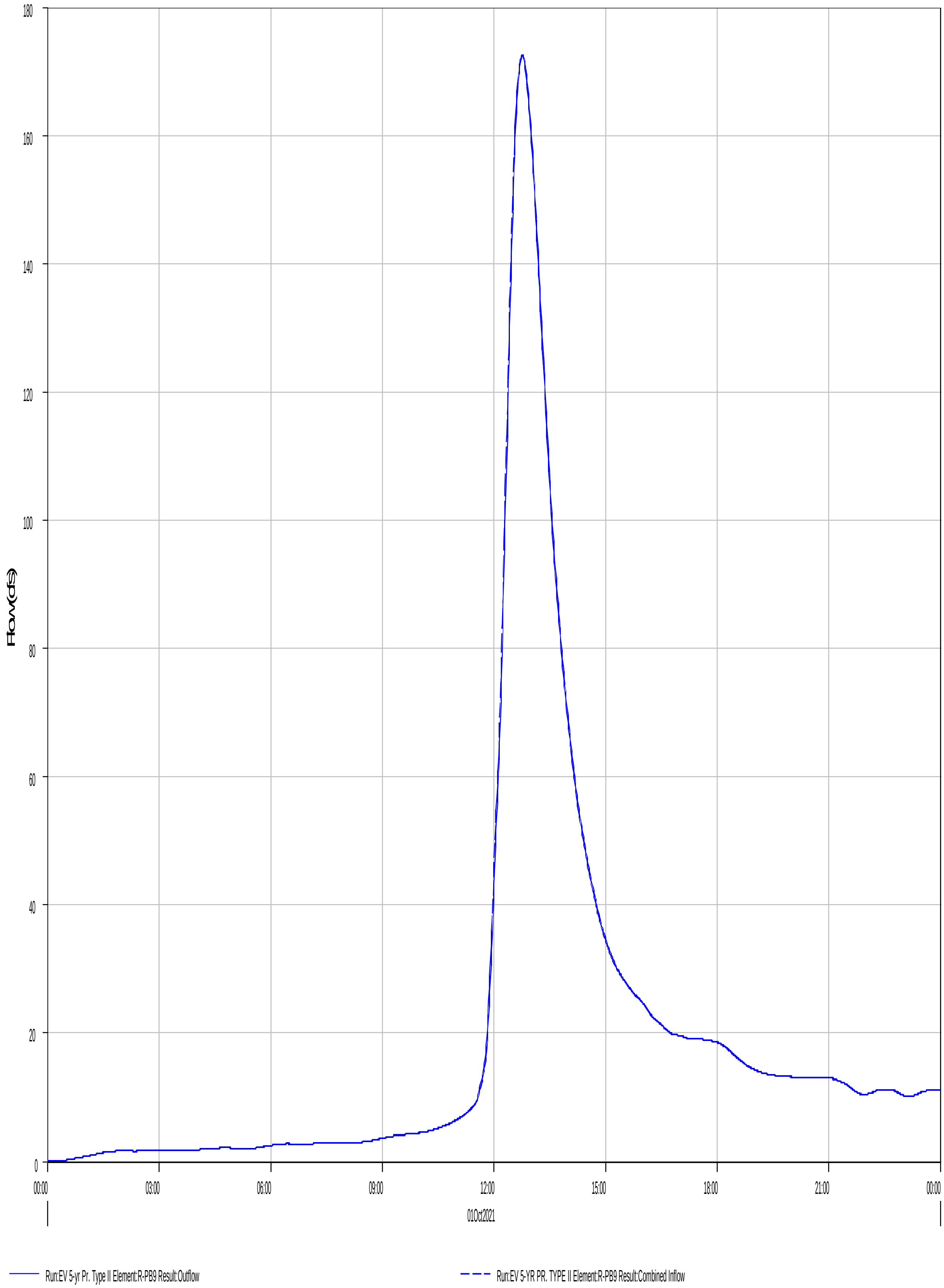
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	172.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:46
Total Outflow :	39.1 (AC-FT)		

Reach "R-PB9" Results for Run "EV 5-yr Pr. Type II"



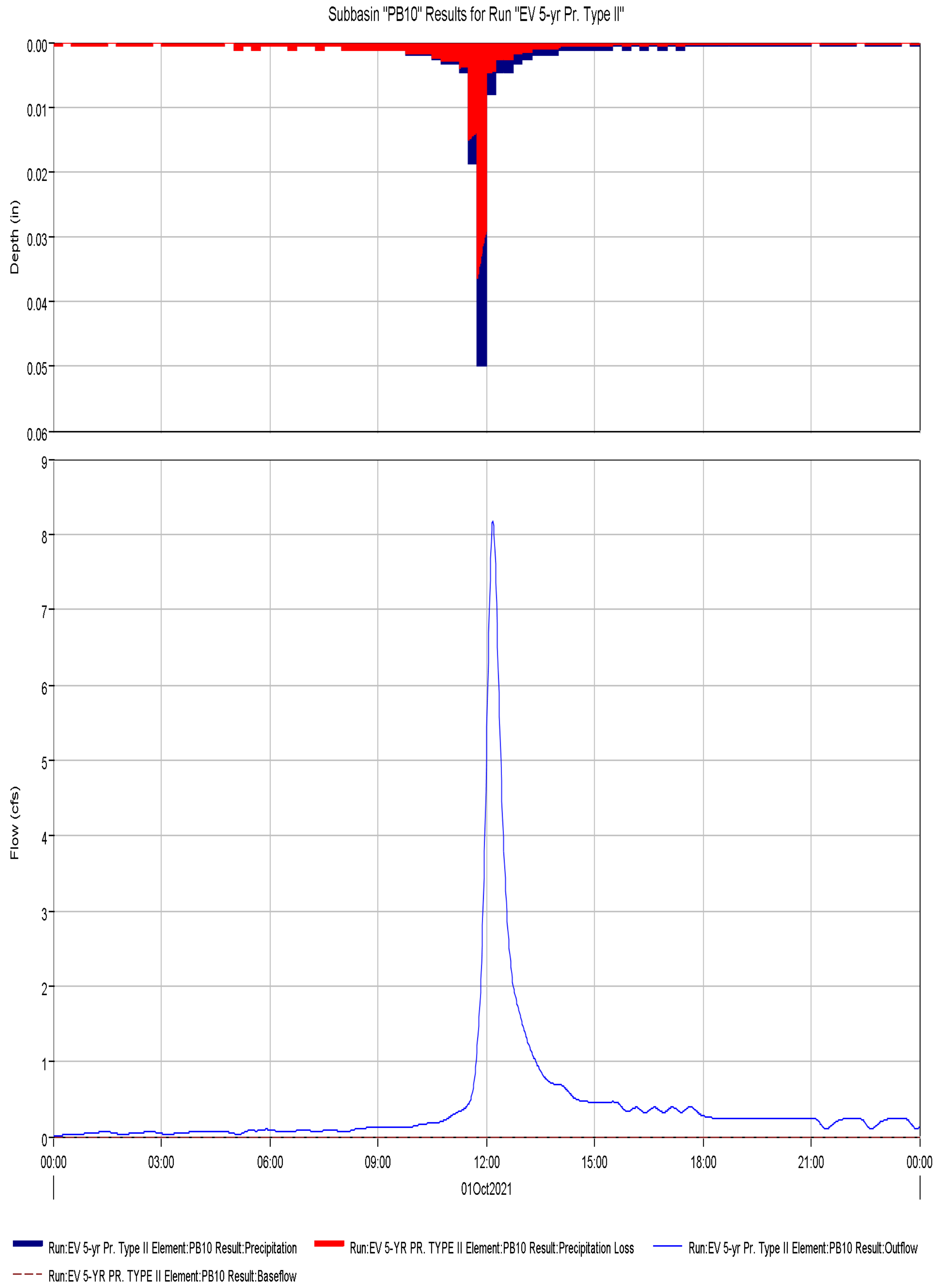
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB9

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	172.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:46
Peak Outflow :	172.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:47
Total Inflow :	39.1 (AC-FT)	Total Outflow :	39.1 (AC-FT)



Subbasin "PB10" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
9
8
7
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB10 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB10 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB10 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB10 Result:Baseflow

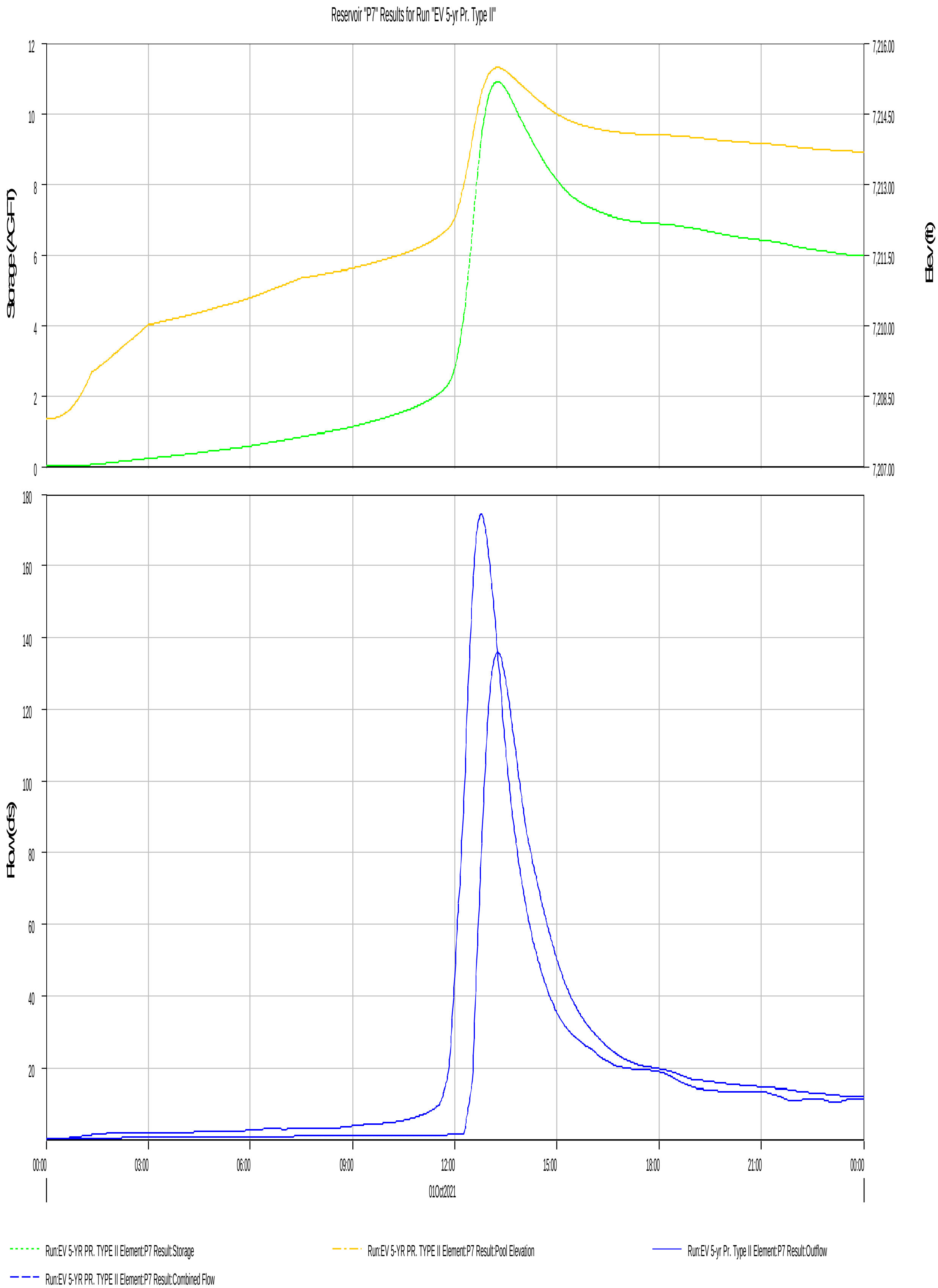
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB10

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	8.2 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:11
Total Precipitation :	2.6 (AC-FT)	Total Direct Runoff :	0.8 (AC-FT)
Total Loss :	1.8 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.8 (AC-FT)	Discharge :	0.8 (AC-FT)



Reservoir "P7" Results for Run "EV 5-yr Pr. Type II"
Storage (AC-FT)
Elev (ft)
Flow (cfs)
0
2
4
6
8
10
12
7,207.00
7,208.50
7,210.00
7,211.50
7,213.00
7,214.50
7,216.00
20
40
60
80
100
120
140
160
180
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-YR PR. TYPE II Element:P7 Result:Storage
Run:EV 5-YR PR. TYPE II Element:P7 Result:Pool Elevation
Run:EV 5-yr Pr. Type II Element:P7 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:P7 Result:Combined Flow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reservoir: P7

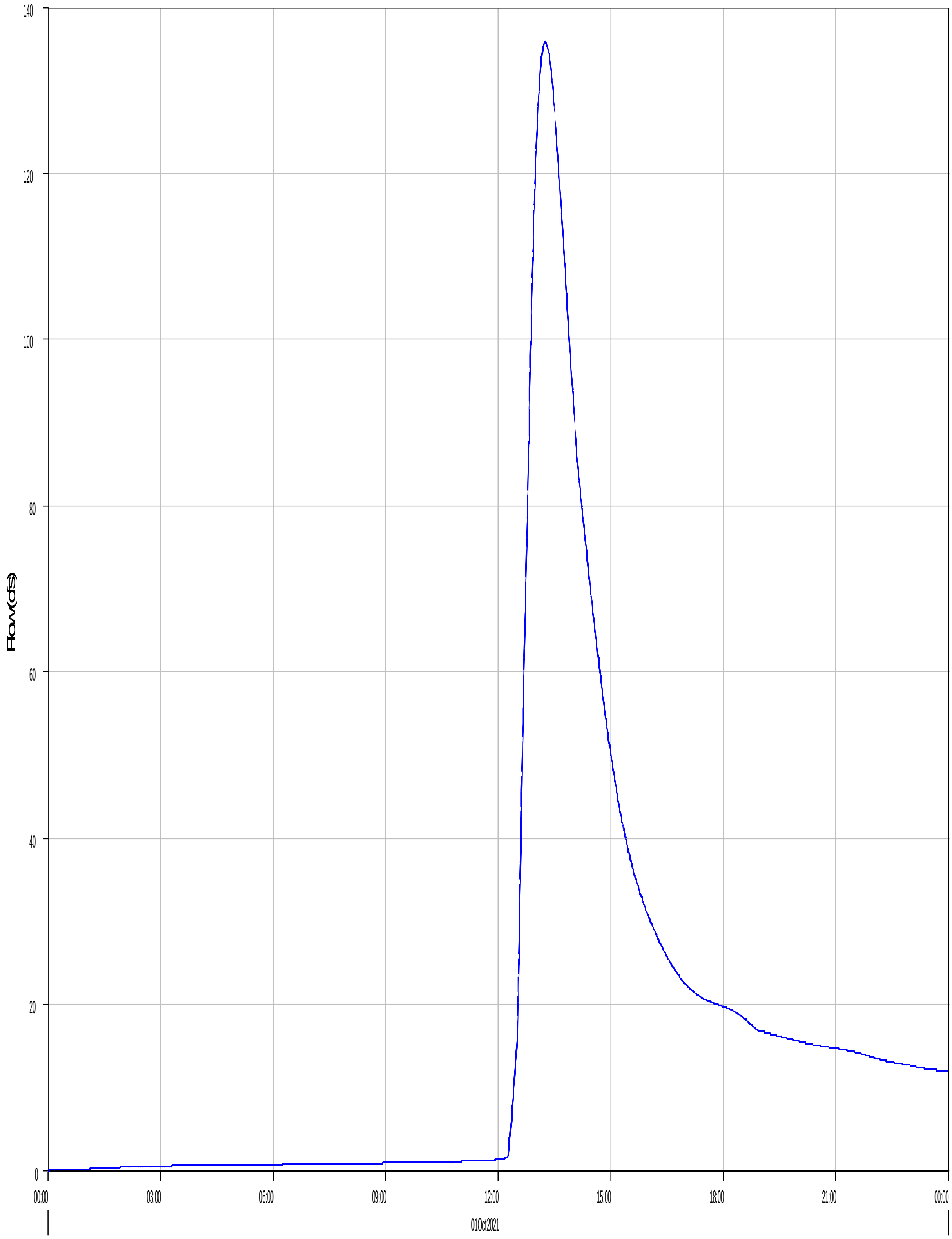
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	174.4 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:47
Peak Outflow :	135.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 13:16
Total Inflow :	40.0 (AC-FT)	Peak Storage :	10.9 (AC-FT)
Total Outflow :	34.0 (AC-FT)	Peak Elevation :	7215.5 (FT)

Reach "R-PB10" Results for Run "EV 5-yr Pr. Type II"



Run:EV 5-yr Pr. Type II Element:R-PB10 Result:Outflow

Run:EV 5-YR PR. TYPE II Element:R-PB10 Result:Combined Inflow

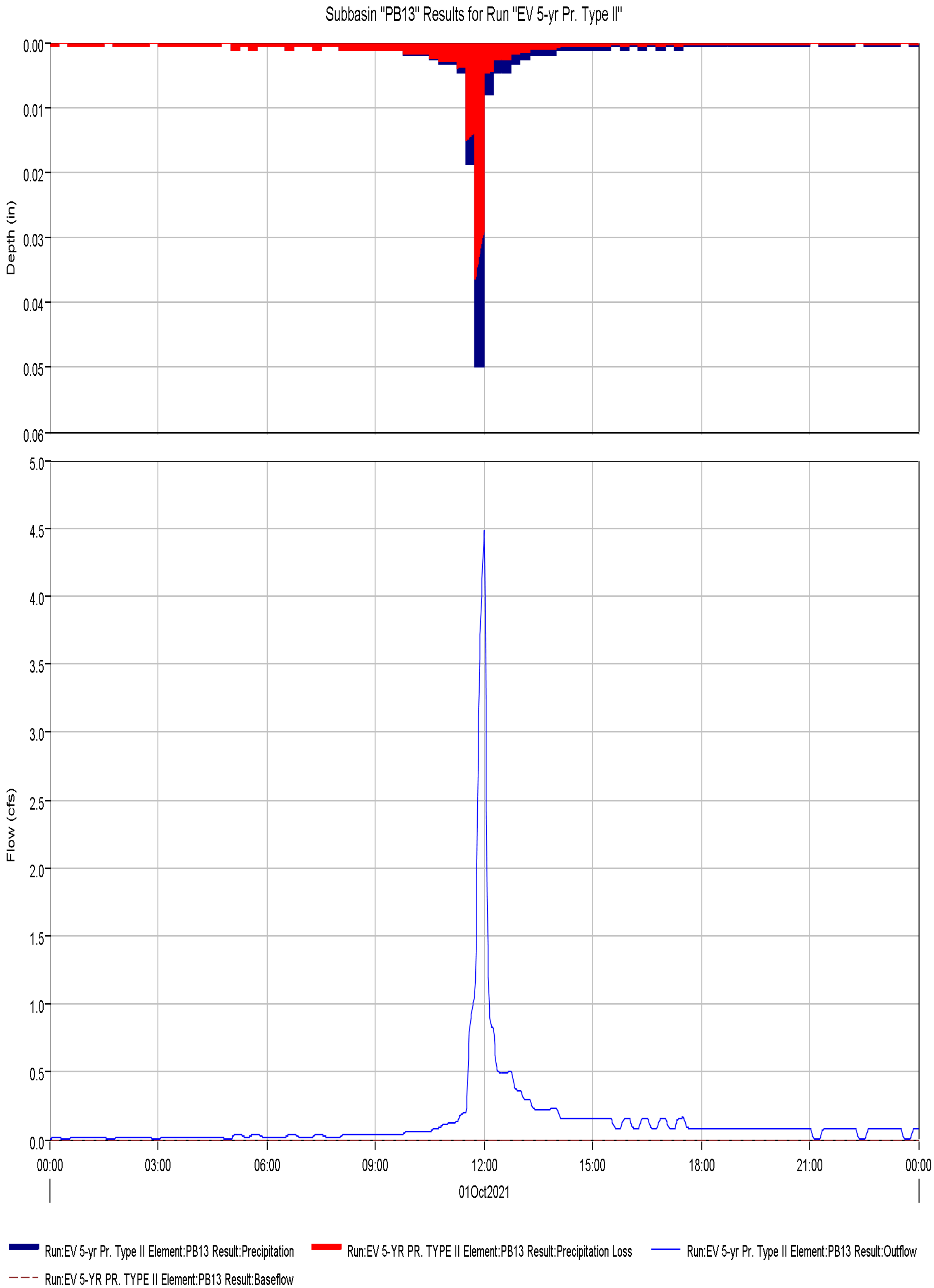
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB10

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	135.8 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 13:16
Peak Outflow :	135.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 13:16
Total Inflow :	34.0 (AC-FT)	Total Outflow :	34.0 (AC-FT)



Subbasin "PB13" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB13 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB13 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB13 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB13 Result:Baseflow

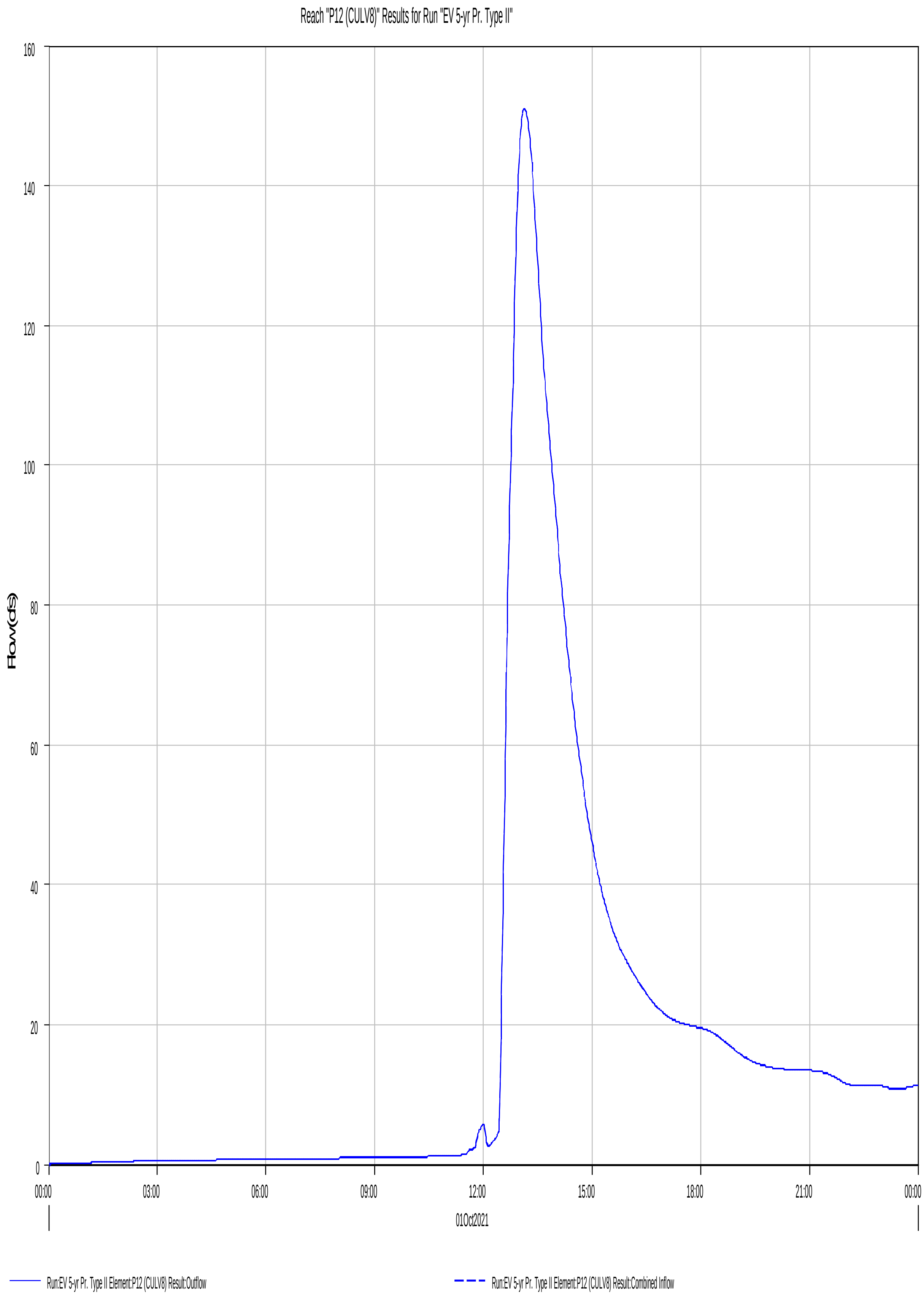
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB13

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	4.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:00
Total Precipitation :	0.9 (AC-FT)	Total Direct Runoff :	0.3 (AC-FT)
Total Loss :	0.6 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.3 (AC-FT)	Discharge :	0.3 (AC-FT)



Reach "P12 (CULV8)" Results for Run "EV 5-yr Pr. Type II"
Flow(cfs)
160
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:P12 (CULV8) Result:Outflow
Run:EV 5-yr Pr. Type II Element:P12 (CULV8) Result:Combined Inflow

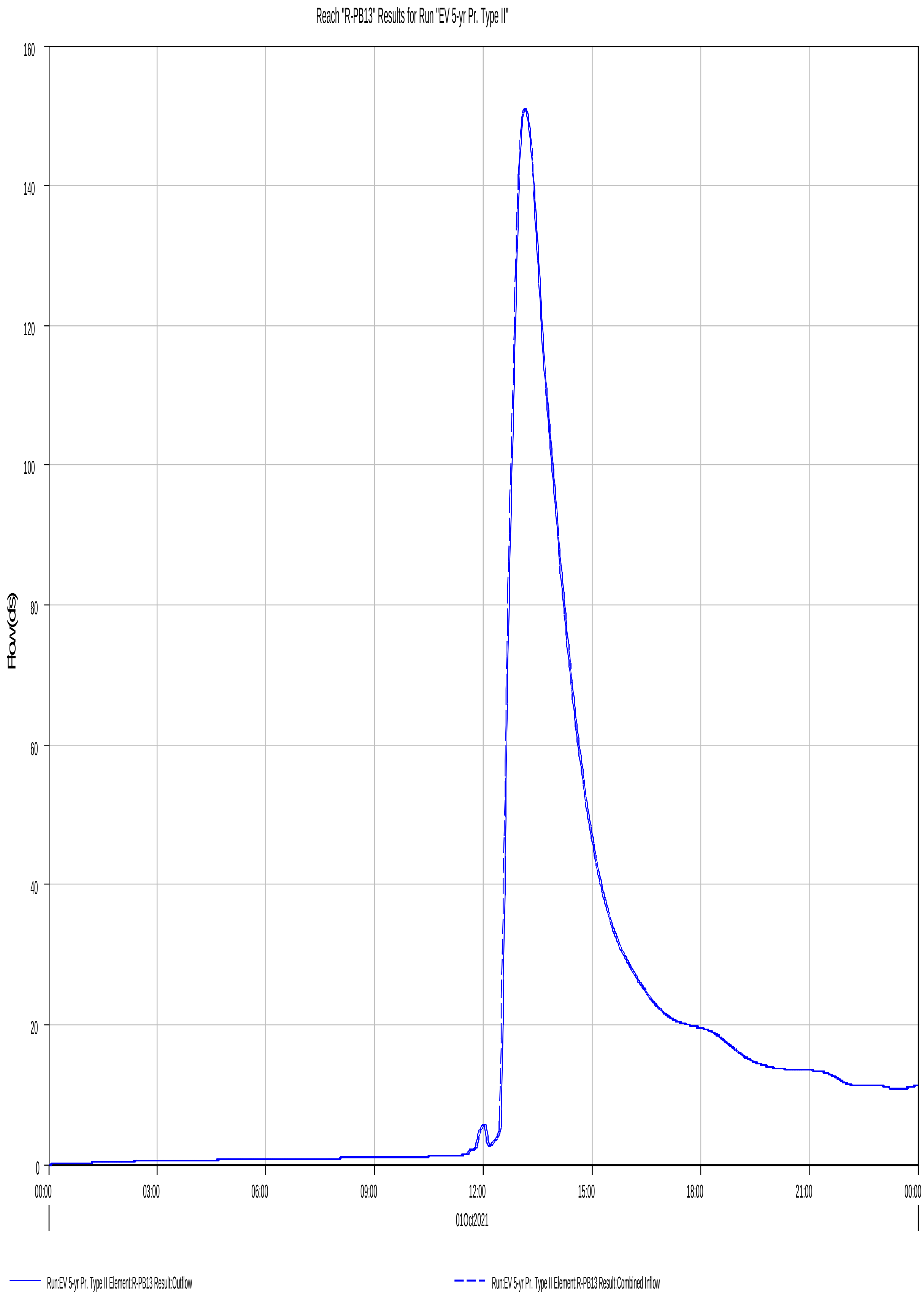
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: P12 (CULV8)

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	21Dec2022, 12:41:54	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	151.0 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 13:08
Peak Outflow :	151.0 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 13:08
Total Inflow :	34.3 (AC-FT)	Total Outflow :	34.3 (AC-FT)



Reach "R-PB13" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
160
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-PB13 Result:Outflow
Run:EV 5-yr Pr. Type II Element:R-PB13 Result:Combined Inflow

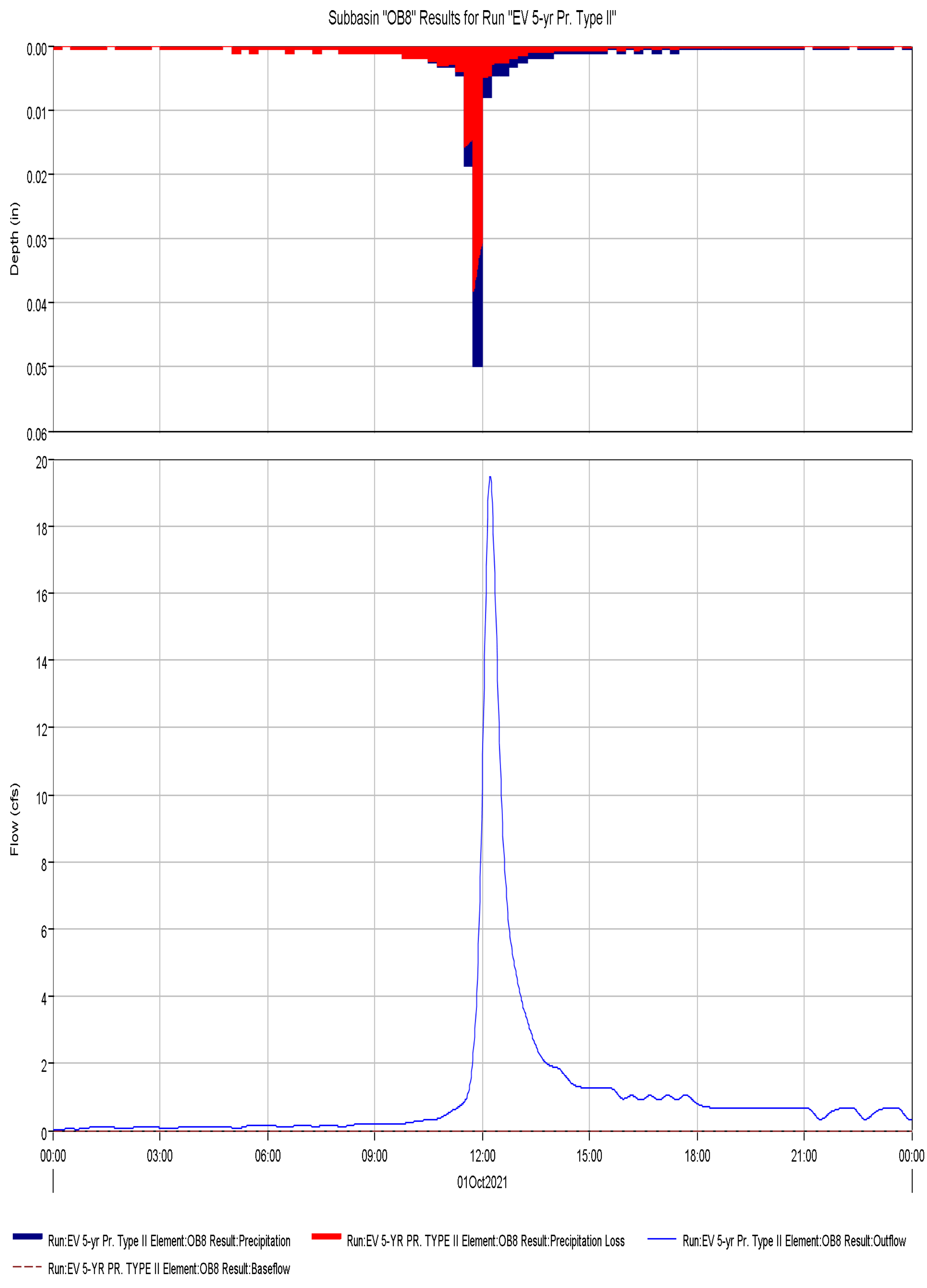
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB13

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	21Dec2022, 12:41:54	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	151.0 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 13:08
Peak Outflow :	151.0 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 13:10
Total Inflow :	34.3 (AC-FT)	Total Outflow :	34.2 (AC-FT)


Subbasin "OB8" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
20
18
16
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:OB8 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:OB8 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:OB8 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:OB8 Result:Baseflow

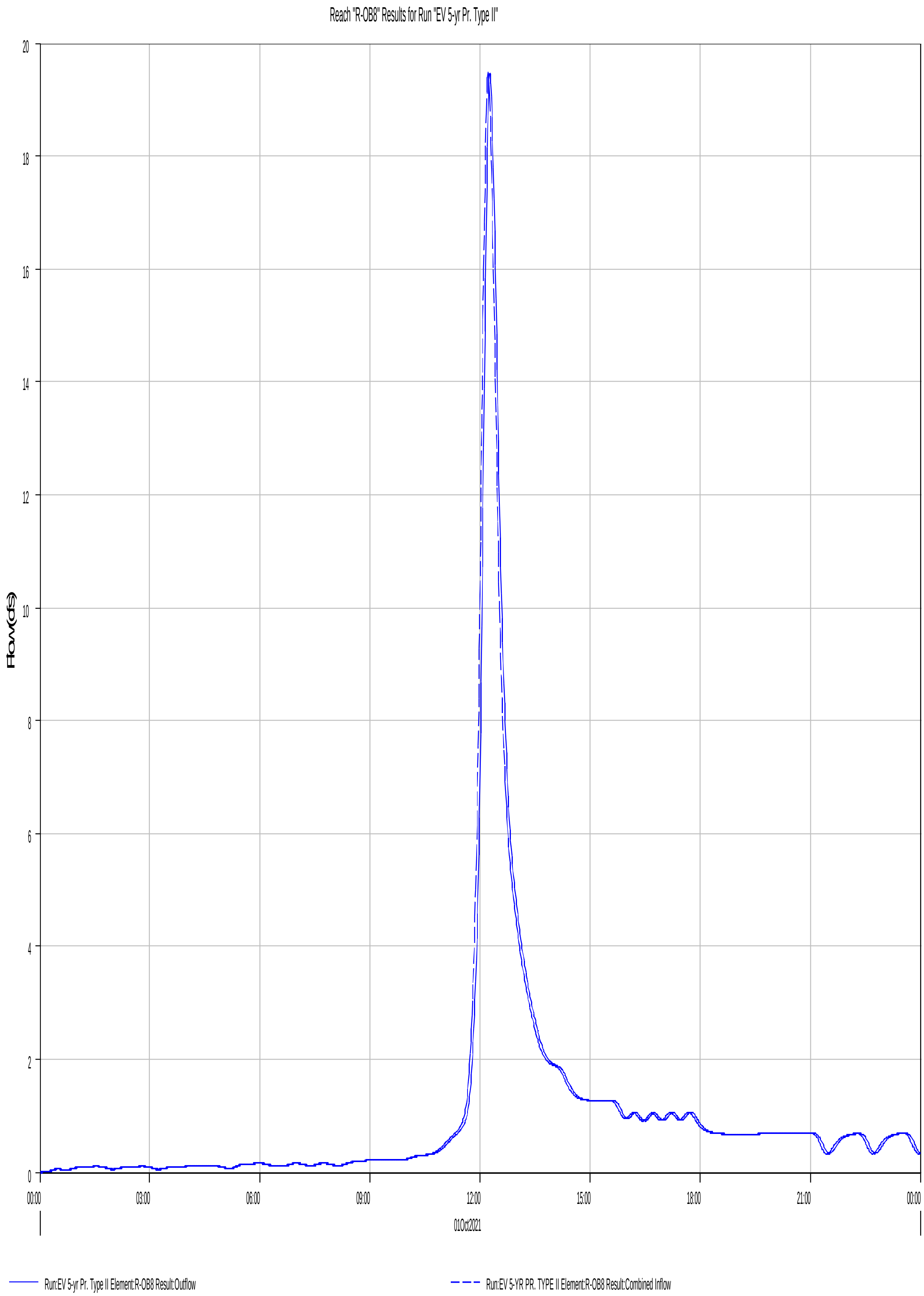
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: OB8

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	19.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:13
Total Precipitation :	7.4 (AC-FT)	Total Direct Runoff :	2.1 (AC-FT)
Total Loss :	5.3 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.2 (AC-FT)	Discharge :	2.1 (AC-FT)



Reach "R-OB8" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
20
18
16
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-OB8 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-OB8 Result:Combined Inflow

Project: Eagleview_Subdivision

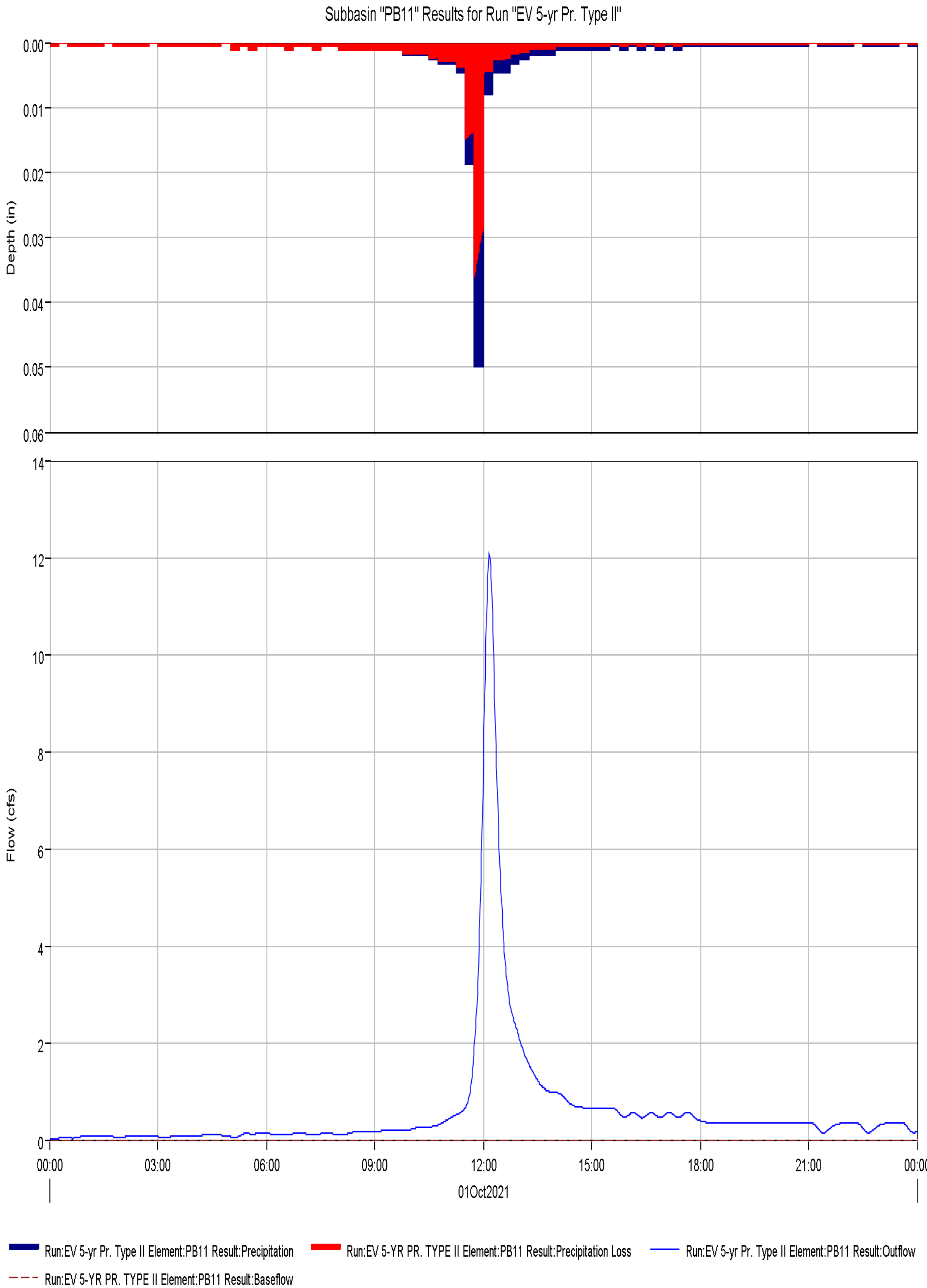
Simulation Run: EV 5-yr Pr. Type II Reach: R-OB8

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	19.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	19.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:16
Total Inflow :	2.1 (AC-FT)	Total Outflow :	2.1 (AC-FT)



Subbasin "PB11" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB11 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB11 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB11 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB11 Result:Baseflow

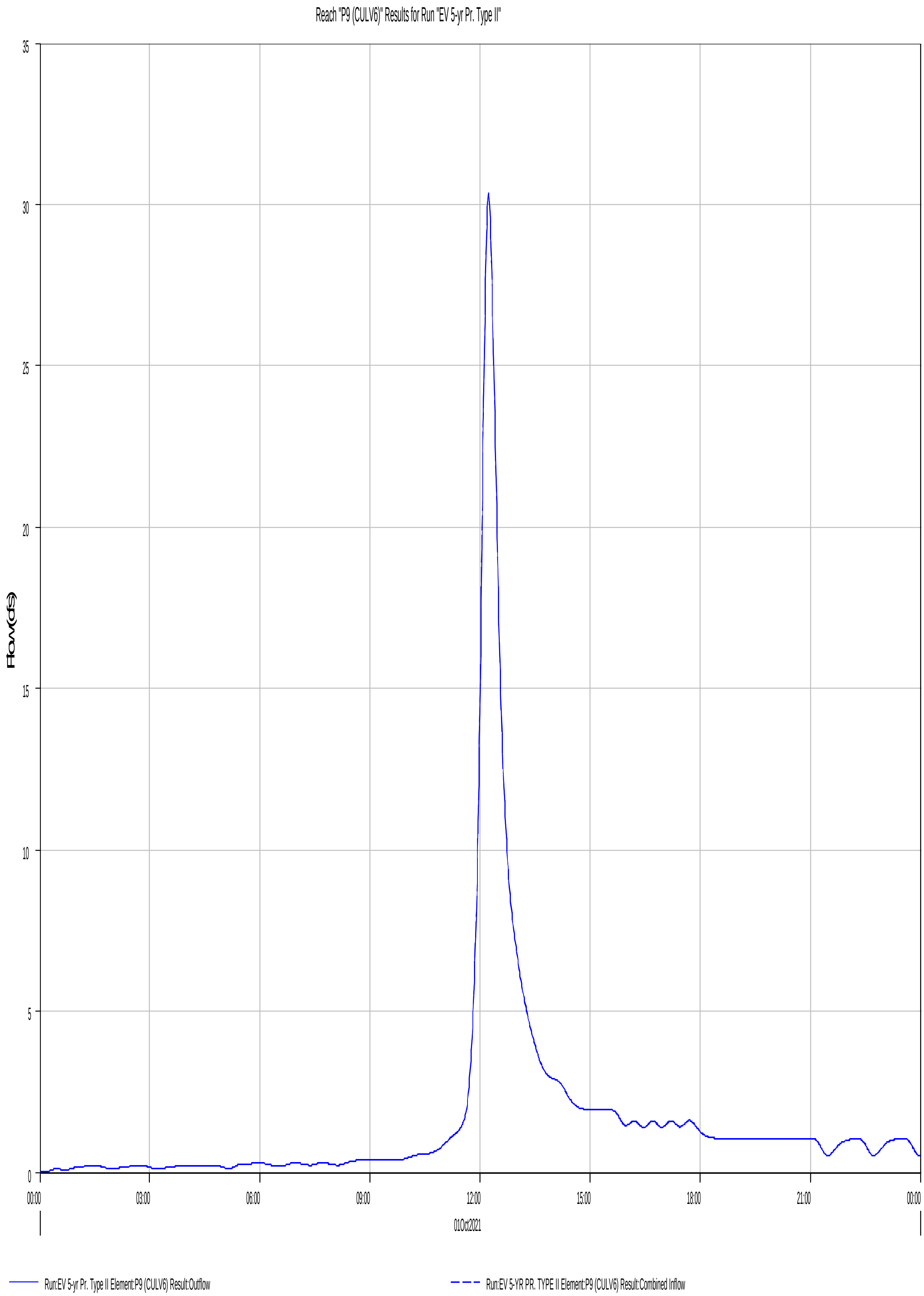
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB11

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	12.1 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:10
Total Precipitation :	3.6 (AC-FT)	Total Direct Runoff :	1.2 (AC-FT)
Total Loss :	2.4 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.2 (AC-FT)	Discharge :	1.2 (AC-FT)



Reach "P9 (CULV6)" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:P9 (CULV6) Result:Outflow
Run:EV 5-YR PR. TYPE II Element:P9 (CULV6) Result:Combined Inflow

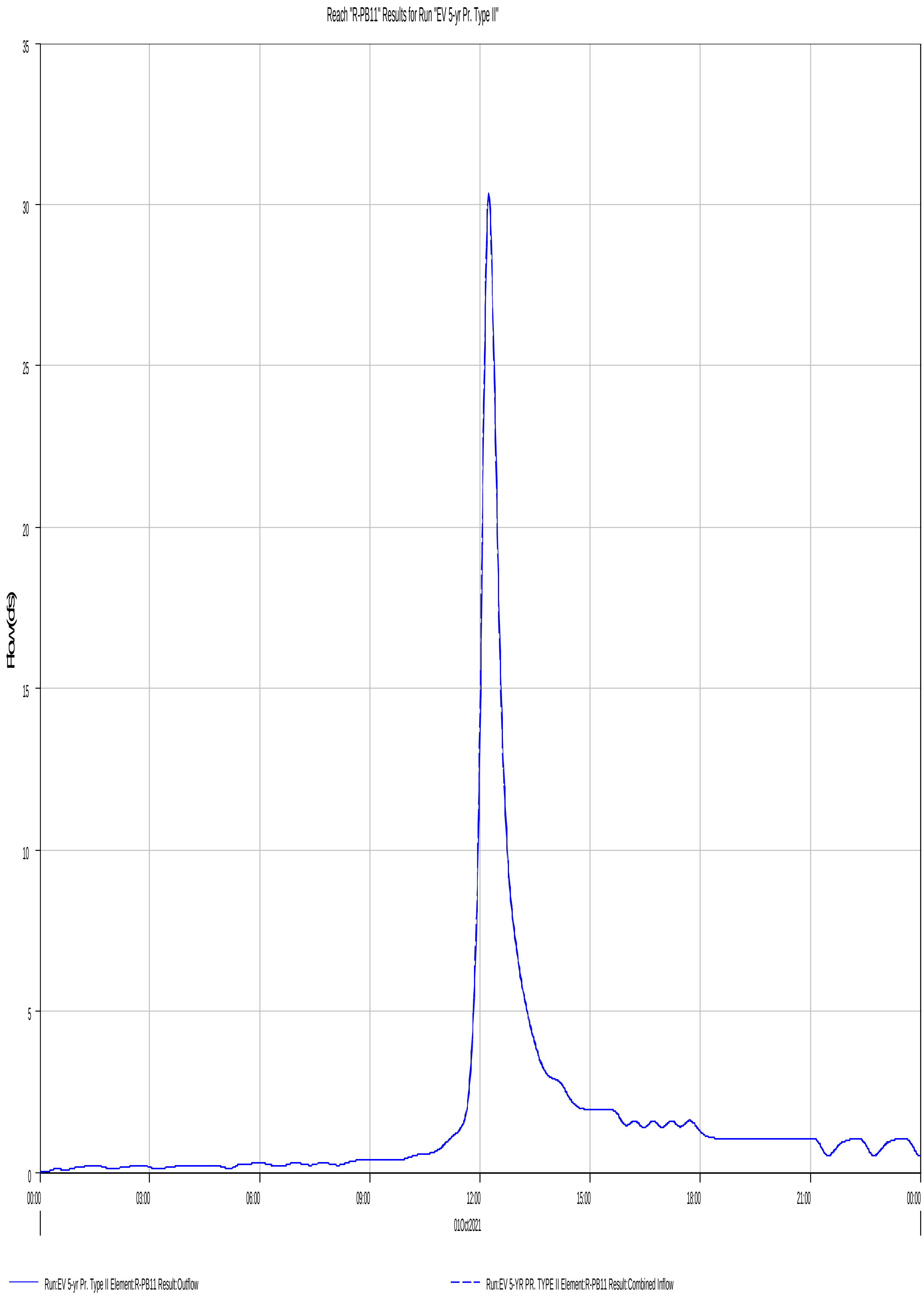
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: P9 (CULV6)

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	30.4 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:14
Peak Outflow :	30.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:14
Total Inflow :	3.3 (AC-FT)	Total Outflow :	3.3 (AC-FT)



Reach "R-PB11" Results for Run "EV 5-yr Pr. Type II"
35
30
25
20
15
10
5
0
Flow (cfs)
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-PB11 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-PB11 Result:Combined Inflow

Project: Eagleview_Subdivision

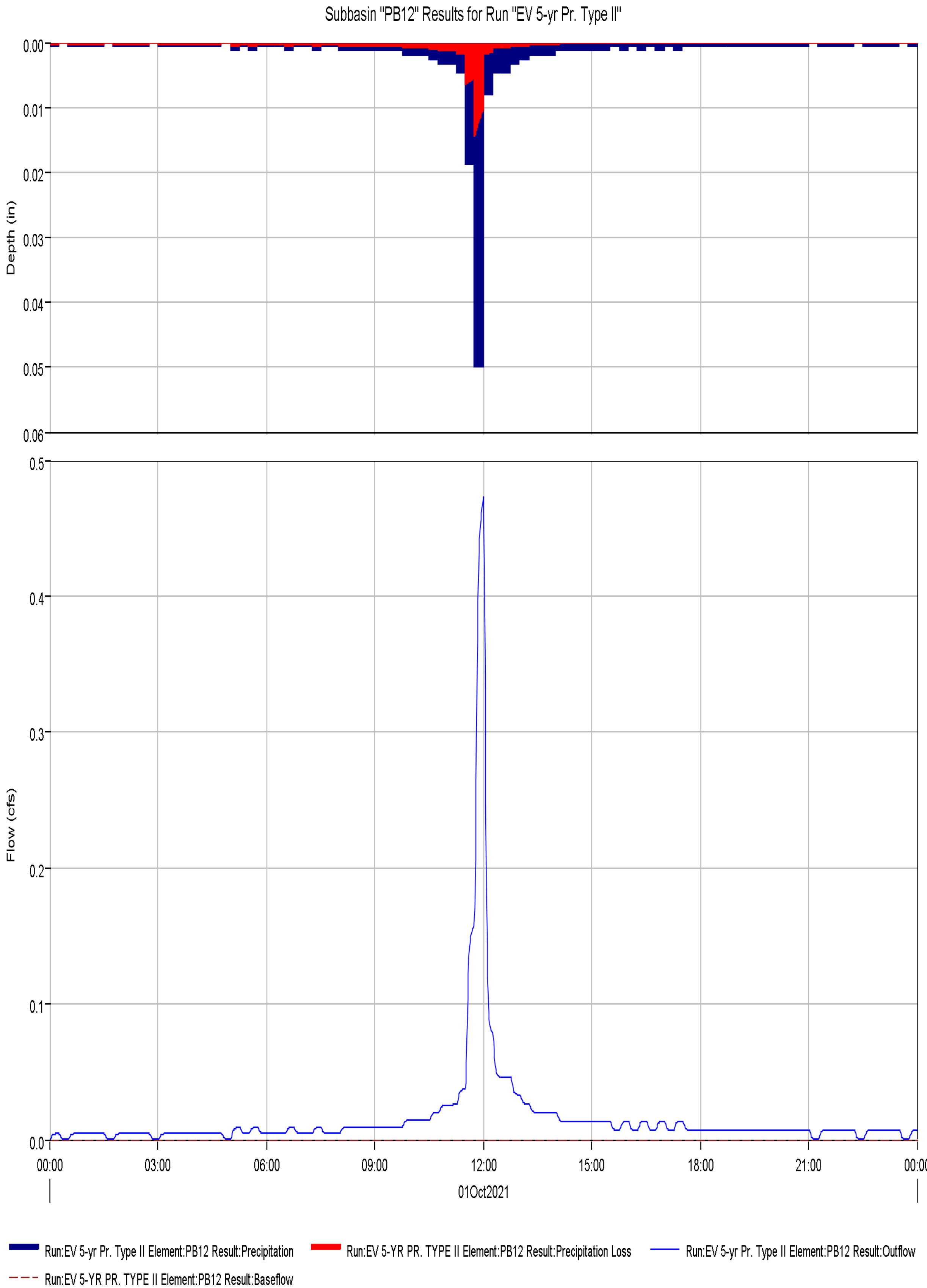
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB11

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	30.4 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:14
Peak Outflow :	30.3 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:15
Total Inflow :	3.3 (AC-FT)	Total Outflow :	3.3 (AC-FT)



Subbasin "PB12" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
0.5
0.4
0.3
0.2
0.1
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB12 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB12 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB12 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB12 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB12

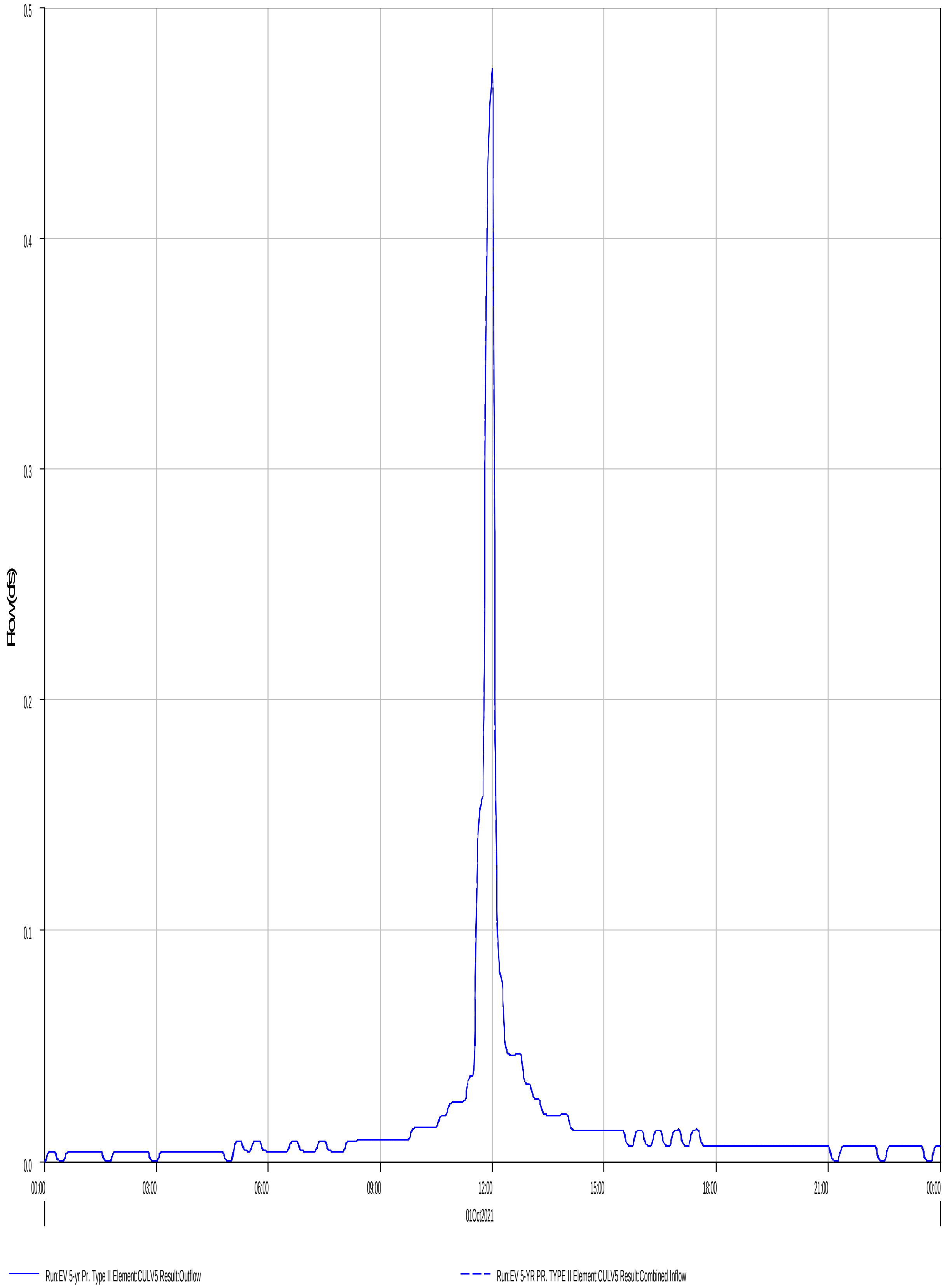
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	0.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:00
Total Precipitation :	0.0 (AC-FT)	Total Direct Runoff :	0.0 (AC-FT)
Total Loss :	0.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.0 (AC-FT)	Discharge :	0.0 (AC-FT)

Reach "CULV5" Results for Run "EV 5-yr Pr. Type II"



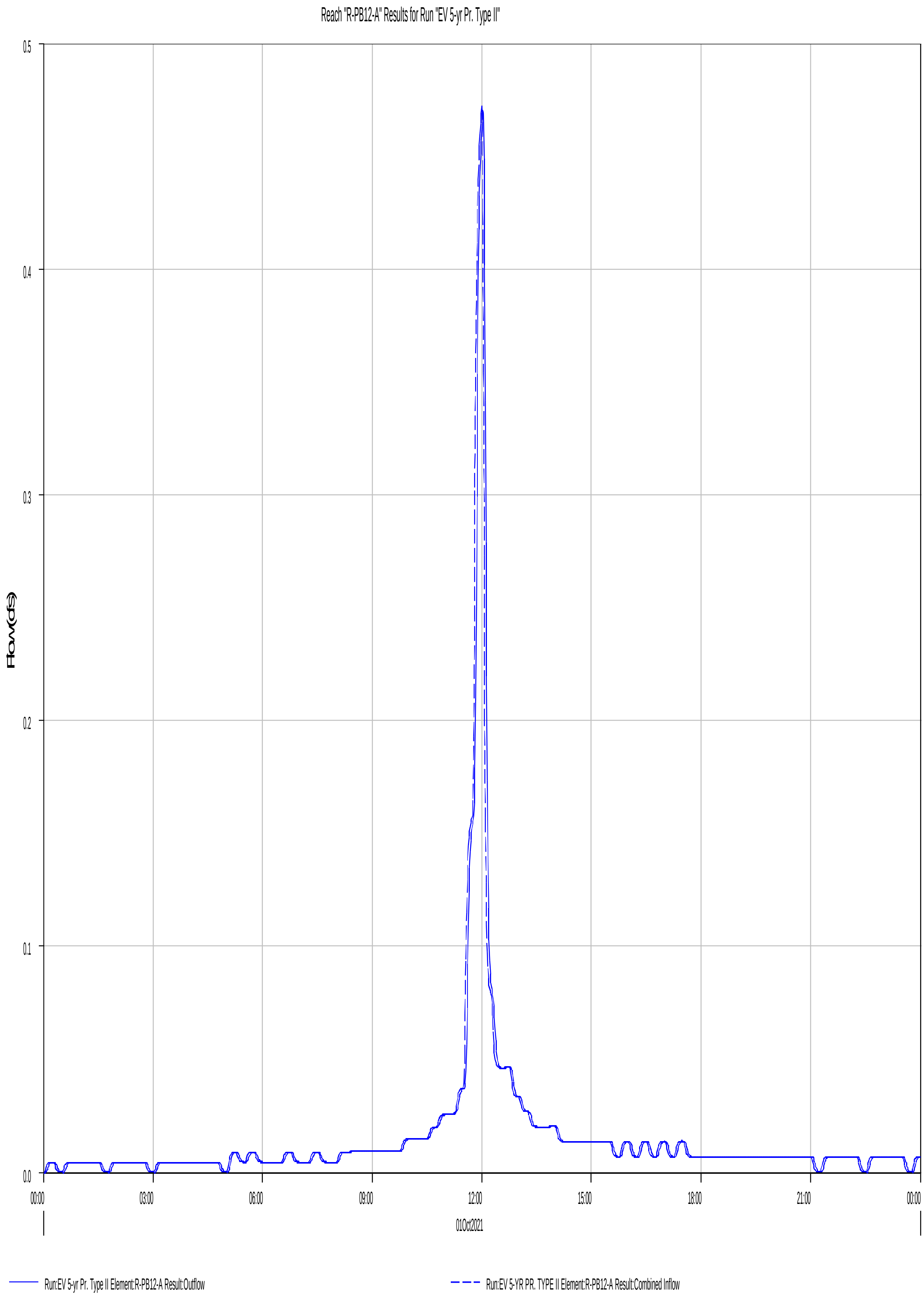
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: CULV5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	0.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:00
Peak Outflow :	0.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:00
Total Inflow :	0.0 (AC-FT)	Total Outflow :	0.0 (AC-FT)



Reach "R-PB12-A" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
0.5
0.4
0.3
0.2
0.1
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-PB12-A Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-PB12-A Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB12-A

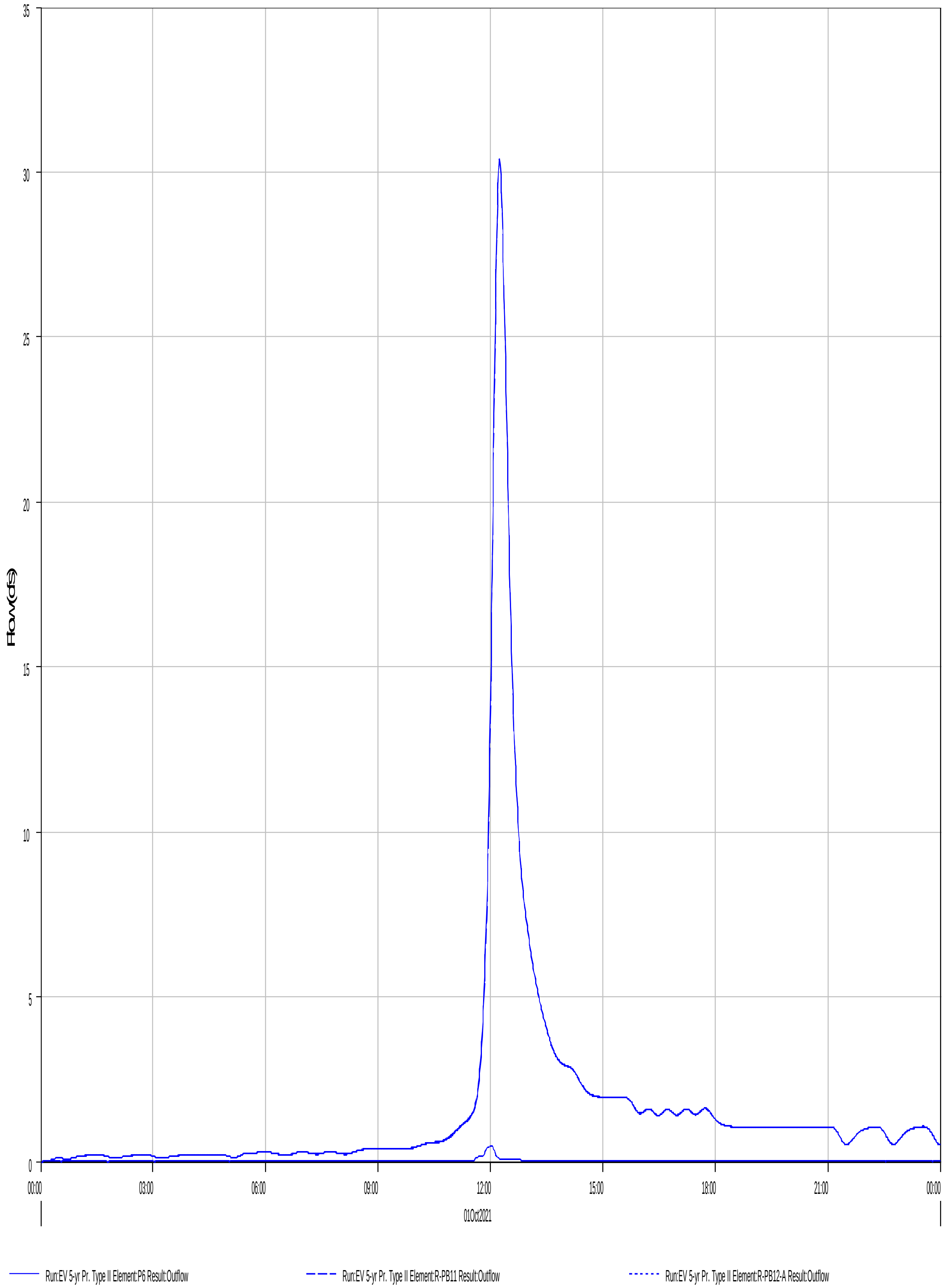
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	0.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:00
Peak Outflow :	0.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:02
Total Inflow :	0.0 (AC-FT)	Total Outflow :	0.0 (AC-FT)

Junction "P6" Results for Run "EV 5-yr Pr. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Junction: P6

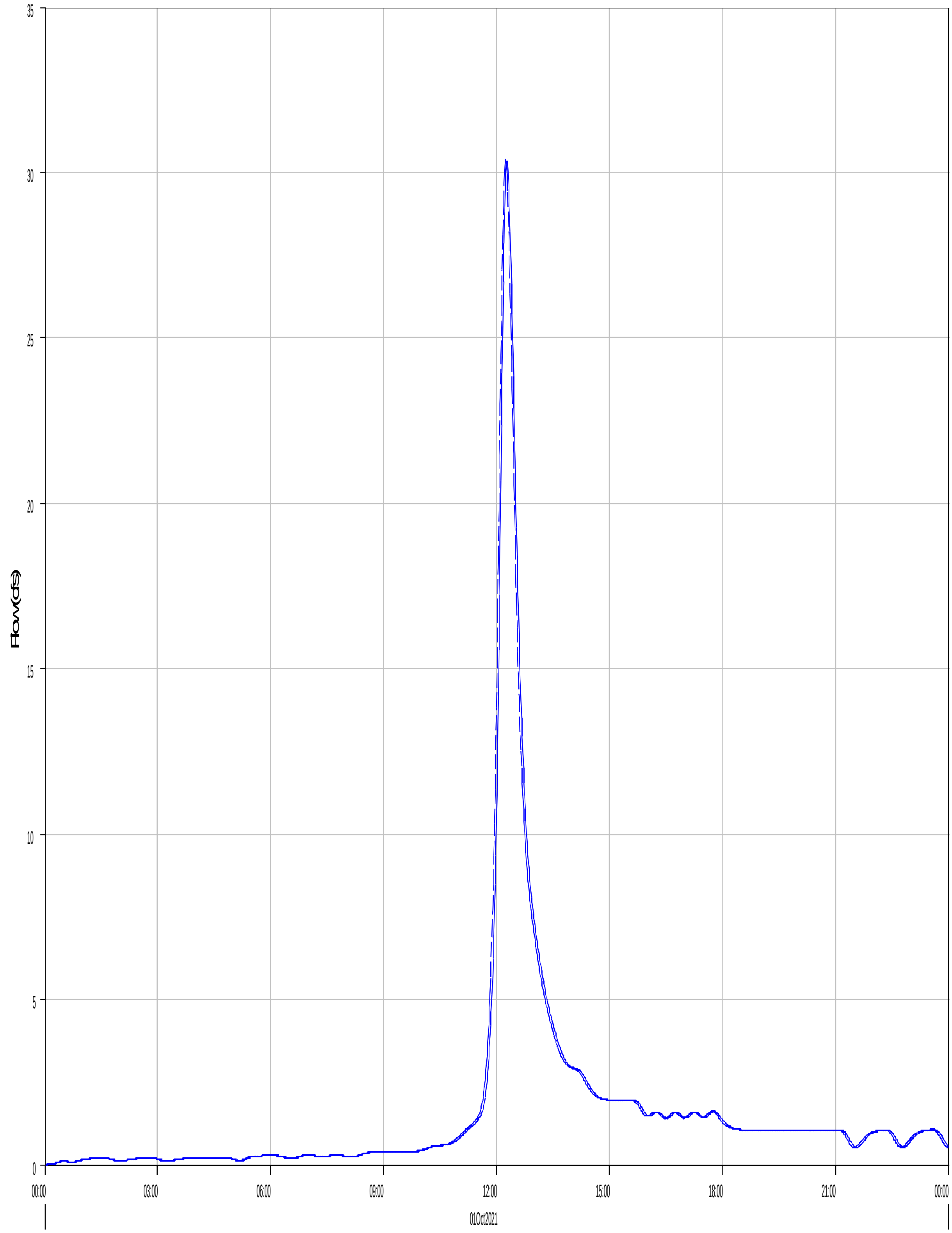
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	30.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:15
Total Outflow :	3.4 (AC-FT)		

Reach "R-PB12-B" Results for Run "EV 5-yr Pr. Type II"



Run:EV 5-yr Pr. Type II Element:R-PB12-B Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-PB12-B Result:Combined Inflow

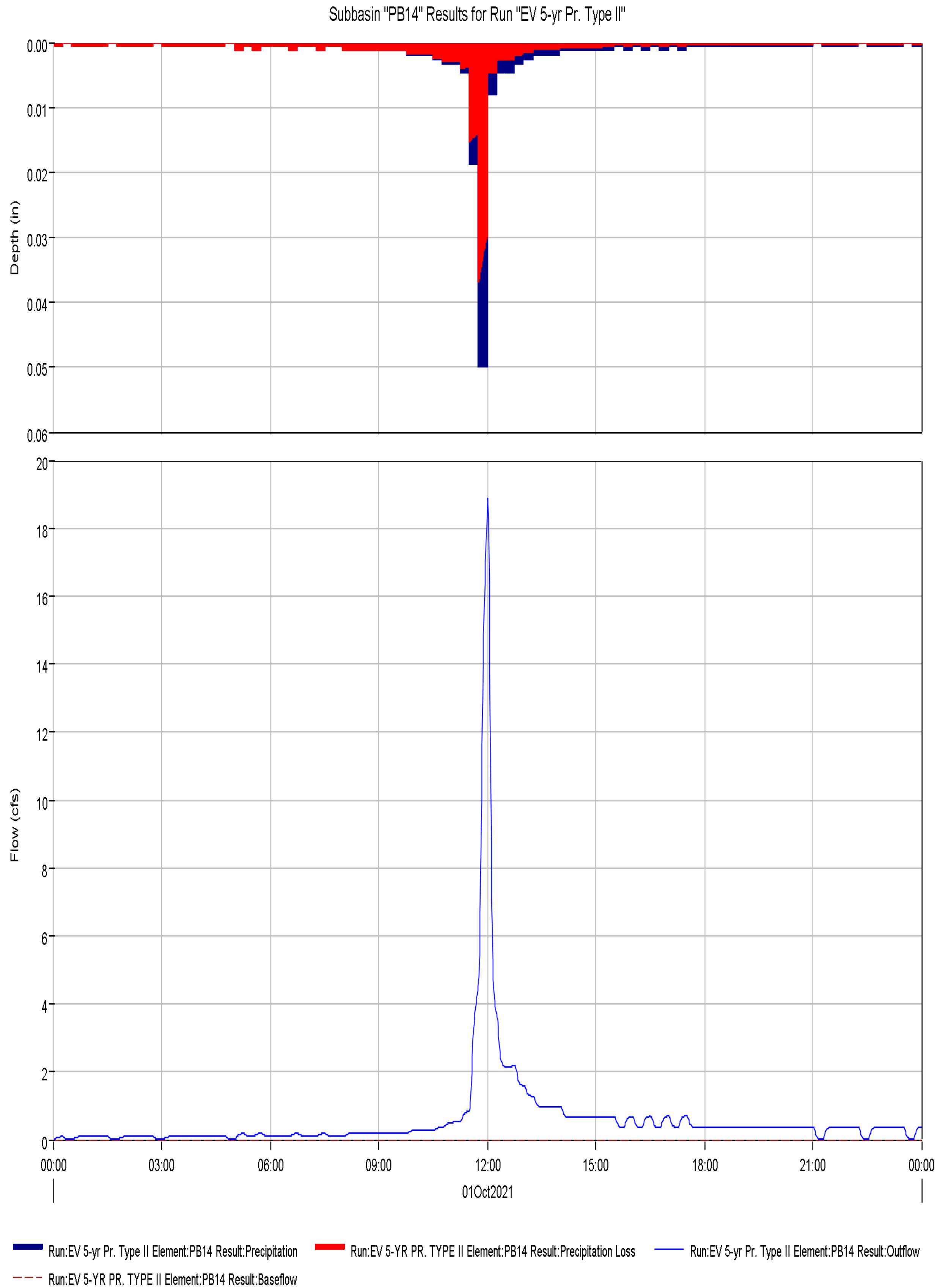
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB12-B

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	30.4 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:15
Peak Outflow :	30.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:17
Total Inflow :	3.4 (AC-FT)	Total Outflow :	3.4 (AC-FT)


Subbasin "PB14" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
20
18
16
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB14 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB14 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB14 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB14 Result:Baseflow

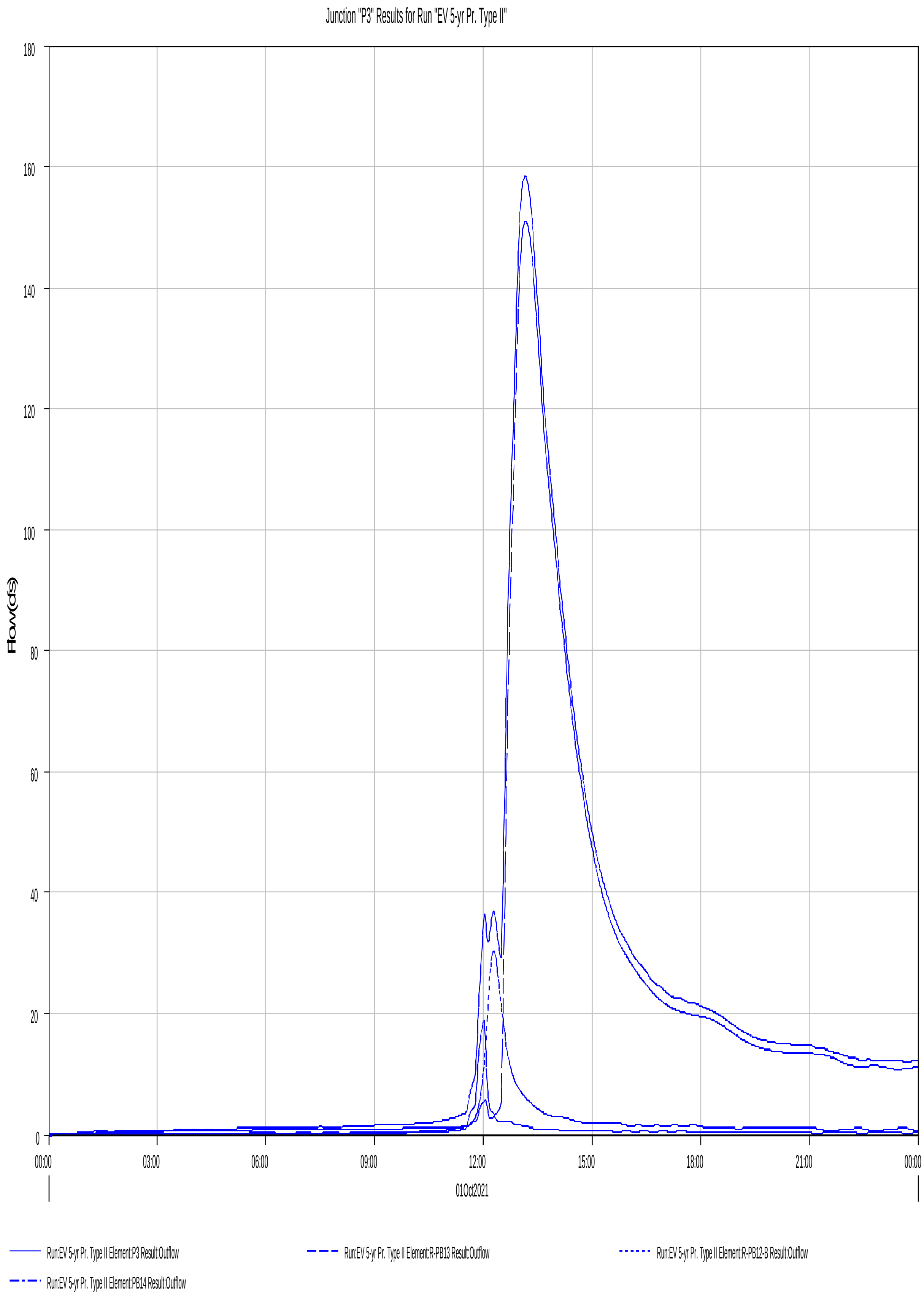
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB14

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	18.9 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:01
Total Precipitation :	3.9 (AC-FT)	Total Direct Runoff :	1.2 (AC-FT)
Total Loss :	2.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.2 (AC-FT)	Discharge :	1.2 (AC-FT)



Junction "P3" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
180
160
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:P3 Result:Outflow
Run:EV 5-yr Pr. Type II Element:R-PB13 Result:Outflow
Run:EV 5-yr Pr. Type II Element:R-PB12-B Result:Outflow
Run:EV 5-yr Pr. Type II Element:PB14 Result:Outflow

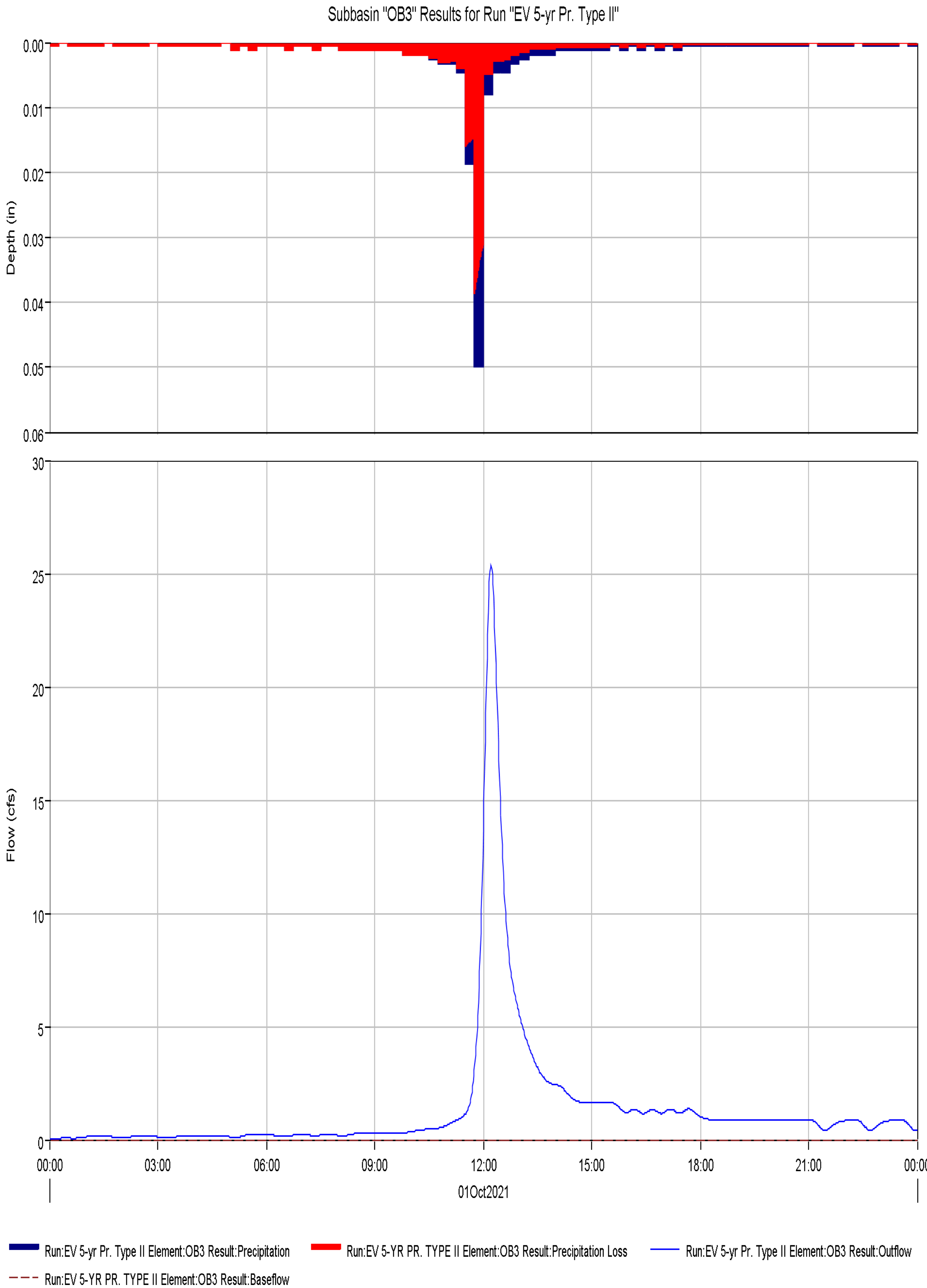
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Junction: P3

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	21Dec2022, 12:41:54	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	158.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 13:09
Total Outflow :	38.8 (AC-FT)		



Subbasin "OB3" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:OB3 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:OB3 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:OB3 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:OB3 Result:Baseflow

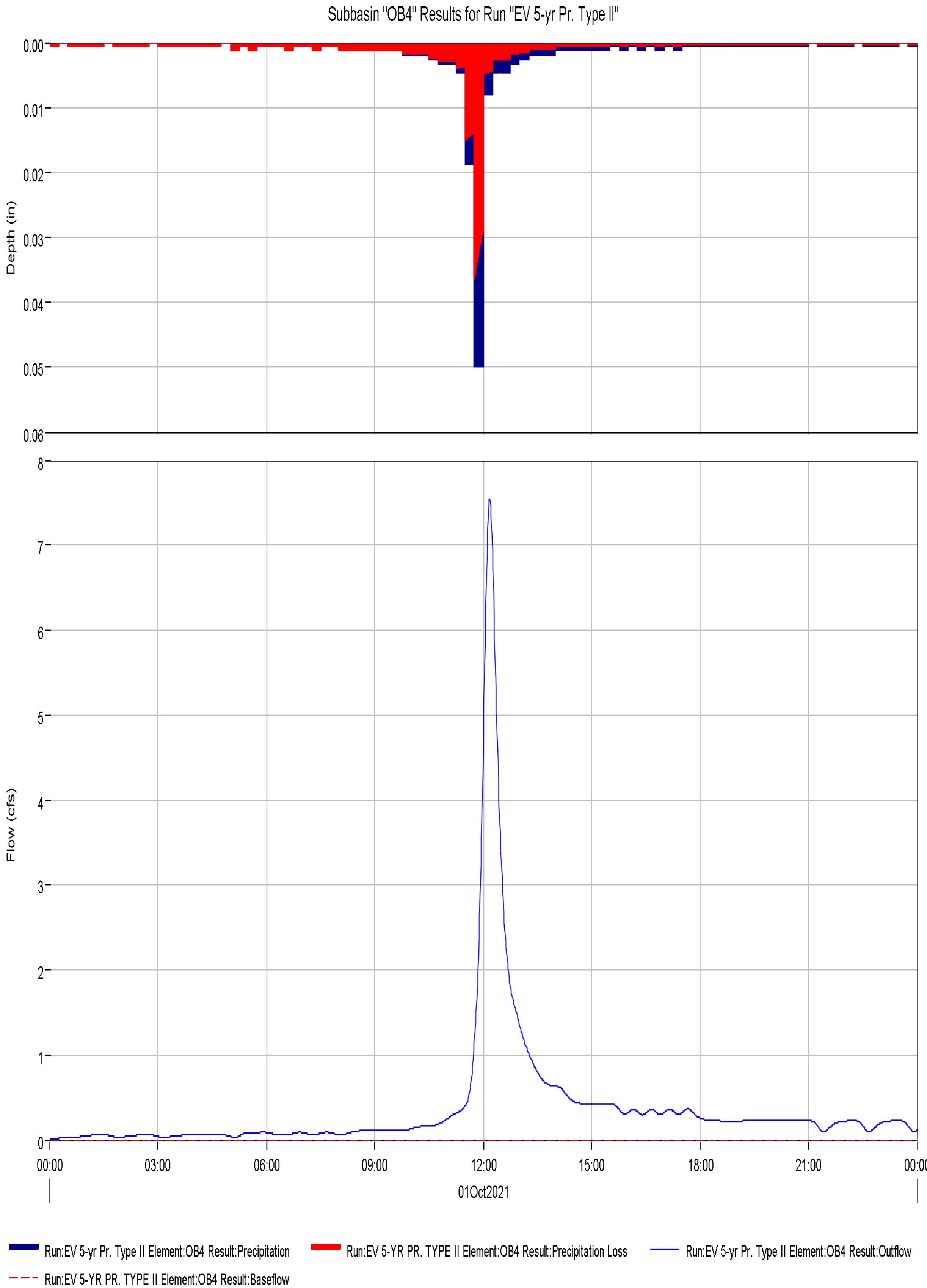
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: OB3

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	25.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:13
Total Precipitation :	9.8 (AC-FT)	Total Direct Runoff :	2.8 (AC-FT)
Total Loss :	7.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.8 (AC-FT)	Discharge :	2.8 (AC-FT)



Subbasin "OB4" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
8
7
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:OB4 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:OB4 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:OB4 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:OB4 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: OB4

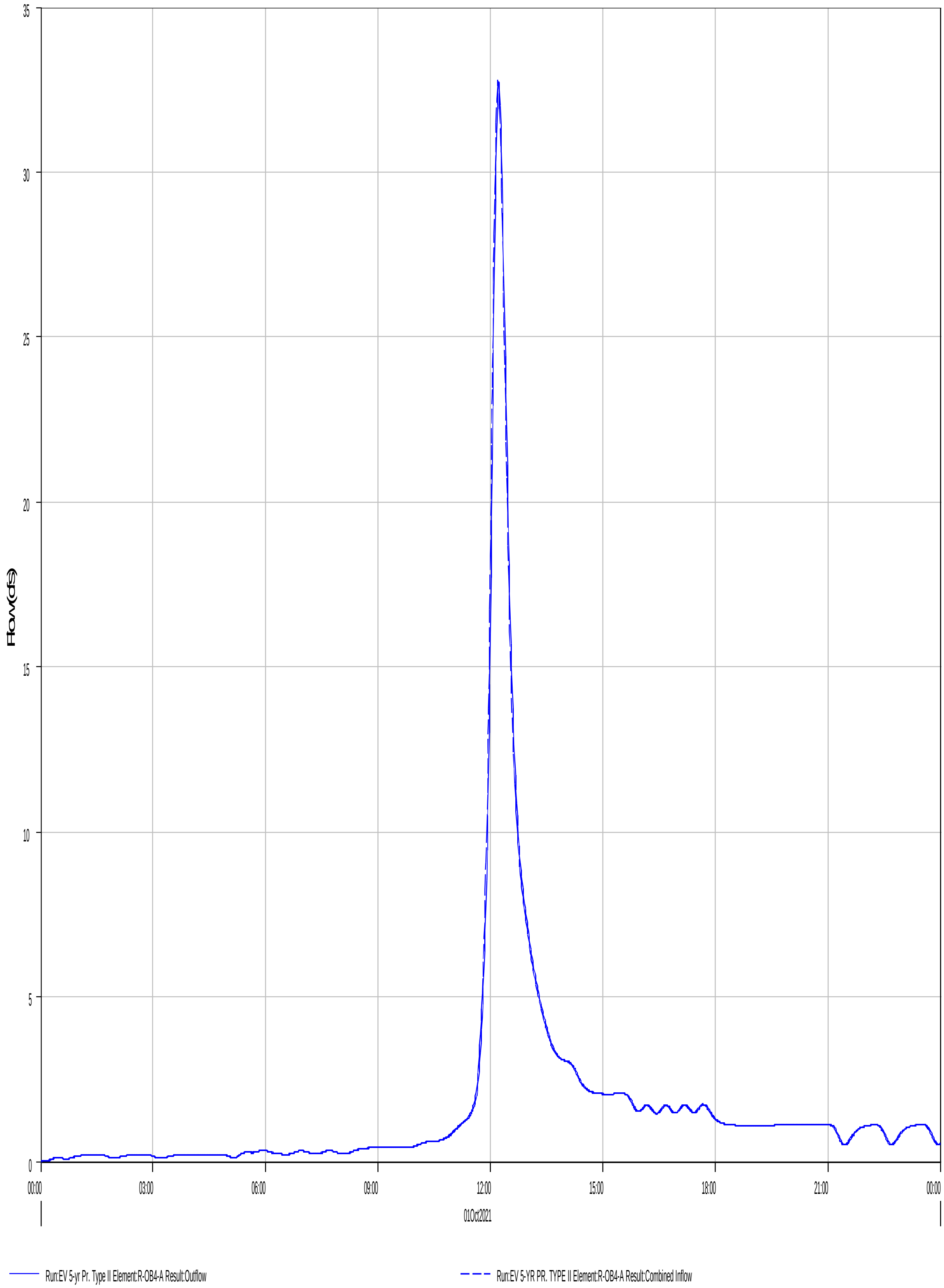
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	7.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:10
Total Precipitation :	2.4 (AC-FT)	Total Direct Runoff :	0.8 (AC-FT)
Total Loss :	1.6 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.8 (AC-FT)	Discharge :	0.8 (AC-FT)

Reach "R-OB4-A" Results for Run "EV 5-yr Pr. Type II"



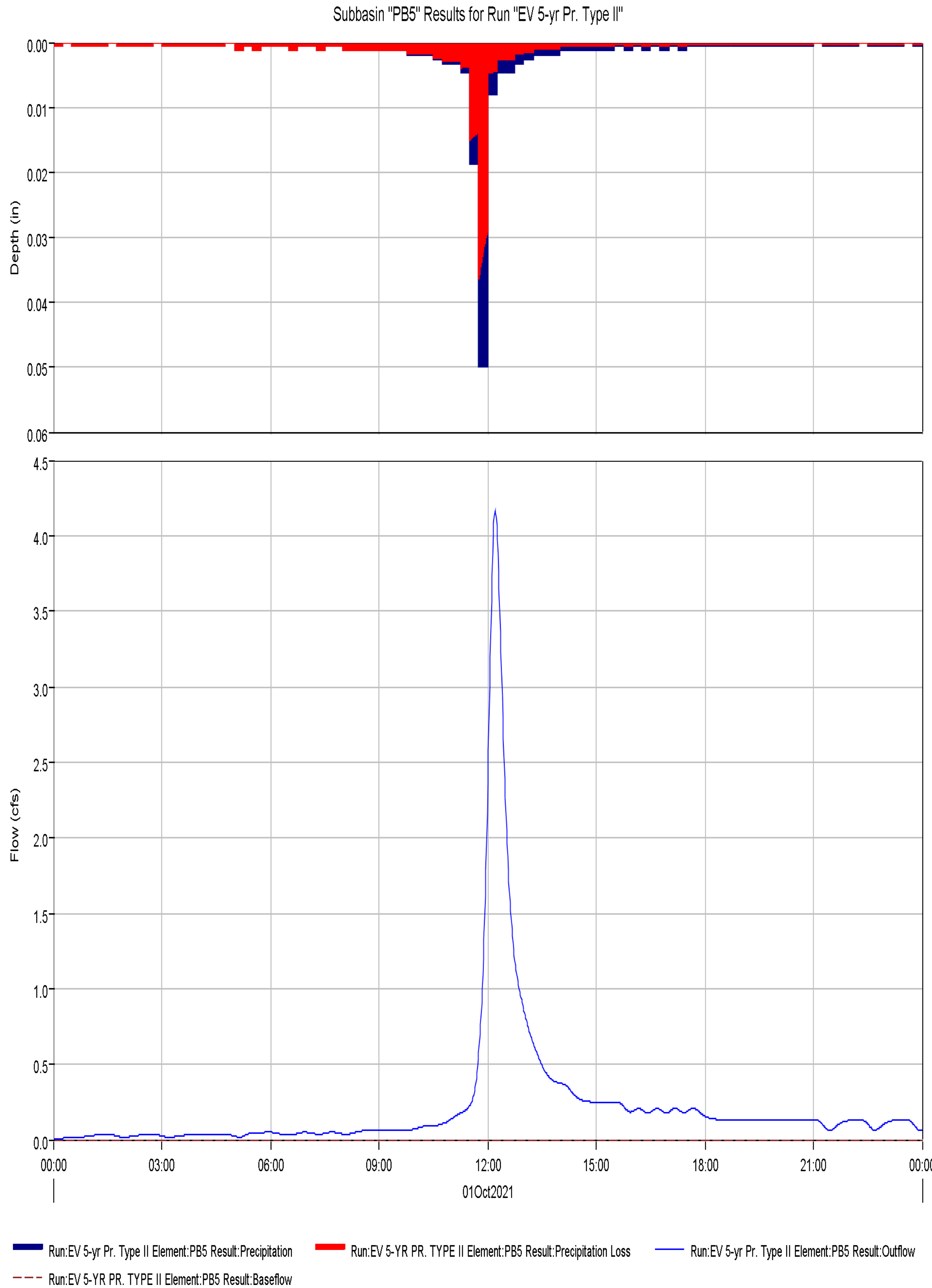
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-OB4-A

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	32.8 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:12
Peak Outflow :	32.7 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Inflow :	3.5 (AC-FT)	Total Outflow :	3.5 (AC-FT)



Subbasin "PB5" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB5 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB5 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB5 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB5 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB5

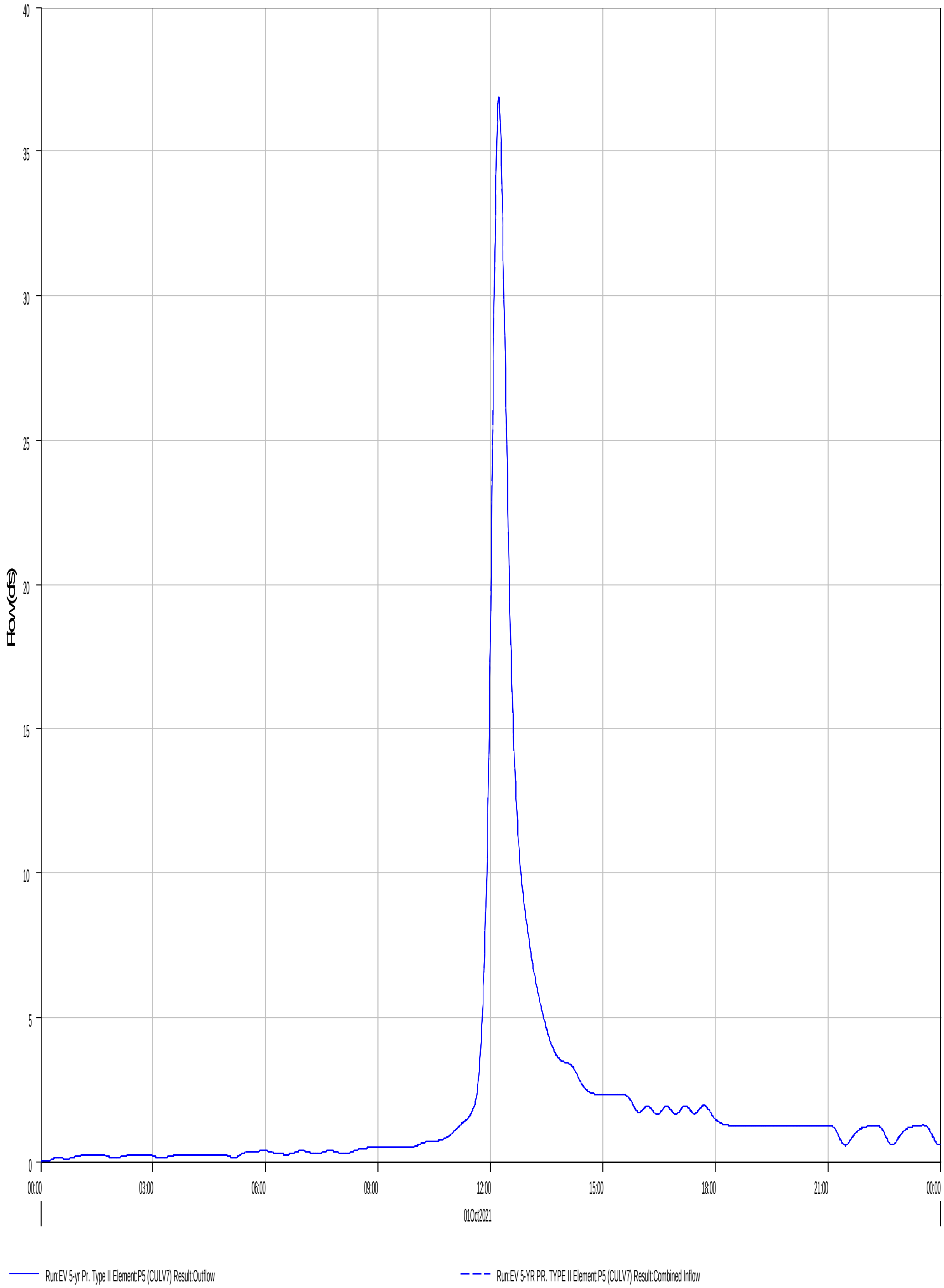
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	4.2 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:12
Total Precipitation :	1.4 (AC-FT)	Total Direct Runoff :	0.5 (AC-FT)
Total Loss :	0.9 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.5 (AC-FT)	Discharge :	0.5 (AC-FT)

Reach "P5 (CULV7)" Results for Run "EV 5-yr Pr. Type II"



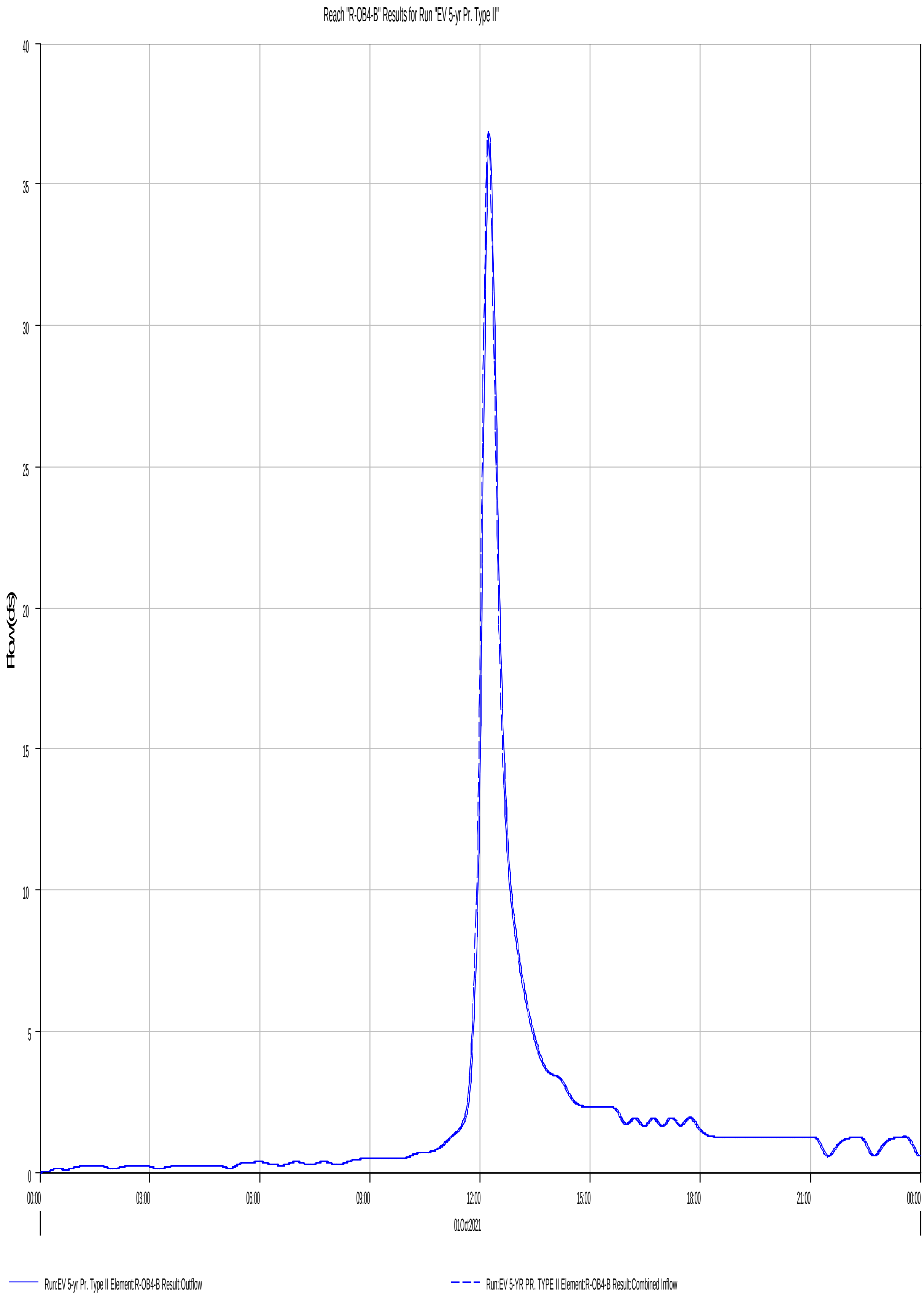
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: P5 (CULV7)

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	36.9 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	36.9 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Inflow :	4.0 (AC-FT)	Total Outflow :	4.0 (AC-FT)



Reach "R-OB4-B" Results for Run "EV 5-yr Pr. Type II"
Flow(cfs)
40
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-OB4-B Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-OB4-B Result:Combined Inflow

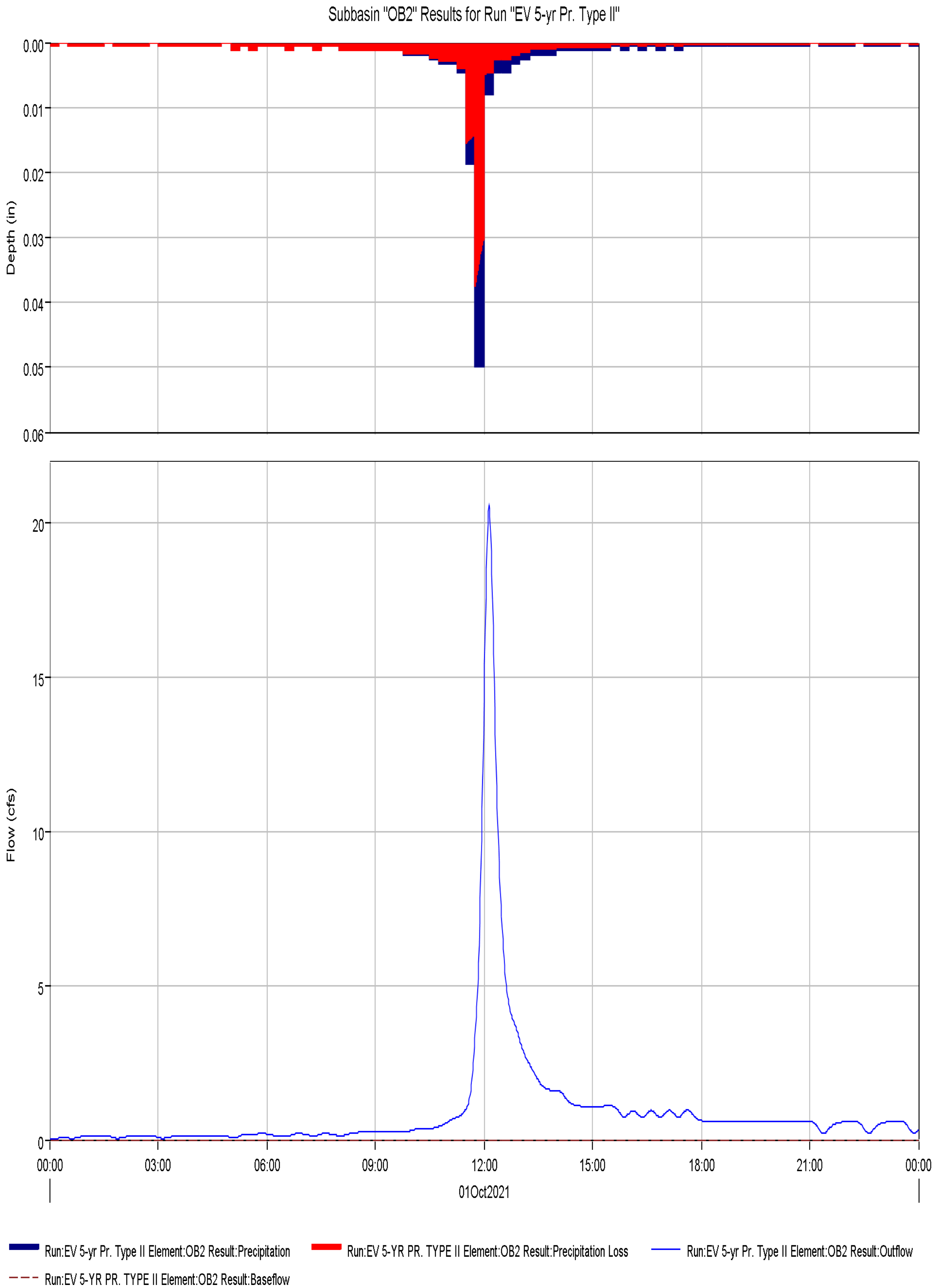
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-OB4-B

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	36.9 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	36.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:15
Total Inflow :	4.0 (AC-FT)	Total Outflow :	4.0 (AC-FT)



Subbasin "OB2" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
0
5
10
15
20
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:OB2 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:OB2 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:OB2 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:OB2 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: OB2

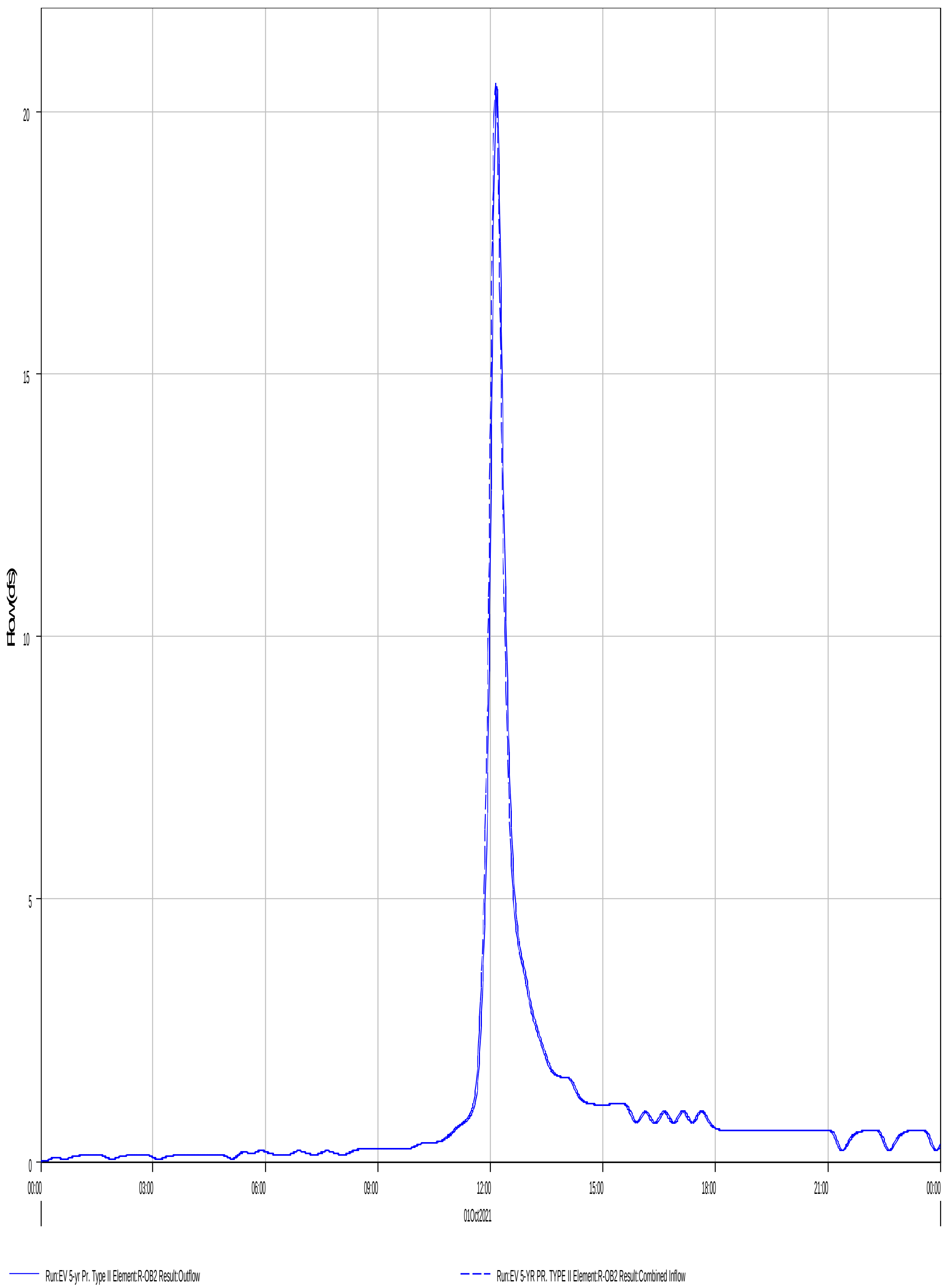
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	20.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	6.3 (AC-FT)	Total Direct Runoff :	1.9 (AC-FT)
Total Loss :	4.4 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.9 (AC-FT)	Discharge :	1.9 (AC-FT)

Reach "R-OB2" Results for Run "EV 5-yr Pr. Type II"



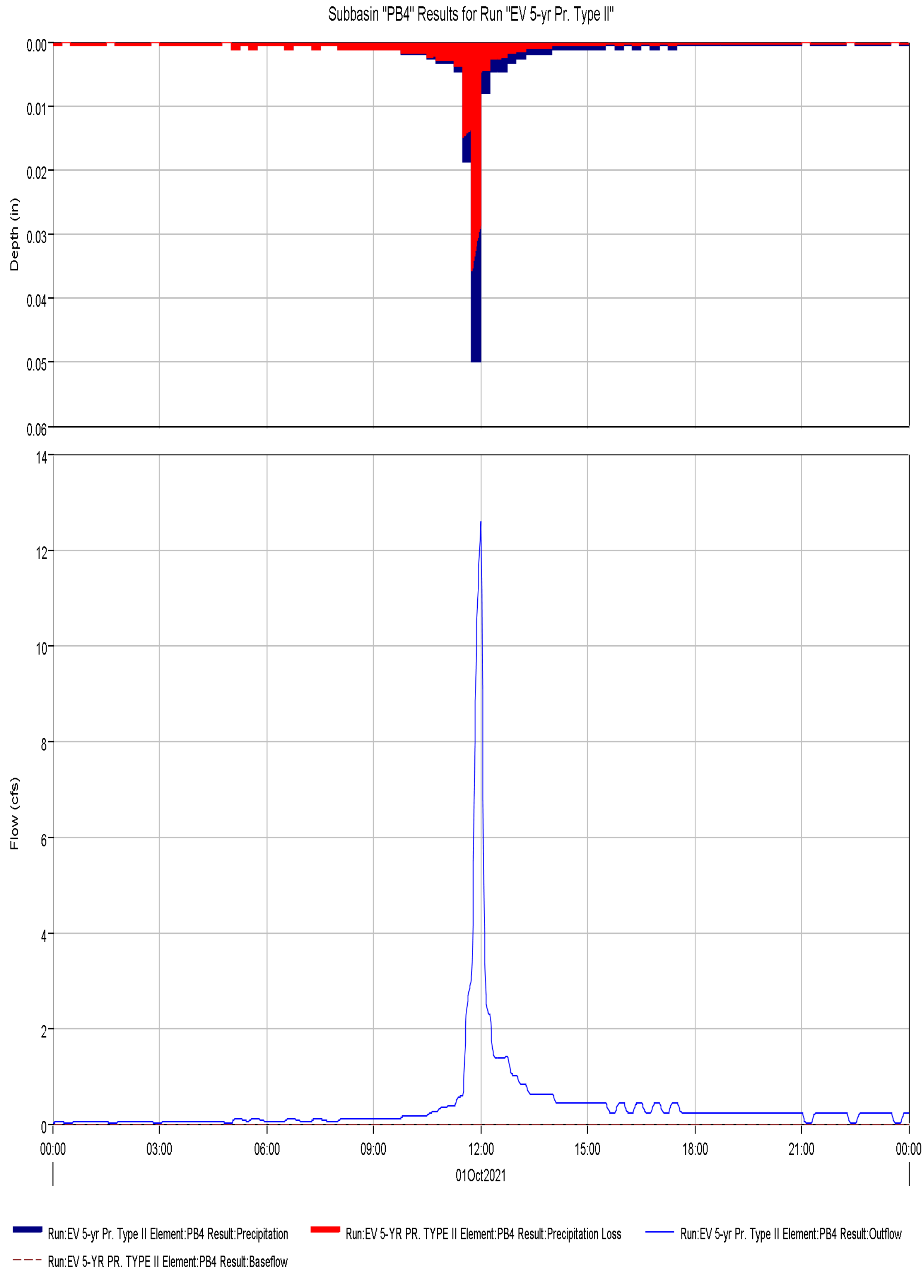
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-OB2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	20.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	20.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:10
Total Inflow :	1.9 (AC-FT)	Total Outflow :	1.9 (AC-FT)



Subbasin "PB4" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB4 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB4 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB4 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB4 Result:Baseflow

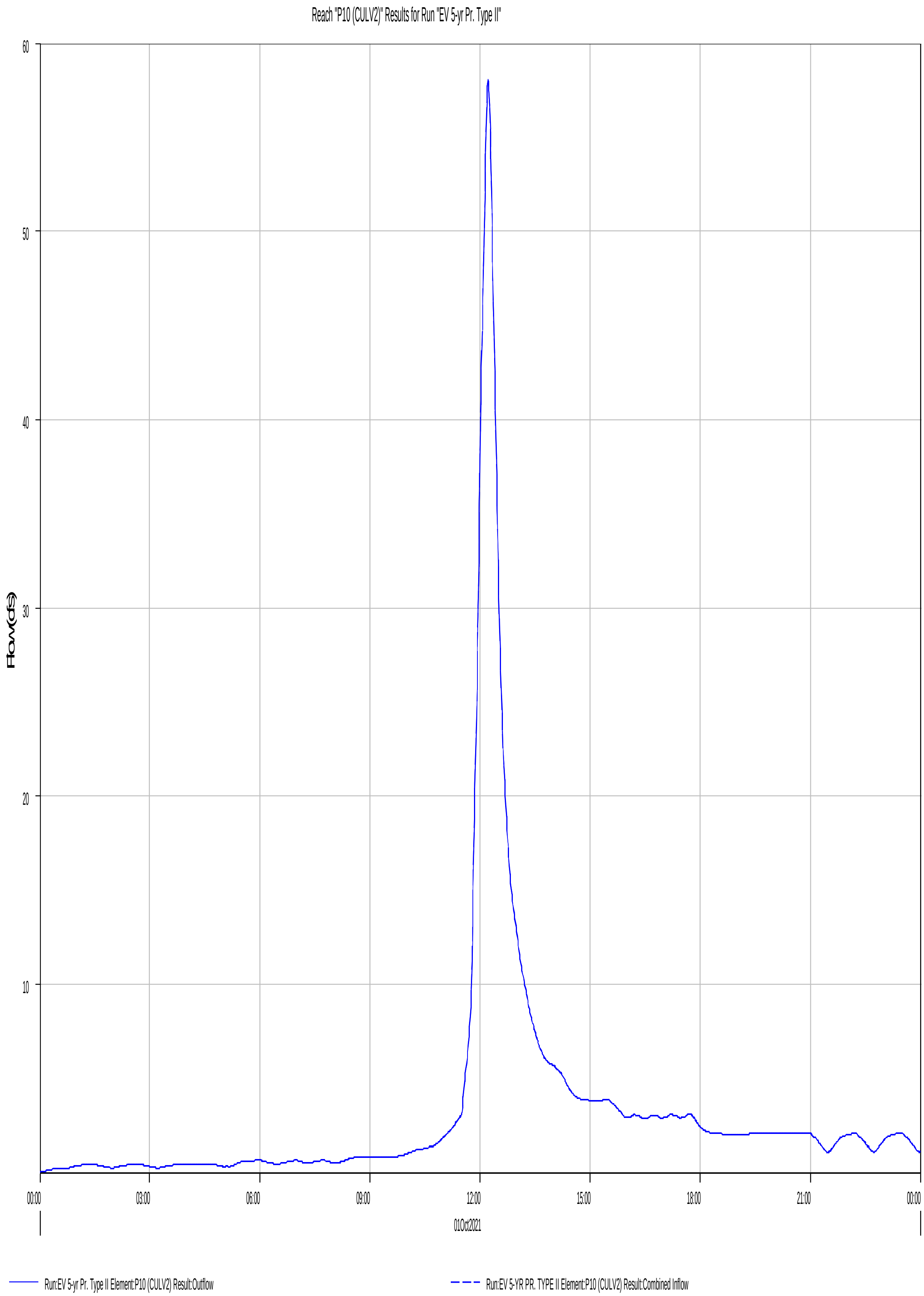
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB4

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	12.6 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:00
Total Precipitation :	2.4 (AC-FT)	Total Direct Runoff :	0.8 (AC-FT)
Total Loss :	1.6 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.8 (AC-FT)	Discharge :	0.8 (AC-FT)


Reach "P10 (CULV2)" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
60
50
40
30
20
10
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:P10 (CULV2) Result:Outflow
Run:EV 5-YR PR. TYPE II Element:P10 (CULV2) Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: P10 (CULV2)

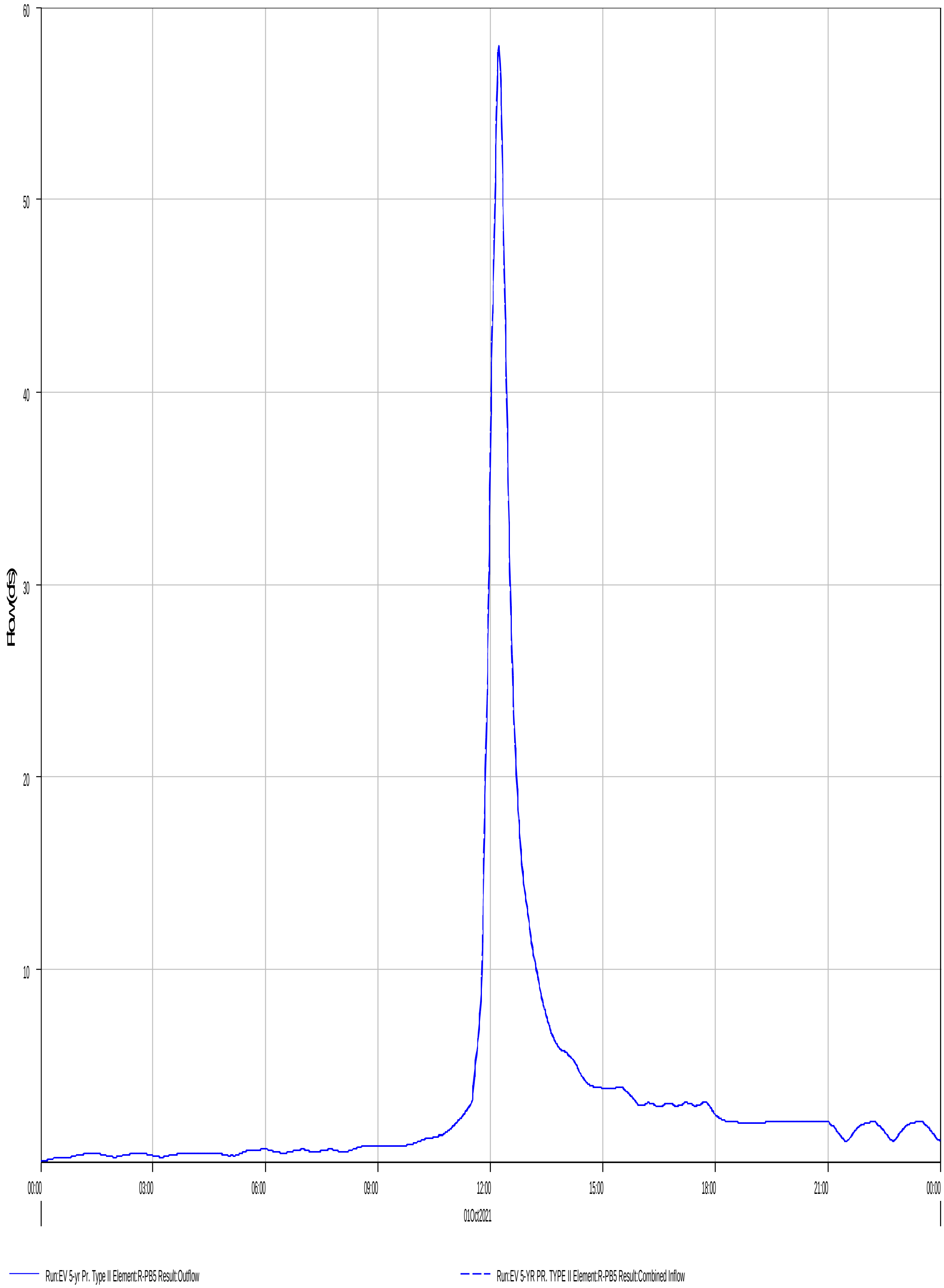
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	58.0 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	58.0 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Inflow :	6.7 (AC-FT)	Total Outflow :	6.7 (AC-FT)

Reach "R-PB5" Results for Run "EV 5-yr Pr. Type II"



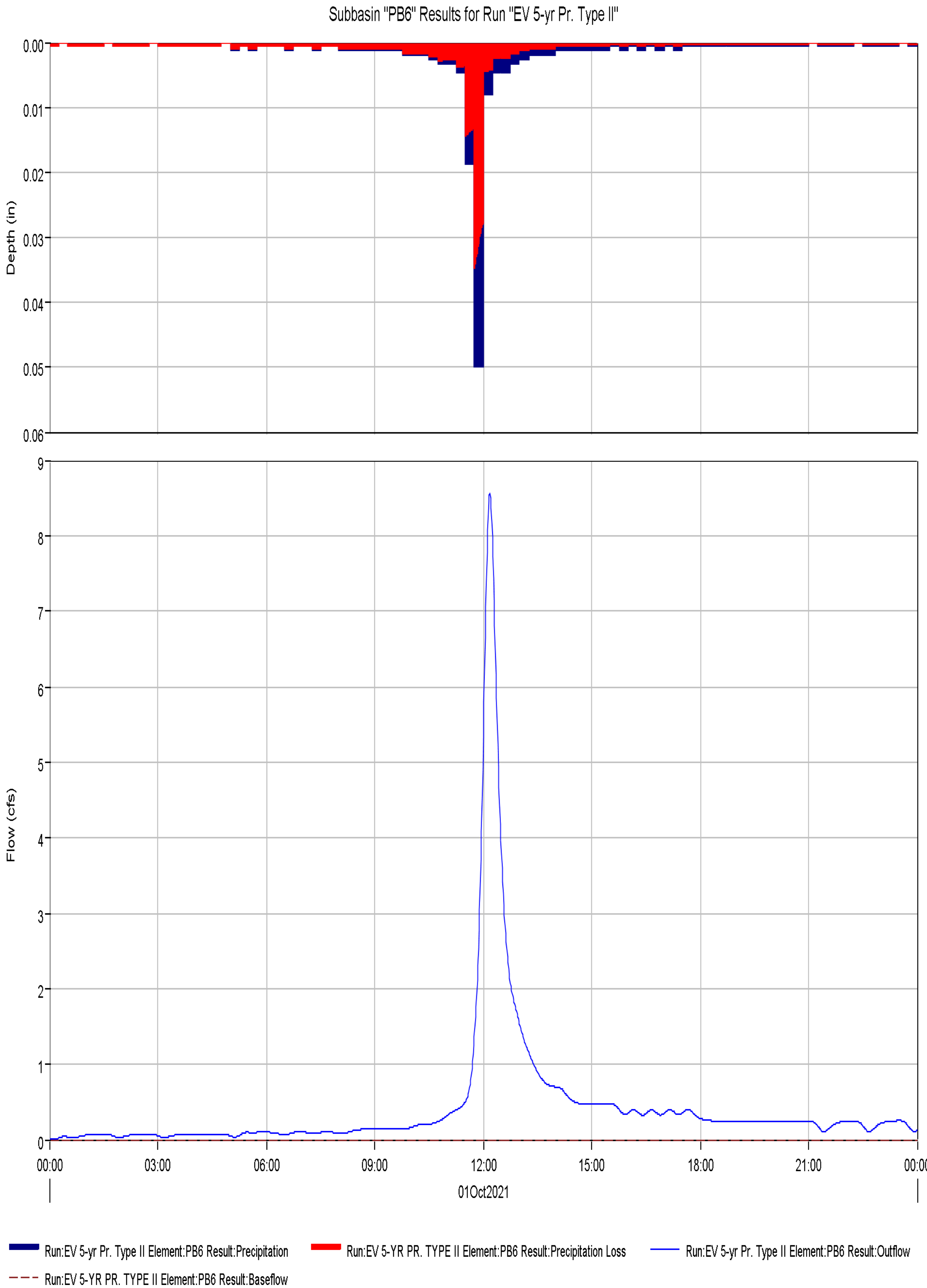
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	58.0 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	58.0 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:14
Total Inflow :	6.7 (AC-FT)	Total Outflow :	6.7 (AC-FT)


Subbasin "PB6" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
9
8
7
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB6 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB6 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB6 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB6 Result:Baseflow

Project: Eagleview_Subdivision

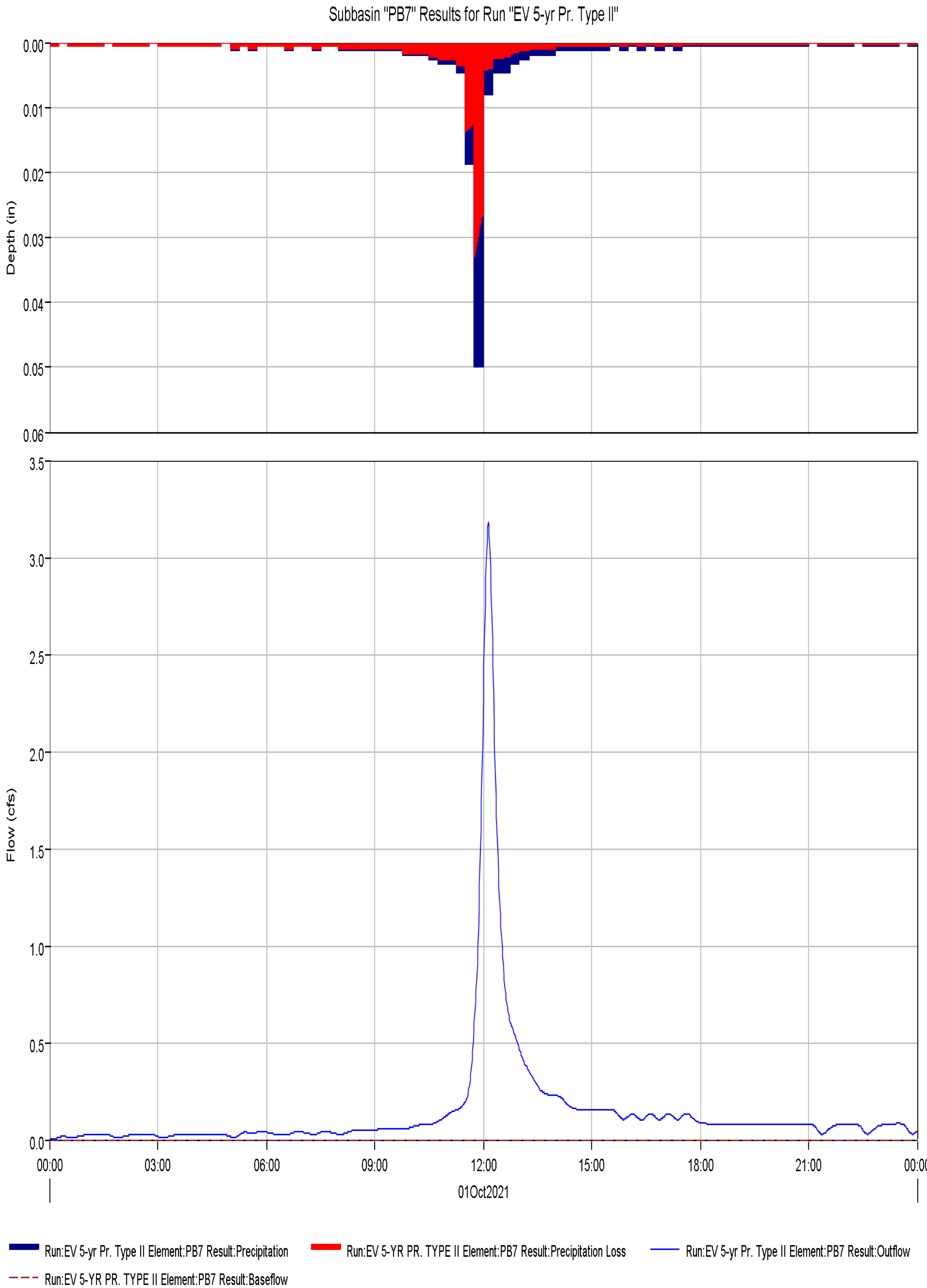
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	8.6 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:11
Total Precipitation :	2.5 (AC-FT)	Total Direct Runoff :	0.9 (AC-FT)
Total Loss :	1.6 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.9 (AC-FT)	Discharge :	0.9 (AC-FT)



Subbasin "PB7" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB7 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB7 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB7 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB7 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB7

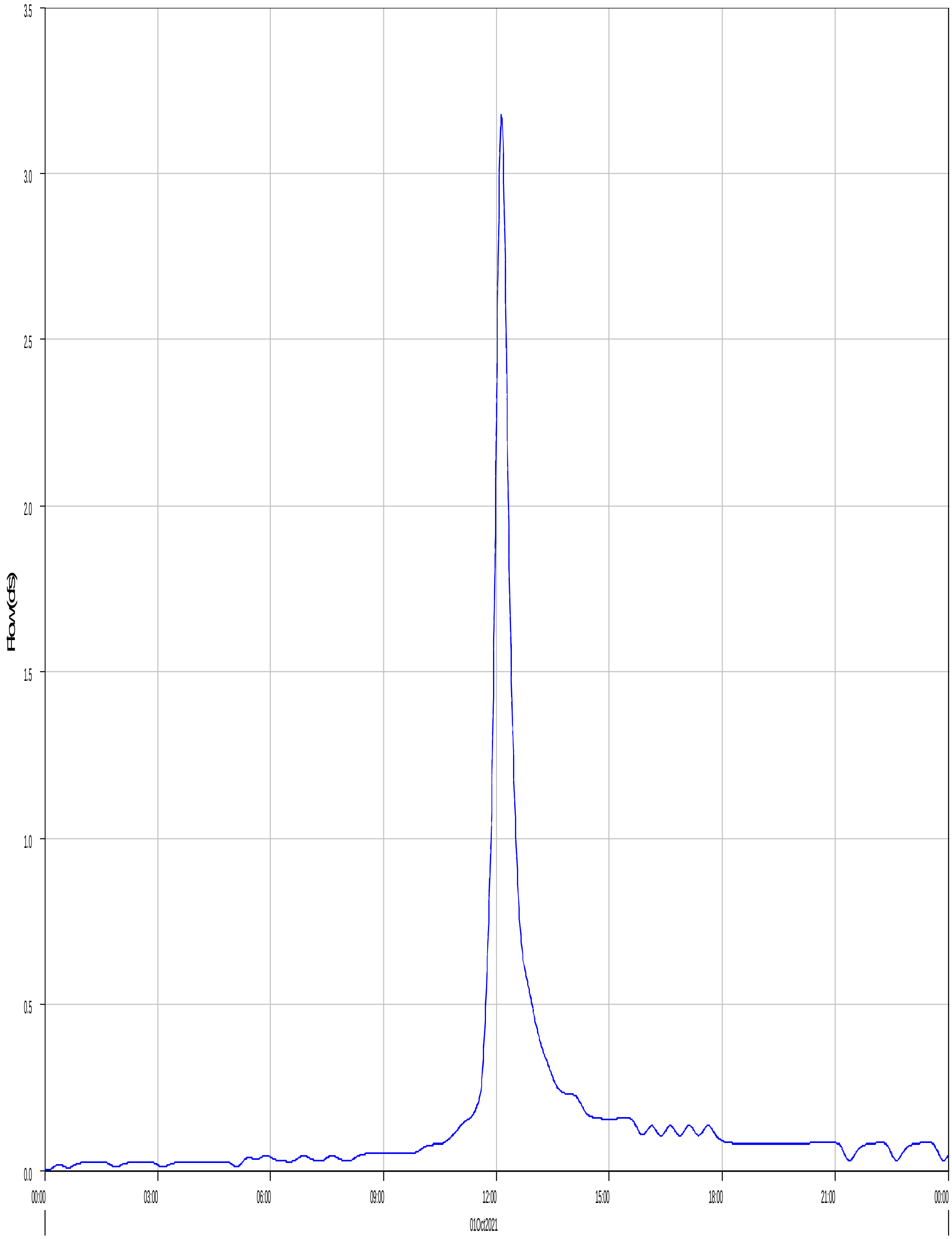
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	3.2 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	0.8 (AC-FT)	Total Direct Runoff :	0.3 (AC-FT)
Total Loss :	0.5 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.3 (AC-FT)	Discharge :	0.3 (AC-FT)

Reach "CULV4" Results for Run "EV 5-yr Pr. Type II"



Run:EV 5-yr Pr. Type II Element:CULV4 Result:Outflow

Run:EV 5-YR PR. TYPE II Element:CULV4 Result:Combined Inflow

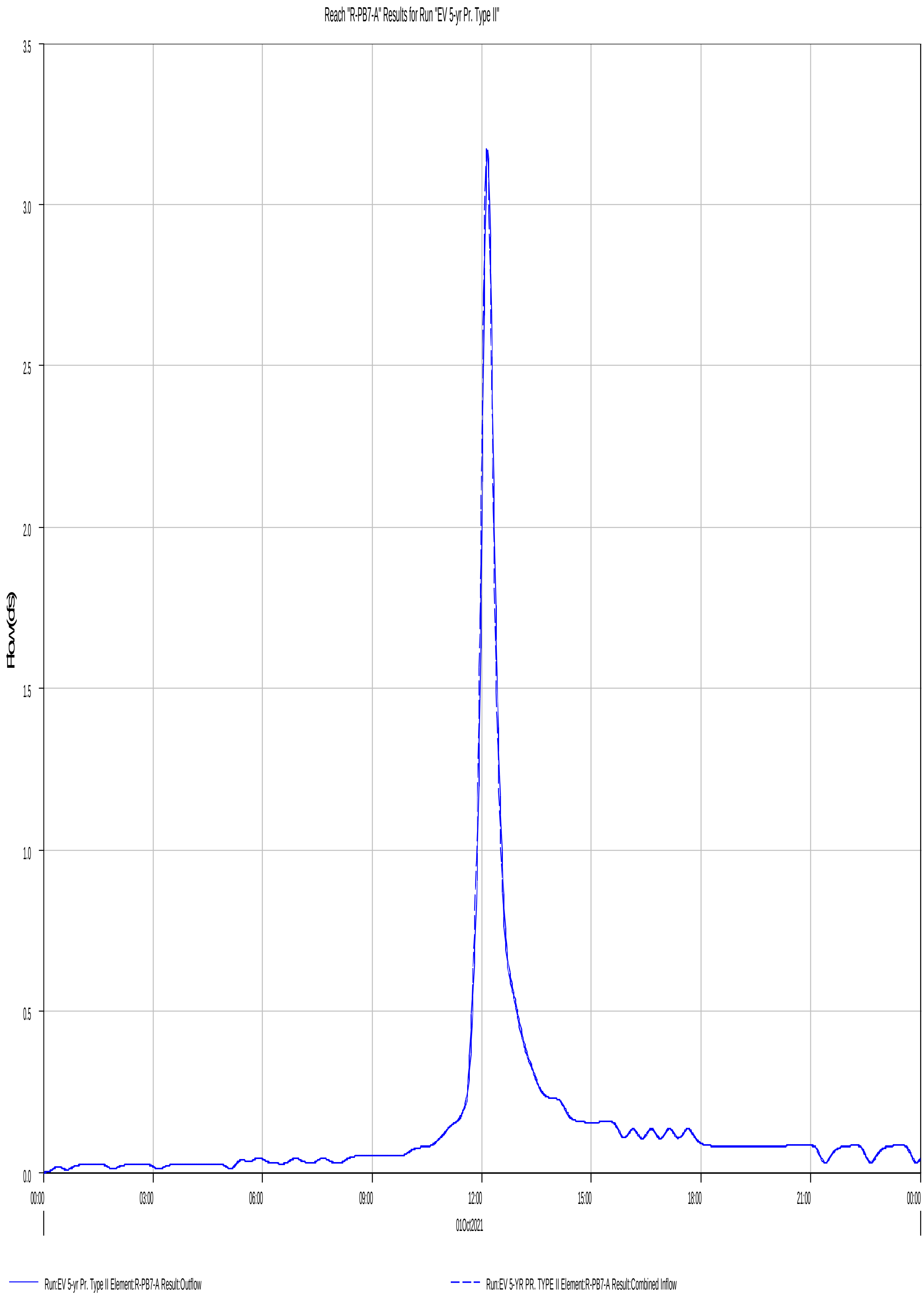
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: CULV4

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	3.2 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	3.2 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:08
Total Inflow :	0.3 (AC-FT)	Total Outflow :	0.3 (AC-FT)



Reach "R-PB7-A" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-PB7-A Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-PB7-A Result:Combined Inflow

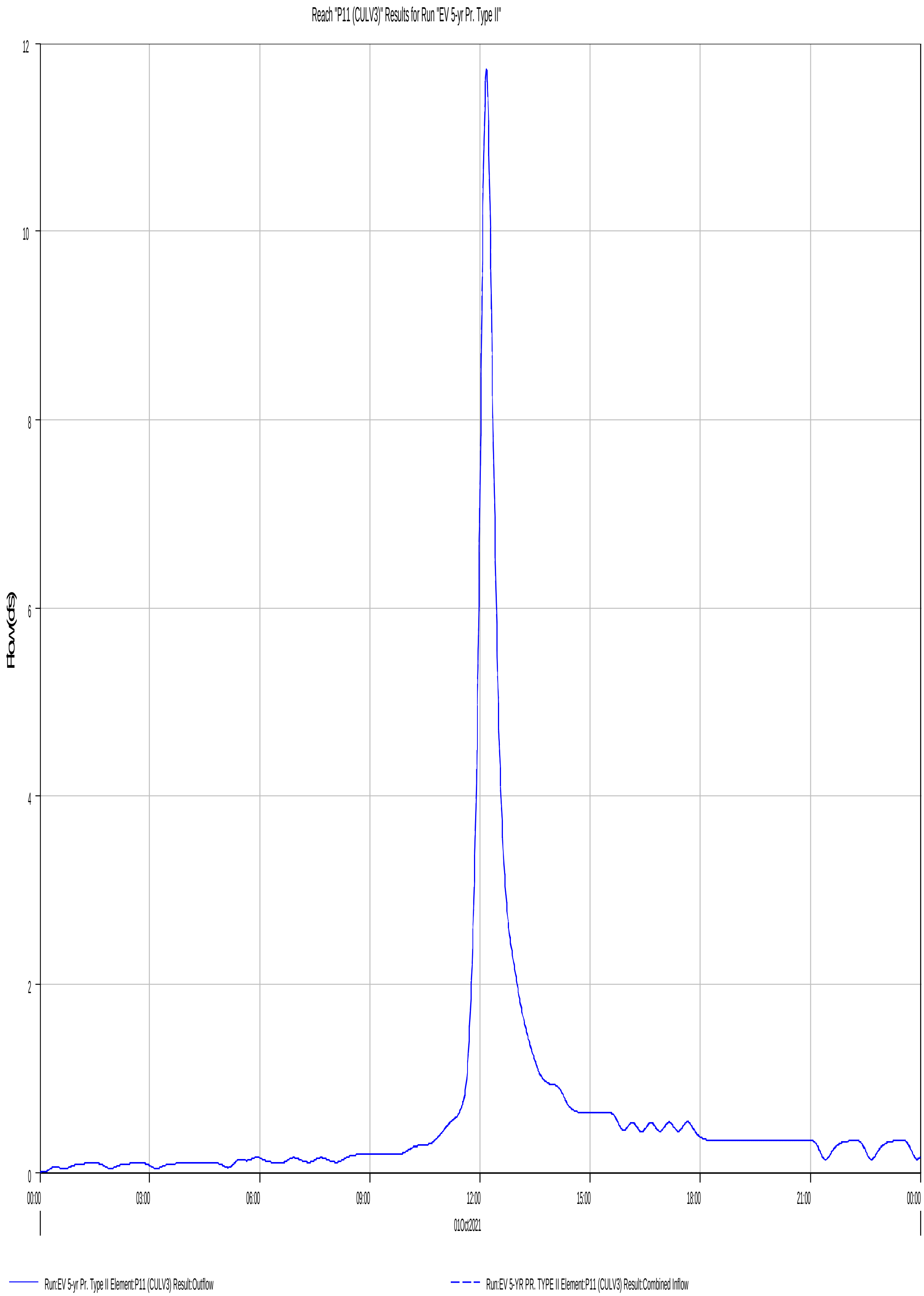
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB7-A

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	3.2 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	3.2 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:10
Total Inflow :	0.3 (AC-FT)	Total Outflow :	0.3 (AC-FT)



Reach "P11 (CULV3)" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
0
2
4
6
8
10
12
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:P11 (CULV3) Result:Outflow
Run:EV 5-YR PR. TYPE II Element:P11 (CULV3) Result:Combined Inflow

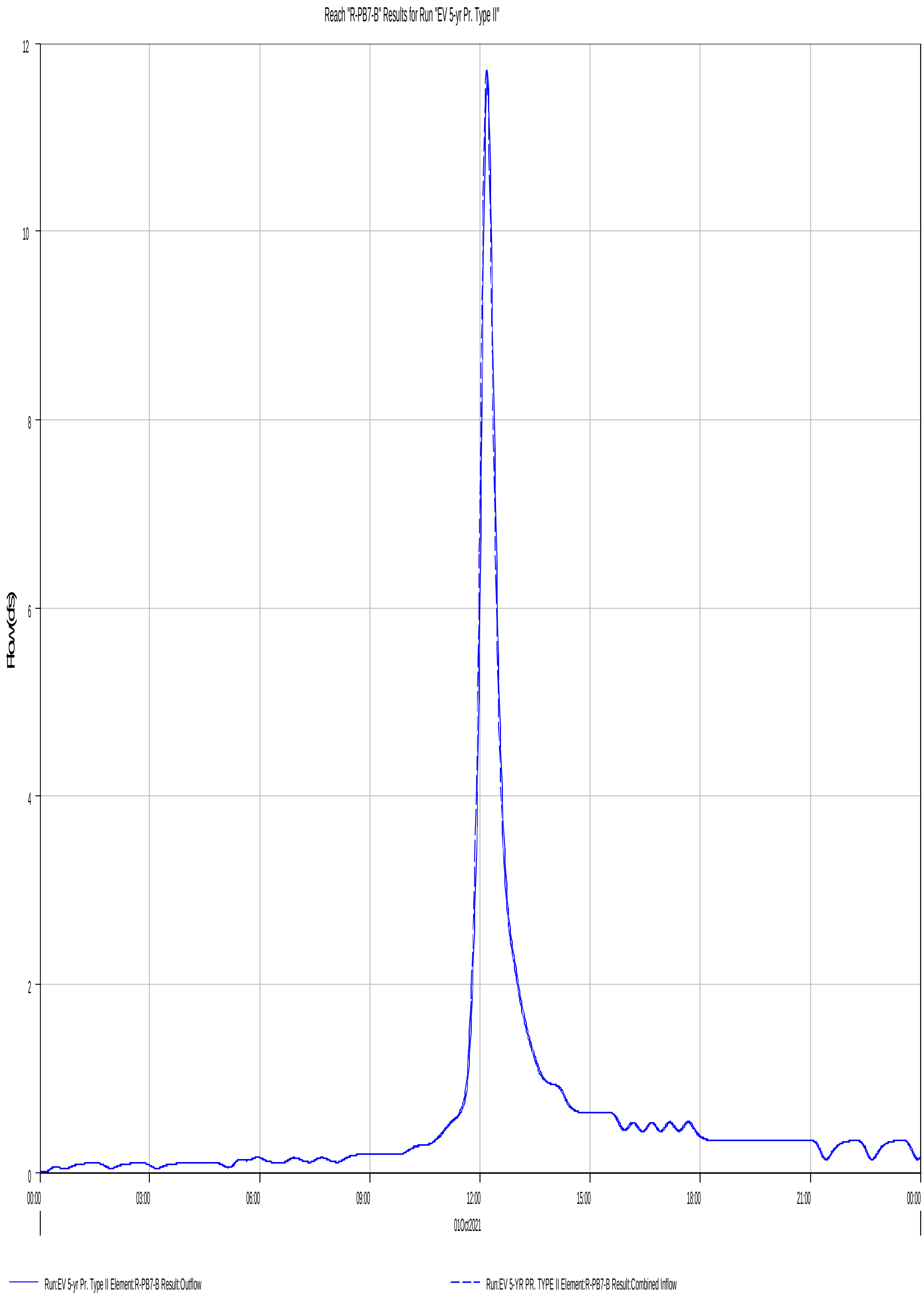
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: P11 (CULV3)

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	11.7 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:10
Peak Outflow :	11.7 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:11
Total Inflow :	1.2 (AC-FT)	Total Outflow :	1.2 (AC-FT)



Reach "R-PB7-B" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
0
2
4
6
8
10
12
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-PB7-B Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-PB7-B Result:Combined Inflow

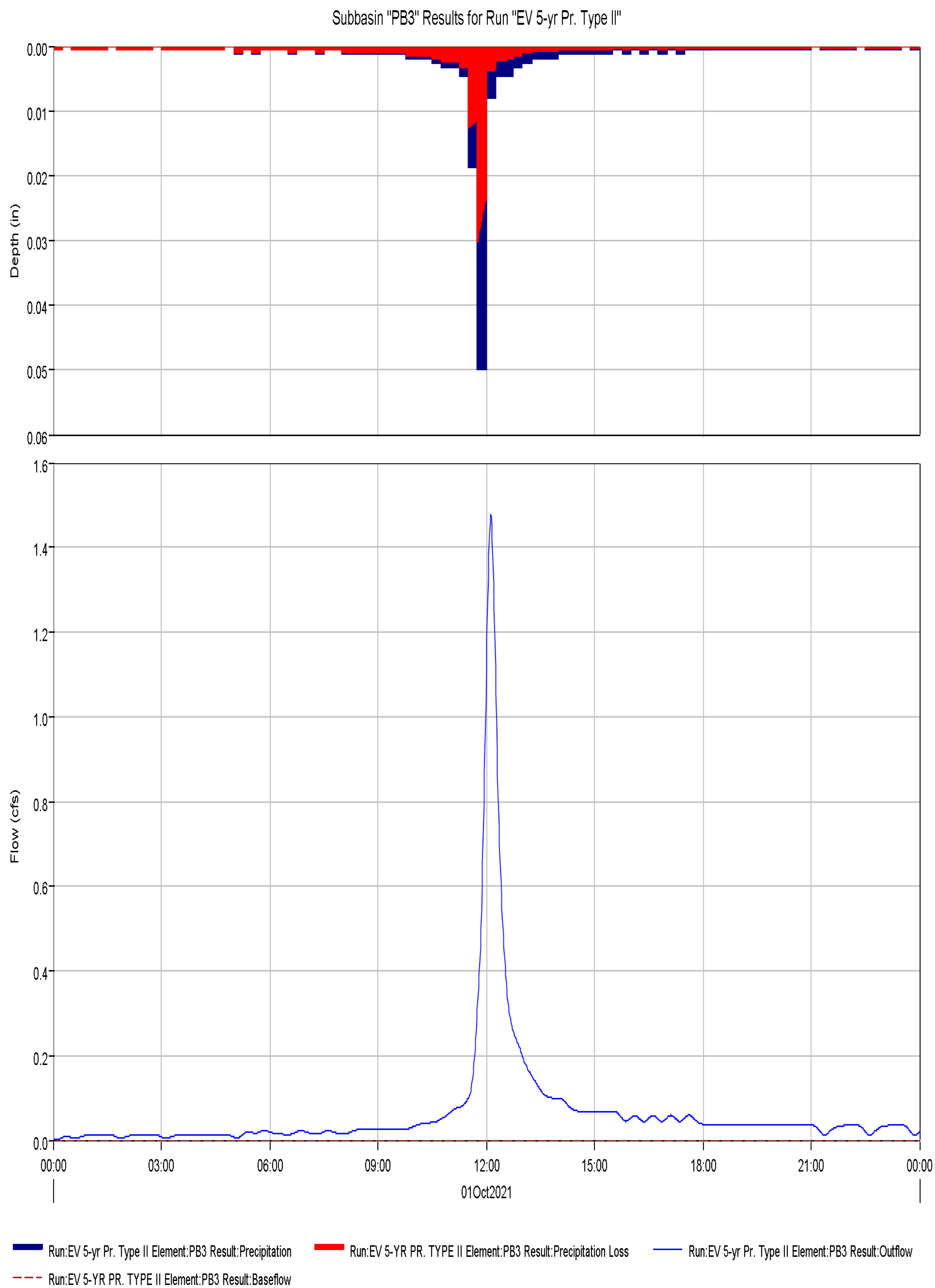
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB7-B

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	11.7 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:11
Peak Outflow :	11.7 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:12
Total Inflow :	1.2 (AC-FT)	Total Outflow :	1.2 (AC-FT)



Subbasin "PB3" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB3 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB3 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB3 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB3 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB3

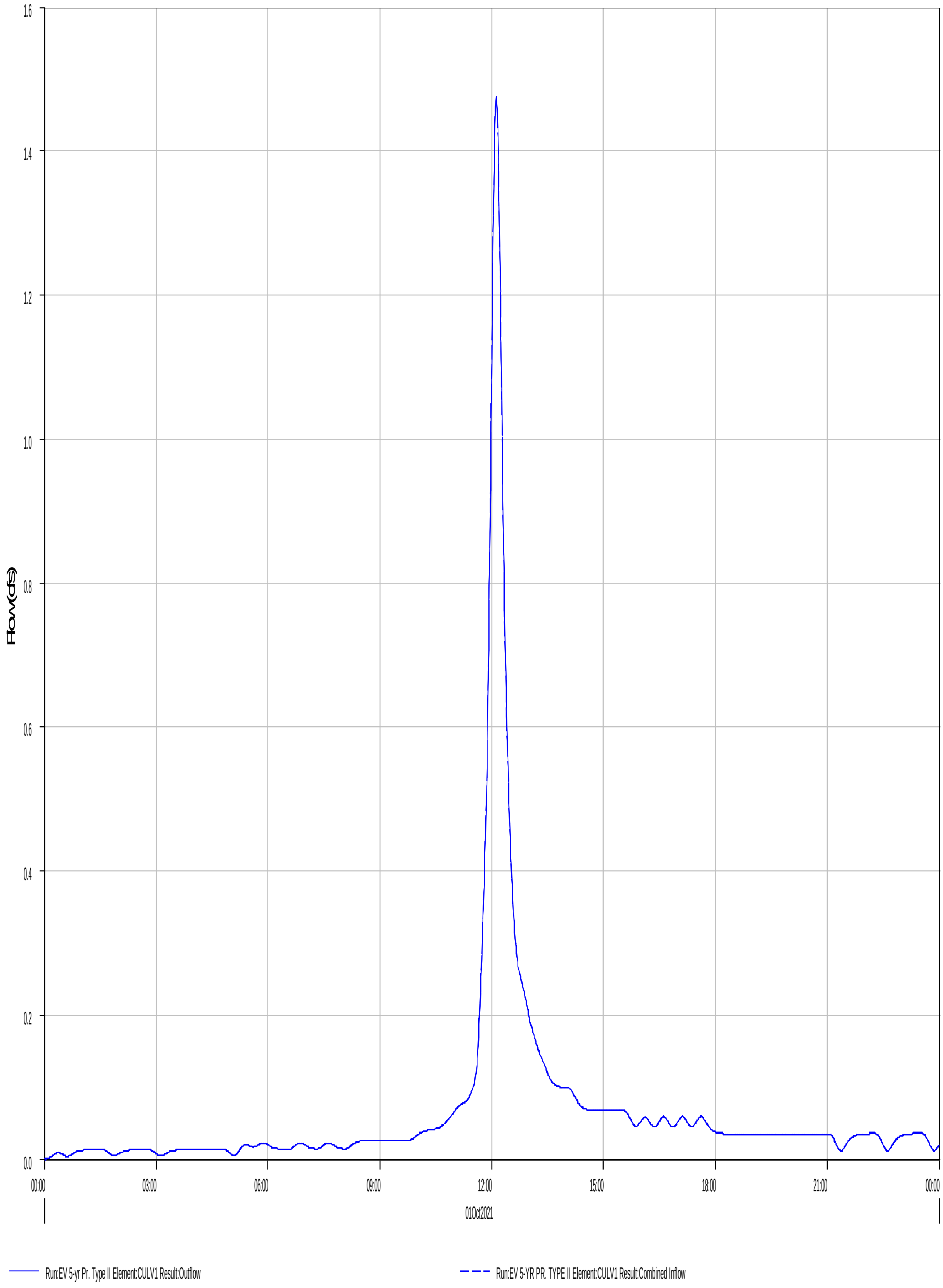
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	1.5 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:07
Total Precipitation :	0.3 (AC-FT)	Total Direct Runoff :	0.1 (AC-FT)
Total Loss :	0.2 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.1 (AC-FT)	Discharge :	0.1 (AC-FT)

Reach "CULV1" Results for Run "EV 5-yr Pr. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: CULV1

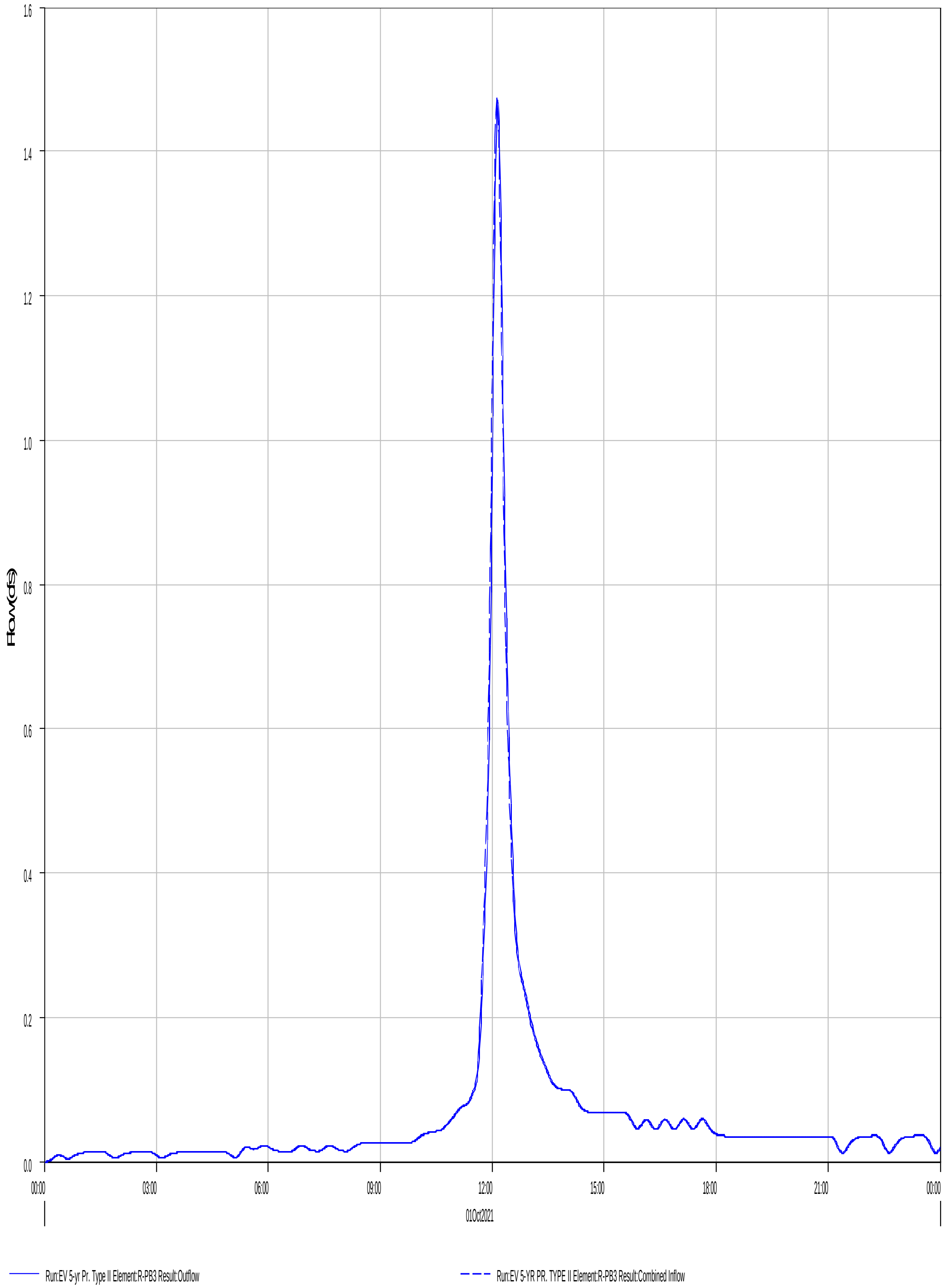
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	1.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:07
Peak Outflow :	1.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:08
Total Inflow :	0.1 (AC-FT)	Total Outflow :	0.1 (AC-FT)

Reach "R-PB3" Results for Run "EV 5-yr Pr. Type II"



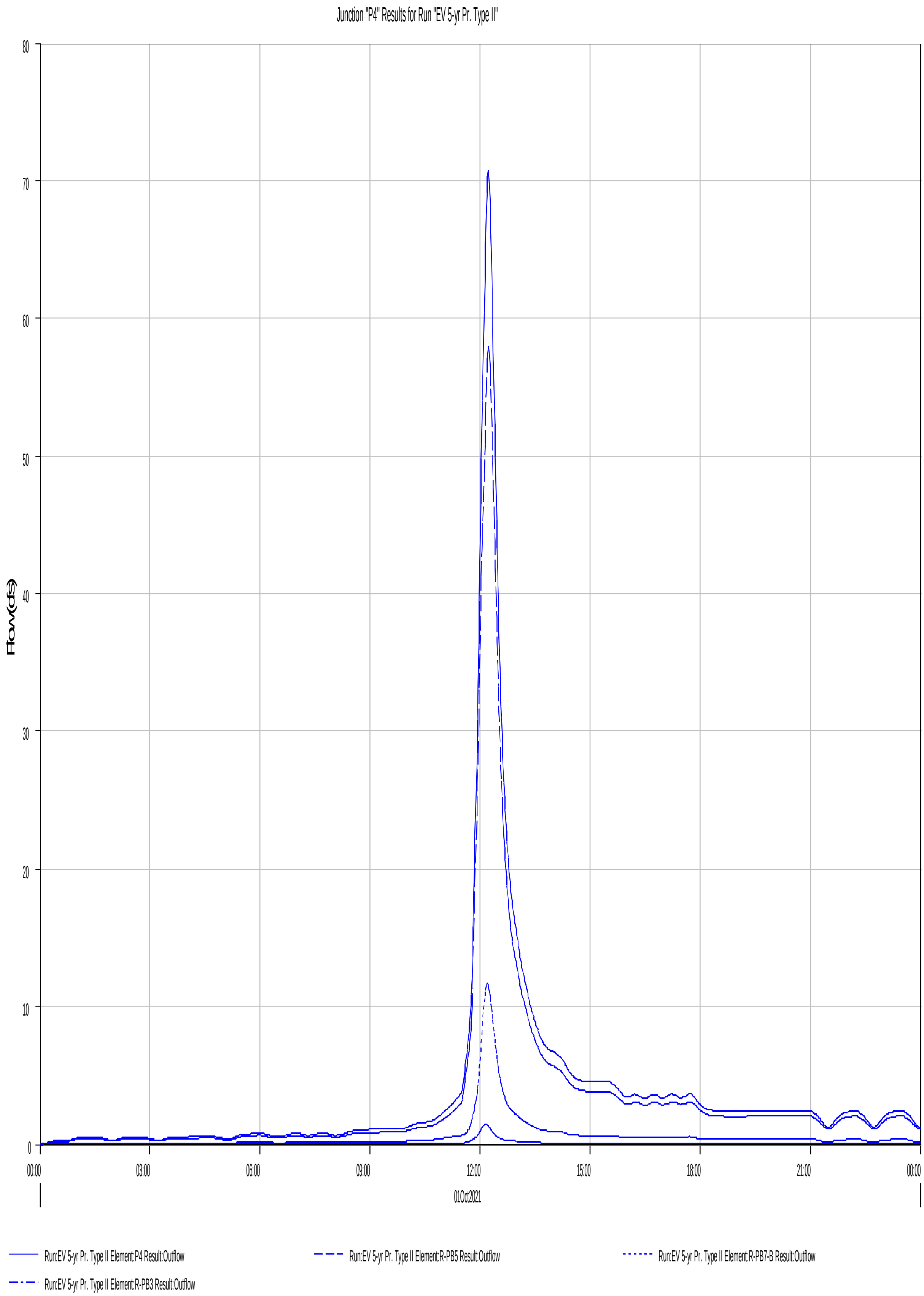
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB3

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	1.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	1.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:09
Total Inflow :	0.1 (AC-FT)	Total Outflow :	0.1 (AC-FT)



Junction "P4" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:P4 Result:Outflow
Run:EV 5-yr Pr. Type II Element:R-PB5 Result:Outflow
Run:EV 5-yr Pr. Type II Element:R-PB7-B Result:Outflow
Run:EV 5-yr Pr. Type II Element:R-PB3 Result:Outflow

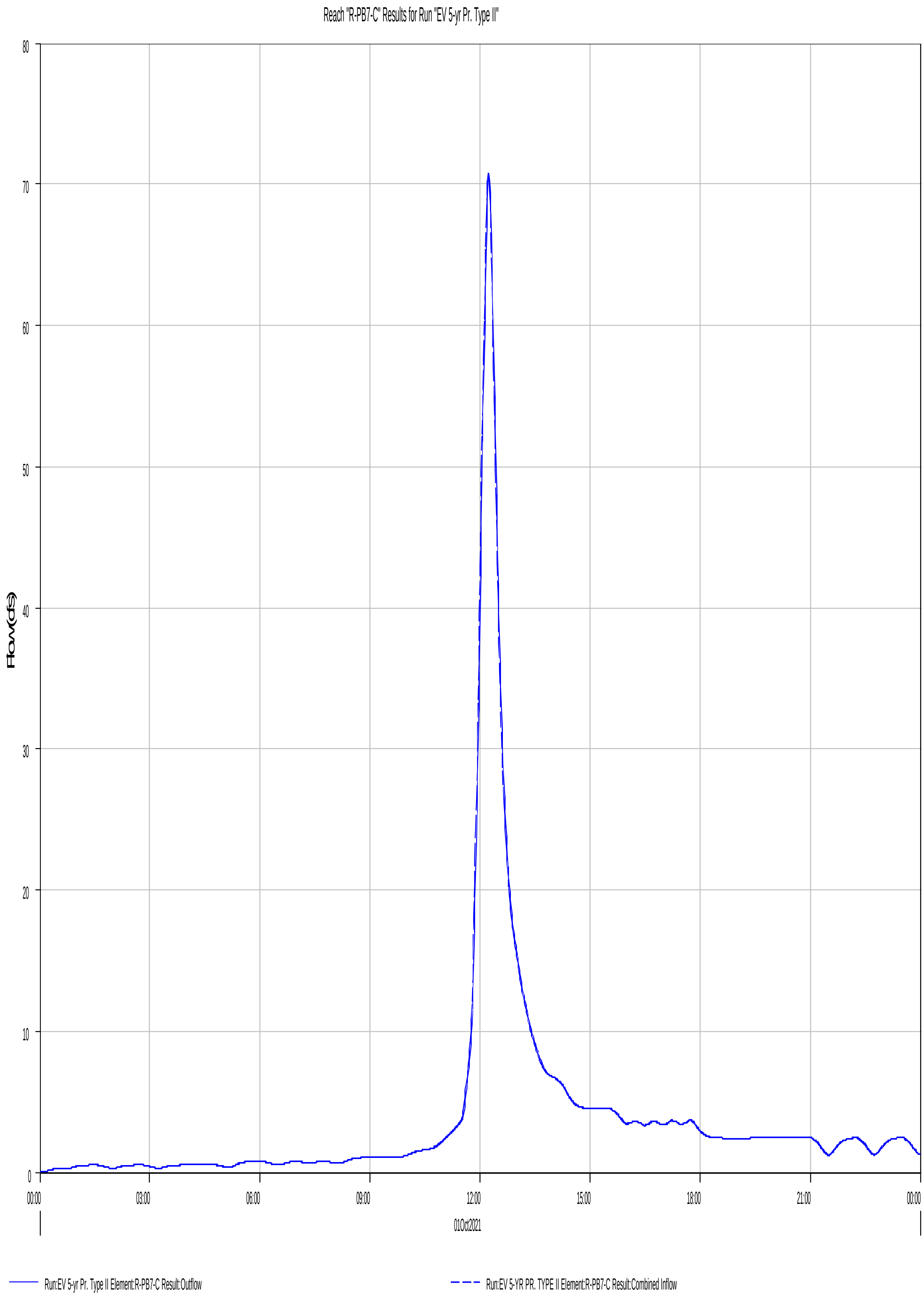
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Junction: P4

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	70.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:14
Total Outflow :	8.0 (AC-FT)		



Reach "R-PB7-C" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-PB7-C Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-PB7-C Result:Combined Inflow

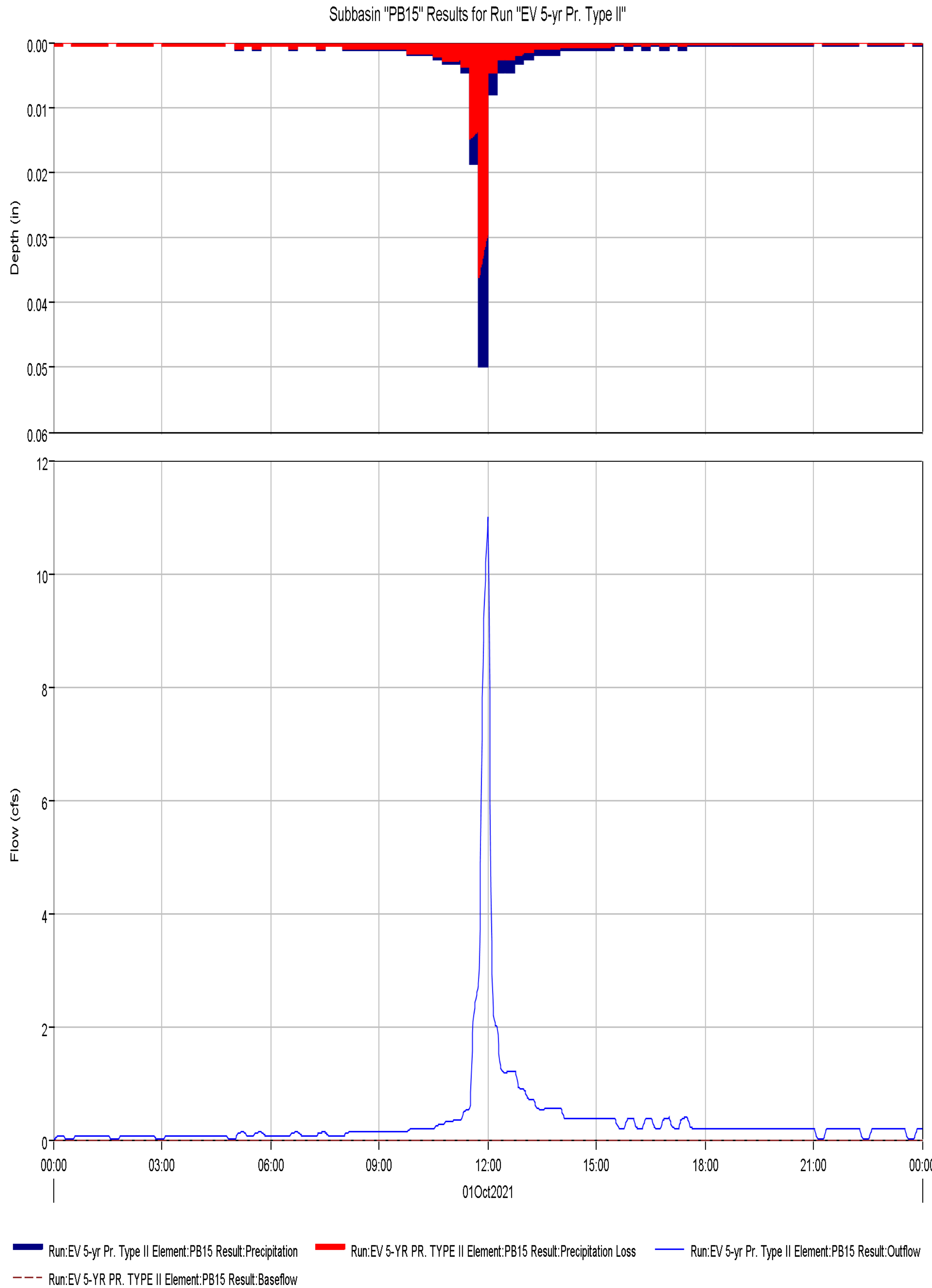
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-PB7-C

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	70.8 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:14
Peak Outflow :	70.7 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:15
Total Inflow :	8.0 (AC-FT)	Total Outflow :	8.0 (AC-FT)



Subbasin "PB15" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB15 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB15 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB15 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB15 Result:Baseflow

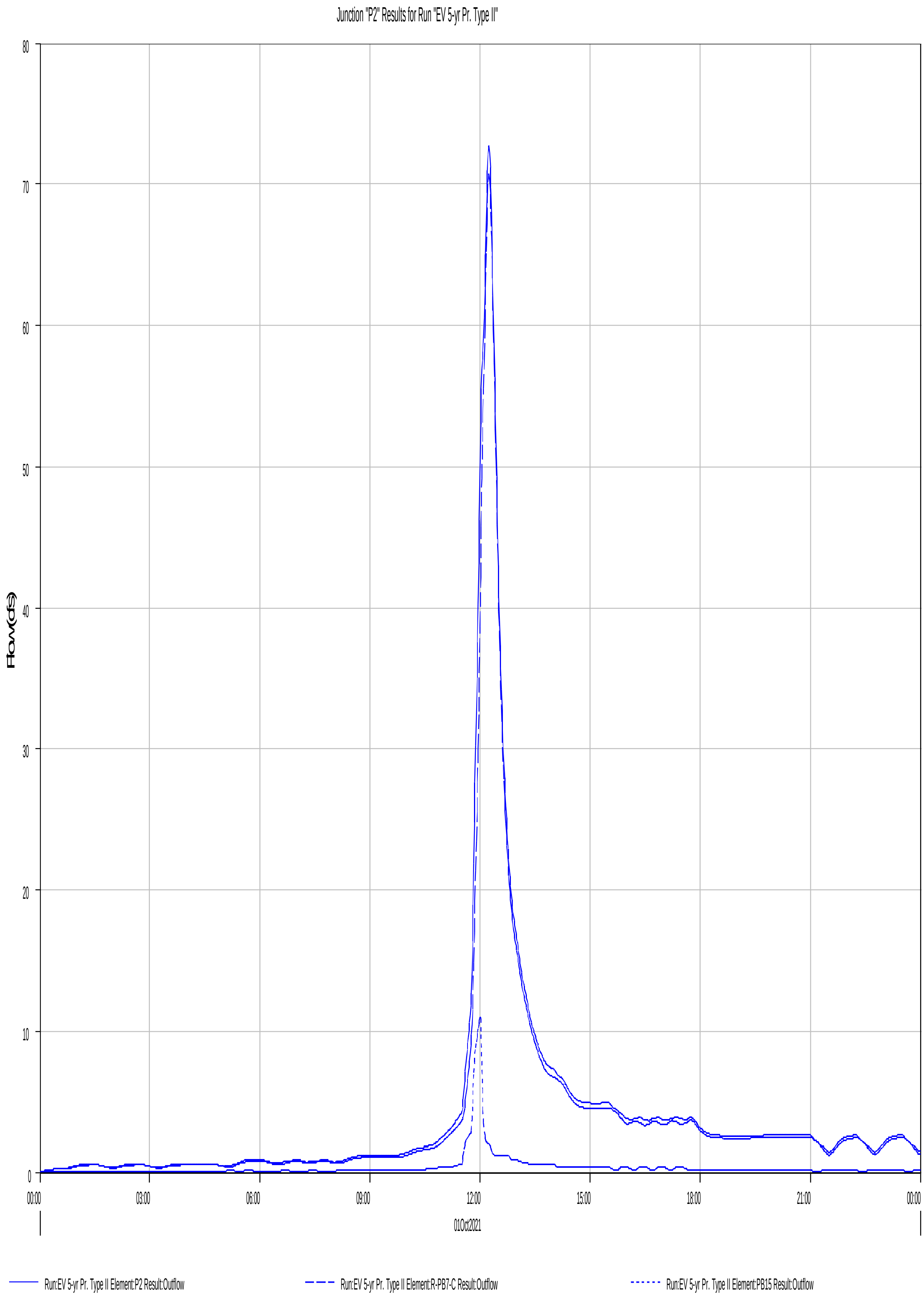
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB15

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	11.0 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:00
Total Precipitation :	2.2 (AC-FT)	Total Direct Runoff :	0.7 (AC-FT)
Total Loss :	1.5 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.7 (AC-FT)	Discharge :	0.7 (AC-FT)


Junction "P2" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:P2 Result:Outflow
Run:EV 5-yr Pr. Type II Element:R-PB7-C Result:Outflow
Run:EV 5-yr Pr. Type II Element:PB15 Result:Outflow

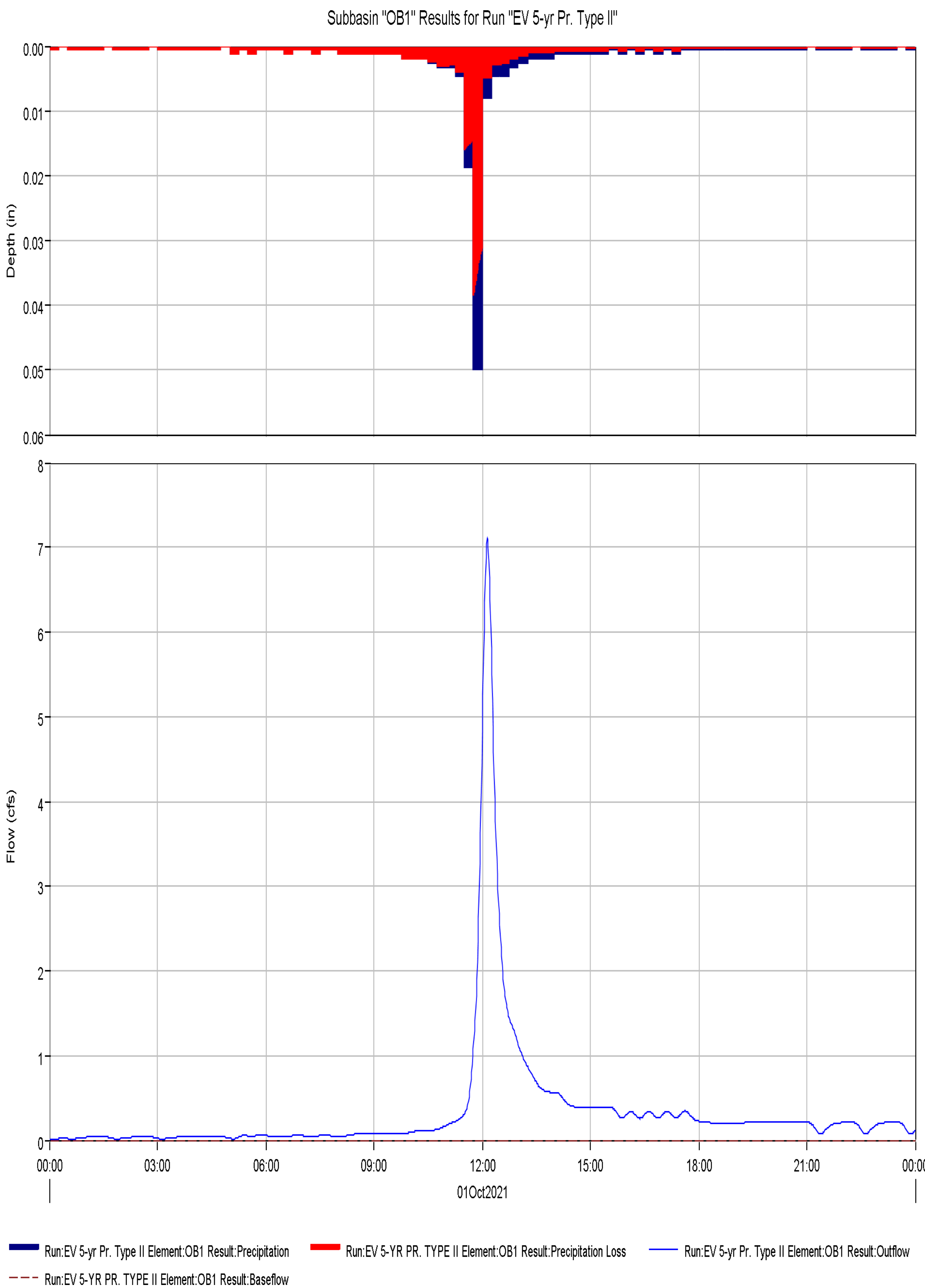
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Junction: P2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	72.7 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:15
Total Outflow :	8.7 (AC-FT)		


Subbasin "OB1" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
8
7
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:OB1 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:OB1 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:OB1 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:OB1 Result:Baseflow

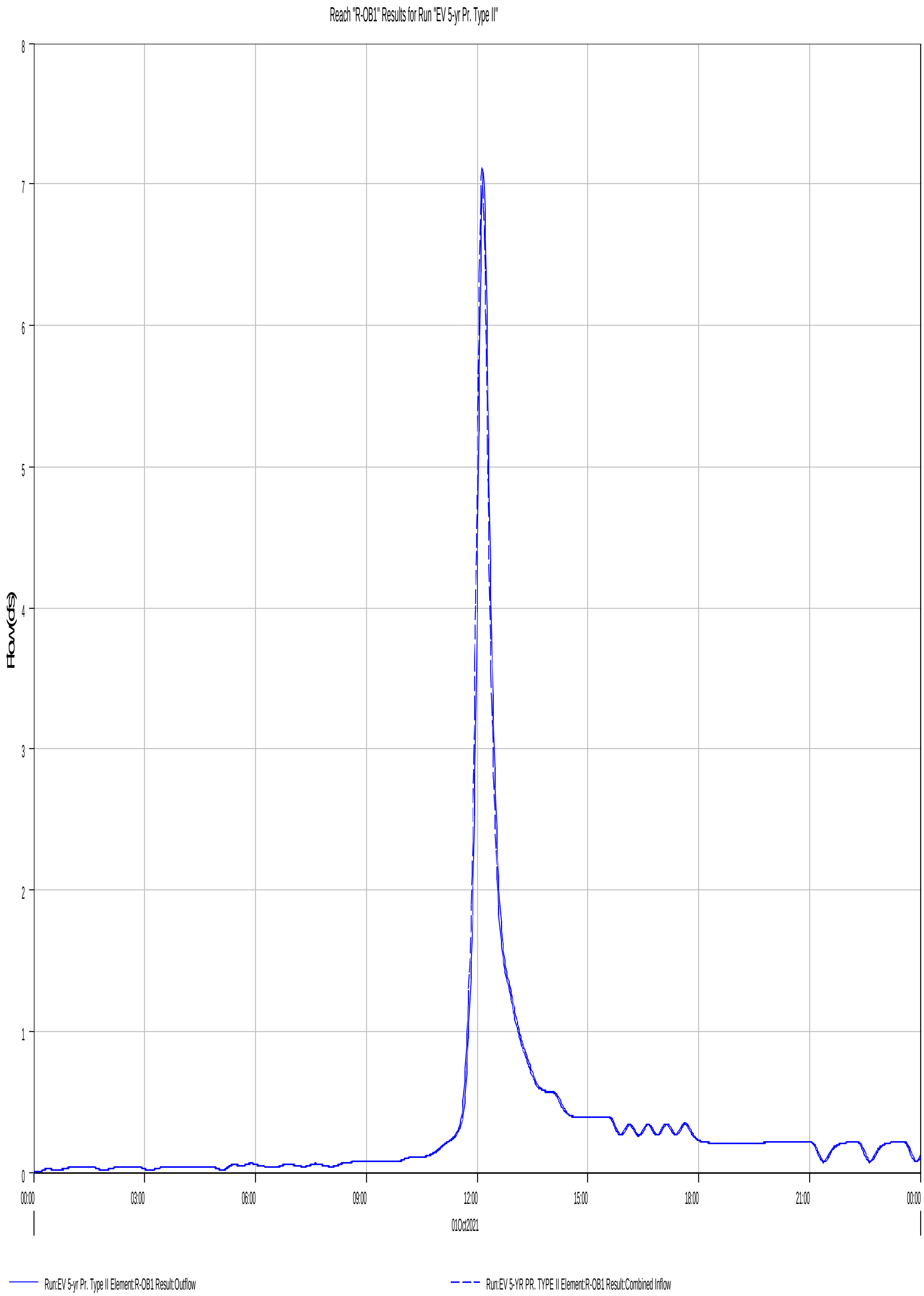
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: OB1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	7.1 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	2.3 (AC-FT)	Total Direct Runoff :	0.7 (AC-FT)
Total Loss :	1.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.7 (AC-FT)	Discharge :	0.7 (AC-FT)



Reach "R-OB1" Results for Run "EV 5-yr Pr. Type II"
Flow (cfs)
0
1
2
3
4
5
6
7
8
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:R-OB1 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:R-OB1 Result:Combined Inflow

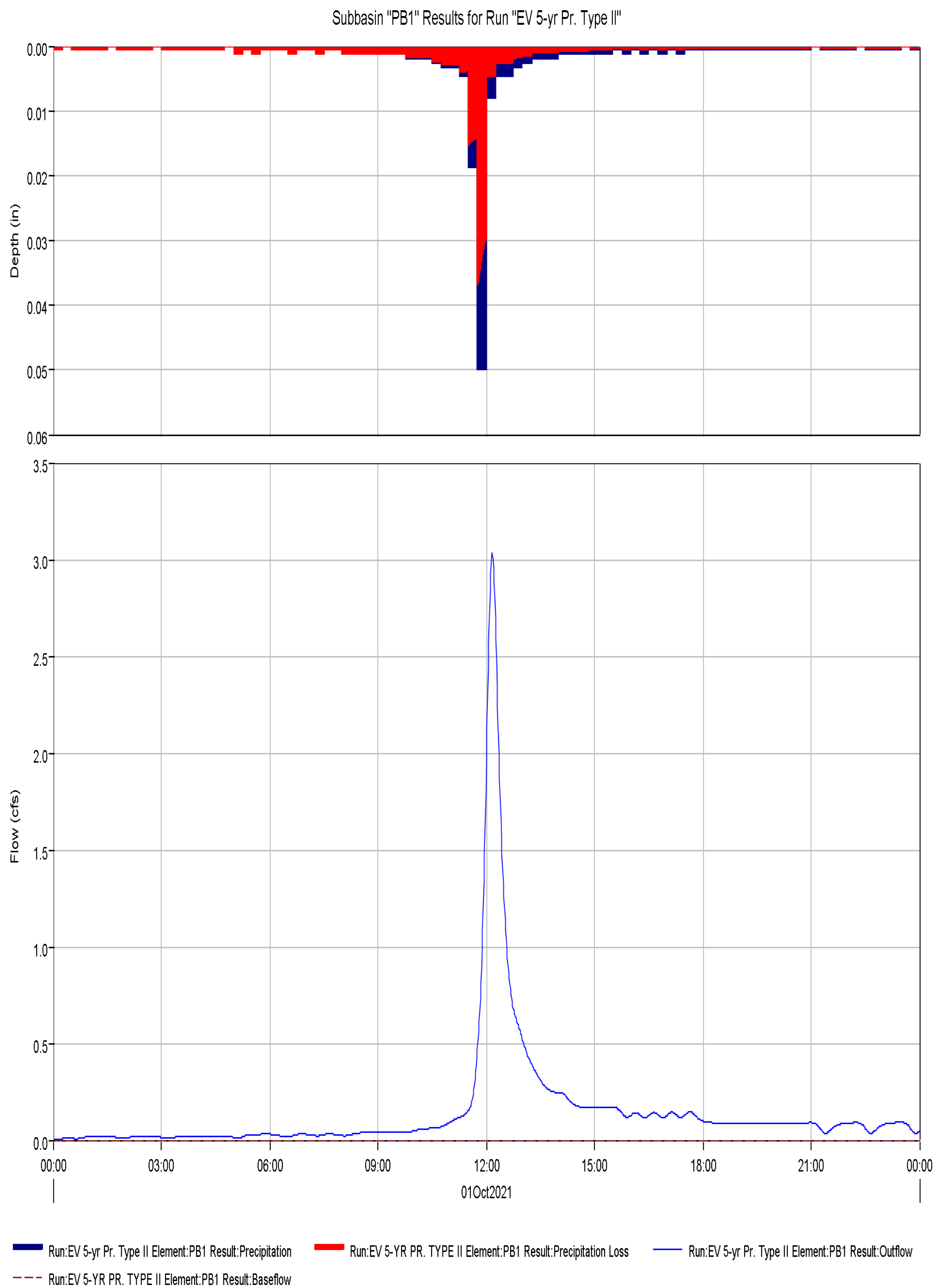
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Reach: R-OB1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	7.1 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	7.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:10
Total Inflow :	0.7 (AC-FT)	Total Outflow :	0.7 (AC-FT)



Subbasin "PB1" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB1 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB1 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB1 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB1 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB1

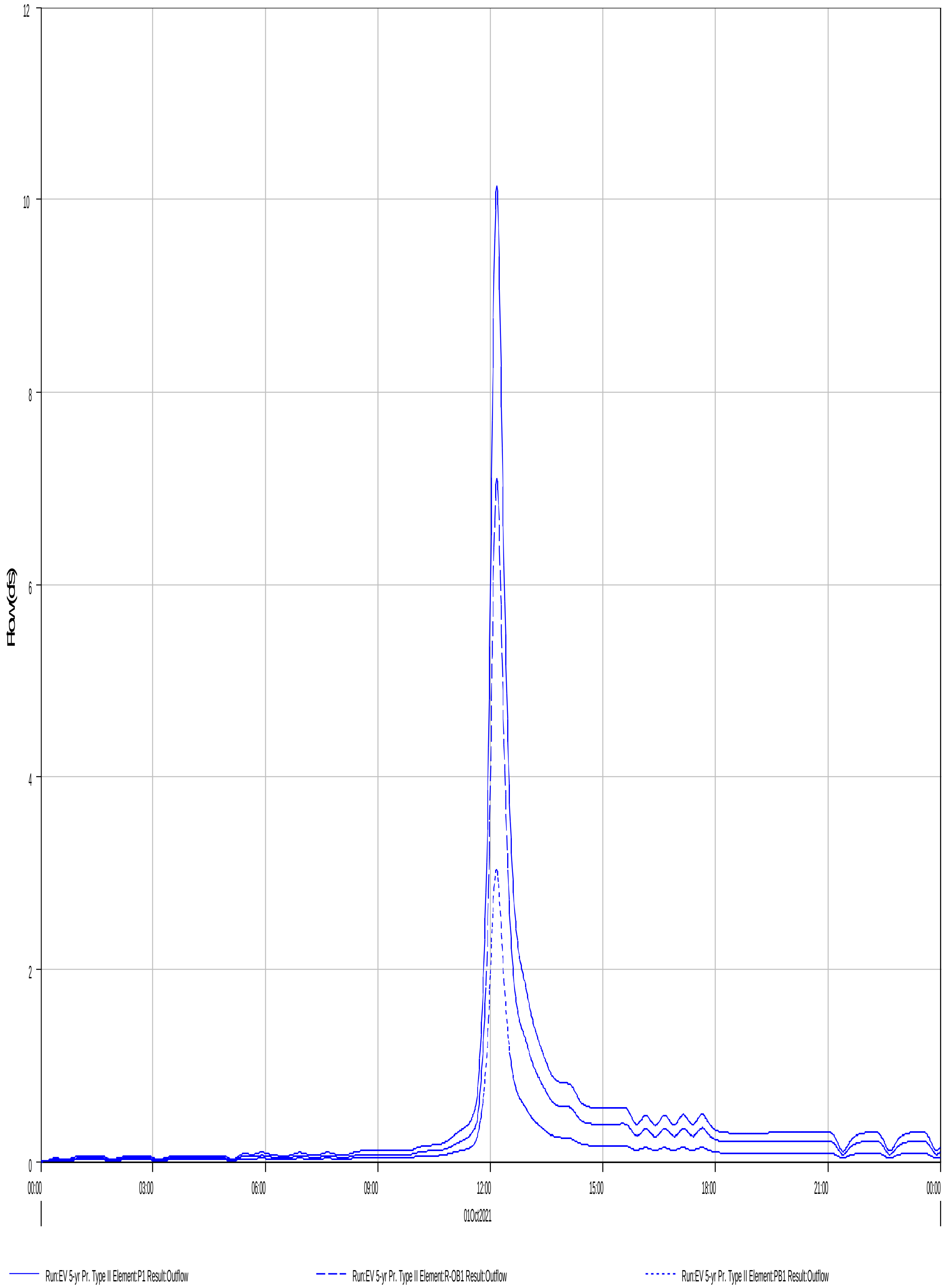
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	3.0 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:10
Total Precipitation :	1.0 (AC-FT)	Total Direct Runoff :	0.3 (AC-FT)
Total Loss :	0.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.3 (AC-FT)	Discharge :	0.3 (AC-FT)

Junction "P1" Results for Run "EV 5-yr Pr. Type II"



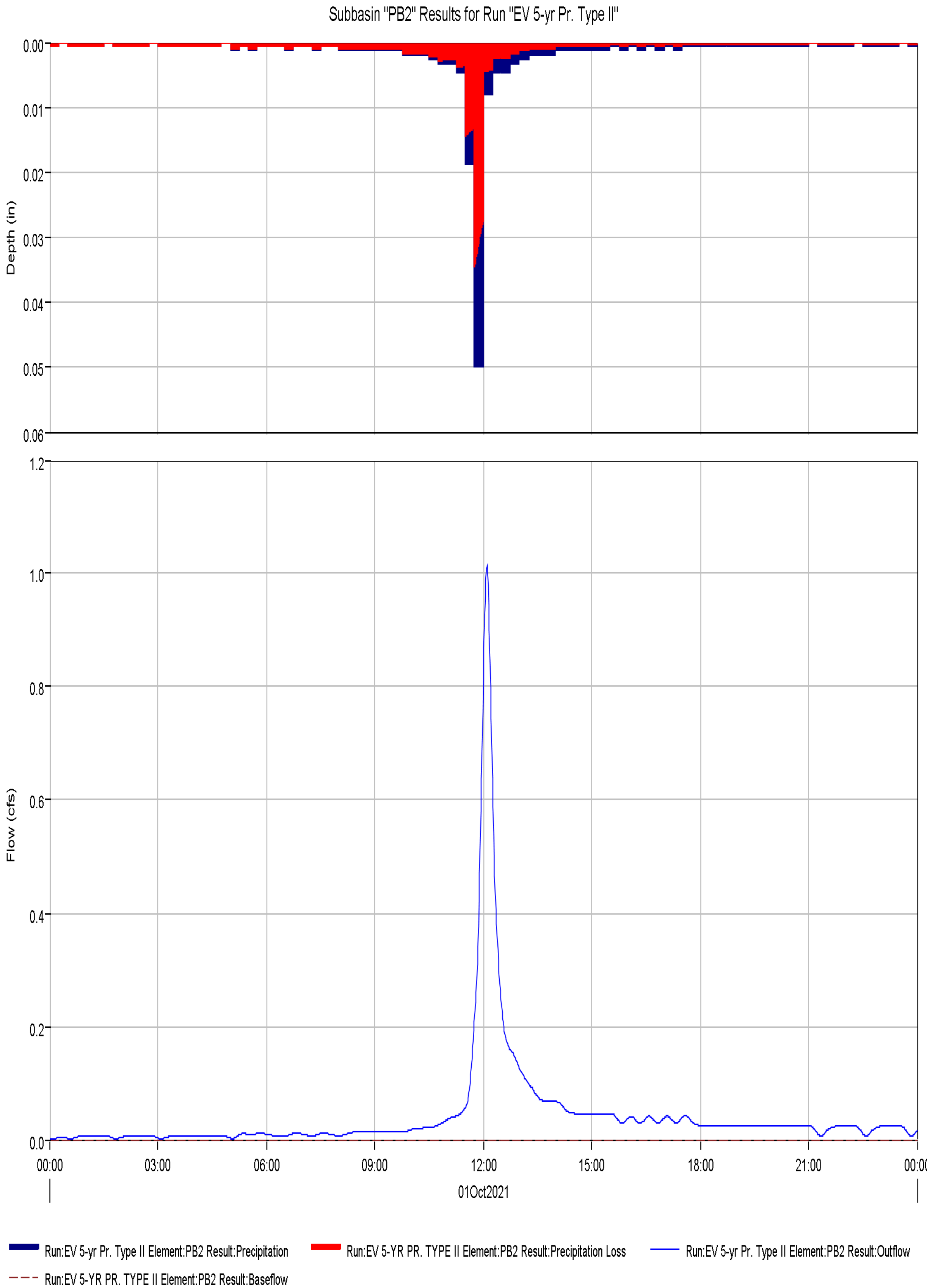
Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Junction: P1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	10.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:10
Total Outflow :	1.0 (AC-FT)		


Subbasin "PB2" Results for Run "EV 5-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
Flow (cfs)
1.2
1.0
0.8
0.6
0.4
0.2
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 5-yr Pr. Type II Element:PB2 Result:Precipitation
Run:EV 5-YR PR. TYPE II Element:PB2 Result:Precipitation Loss
Run:EV 5-yr Pr. Type II Element:PB2 Result:Outflow
Run:EV 5-YR PR. TYPE II Element:PB2 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 5-yr Pr. Type II Subbasin: PB2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	5-yr Type II
Compute Time:	16Dec2022, 14:19:58	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

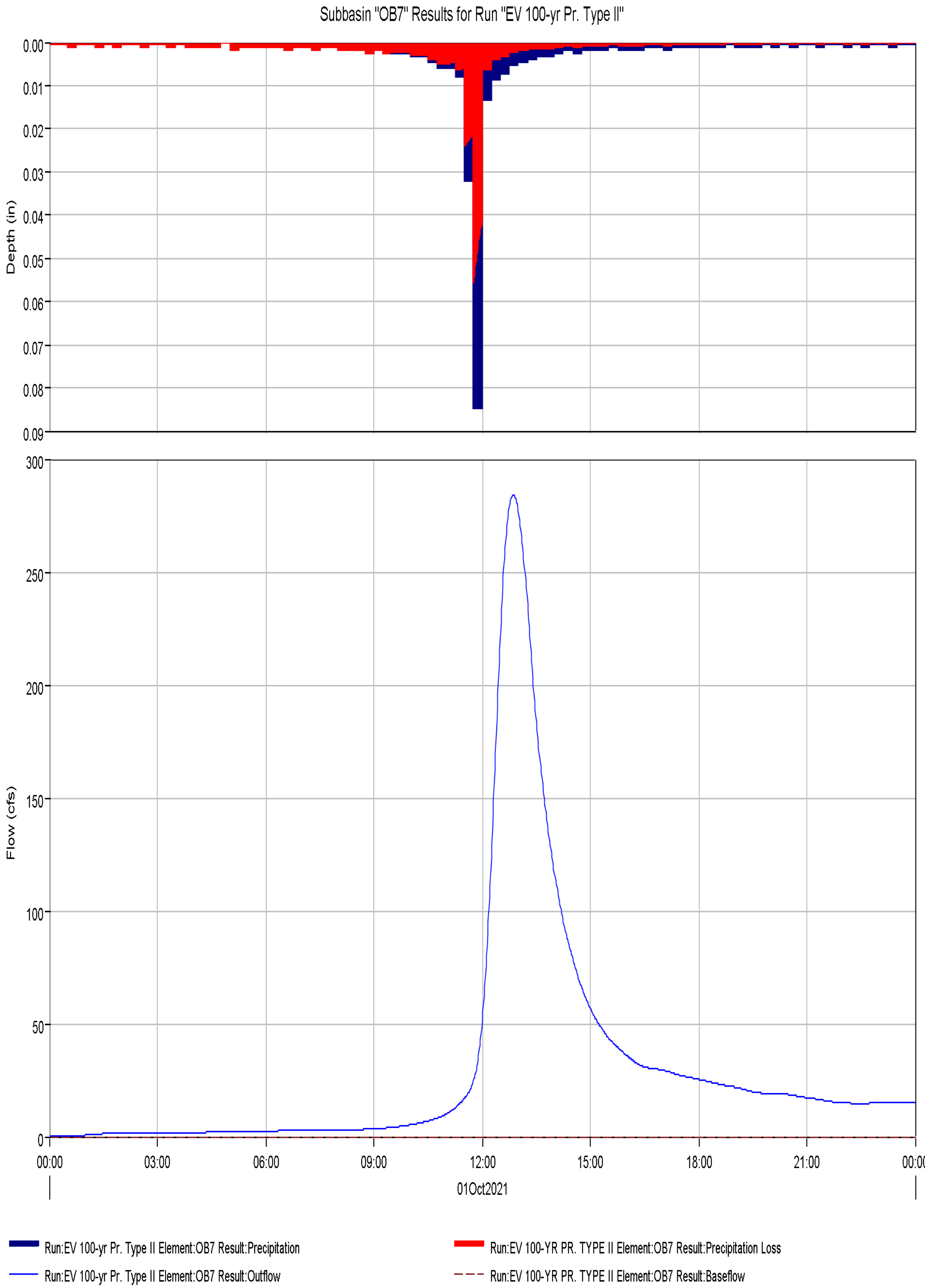
Peak Discharge :	1.0 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:06
Total Precipitation :	0.2 (AC-FT)	Total Direct Runoff :	0.1 (AC-FT)
Total Loss :	0.2 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.1 (AC-FT)	Discharge :	0.1 (AC-FT)

Project: Eagleview_Subdivision Simulation Run: EV 100-yr Pr. Type II

Start of Run: 01Oct2021, 00:00 Basin Model: Eagleview_Proposed
End of Run: 02Oct2021, 00:00 Meteorologic Model: 100-yr Type II
Compute Time: 19Dec2022, 08:31:16 Control Specifications: 24-hr Storm

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
CULV1	0.0021625	3.3	01Oct2021, 12:07	0.3
CULV4	0.0054094	7.4	01Oct2021, 12:08	0.7
CULV5	.000315625	0.9	01Oct2021, 12:00	0.1
OB1	0.0162031	18.8	01Oct2021, 12:08	1.7
OB2	0.0438438	52.7	01Oct2021, 12:08	4.7
OB3	0.0678750	67.2	01Oct2021, 12:12	7.0
OB4	0.0164062	18.9	01Oct2021, 12:10	1.8
OB5	0.22472	107.1	01Oct2021, 12:40	19.8
OB6	0.18501	113.3	01Oct2021, 12:29	17.5
OB7	0.65812	284.3	01Oct2021, 12:52	60.6
OB8	0.0516742	51.6	01Oct2021, 12:13	5.4
P1	0.0228484	26.4	01Oct2021, 12:09	2.4
P10 (CULV2)	0.15425	150.2	01Oct2021, 12:12	16.4
P11 (CULV3)	0.0227406	28.0	01Oct2021, 12:10	2.7
P12 (CULV8)	1.1303	458.6	01Oct2021, 12:58	97.5
P2	0.19421	185.4	01Oct2021, 12:13	21.1
P3	1.2345	479.5	01Oct2021, 12:58	108.6
P4	0.17916	180.8	01Oct2021, 12:12	19.4
P5 (CULV7)	0.0939437	96.1	01Oct2021, 12:13	9.9
P6	0.0771664	79.1	01Oct2021, 12:14	8.3
P7	1.1243	457.8	01Oct2021, 12:57	96.8
P8	1.1062	485.7	01Oct2021, 12:44	102.0
P9 (CULV6)	0.0768508	79.1	01Oct2021, 12:13	8.2
PB1	0.0066453	7.7	01Oct2021, 12:09	0.7
PB10	0.0180156	20.4	01Oct2021, 12:10	2.0
PB11	0.0251766	29.8	01Oct2021, 12:10	2.9

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
PB12	.000315625	0.9	01Oct2021, 12:00	0.1
PB13	0.0060438	10.9	01Oct2021, 12:00	0.7
PB14	0.0270031	46.3	01Oct2021, 12:01	2.9
PB15	0.0150500	26.3	01Oct2021, 12:00	1.7
PB2	0.0016935	2.4	01Oct2021, 12:06	0.2
PB3	0.0021625	3.3	01Oct2021, 12:07	0.3
PB4	0.0164672	30.2	01Oct2021, 12:00	1.9
PB5	0.0096625	10.4	01Oct2021, 12:12	1.1
PB6	0.0173312	20.7	01Oct2021, 12:10	2.0
PB7	0.0054094	7.4	01Oct2021, 12:08	0.7
PB8	0.0184000	30.4	01Oct2021, 12:01	2.0
PB9	0.0199984	24.8	01Oct2021, 12:07	2.2
R-OB1	0.0162031	18.7	01Oct2021, 12:09	1.7
R-OB2	0.0438438	52.5	01Oct2021, 12:09	4.7
R-OB4-A	0.0842812	85.7	01Oct2021, 12:13	8.8
R-OB4-B	0.0939437	95.9	01Oct2021, 12:14	9.8
R-OB7	1.0678	478.0	01Oct2021, 12:44	97.8
R-OB8	0.0516742	51.6	01Oct2021, 12:15	5.4
R-PB10	1.1243	457.8	01Oct2021, 12:58	96.8
R-PB11	0.0768508	79.0	01Oct2021, 12:14	8.2
R-PB12-A	.000315625	0.9	01Oct2021, 12:02	0.1
R-PB12-B	0.0771664	79.1	01Oct2021, 12:15	8.3
R-PB13	1.1303	458.5	01Oct2021, 12:59	97.4
R-PB3	0.0021625	3.3	01Oct2021, 12:09	0.3
R-PB5	0.15425	150.1	01Oct2021, 12:13	16.4
R-PB7-A	0.0054094	7.4	01Oct2021, 12:09	0.7
R-PB7-B	0.0227406	27.9	01Oct2021, 12:11	2.7
R-PB7-C	0.17916	180.8	01Oct2021, 12:13	19.4
R-PB9	1.1062	485.6	01Oct2021, 12:45	102.0



Subbasin "OB7" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
300
250
200
150
100
50
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:OB7 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:OB7 Result:Precipitation Loss
Run:EV 100-yr Pr. Type II Element:OB7 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:OB7 Result:Baseflow

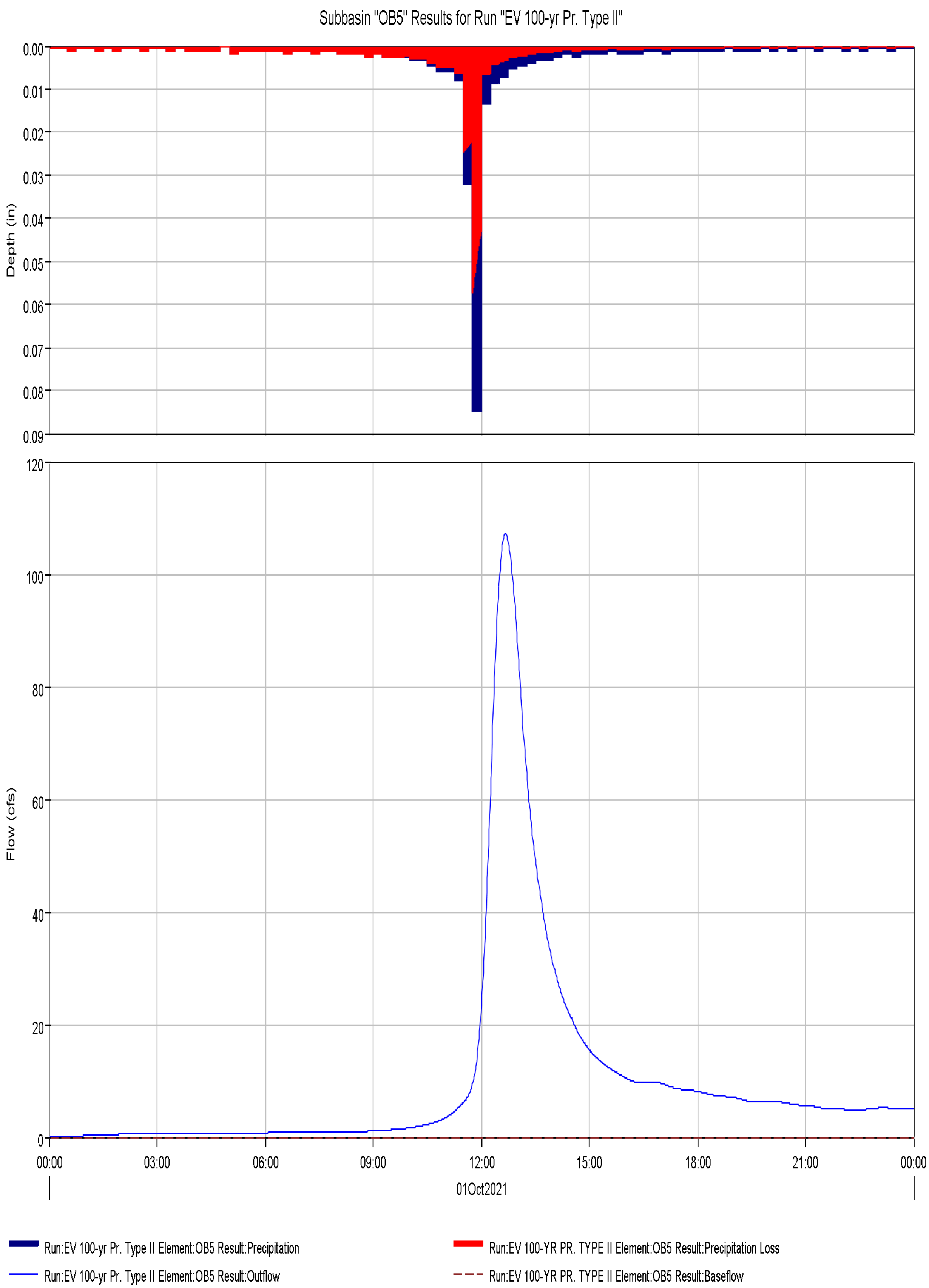
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: OB7

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

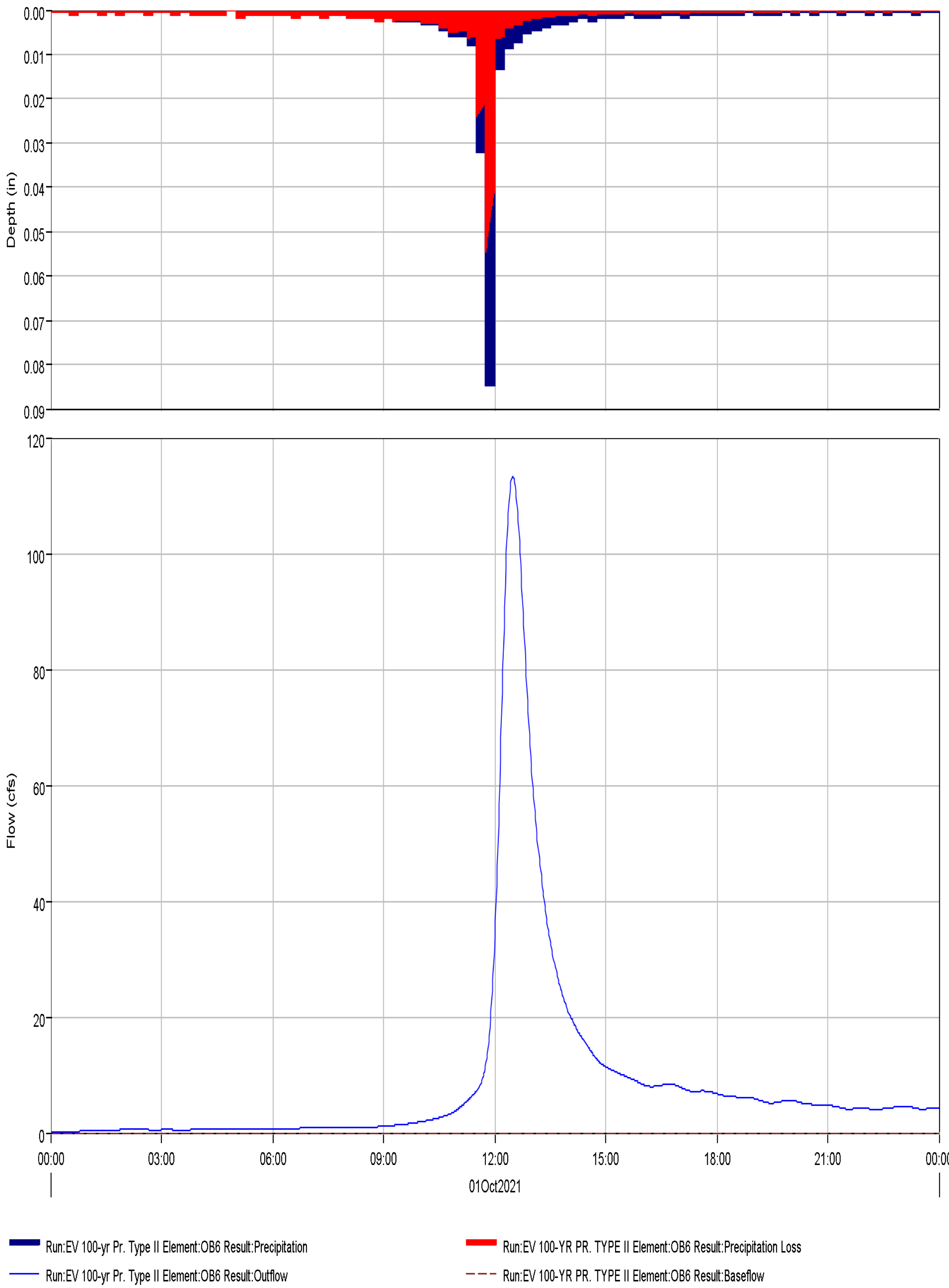
Volume Units: AC-FT

Computed Results

Peak Discharge :	284.3 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:52
Total Precipitation :	161.5 (AC-FT)	Total Direct Runoff :	60.6 (AC-FT)
Total Loss :	99.5 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	62.0 (AC-FT)	Discharge :	60.6 (AC-FT)


Subbasin "OB5" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:OB5 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:OB5 Result:Precipitation Loss
Run:EV 100-yr Pr. Type II Element:OB5 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:OB5 Result:Baseflow

Subbasin "OB6" Results for Run "EV 100-yr Pr. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: OB5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	107.1 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:40
Total Precipitation :	55.1 (AC-FT)	Total Direct Runoff :	19.8 (AC-FT)
Total Loss :	35.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	20.2 (AC-FT)	Discharge :	19.8 (AC-FT)

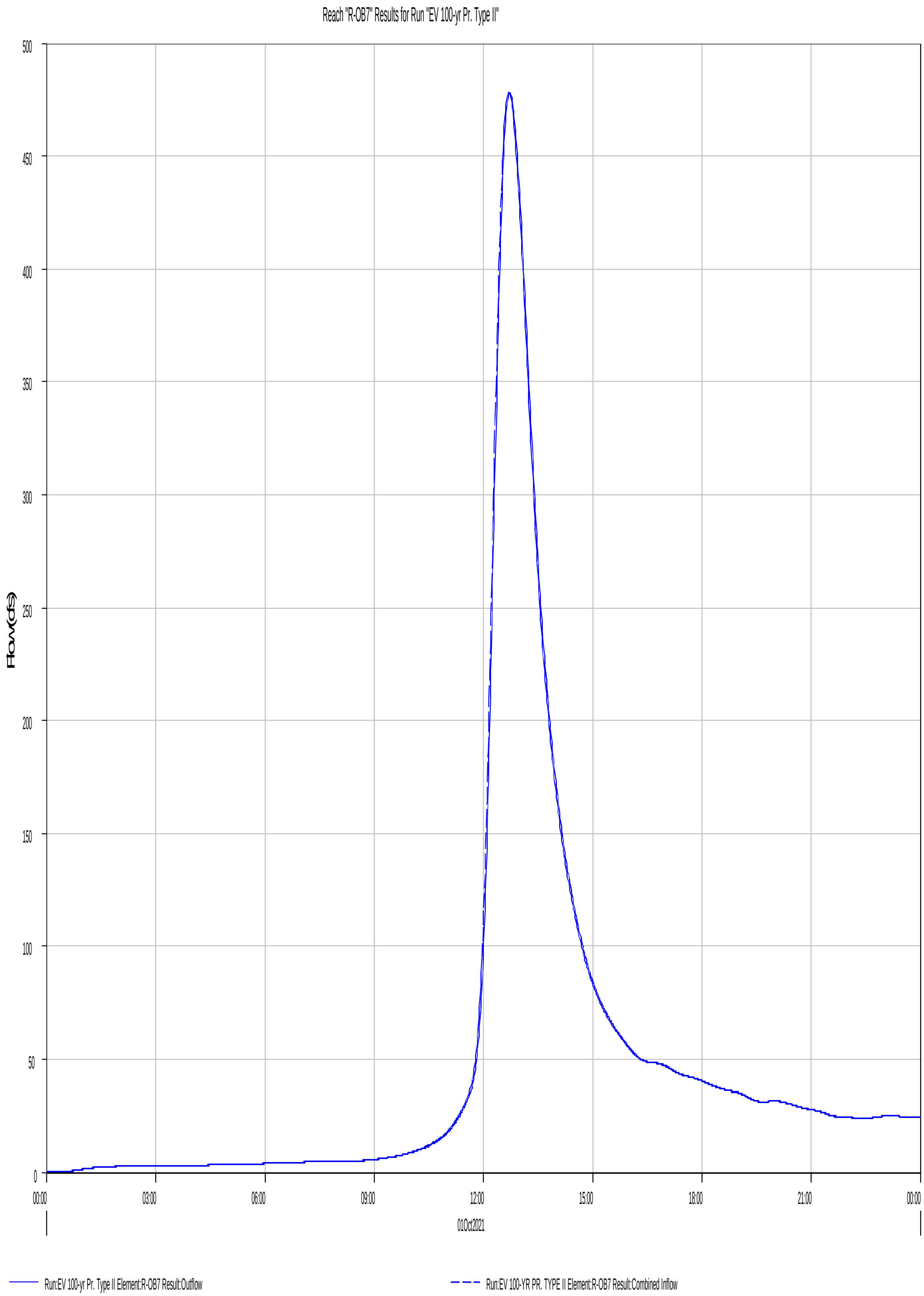
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: OB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	113.3 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:29
Total Precipitation :	45.4 (AC-FT)	Total Direct Runoff :	17.5 (AC-FT)
Total Loss :	27.6 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	17.8 (AC-FT)	Discharge :	17.5 (AC-FT)


Reach "R-OB7" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
500
450
400
350
300
250
200
150
100
50
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:R-OB7 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-OB7 Result:Combined Inflow

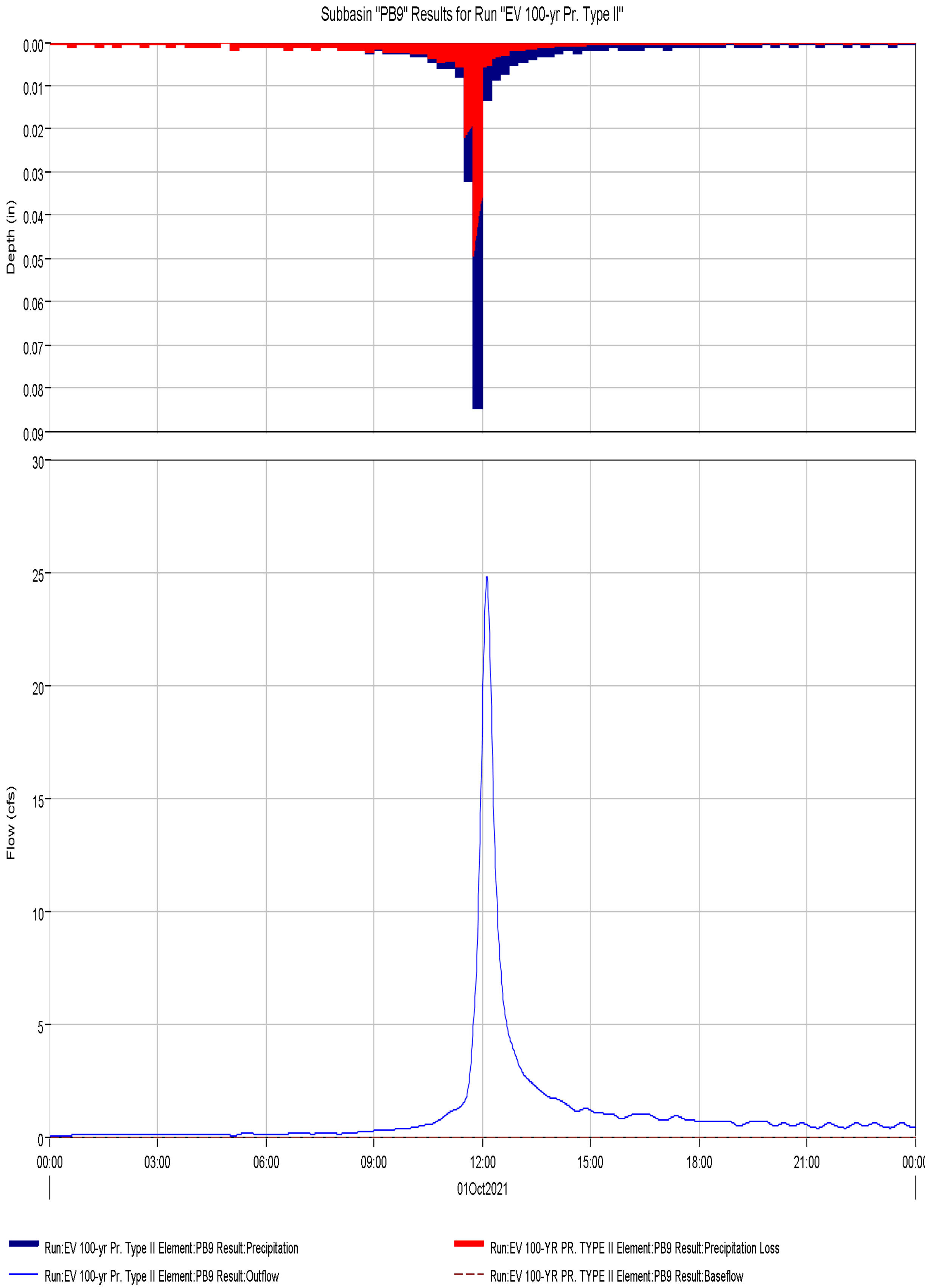
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-OB7

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	478.0 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:43
Peak Outflow :	478.0 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:44
Total Inflow :	97.9 (AC-FT)	Total Outflow :	97.8 (AC-FT)



Subbasin "PB9" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB9 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB9 Result:Precipitation Loss
Run:EV 100-yr Pr. Type II Element:PB9 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB9 Result:Baseflow

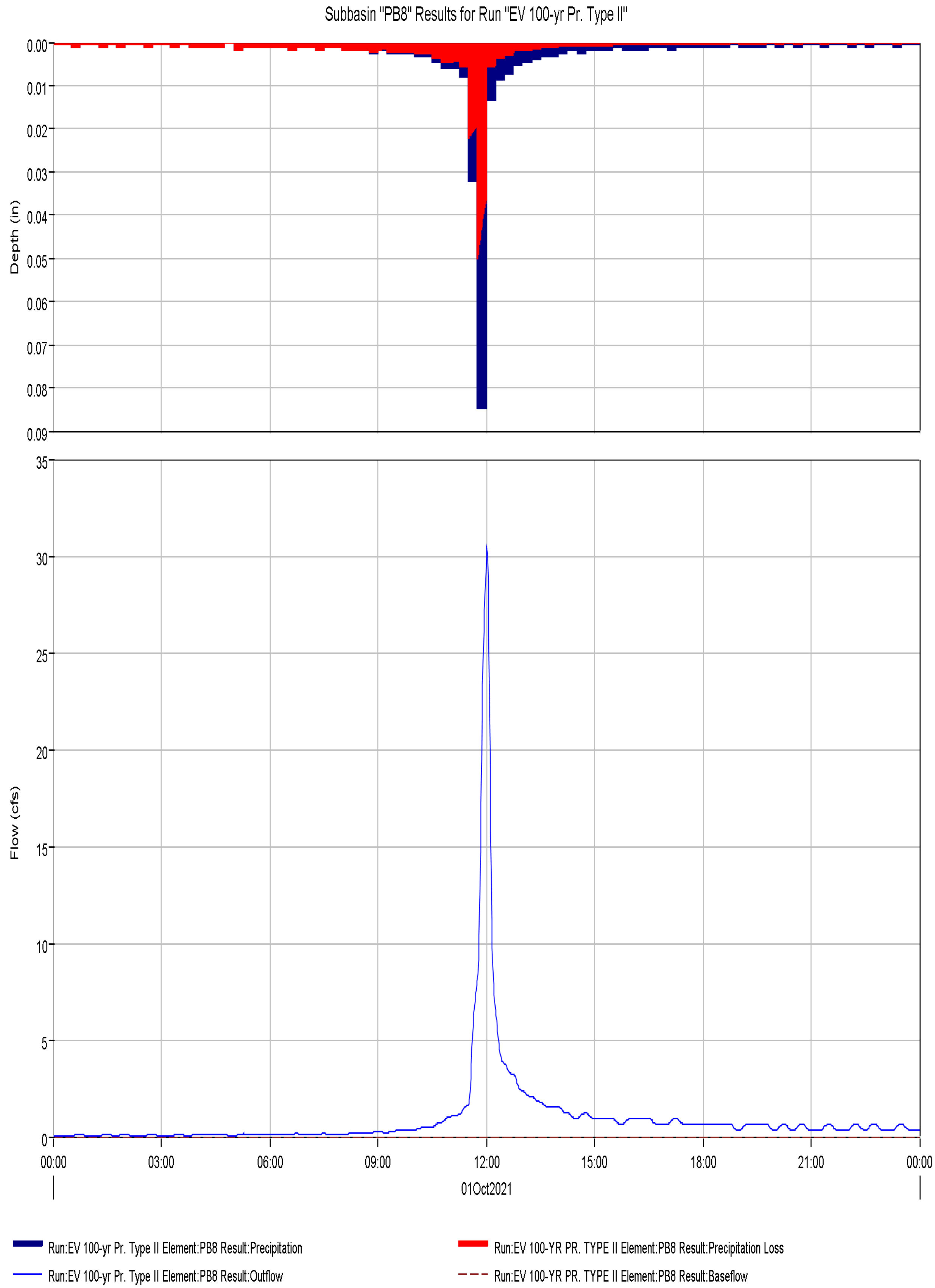
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB9

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	24.8 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:07
Total Precipitation :	4.9 (AC-FT)	Total Direct Runoff :	2.2 (AC-FT)
Total Loss :	2.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.2 (AC-FT)	Discharge :	2.2 (AC-FT)


Subbasin "PB8" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB8 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB8 Result:Precipitation Loss
Run:EV 100-yr Pr. Type II Element:PB8 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB8 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB8

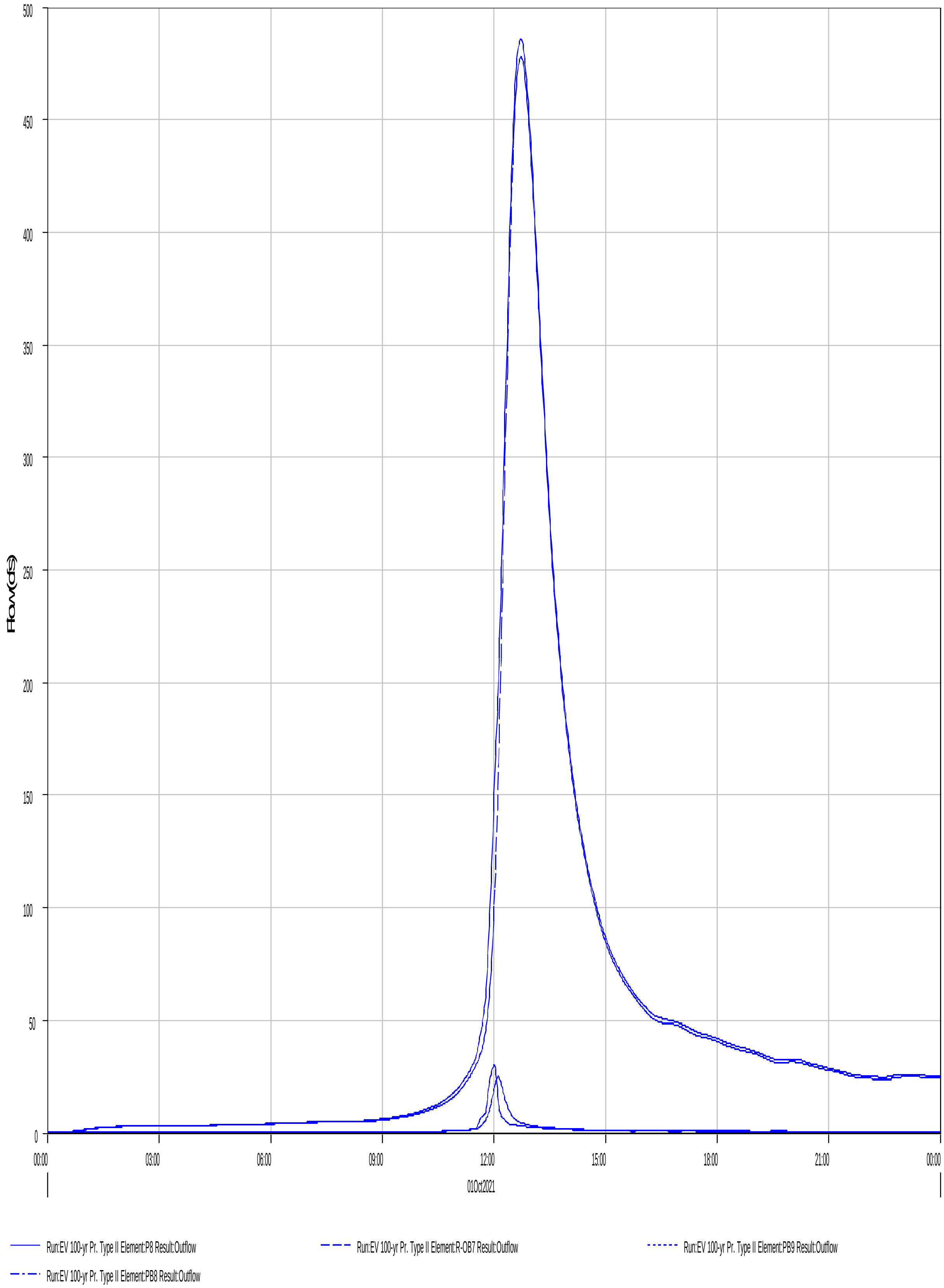
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	30.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:01
Total Precipitation :	4.5 (AC-FT)	Total Direct Runoff :	2.0 (AC-FT)
Total Loss :	2.5 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.0 (AC-FT)	Discharge :	2.0 (AC-FT)

Junction "P8" Results for Run "EV 100-yr Pr. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Junction: P8

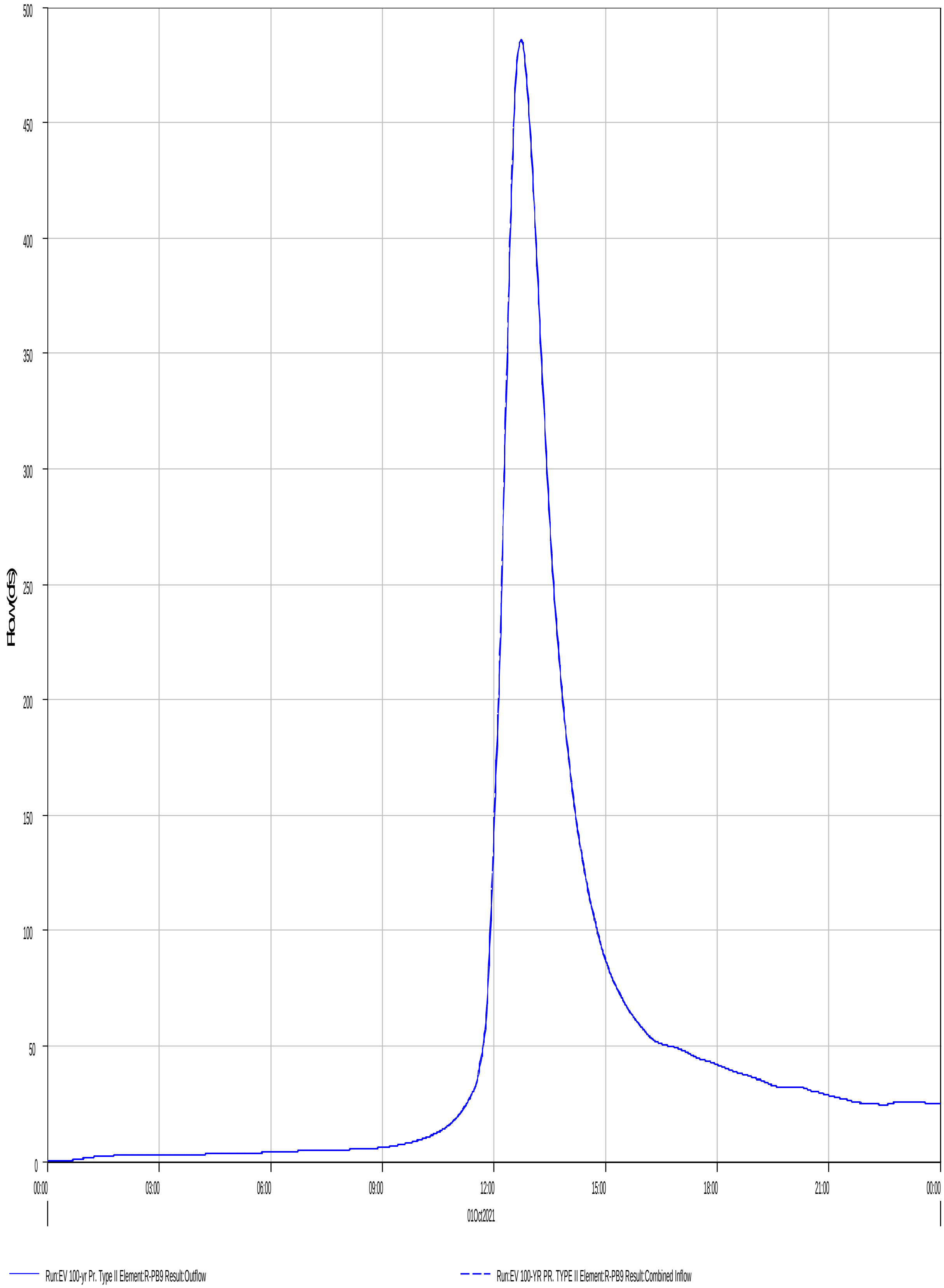
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	485.7 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:44
Total Outflow :	102.0 (AC-FT)		

Reach "R-PB9" Results for Run "EV 100-yr Pr. Type II"



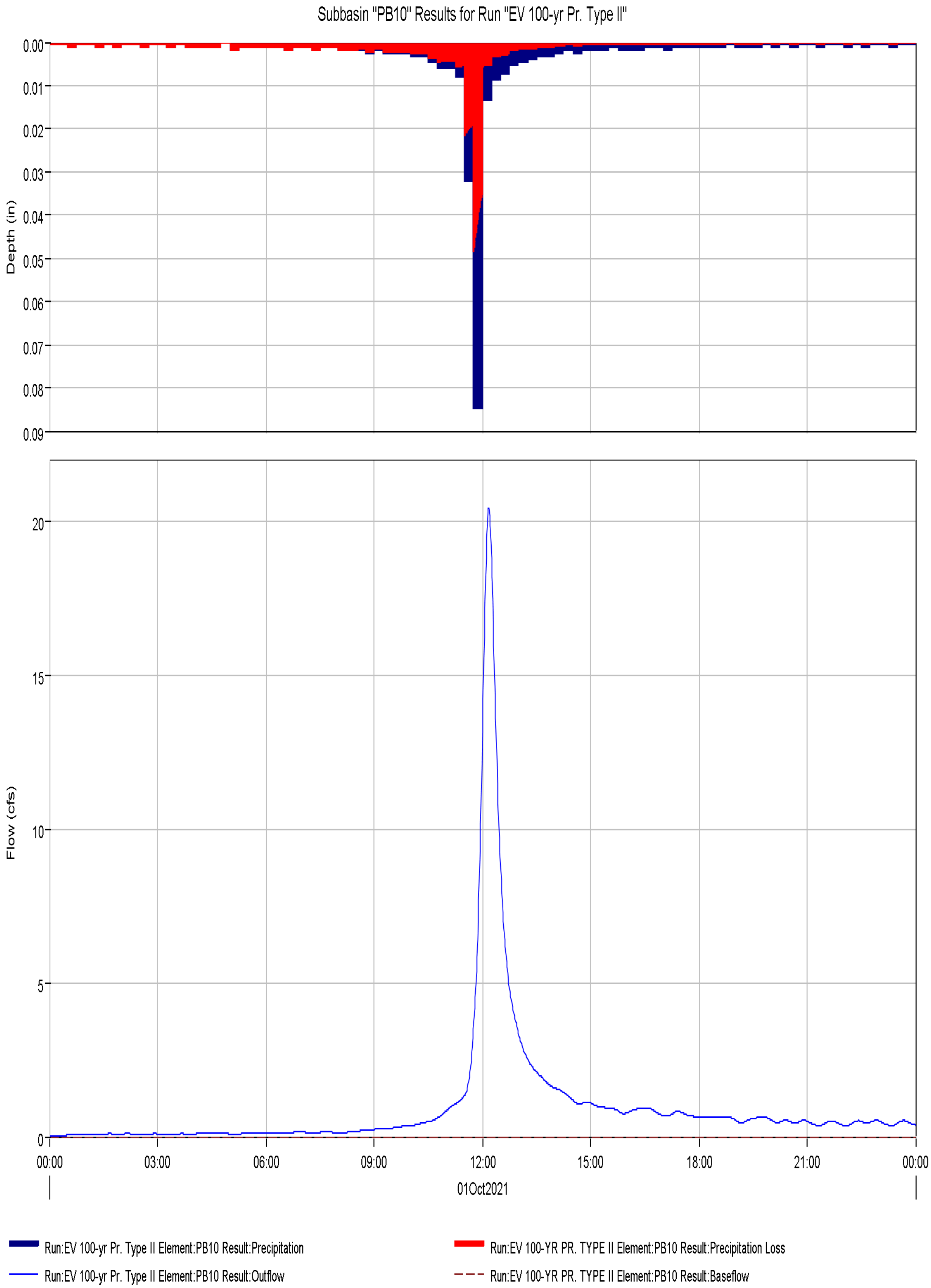
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-PB9

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	485.7 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:44
Peak Outflow :	485.6 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:45
Total Inflow :	102.0 (AC-FT)	Total Outflow :	102.0 (AC-FT)



Subbasin "PB10" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB10 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB10 Result:Precipitation Loss
Run:EV 100-yr Pr. Type II Element:PB10 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB10 Result:Baseflow

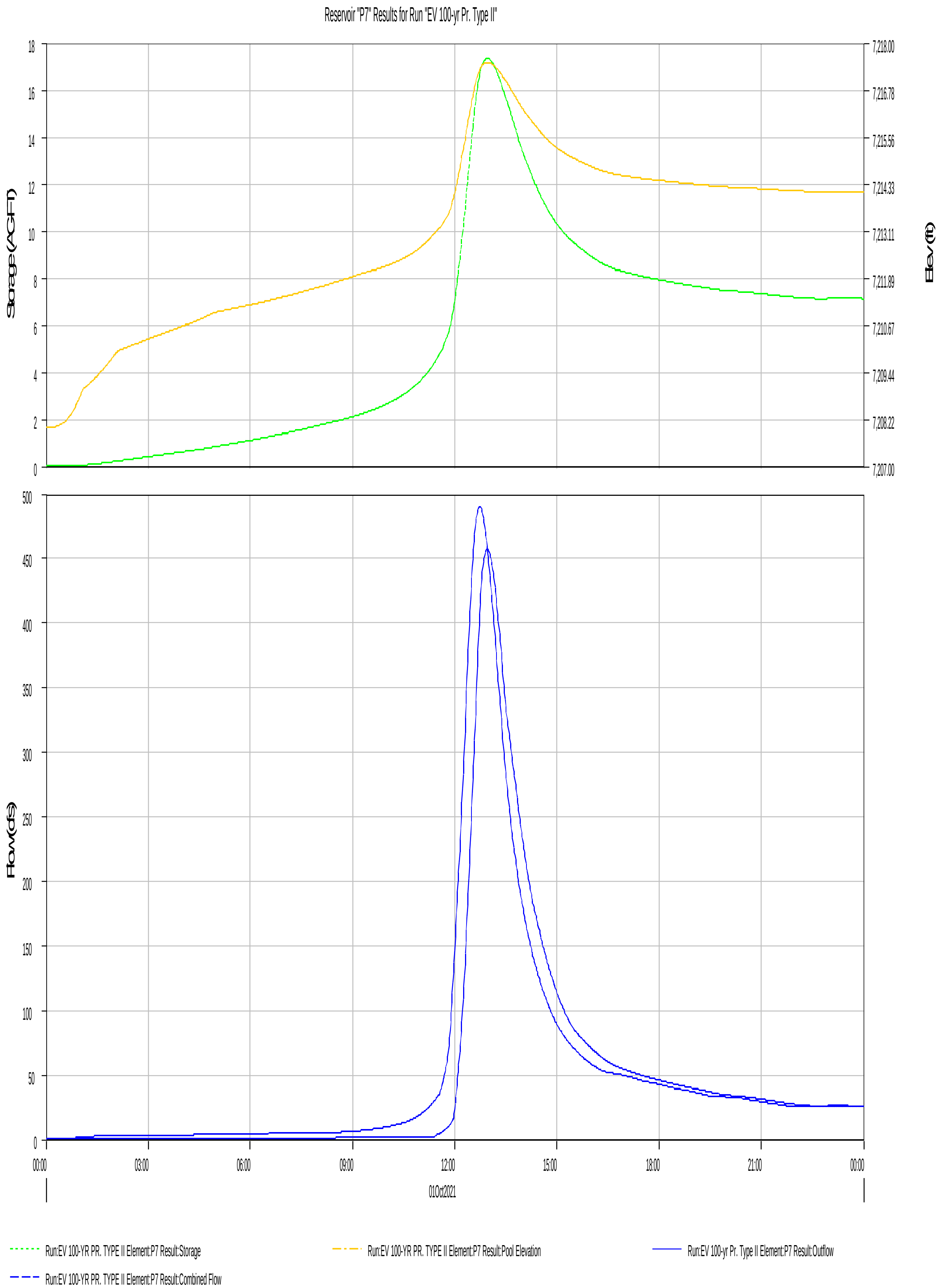
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB10

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	20.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:10
Total Precipitation :	4.4 (AC-FT)	Total Direct Runoff :	2.0 (AC-FT)
Total Loss :	2.4 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.0 (AC-FT)	Discharge :	2.0 (AC-FT)



Reservoir "P7" Results for Run "EV 100-yr Pr. Type II"
Storage (AC-FT)
Elev (ft)
Flow (cfs)
18
16
14
12
10
8
6
4
2
0
7,218.00
7,216.78
7,215.56
7,214.33
7,213.11
7,211.89
7,210.67
7,209.44
7,208.22
7,207.00
500
450
400
350
300
250
200
150
100
50
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:P7 Result:Storage
Run:EV 100-YR PR. TYPE II Element:P7 Result:Pool Elevation
Run:EV 100-yr Pr. Type II Element:P7 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:P7 Result:Combined Flow

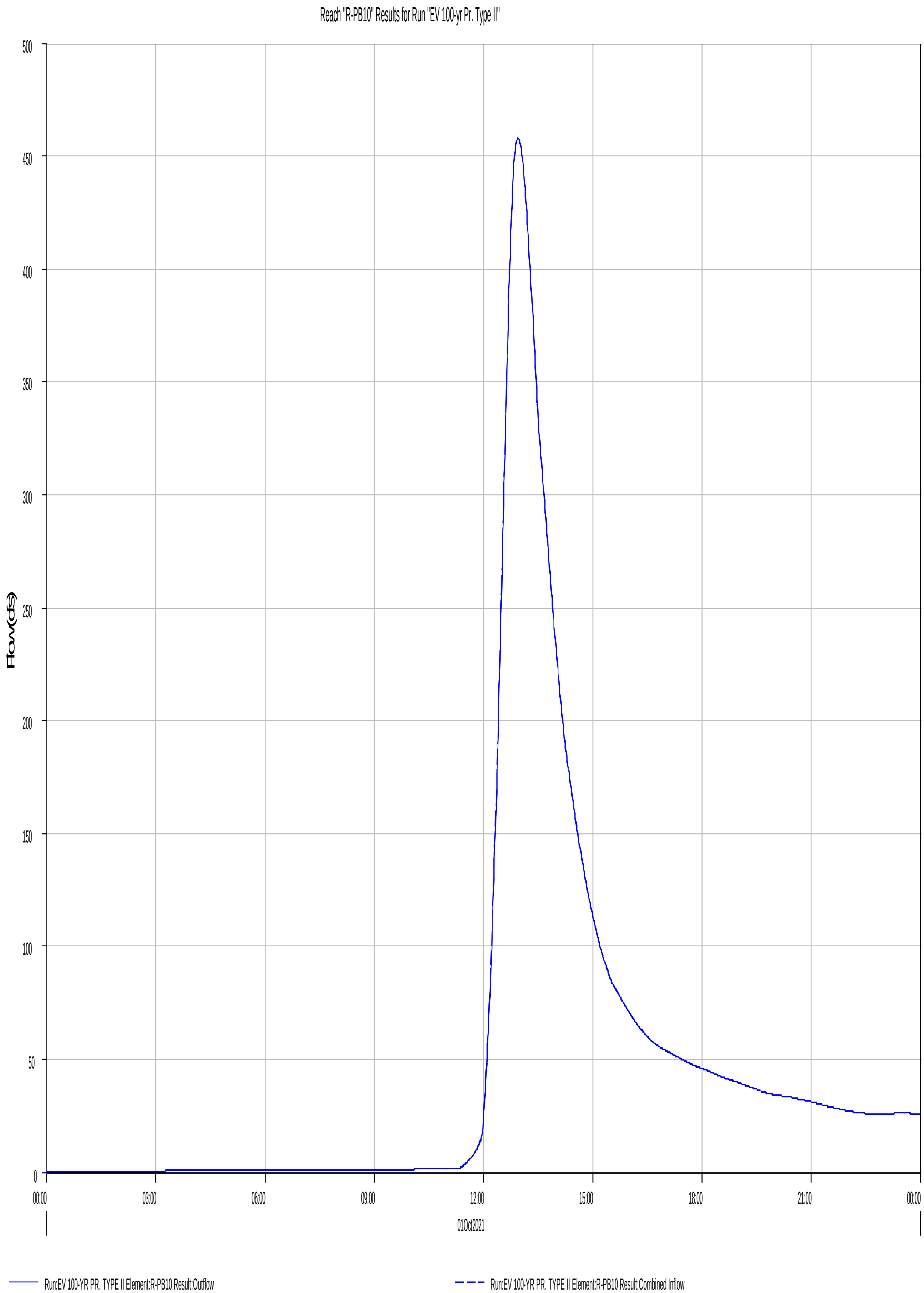
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reservoir: P7

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 08:31:16	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	490.6 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:44
Peak Outflow :	457.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:57
Total Inflow :	104.0 (AC-FT)	Peak Storage :	17.3 (AC-FT)
Total Outflow :	96.8 (AC-FT)	Peak Elevation :	7217.5 (FT)



Reach "R-PB10" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
500
450
400
350
300
250
200
150
100
50
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-PB10 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-PB10 Result:Combined Inflow

Project: Eagleview_Subdivision

Simulation Run: EV 100-yr Pr. Type II   Reach: R-PB10

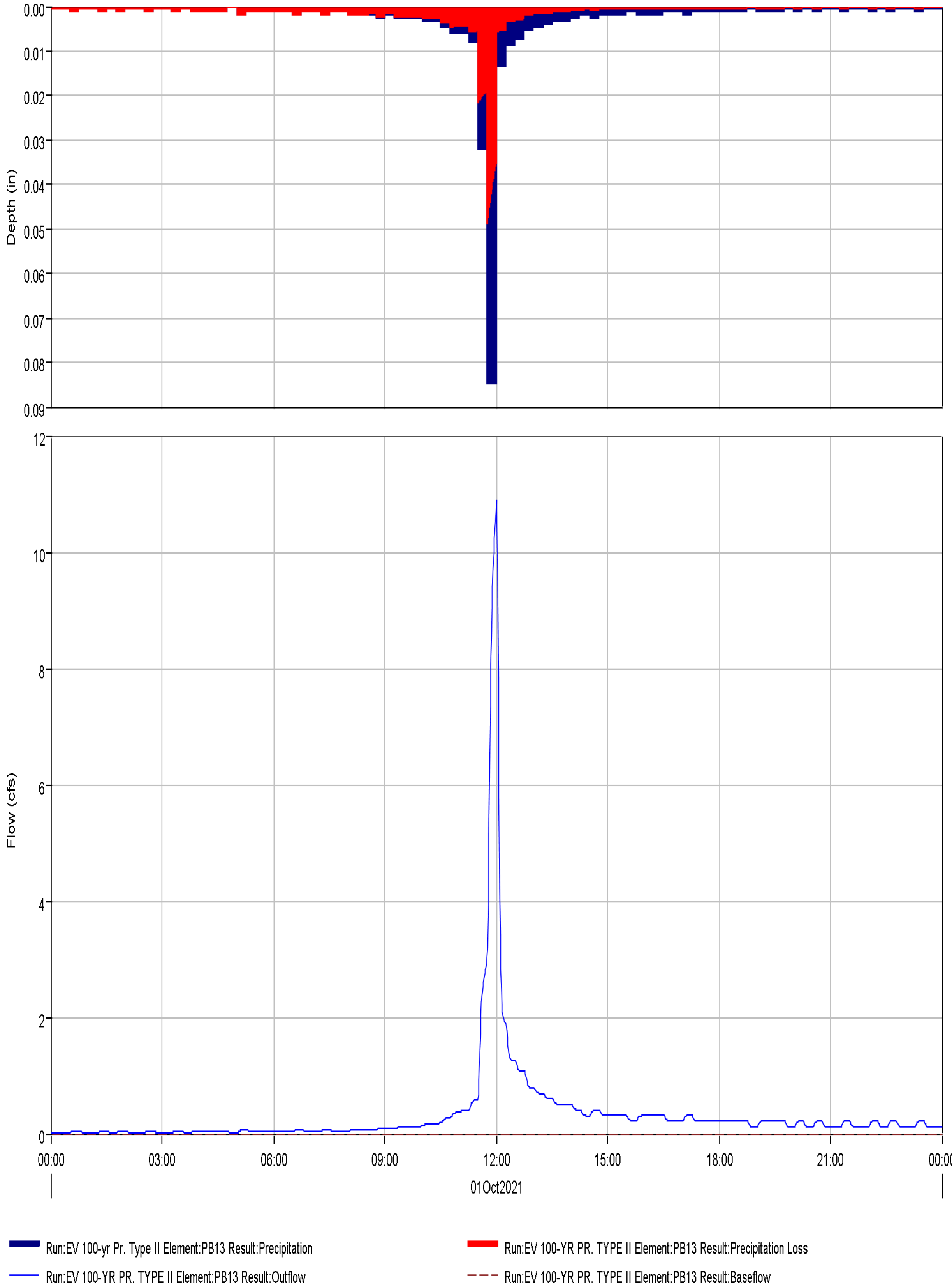
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	457.8 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:57
Peak Outflow :	457.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:58
Total Inflow :	96.8 (AC-FT)	Total Outflow :	96.8 (AC-FT)

Subbasin "PB13" Results for Run "EV 100-yr Pr. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB13

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	10.9 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:00
Total Precipitation :	1.5 (AC-FT)	Total Direct Runoff :	0.7 (AC-FT)
Total Loss :	0.8 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.7 (AC-FT)	Discharge :	0.7 (AC-FT)

Project: Eagleview_Subdivision

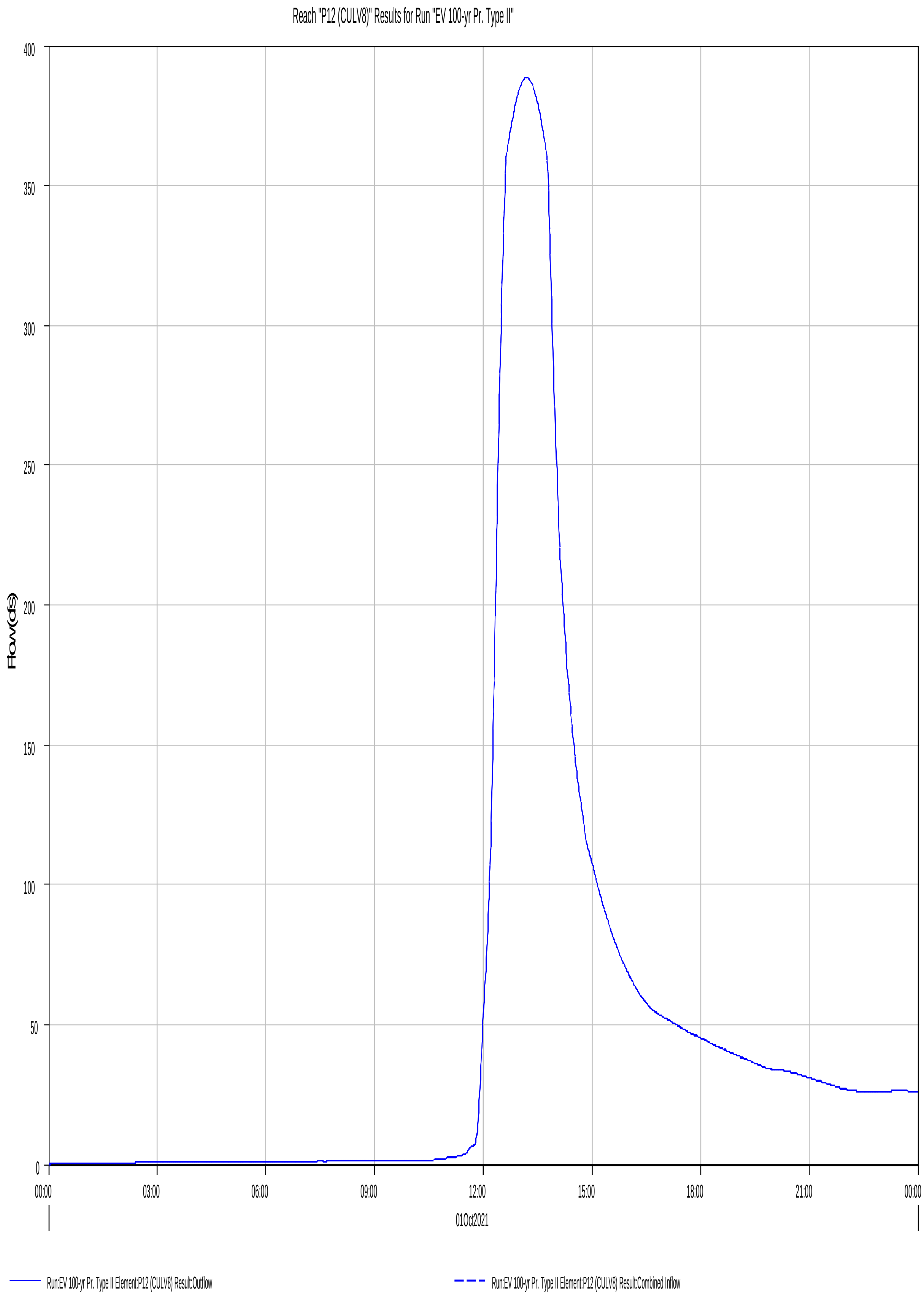
Simulation Run: EV 100-yr Pr. Type II Reach: P12 (CULV8)

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	21Dec2022, 11:38:03	Control Specifications:	24-hr Storm

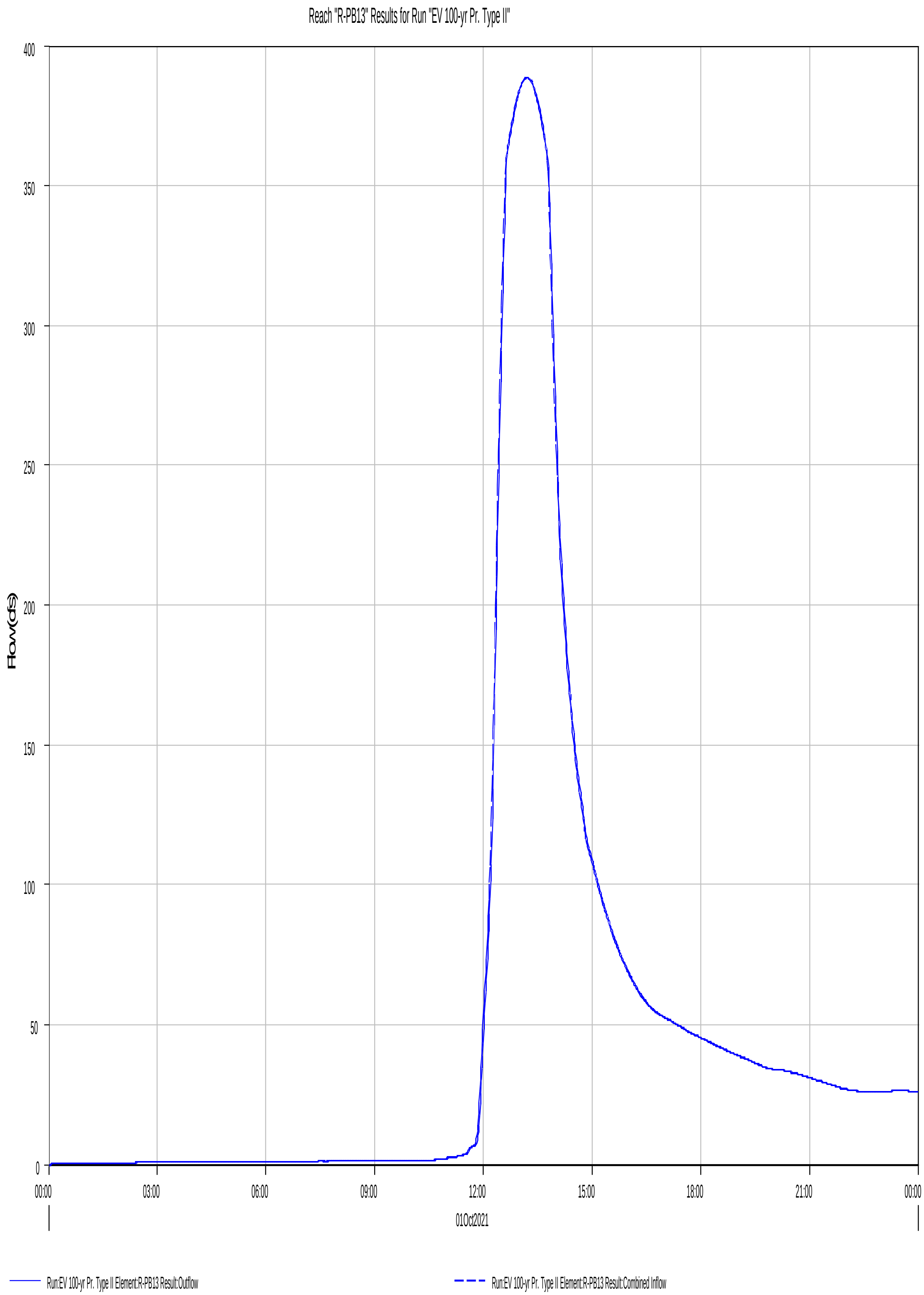
Volume Units: AC-FT

Computed Results

Peak Inflow :	388.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 13:12
Peak Outflow :	388.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 13:12
Total Inflow :	98.2 (AC-FT)	Total Outflow :	98.2 (AC-FT)



Reach "P12 (CULV8)" Results for Run "EV 100-yr Pr. Type II"
Flow(cfs)
400
350
300
250
200
150
100
50
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:P12 (CULV8) Result:Outflow
Run:EV 100-yr Pr. Type II Element:P12 (CULV8) Result:Combined Inflow



Reach "R-PB13" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
400
350
300
250
200
150
100
50
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:R-PB13 Result:Outflow
Run:EV 100-yr Pr. Type II Element:R-PB13 Result:Combined Inflow

Project: Eagleview_Subdivision

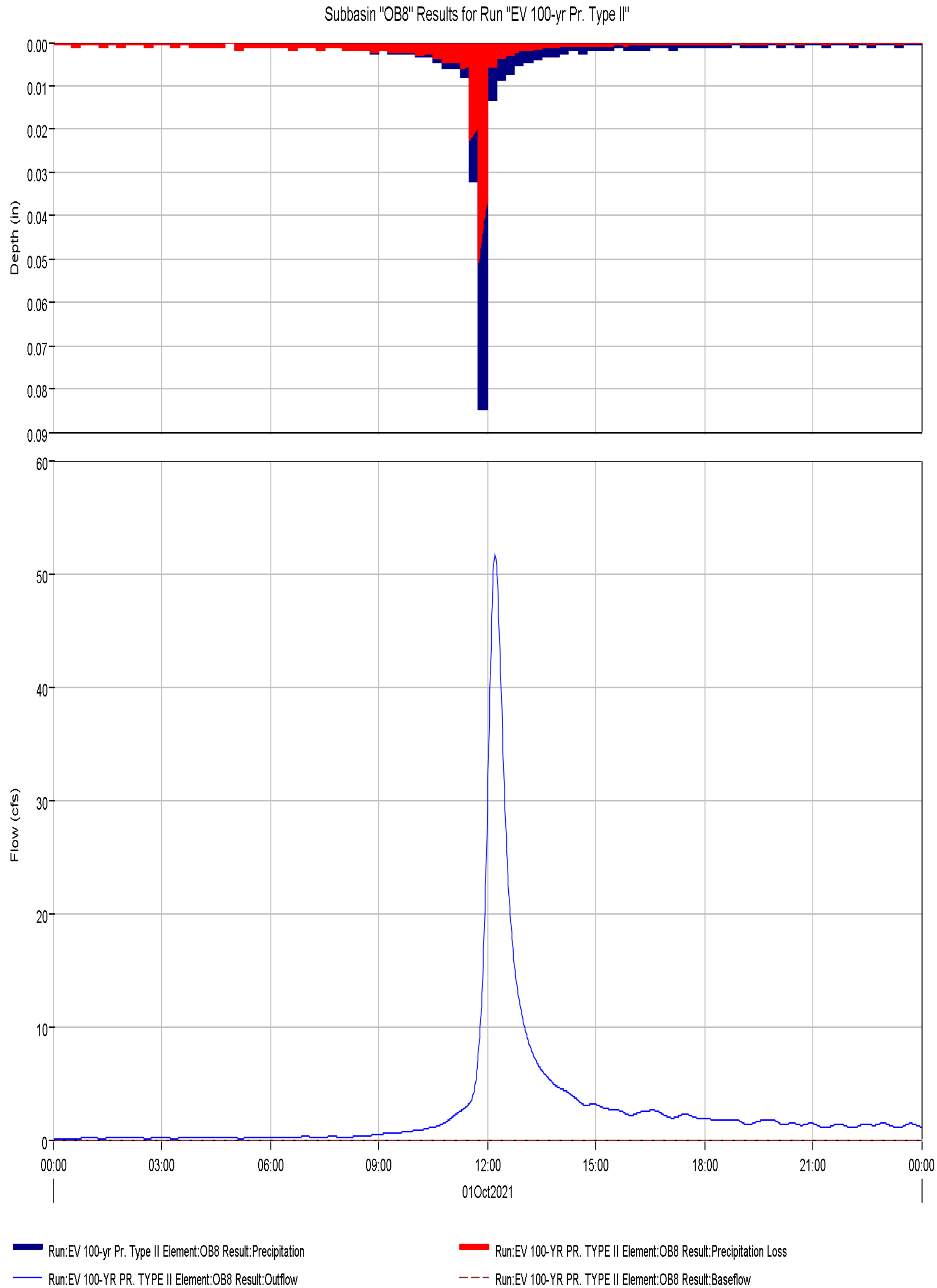
Simulation Run: EV 100-yr Pr. Type II   Reach: R-PB13

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	21Dec2022, 11:38:03	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	388.5 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 13:12
Peak Outflow :	388.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 13:13
Total Inflow :	98.2 (AC-FT)	Total Outflow :	98.1 (AC-FT)



Subbasin "OB8" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:OB8 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:OB8 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:OB8 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:OB8 Result:Baseflow

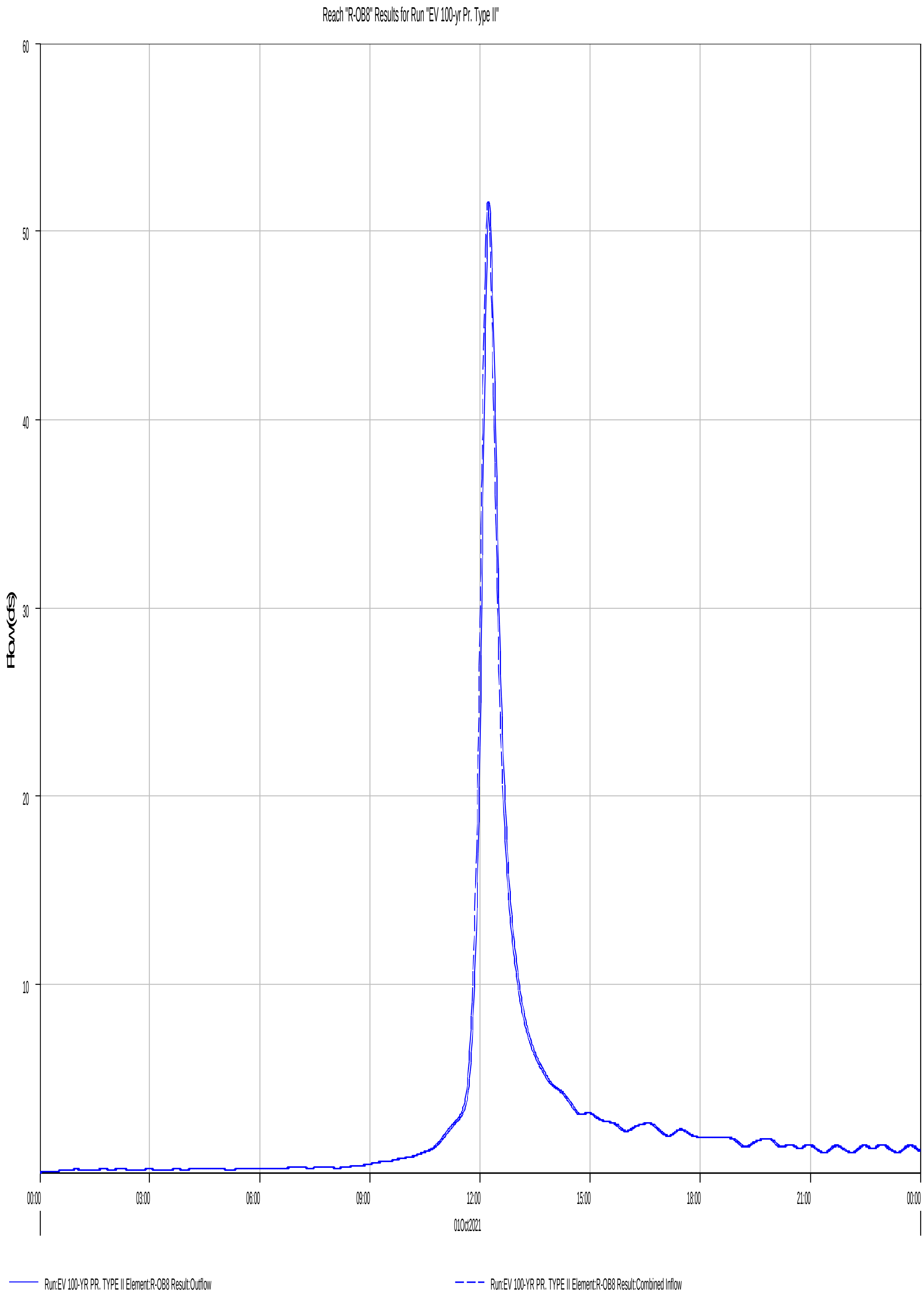
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: OB8

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	51.6 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:13
Total Precipitation :	12.7 (AC-FT)	Total Direct Runoff :	5.4 (AC-FT)
Total Loss :	7.3 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	5.4 (AC-FT)	Discharge :	5.4 (AC-FT)



Reach "R-OB8" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
60
50
40
30
20
10
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-OB8 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-OB8 Result:Combined Inflow

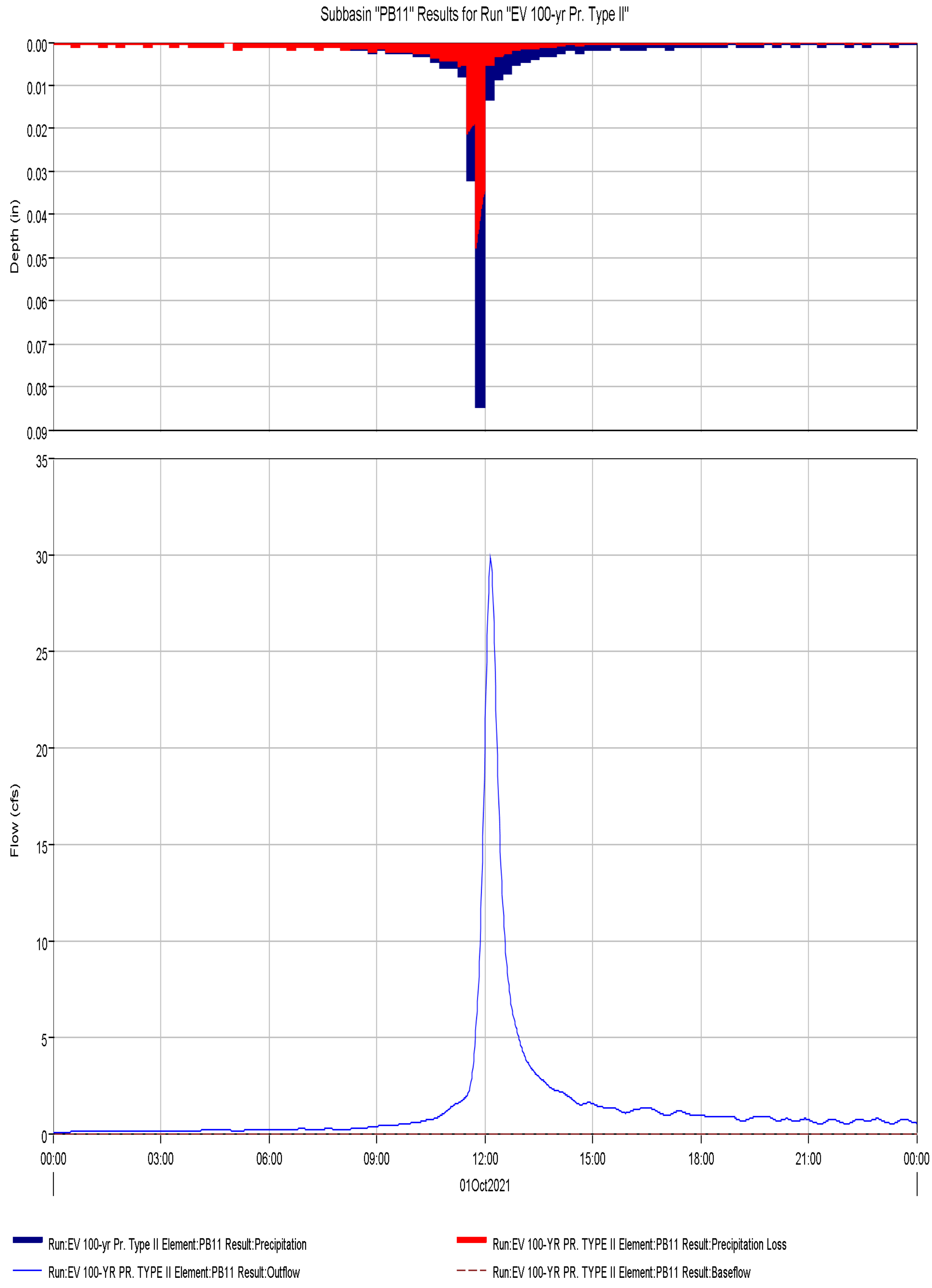
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-OB8

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	51.6 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	51.6 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:15
Total Inflow :	5.4 (AC-FT)	Total Outflow :	5.4 (AC-FT)



Subbasin "PB11" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB11 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB11 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:PB11 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB11 Result:Baseflow

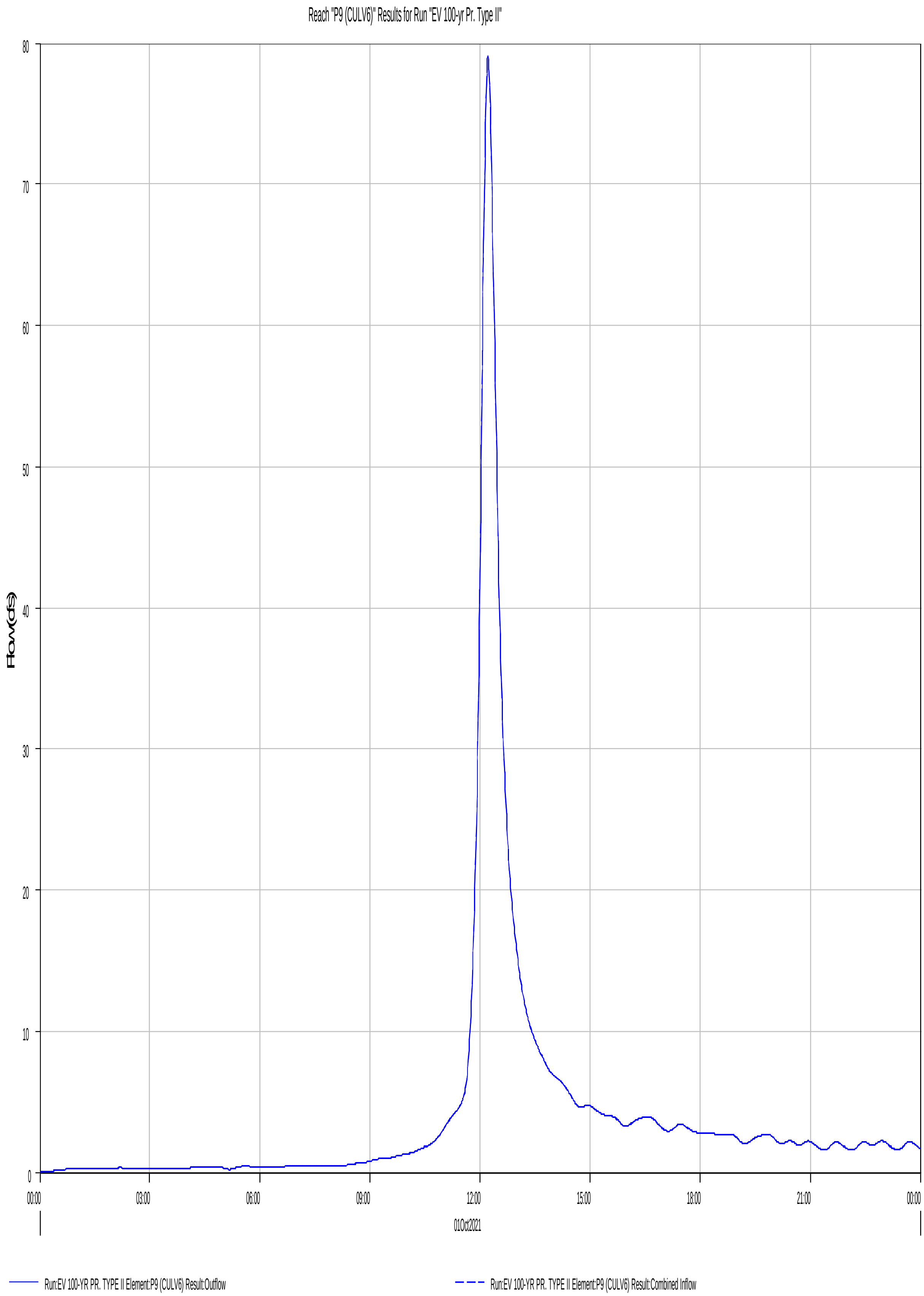
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB11

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	29.8 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:10
Total Precipitation :	6.2 (AC-FT)	Total Direct Runoff :	2.9 (AC-FT)
Total Loss :	3.3 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.9 (AC-FT)	Discharge :	2.9 (AC-FT)


Reach "P9 (CULV6)" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:P9 (CULV6) Result:Outflow
Run:EV 100-YR PR. TYPE II Element:P9 (CULV6) Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: P9 (CULV6)

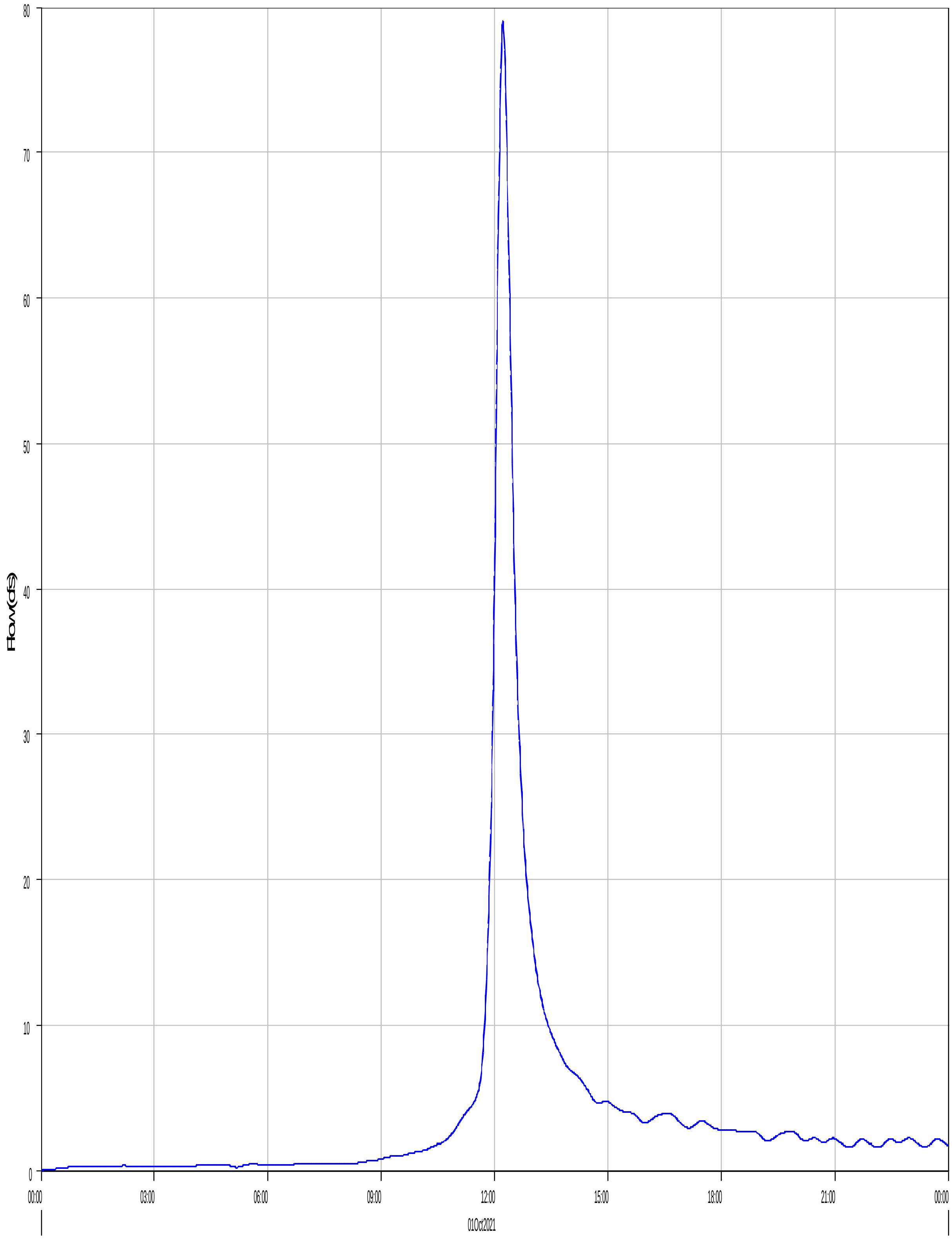
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	79.1 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	79.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Inflow :	8.2 (AC-FT)	Total Outflow :	8.2 (AC-FT)

Reach "R-PB11" Results for Run "EV 100-yr Pr. Type II"



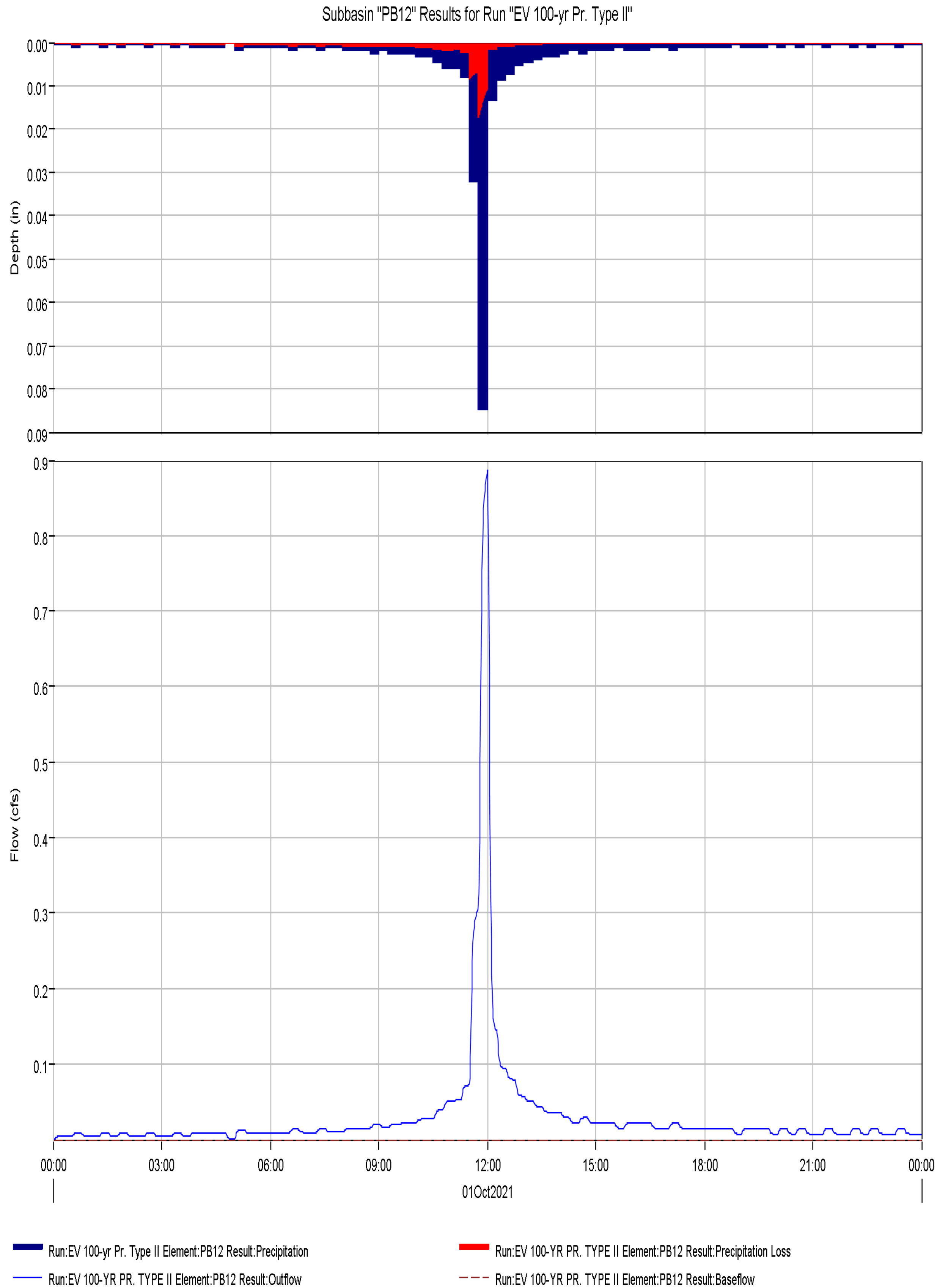
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-PB11

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	79.1 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	79.0 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:14
Total Inflow :	8.2 (AC-FT)	Total Outflow :	8.2 (AC-FT)



Subbasin "PB12" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB12 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB12 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:PB12 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB12 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB12

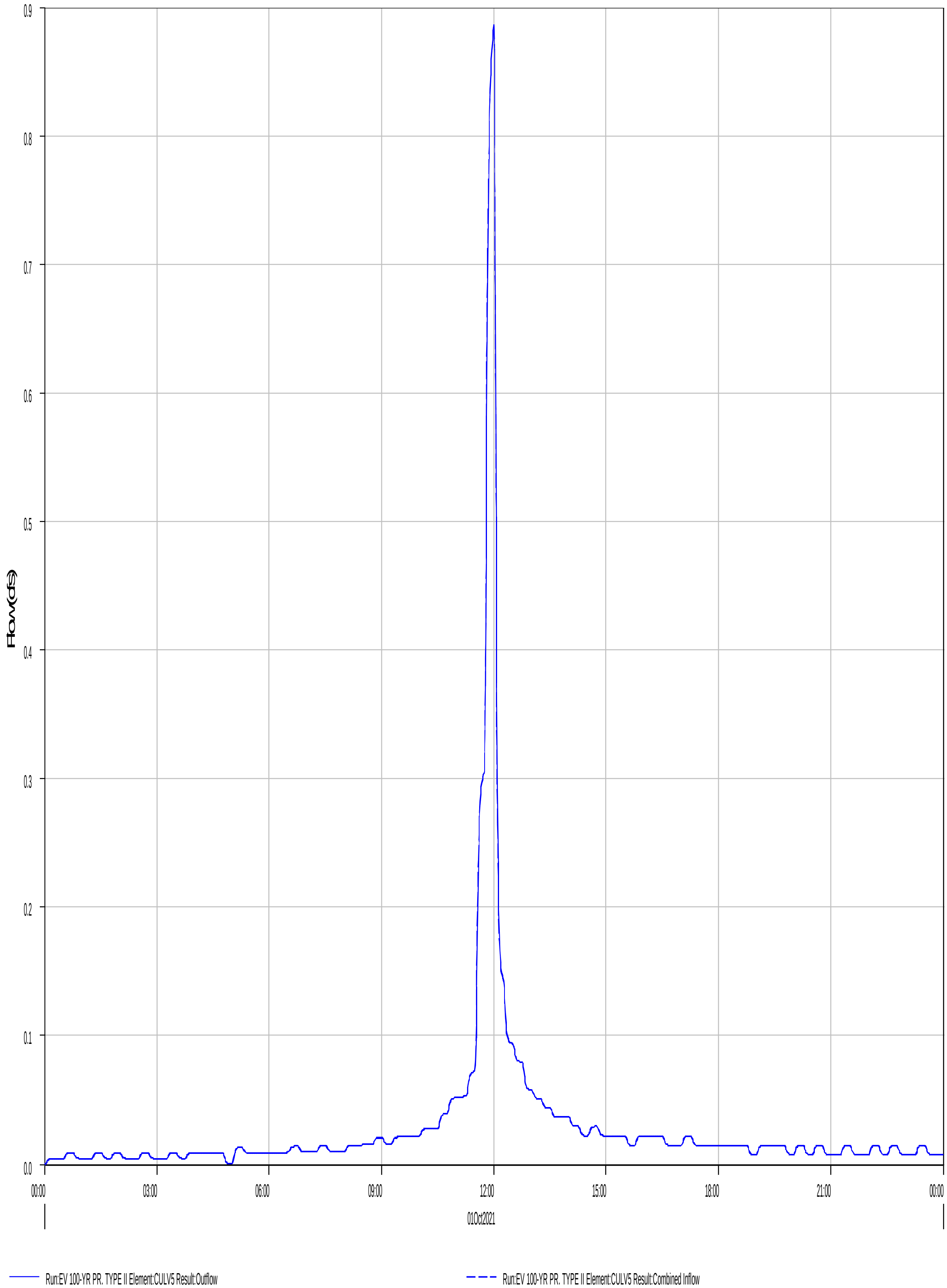
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	0.9 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:00
Total Precipitation :	0.1 (AC-FT)	Total Direct Runoff :	0.1 (AC-FT)
Total Loss :	0.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.1 (AC-FT)	Discharge :	0.1 (AC-FT)

Reach "CULV5" Results for Run "EV 100-yr Pr. Type II"



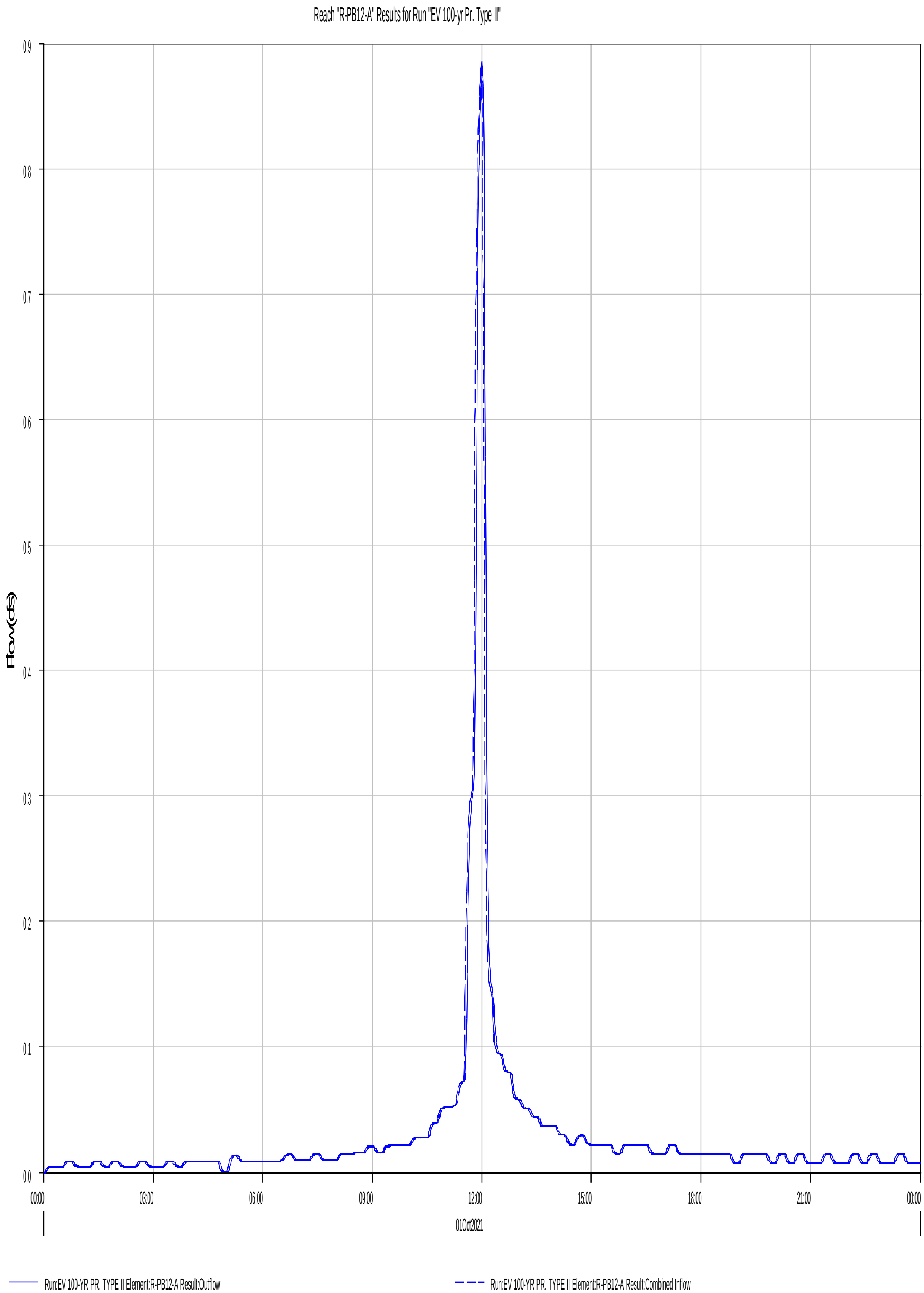
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: CULV5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	0.9 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:00
Peak Outflow :	0.9 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:00
Total Inflow :	0.1 (AC-FT)	Total Outflow :	0.1 (AC-FT)



Reach "R-PB12-A" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-PB12-A Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-PB12-A Result:Combined Inflow

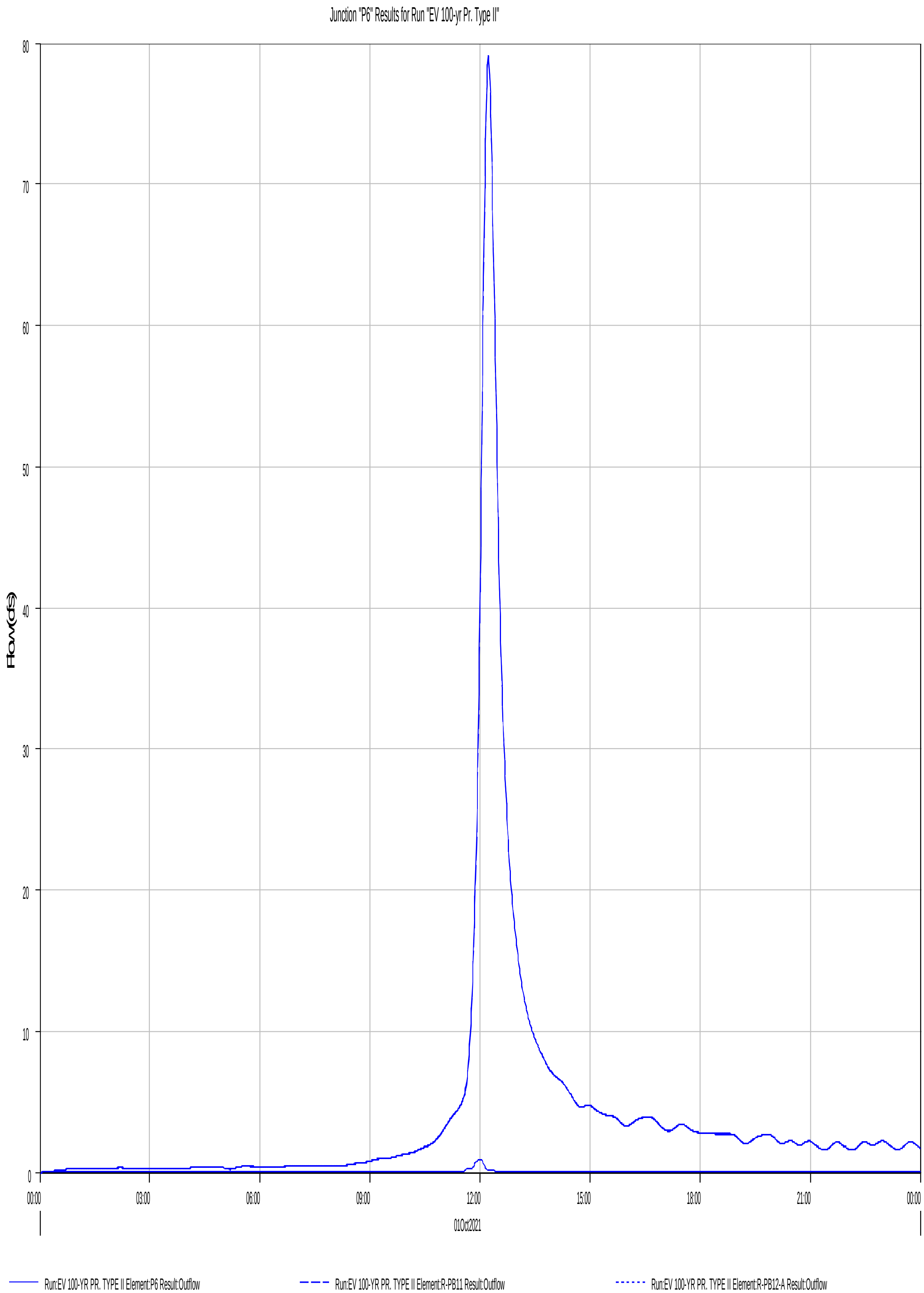
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-PB12-A

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	0.9 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:00
Peak Outflow :	0.9 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:02
Total Inflow :	0.1 (AC-FT)	Total Outflow :	0.1 (AC-FT)


Junction "P6" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:P6 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-PB11 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-PB12-A Result:Outflow

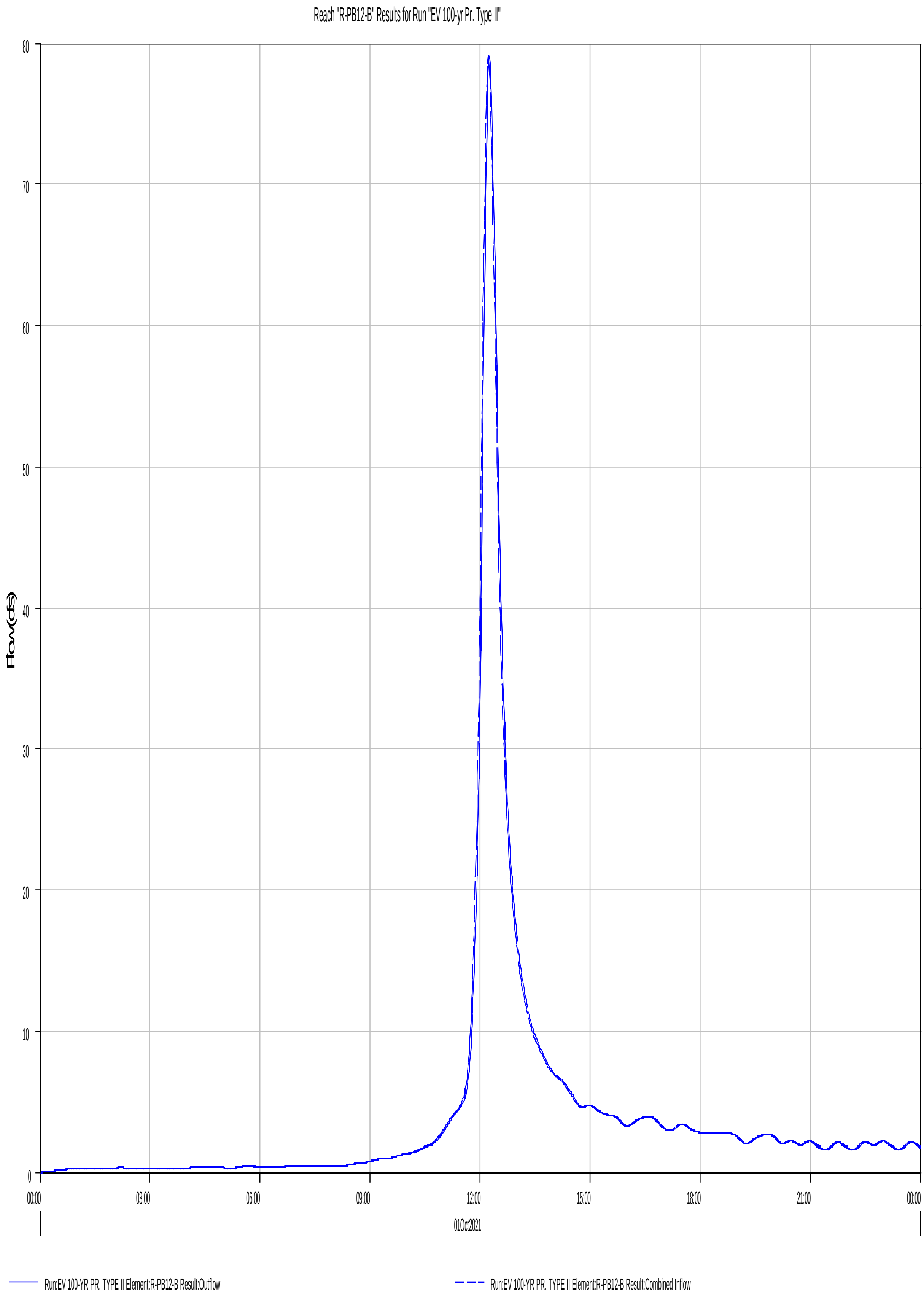
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Junction: P6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	79.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:14
Total Outflow :	8.3 (AC-FT)		


Reach "R-PB12-B" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-PB12-B Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-PB12-B Result:Combined Inflow

Project: Eagleview_Subdivision

Simulation Run: EV 100-yr Pr. Type II Reach: R-PB12-B

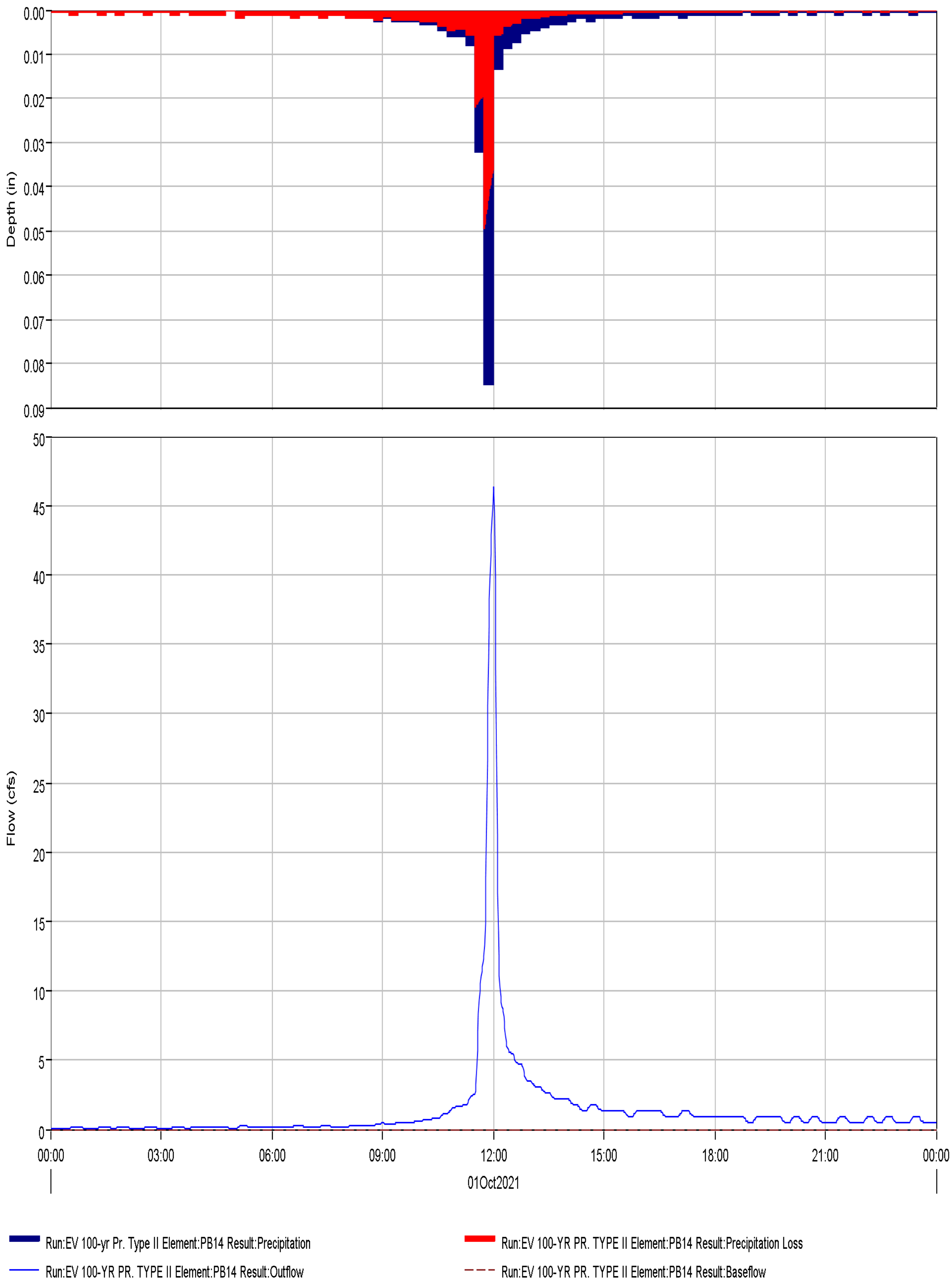
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	79.1 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:14
Peak Outflow :	79.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:15
Total Inflow :	8.3 (AC-FT)	Total Outflow :	8.3 (AC-FT)

Subbasin "PB14" Results for Run "EV 100-yr Pr. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB14

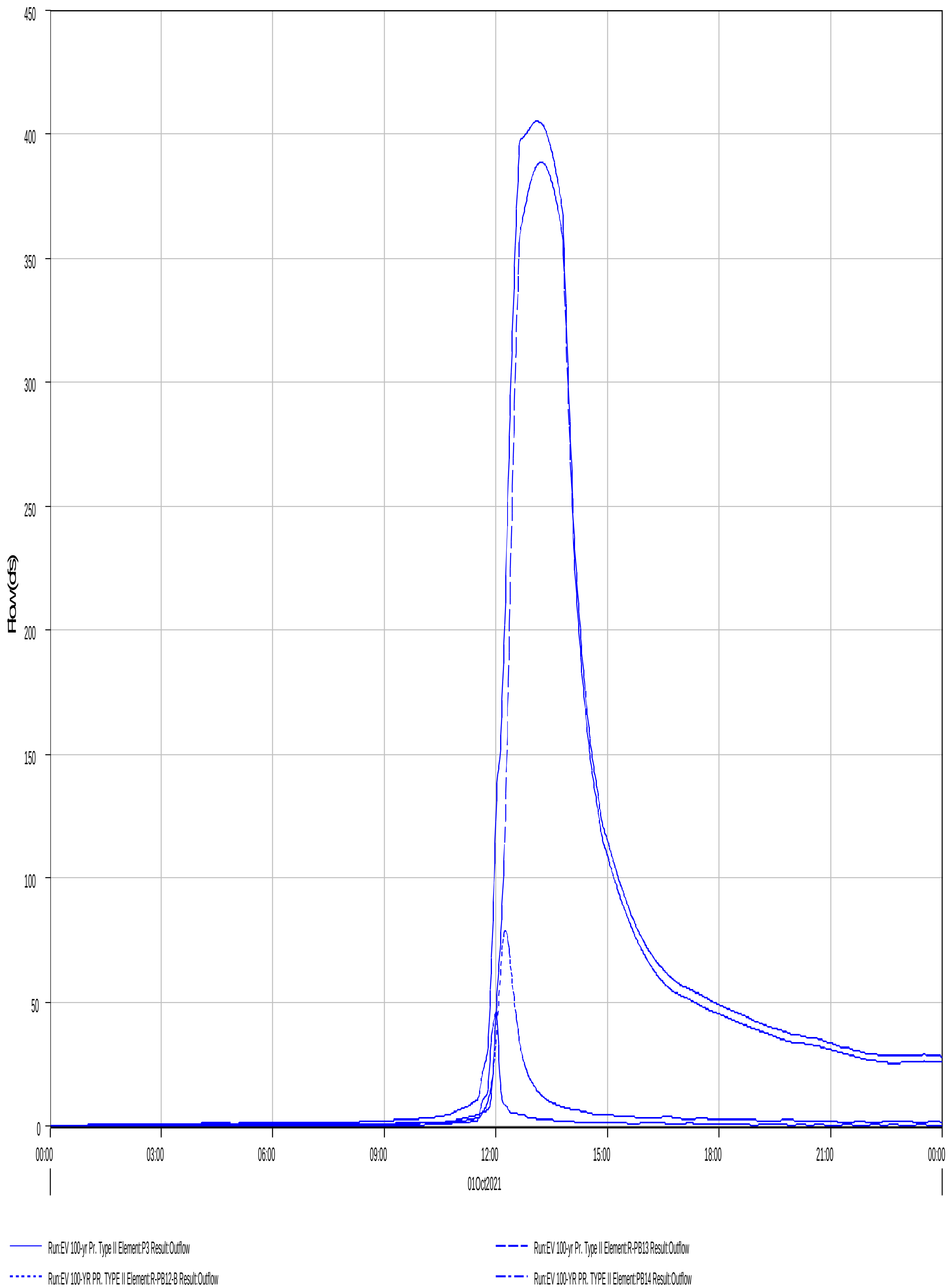
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	46.3 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:01
Total Precipitation :	6.6 (AC-FT)	Total Direct Runoff :	2.9 (AC-FT)
Total Loss :	3.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.9 (AC-FT)	Discharge :	2.9 (AC-FT)

Junction "P3" Results for Run "EV 100-yr Pr. Type II"



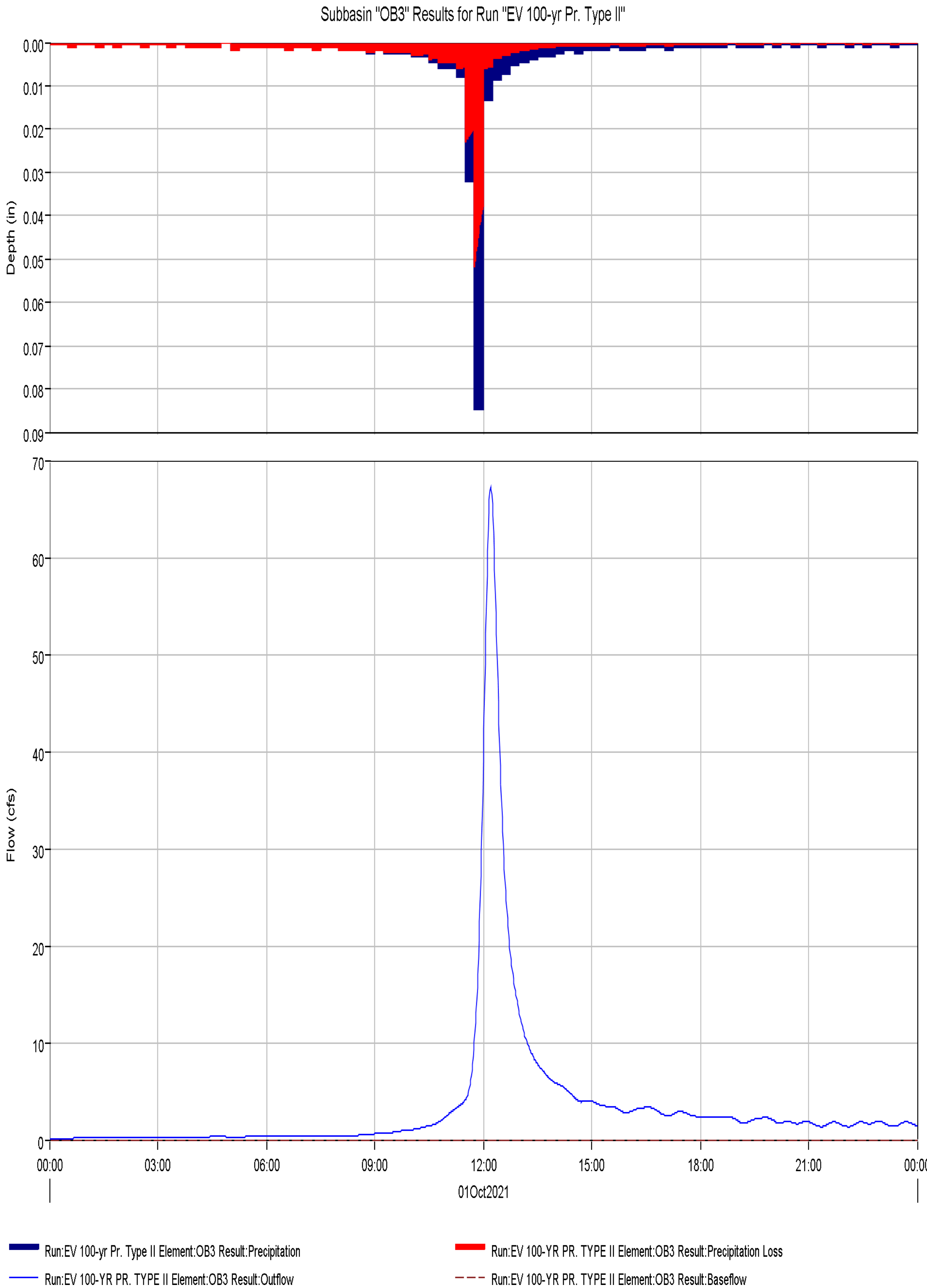
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Junction: P3

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	21Dec2022, 11:38:03	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	405.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 13:06
Total Outflow :	109.4 (AC-FT)		


Subbasin "OB3" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:OB3 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:OB3 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:OB3 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:OB3 Result:Baseflow

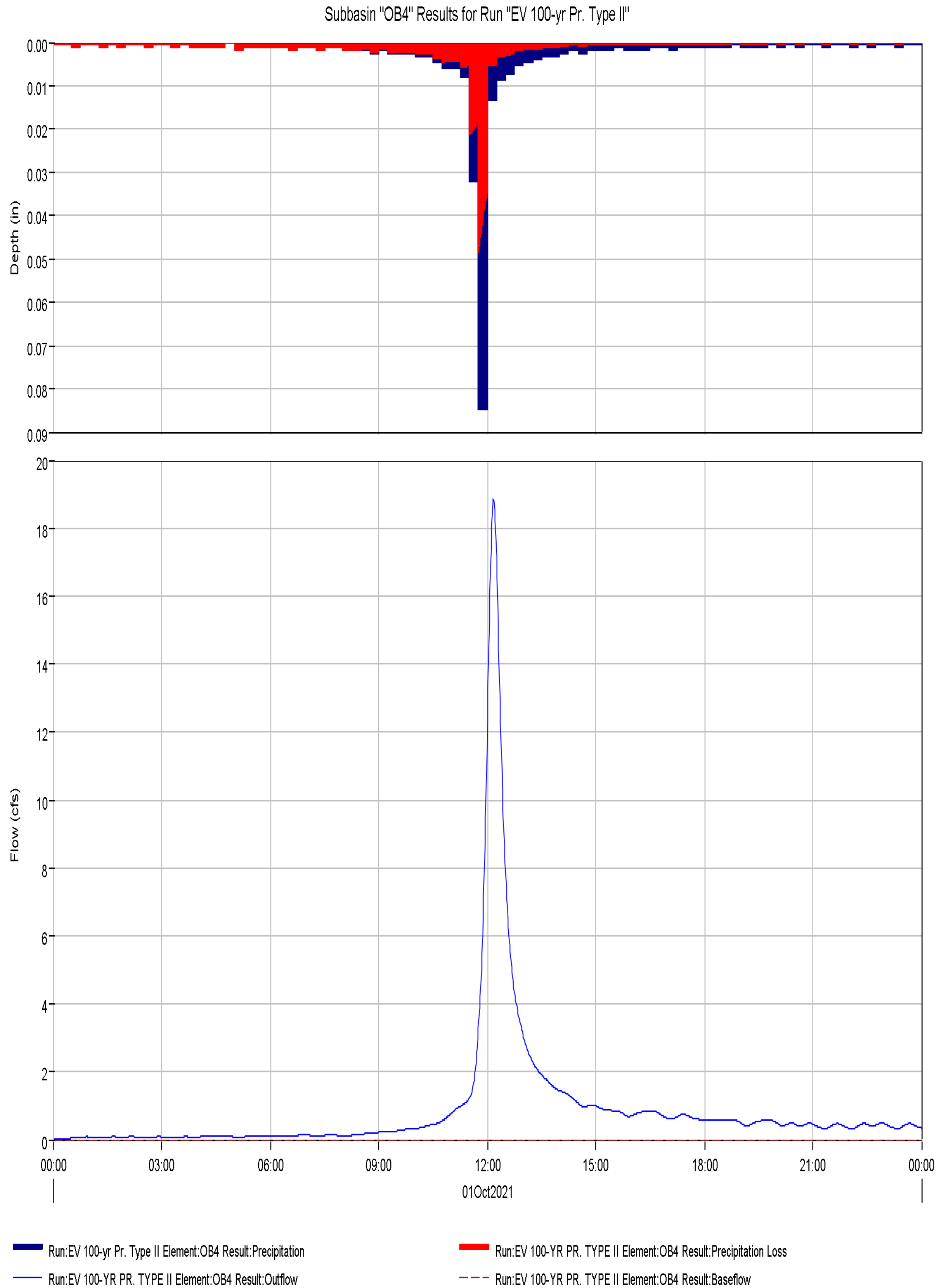
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: OB3

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	67.2 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:12
Total Precipitation :	16.7 (AC-FT)	Total Direct Runoff :	7.0 (AC-FT)
Total Loss :	9.7 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	7.0 (AC-FT)	Discharge :	7.0 (AC-FT)


Subbasin "OB4" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
20
18
16
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:OB4 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:OB4 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:OB4 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:OB4 Result:Baseflow

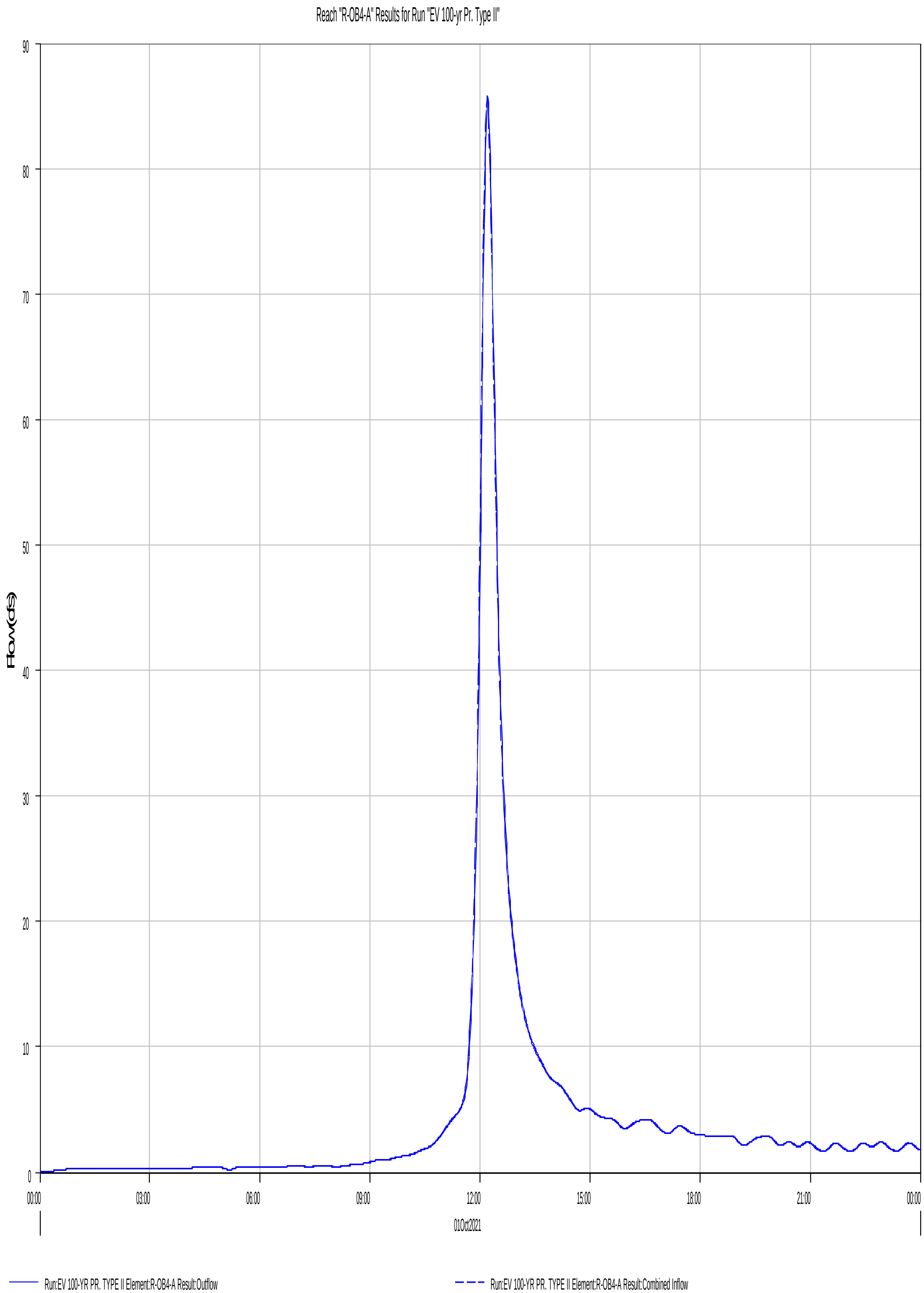
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: OB4

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	18.9 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:10
Total Precipitation :	4.0 (AC-FT)	Total Direct Runoff :	1.8 (AC-FT)
Total Loss :	2.2 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.8 (AC-FT)	Discharge :	1.8 (AC-FT)



Reach "R-OB4-A" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
0
10
20
30
40
50
60
70
80
90
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-OB4-A Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-OB4-A Result:Combined Inflow

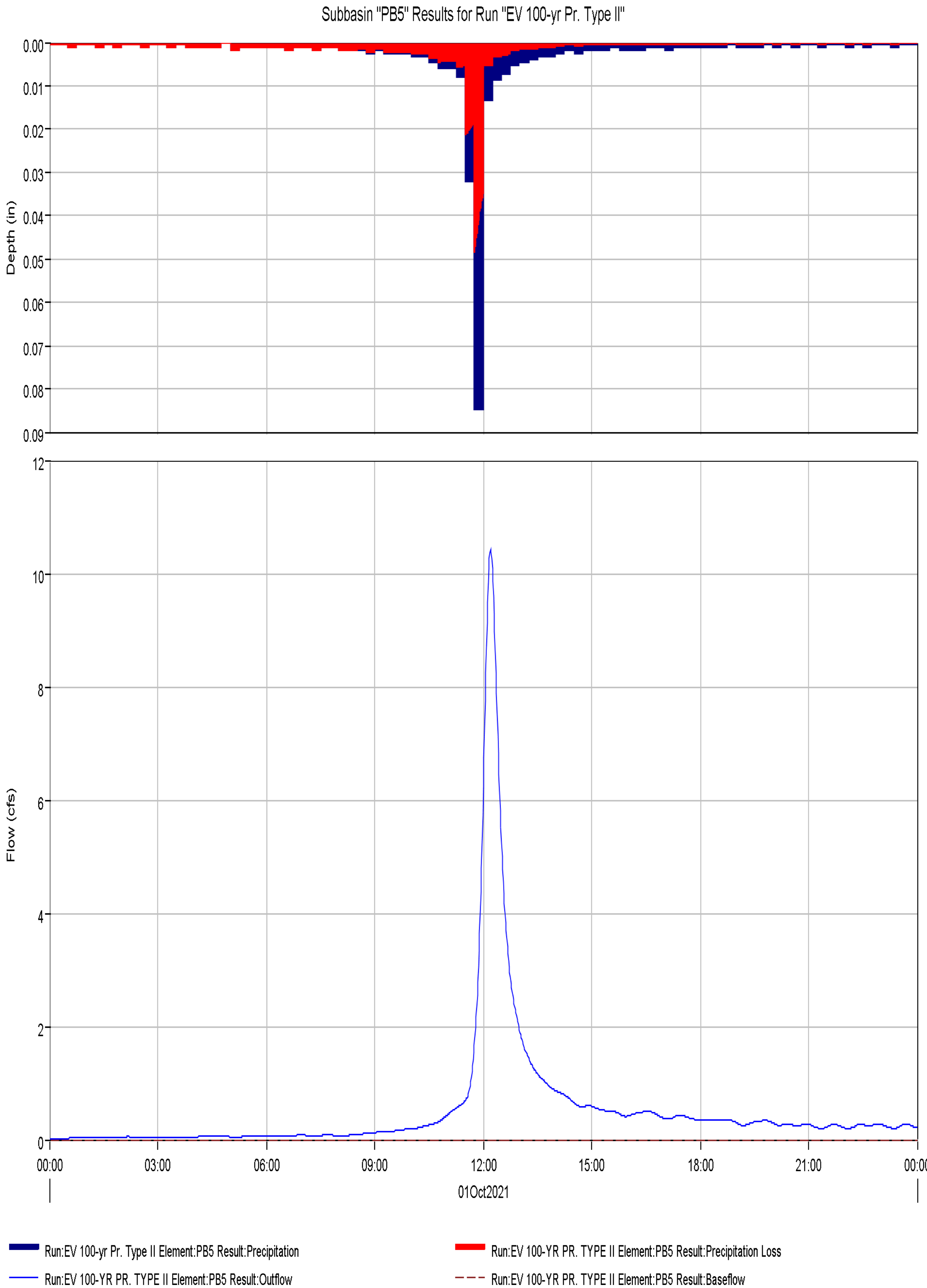
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-OB4-A

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	85.8 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:12
Peak Outflow :	85.7 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Inflow :	8.8 (AC-FT)	Total Outflow :	8.8 (AC-FT)


Subbasin "PB5" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB5 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB5 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:PB5 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB5 Result:Baseflow

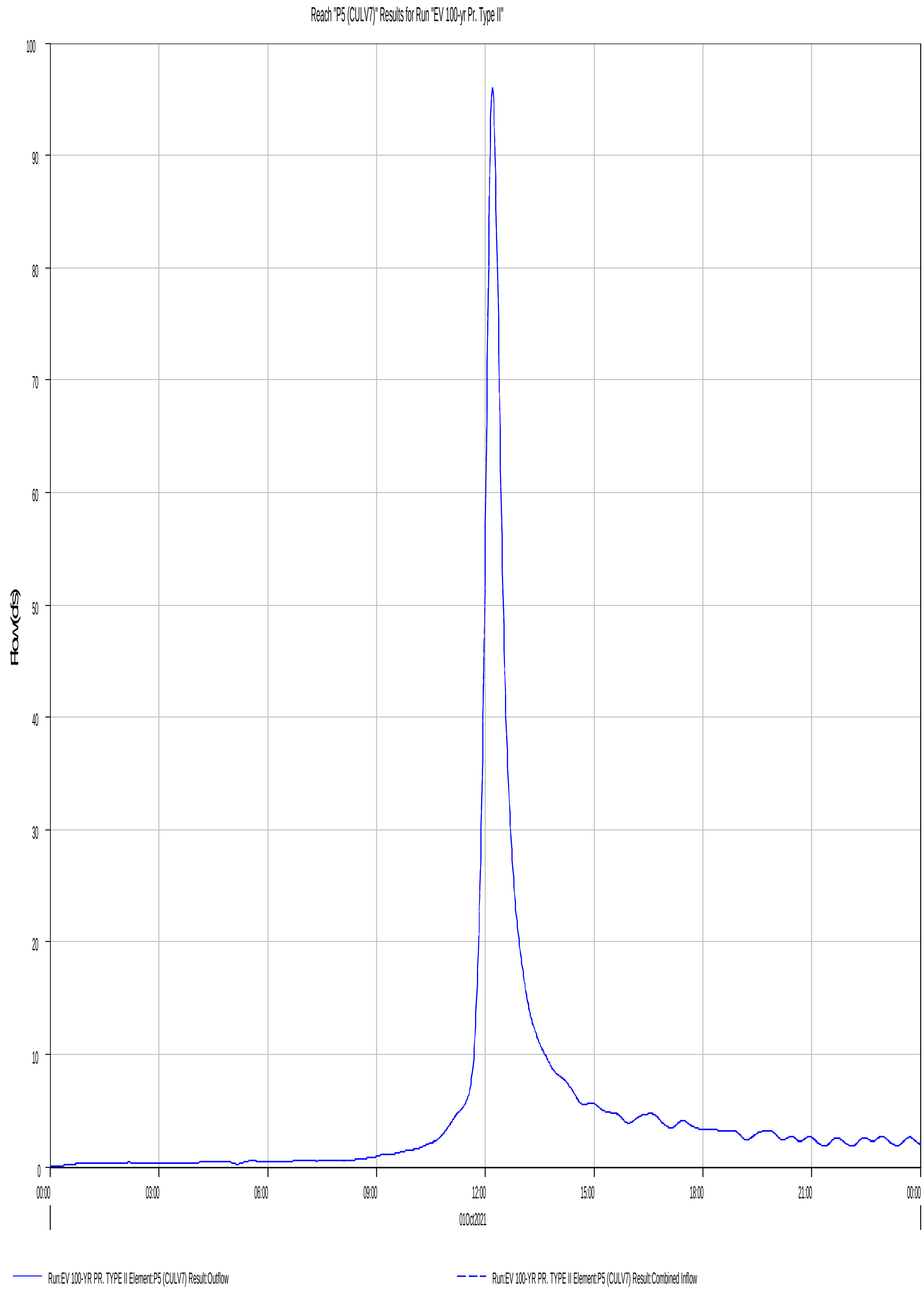
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	10.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:12
Total Precipitation :	2.4 (AC-FT)	Total Direct Runoff :	1.1 (AC-FT)
Total Loss :	1.3 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.1 (AC-FT)	Discharge :	1.1 (AC-FT)


Reach "P5 (CULV7)" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
100
90
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:P5 (CULV7) Result:Outflow
Run:EV 100-YR PR. TYPE II Element:P5 (CULV7) Result:Combined Inflow

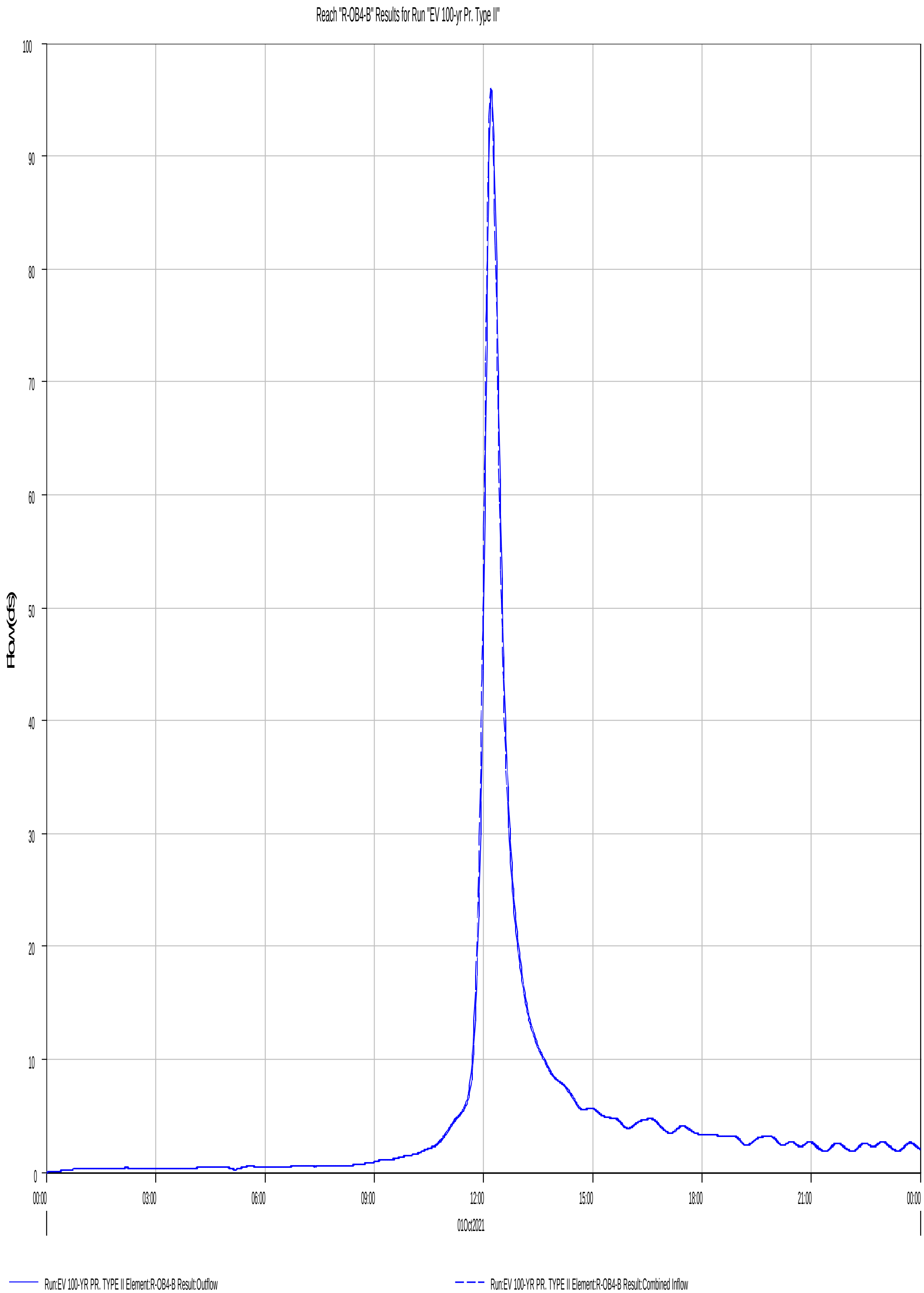
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: P5 (CULV7)

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	96.1 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	96.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Inflow :	9.9 (AC-FT)	Total Outflow :	9.9 (AC-FT)


Reach "R-OB4-B" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
100
90
80
70
60
50
40
30
20
10
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-OB4-B Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-OB4-B Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-OB4-B

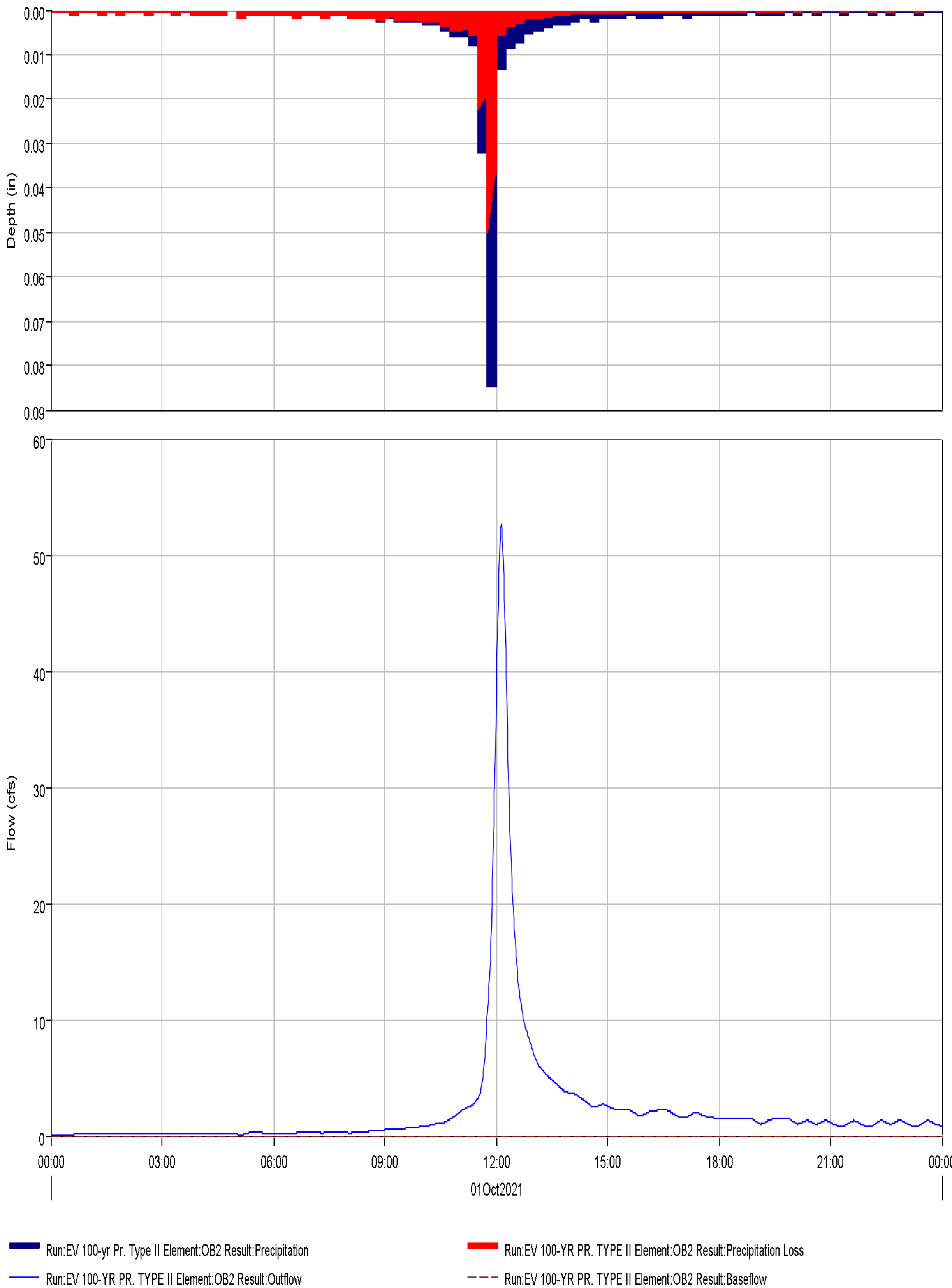
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	96.1 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:13
Peak Outflow :	95.9 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:14
Total Inflow :	9.9 (AC-FT)	Total Outflow :	9.8 (AC-FT)

Subbasin "OB2" Results for Run "EV 100-yr Pr. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: OB2

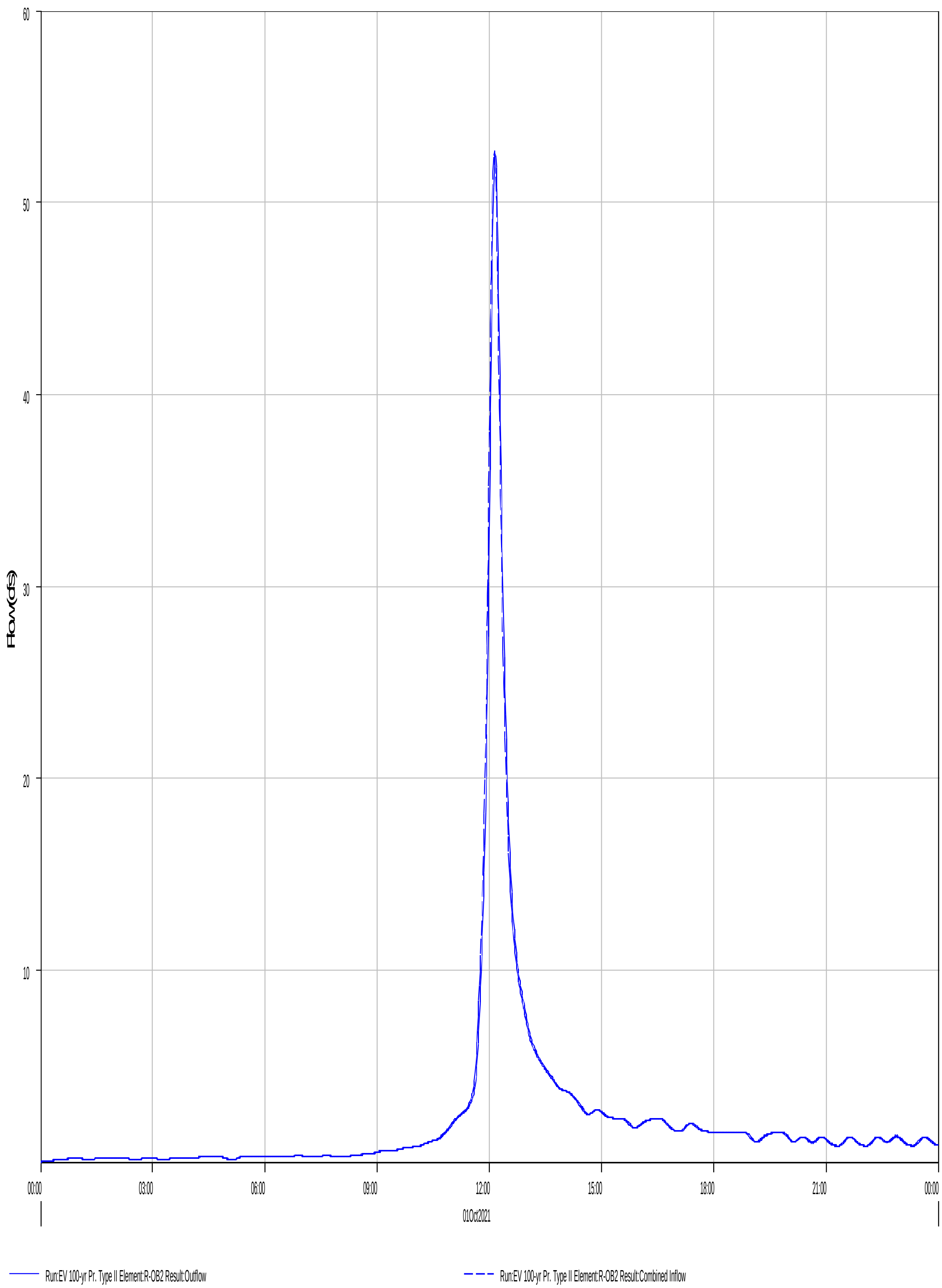
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	52.7 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	10.8 (AC-FT)	Total Direct Runoff :	4.7 (AC-FT)
Total Loss :	6.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	4.7 (AC-FT)	Discharge :	4.7 (AC-FT)

Reach "R-OB2" Results for Run "EV 100-yr Pr. Type II"



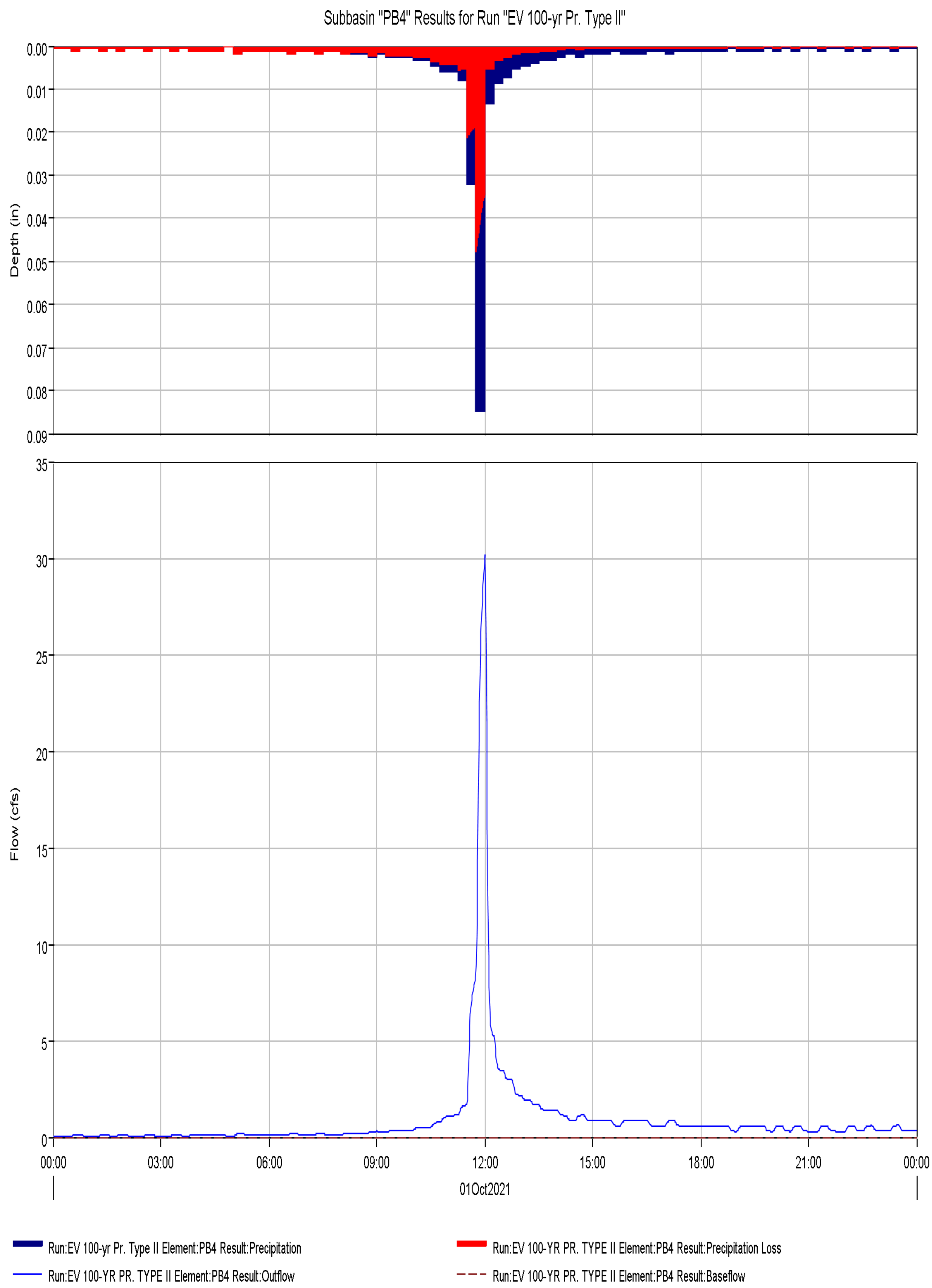
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-OB2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	52.7 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	52.5 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:09
Total Inflow :	4.7 (AC-FT)	Total Outflow :	4.7 (AC-FT)



Subbasin "PB4" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
35
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB4 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB4 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:PB4 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB4 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB4

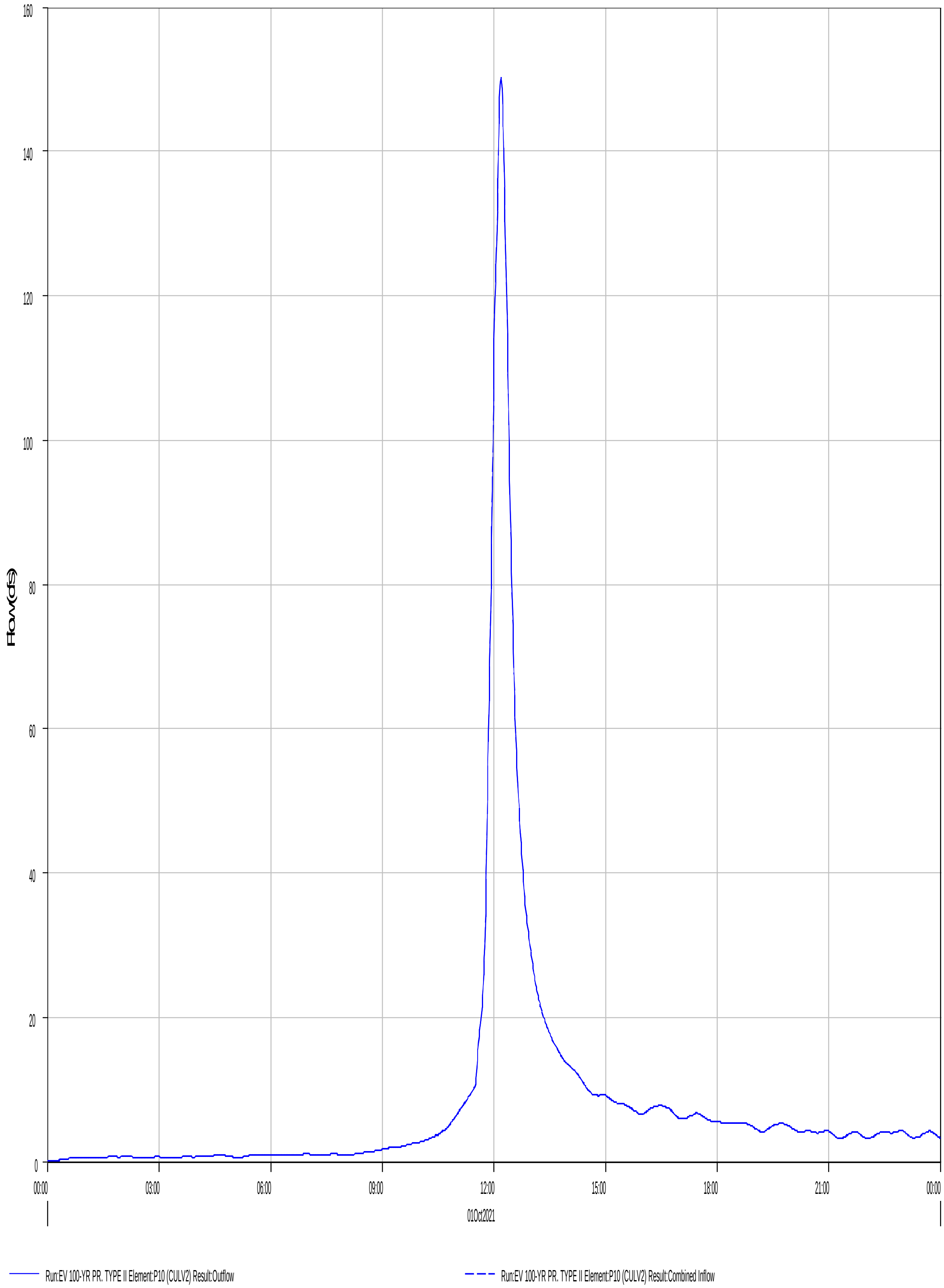
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	30.2 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:00
Total Precipitation :	4.0 (AC-FT)	Total Direct Runoff :	1.9 (AC-FT)
Total Loss :	2.2 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.9 (AC-FT)	Discharge :	1.9 (AC-FT)

Reach "P10 (CULV2)" Results for Run "EV 100-yr Pr. Type II"



Project: Eagleview_Subdivision

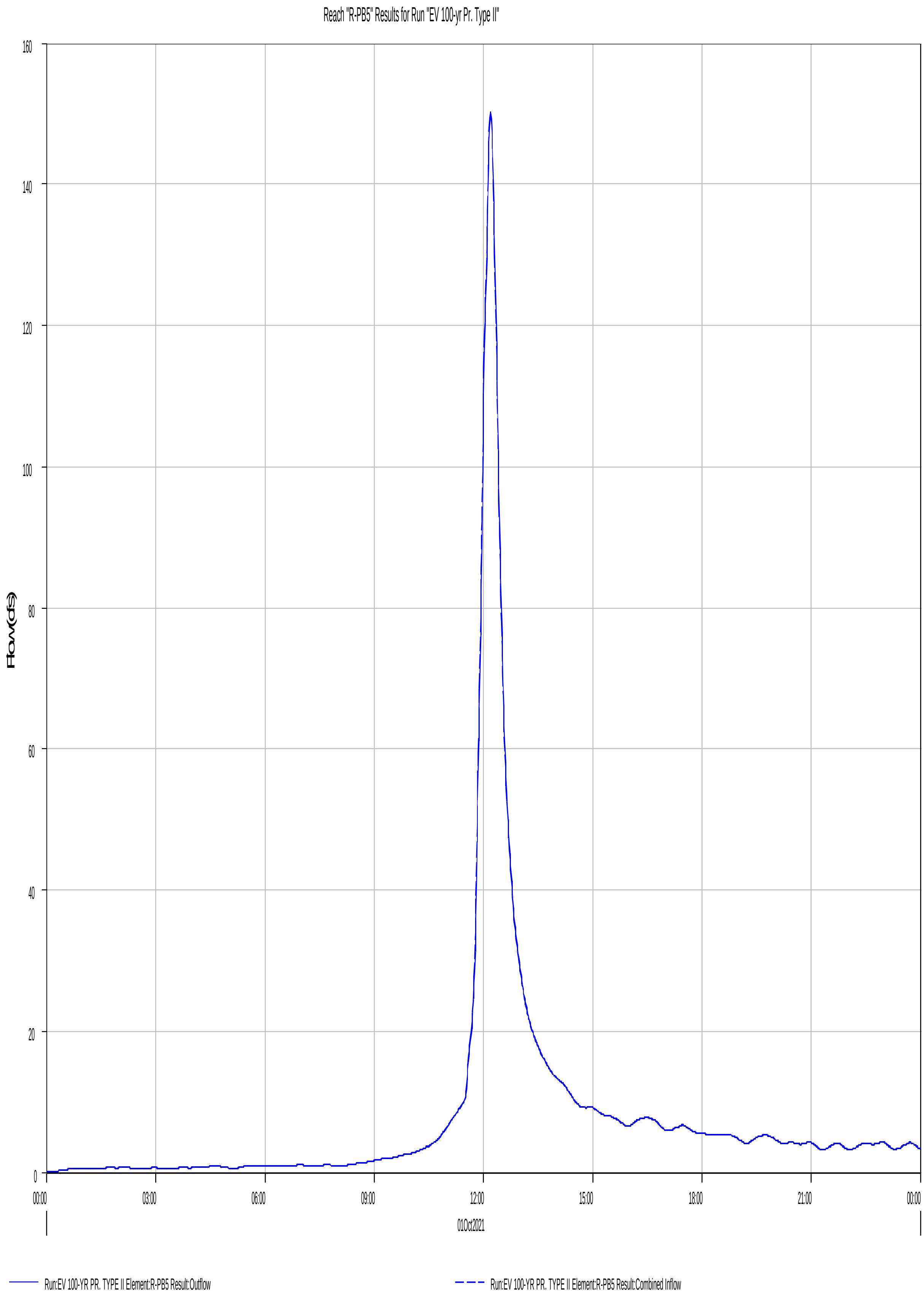
Simulation Run: EV 100-yr Pr. Type II Reach: P10 (CULV2)

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	150.3 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:12
Peak Outflow :	150.2 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:12
Total Inflow :	16.4 (AC-FT)	Total Outflow :	16.4 (AC-FT)



Reach "R-PB5" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
160
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-PB5 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-PB5 Result:Combined Inflow

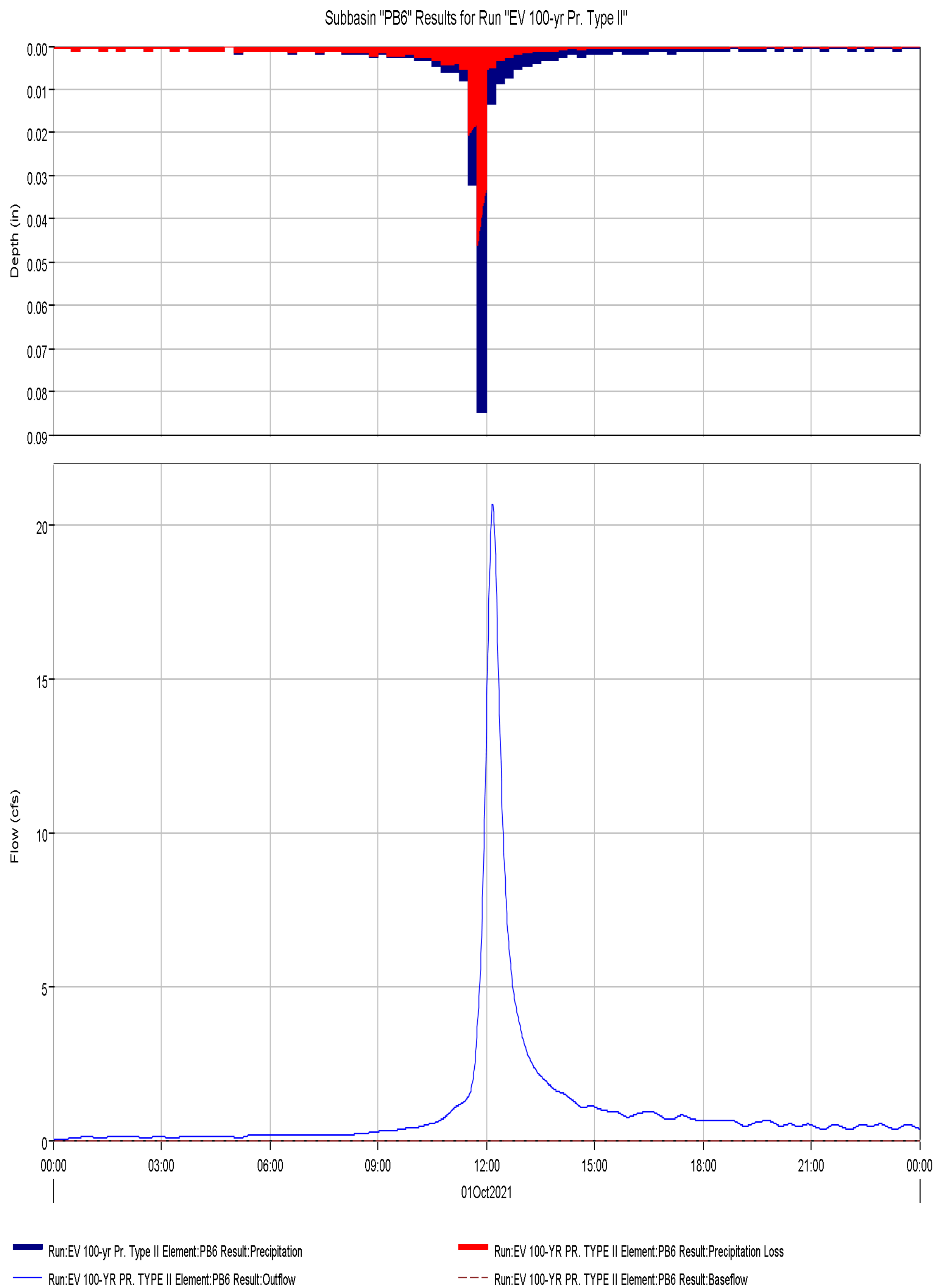
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-PB5

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	150.2 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:12
Peak Outflow :	150.1 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Inflow :	16.4 (AC-FT)	Total Outflow :	16.4 (AC-FT)


Subbasin "PB6" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
0
5
10
15
20
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB6 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB6 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:PB6 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB6 Result:Baseflow

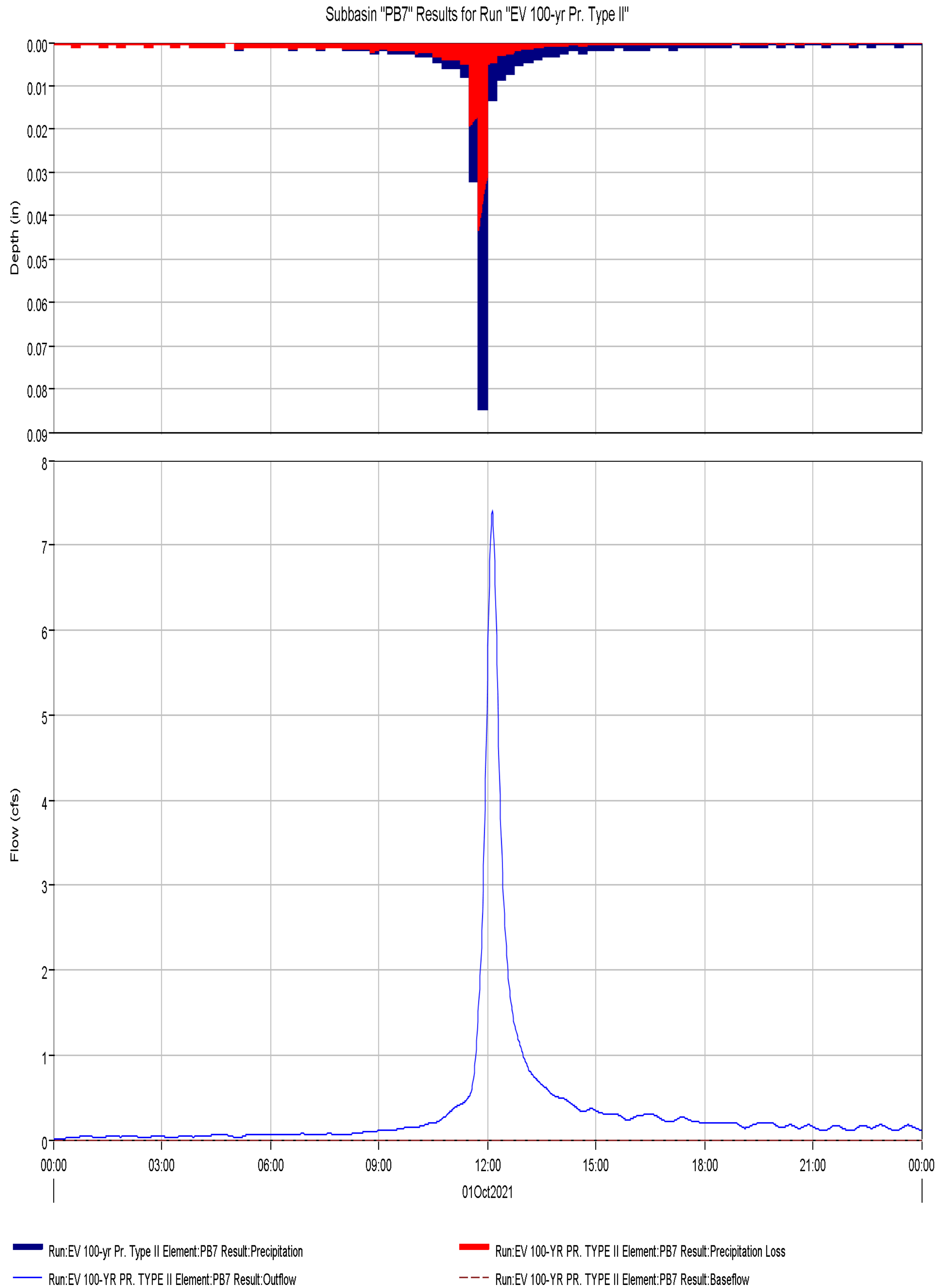
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB6

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	20.7 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:10
Total Precipitation :	4.3 (AC-FT)	Total Direct Runoff :	2.0 (AC-FT)
Total Loss :	2.2 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	2.1 (AC-FT)	Discharge :	2.0 (AC-FT)


Subbasin "PB7" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
8
7
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB7 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB7 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:PB7 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB7 Result:Baseflow

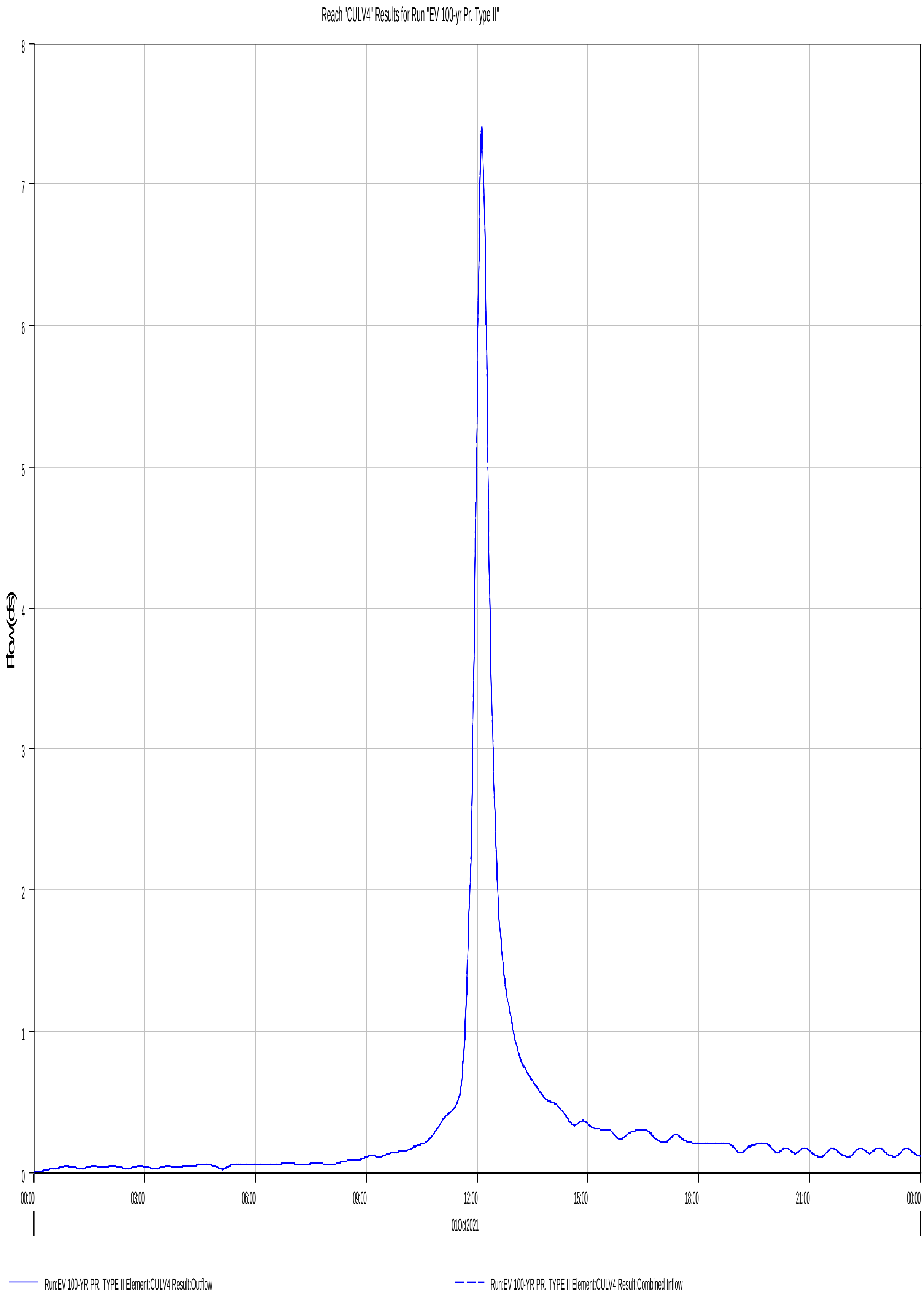
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB7

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	7.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	1.3 (AC-FT)	Total Direct Runoff :	0.7 (AC-FT)
Total Loss :	0.6 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.7 (AC-FT)	Discharge :	0.7 (AC-FT)



Reach "CULV4" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
8
7
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:CULV4 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:CULV4 Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: CULV4

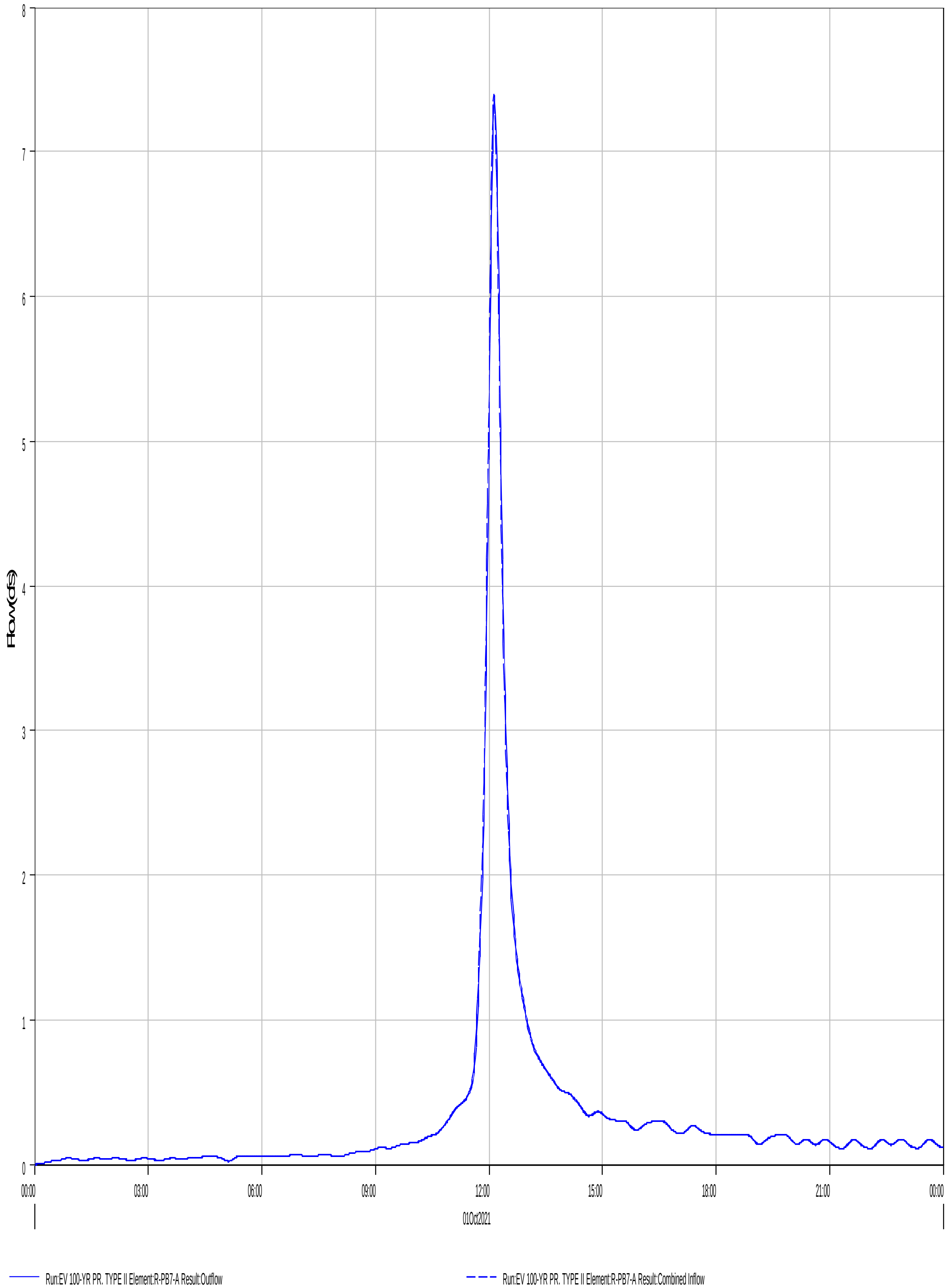
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	7.4 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	7.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:08
Total Inflow :	0.7 (AC-FT)	Total Outflow :	0.7 (AC-FT)

Reach "R-PB7-A" Results for Run "EV 100-yr Pr. Type II"



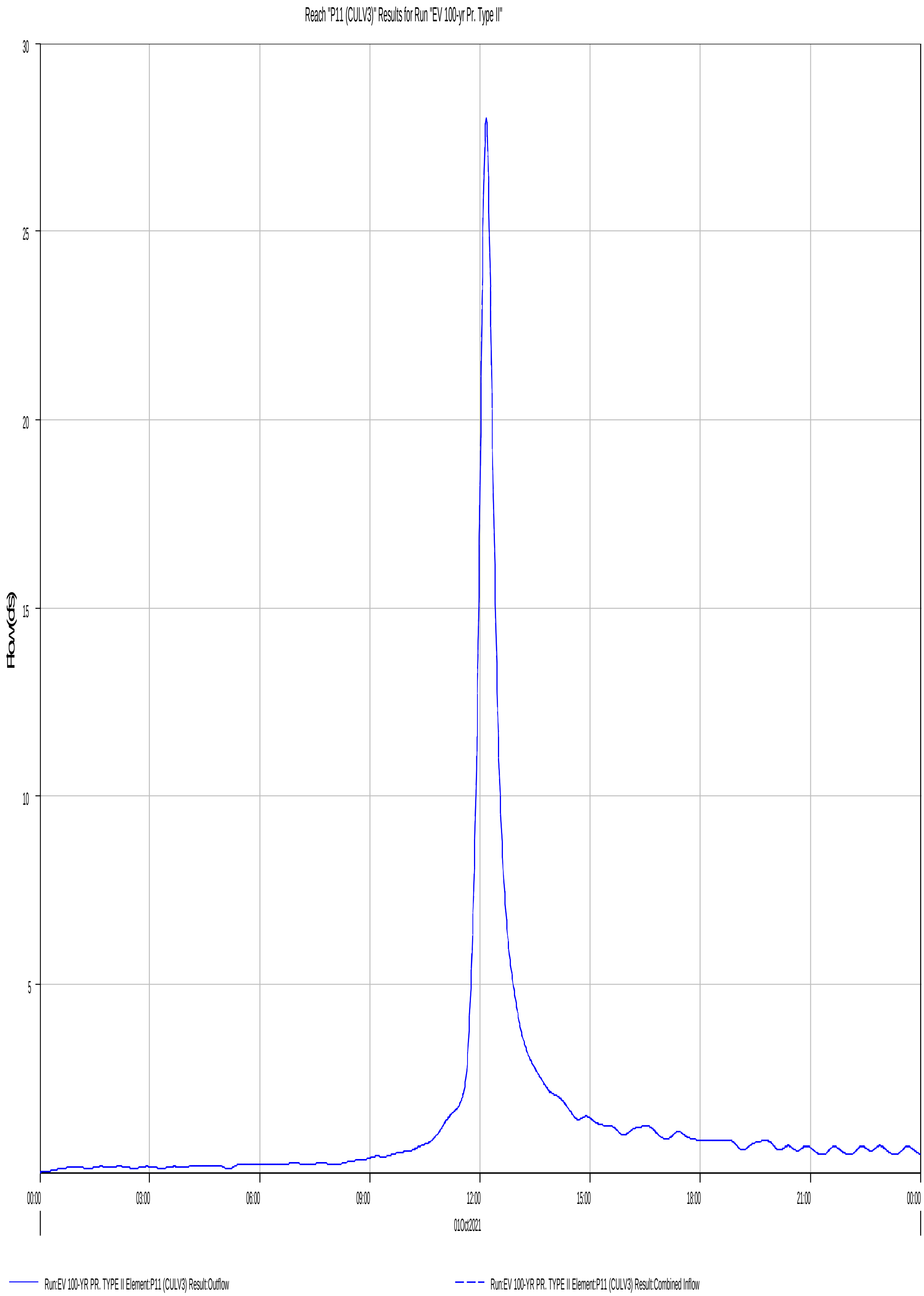
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-PB7-A

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	7.4 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	7.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:09
Total Inflow :	0.7 (AC-FT)	Total Outflow :	0.7 (AC-FT)



Reach "P11 (CULV3)" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
30
25
20
15
10
5
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:P11 (CULV3) Result:Outflow
Run:EV 100-YR PR. TYPE II Element:P11 (CULV3) Result:Combined Inflow

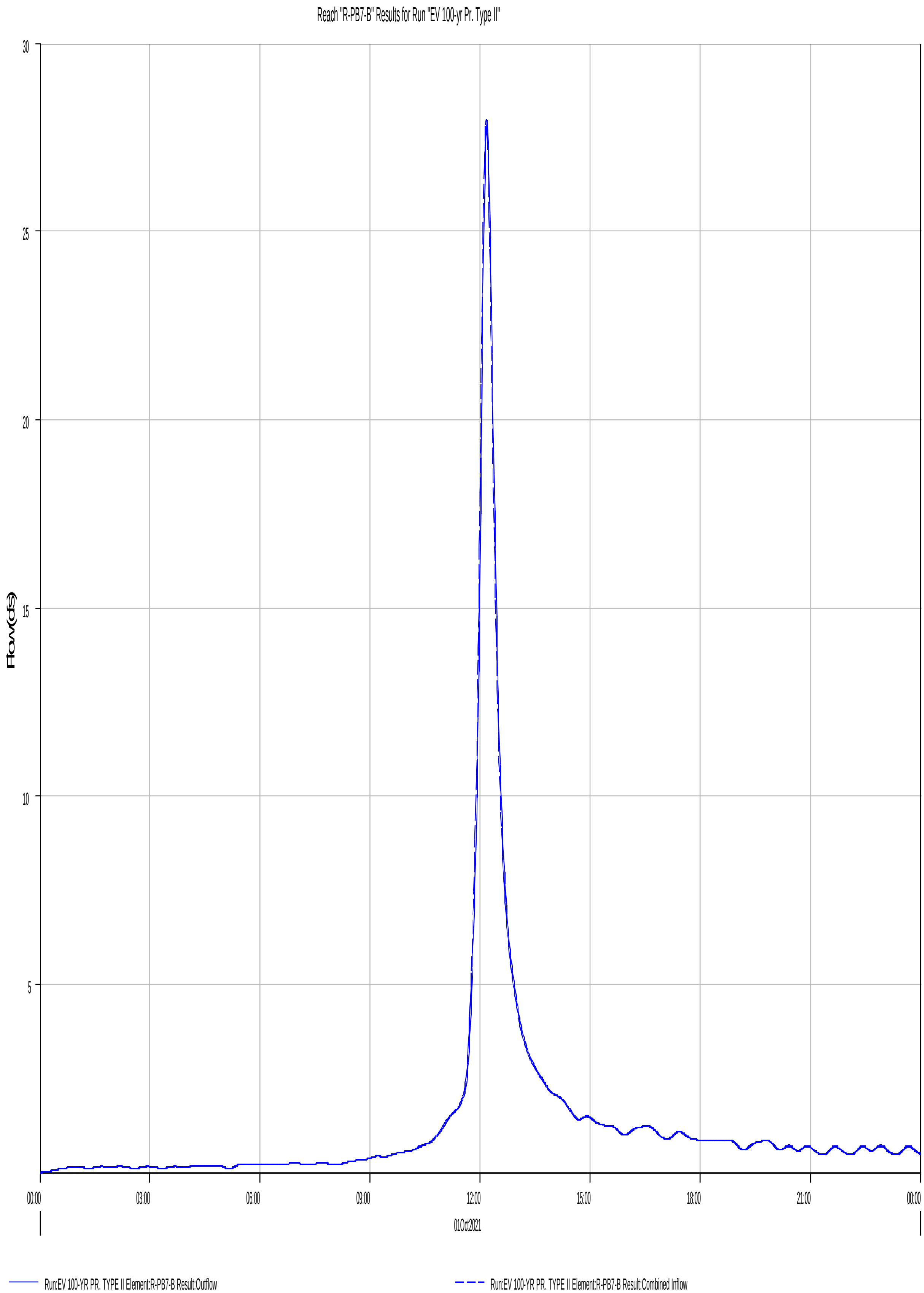
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: P11 (CULV3)

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	28.0 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:10
Peak Outflow :	28.0 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:10
Total Inflow :	2.7 (AC-FT)	Total Outflow :	2.7 (AC-FT)



Reach "R-PB7-B" Results for Run "EV 100-yr Pr. Type II"
30
25
20
15
10
5
Flow (cfs)
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-PB7-B Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-PB7-B Result:Combined Inflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-PB7-B

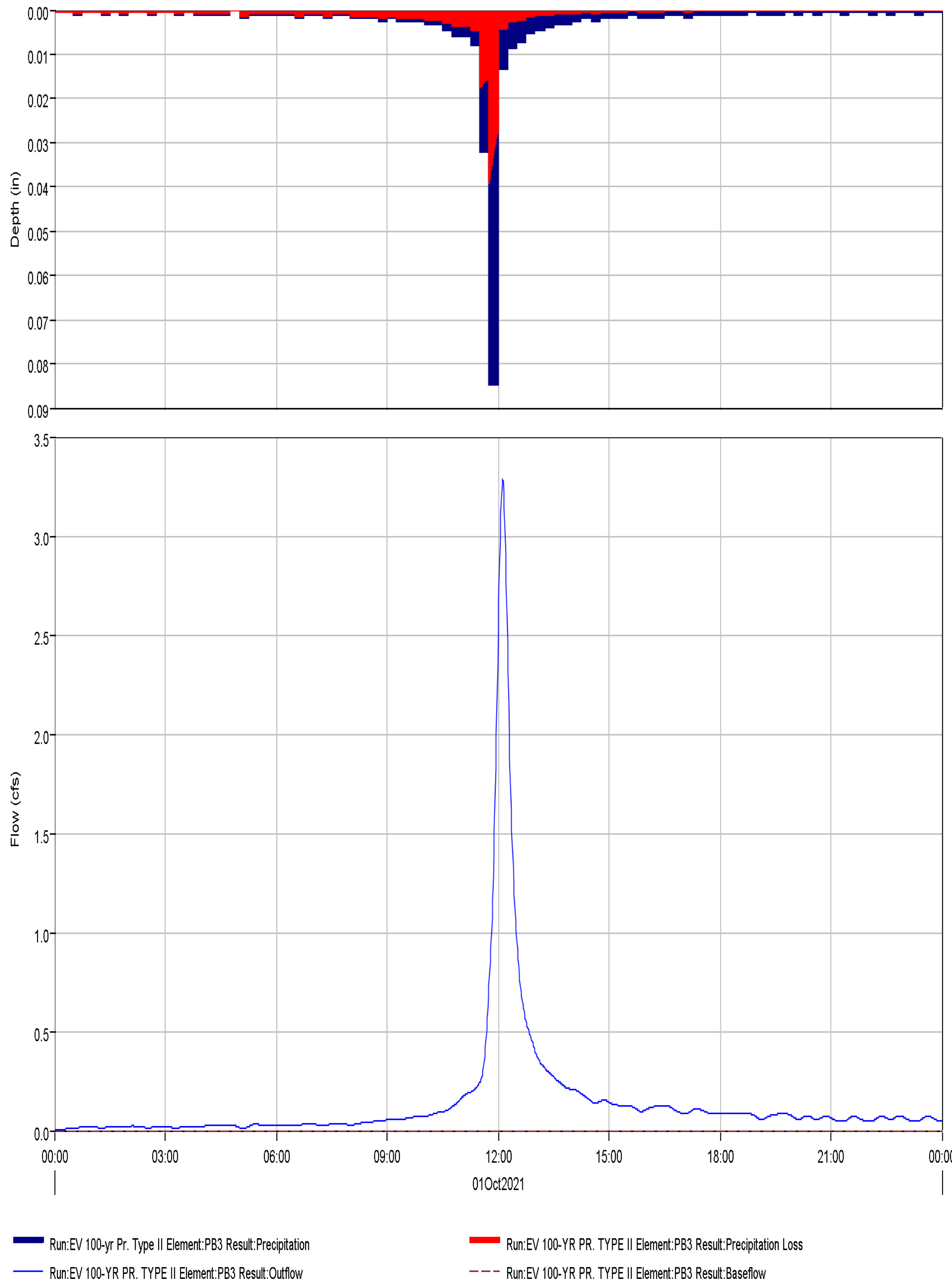
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	28.0 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:10
Peak Outflow :	27.9 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:11
Total Inflow :	2.7 (AC-FT)	Total Outflow :	2.7 (AC-FT)

Subbasin "PB3" Results for Run "EV 100-yr Pr. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB3

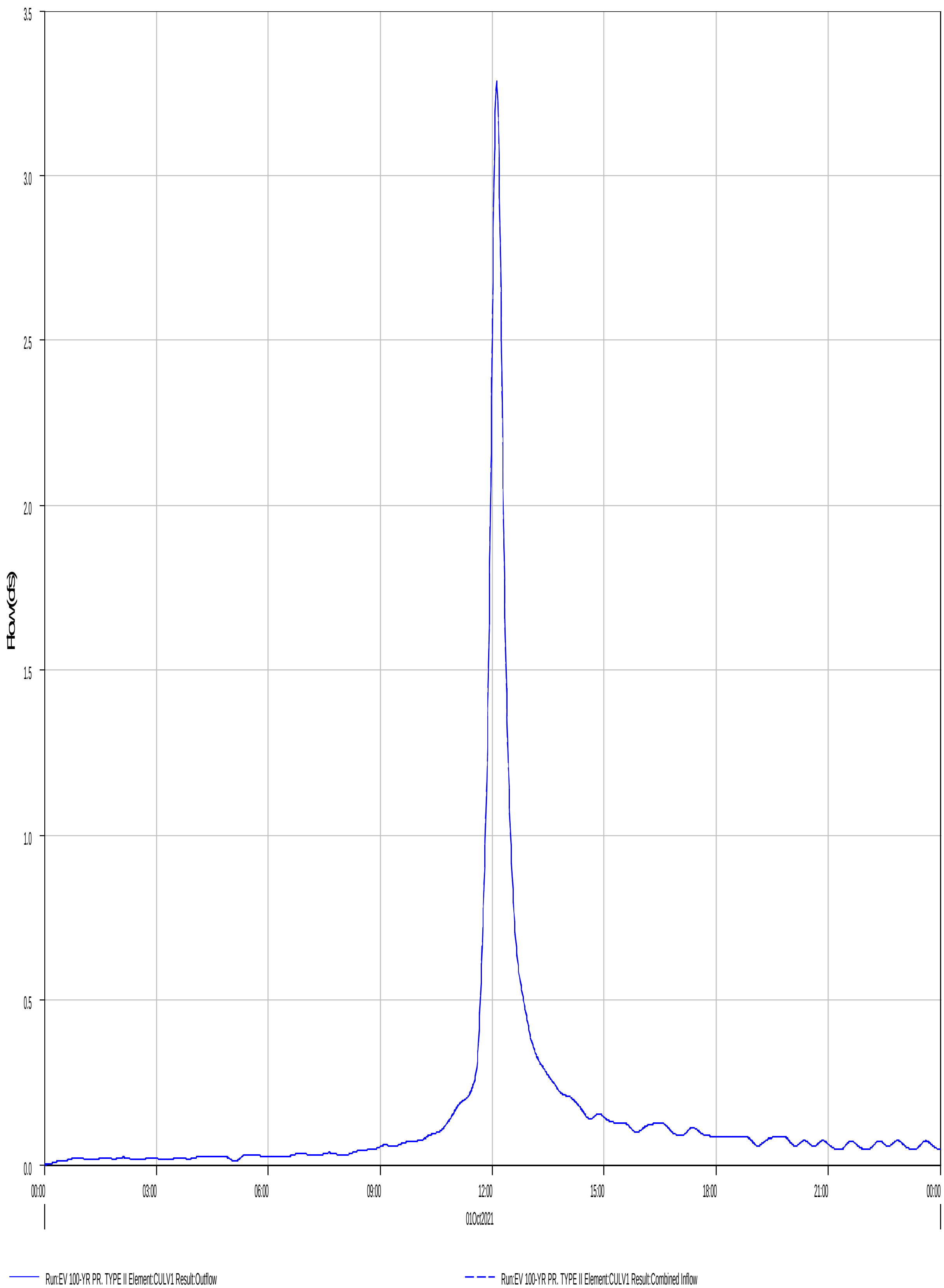
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	3.3 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:07
Total Precipitation :	0.5 (AC-FT)	Total Direct Runoff :	0.3 (AC-FT)
Total Loss :	0.2 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.3 (AC-FT)	Discharge :	0.3 (AC-FT)

Reach "CULV1" Results for Run "EV 100-yr Pr. Type II"



Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: CULV1

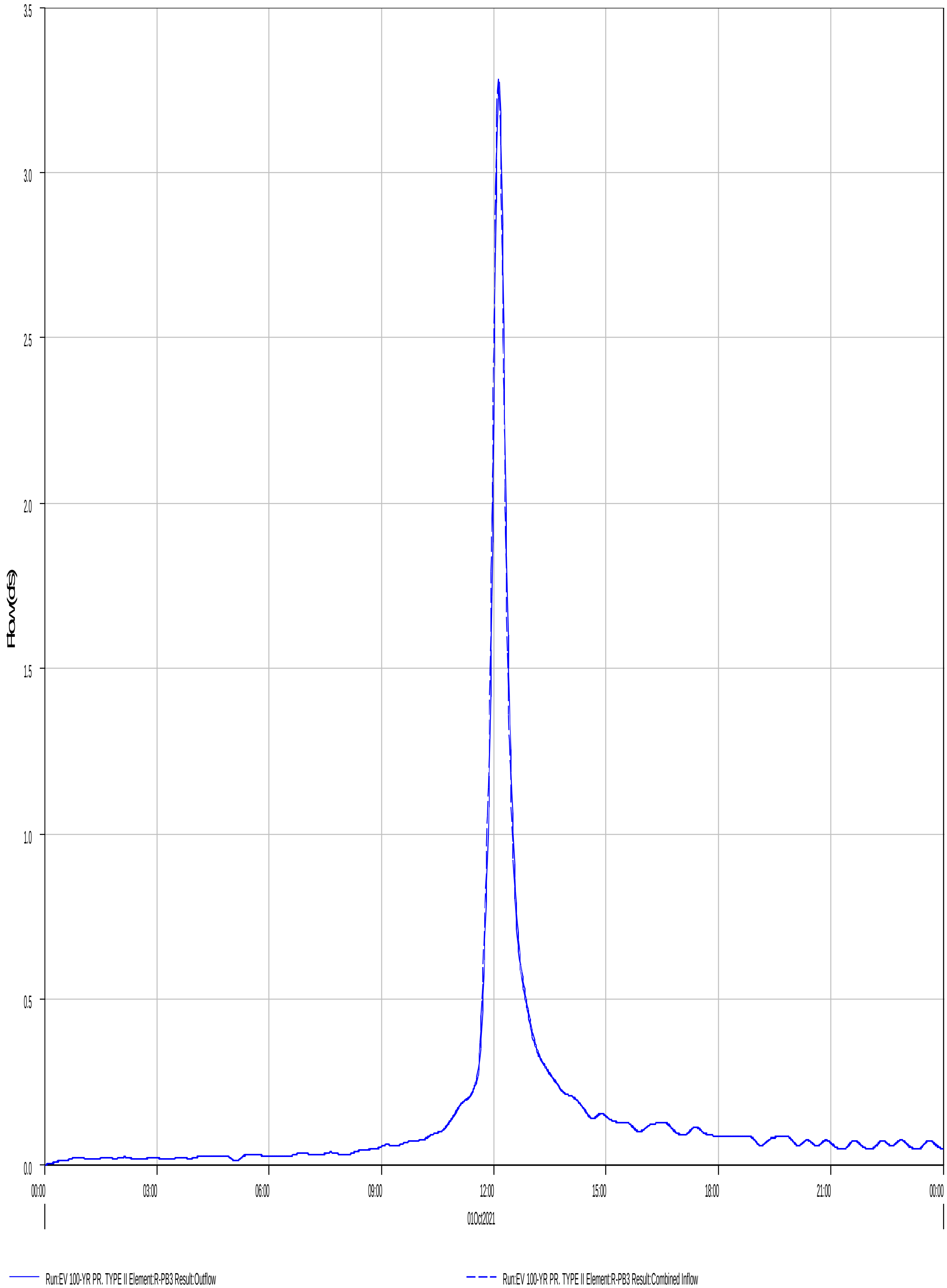
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	3.3 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:07
Peak Outflow :	3.3 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:07
Total Inflow :	0.3 (AC-FT)	Total Outflow :	0.3 (AC-FT)

Reach "R-PB3" Results for Run "EV 100-yr Pr. Type II"



Project: Eagleview_Subdivision

Simulation Run: EV 100-yr Pr. Type II Reach: R-PB3

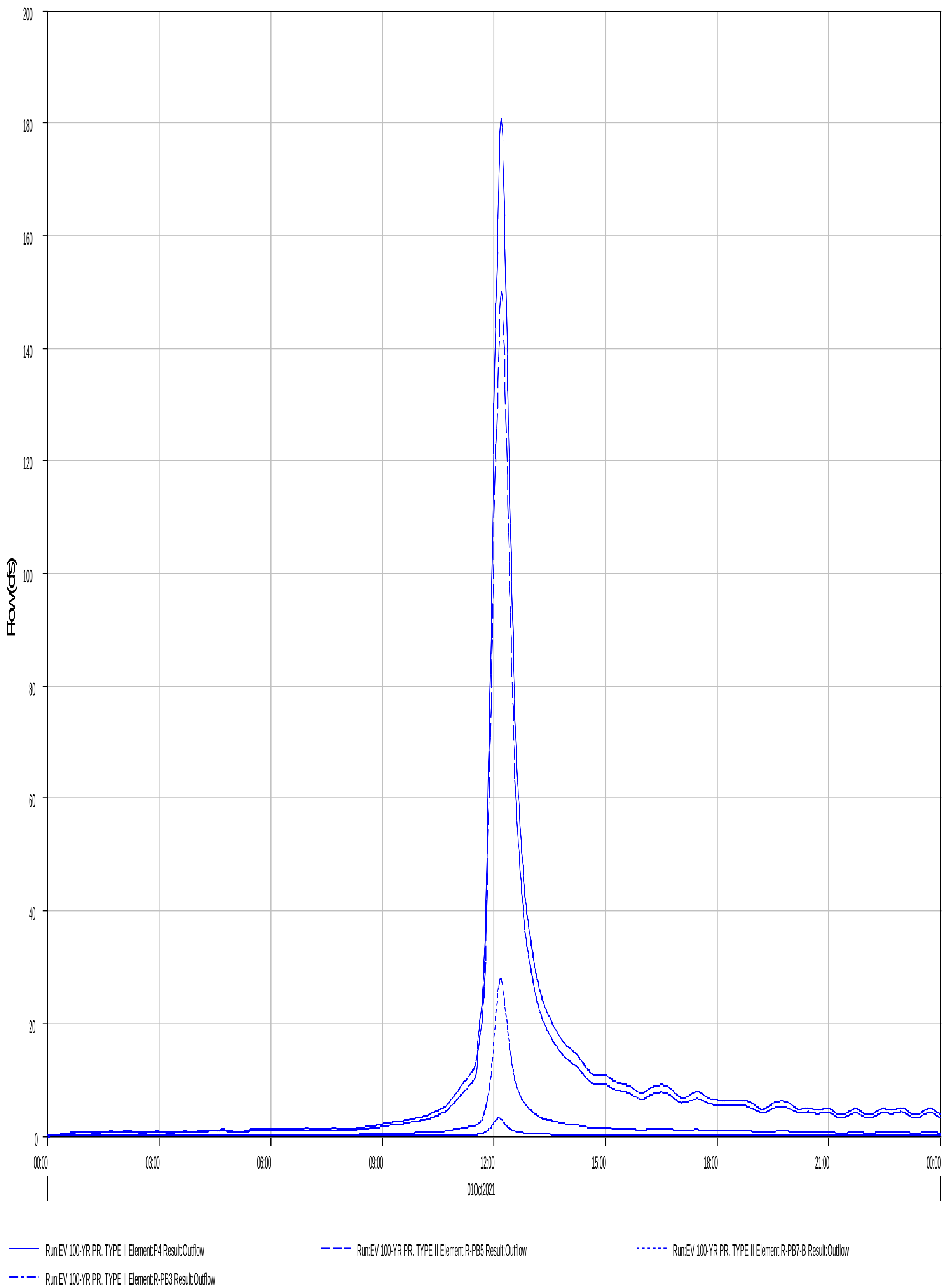
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	3.3 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:07
Peak Outflow :	3.3 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:09
Total Inflow :	0.3 (AC-FT)	Total Outflow :	0.3 (AC-FT)

Junction "P4" Results for Run "EV 100-yr Pr. Type II"



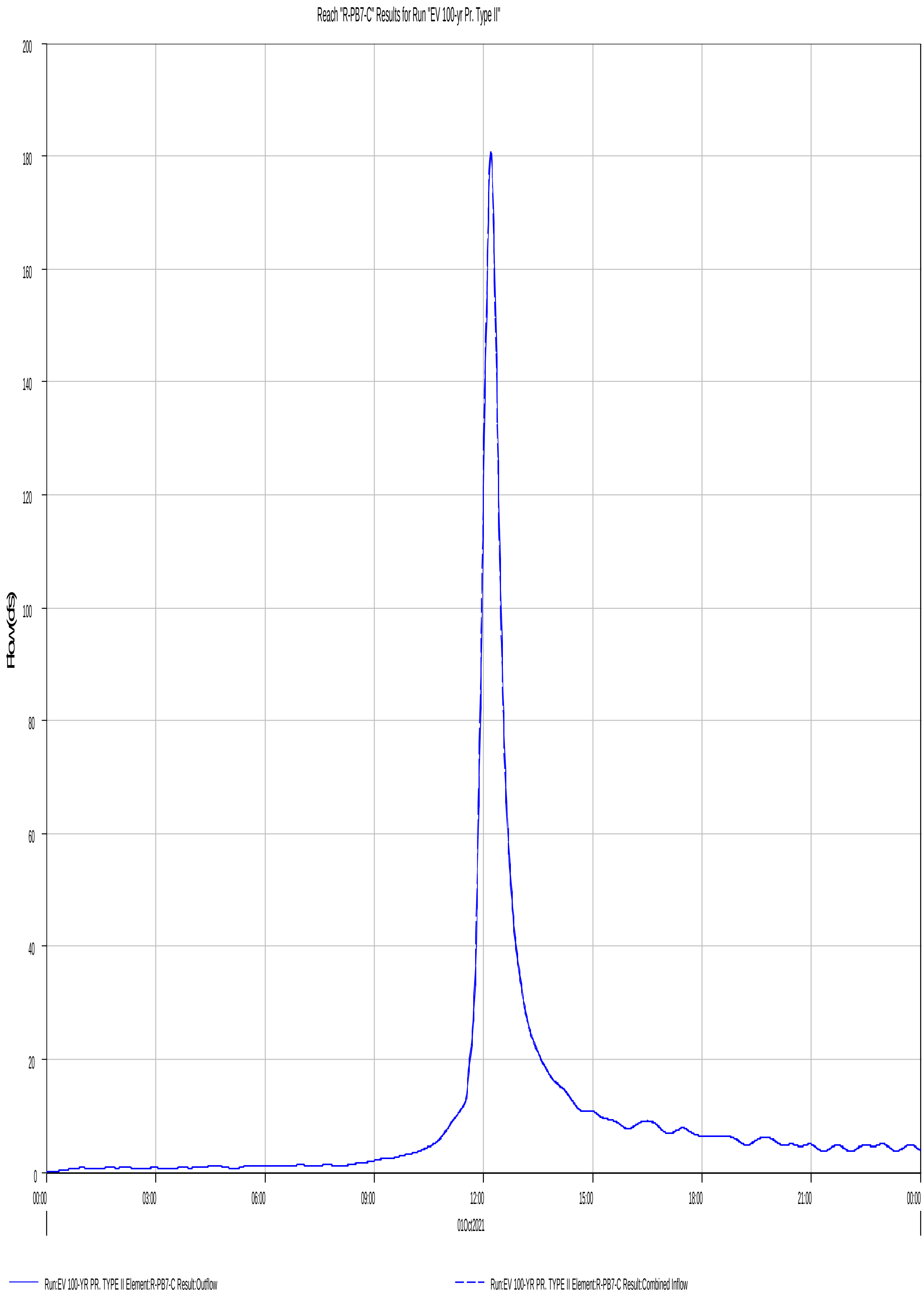
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Junction: P4

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	180.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:12
Total Outflow :	19.4 (AC-FT)		



Reach "R-PB7-C" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
200
180
160
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-PB7-C Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-PB7-C Result:Combined Inflow

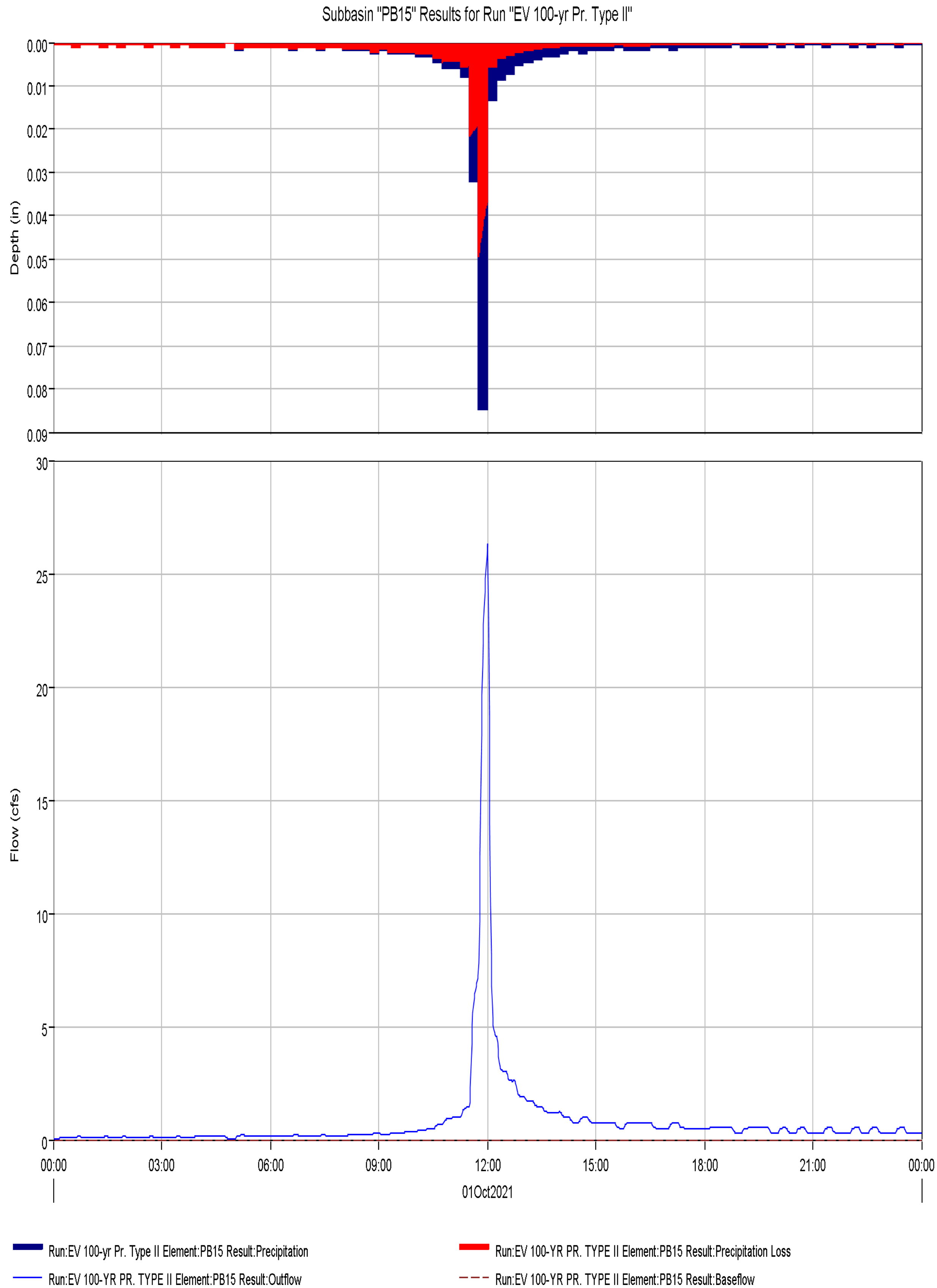
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Reach: R-PB7-C

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	180.8 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:12
Peak Outflow :	180.8 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Inflow :	19.4 (AC-FT)	Total Outflow :	19.4 (AC-FT)



Subbasin "PB15" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
30
25
20
15
10
5
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB15 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB15 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:PB15 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB15 Result:Baseflow

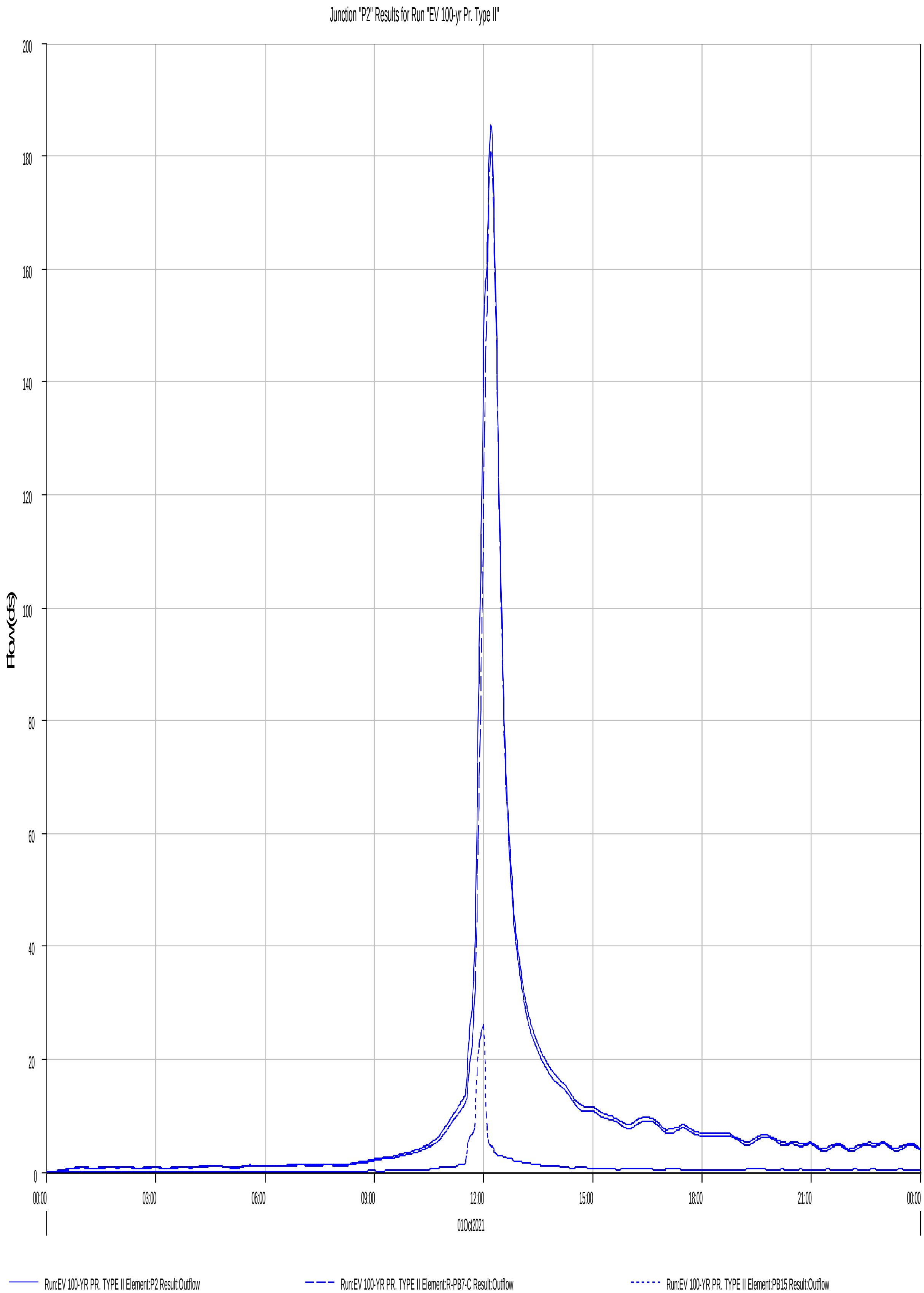
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB15

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	26.3 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:00
Total Precipitation :	3.7 (AC-FT)	Total Direct Runoff :	1.7 (AC-FT)
Total Loss :	2.0 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.7 (AC-FT)	Discharge :	1.7 (AC-FT)


Junction "P2" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
200
180
160
140
120
100
80
60
40
20
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:P2 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-PB7-C Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB15 Result:Outflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Junction: P2

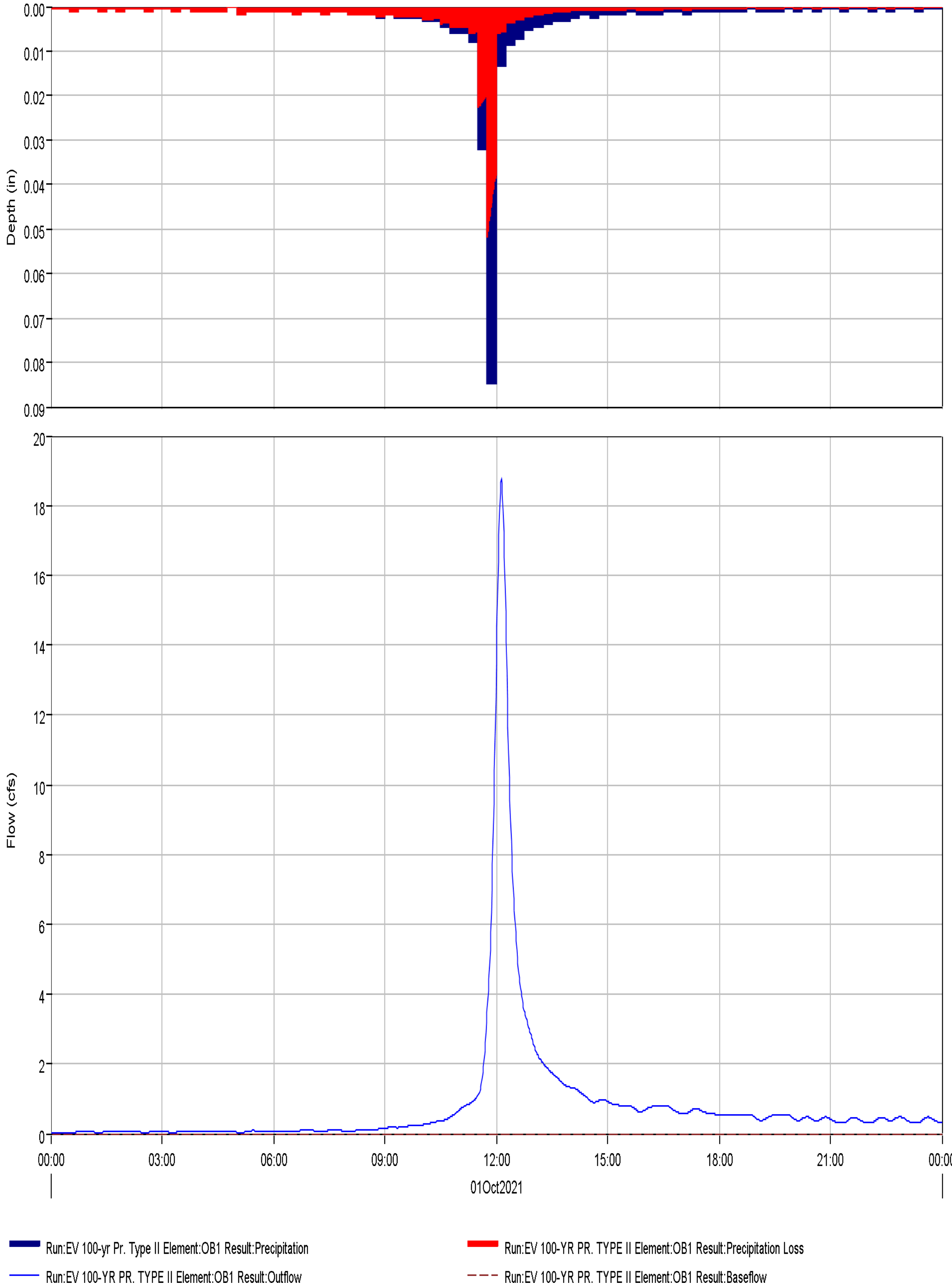
Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	185.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:13
Total Outflow :	21.1 (AC-FT)		

Subbasin "OB1" Results for Run "EV 100-yr Pr. Type II"



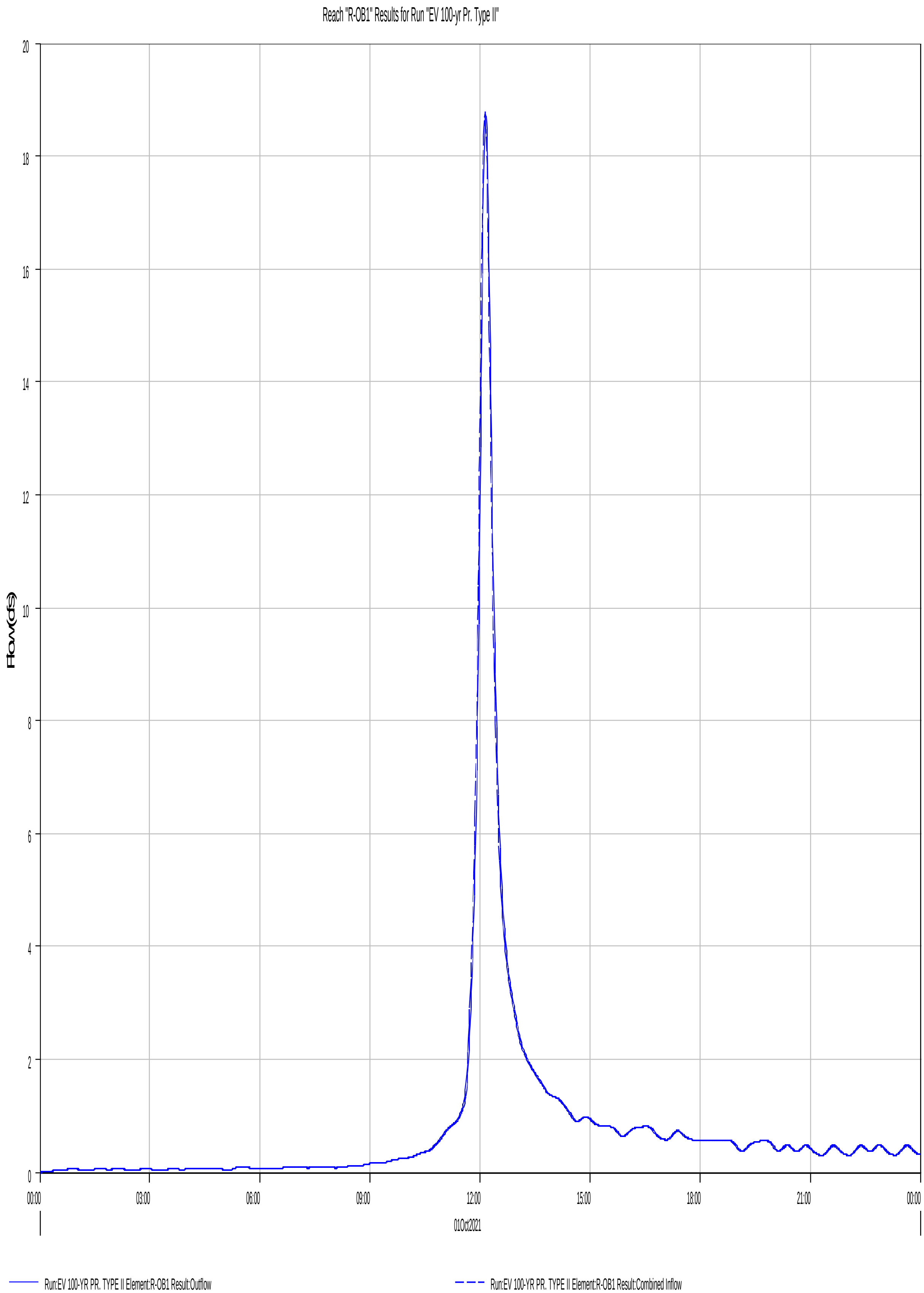
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: OB1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	18.8 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:08
Total Precipitation :	4.0 (AC-FT)	Total Direct Runoff :	1.7 (AC-FT)
Total Loss :	2.3 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	1.7 (AC-FT)	Discharge :	1.7 (AC-FT)



Reach "R-OB1" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
20
18
16
14
12
10
8
6
4
2
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:R-OB1 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-OB1 Result:Combined Inflow

Project: Eagleview_Subdivision

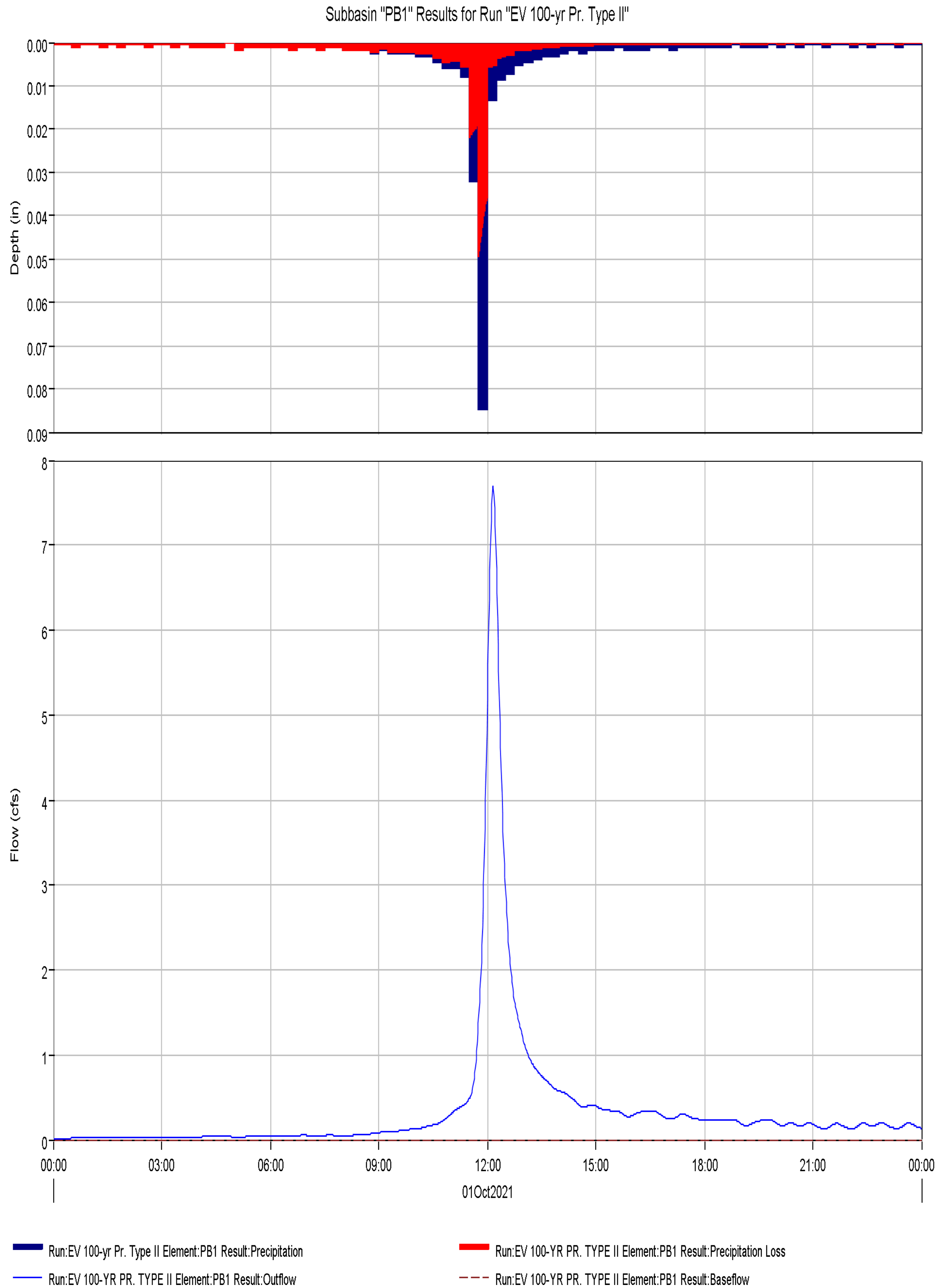
Simulation Run: EV 100-yr Pr. Type II   Reach: R-OB1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Inflow :	18.8 (CFS)	Date/Time of Peak Inflow :	01Oct2021, 12:08
Peak Outflow :	18.7 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:09
Total Inflow :	1.7 (AC-FT)	Total Outflow :	1.7 (AC-FT)


Subbasin "PB1" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
8
7
6
5
4
3
2
1
0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB1 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB1 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:PB1 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB1 Result:Baseflow

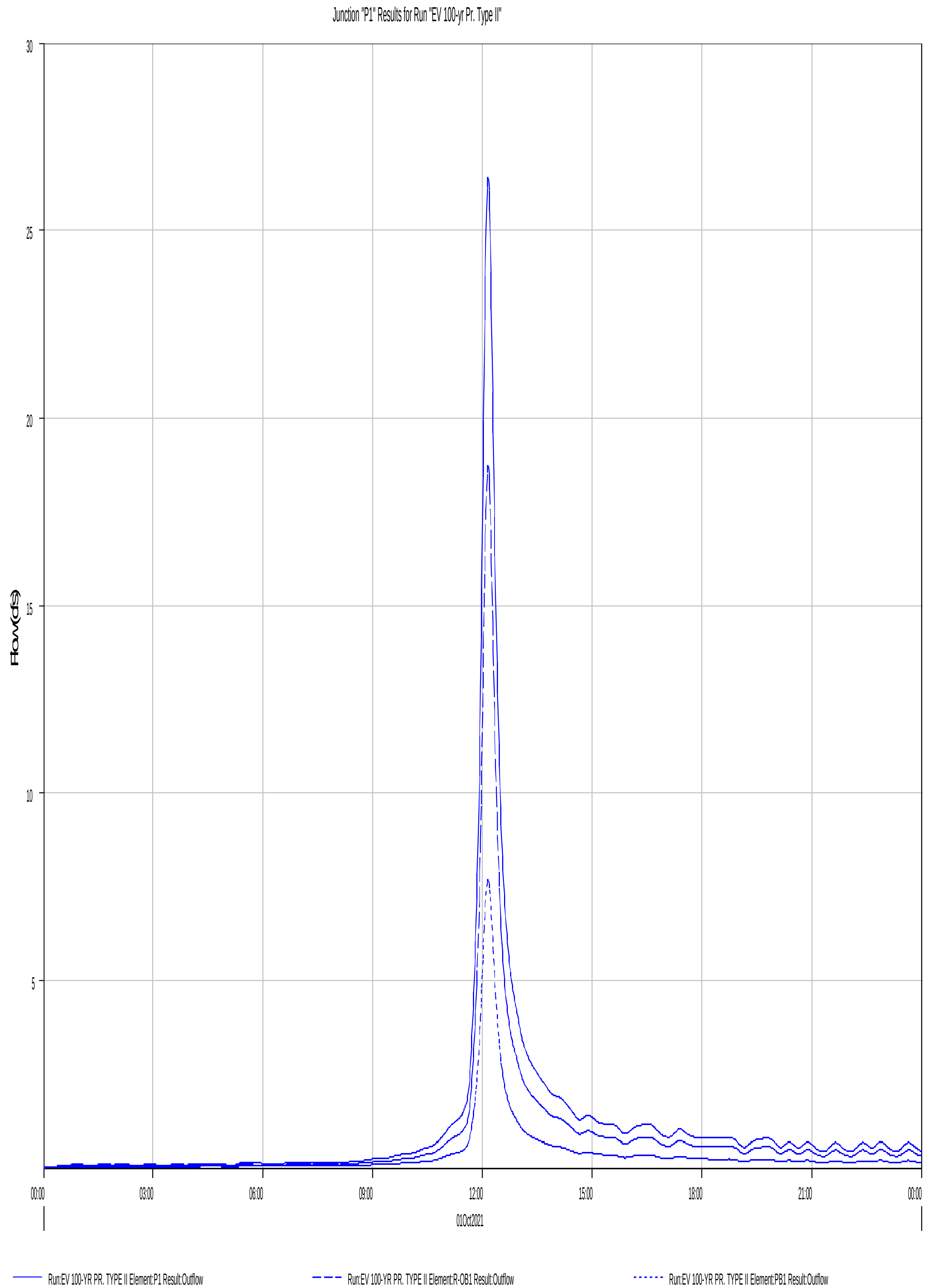
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	7.7 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:09
Total Precipitation :	1.6 (AC-FT)	Total Direct Runoff :	0.7 (AC-FT)
Total Loss :	0.9 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.7 (AC-FT)	Discharge :	0.7 (AC-FT)


Junction "P1" Results for Run "EV 100-yr Pr. Type II"
Flow (cfs)
30
25
20
15
10
5
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-YR PR. TYPE II Element:P1 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:R-OB1 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB1 Result:Outflow

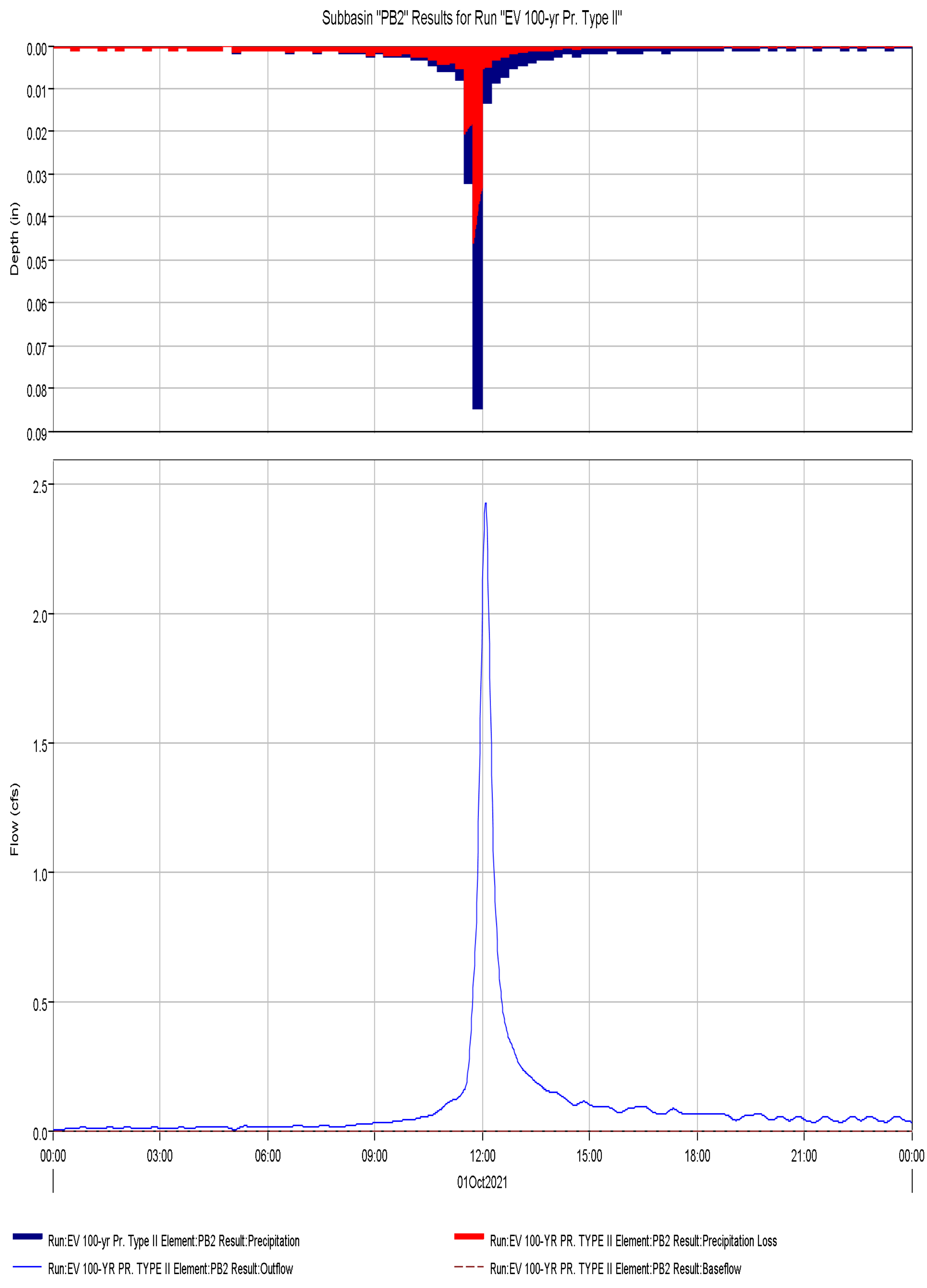
Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Junction: P1

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Outflow :	26.4 (CFS)	Date/Time of Peak Outflow :	01Oct2021, 12:09
Total Outflow :	2.4 (AC-FT)		



Subbasin "PB2" Results for Run "EV 100-yr Pr. Type II"
Depth (in)
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Flow (cfs)
2.5
2.0
1.5
1.0
0.5
0.0
00:00
03:00
06:00
09:00
12:00
15:00
18:00
21:00
00:00
01Oct2021
Run:EV 100-yr Pr. Type II Element:PB2 Result:Precipitation
Run:EV 100-YR PR. TYPE II Element:PB2 Result:Precipitation Loss
Run:EV 100-YR PR. TYPE II Element:PB2 Result:Outflow
Run:EV 100-YR PR. TYPE II Element:PB2 Result:Baseflow

Project: Eagleview_Subdivision
Simulation Run: EV 100-yr Pr. Type II Subbasin: PB2

Start of Run:	01Oct2021, 00:00	Basin Model:	Eagleview_Proposed
End of Run:	02Oct2021, 00:00	Meteorologic Model:	100-yr Type II
Compute Time:	19Dec2022, 10:08:23	Control Specifications:	24-hr Storm

Volume Units: AC-FT

Computed Results

Peak Discharge :	2.4 (CFS)	Date/Time of Peak Discharge :	01Oct2021, 12:06
Total Precipitation :	0.4 (AC-FT)	Total Direct Runoff :	0.2 (AC-FT)
Total Loss :	0.2 (AC-FT)	Total Baseflow :	0.0 (AC-FT)
Total Excess :	0.2 (AC-FT)	Discharge :	0.2 (AC-FT)

Worksheet for R-B1 (Tri)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.031	ft/ft
Left Side Slope	1.300	H:V
Right Side Slope	1.300	H:V
Discharge	18.80	cfs

Results

Normal Depth	18.3	in
Flow Area	3.0	ft²
Wetted Perimeter	5.0	ft
Hydraulic Radius	7.2	in
Top Width	3.96	ft
Critical Depth	20.0	in
Critical Slope	0.019	ft/ft
Velocity	6.23	ft/s
Velocity Head	0.60	ft
Specific Energy	2.13	ft
Froude Number	1.258	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	18.3	in
Critical Depth	20.0	in
Channel Slope	0.031	ft/ft
Critical Slope	0.019	ft/ft

Worksheet for R-OB4 (Tri)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.020	ft/ft
Left Side Slope	1.300	H:V
Right Side Slope	1.300	H:V
Discharge	136.10	cfs

Results

Normal Depth	41.7	in
Flow Area	15.7	ft²
Wetted Perimeter	11.4	ft
Hydraulic Radius	16.5	in
Top Width	9.03	ft
Critical Depth	44.2	in
Critical Slope	0.015	ft/ft
Velocity	8.67	ft/s
Velocity Head	1.17	ft
Specific Energy	4.64	ft
Froude Number	1.160	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	41.7	in
Critical Depth	44.2	in
Channel Slope	0.020	ft/ft
Critical Slope	0.015	ft/ft

Worksheet for R-OB5 (Trap)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030
Channel Slope	0.020 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	15.00 ft
Discharge	106.90 cfs

Results

Normal Depth	11.6 in
Flow Area	17.4 ft²
Wetted Perimeter	21.1 ft
Hydraulic Radius	9.9 in
Top Width	20.82 ft
Critical Depth	13.0 in
Critical Slope	0.014 ft/ft
Velocity	6.15 ft/s
Velocity Head	0.59 ft
Specific Energy	1.56 ft
Froude Number	1.187
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	11.6 in
Critical Depth	13.0 in
Channel Slope	0.020 ft/ft
Critical Slope	0.014 ft/ft

Worksheet for R-OB6 (Trap)

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Roughness Coefficient	0.030
Channel Slope	0.020 ft/ft
Left Side Slope	3.000 H:V
Right Side Slope	3.000 H:V
Bottom Width	15.00 ft
Discharge	371.30 cfs

Results	
Normal Depth	23.4 in
Flow Area	40.7 ft²
Wetted Perimeter	27.3 ft
Hydraulic Radius	17.9 in
Top Width	26.70 ft
Critical Depth	27.3 in
Critical Slope	0.011 ft/ft
Velocity	9.13 ft/s
Velocity Head	1.30 ft
Specific Energy	3.25 ft
Froude Number	1.304
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	23.4 in
Critical Depth	27.3 in
Channel Slope	0.020 ft/ft
Critical Slope	0.011 ft/ft

Worksheet for R-OB7 (Trap)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.020	ft/ft
Left Side Slope	3.000	H:V
Right Side Slope	3.000	H:V
Bottom Width	15.00	ft
Discharge	478.00	cfs

Results

Normal Depth	26.8	in
Flow Area	48.6	ft²
Wetted Perimeter	29.1	ft
Hydraulic Radius	20.0	in
Top Width	28.42	ft
Critical Depth	31.6	in
Critical Slope	0.011	ft/ft
Velocity	9.84	ft/s
Velocity Head	1.51	ft
Specific Energy	3.74	ft
Froude Number	1.328	
Flow Type	Supercritical	

GVF Input Data

Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	26.8	in
Critical Depth	31.6	in
Channel Slope	0.020	ft/ft
Critical Slope	0.011	ft/ft

Worksheet for R-OB8 (Tri)

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Roughness Coefficient	0.030
Channel Slope	0.033 ft/ft
Left Side Slope	1.300 H:V
Right Side Slope	1.300 H:V
Discharge	51.60 cfs

Results

Normal Depth	26.4 in
Flow Area	6.3 ft²
Wetted Perimeter	7.2 ft
Hydraulic Radius	10.5 in
Top Width	5.72 ft
Critical Depth	30.0 in
Critical Slope	0.017 ft/ft
Velocity	8.21 ft/s
Velocity Head	1.05 ft
Specific Energy	3.25 ft
Froude Number	1.380
Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

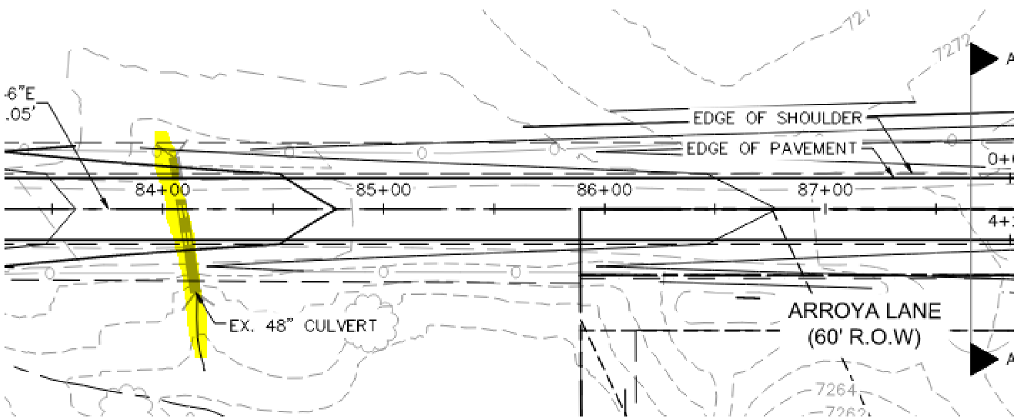
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	26.4 in
Critical Depth	30.0 in
Channel Slope	0.033 ft/ft
Critical Slope	0.017 ft/ft

APPENDIX C: HYDRAULICS

Culvert Summary Table													
Culvert	Design Point	Pipe Size (in)	Barrels (No.)	Design Discharge Q100 (cfs)	Low Tailwater Basin Bottom Width -W (ft)	Low Tailwater Basin Length - L (ft)	Low Tailwater Basin Top Width (ft)	Headwater Depth	Upstream Invert	HW/D	HGL (Upstream Ponding Depth Elevation)	Culvert Normal Depth [HGL in Culvert] (ft)
1	PB3	18	1	3.3	4	15	16	1	7207.85	0.67	7208.85	0.56
2	P10	36	3	150.2	26	20	38	4	7205.35	1.33	7209.35	2.41
3	P11	24	2	28	12	15	24	2.13	7204.5	1.07	7206.63	1.08
4	PB7	18	1	7.4	4	15	16	1.71	7210.32	1.14	7212.03	0.94
5	PB 13 N/A	18	1	0.9	4	15	16	0.48	7216.66	0.32	7217.14	0.36
6	P9	36	2	79.1	16	20	28	3.26	7214.87	1.09	7218.13	1.73
7	P5	36	2	96.1	16	20	28	3.82	7230.29	1.27	7234.11	1.35
8	P12	72	2	388.5	22	32	34	5.9	7202.32	0.98	7208.22	4.04
Pond Outfall	P7	72	2	387	22	32	34	N/A	7208.5	N/A	N/A	2.8
*WQ Feature 1	N/A	24	1	19.1	4	15	16	N/A	7192	N/A	N/A	2
*WQ Feature 2	N/A	18	1	6.1	4	15	16	N/A	7199.39	N/A	N/A	0.98

*The water quality features are designed to release the 2-year flow.

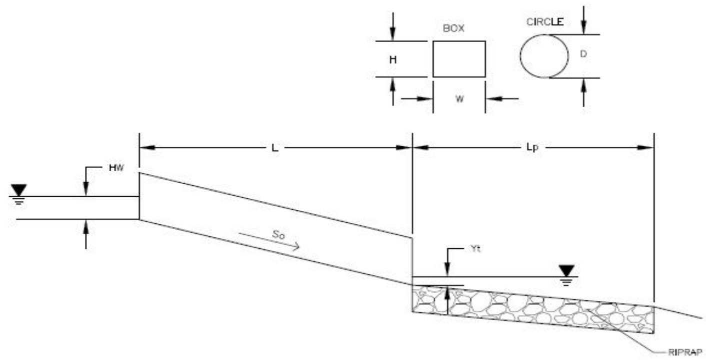
Provide analysis of the existing 48" culvert on Arroya Lane and determine if end treatment/erosion protection is needed.



DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Culvert 1



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	3.3	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	18	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7207.85	ft
Outlet Elevation OR Slope	Elev OUT =	7207.09	ft
Culvert Length	L =	79.8	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

Calculated Results:

Culvert Cross Sectional Area Available	A =	1.77	ft^2
Culvert Normal Depth	Y_n =	0.56	ft
Culvert Critical Depth	Y_c =	0.69	ft
Froude Number	Fr =	1.50	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	1.23	
Sum of All Loss Coefficients	k_s =	2.73	ft
Headwater:			
Inlet Control Headwater	HW_I =	1.00	ft
Outlet Control Headwater	HW_O =	N/A	ft
Design Headwater Elevation	HW =	N/A	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	N/A	

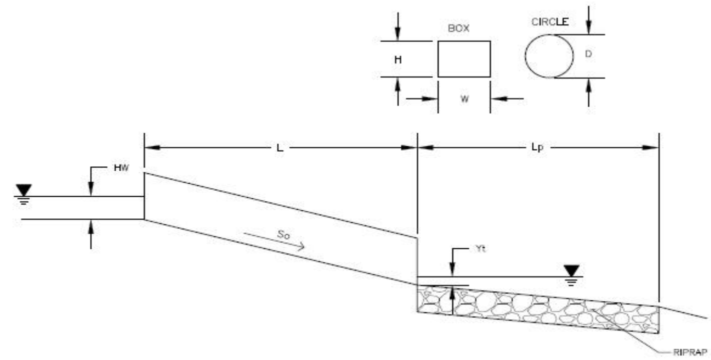
Outlet Control Headwater Approximation Method Inaccurate for Low Flow - Backwater Calculations Required

Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	1.20	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	0.60	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	6.51	
Flow Area at Max Channel Velocity	A_t =	0.66	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	5	ft
Width of Riprap Protection at Downstream End	T =	3	ft
Adjusted Diameter for Supercritical Flow	Da =	1.03	ft
Minimum Theoretical Riprap Size	d_{50} min=	2	in
Nominal Riprap Size	d_{50} nominal=	6	in
MHFD Riprap Type	Type =	VL	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Culvert 2



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Design Information:

Design Discharge	Q =	150.2	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	36	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	3	
Inlet Elevation	Elev IN =	7205.35	ft
Outlet Elevation OR Slope	Elev OUT =	7204.97	ft
Culvert Length	L =	76.5	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

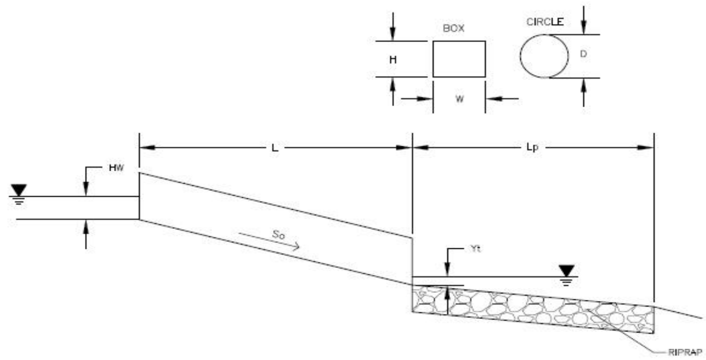
Calculated Results:

Culvert Cross Sectional Area Available	A =	7.07	ft^2
Culvert Normal Depth	Y_n =	2.41	ft
Culvert Critical Depth	Y_c =	2.30	ft
Froude Number	Fr =	0.91	
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.47	
Sum of All Loss Coefficients	k_s =	1.97	ft
Headwater:			
Inlet Control Headwater	HW_I =	4.00	ft
Outlet Control Headwater	HW_O =	3.81	ft
Design Headwater Elevation	HW =	7209.35	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.33	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	3.21	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	1.20	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.20	
Flow Area at Max Channel Velocity	A_t =	30.04	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	9.00	ft
Length of Riprap Protection	L_p =	30	ft
Width of Riprap Protection at Downstream End	T =	17	ft
Adjusted Diameter for Supercritical Flow	Da =	-	ft
Minimum Theoretical Riprap Size	d_{50} min=	8	in
Nominal Riprap Size	d_{50} nominal=	9	in
MHFD Riprap Type	Type =	L	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Culvert 3



Soil Type:
Choose One:
◉ Sandy
○ Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	28	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	24	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	2	
Inlet Elevation	Elev IN =	7204.5	ft
Outlet Elevation OR Slope	Elev OUT =	7203.49	ft
Culvert Length	L =	100.6	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t,\ Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

Calculated Results:

Culvert Cross Sectional Area Available	A =	3.14	ft^2
Culvert Normal Depth	Y_n =	1.08	ft
Culvert Critical Depth	Y_c =	1.35	ft
Froude Number	Fr =	1.53	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	1.06	
Sum of All Loss Coefficients	k_s =	2.56	ft
Headwater:			
Inlet Control Headwater	HW_I =	2.13	ft
Outlet Control Headwater	HW_O =	N/A	ft
Design Headwater Elevation	HW =	7206.63	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.07	

Outlet Control Headwater Approximation Method Inaccurate for Low Flow - Backwater Calculations Required

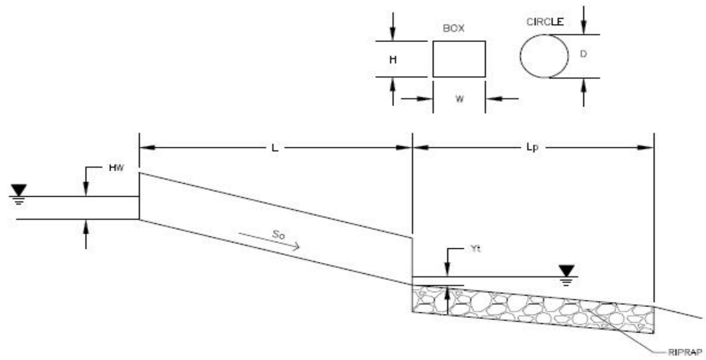
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	2.47	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	0.80	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	5.10	
Flow Area at Max Channel Velocity	A_t =	5.60	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	4.00	ft
Length of Riprap Protection	L_p =	16	ft
Width of Riprap Protection at Downstream End	T =	8	ft
Adjusted Diameter for Supercritical Flow	Da =	1.54	ft
Minimum Theoretical Riprap Size	d_{50} min=	4	in
Nominal Riprap Size	d_{50} nominal=	6	in
MHFD Riprap Type	Type =	VL	

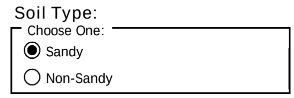
DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview

ID: Culvert 4





Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	7.4	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	18	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7210.32	ft
Outlet Elevation OR Slope	Elev OUT =	7209.67	ft
Culvert Length	L =	78.9	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

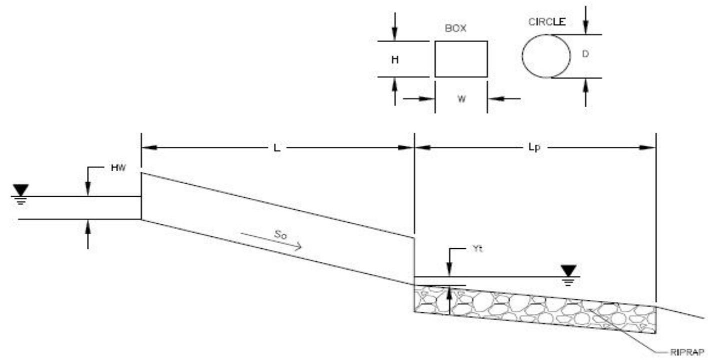
Calculated Results:

Culvert Cross Sectional Area Available	A =	1.77	ft^2
Culvert Normal Depth	Y_n =	0.94	ft
Culvert Critical Depth	Y_c =	1.05	ft
Froude Number	Fr =	1.25	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	1.22	
Sum of All Loss Coefficients	k_s =	2.72	ft
Headwater:			
Inlet Control Headwater	HW_I =	1.71	ft
Outlet Control Headwater	HW_O =	1.37	ft
Design Headwater Elevation	HW =	7212.03	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.14	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	2.69	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	0.60	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.81	
Flow Area at Max Channel Velocity	A_t =	1.48	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	5	ft
Width of Riprap Protection at Downstream End	T =	3	ft
Adjusted Diameter for Supercritical Flow	Da =	1.22	ft
Minimum Theoretical Riprap Size	d_{50} min=	4	in
Nominal Riprap Size	d_{50} nominal=	6	in
MHFD Riprap Type	Type =	VL	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Culvert 5



Soil Type:
Choose One:
◉ Sandy
○ Non-Sandy

Design Information:

Design Discharge	Q =	0.9	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	18	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7216.66	ft
Outlet Elevation OR Slope	Elev OUT =	7216.35	ft
Culvert Length	L =	62.6	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

Calculated Results:

Culvert Cross Sectional Area Available	A =	1.77	ft^2
Culvert Normal Depth	Y_n =	0.36	ft
Culvert Critical Depth	Y_c =	0.35	ft
Froude Number	Fr =	0.94	
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.97	
Sum of All Loss Coefficients	k_s =	2.47	ft
Headwater:			
Inlet Control Headwater	HW_I =	0.48	ft
Outlet Control Headwater	HW_O =	N/A	ft
Design Headwater Elevation	HW =	N/A	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	N/A	

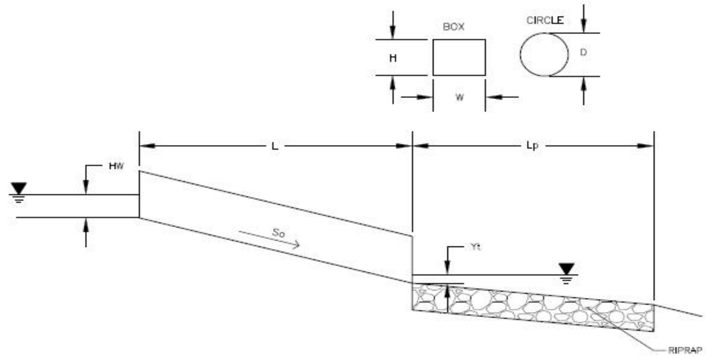
Outlet Control Headwater Approximation Method Inaccurate for Low Flow - Backwater Calculations Required

Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	0.33	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	0.60	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	6.70	
Flow Area at Max Channel Velocity	A_t =	0.18	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	5	ft
Width of Riprap Protection at Downstream End	T =	3	ft
Adjusted Diameter for Supercritical Flow	Da =	-	ft
Minimum Theoretical Riprap Size	d_{50} min=	0	in
Nominal Riprap Size	d_{50} nominal=	6	in
MHFD Riprap Type	Type =	VL	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Culvert 6



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	79.1	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	36	inches
Inlet Edge Type (Choose from pull-down list)		Square Edge with Headwall	
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	2	
Inlet Elevation	Elev IN =	7214.87	ft
Outlet Elevation OR Slope	Elev OUT =	7214.25	ft
Culvert Length	L =	83.3	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

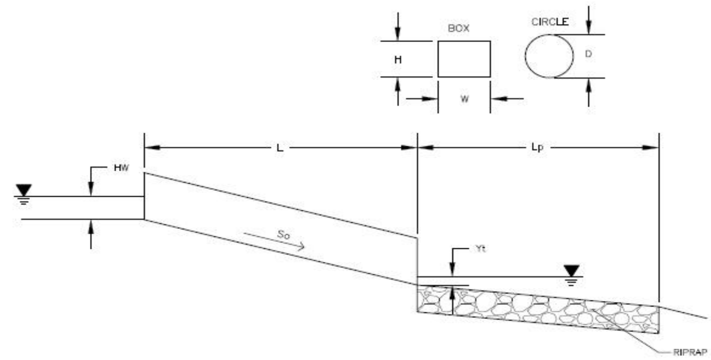
Calculated Results:

Culvert Cross Sectional Area Available	A =	7.07	ft^2
Culvert Normal Depth	Y_n =	1.73	ft
Culvert Critical Depth	Y_c =	2.05	ft
Froude Number	Fr =	1.38	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.51	
Sum of All Loss Coefficients	k_s =	2.01	ft
Headwater:			
Inlet Control Headwater	HW_I =	3.26	ft
Outlet Control Headwater	HW_O =	2.88	ft
Design Headwater Elevation	HW =	7218.13	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.09	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	2.54	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	1.20	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	5.01	
Flow Area at Max Channel Velocity	A_t =	15.82	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	6.00	ft
Length of Riprap Protection	L_p =	30	ft
Width of Riprap Protection at Downstream End	T =	12	ft
Adjusted Diameter for Supercritical Flow	Da =	2.37	ft
Minimum Theoretical Riprap Size	d_{50} min=	7	in
Nominal Riprap Size	d_{50} nominal=	9	in
MHFD Riprap Type	Type =	L	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Culvert 7



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	96.1	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	36	inches
Inlet Edge Type (Choose from pull-down list)		Square Edge with Headwall	
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	2	
Inlet Elevation	Elev IN =	7230.29	ft
Outlet Elevation OR Slope	Elev OUT =	7228.38	ft
Culvert Length	L =	76.4	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t,\ Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

Calculated Results:

Culvert Cross Sectional Area Available	A =	7.07	ft^2
Culvert Normal Depth	Y_n =	1.35	ft
Culvert Critical Depth	Y_c =	2.26	ft
Froude Number	Fr =	2.68	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.47	
Sum of All Loss Coefficients	k_s =	1.97	ft
Headwater:			
Inlet Control Headwater	HW_I =	3.82	ft
Outlet Control Headwater	HW_O =	N/A	ft
Design Headwater Elevation	HW =	7234.11	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.27	

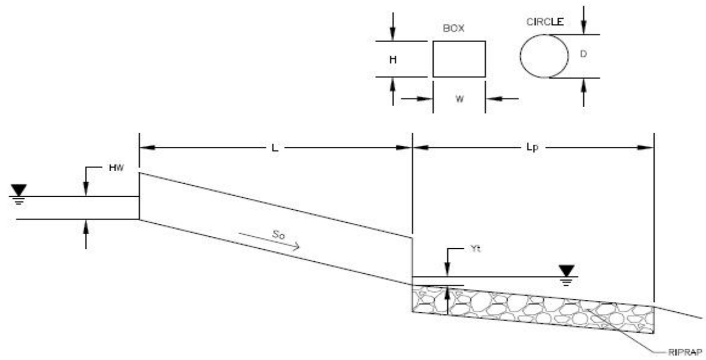
Outlet Control Headwater Approximation Method Inaccurate for Low Flow - Backwater Calculations Required

Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	3.08	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	1.20	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.31	
Flow Area at Max Channel Velocity	A_t =	19.22	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	6.00	ft
Length of Riprap Protection	L_p =	30	ft
Width of Riprap Protection at Downstream End	T =	13	ft
Adjusted Diameter for Supercritical Flow	Da =	2.18	ft
Minimum Theoretical Riprap Size	d_{50} min=	8	in
Nominal Riprap Size	d_{50} nominal=	9	in
MHFD Riprap Type	Type =	L	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Culvert 8



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Design Information:

Design Discharge	Q =	388.5	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	72	inches
Inlet Edge Type (Choose from pull-down list)		Square Edge with Headwall	
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	2	
Inlet Elevation	Elev IN =	7202.32	ft
Outlet Elevation OR Slope	Elev OUT =	7202	ft
Culvert Length	L =	113	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

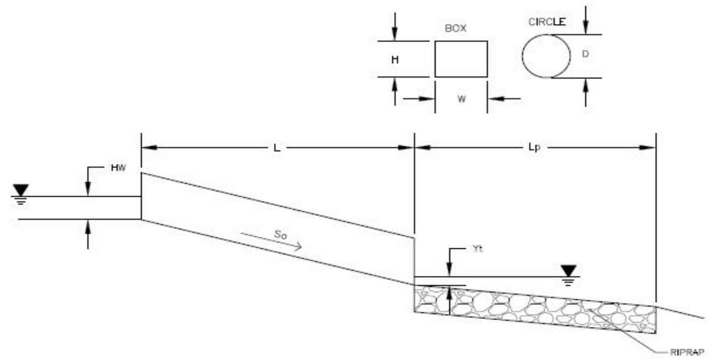
Calculated Results:

Culvert Cross Sectional Area Available	A =	28.27	ft^2
Culvert Normal Depth	Y_n =	4.04	ft
Culvert Critical Depth	Y_c =	3.81	ft
Froude Number	Fr =	0.89	
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.27	
Sum of All Loss Coefficients	k_s =	1.77	ft
Headwater:			
Inlet Control Headwater	HW_I =	5.90	ft
Outlet Control Headwater	HW_O =	5.88	ft
Design Headwater Elevation	HW =	7208.22	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	0.98	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	2.20	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	2.40	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	5.47	
Flow Area at Max Channel Velocity	A_t =	77.70	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	12.00	ft
Length of Riprap Protection	L_p =	60	ft
Width of Riprap Protection at Downstream End	T =	23	ft
Adjusted Diameter for Supercritical Flow	Da =	-	ft
Minimum Theoretical Riprap Size	d_{50} min=	11	in
Nominal Riprap Size	d_{50} nominal=	12	in
MHFD Riprap Type	Type =	M	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Pond Outfall



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	387	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	72	inches
Inlet Edge Type (Choose from pull-down list)		Square Edge with Headwall	
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	2	
Inlet Elevation	Elev IN =	7208.5	ft
Outlet Elevation OR Slope	Elev OUT =	7207.95	ft
Culvert Length	L =	61	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t,\ Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

Calculated Results:

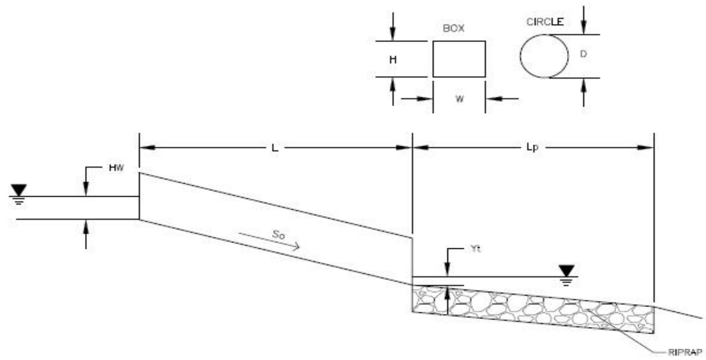
Culvert Cross Sectional Area Available	A =	28.27	ft^2
Culvert Normal Depth	Y_n =	2.80	ft
Culvert Critical Depth	Y_c =	3.80	ft
Froude Number	Fr =	1.80	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.15	
Sum of All Loss Coefficients	k_s =	1.65	ft
Headwater:			
Inlet Control Headwater	HW_I =	5.87	ft
Outlet Control Headwater	HW_O =	5.55	ft
Design Headwater Elevation	HW =	7214.37	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	0.98	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	2.19	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	2.40	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	5.48	
Flow Area at Max Channel Velocity	A_t =	77.40	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	12.00	ft
Length of Riprap Protection	L_p =	60	ft
Width of Riprap Protection at Downstream End	T =	23	ft
Adjusted Diameter for Supercritical Flow	Da =	4.40	ft
Minimum Theoretical Riprap Size	d_{50} min=	12	in
Nominal Riprap Size	d_{50} nominal=	12	in
MHFD Riprap Type	Type =	M	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview

ID: Water Quality Feature 1 Outfall



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Design Information:

Design Discharge	Q =	19.1	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	24	inches
Inlet Edge Type (Choose from pull-down list)	Grooved Edge Projecting		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7192	ft
Outlet Elevation OR Slope	Elev OUT =	7191.74	ft
Culvert Length	L =	52	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

Calculated Results:

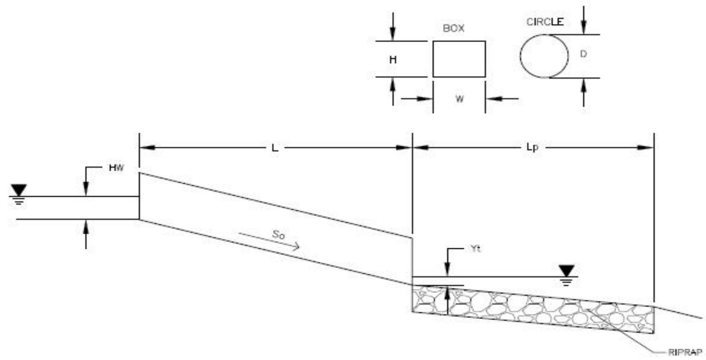
Culvert Cross Sectional Area Available	A =	3.14	ft^2
Culvert Normal Depth	Y_n =	2.00	ft
Culvert Critical Depth	Y_c =	1.57	ft
Froude Number	Fr =	-	Pressure flow!
Entrance Loss Coefficient	k_e =	0.20	
Friction Loss Coefficient	k_f =	0.55	
Sum of All Loss Coefficients	k_s =	1.75	ft
Headwater:			
Inlet Control Headwater	HW_I =	2.55	ft
Outlet Control Headwater	HW_O =	2.53	ft
Design Headwater Elevation	HW =	7194.55	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.27	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	3.38	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	0.80	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.05	
Flow Area at Max Channel Velocity	A_t =	3.82	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	12	ft
Width of Riprap Protection at Downstream End	T =	5	ft
Adjusted Diameter for Supercritical Flow	Da =	-	ft
Minimum Theoretical Riprap Size	d_{50} min=	6	in
Nominal Riprap Size	d_{50} nominal=	6	in
MHFD Riprap Type	Type =	VL	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview

ID: Water Quality Feature 2 Outfall



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Design Information:

Design Discharge	Q =	6.1	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	18	inches
Inlet Edge Type (Choose from pull-down list)		Grooved Edge Projecting	
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7199.39	ft
Outlet Elevation OR Slope	Elev OUT =	7199	ft
Culvert Length	L =	78.5	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t,\ Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

Calculated Results:

Culvert Cross Sectional Area Available	A =	1.77	ft^2
Culvert Normal Depth	Y_n =	0.98	ft
Culvert Critical Depth	Y_c =	0.95	ft
Froude Number	Fr =	0.96	
Entrance Loss Coefficient	k_e =	0.20	
Friction Loss Coefficient	k_f =	1.21	
Sum of All Loss Coefficients	k_s =	2.41	ft
Headwater:			
Inlet Control Headwater	HW_I =	1.40	ft
Outlet Control Headwater	HW_O =	1.28	ft
Design Headwater Elevation	HW =	7200.79	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	0.93	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	2.21	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	0.60	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	5.45	
Flow Area at Max Channel Velocity	A_t =	1.22	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	5	ft
Width of Riprap Protection at Downstream End	T =	3	ft
Adjusted Diameter for Supercritical Flow	Da =	-	ft
Minimum Theoretical Riprap Size	d_{50} min=	3	in
Nominal Riprap Size	d_{50} nominal=	6	in
MHFD Riprap Type	Type =	VL	

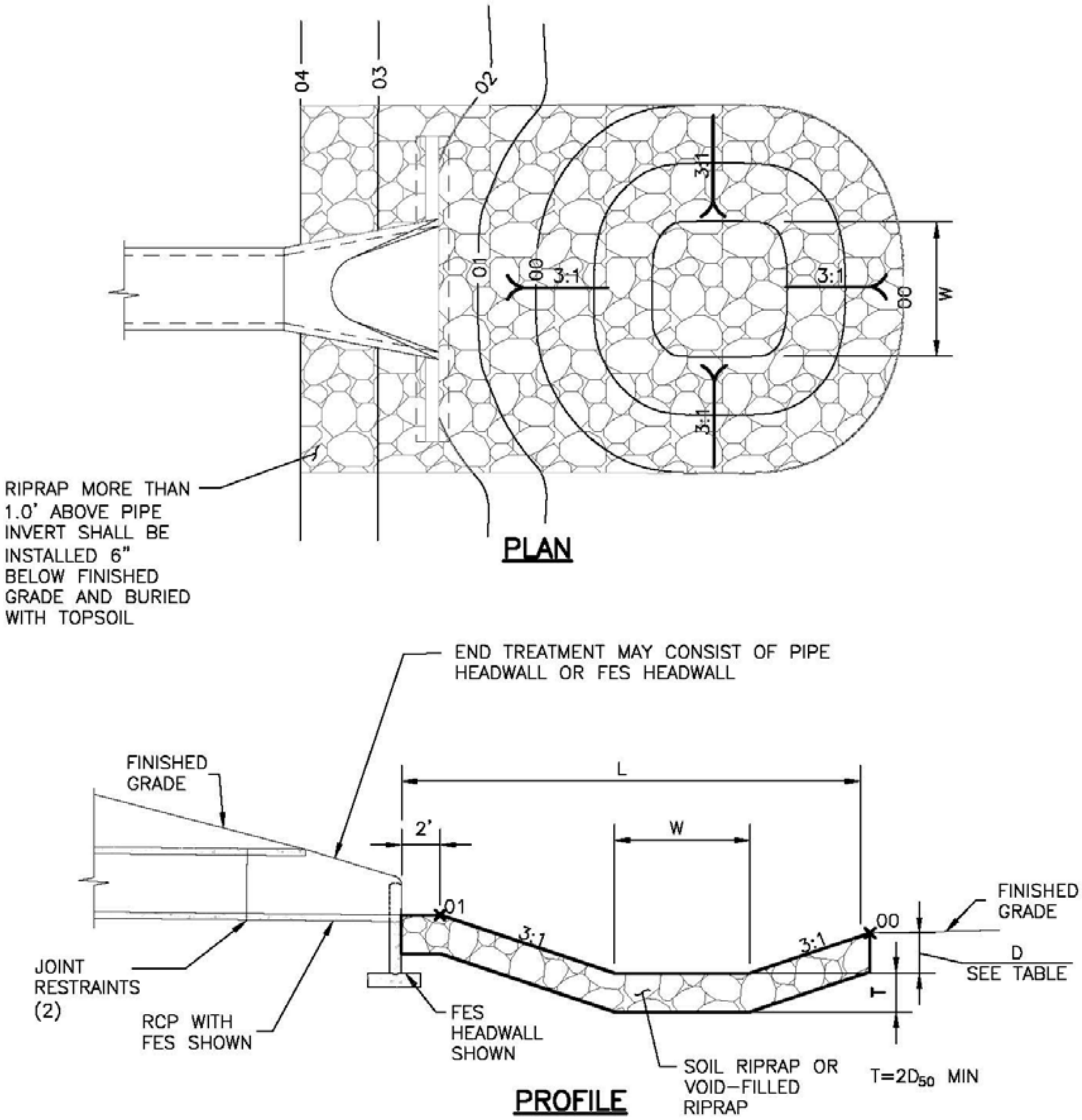
DRIVEWAY CULVERT SIZING TABLE					
Lot	Basin Located in	100 yr. Flow (cfs)	Culvert size (in)	Anticipated Driveway Location	Notes
1	PB3	<8	18	North side of lot	Cross roadside ditch
1	PB1	<8	18	East side of lot	Cross roadside ditch
2	PB3	<8	18	Northeast side of lot	Cross roadside ditch
3	PB4	<8	18	East side of lot	Cross roadside ditch
4	PB4	<8	18	South side of lot	Cross roadside ditch
5	PB4	<8	18	Southwest side of lot	Cross roadside ditch. If culvert is placed on the southwest side of the lot, the driveway would cross a drainage way that would require an additional 3-36" RCPs to be built.
5	PB6	<8	18	Southeast side of lot	Cross roadside ditch
6	PB6	15.9	24	East side of lot	Cross roadside ditch
6	PB6	<8	18	North side of lot	Cross roadside ditch
7	PB6	<8	18	Northeast side of lot	Cross roadside ditch
8	PB6	<8	18	North side of lot	Cross roadside ditch
9	PB6	<8	N/A	Northwest side of lot	Sheet flows off road and through Lot 9
10	PB4	<8	18	Southeast side of lot	Cross roadside ditch
11	PB5	<8	18	Southeast side of lot	Cross roadside ditch
12	PB5	<8	18	South side of lot	Cross roadside ditch
13	PB7	<8	18	South side of lot	Cross roadside ditch
14	PB7	<8	18	Southwest side of lot	Cross roadside ditch
15	PB7	<8	18	Southwest side of lot	Cross roadside ditch
16	PB15	<8	18	West side of lot	Cross roadside ditch
16	PB15	<8	18	South side of lot	Cross roadside ditch
17	PB15	<8	18	West side of lot	Cross roadside ditch
18	PB15	<8	18	North side of lot	Cross roadside ditch
19	PB15	<8	N/A	Northeast side of lot	Sheet flows off road and through Lot 19. If culvert is placed on the northeast side of the lot, the driveway would cross a drainage way that would require an additional 2-24" RCPs to be built.
19	PB15	<8	18	Northwest side of lot	Cross roadside ditch
20	PB15	<8	N/A	Northwest side of lot south of intersection	Sheet flows off road and through Lot 20
21	PB10	<8	18	East side of lot	Cross roadside ditch
22	PB10	<8	18	East side of lot	Cross roadside ditch
23	PB10	<8	18	Southeast side of lot	Cross roadside ditch
24	PB10	<8	18	South side of lot	Cross roadside ditch
25	PB11	<8	18	Southwest side of lot	Cross roadside ditch
26	PB11	<8	18	Southwest side of lot	Cross roadside ditch
27	PB11	<8	18	West side of lot	Cross roadside ditch
28	PB11	<8	18	West side of lot	Cross roadside ditch
29	PB11	8.2	24	West side of lot	Cross roadside ditch
30	PB11	9.0	24	West side of lot	Cross roadside ditch
30	PB11	<8	18	South side of lot	Cross roadside ditch. Culvert would need to be placed east of the Culvert 6 crossing underneath Acequia Ct.
31	PB14	<8	18	North side of lot	Shared Lot 31 and 32 driveway
32	PB14	<8	18	North side of lot	Shared Lot 31 and 32 driveway
33	PB14	<8	18	North side of lot	Cross roadside ditch
34	PB14	<8	18	North side of lot	Cross roadside ditch. Culvert would need to be placed east of the Culvert 6 crossing underneath Acequia Ct.
34	PB14	<8	18	Northwest side of lot	Cross roadside ditch. If culvert is placed on the northwest side of the lot, the driveway would cross a drainage way that would require an additional culvert that would be larger than an 18" RCP to be built.
35	PB8	<8	18	North side of lot	Cross roadside ditch
36	PB9	<8	18	Northwest side of lot	Sheet flows off road and through Lot 36
37	PB9	<8	18	Northwest side of lot	Sheet flows off road and through Lot 37
38	PB9	<8	18	West side of lot	Cross roadside ditch
38*	PB9	120.9	2 - 42"	Inside of lot culvert	Culvert crossing natural Channel section A in Lot 38

*Culvert sizing is based on flows in roadside ditch. If driveways cross natural channels, an engineering site plan would be required.

Generic Driveway Culvert Sizing Table*

Culvert Diameter (in)	# of Barrels	Allowable Flow (cfs)
18	1	8
24	1	18
30	1	30
36	1	45
42	1	70
48	1	100
42	2	150

*See Generic Driveway Culvert Sizing calculations for Hw/D and culvert slope assumptions for each culvert size.



PIPE SIZE OR BOX HEIGHT	D	W*	L
18" – 24"	1'–0"	4'	15'
30" – 36"	1'–6"	6'	20'
42" – 48"	2'–0"	7'	24'
54" – 60"	2'–6"	8'	28'
66" – 72"	3'–0"	9'	32'

* IF OUTLET PIPE IS A BOX CULVERT WITH A WIDTH GREATER THAN W, THEN W = CULVERT WIDTH

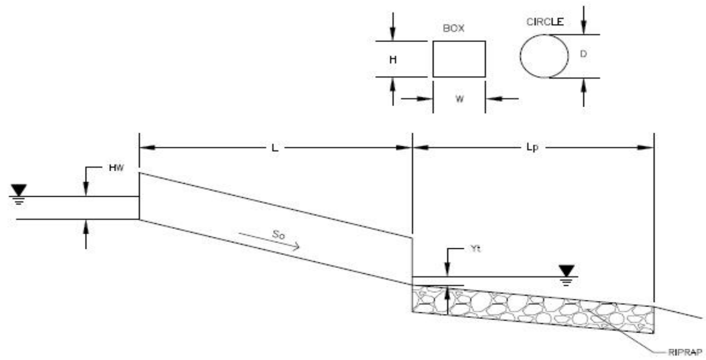
Figure 9-37. Low tailwater riprap basin

Eagleview Low Tailwater Basin Summary Table											
Culvert	Pipe Size (in)	Barrels (No.)	Bottom Width -W (ft)	Length - L (ft)	Top Width (ft)	Tailwater Basin Depth - D (ft)	D50 (in)	RipRap Thickness - [2*D50] (ft)	MHFD Riprap Type	Vol (ft^3)	Vol (yd^3)
1	18	1	4	15	16	1	6	1	VL	240	8.89
2	36	3	26	20	38	1.5	9	1.5	L	1140	42.22
3	24	2	12	15	24	1	6	1	VL	360	13.33
4	18	1	4	15	16	1	6	1	VL	240	8.89
5	18	1	4	15	16	1	6	1	VL	240	8.89
6	36	2	16	20	28	1.5	9	1.5	L	840	31.11
7	36	2	16	20	28	1.5	9	1.5	L	840	31.11
8	72	2	22	32	34	3	12	2	M	2176	80.59
Pond Outfall	72	2	22	32	34	3	18	3	H	3264	120.89
WQ Feature 1	24	1	4	15	16	1	18	3	H	720	26.67
WQ Feature 2	18	1	4	15	16	1	12	2	M	480	17.78
Total			126	184	234					9340	346

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Generic Driveway Culvert 18-inch



Soil Type:
Choose One:
◉ Sandy
○ Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	8	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	18	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7222.1	ft
Outlet Elevation OR Slope	Elev OUT =	7222	ft
Culvert Length	L =	10	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

Calculated Results:

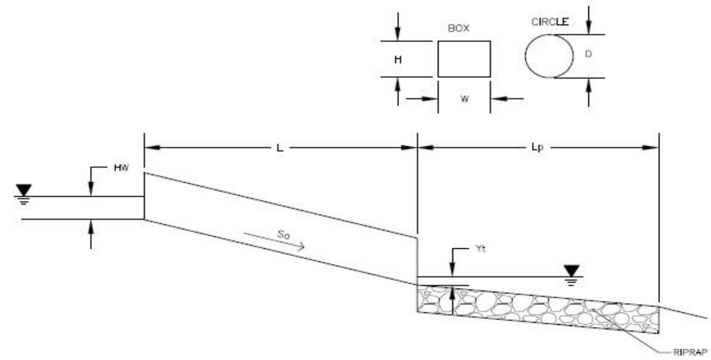
Culvert Cross Sectional Area Available	A =	1.77	ft^2
Culvert Normal Depth	Y_n =	0.93	ft
Culvert Critical Depth	Y_c =	1.10	ft
Froude Number	Fr =	1.39	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.15	
Sum of All Loss Coefficients	k_s =	1.65	ft
Headwater:			
Inlet Control Headwater	HW_I =	1.82	ft
Outlet Control Headwater	HW_O =	1.72	ft
Design Headwater Elevation	HW =	7223.92	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.21	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	2.90	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	0.60	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.51	
Flow Area at Max Channel Velocity	A_t =	1.60	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	6	ft
Width of Riprap Protection at Downstream End	T =	3	ft
Adjusted Diameter for Supercritical Flow	Da =	1.21	ft
Minimum Theoretical Riprap Size	d_{50} min=	4	in
Nominal Riprap Size	d_{50} nominal=	6	in
MHFD Riprap Type	Type =	VL	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview

ID: Generic Driveway Culvert 24-inch



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	18	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	24	inches
Inlet Edge Type (Choose from pull-down list)		Square Edge with Headwall	
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7222.1	ft
Outlet Elevation OR Slope	Elev OUT =	7222	ft
Culvert Length	L =	10	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

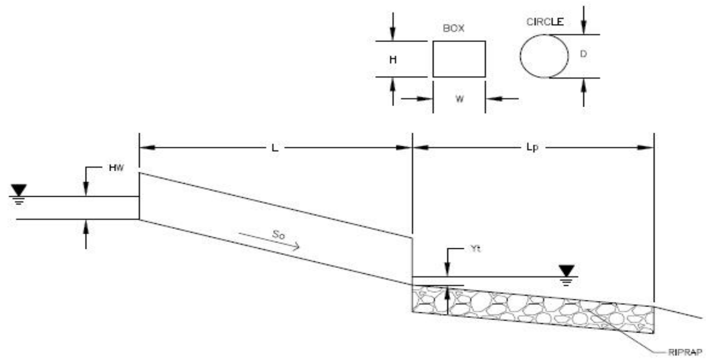
Calculated Results:

Culvert Cross Sectional Area Available	A =	3.14	ft^2
Culvert Normal Depth	Y_n =	1.27	ft
Culvert Critical Depth	Y_c =	1.53	ft
Froude Number	Fr =	1.44	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.11	
Sum of All Loss Coefficients	k_s =	1.61	ft
Headwater:			
Inlet Control Headwater	HW_I =	2.64	ft
Outlet Control Headwater	HW_O =	2.48	ft
Design Headwater Elevation	HW =	7224.74	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.32	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	3.18	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	0.80	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.22	
Flow Area at Max Channel Velocity	A_t =	3.60	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	11	ft
Width of Riprap Protection at Downstream End	T =	5	ft
Adjusted Diameter for Supercritical Flow	Da =	1.64	ft
Minimum Theoretical Riprap Size	d_{50} min=	6	in
Nominal Riprap Size	d_{50} nominal=	6	in
MHFD Riprap Type	Type =	VL	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Generic Driveway Culvert 30-inch



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	30	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	30	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7222.1	ft
Outlet Elevation OR Slope	Elev OUT =	7222	ft
Culvert Length	L =	10	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

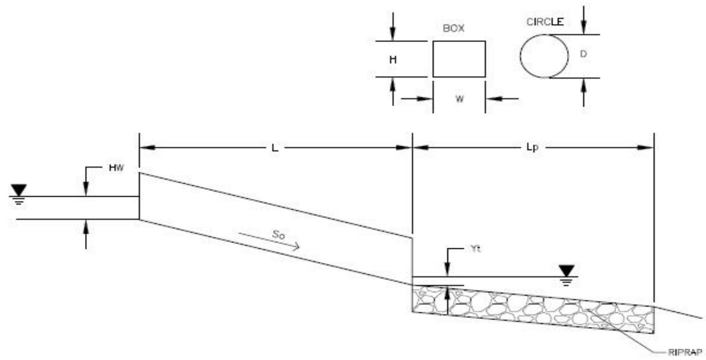
Calculated Results:

Culvert Cross Sectional Area Available	A =	4.91	ft^2
Culvert Normal Depth	Y_n =	1.50	ft
Culvert Critical Depth	Y_c =	1.87	ft
Froude Number	Fr =	1.53	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.08	
Sum of All Loss Coefficients	k_s =	1.58	ft
Headwater:			
Inlet Control Headwater	HW_I =	3.15	ft
Outlet Control Headwater	HW_O =	3.00	ft
Design Headwater Elevation	HW =	7225.25	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.26	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	3.04	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	1.00	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.35	
Flow Area at Max Channel Velocity	A_t =	6.00	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	16	ft
Width of Riprap Protection at Downstream End	T =	7	ft
Adjusted Diameter for Supercritical Flow	Da =	2.00	ft
Minimum Theoretical Riprap Size	d_{50} min=	7	in
Nominal Riprap Size	d_{50} nominal=	9	in
MHFD Riprap Type	Type =	L	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Generic Driveway Culvert 36-inch



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	45	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	36	inches
Inlet Edge Type (Choose from pull-down list)		Square Edge with Headwall	
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7222.1	ft
Outlet Elevation OR Slope	Elev OUT =	7222	ft
Culvert Length	L =	10	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

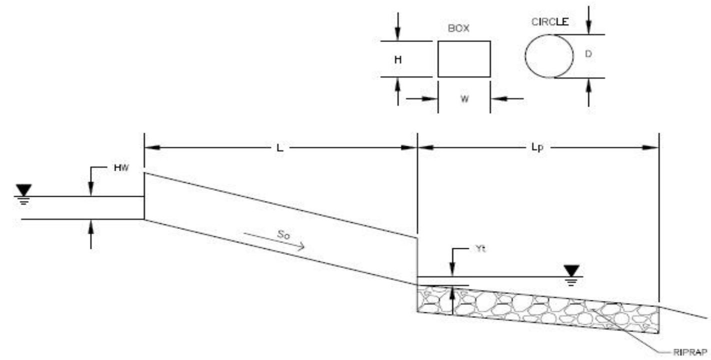
Calculated Results:

Culvert Cross Sectional Area Available	A =	7.07	ft^2
Culvert Normal Depth	Y_n =	1.71	ft
Culvert Critical Depth	Y_c =	2.19	ft
Froude Number	Fr =	1.61	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.06	
Sum of All Loss Coefficients	k_s =	1.56	ft
Headwater:			
Inlet Control Headwater	HW_I =	3.62	ft
Outlet Control Headwater	HW_O =	3.48	ft
Design Headwater Elevation	HW =	7225.72	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.21	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	2.89	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	1.20	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.54	
Flow Area at Max Channel Velocity	A_t =	9.00	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	21	ft
Width of Riprap Protection at Downstream End	T =	8	ft
Adjusted Diameter for Supercritical Flow	Da =	2.36	ft
Minimum Theoretical Riprap Size	d_{50} min=	8	in
Nominal Riprap Size	d_{50} nominal=	9	in
MHFD Riprap Type	Type =	L	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Generic Driveway Culvert 42-inch



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	70	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	42	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7222.1	ft
Outlet Elevation OR Slope	Elev OUT =	7222	ft
Culvert Length	L =	10	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

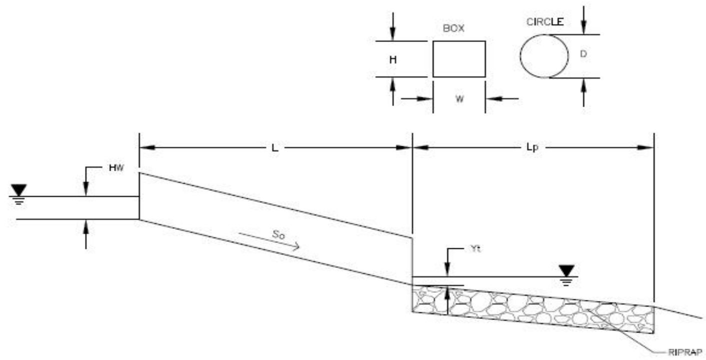
Calculated Results:

Culvert Cross Sectional Area Available	A =	9.62	ft^2
Culvert Normal Depth	Y_n =	2.04	ft
Culvert Critical Depth	Y_c =	2.62	ft
Froude Number	Fr =	1.64	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.05	
Sum of All Loss Coefficients	k_s =	1.55	ft
Headwater:			
Inlet Control Headwater	HW_I =	4.44	ft
Outlet Control Headwater	HW_O =	4.23	ft
Design Headwater Elevation	HW =	7226.54	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.27	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	3.05	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	1.40	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.33	
Flow Area at Max Channel Velocity	A_t =	14.00	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	29	ft
Width of Riprap Protection at Downstream End	T =	11	ft
Adjusted Diameter for Supercritical Flow	Da =	2.77	ft
Minimum Theoretical Riprap Size	d_{50} min=	10	in
Nominal Riprap Size	d_{50} nominal=	12	in
MHFD Riprap Type	Type =	M	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Generic Driveway Culvert 48-inch



Soil Type:
Choose One:
(●) Sandy
( ) Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	100	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	48	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	1	
Inlet Elevation	Elev IN =	7222.1	ft
Outlet Elevation OR Slope	Elev OUT =	7222	ft
Culvert Length	L =	10	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t,\ Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

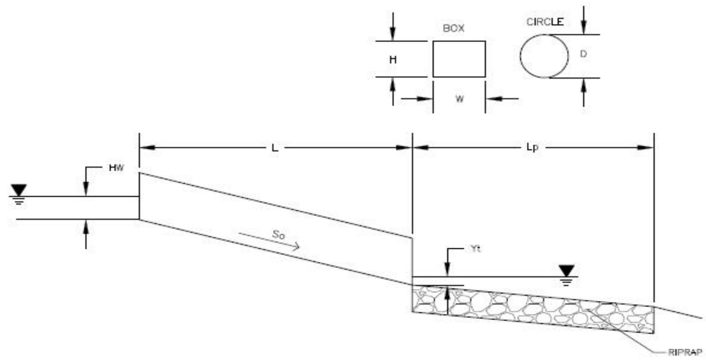
Calculated Results:

Culvert Cross Sectional Area Available	A =	12.57	ft^2
Culvert Normal Depth	Y_n =	2.33	ft
Culvert Critical Depth	Y_c =	3.03	ft
Froude Number	Fr =	1.67	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.04	
Sum of All Loss Coefficients	k_s =	1.54	ft
Headwater:			
Inlet Control Headwater	HW_I =	5.18	ft
Outlet Control Headwater	HW_O =	4.93	ft
Design Headwater Elevation	HW =	7227.28	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.30	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	3.13	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	1.60	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.27	
Flow Area at Max Channel Velocity	A_t =	20.00	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	-	ft
Length of Riprap Protection	L_p =	37	ft
Width of Riprap Protection at Downstream End	T =	13	ft
Adjusted Diameter for Supercritical Flow	Da =	3.16	ft
Minimum Theoretical Riprap Size	d_{50} min=	11	in
Nominal Riprap Size	d_{50} nominal=	12	in
MHFD Riprap Type	Type =	M	

DETERMINATION OF CULVERT HEADWATER AND OUTLET PROTECTION

MHFD-Culvert, Version 4.00 (May 2020)

Project: Eagleview
ID: Generic Driveway Culvert Double 42-inch



Soil Type:
Choose One:
◉ Sandy
○ Non-Sandy

Supercritical Flow! Using Adjusted Diameter to calculate protection type.

Design Information:

Design Discharge	Q =	150	cfs
Circular Culvert:			
Barrel Diameter in Inches	D =	42	inches
Inlet Edge Type (Choose from pull-down list)	Square Edge with Headwall		
OR:			
Box Culvert:		OR	
Barrel Height (Rise) in Feet	H (Rise) =		ft
Barrel Width (Span) in Feet	W (Span) =		ft
Inlet Edge Type (Choose from pull-down list)			
Number of Barrels	# Barrels =	2	
Inlet Elevation	Elev IN =	7222.1	ft
Outlet Elevation OR Slope	Elev OUT =	7222	ft
Culvert Length	L =	10	ft
Manning's Roughness	n =	0.012	
Bend Loss Coefficient	k_b =	0	
Exit Loss Coefficient	k_x =	1	
Tailwater Surface Elevation	$Y_{t, Elevation}$ =		ft
Max Allowable Channel Velocity	V =	5	ft/s

Calculated Results:

Culvert Cross Sectional Area Available	A =	9.62	ft^2
Culvert Normal Depth	Y_n =	2.04	ft
Culvert Critical Depth	Y_c =	2.62	ft
Froude Number	Fr =	1.64	Supercritical!
Entrance Loss Coefficient	k_e =	0.50	
Friction Loss Coefficient	k_f =	0.05	
Sum of All Loss Coefficients	k_s =	1.55	ft
Headwater:			
Inlet Control Headwater	HW_I =	4.44	ft
Outlet Control Headwater	HW_O =	4.23	ft
Design Headwater Elevation	HW =	7226.54	ft
Headwater/Diameter OR Headwater/Rise Ratio	HW/D =	1.27	
Outlet Protection:			
Flow/(Diameter^2.5)	Q/D^2.5 =	3.27	$ft^{0.5}/s$
Tailwater Surface Height	Y_t =	1.40	ft
Tailwater/Diameter	Yt/D =	0.40	
Expansion Factor	1/(2*tan(Θ)) =	4.14	
Flow Area at Max Channel Velocity	A_t =	30.00	ft^2
Width of Equivalent Conduit for Multiple Barrels	W_{eq} =	7.00	ft
Length of Riprap Protection	L_p =	29	ft
Width of Riprap Protection at Downstream End	T =	15	ft
Adjusted Diameter for Supercritical Flow	Da =	2.77	ft
Minimum Theoretical Riprap Size	d_{50} min=	10	in
Nominal Riprap Size	d_{50} nominal=	12	in
MHFD Riprap Type	Type =	M	

EXISTING CHANNEL FLOWS SUMMARY				
Reach/Channel ID	Contributing Basins	Tributary Areas (ac)	Flows (cfs)	Slope (%)
CHNL A	(7%B3) + OB6	122.6	120.9	5.65
CHNL B	(7%B3) + (100%OB5)	148.0	114.6	5.98
CHNL C	(4%B3) + (62%OB5)	91.6	70.7	8.54
CHNL D	(9%B3) + (1%OB7)	9.6	12.7	3.32
CHNL E	(70%B4) + OB8	43.3	64.3	2.57
CHNL F	(7%B2) + OB4	13.4	22.3	2.05
CHNL G	(86%B4) + OB8	45.7	67.3	2.29
CHNL H	(11%B2) + OB4 + OB3 + OB2	86.6	144.0	2.45
CHNL I	(17%B2) + OB4 + OB3 + OB2	89.0	146.9	2.22
CHNL J	(40%B2)	16.6	19.4	1.25
CHNL K	(27%B2) + OB4 + OB3 + OB2	93.2	151.8	2.46
CHNL L	(16%B1) + OB1	11.3	20.2	3.87
CHNL M	(34%B2) + OB4 + OB3 + OB2	96.1	155.2	4.54
CHNL O	(65%B2)	26.9	31.5	3.26
CHNL P	(7%B3)	4.2	7.7	7.65

Worksheet for EX CHNL A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.560 %
Discharge	120.90 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,239.40
0+61	7,236.49
1+07	7,231.74
1+84	7,246.00
2+04	7,246.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,239.40)	(2+04, 7,246.60)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	17.9 in
Roughness Coefficient	0.040
Elevation	7,233.23 ft
Elevation Range	7,231.7 to 7,246.6 ft
Flow Area	16.9 ft²
Wetted Perimeter	22.9 ft
Hydraulic Radius	8.9 in
Top Width	22.68 ft
Normal Depth	17.9 in
Critical Depth	20.8 in
Critical Slope	2.476 %
Velocity	7.16 ft/s
Velocity Head	0.80 ft
Specific Energy	2.29 ft
Froude Number	1.461
Flow Type	Supercritical

Worksheet for EX CHNL A

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

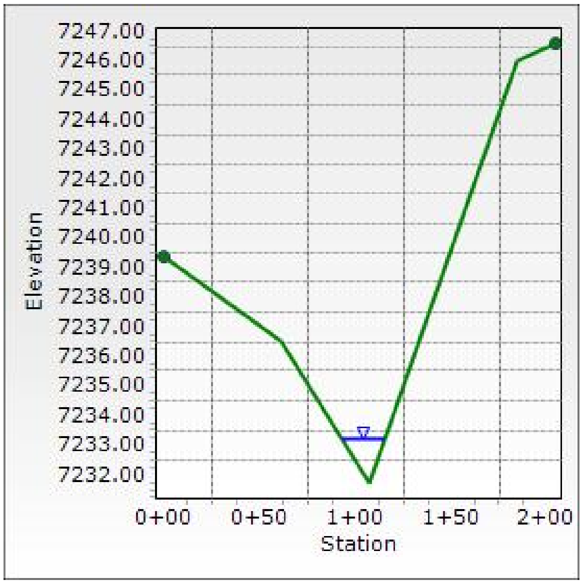
GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	17.9 in
Critical Depth	20.8 in
Channel Slope	5.560 %
Critical Slope	2.476 %

Cross Section for EX CHNL A

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	5.560 %
Normal Depth	17.9 in
Discharge	120.90 cfs



Worksheet for EX CHNL B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.980 %
Discharge	114.60 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,249.10
0+38	7,248.00
0+78	7,243.32
0+95	7,240.83
1+48	7,247.55
1+79	7,249.28

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,249.10)	(1+79, 7,249.28)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	17.4 in
Roughness Coefficient	0.040
Elevation	7,242.28 ft
Elevation Range	7,240.8 to 7,249.3 ft
Flow Area	15.7 ft²
Wetted Perimeter	21.8 ft
Hydraulic Radius	8.6 in
Top Width	21.60 ft
Normal Depth	17.4 in
Critical Depth	20.6 in
Critical Slope	2.484 %
Velocity	7.30 ft/s
Velocity Head	0.83 ft
Specific Energy	2.28 ft
Froude Number	1.509

Worksheet for EX CHNL B

Results

Flow Type	Supercritical

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	17.4 in
Critical Depth	20.6 in
Channel Slope	5.980 %
Critical Slope	2.484 %

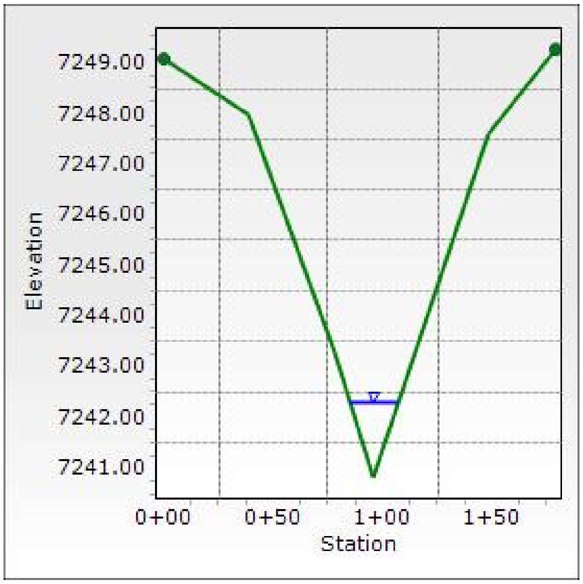
Cross Section for EX CHNL B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.980 %
Normal Depth	17.4 in
Discharge	114.60 cfs



Worksheet for EX CHNL C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	8.540 %
Discharge	70.70 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+07	7,248.79
0+81	7,244.00
1+03	7,237.94
1+22	7,246.00
1+63	7,250.20

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+07, 7,248.79)	(1+63, 7,250.20)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	19.3 in
Roughness Coefficient	0.040
Elevation	7,239.54 ft
Elevation Range	7,237.9 to 7,250.2 ft
Flow Area	7.8 ft^2
Wetted Perimeter	10.3 ft
Hydraulic Radius	9.1 in
Top Width	9.74 ft
Normal Depth	19.3 in
Critical Depth	24.3 in
Critical Slope	2.497 %
Velocity	9.05 ft/s
Velocity Head	1.27 ft
Specific Energy	2.88 ft
Froude Number	1.780
Flow Type	Supercritical

Worksheet for EX CHNL C

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	19.3 in
Critical Depth	24.3 in
Channel Slope	8.540 %
Critical Slope	2.497 %

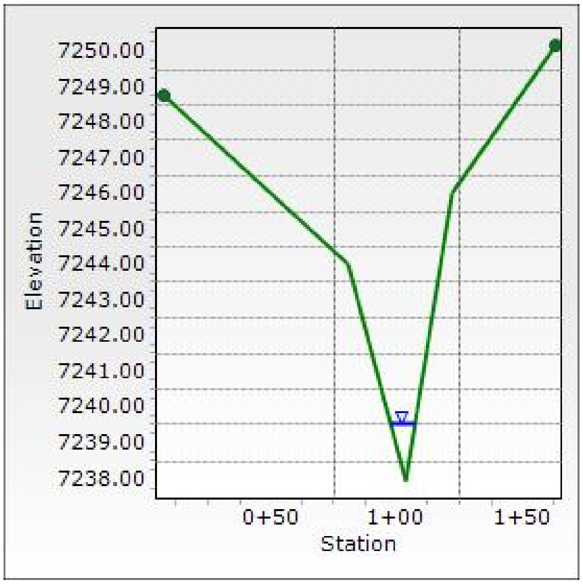
Cross Section for EX CHNL C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	8.540 %
Normal Depth	19.3 in
Discharge	70.70 cfs



Worksheet for EX CHNL D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.320 %
Discharge	12.70 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,237.14
0+22	7,237.45
0+78	7,235.70
0+84	7,235.20
0+98	7,236.20
1+12	7,236.63
1+58	7,239.52
1+69	7,239.77

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,237.14)	(1+69, 7,239.77)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	7.0 in
Roughness Coefficient	0.040
Elevation	7,235.78 ft
Elevation Range	7,235.2 to 7,239.8 ft
Flow Area	4.5 ft²
Wetted Perimeter	16.9 ft
Hydraulic Radius	3.2 in
Top Width	16.86 ft
Normal Depth	7.0 in
Critical Depth	6.9 in
Critical Slope	3.641 %
Velocity	2.81 ft/s
Velocity Head	0.12 ft

Worksheet for EX CHNL D

Results		
Specific Energy	0.71	ft
Froude Number	0.956	
Flow Type	Subcritical	

GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	7.0	in
Critical Depth	6.9	in
Channel Slope	3.320	%
Critical Slope	3.641	%

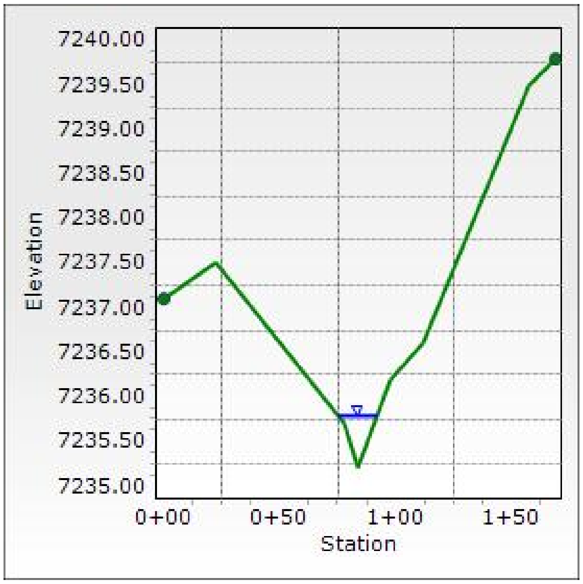
Cross Section for EX CHNL D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.320 %
Normal Depth	7.0 in
Discharge	12.70 cfs



Worksheet for EX CHNL E

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.570 %
Discharge	64.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,229.28
0+45	7,228.39
0+96	7,224.00
1+37	7,222.21
1+52	7,221.75
1+73	7,222.00
2+07	7,224.35
2+62	7,225.92

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,229.28)	(2+62, 7,225.92)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	7.9 in
Roughness Coefficient	0.040
Elevation	7,222.41 ft
Elevation Range	7,221.8 to 7,229.3 ft
Flow Area	19.3 ft²
Wetted Perimeter	46.5 ft
Hydraulic Radius	5.0 in
Top Width	46.45 ft
Normal Depth	7.9 in
Critical Depth	7.6 in
Critical Slope	3.175 %
Velocity	3.32 ft/s
Velocity Head	0.17 ft

Worksheet for EX CHNL E

Results		
Specific Energy	0.83	ft
Froude Number	0.908	
Flow Type	Subcritical	

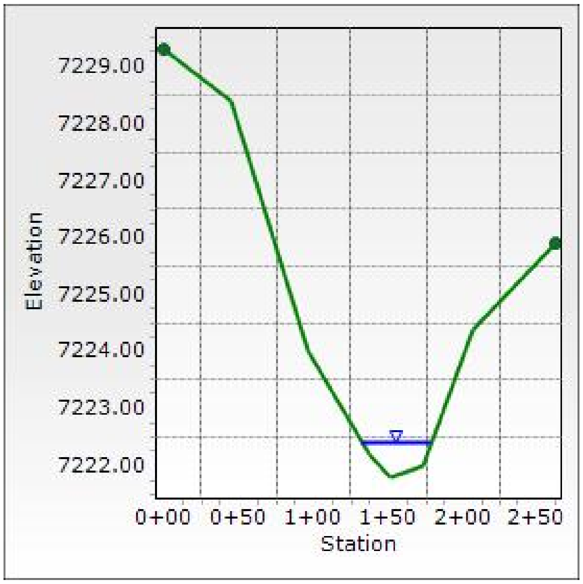
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	0.00	ft/s
Upstream Velocity	0.00	ft/s
Normal Depth	7.9	in
Critical Depth	7.6	in
Channel Slope	2.570	%
Critical Slope	3.175	%

Cross Section for EX CHNL E

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.570 %
Normal Depth	7.9 in
Discharge	64.30 cfs



Worksheet for EX CHNL F

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.050 %
Discharge	22.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+04	7,238.00
0+58	7,237.06
1+10	7,237.86
1+28	7,238.35

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+04, 7,238.00)	(1+28, 7,238.35)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	5.2 in
Roughness Coefficient	0.040
Elevation	7,237.50 ft
Elevation Range	7,237.1 to 7,238.4 ft
Flow Area	11.6 ft^2
Wetted Perimeter	53.3 ft
Hydraulic Radius	2.6 in
Top Width	53.27 ft
Normal Depth	5.2 in
Critical Depth	4.6 in
Critical Slope	4.045 %
Velocity	1.92 ft/s
Velocity Head	0.06 ft
Specific Energy	0.49 ft
Froude Number	0.727
Flow Type	Subcritical

Worksheet for EX CHNL F

GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	5.2	in
Critical Depth	4.6	in
Channel Slope	2.050	%
Critical Slope	4.045	%

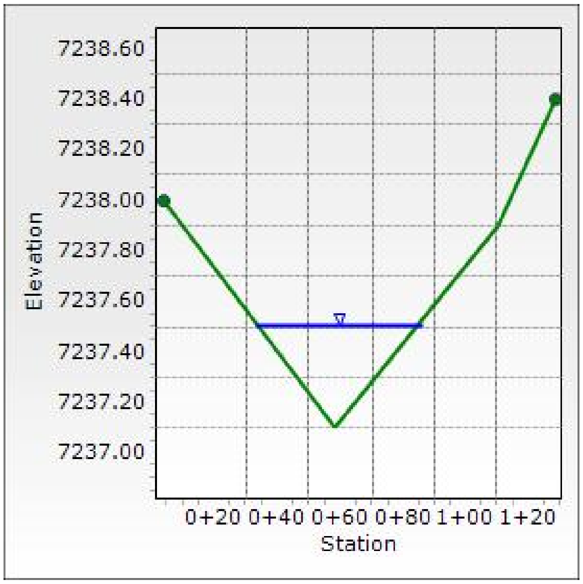
Cross Section for EX CHNL F

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.050 %
Normal Depth	5.2 in
Discharge	22.30 cfs



Worksheet for EX CHNL G

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.290 %
Discharge	67.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,215.15
0+58	7,209.92
0+75	7,209.09
0+88	7,210.43
1+14	7,211.58

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,215.15)	(1+14, 7,211.58)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	12.9 in
Roughness Coefficient	0.040
Elevation	7,210.16 ft
Elevation Range	7,209.1 to 7,215.2 ft
Flow Area	17.5 ft²
Wetted Perimeter	30.8 ft
Hydraulic Radius	6.8 in
Top Width	30.70 ft
Normal Depth	12.9 in
Critical Depth	12.3 in
Critical Slope	2.871 %
Velocity	3.85 ft/s
Velocity Head	0.23 ft
Specific Energy	1.30 ft
Froude Number	0.901
Flow Type	Subcritical

Worksheet for EX CHNL G

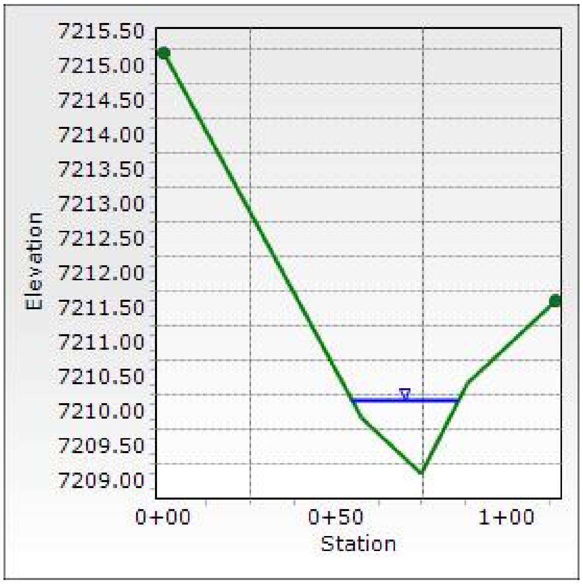
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	12.9 in
Critical Depth	12.3 in
Channel Slope	2.290 %
Critical Slope	2.871 %

Cross Section for EX CHNL G

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.290 %
Normal Depth	12.9 in
Discharge	67.30 cfs



Worksheet for EX CHNL H

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.450 %
Discharge	144.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,224.47
0+19	7,224.03
0+31	7,222.38
0+48	7,224.36
0+60	7,224.54

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,224.47)	(0+60, 7,224.54)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	22.6 in
Roughness Coefficient	0.040
Elevation	7,224.26 ft
Elevation Range	7,222.4 to 7,224.5 ft
Flow Area	29.7 ft^2
Wetted Perimeter	38.9 ft
Hydraulic Radius	9.2 in
Top Width	38.64 ft
Normal Depth	22.6 in
Critical Depth	22.4 in
Critical Slope	2.566 %
Velocity	4.86 ft/s
Velocity Head	0.37 ft
Specific Energy	2.25 ft
Froude Number	0.977
Flow Type	Subcritical

Worksheet for EX CHNL H

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	22.6 in
Critical Depth	22.4 in
Channel Slope	2.450 %
Critical Slope	2.566 %

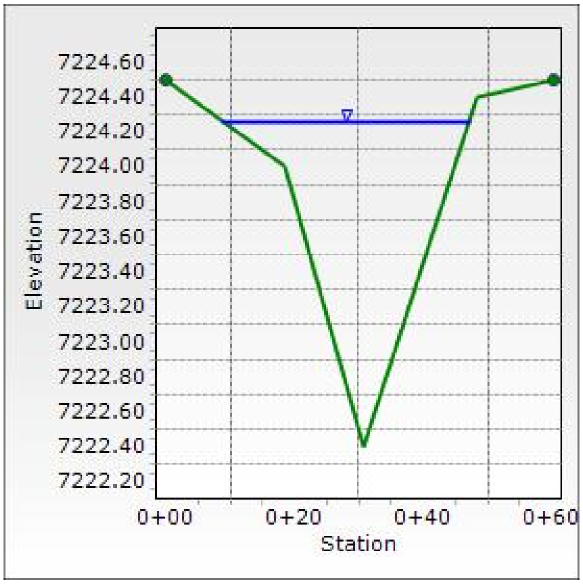
Cross Section for EX CHNL H

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.450 %
Normal Depth	22.6 in
Discharge	144.00 cfs



Worksheet for EX CHNL I

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.220 %
Discharge	146.90 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,218.31
0+47	7,218.50
0+86	7,216.59
1+59	7,221.00
1+71	7,221.35

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,218.31)	(1+71, 7,221.35)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	16.4 in
Roughness Coefficient	0.040
Elevation	7,217.96 ft
Elevation Range	7,216.6 to 7,221.4 ft
Flow Area	34.2 ft²
Wetted Perimeter	50.2 ft
Hydraulic Radius	8.2 in
Top Width	50.08 ft
Normal Depth	16.4 in
Critical Depth	15.8 in
Critical Slope	2.683 %
Velocity	4.29 ft/s
Velocity Head	0.29 ft
Specific Energy	1.65 ft
Froude Number	0.915
Flow Type	Subcritical

Worksheet for EX CHNL I

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

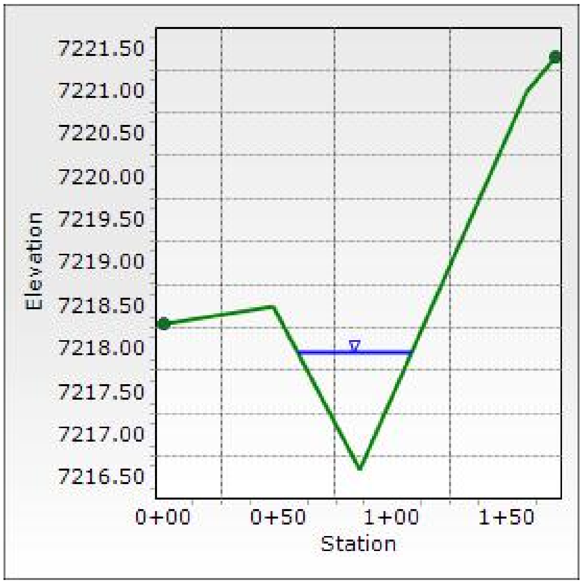
GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	16.4 in
Critical Depth	15.8 in
Channel Slope	2.220 %
Critical Slope	2.683 %

Cross Section for EX CHNL I

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.220 %
Normal Depth	16.4 in
Discharge	146.90 cfs



Worksheet for EX CHNL L

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.870 %
Discharge	20.20 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,226.12
0+53	7,222.85
0+74	7,221.57
1+55	7,223.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,226.12)	(1+55, 7,223.80)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	6.1 in
Roughness Coefficient	0.040
Elevation	7,222.08 ft
Elevation Range	7,221.6 to 7,226.1 ft
Flow Area	6.9 ft²
Wetted Perimeter	26.8 ft
Hydraulic Radius	3.1 in
Top Width	26.79 ft
Normal Depth	6.1 in
Critical Depth	6.2 in
Critical Slope	3.664 %
Velocity	2.94 ft/s
Velocity Head	0.13 ft
Specific Energy	0.65 ft
Froude Number	1.026
Flow Type	Supercritical

Worksheet for EX CHNL L

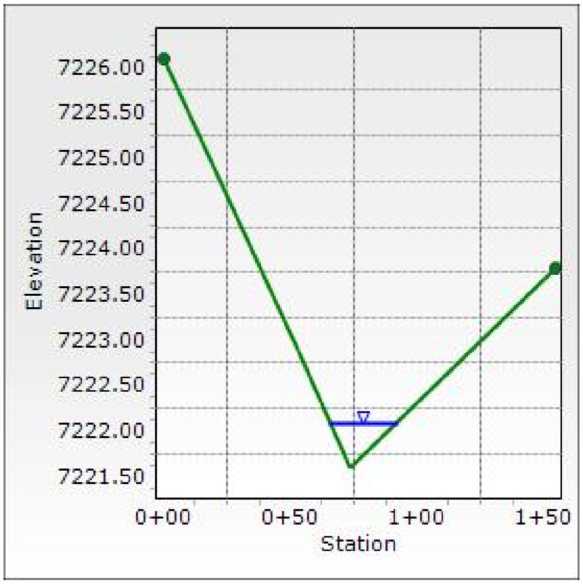
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.1 in
Critical Depth	6.2 in
Channel Slope	3.870 %
Critical Slope	3.664 %

Cross Section for EX CHNL L

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.870 %
Normal Depth	6.1 in
Discharge	20.20 cfs



Worksheet for EX CHNL M

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.540 %
Discharge	155.20 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,203.94
0+72	7,201.87
1+11	7,198.36
1+38	7,202.50
2+08	7,202.04

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,203.94)	(2+08, 7,202.04)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	19.3 in
Roughness Coefficient	0.040
Elevation	7,199.97 ft
Elevation Range	7,198.4 to 7,203.9 ft
Flow Area	22.8 ft²
Wetted Perimeter	28.6 ft
Hydraulic Radius	9.6 in
Top Width	28.37 ft
Normal Depth	19.3 in
Critical Depth	21.7 in
Critical Slope	2.434 %
Velocity	6.81 ft/s
Velocity Head	0.72 ft
Specific Energy	2.33 ft
Froude Number	1.339
Flow Type	Supercritical

Worksheet for EX CHNL M

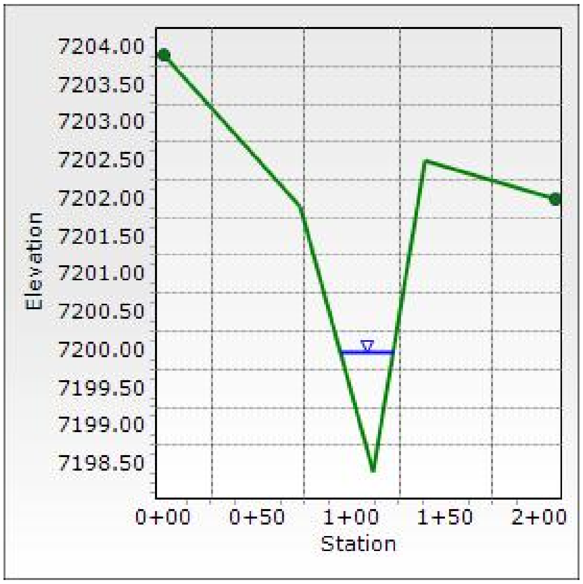
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	19.3 in
Critical Depth	21.7 in
Channel Slope	4.540 %
Critical Slope	2.434 %

Cross Section for EX CHNL M

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	4.540	%
Normal Depth	19.3	in
Discharge	155.20	cfs



Worksheet for EX CHNL O

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.260 %
Discharge	31.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,195.73
0+70	7,196.09
1+00	7,192.99
1+30	7,195.99
1+83	7,197.86

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,195.73)	(1+83, 7,197.86)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	10.8 in
Roughness Coefficient	0.040
Elevation	7,193.89 ft
Elevation Range	7,193.0 to 7,197.9 ft
Flow Area	8.0 ft²
Wetted Perimeter	17.9 ft
Hydraulic Radius	5.4 in
Top Width	17.79 ft
Normal Depth	10.8 in
Critical Depth	11.0 in
Critical Slope	3.049 %
Velocity	3.93 ft/s
Velocity Head	0.24 ft
Specific Energy	1.14 ft
Froude Number	1.032
Flow Type	Supercritical

Worksheet for EX CHNL O

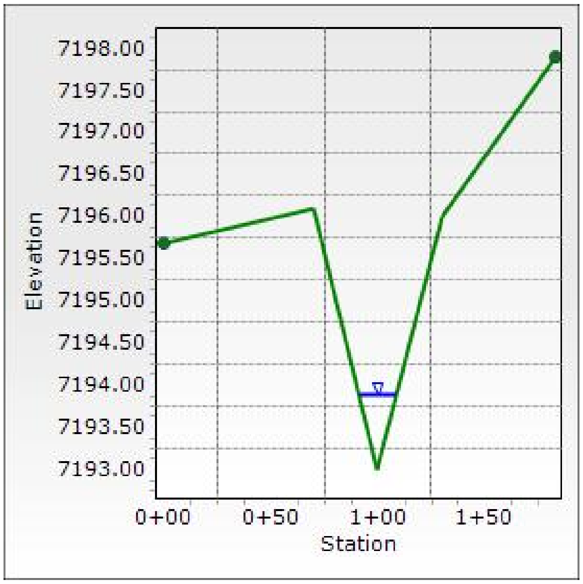
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	10.8	in
Critical Depth	11.0	in
Channel Slope	3.260	%
Critical Slope	3.049	%

Cross Section for EX CHNL O

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	3.260 %
Normal Depth	10.8 in
Discharge	31.50 cfs



Worksheet for EX CHNL P

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	7.650 %
Discharge	7.70 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,199.37
0+28	7,199.01
0+88	7,193.89
1+16	7,198.17
1+63	7,198.52

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,199.37)	(1+63, 7,198.52)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	5.6 in
Roughness Coefficient	0.040
Elevation	7,194.36 ft
Elevation Range	7,193.9 to 7,199.4 ft
Flow Area	2.0 ft²
Wetted Perimeter	8.6 ft
Hydraulic Radius	2.8 in
Top Width	8.53 ft
Normal Depth	5.6 in
Critical Depth	6.4 in
Critical Slope	3.649 %
Velocity	3.87 ft/s
Velocity Head	0.23 ft
Specific Energy	0.70 ft
Froude Number	1.414
Flow Type	Supercritical

Worksheet for EX CHNL P

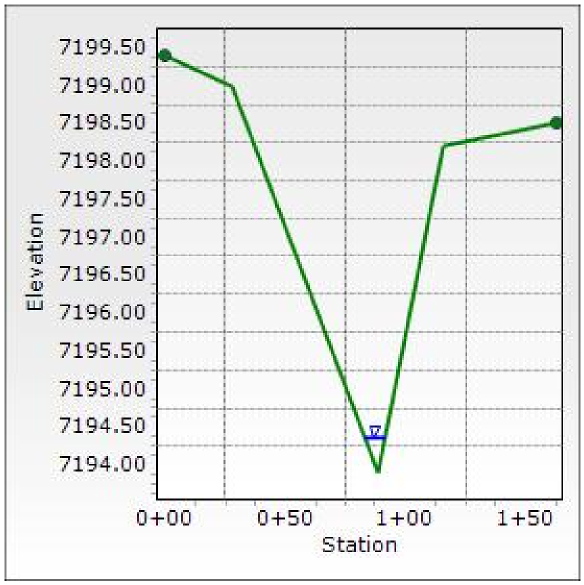
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.6 in
Critical Depth	6.4 in
Channel Slope	7.650 %
Critical Slope	3.649 %

Cross Section for EX CHNL P

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	7.650 %
Normal Depth	5.6 in
Discharge	7.70 cfs



Worksheet for EX CHNL J

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.250 %
Discharge	19.40 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,205.29
1+14	7,202.00
1+30	7,201.92
2+31	7,203.75

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,205.29)	(2+31, 7,203.75)	0.040

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Normal Depth	4.8 in
Roughness Coefficient	0.040
Elevation	7,202.32 ft
Elevation Range	7,201.9 to 7,205.3 ft
Flow Area	12.0 ft²
Wetted Perimeter	49.2 ft
Hydraulic Radius	2.9 in
Top Width	49.18 ft
Normal Depth	4.8 in
Critical Depth	3.7 in
Critical Slope	4.048 %
Velocity	1.62 ft/s
Velocity Head	0.04 ft
Specific Energy	0.44 ft
Froude Number	0.579
Flow Type	Subcritical

Worksheet for EX CHNL J

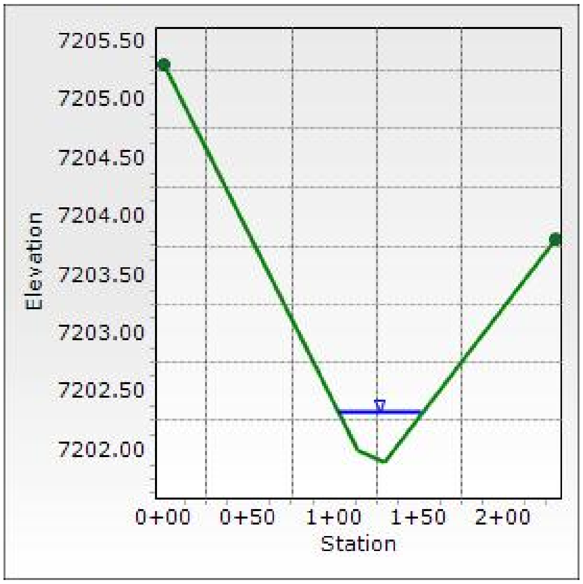
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	4.8 in
Critical Depth	3.7 in
Channel Slope	1.250 %
Critical Slope	4.048 %

Cross Section for EX CHNL J

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	1.250 %
Normal Depth	4.8 in
Discharge	19.40 cfs



Worksheet for EX CHNL K

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.460 %
Discharge	151.80 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,212.20
0+95	7,210.70
1+38	7,211.30
1+68	7,210.90
2+11	7,211.97

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,212.20)	(2+11, 7,211.97)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	8.8 in
Roughness Coefficient	0.040
Elevation	7,211.43 ft
Elevation Range	7,210.7 to 7,212.2 ft
Flow Area	51.2 ft²
Wetted Perimeter	140.8 ft
Hydraulic Radius	4.4 in
Top Width	140.76 ft
Normal Depth	8.8 in
Critical Depth	8.4 in
Critical Slope	3.352 %
Velocity	2.97 ft/s
Velocity Head	0.14 ft
Specific Energy	0.87 ft
Froude Number	0.868
Flow Type	Subcritical

Worksheet for EX CHNL K

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	8.8 in
Critical Depth	8.4 in
Channel Slope	2.460 %
Critical Slope	3.352 %

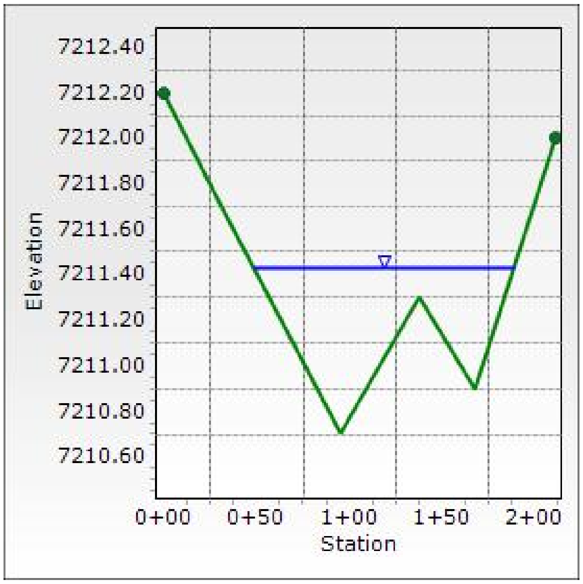
Cross Section for EX CHNL K

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.460 %
Normal Depth	8.8 in
Discharge	151.80 cfs



PROPOSED CHANNEL FLOWS SUMMARY					
Reach/Channel ID	Contributing Basins	Tributary Areas (ac)	Flows (cfs)	Slope (%)	Lining
CHNL A	(30%PB9) + OB6	122.2	120.7	5.65	TRM
CHNL B	(34%PB8) + OB5	147.8	117.4	5.98	TRM
CHNL C	(20%PB8) + (2%OB5)	5.2	8.2	8.54	TRM
CHNL D	(47%PB10) + (1%OB7)	38.5	61.2	3.32	TRM
CHNL E	PB11 + OB8	49.2	81.4	2.57	TRM
CHNL F	(46%PB5) + OB4	13.3	23.7	2.05	-
CHNL G	(6%PB14) + PB11 + OB8	50.2	84.2	2.29	TRM
CHNL H	(20%PB4) + OB2 + OB3 + OB4	84.1	144.8	2.45	TRM
CHNL I	(45%PB4) + OB2 + OB3 + OB4	86.7	152.4	2.22	TRM
CHNL J	(7%PB15) + PB6 + PB7	15.2	29.9	1.25	-
CHNL K	(95%PB4) + OB2 + OB3 + OB4	92.0	167.5	2.46	-
CHNL L	(40%PB1) + OB1	12.1	21.9	3.87	TRM
CHNL M	(10%PB15) + OB2 + OB3 + OB4 + PB5 + PB4 + PB3	101.1	185.3	4.54	TRM
CHNL N	(50%PB15) + PB6 + PB7	19.4	41.3	0.50	-
CHNL O	(21%PB15)	2.0	5.5	3.26	TRM
CHNL P	(5%PB14)	0.9	2.3	7.65	TRM

Worksheet for PROP CHNL A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.650 %
Discharge	120.70 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,239.40
0+61	7,236.49
1+07	7,231.74
1+84	7,246.00
2+04	7,246.60

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,239.40)	(2+04, 7,246.60)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	17.8 in
Roughness Coefficient	0.040
Elevation	7,233.22 ft
Elevation Range	7,231.7 to 7,246.6 ft
Flow Area	16.8 ft²
Wetted Perimeter	22.8 ft
Hydraulic Radius	8.8 in
Top Width	22.60 ft
Normal Depth	17.8 in
Critical Depth	20.8 in
Critical Slope	2.476 %
Velocity	7.20 ft/s
Velocity Head	0.80 ft
Specific Energy	2.29 ft
Froude Number	1.472
Flow Type	Supercritical

Worksheet for PROP CHNL A

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	17.8 in
Critical Depth	20.8 in
Channel Slope	5.650 %
Critical Slope	2.476 %

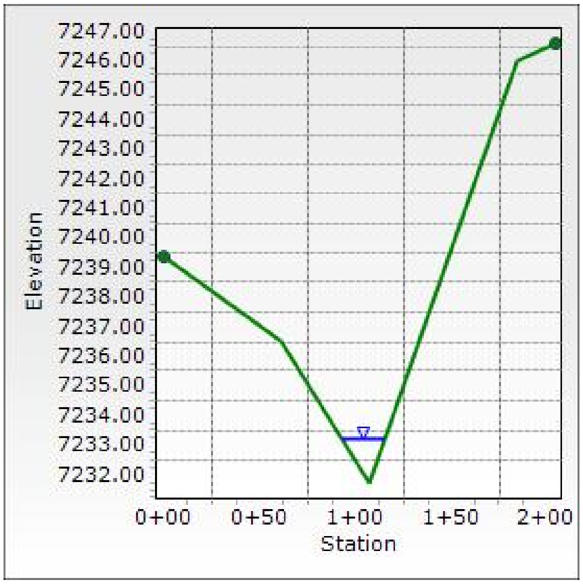
Cross Section for PROP CHNL A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.650 %
Normal Depth	17.8 in
Discharge	120.70 cfs



Worksheet for PROP CHNL B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.980 %
Discharge	117.40 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,249.10
0+38	7,248.00
0+78	7,243.32
0+95	7,240.83
1+06	7,243.14
1+48	7,247.55
1+79	7,249.28

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,249.10)	(1+79, 7,249.28)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	19.2 in
Roughness Coefficient	0.040
Elevation	7,242.43 ft
Elevation Range	7,240.8 to 7,249.3 ft
Flow Area	15.1 ft²
Wetted Perimeter	19.2 ft
Hydraulic Radius	9.5 in
Top Width	18.94 ft
Normal Depth	19.2 in
Critical Depth	22.7 in
Critical Slope	2.420 %
Velocity	7.75 ft/s
Velocity Head	0.93 ft
Specific Energy	2.53 ft

Worksheet for PROP CHNL B

Results	
Froude Number	1.528
Flow Type	Supercritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	19.2 in
Critical Depth	22.7 in
Channel Slope	5.980 %
Critical Slope	2.420 %

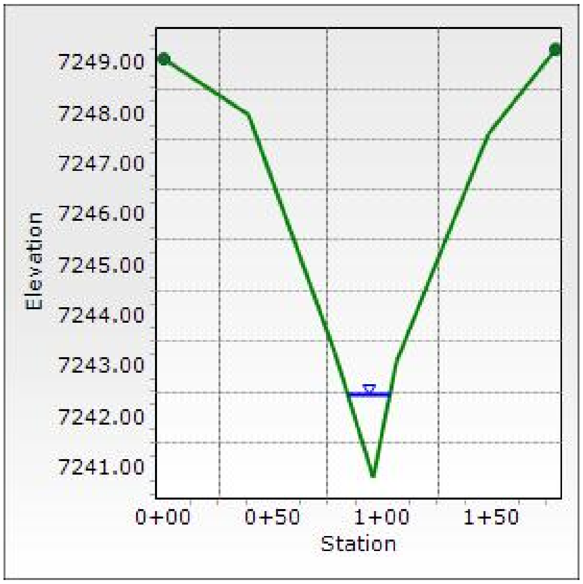
Cross Section for PROP CHNL B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	5.980 %
Normal Depth	19.2 in
Discharge	117.40 cfs



Worksheet for PROP CHNL C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	8.540	%
Discharge	8.20	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,248.79
0+77	7,244.26
0+98	7,243.56
1+16	7,244.42
1+79	7,250.54

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,248.79)	(1+79, 7,250.54)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	3.8	in
Roughness Coefficient	0.040	
Elevation	7,243.88	ft
Elevation Range	7,243.6 to 7,250.5 ft	
Flow Area	2.6	ft²
Wetted Perimeter	16.1	ft
Hydraulic Radius	1.9	in
Top Width	16.05	ft
Normal Depth	3.8	in
Critical Depth	4.4	in
Critical Slope	4.108	%
Velocity	3.19	ft/s
Velocity Head	0.16	ft
Specific Energy	0.48	ft
Froude Number	1.407	
Flow Type	Supercritical	

Worksheet for PROP CHNL C

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

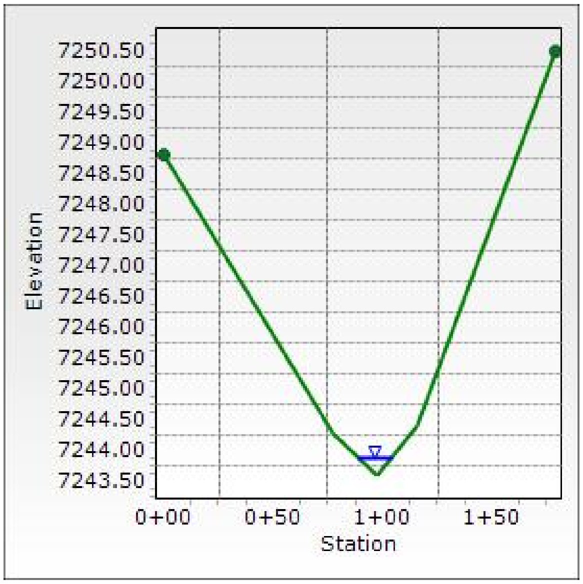
GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.8 in
Critical Depth	4.4 in
Channel Slope	8.540 %
Critical Slope	4.108 %

Cross Section for PROP CHNL C

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	8.540 %
Normal Depth	3.8 in
Discharge	8.20 cfs



Worksheet for PROP CHNL D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.320	%
Discharge	61.20	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,237.14
0+22	7,237.45
0+78	7,235.70
0+84	7,235.20
0+98	7,236.20
1+12	7,236.63
1+58	7,239.52
1+69	7,239.77

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,237.14)	(1+69, 7,239.77)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	12.1	in
Roughness Coefficient	0.040	
Elevation	7,236.21	ft
Elevation Range	7,235.2 to 7,239.8	ft
Flow Area	15.8	ft^2
Wetted Perimeter	36.3	ft
Hydraulic Radius	5.2	in
Top Width	36.22	ft
Normal Depth	12.1	in
Critical Depth	12.3	in
Critical Slope	3.076	%
Velocity	3.88	ft/s
Velocity Head	0.23	ft

Worksheet for PROP CHNL D

Results		
Specific Energy	1.24	ft
Froude Number	1.038	
Flow Type	Supercritical	

GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	12.1	in
Critical Depth	12.3	in
Channel Slope	3.320	%
Critical Slope	3.076	%

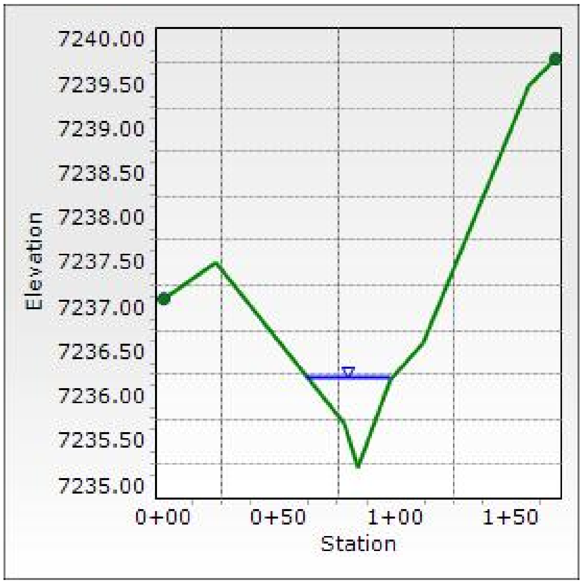
Cross Section for PROP CHNL D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.320 %
Normal Depth	12.1 in
Discharge	61.20 cfs



Worksheet for PROP CHNL E

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.570 %
Discharge	81.40 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,229.28
0+45	7,228.39
0+96	7,224.00
1+37	7,222.21
1+52	7,221.75
1+73	7,222.00
2+07	7,224.35
2+62	7,225.92

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,229.28)	(2+62, 7,225.92)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	8.8 in
Roughness Coefficient	0.040
Elevation	7,222.48 ft
Elevation Range	7,221.8 to 7,229.3 ft
Flow Area	22.8 ft²
Wetted Perimeter	49.2 ft
Hydraulic Radius	5.6 in
Top Width	49.15 ft
Normal Depth	8.8 in
Critical Depth	8.5 in
Critical Slope	3.053 %
Velocity	3.57 ft/s
Velocity Head	0.20 ft

Worksheet for PROP CHNL E

Results		
Specific Energy	0.93	ft
Froude Number	0.924	
Flow Type	Subcritical	

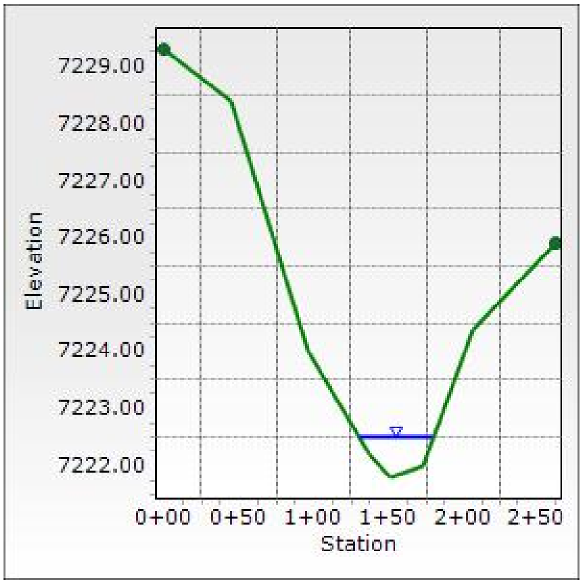
GVF Input Data		
Downstream Depth	0.0	in
Length	0.0	ft
Number Of Steps	0	

GVF Output Data		
Upstream Depth	0.0	in
Profile Description	N/A	
Profile Headloss	0.00	ft
Downstream Velocity	0.00	ft/s
Upstream Velocity	0.00	ft/s
Normal Depth	8.8	in
Critical Depth	8.5	in
Channel Slope	2.570	%
Critical Slope	3.053	%

Cross Section for PROP CHNL E

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	2.570 %
Normal Depth	8.8 in
Discharge	81.40 cfs



Worksheet for PROP CHNL F

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.050 %
Discharge	23.70 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+04	7,238.00
0+58	7,237.06
1+10	7,237.86
1+28	7,238.35

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+04, 7,238.00)	(1+28, 7,238.35)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	5.3 in
Roughness Coefficient	0.040
Elevation	7,237.51 ft
Elevation Range	7,237.1 to 7,238.4 ft
Flow Area	12.1 ft²
Wetted Perimeter	54.5 ft
Hydraulic Radius	2.7 in
Top Width	54.50 ft
Normal Depth	5.3 in
Critical Depth	4.7 in
Critical Slope	4.013 %
Velocity	1.95 ft/s
Velocity Head	0.06 ft
Specific Energy	0.50 ft
Froude Number	0.730
Flow Type	Subcritical

Worksheet for PROP CHNL F

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.3 in
Critical Depth	4.7 in
Channel Slope	2.050 %
Critical Slope	4.013 %

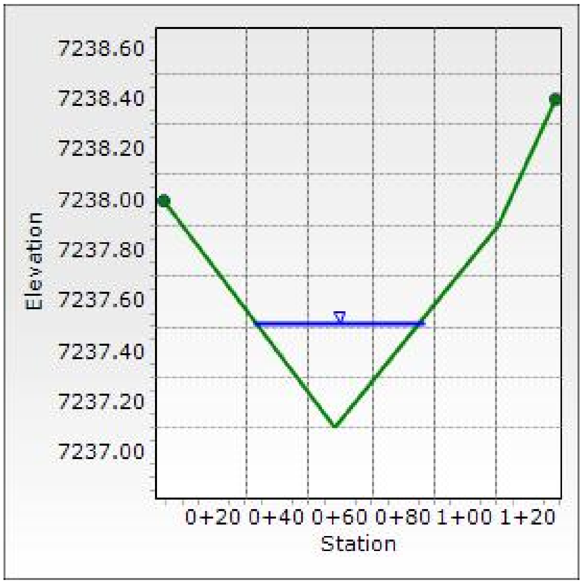
Cross Section for PROP CHNL F

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.050 %
Normal Depth	5.3 in
Discharge	23.70 cfs



Worksheet for PROP CHNL G

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.290 %
Discharge	84.20 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,215.15
0+58	7,209.92
0+75	7,209.09
0+88	7,210.43
1+14	7,211.58

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,215.15)	(1+14, 7,211.58)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	14.0 in
Roughness Coefficient	0.040
Elevation	7,210.26 ft
Elevation Range	7,209.1 to 7,215.2 ft
Flow Area	20.5 ft²
Wetted Perimeter	32.8 ft
Hydraulic Radius	7.5 in
Top Width	32.71 ft
Normal Depth	14.0 in
Critical Depth	13.5 in
Critical Slope	2.772 %
Velocity	4.11 ft/s
Velocity Head	0.26 ft
Specific Energy	1.43 ft
Froude Number	0.915
Flow Type	Subcritical

Worksheet for PROP CHNL G

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	14.0 in
Critical Depth	13.5 in
Channel Slope	2.290 %
Critical Slope	2.772 %

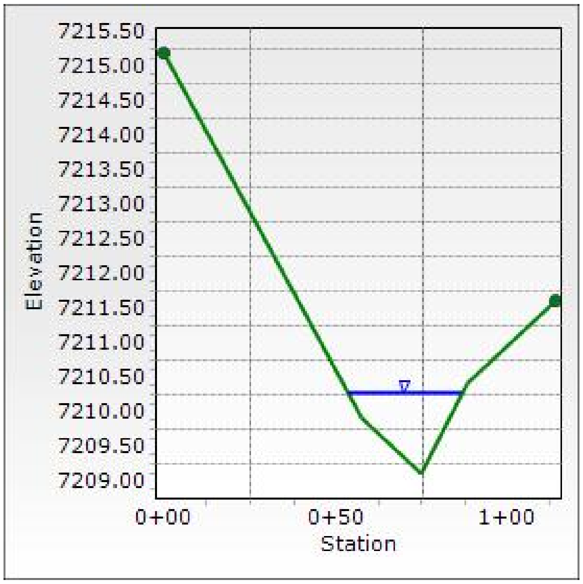
Cross Section for PROP CHNL G

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.290 %
Normal Depth	14.0 in
Discharge	84.20 cfs



Worksheet for PROP CHNL H

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.450 %
Discharge	144.80 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,224.50
0+19	7,224.00
0+31	7,222.40
0+48	7,224.40
0+53	7,224.66

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,224.50)	(0+53, 7,224.66)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	22.7 in
Roughness Coefficient	0.040
Elevation	7,224.29 ft
Elevation Range	7,222.4 to 7,224.7 ft
Flow Area	29.9 ft²
Wetted Perimeter	39.4 ft
Hydraulic Radius	9.1 in
Top Width	39.15 ft
Normal Depth	22.7 in
Critical Depth	22.5 in
Critical Slope	2.571 %
Velocity	4.84 ft/s
Velocity Head	0.36 ft
Specific Energy	2.26 ft
Froude Number	0.976
Flow Type	Subcritical

Worksheet for PROP CHNL H

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	22.7 in
Critical Depth	22.5 in
Channel Slope	2.450 %
Critical Slope	2.571 %

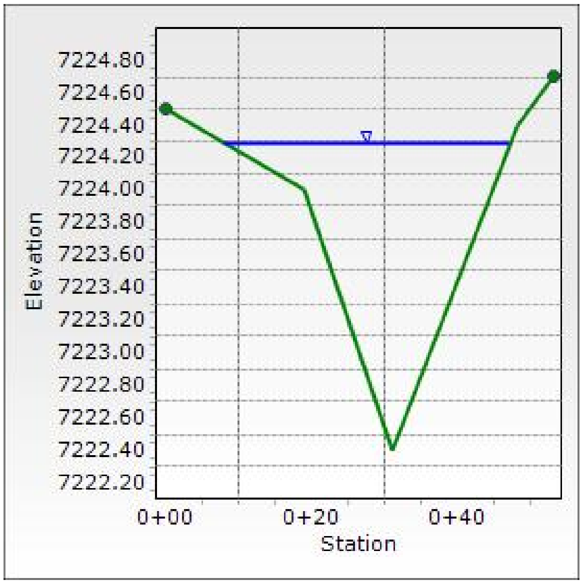
Cross Section for PROP CHNL H

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.450 %
Normal Depth	22.7 in
Discharge	144.80 cfs



Worksheet for PROP CHNL I

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.220 %
Discharge	152.40 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,218.31
0+47	7,218.50
0+86	7,216.59
1+59	7,221.00
1+71	7,221.35

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,218.31)	(1+71, 7,221.35)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	16.6 in
Roughness Coefficient	0.040
Elevation	7,217.98 ft
Elevation Range	7,216.6 to 7,221.4 ft
Flow Area	35.2 ft²
Wetted Perimeter	50.9 ft
Hydraulic Radius	8.3 in
Top Width	50.78 ft
Normal Depth	16.6 in
Critical Depth	16.1 in
Critical Slope	2.670 %
Velocity	4.33 ft/s
Velocity Head	0.29 ft
Specific Energy	1.68 ft
Froude Number	0.917
Flow Type	Subcritical

Worksheet for PROP CHNL I

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	16.6 in
Critical Depth	16.1 in
Channel Slope	2.220 %
Critical Slope	2.670 %

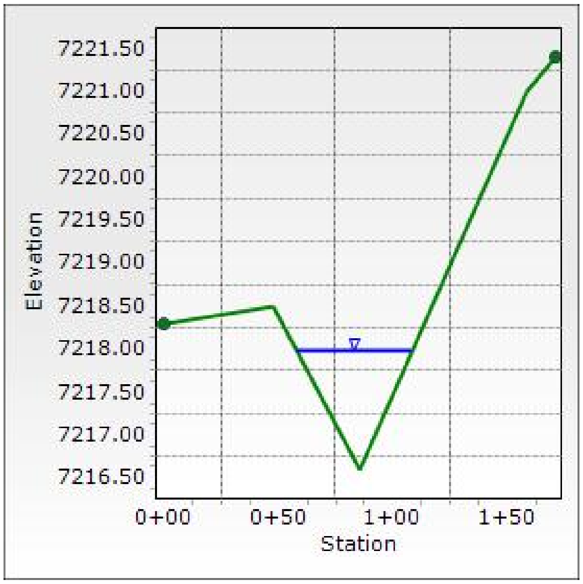
Cross Section for PROP CHNL I

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.220 %
Normal Depth	16.6 in
Discharge	152.40 cfs



Worksheet for PROP CHNL J

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	1.250 %
Discharge	29.90 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+24	7,204.53
1+22	7,201.99
2+31	7,203.75

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+24, 7,204.53)	(2+31, 7,203.75)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	6.9 in
Roughness Coefficient	0.040
Elevation	7,202.56 ft
Elevation Range	7,202.0 to 7,204.5 ft
Flow Area	16.5 ft²
Wetted Perimeter	57.5 ft
Hydraulic Radius	3.4 in
Top Width	57.48 ft
Normal Depth	6.9 in
Critical Depth	5.6 in
Critical Slope	3.787 %
Velocity	1.81 ft/s
Velocity Head	0.05 ft
Specific Energy	0.63 ft
Froude Number	0.595
Flow Type	Subcritical

GVF Input Data

Worksheet for PROP CHNL J

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

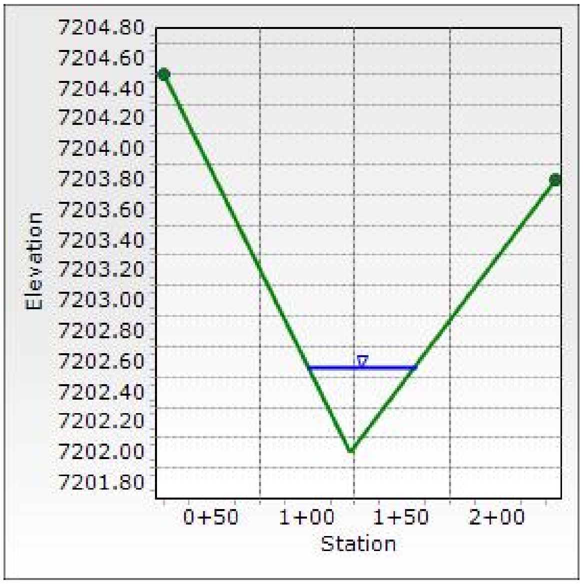
GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.9 in
Critical Depth	5.6 in
Channel Slope	1.250 %
Critical Slope	3.787 %

Cross Section for PROP CHNL J

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data		
Channel Slope	1.250	%
Normal Depth	6.9	in
Discharge	29.90	cfs



Worksheet for PROP CHNL K

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.460 %
Discharge	167.50 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,212.20
0+96	7,210.71
1+60	7,211.35
1+65	7,210.93
1+72	7,210.90
1+75	7,211.02
1+83	7,213.46

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,212.20)	(1+83, 7,213.46)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	8.9 in
Roughness Coefficient	0.040
Elevation	7,211.46 ft
Elevation Range	7,210.7 to 7,213.5 ft
Flow Area	52.4 ft²
Wetted Perimeter	128.9 ft
Hydraulic Radius	4.9 in
Top Width	128.77 ft
Normal Depth	8.9 in
Critical Depth	8.5 in
Critical Slope	3.224 %
Velocity	3.20 ft/s
Velocity Head	0.16 ft
Specific Energy	0.90 ft

Worksheet for PROP CHNL K

Results	
Froude Number	0.883
Flow Type	Subcritical

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	0.00 ft/s
Upstream Velocity	0.00 ft/s
Normal Depth	8.9 in
Critical Depth	8.5 in
Channel Slope	2.460 %
Critical Slope	3.224 %

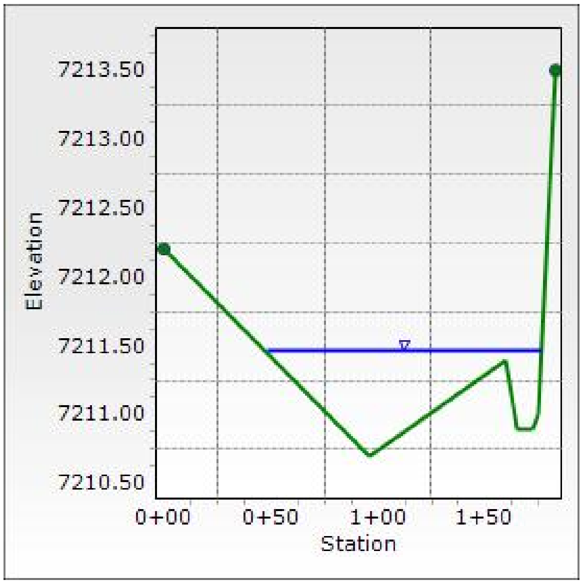
Cross Section for PROP CHNL K

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	2.460 %
Normal Depth	8.9 in
Discharge	167.50 cfs



Worksheet for PROP CHNL L

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.870 %
Discharge	21.90 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+12	7,226.00
0+53	7,222.85
0+74	7,221.57
1+55	7,223.80

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+12, 7,226.00)	(1+55, 7,223.80)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	6.3 in
Roughness Coefficient	0.040
Elevation	7,222.10 ft
Elevation Range	7,221.6 to 7,226.0 ft
Flow Area	7.3 ft^2
Wetted Perimeter	27.6 ft
Hydraulic Radius	3.2 in
Top Width	27.62 ft
Normal Depth	6.3 in
Critical Depth	6.4 in
Critical Slope	3.624 %
Velocity	3.00 ft/s
Velocity Head	0.14 ft
Specific Energy	0.67 ft
Froude Number	1.031
Flow Type	Supercritical

Worksheet for PROP CHNL L

GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data	
Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	6.3 in
Critical Depth	6.4 in
Channel Slope	3.870 %
Critical Slope	3.624 %

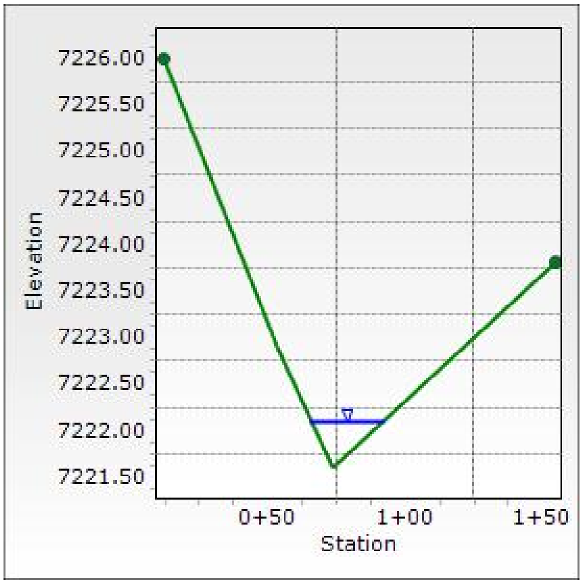
Cross Section for PROP CHNL L

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.870 %
Normal Depth	6.3 in
Discharge	21.90 cfs



Worksheet for PROP CHNL M

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.540 %
Discharge	185.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,203.94
0+72	7,201.87
1+11	7,198.36
1+38	7,202.50
2+08	7,202.04

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,203.94)	(2+08, 7,202.04)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	20.6 in
Roughness Coefficient	0.040
Elevation	7,200.08 ft
Elevation Range	7,198.4 to 7,203.9 ft
Flow Area	26.0 ft^2
Wetted Perimeter	30.5 ft
Hydraulic Radius	10.2 in
Top Width	30.32 ft
Normal Depth	20.6 in
Critical Depth	23.3 in
Critical Slope	2.377 %
Velocity	7.12 ft/s
Velocity Head	0.79 ft
Specific Energy	2.50 ft
Froude Number	1.355
Flow Type	Supercritical

Worksheet for PROP CHNL M

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	20.6 in
Critical Depth	23.3 in
Channel Slope	4.540 %
Critical Slope	2.377 %

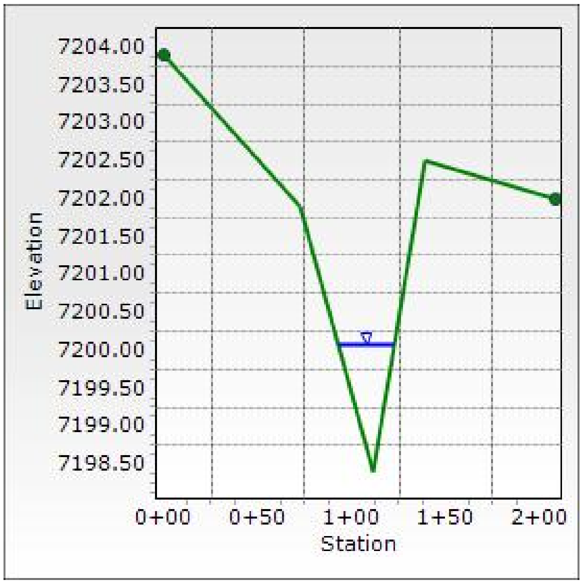
Cross Section for PROP CHNL M

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	4.540 %
Normal Depth	20.6 in
Discharge	185.30 cfs



Worksheet for PROP CHNL N

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.500 %
Discharge	41.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+03	7,201.34
0+15	7,198.34
0+21	7,198.34
0+33	7,201.34

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+03, 7,201.34)	(0+33, 7,201.34)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	17.0 in
Roughness Coefficient	0.040
Elevation	7,199.75 ft
Elevation Range	7,198.3 to 7,201.3 ft
Flow Area	16.5 ft²
Wetted Perimeter	17.7 ft
Hydraulic Radius	11.2 in
Top Width	17.31 ft
Normal Depth	17.0 in
Critical Depth	11.0 in
Critical Slope	2.729 %
Velocity	2.51 ft/s
Velocity Head	0.10 ft
Specific Energy	1.51 ft
Froude Number	0.453
Flow Type	Subcritical

Worksheet for PROP CHNL N

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

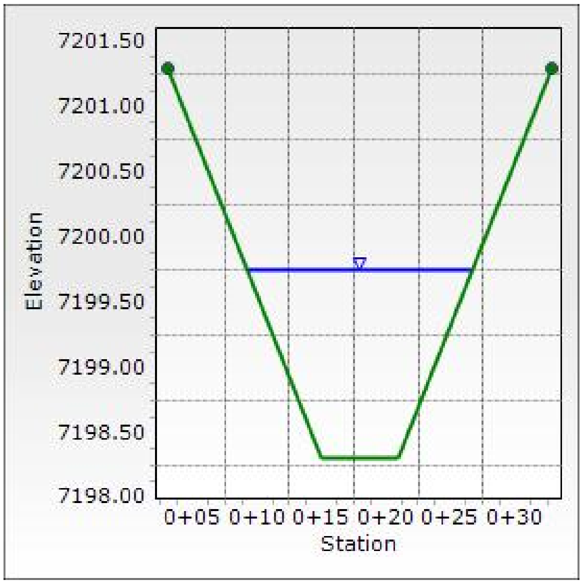
GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	17.0 in
Critical Depth	11.0 in
Channel Slope	0.500 %
Critical Slope	2.729 %

Cross Section for PROP CHNL N

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.500 %
Normal Depth	17.0 in
Discharge	41.30 cfs



Worksheet for PROP CHNL O

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.260	%
Discharge	5.50	cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,195.73
0+70	7,196.09
1+00	7,192.99
1+30	7,195.99
1+83	7,197.86

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,195.73)	(1+83, 7,197.86)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	5.6	in
Roughness Coefficient	0.040	
Elevation	7,193.46	ft
Elevation Range	7,193.0 to 7,197.9 ft	
Flow Area	2.2	ft²
Wetted Perimeter	9.3	ft
Hydraulic Radius	2.8	in
Top Width	9.25	ft
Normal Depth	5.6	in
Critical Depth	5.5	in
Critical Slope	3.848	%
Velocity	2.54	ft/s
Velocity Head	0.10	ft
Specific Energy	0.57	ft
Froude Number	0.924	
Flow Type	Subcritical	

Worksheet for PROP CHNL O

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	5.6 in
Critical Depth	5.5 in
Channel Slope	3.260 %
Critical Slope	3.848 %

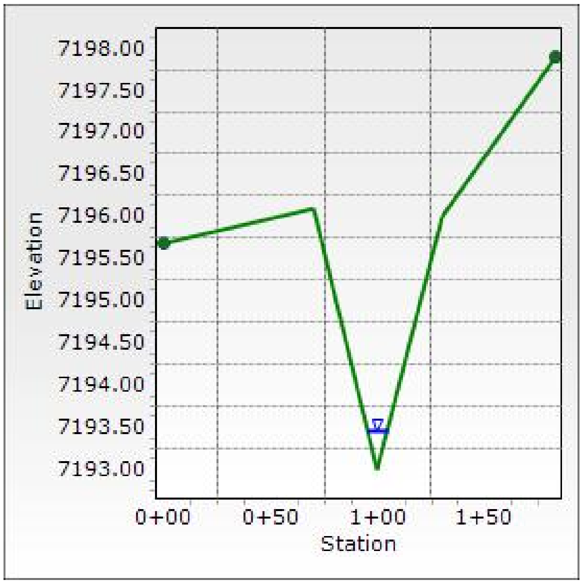
Cross Section for PROP CHNL O

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	3.260 %
Normal Depth	5.6 in
Discharge	5.50 cfs



Worksheet for PROP CHNL P

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	7.650 %
Discharge	2.30 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	7,199.37
0+28	7,199.01
0+88	7,193.89
1+16	7,198.17
1+63	7,198.52

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 7,199.37)	(1+63, 7,198.52)	0.040

Options

Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results

Normal Depth	3.6 in
Roughness Coefficient	0.040
Elevation	7,194.19 ft
Elevation Range	7,193.9 to 7,199.4 ft
Flow Area	0.8 ft²
Wetted Perimeter	5.5 ft
Hydraulic Radius	1.8 in
Top Width	5.42 ft
Normal Depth	3.6 in
Critical Depth	4.0 in
Critical Slope	4.288 %
Velocity	2.86 ft/s
Velocity Head	0.13 ft
Specific Energy	0.42 ft
Froude Number	1.312
Flow Type	Supercritical

Worksheet for PROP CHNL P

GVF Input Data

Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

GVF Output Data

Upstream Depth	0.0 in
Profile Description	N/A
Profile Headloss	0.00 ft
Downstream Velocity	Infinity ft/s
Upstream Velocity	Infinity ft/s
Normal Depth	3.6 in
Critical Depth	4.0 in
Channel Slope	7.650 %
Critical Slope	4.288 %

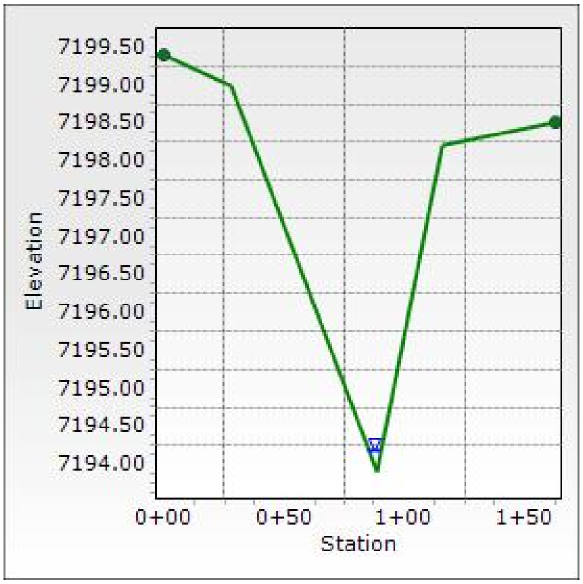
Cross Section for PROP CHNL P

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	7.650 %
Normal Depth	3.6 in
Discharge	2.30 cfs



ROADSIDE DITCH SUMMARY TABLE

Ditch #	ROADWAY	FROM STA	TO STA	PROPOSED SLOPE (%)	SIDE	SIDE SLOPE (L/R)	CHANNEL DEPTH (FT)	FRICTION FACTOR	BASIN	Q100 FLOW (CFS)	DITCH FLOW % OF BASIN	DITCH FLOW (CFS)	Q100 DEPTH (FT)	Q100 VELOCITY (FT/S)	Froude No. (Fr)	DITCH LINING
1	NORTHWEST CUL-DE-SAC	86+30	89+59	1.25%	LEFT	4:1/4:1	2.5	0.04	5%OB5	107.1	5%	5.4	0.8	2.2	0.6	GRASS
2	NORTHWEST CUL-DE-SAC	86+30	89+59	1.02%	RIGHT	4:1/4:1	2.5	0.04	1%OB5	107.1	1%	1.1	0.4	1.4	0.5	GRASS
3	S. ARROYA LANE	20+00	24+28	3.28%	RIGHT	4:1/4:1	2.5	0.04	12%PB11	29.8	12%	3.6	0.6	2.8	0.9	GRASS/TRM
4	S. ARROYA LANE	20+00	24+28	2.88%	LEFT	4:1/4:1	2.5	0.04	5%PB10	20.4	5%	6.1	0.7	3.1	0.9	GRASS/TRM
5	S. ARROYA LANE	16+50	20+00	3.81%	RIGHT	4:1/4:1	2.5	0.04	25%PB11	29.8	25%	7.5	0.7	3.6	1.1	GRASS/TRM
6	S. ARROYA LANE	15+88	16+50	4.42%	LEFT	4:1/4:1	2.5	0.04	PB12	0.9	100%	0.9	0.3	2.2	1.0	GRASS/TRM
7	S. ARROYA LANE	15+88	16+50	2.69%	RIGHT	4:1/4:1	2.5	0.04	30%PB11	29.8	30%	8.9	0.8	3.3	0.9	GRASS/TRM
8	ACEQUIA COURT (RIGHT CUL-DE-SAC)	70+30.50	71+00	1.56%	LEFT	4:1/4:1	2.5	0.04	30%PB11	29.8	30%	8.9	1.0	2.4	0.6	GRASS
9	ACEQUIA COURT (RIGHT CUL-DE-SAC)	71+60	75+44	1.23%	LEFT	4:1/4:1	2.5	0.04	5%PB11	29.8	5%	1.5	0.5	1.6	0.6	GRASS
10	ACEQUIA COURT (RIGHT CUL-DE-SAC)	71+60	75+44	2.14%	RIGHT	4:1/4:1	2.5	0.04	10%PB14	46.3	10%	4.6	0.7	2.6	0.8	GRASS
11	FLAMING SUN DRIVE	24+40	26+88	1.84%	RIGHT	4:1/4:1	2.5	0.04	10%OB2	52.7	10%	5.3	0.7	2.5	0.7	GRASS
12	FLAMING SUN DRIVE	26+88	30+80	2.03%	LEFT	4:1/4:1	2.5	0.04	5% OB2 + 2%OB3	67.2	3%	2.2	0.5	2.1	0.7	GRASS
13	FLAMING SUN DRIVE	26+88	30+80	1.87%	RIGHT	4:1/4:1	2.5	0.04	10%OB2	52.7	10%	5.3	0.7	2.5	0.7	GRASS
14	FLAMING SUN DRIVE	34+00	37+76	1.40%	LEFT	4:1/4:1	2.5	0.04	20%PB5	10.4	20%	2.1	0.5	1.8	0.6	GRASS
15	FLAMING SUN DRIVE	34+00	37+76	1.43%	RIGHT	4:1/4:1	2.5	0.04	1%PB6	20.7	1%	0.2	0.2	1.0	0.5	GRASS
16	FLAMING SUN DRIVE	39+81	43+10	3.48%	LEFT	4:1/4:1	2.5	0.04	75%PB7	7.4	75%	5.6	0.7	3.2	1.0	GRASS/TRM
17	FLAMING SUN DRIVE	43+10	44+00	3.29%	RIGHT	4:1/4:1	2.5	0.04	8%PB6	20.7	8%	1.7	0.4	2.4	0.9	GRASS/TRM
18	FLAMING SUN DRIVE	43+10	44+00	3.43%	LEFT	4:1/4:1	2.5	0.04	PB7	7.4	100%	7.4	0.7	3.5	1.0	GRASS/TRM
19	S. ARROYA LANE	8+67	12+00	1.21%	LEFT	4:1/4:1	2.5	0.04	PB7 + 10%PB6	28.1	34%	12.6	1.1	2.7	0.6	GRASS
20	S. ARROYA LANE	8+67	12+00	1.64%	RIGHT	4:1/4:1	2.5	0.04	1%PB14	46.3	1%	0.5	0.3	1.3	0.6	GRASS
21	CHAMITA TRAIL (SOUTH CUL-DE-SAC)	60+00	63+78.50	1.23%	LEFT	4:1/4:1	2.5	0.04	15%PB15+1%PB14	26.3	15%	3.9	0.7	2.0	0.6	GRASS

Design Data and Test Results

Excel PP5-12™

Make sure the construction plans notes the specific product to be used.

IECA Member

ECTC Directing Member

Specifications

A variety of test methods are utilized to determine performance and conformance values for Rolled Erosion Control Products (RECPs). Information within this document is presented to provide conformance values and recommended design values. Test results obtained for the Excel PP5-12 Turf Reinforcement Mat (TRM) and general design values are presented in Tables 1-4. For specific information detailing testing protocols, results and application of design values, refer to document number WE_EXCEL_PERF_GEN.

Table 1 - Bench Scale Testing / NTPEP

Test Method	Condition	Result
ASTM D7101 Bench Scale Rainfall and Rainsplash Test	2 in per hour	14.53
	4 in per hour	5.59
	6 in per hour	4.82
ASTM D7207 Bench Scale Shear Resistance Test	3.0 psf (145 PA)	0.5 in (12 mm)
ASTM D7322 Bench Scale Vegetation Establishment Test	Top Soil, Fescue, 21 Day Incubation	661 %
NTPEP Report Number	ECP-2016-03-008	

Table 2 - Texas Transportation Institute (TTI) Results

Class	Test Condition	Result
A	< 3H:1 Clay Slope Test	N/A
B	< 3H:1 Sand Slope Test	N/A
C	> 3H:1 Clay Slope Test	N/A
D	> 3H:1 Sand Slope Test	N/A
E	2 psf Partially Vegetated Channel Test	Approved
F	4 psf Partially Vegetated Channel Test	Approved
G	6 psf Partially Vegetated Channel Test	Approved
H	8 psf Partially Vegetated Channel Test	Approved

Table 3 - Recommended Design Values*

Design Value	Unvegetated	Vegetated
Typical RUSLE Cover Factor (C Factor)**	0.03	N/A
Maximum Slope Gradient (RUSLE)	1H : 1V	N/A
Max Allowable Velocity (0.5 in (12mm) soil loss)***	9.0 ft/s (2.7 m/s)	15.0 ft/s (4.6 m/s)
Max Allowable Shear Stress (0.5 in (12mm) soil loss)***	2.8 psf (134 PA)	12.0 psf (575 PA)
CF_{veg}/CF_{TRM}	N/A	0.26

C Factor value compliant with ASTM D6459. * Shear Stress and Velocity values compliant with ASTM D6460.

Table 4 - HEC-15 Resistance to Flow Values

Design Value	Unvegetated
Manning's n @ Tau_{lower} (0.7 psf (34 PA))	0.027
Manning's n @ Tau_{mid} (1.4 psf (67 PA))	0.027
Manning's n @ Tau_{upper} (2.8 psf (134 PA))	0.027

*Recommended Design Values are based on results of standardized industry full-scale testing and may not be applicable for all field conditions. For most accurate computation of field performance, consult Excel Erosion Design (EED) at www.westernexcelsior.com.

ROCK CHUTE DETAILS

Rock Chute ID	Rock Chute Location	Contributing Basins	Q100 Flow (cfs)	Upstream Inlet Apron Length (ft)	Drop (ft) *(Inlet Apron to Outlet Apron)*	Chute Length (ft)	Downstream Outlet Apron Length (ft)	Chute Width (ft)	D50 (in)	Rock Chute Thickness (in)	Radius (ft)	Rock Chute Depth* (ft)	Top Chute Width** (ft)
1	PB9	PB9(70%), OB6, OB7	415	20	9	45	29	22	24	48	67	4.0	54
2	PB8	PB8 (70%), OB5	128	10	17	68	18	22	18	36	50	2.5	42
3	PB8	PB8 (40%), OB5	120	12	8	40	19	14	18	36	50	3.0	38
4	PB8	PB8 (30%)	10	10	4	12	7	14	6	12	17	1.5	26
5	PB8	Undetained 100YR Pond Inflow	490	23	7	175	13	20	12	24	33	5.0	60
6	PB14	OB8, PB11, PB14 (10%)	85	11	7	64	15	10	18	36	50	3.0	34
7	PB15	PB6, PB7, PB15(55%)	43	10	6	24	13	14	12	24	33	2.0	30
8	PB15	OB2, OB3, OB4, PB3, PB4, PB5, PB15 (10%)	185	14	5	20	23	18	24	48	67	3.5	46
9	PB10	PB10 (20%)	4	10	9	30	9	2	9	18	25	2.0	18

<u>NOTES:</u>
*: Rock Chute Depth accounts for 1' of freeboard.
**: Top Chute Width accounts for 1' of freeboard.

Rock Chute Design Data

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: *Eagleview Rock Chute 1* **County:** *El Paso*
Designer: *BAH* **Checked by:**
Date: *December 21, 2022* **Date:**

Input Geometry:

Upstream Channel	Chute	Downstream Channel
Bw = 22.0 ft.	Bw = 22.0 ft.	Bw = 22.0 ft.
Side slopes = 4.0 (m:1)	Factor of safety = 1.60 (F_s) → 1.2 Min	Side slopes = 4.0 (m:1)
Velocity n-value = 0.040	Side slopes = 4.0 (m:1) → 2.0:1 max.	Velocity n-value = 0.040
Bed slope = 0.0250 ft./ft.	Bed slope (5:1) = 0.200 ft./ft → 3.0:1 max.	Bed slope = 0.0050 ft./ft.
Note: n value = a) velocity n from waterway program or b) computed mannings n for channel	Freeboard = 1.0 ft.	
	Outlet apron depth, d = 1.0 ft.	Base flow = 0.0 cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = 7222.0 ft. ------- Outlet 7213.0 ft. --- (H_{drop} = 8 ft.)

Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410

Q_5 = Runofff from a 5-year,24-hour storm.

***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*

***Input tailwater (Tw)**:* 0.20 1.60

Q_{high} = 415.0 cfs High flow storm through chute → Tw (ft.) = *Program*

Q_5 = 152.0 cfs Low flow storm through chute → Tw (ft.) = *Program*

Profile and Cross Section (Output):

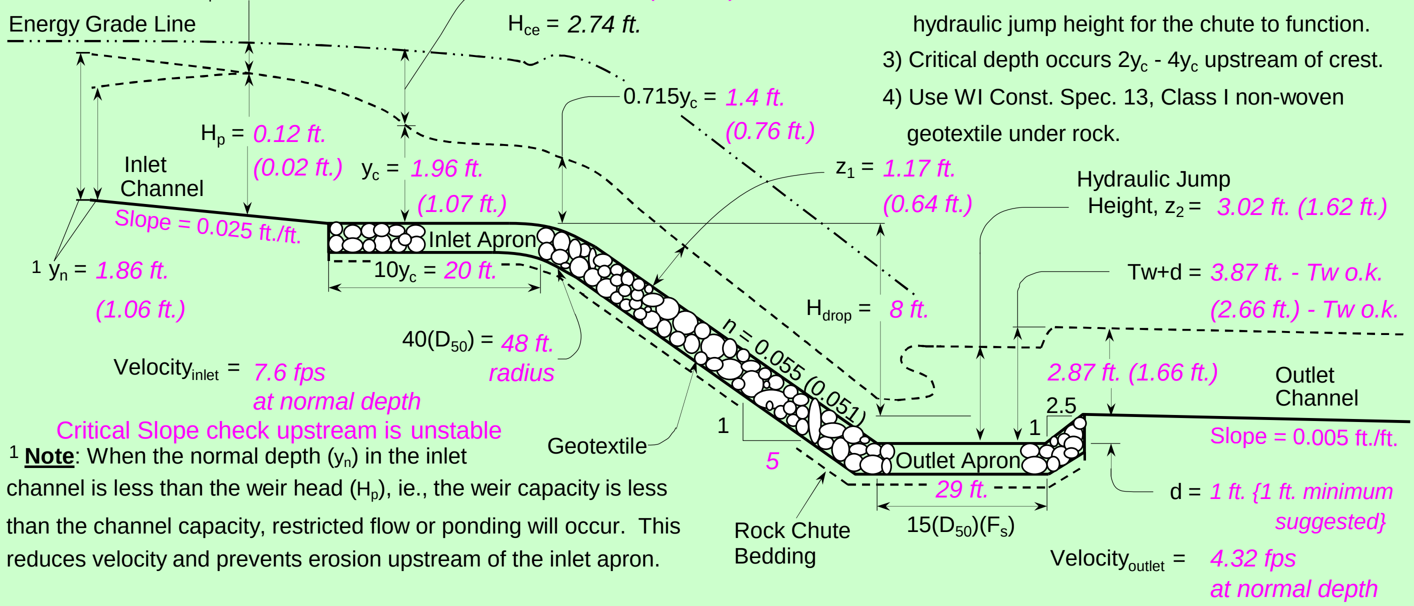
Starting Station = 0+00.0

h_{pv} = 140.75 ft. (469.01 ft.)

H_{pe} = 140.87 ft.

Notes:

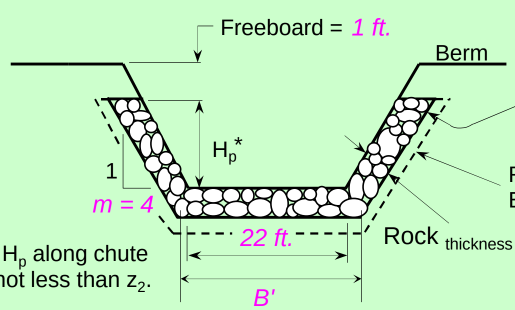
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs $2y_c$ - $4y_c$ upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.



[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	15.62 cfs/ft.	Equivalent unit discharge
F_S =	1.60	Factor of safety (multiplier)
z_1 =	1.17 ft.	Normal depth in chute
n-value =	0.055	Manning's roughness coefficient
$D_{50}(F_s)$ =	23.2 in.	Minimum Design D50*
$2(D_{50})(F_s)$ =	46.4 in.	Rock chute thickness
Tw + d =	3.87 ft.	Tailwater above outlet apron
z_2 =	3.02 ft.	Hydraulic jump height
***** The outlet***	will	***function adequately***

High Flow Storm Information

Rock Chute Design - Plan Sheet

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview Rock Chute 1 **County:** El Paso
Designer: BAH **Checked by:**
Date: 12/21/2022 **Date:**

Minimum Design Values		*Enter Plan Values*	
23.2 in.	D_{50} dia. =	24.00	in.
46.4 in.	$Rock_{chute}$ thickness =	48.00	in.
20 ft.	Inlet apron length =	20.00	ft.
29 ft.	Outlet apron length =	29.00	ft.
48 ft.	Radius =	67	ft.

Will bedding be used? Yes ---------- Depth (in.) = 12.0

Rock Gradation Envelope

% Passing		*Diameter, in. (weight, lbs.)*
D_{100}	---------	36 - 48 (3302 - 7827)
D_{85}	---------	31 - 43 (2150 - 5706)
D_{50}	---------	24 - 36 (978 - 3302)
D_{10}	---------	19 - 31 (501 - 2150)

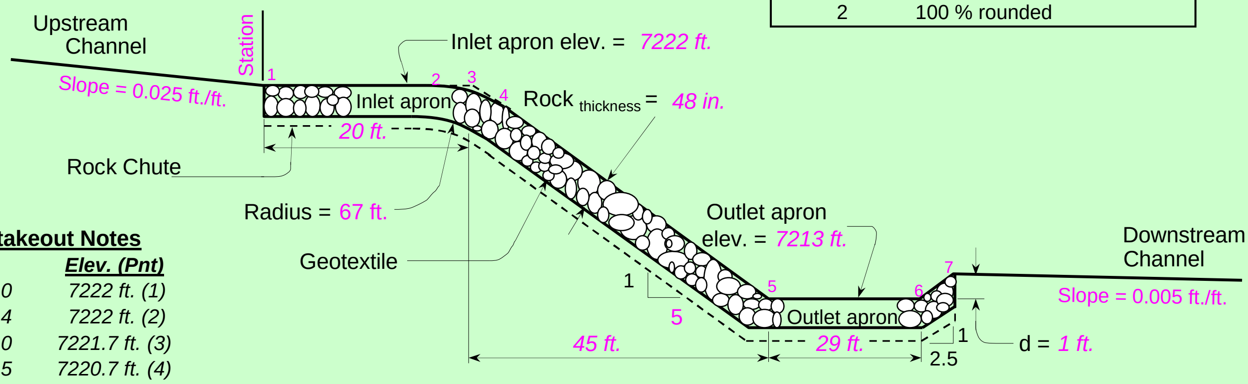
Quantities [a]

Rock =	924	yd^3
Geotextile (WCS-13)[b] =	877	yd^2
Bedding 12 in. =	308	yd^3
Excavation =	0	yd^3
Earthfill =	0	yd^3
Seeding =	0.0	acres

Notes: [a] Rock, bedding, and geotextile quantities are determined from the x-section below (neglect radius).
[b] Geotextile Class I (non-woven) shall be overlapped and anchored (18-in. min. along sides and 24-in. min. on the ends).

Degree of angularity = 1

1	50% angular, 50% rounded
2	100 % rounded



Profile Along Centerline of Rock Chute

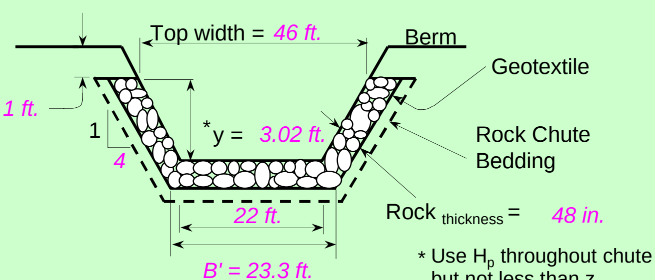
** ***Note***: ***The outlet will function adequately***

Stakeout Notes

Sta.	*Elev. (Pnt)*
0+00.0	7222 ft. (1)
0+13.4	7222 ft. (2)
0+20.0	7221.7 ft. (3)
0+26.5	7220.7 ft. (4)
0+65.0	7213 ft. (5)
0+94.0	7213 ft. (6)
0+96.5	7214 ft. (7)

Class I non-woven

Rock gradation envelope can be met with Gradation printed



Rock Chute Cross Section

Rock Chute Cost Estimate

Unit	*Unit Cost*	*Cost*
Rock	$10.00 /$yd^3$	$9,240.00
Geotextile	$12.00/$yd^2$	$10,524.00
Bedding	$12.00 /$yd^3$	$3,696.00
Excavation	$12.00/$yd^3$	$0.00
Earthfill	$1.00 /$yd^3$	$0.00
Seeding	$2.00 /ac.	$0.00
	Total	**$23,460.00**

Profile, Cross Sections, and Quantities

NRCS Natural Resources Conservation Service, United States Department of Agriculture

Eagleview Rock Chute 1
El Paso County

		Date
Designed	BAH	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet ___ of ___

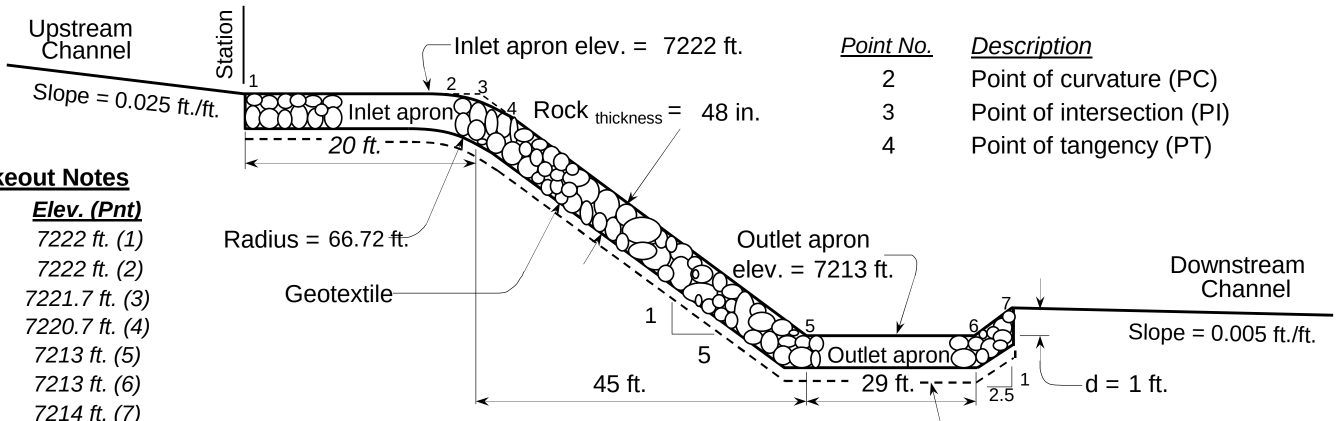
Rock Chute Design - Cut/Paste Plan

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview Rock Chute 1 **County:** El Paso
Designer: BAH **Checked by:**
Date: 12/21/2022 **Date:**

Design Values	***Rock Gradation Envelope***		***Quantities*** [a]
	% Passing	*Diameter, in. (weight, lbs.)*	
D_{50} dia. = 24.0 in.	D_{100} ---------	36 - 48 (3302 - 7827)	Rock = 924 yd^3
$Rock_{chute}$ thickness = 48.0 in.	D_{85} ---------	31 - 43 (2150 - 5706)	Geotextile (WCS-13)[b] = 877 yd^2
Inlet apron length = 20 ft.	D_{50} ---------	24 - 36 (978 - 3302)	Bedding 12 in. = 308 yd^3
Outlet apron length = 29 ft.	D_{10} ---------	19 - 31 (501 - 2150)	Excavation = 0 yd^3
Radius = 67 ft.			Earthfill = 0 yd^3
Will bedding be used? Yes	*Coefficient of Uniformity, $(D_{60})/(D_{10}) < 1.7$*		Seeding = 0.0 acres

Notes : [a] *Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).*
[b] *Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.*

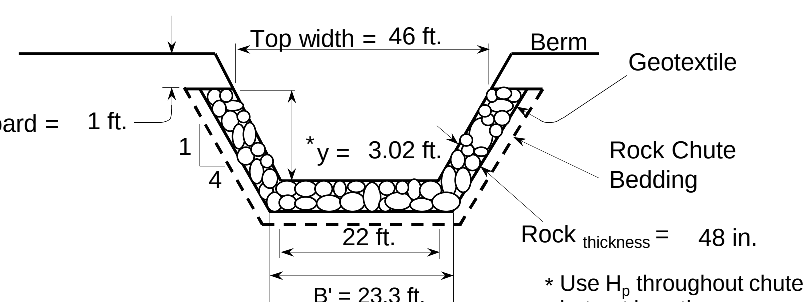


Point No.	*Description*
2	Point of curvature (PC)
3	Point of intersection (PI)
4	Point of tangency (PT)

Stakeout Notes

Sta.	*Elev. (Pnt)*
0+00.0	*7222 ft. (1)*
0+13.4	*7222 ft. (2)*
0+20.0	*7221.7 ft. (3)*
0+26.5	*7220.7 ft. (4)*
0+65.0	*7213 ft. (5)*
0+94.0	*7213 ft. (6)*
0+96.5	*7214 ft. (7)*

Profile Along Centerline of Rock Chute



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Notes:
Rock gradation envelope can be met with
Gradation printed

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview Rock Chute 1

El Paso County

		Date	
Designed	BAH		File Name
Drawn			Drawing Name
Checked			
Approved			Sheet __ of __

Rock Chute Design Data

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview Rock Chute South-2 **County:** El Paso
Designer: TOS **Checked by:**
Date: December 21, 2022 **Date:**

Input Geometry:

Upstream Channel	Chute	Downstream Channel
Bw = 22.0 ft.	Bw = 22.0 ft.	Bw = 22.0 ft.
Side slopes = 4.0 (m:1)	Factor of safety = 1.60 (F_s) → 1.2 Min	Side slopes = 4.0 (m:1)
Velocity n-value = 0.040	Side slopes = 4.0 (m:1) → 2.0:1 max.	Velocity n-value = 0.040
Bed slope = 0.0300 ft./ft.	Bed slope (4:1) = 0.250 ft./ft → 3.0:1 max.	Bed slope = 0.0050 ft./ft.
Note: n value = a) velocity n from waterway program	Freeboard = 1.0 ft.	
or b) computed mannings n for channel	Outlet apron depth, d = 1.0 ft.	Base flow = 0.0 cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = 7231.0 ft. ------- Outlet 7214.0 ft. --- (H_{drop} = 16 ft.)

Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410

Q_5 = Runofff from a 5-year,24-hour storm.

***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*

***Input tailwater (Tw)**:* 0.25 1.60

Q_{high} = 128.0 cfs High flow storm through chute → Tw (ft.) = Program

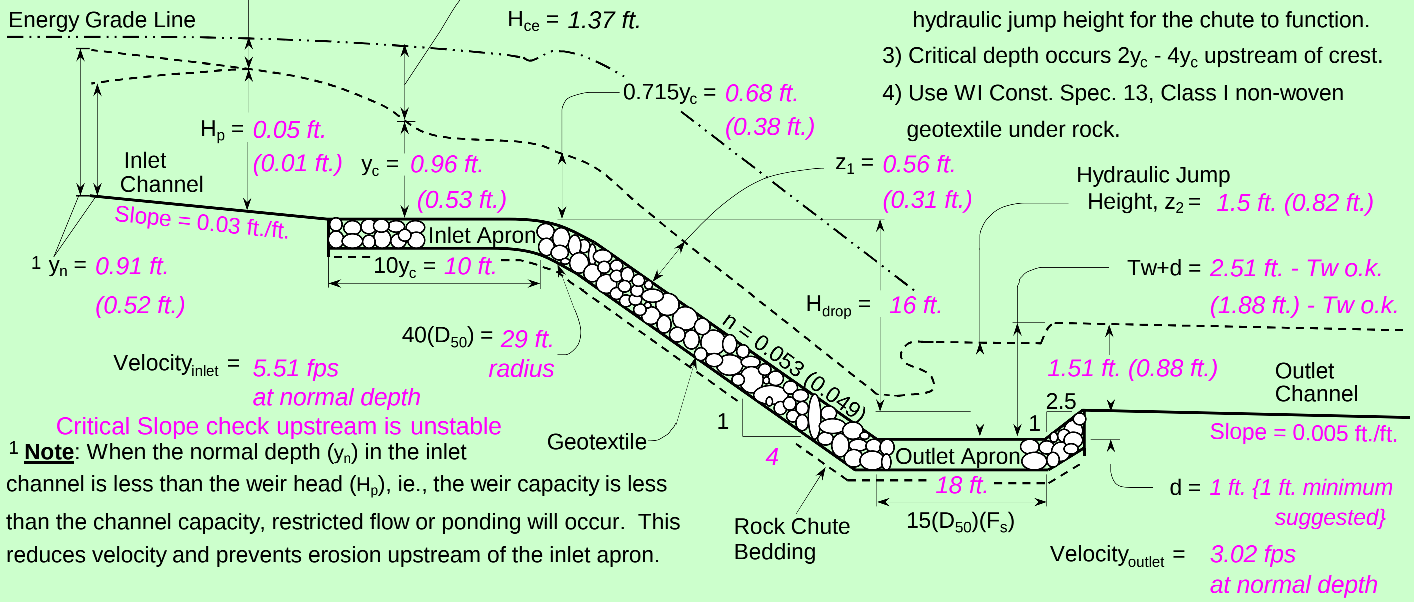
Q_5 = 50.0 cfs Low flow storm through chute → Tw (ft.) = Program

Profile and Cross Section (Output):

Starting Station = 0+00.0

Notes:

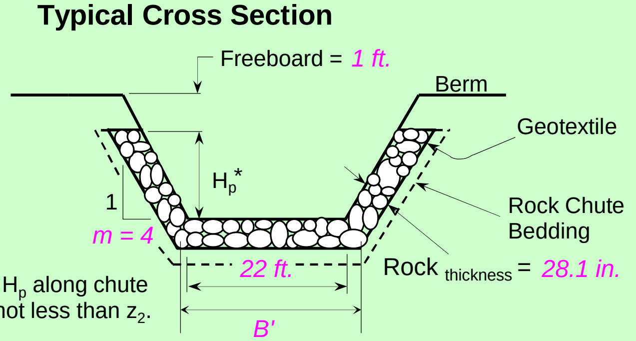
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs $2y_c$ - $4y_c$ upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.



[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	5.31 cfs/ft.	Equivalent unit discharge
F_S =	1.60	Factor of safety (multiplier)
z_1 =	0.56 ft.	Normal depth in chute
n-value =	0.053	Manning's roughness coefficient
$D_{50}(F_s)$ =	14 in.	Minimum Design D50*
$2(D_{50})(F_s)$ =	28.1 in.	Rock chute thickness
Tw + d =	2.51 ft.	Tailwater above outlet apron
z_2 =	1.5 ft.	Hydraulic jump height
***** The outlet**	***will***	***function adequately***

High Flow Storm Information

Rock Chute Design - Plan Sheet

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eaglevience Rock Chute South-2 | **County:** El Paso
Designer: TOS | **Checked by:**
Date: 12/21/2022 | **Date:**

Minimum Design Values		***Enter Plan Values***	
14.0 in.	D_{50} dia. =	18.00	in.
28.1 in.	$Rock_{chute}$ thickness =	36.00	in.
10 ft.	Inlet apron length =	10.00	ft.
18 ft.	Outlet apron length =	18.00	ft.
29 ft.	Radius =	*50*	ft.

Will bedding be used? *Yes* ---------- Depth (in.) = *12.0*

Rock Gradation Envelope

% Passing		*Diameter, in. (weight, lbs.)*
D_{100}	---------	27 - 36 (1393 - 3302)
D_{85}	---------	23 - 32 (907 - 2407)
D_{50}	---------	18 - 27 (413 - 1393)
D_{10}	---------	14 - 23 (211 - 907)

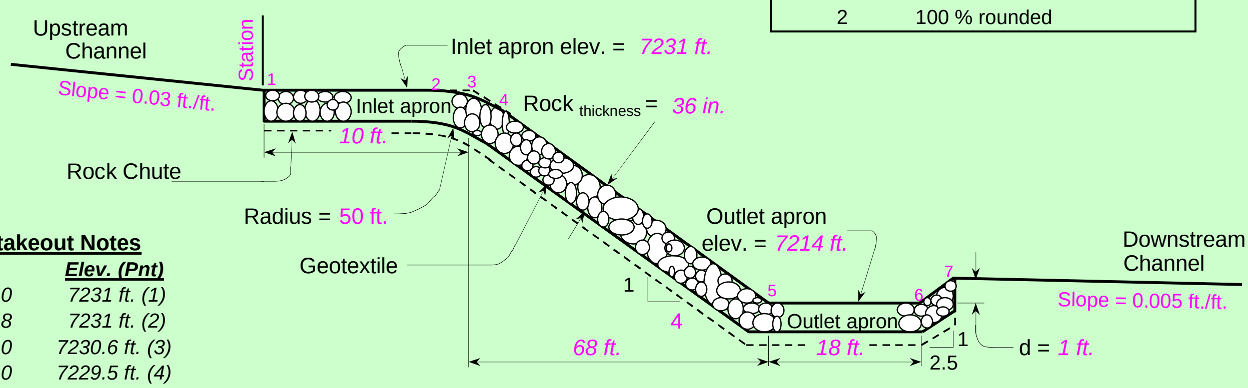
Quantities [a]

Rock =	528	yd^3
Geotextile (WCS-13)[b] =	670	yd^2
Bedding 12 in. =	240	yd^3
Excavation =	*0*	yd^3
Earthfill =	*0*	yd^3
Seeding =	*0.0*	acres

Notes: [a] Rock, bedding, and geotextile quantities are determined from the x-section below (neglect radius).
[b] Geotextile Class I (non-woven) shall be overlapped and anchored (18-in. min. along sides and 24-in. min. on the ends).

Degree of angularity = 1

1	50% angular, 50% rounded
2	100 % rounded



Profile Along Centerline of Rock Chute

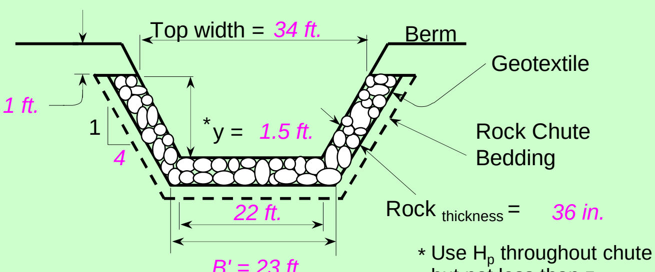
** ***Note***: ***The outlet will function adequately***

Stakeout Notes

Sta.	*Elev. (Pnt)*
0+00.0	*7231 ft. (1)*
0+03.8	*7231 ft. (2)*
0+10.0	*7230.6 ft. (3)*
0+16.0	*7229.5 ft. (4)*
0+78.0	*7214 ft. (5)*
0+96.0	*7214 ft. (6)*
0+98.5	*7215 ft. (7)*

Class I non-woven

Rock gradation envelope can be met with Gradation printed



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Rock Chute Cost Estimate

Unit	*Unit Cost*	*Cost*
Rock	*$10.00* /$yd^3$	$5,280.00
Geotextile	*$12.00*/$yd^2$	$8,040.00
Bedding	*$12.00* /$yd^3$	$2,880.00
Excavation	*$12.00*/$yd^3$	$0.00
Earthfill	*$1.00* /$yd^3$	$0.00
Seeding	*$2.00* /ac.	$0.00
	Total	**$16,200.00**

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview Rock Chute South-2
El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet ___ of ___

Rock Chute Design - Cut/Paste Plan

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview Rock Chute South-2 **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/21/2022 **Date:**

Design Values

D_{50} dia. =	18.0 in.
$Rock_{chute}$ thickness =	36.0 in.
Inlet apron length =	10 ft.
Outlet apron length =	18 ft.
Radius =	50 ft.
Will bedding be used?	Yes

Rock Gradation Envelope

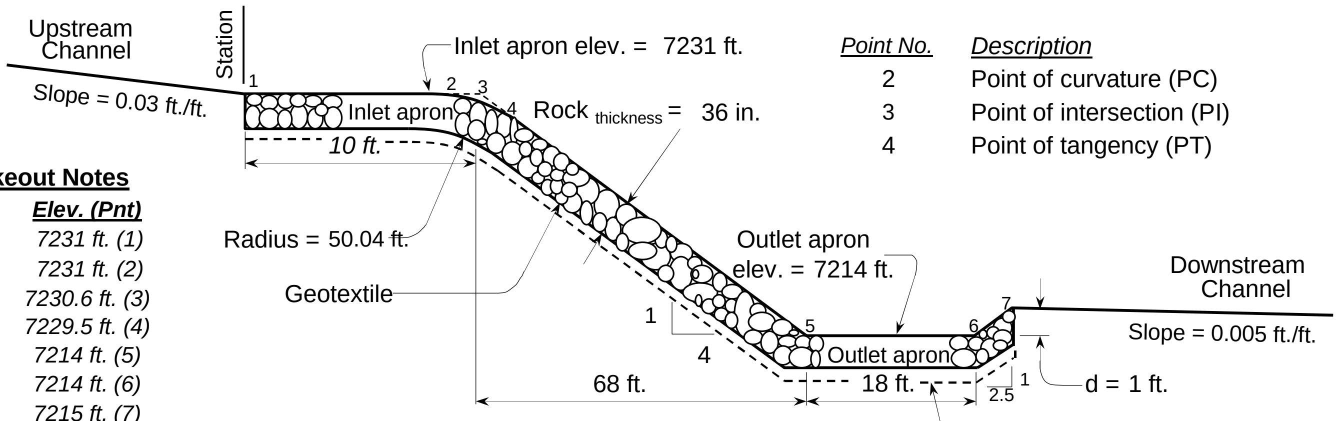
% Passing	*Diameter, in. (weight, lbs.)*
D_{100} ---------	27 - 36 (1393 - 3302)
D_{85} ---------	23 - 32 (907 - 2407)
D_{50} ---------	18 - 27 (413 - 1393)
D_{10} ---------	14 - 23 (211 - 907)

Coefficient of Uniformity, $(D_{60})/(D_{10})$ < 1.7

Quantities [a]

Rock =	528 yd^3
Geotextile (WCS-13)[b] =	670 yd^2
Bedding 12 in. =	240 yd^3
Excavation =	0 yd^3
Earthfill =	0 yd^3
Seeding =	0.0 acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).*
[b] *Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.*

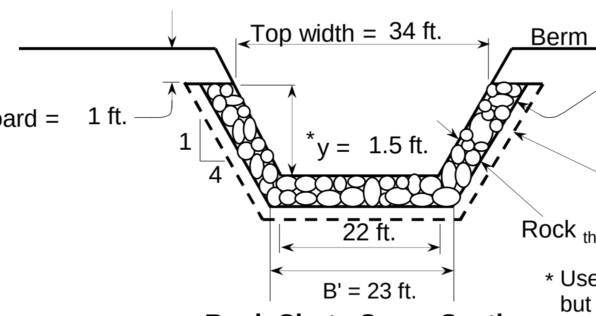


Point No.	*Description*
2	Point of curvature (PC)
3	Point of intersection (PI)
4	Point of tangency (PT)

Stakeout Notes

Sta.	***Elev. (Pnt)***
0+00.0	*7231 ft. (1)*
0+03.8	*7231 ft. (2)*
0+10.0	*7230.6 ft. (3)*
0+16.0	*7229.5 ft. (4)*
0+78.0	*7214 ft. (5)*
0+96.0	*7214 ft. (6)*
0+98.5	*7215 ft. (7)*

Profile Along Centerline of Rock Chute



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Notes:
Rock gradation envelope can be met with
Gradation printed

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview Rock Chute South-2

El Paso County

		Date
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Checked		
Approved		

File Name
Drawing Name
Sheet __ of __

Rock Chute Design Data

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: *Eagleview Rock Chute 3* **County:** *El Paso*
Designer: *TOS* **Checked by:**
Date: *December 19, 2022* **Date:**

Input Geometry:

Upstream Channel	Chute	Downstream Channel
Bw = *14.0* ft.	Bw = *14.0* ft.	Bw = *14.0* ft.
Side slopes = *3.0* (m:1)	Factor of safety = *1.60* (F_s) → ***1.2 Min***	Side slopes = *3.0* (m:1)
Velocity n-value = *0.040*	Side slopes = *4.0* (m:1) → ***2.0:1 max.***	Velocity n-value = *0.040*
Bed slope = *0.0500* ft./ft.	Bed slope (5:1) = *0.200* ft./ft → ***3.0:1 max.***	Bed slope = *0.0050* ft./ft.
Note: n value = a) velocity n from waterway program	Freeboard = *1.0* ft.	
or b) computed mannings n for channel	Outlet apron depth, d = *1.0* ft.	Base flow = *0.0* cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = *7242.0* ft. ------- Outlet *7234.0* ft. --- (H_{drop} = 7 ft.)

***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*

Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410

Q_5 = Runofff from a 5-year,24-hour storm.

***Input tailwater (Tw)**:* 0.20 1.60

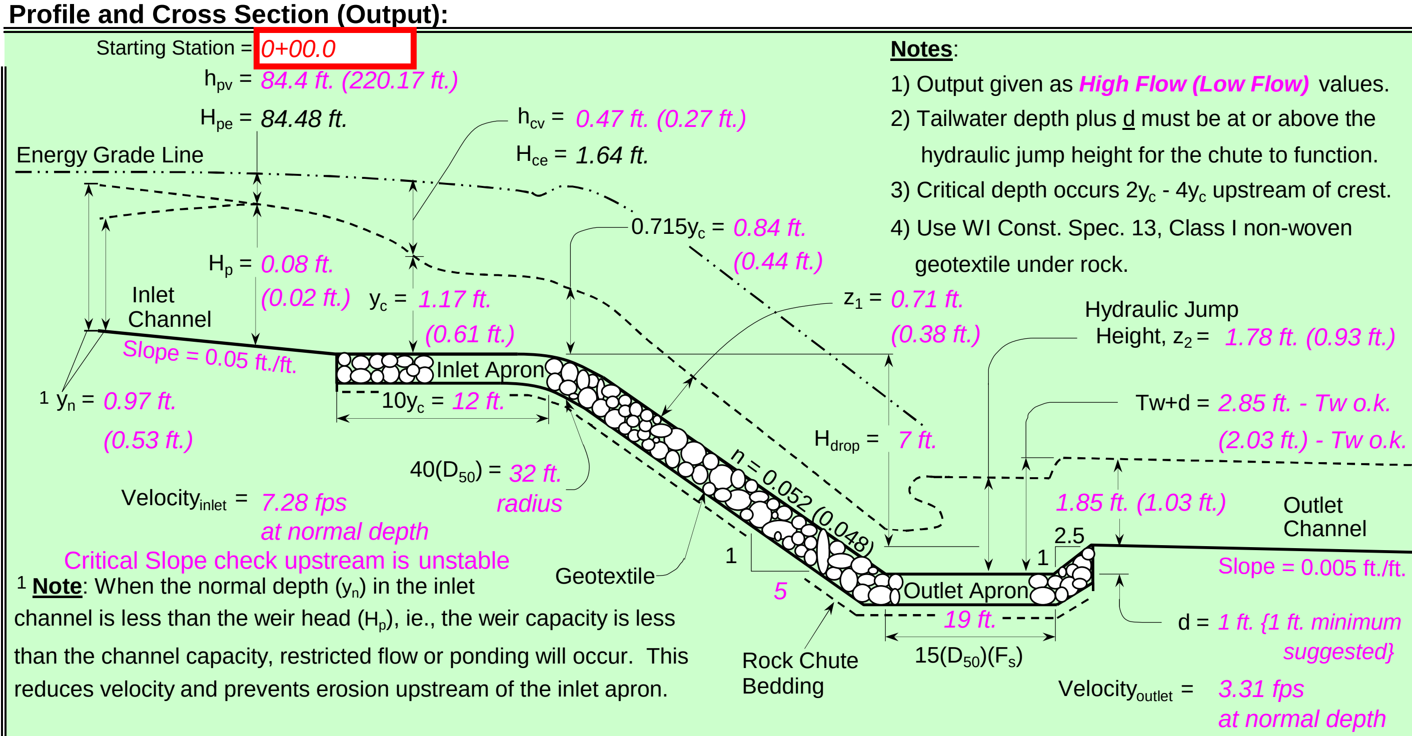
Q_{high} = *120.0* cfs High flow storm through chute → Tw (ft.) = *Program*

Q_5 = *42.0* cfs Low flow storm through chute → Tw (ft.) = *Program*

Profile and Cross Section (Output):

Notes:

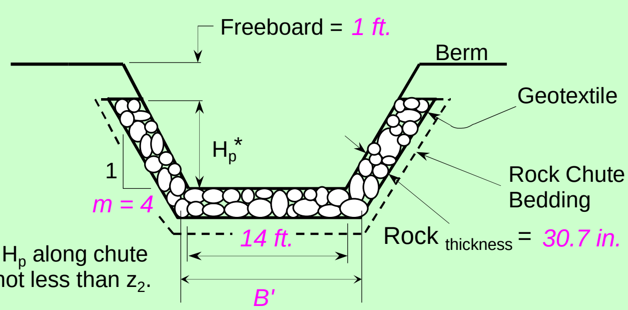
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs $2y_c$ - $4y_c$ upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.



[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	7.18 cfs/ft.	Equivalent unit discharge
F_S =	*1.60*	Factor of safety (multiplier)
z_1 =	*0.71 ft.*	Normal depth in chute
n-value =	*0.052*	Manning's roughness coefficient
$D_{50}(F_s)$ =	*15.4 in.*	Minimum Design D50*
$2(D_{50})(F_s)$ =	*30.7 in.*	Rock chute thickness
Tw + d =	*2.85 ft.*	Tailwater above outlet apron
z_2 =	*1.78 ft.*	Hydraulic jump height
****** The outlet***	***will***	***function adequately***

High Flow Storm Information

Rock Chute Design - Plan Sheet

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview Rock Chute 3 **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/19/2022 **Date:**

Minimum Design Values		*Enter Plan Values*	
15.4 in.	D_{50} dia. =	18.00	in.
30.7 in.	$Rock_{chute}$ thickness =	36.00	in.
12 ft.	Inlet apron length =	12.00	ft.
19 ft.	Outlet apron length =	19.00	ft.
32 ft.	Radius =	50	ft.

Will bedding be used? Yes ---------- Depth (in.) = 12.0

Rock Gradation Envelope

% Passing		*Diameter, in. (weight, lbs.)*
D_{100}	---------	27 - 36 (1393 - 3302)
D_{85}	---------	23 - 32 (907 - 2407)
D_{50}	---------	18 - 27 (413 - 1393)
D_{10}	---------	14 - 23 (211 - 907)

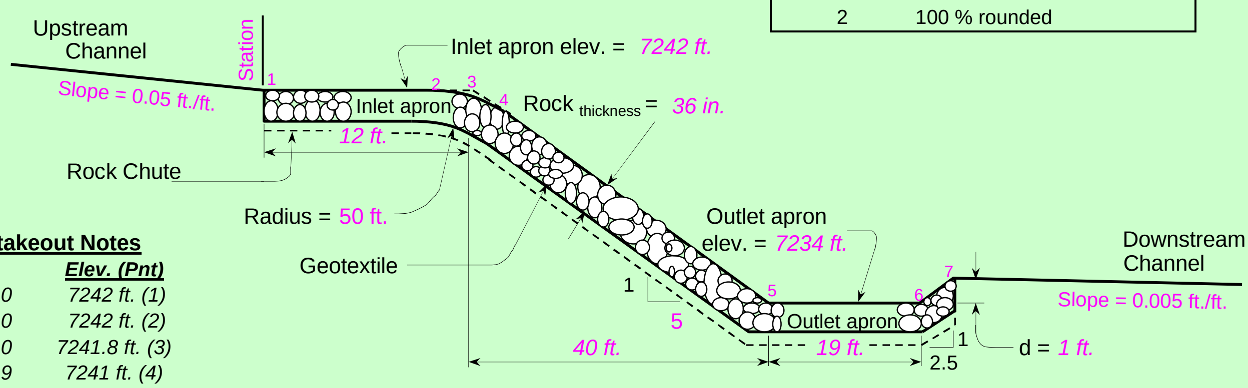
Quantities [a]

Rock =	343	yd^3
Geotextile (WCS-13)[b] =	448	yd^2
Bedding 12 in. =	162	yd^3
Excavation =	0	yd^3
Earthfill =	0	yd^3
Seeding =	0.0	acres

Notes: [a] Rock, bedding, and geotextile quantities are determined from the x-section below (neglect radius).
[b] Geotextile Class I (non-woven) shall be overlapped and anchored (18-in. min. along sides and 24-in. min. on the ends).

Degree of angularity = 1

1	50% angular, 50% rounded
2	100 % rounded



Profile Along Centerline of Rock Chute

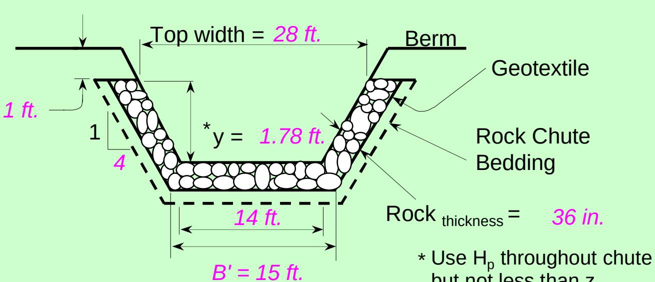
Stakeout Notes

Sta.	*Elev. (Pnt)*
0+00.0	7242 ft. (1)
0+07.0	7242 ft. (2)
0+12.0	7241.8 ft. (3)
0+16.9	7241 ft. (4)
0+52.0	7234 ft. (5)
0+71.0	7234 ft. (6)
0+73.5	7235 ft. (7)

*****Note: The outlet will function adequately***

Class I non-woven

Rock gradation envelope can be met with Gradation printed



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Rock Chute Cost Estimate

Unit	Unit Cost		Cost
Rock	$10.00	$/yd^3$	$3,430.00
Geotextile	$12.00	$/yd^2$	$5,376.00
Bedding	$12.00	$/yd^3$	$1,944.00
Excavation	$12.00	$/yd^3$	$0.00
Earthfill	$1.00	$/yd^3$	$0.00
Seeding	$2.00	/ac.	$0.00
	Total		**$10,750.00**

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview Rock Chute 3
El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet ___ of ___

Rock Chute Design - Cut/Paste Plan

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview Rock Chute 3 **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/19/2022 **Date:**

Design Values

D_{50} dia. =	18.0 in.
$Rock_{chute}$ thickness =	36.0 in.
Inlet apron length =	12 ft.
Outlet apron length =	19 ft.
Radius =	50 ft.
Will bedding be used?	Yes

Rock Gradation Envelope

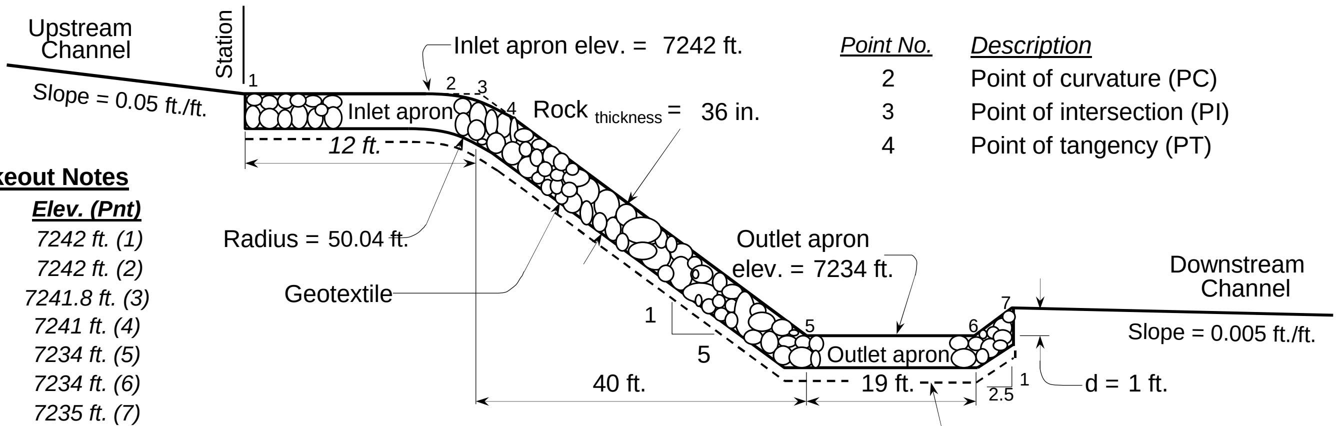
% Passing	*Diameter, in. (weight, lbs.)*
D_{100} ---------	27 - 36 (1393 - 3302)
D_{85} ---------	23 - 32 (907 - 2407)
D_{50} ---------	18 - 27 (413 - 1393)
D_{10} ---------	14 - 23 (211 - 907)

Coefficient of Uniformity, $(D_{60})/(D_{10}) < 1.7$

Quantities [a]

Rock =	343 yd^3
Geotextile (WCS-13)[b] =	448 yd^2
Bedding 12 in. =	162 yd^3
Excavation =	0 yd^3
Earthfill =	0 yd^3
Seeding =	0.0 acres

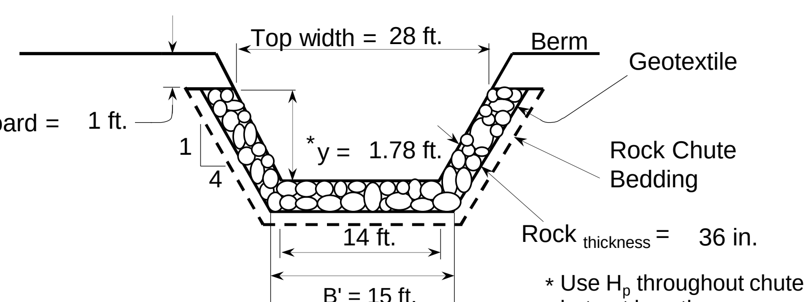
Notes: [a] *Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).*
[b] *Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.*



Stakeout Notes

Sta.	***Elev. (Pnt)***
0+00.0	*7242 ft. (1)*
0+07.0	*7242 ft. (2)*
0+12.0	*7241.8 ft. (3)*
0+16.9	*7241 ft. (4)*
0+52.0	*7234 ft. (5)*
0+71.0	*7234 ft. (6)*
0+73.5	*7235 ft. (7)*

Profile Along Centerline of Rock Chute



Rock Chute Cross Section

Notes:
Rock gradation envelope can be met with
Gradation printed

Profile, Cross Sections, and Quantities

NRCS Natural Resources Conservation Service United States Department of Agriculture	Eagleview Rock Chute 3 El Paso County	Date Designed TOS Drawn Checked Approved	File Name Drawing Name Sheet __ of __

Rock Chute Design Data

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: *Eagleview Rock Chute 4* **County:** *El Paso*
Designer: *TOS* **Checked by:**
Date: *December 21, 2022* **Date:**

Input Geometry:

Upstream Channel	Chute	Downstream Channel
Bw = *14.0* ft.	Bw = *14.0* ft.	Bw = *14.0* ft.
Side slopes = *4.0* (m:1)	Factor of safety = *1.60* (F_s) → ***1.2 Min***	Side slopes = *2.0* (m:1)
Velocity n-value = *0.040*	Side slopes = *2.0* (m:1) → ***2.0:1 max.***	Velocity n-value = *0.040*
Bed slope = *0.0300* ft./ft.	Bed slope (3:1) = *0.330* ft./ft → ***3.0:1 max.***	Bed slope = *0.0050* ft./ft.
Note: n value = a) velocity n from waterway program	Freeboard = *1.0* ft.	
or b) computed mannings n for channel	Outlet apron depth, d = *1.0* ft.	Base flow = *0.0* cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = *7241.0* ft. ------- Outlet *7237.0* ft. --- (H_{drop} = 3 ft.)

***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*

Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410

Q_5 = Runofff from a 5-year,24-hour storm.

***Input tailwater (Tw)**:* 0.33 1.60

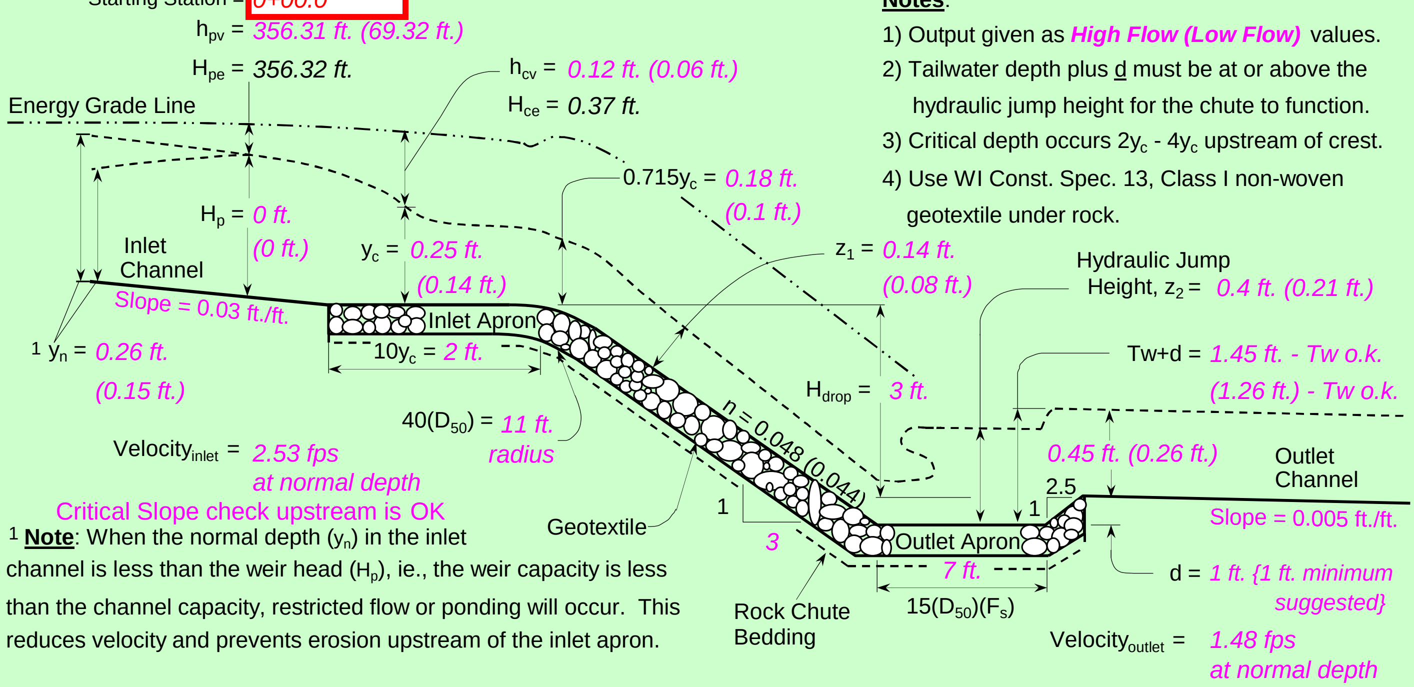
Q_{high} = *10.0* cfs High flow storm through chute → Tw (ft.) = *Program*

Q_5 = *4.0* cfs Low flow storm through chute → Tw (ft.) = *Program*

Profile and Cross Section (Output):

Starting Station = *0+00.0*

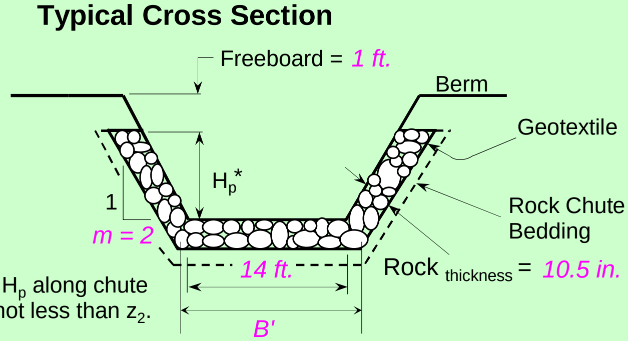
Notes:
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs $2y_c$ - $4y_c$ upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.



[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	0.7 cfs/ft.	Equivalent unit discharge
F_S =	1.60	Factor of safety (multiplier)
z_1 =	0.14 ft.	Normal depth in chute
n-value =	0.048	Manning's roughness coefficient
$D_{50}(F_s)$ =	5.2 in.	Minimum Design D50*
$2(D_{50})(F_s)$ =	10.5 in.	Rock chute thickness
Tw + d =	1.45 ft.	Tailwater above outlet apron
z_2 =	0.4 ft.	Hydraulic jump height
****** The outlet***	***will***	***function adequately***

High Flow Storm Information

Rock Chute Design - Plan Sheet

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview Rock Chute 4 **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/21/2022 **Date:**

Minimum Design Values		***Enter Plan Values***	
5.2 in.	D_{50} dia. =	6.00	in.
10.5 in.	$Rock_{chute}$ thickness =	12.00	in.
2 ft.	Inlet apron length =	10.00	ft.
7 ft.	Outlet apron length =	7.00	ft.
11 ft.	Radius =	17	ft.

Will bedding be used? *Yes* ----------

Rock Gradation Envelope

% Passing		*Diameter, in. (weight, lbs.)*
D_{100}	---------	9 - 12 (52 - 122)
D_{85}	---------	8 - 11 (34 - 89)
D_{50}	---------	6 - 9 (15 - 52)
D_{10}	---------	5 - 8 (8 - 34)

Depth (in.) = *12.0*

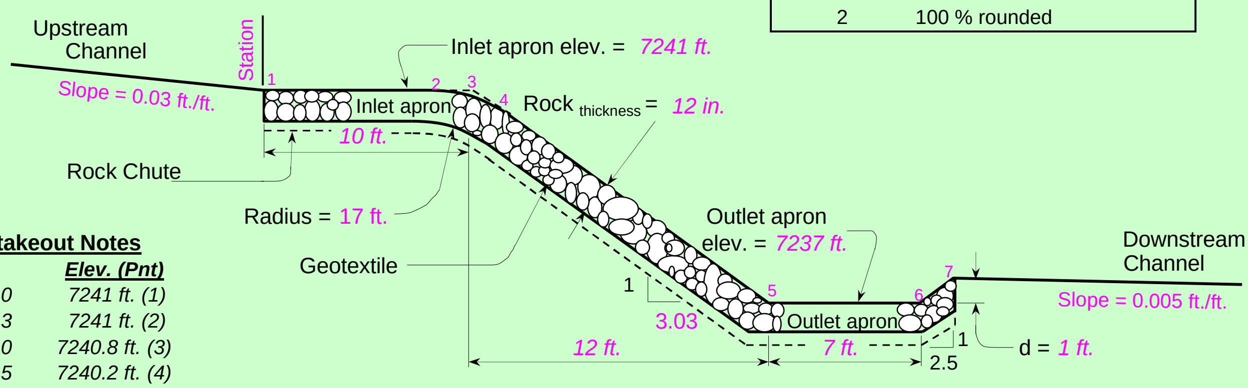
Quantities [a]

Rock =	22	yd^3
Geotextile (WCS-13)[b] =	75	yd^2
Bedding 12 in. =	28	yd^3
Excavation =	*0*	yd^3
Earthfill =	*0*	yd^3
Seeding =	*0.0*	acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from the x-section below (neglect radius).*
[b] *Geotextile Class I (non-woven) shall be overlapped and anchored (18-in. min. along sides and 24-in. min. on the ends).*

Degree of angularity = 1

1	50% angular, 50% rounded
2	100 % rounded



Profile Along Centerline of Rock Chute

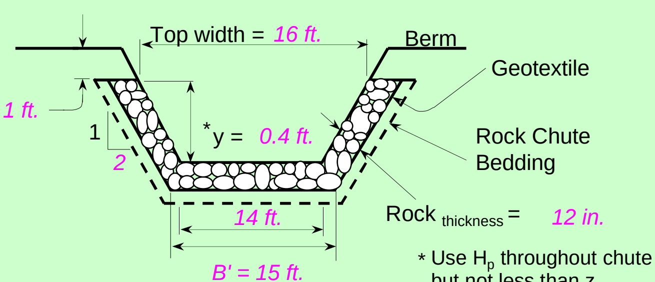
Stakeout Notes

Sta.	***Elev. (Pnt)***
0+00.0	*7241 ft. (1)*
0+07.3	*7241 ft. (2)*
0+10.0	*7240.8 ft. (3)*
0+12.5	*7240.2 ft. (4)*
0+22.1	*7237 ft. (5)*
0+29.1	*7237 ft. (6)*
0+31.6	*7238 ft. (7)*

****Note*: *The outlet will function adequately***

Class I non-woven

Rock gradation envelope can be met with DOT Light riprap Gradation



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Profile, Cross Sections, and Quantities

Rock Chute Cost Estimate

Unit	*Unit Cost*	*Cost*
Rock	*$10.00* /$yd^3$	$220.00
Geotextile	*$12.00*/$yd^2$	$900.00
Bedding	*$12.00* /$yd^3$	$336.00
Excavation	*$12.00*/$yd^3$	$0.00
Earthfill	*$1.00* /$yd^3$	$0.00
Seeding	*$2.00* /ac.	$0.00
	Total	**$1,456.00**

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview Rock Chute 4
El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet ___ of ___

Rock_Chute.xls
for construction plan

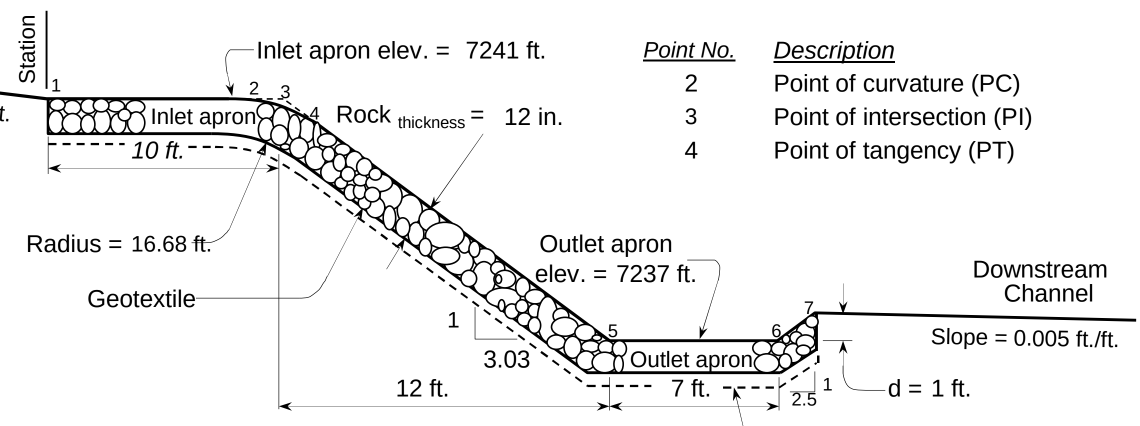
Rock Chute Design - Cut/Paste Plan

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview Rock Chute 4 **County:** El Paso
Designer: TOS **Checked by:** ____________
Date: 12/21/2022 **Date:** ____________

Design Values		***Rock Gradation Envelope***		***Quantities*** [a]	
		% Passing	*Diameter, in. (weight, lbs.)*		
D_{50} dia. =	6.0 in.	D_{100} ---------	9 - 12 (52 - 122)	Rock =	22 yd^3
$Rock_{chute}$ thickness =	12.0 in.	D_{85} ---------	8 - 11 (34 - 89)	Geotextile (WCS-13)[b] =	75 yd^2
Inlet apron length =	10 ft.	D_{50} ---------	6 - 9 (15 - 52)	Bedding 12 in. =	28 yd^3
Outlet apron length =	7 ft.	D_{10} ---------	5 - 8 (8 - 34)	Excavation =	0 yd^3
Radius =	17 ft.			Earthfill =	0 yd^3
Will bedding be used?	Yes	*Coefficient of Uniformity, $(D_{60})/(D_{10}) < 1.7$*		Seeding =	0.0 acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).*
[b] *Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.*



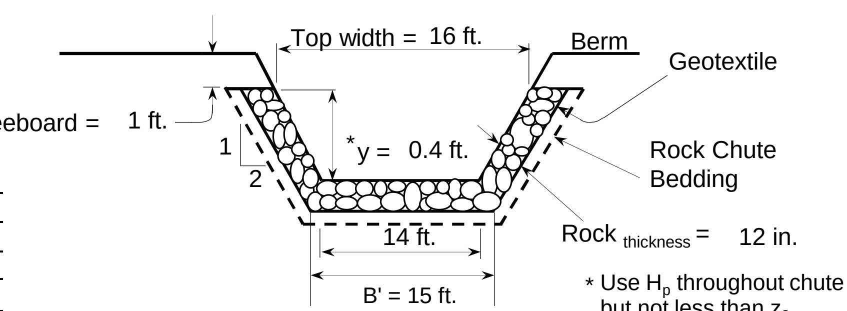
Point No.	*Description*
2	Point of curvature (PC)
3	Point of intersection (PI)
4	Point of tangency (PT)

Stakeout Notes

Sta.	***Elev. (Pnt)***
0+00.0	*7241 ft. (1)*
0+07.3	*7241 ft. (2)*
0+10.0	*7240.8 ft. (3)*
0+12.5	*7240.2 ft. (4)*
0+22.1	*7237 ft. (5)*
0+29.1	*7237 ft. (6)*
0+31.6	*7238 ft. (7)*

Profile Along Centerline of Rock Chute

Freeboard = 1 ft.



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Notes:
Rock gradation envelope can be met with
DOT Light riprap Gradation

Profile, Cross Sections, and Quantities

NRCS Natural Resources Conservation Service United States Department of Agriculture	Eagleview Rock Chute 4 El Paso County		Date	File Name
		Designed TOS		Drawing Name
		Drawn		
		Checked		Sheet __ of __
		Approved		

Rock Chute Design Data

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: *Eagleview - Rock Chute 5 (Spillway)* **County:** *El Paso*
Designer: *TOS* **Checked by:**
Date: *December 21, 2022* **Date:**

Input Geometry:

Upstream Channel	Chute	Downstream Channel
Bw = *60.0* ft.	Bw = *20.0* ft.	Bw = *20.0* ft.
Side slopes = *4.0* (m:1)	Factor of safety = *1.60* (F_s) → ***1.2 Min***	Side slopes = *4.0* (m:1)
Velocity n-value = *0.040*	Side slopes = *4.0* (m:1) → ***2.0:1 max.***	Velocity n-value = *0.040*
Bed slope = *0.0010* ft./ft.	Bed slope (25:1) = *0.040* ft./ft → ***3.0:1 max.***	Bed slope = *0.0200* ft./ft.
Note: n value = a) velocity n from waterway program	Freeboard = *1.0* ft.	
or b) computed mannings n for channel	Outlet apron depth, d = *1.0* ft.	Base flow = *0.0* cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = *7213.0* ft. ------- Outlet *7206.0* ft. --- (H_{drop} = 6 ft.)

Q_{high} = *Runoff from design storm capacity from Table 2, FOTG Standard 410*

Q_5 = *Runofff from a 5-year,24-hour storm.*

***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*

***Input tailwater (Tw)**:*

Q_{high} = *490.0* cfs High flow storm through chute → Tw (ft.) = *Program*

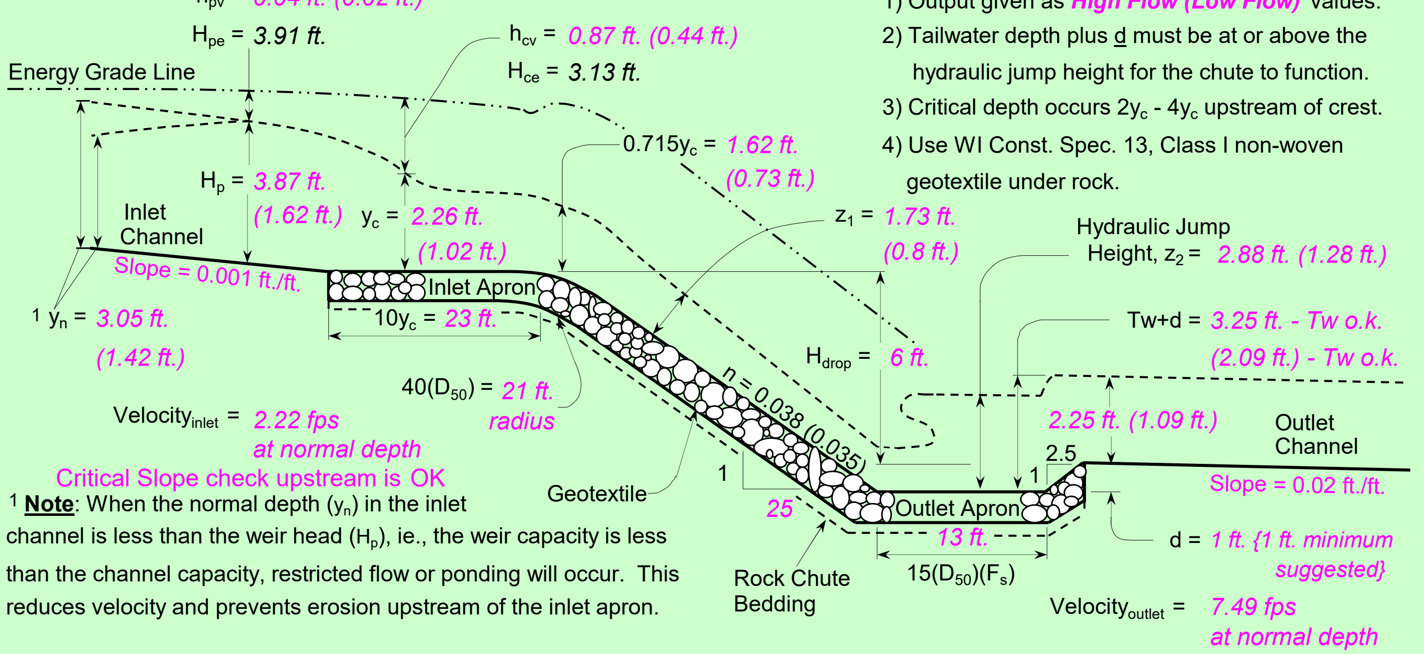
Q_5 = *131.0* cfs Low flow storm through chute → Tw (ft.) = *Program*

Profile and Cross Section (Output):

Starting Station = *0+00.0*

Notes:

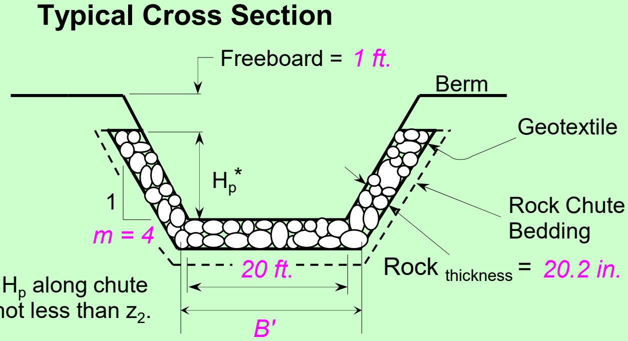
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs $2y_c$ - $4y_c$ upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.



[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	19.32 cfs/ft.	Equivalent unit discharge
F_S =	*1.60*	Factor of safety (multiplier)
z_1 =	*1.73 ft.*	Normal depth in chute
n-value =	*0.038*	Manning's roughness coefficient
$D_{50}(F_s)$ =	*10.1 in.*	Minimum Design D50*
$2(D_{50})(F_s)$ =	*20.2 in.*	Rock chute thickness
Tw + d =	*3.25 ft.*	Tailwater above outlet apron
z_2 =	*2.88 ft.*	Hydraulic jump height
*** ***The outlet***	***will***	***function adequately***

High Flow Storm Information

Rock Chute Design - Plan Sheet

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 5 (Spillway) **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/21/2022 **Date:**

Minimum Design Values		*Enter Plan Values*	
10.1 in.	D_{50} dia. =	12.00	in.
20.2 in.	$Rock_{chute}$ thickness =	24.00	in.
23 ft.	Inlet apron length =	23.00	ft.
13 ft.	Outlet apron length =	13.00	ft.
21 ft.	Radius =	33	ft.

Will bedding be used? No

Rock Gradation Envelope

% Passing		*Diameter, in. (weight, lbs.)*
D_{100}	---------	18 - 24 (413 - 978)
D_{85}	---------	16 - 22 (269 - 713)
D_{50}	---------	12 - 18 (122 - 413)
D_{10}	---------	10 - 16 (63 - 269)

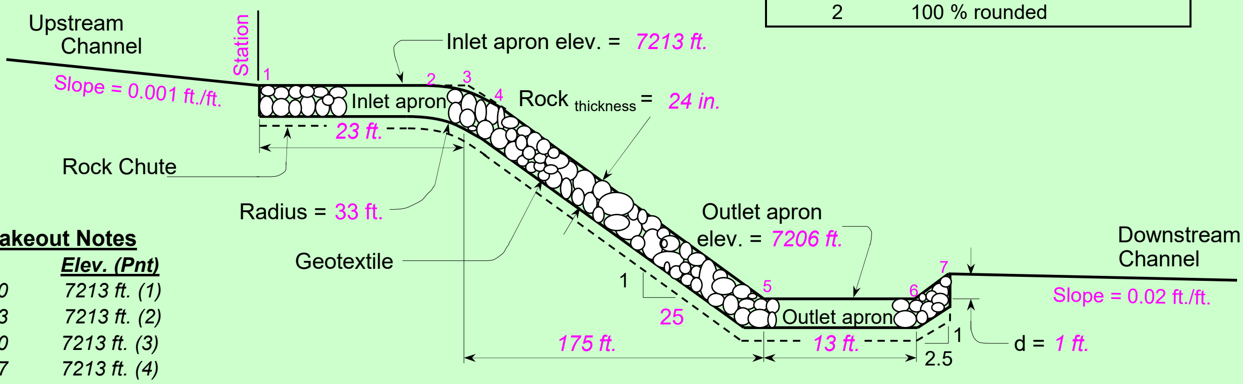
Quantities [a]

Rock =	957	yd^3
Geotextile (WCS-13)[b] =	1637	yd^2
Bedding =	0	yd^3
Excavation =	0	yd^3
Earthfill =	0	yd^3
Seeding =	0.0	acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from the x-section below (neglect radius).*
[b] *Geotextile Class I (non-woven) shall be overlapped and anchored (18-in. min. along sides and 24-in. min. on the ends).*

Degree of angularity = 1

1	50% angular, 50% rounded
2	100 % rounded



Profile Along Centerline of Rock Chute

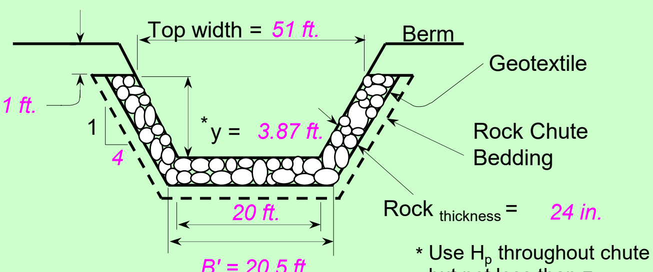
** ***Note**: The outlet will function adequately*

Stakeout Notes

Sta.	*Elev. (Pnt)*
0+00.0	7213 ft. (1)
0+22.3	7213 ft. (2)
0+23.0	7213 ft. (3)
0+23.7	7213 ft. (4)
1+98.0	7206 ft. (5)
2+11.0	7206 ft. (6)
2+13.5	7207 ft. (7)

Class I non-woven

Rock gradation envelope can be met with DOT Extra Heavy riprap Gradation



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Rock Chute Cost Estimate

Unit	Unit Cost	Cost
Rock	$10.00 /$yd^3$	$9,570.00
Geotextile	$12.00/$yd^2$	$19,644.00
Bedding	$12.00 /$yd^3$	$0.00
Excavation	$12.00/$yd^3$	$0.00
Earthfill	$1.00 /$yd^3$	$0.00
Seeding	$2.00 /ac.	$0.00
	Total	**$29,214.00**

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview - Rock Chute 5 (Spillway)
El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet ___ of ___

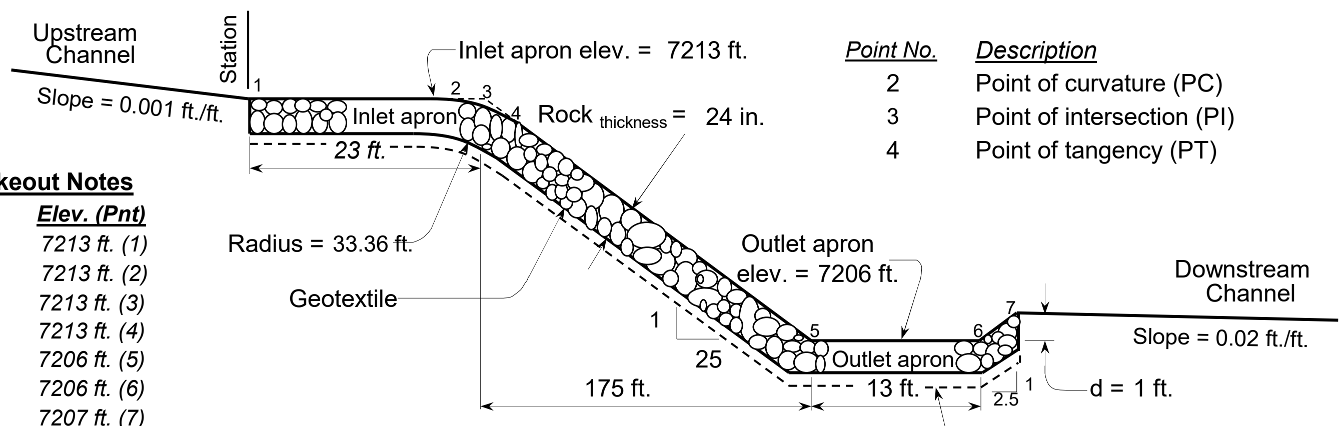
Rock Chute Design - Cut/Paste Plan

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 5 (Spillway) **County:** El Paso
Designer: TOS **Checked by:** ____________
Date: 12/21/2022 **Date:** ____________

Design Values		***Rock Gradation Envelope***		***Quantities*** [a]
D_{50} dia. = 12.0 in.	***% Passing***	***Diameter, in. (weight, lbs.)***		Rock = 957 yd^3
$Rock_{chute}$ thickness = 24.0 in.	D_{100} ---------	18 - 24 (413 - 978)		Geotextile (WCS-13)[b] = 1637 yd^2
Inlet apron length = 23 ft.	D_{85} ---------	16 - 22 (269 - 713)		Bedding = 0 yd^3
Outlet apron length = 13 ft.	D_{50} ---------	12 - 18 (122 - 413)		Excavation = 0 yd^3
Radius = 33 ft.	D_{10} ---------	10 - 16 (63 - 269)		Earthfill = 0 yd^3
Will bedding be used? No	*Coefficient of Uniformity, $(D_{60})/(D_{10}) < 1.7$*			Seeding = 0.0 acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).*
[b] *Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.*

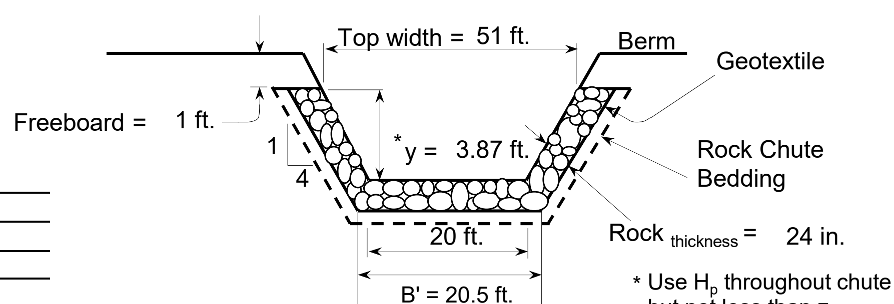


Point No.	*Description*
2	Point of curvature (PC)
3	Point of intersection (PI)
4	Point of tangency (PT)

Stakeout Notes

Sta.	***Elev. (Pnt)***
0+00.0	*7213 ft. (1)*
0+22.3	*7213 ft. (2)*
0+23.0	*7213 ft. (3)*
0+23.7	*7213 ft. (4)*
1+98.0	*7206 ft. (5)*
2+11.0	*7206 ft. (6)*
2+13.5	*7207 ft. (7)*

Profile Along Centerline of Rock Chute



Rock Chute Cross Section

Notes:
Rock gradation envelope can be met with
DOT Extra Heavy riprap Gradation

Profile, Cross Sections, and Quantities

NRCS Natural Resources Conservation Service, United States Department of Agriculture	Eagleview - Rock Chute 5 (Spillway) El Paso County			Date	File Name
		Designed	TOS		Drawing Name
		Drawn			
		Checked			Sheet __ of __
		Approved			

Rock Chute Design Data

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 6 (WQ 2) **County:** El Paso
Designer: TOS **Checked by:**
Date: December 21, 2022 **Date:**

Input Geometry:

Upstream Channel	Chute	Downstream Channel
Bw = 10.0 ft.	Bw = 10.0 ft.	Bw = 10.0 ft.
Side slopes = 4.0 (m:1)	Factor of safety = 1.60 (F_s) → 1.2 Min	Side slopes = 4.0 (m:1)
Velocity n-value = 0.040	Side slopes = 4.0 (m:1) → 2.0:1 max.	Velocity n-value = 0.040
Bed slope = 0.0600 ft./ft.	Bed slope (9.1:1) = 0.110 ft./ft → 3.0:1 max.	Bed slope = 0.0200 ft./ft.
Note: n value = a) velocity n from waterway program	Freeboard = 1.0 ft.	
or b) computed mannings n for channel	Outlet apron depth, d = 1.0 ft.	Base flow = 0.0 cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = 7205.0 ft. ------- Outlet 7198.0 ft. --- (H_{drop} = 6 ft.)

Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410
Q_5 = Runofff from a 5-year,24-hour storm.

***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*

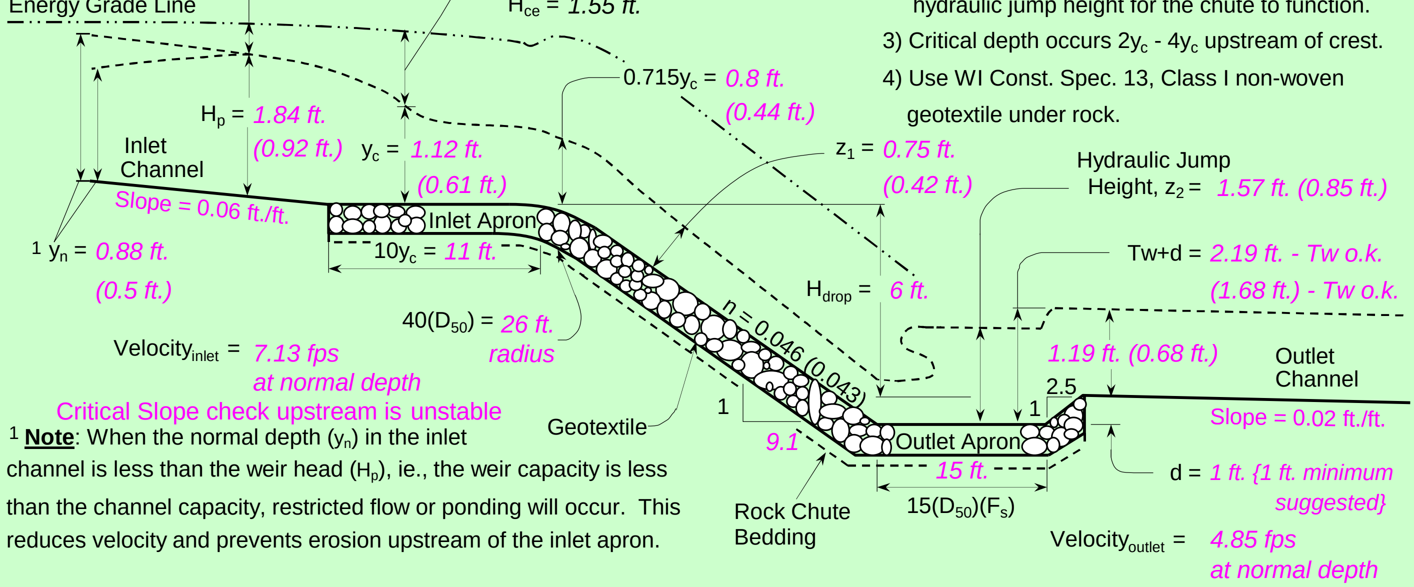
***Input tailwater (Tw)**:* 0.11 1.60

Q_{high} = 85.0 cfs High flow storm through chute → Tw (ft.) = Program
Q_5 = 31.0 cfs Low flow storm through chute → Tw (ft.) = Program

Profile and Cross Section (Output):

Starting Station = 0+00.0

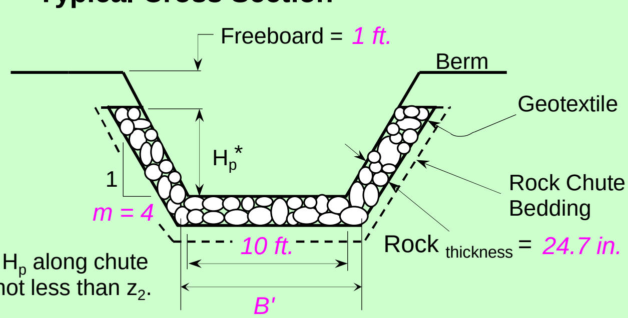
Notes:
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs $2y_c$ - $4y_c$ upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.



[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	6.72 cfs/ft.	Equivalent unit discharge
F_S =	1.60	Factor of safety (multiplier)
z_1 =	0.75 ft.	Normal depth in chute
n-value =	0.046	Manning's roughness coefficient
$D_{50}(F_s)$ =	12.3 in.	Minimum Design D50*
$2(D_{50})(F_s)$ =	24.7 in.	Rock chute thickness
Tw + d =	2.19 ft.	Tailwater above outlet apron
z_2 =	1.57 ft.	Hydraulic jump height
****** The outlet***	will	***function adequately***

High Flow Storm Information

Rock Chute Design - Plan Sheet

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 6 (WQ 2) **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/21/2022 **Date:**

Minimum Design Values		***Enter Plan Values***	
12.3 in.	D_{50} dia. =	18.00	in.
24.7 in.	$Rock_{chute}$ thickness =	36.00	in.
11 ft.	Inlet apron length =	11.00	ft.
15 ft.	Outlet apron length =	15.00	ft.
26 ft.	Radius =	50	ft.

Will bedding be used? No

Rock Gradation Envelope

% Passing		*Diameter, in. (weight, lbs.)*
D_{100}	---------	27 - 36 (1393 - 3302)
D_{85}	---------	23 - 32 (907 - 2407)
D_{50}	---------	18 - 27 (413 - 1393)
D_{10}	---------	14 - 23 (211 - 907)

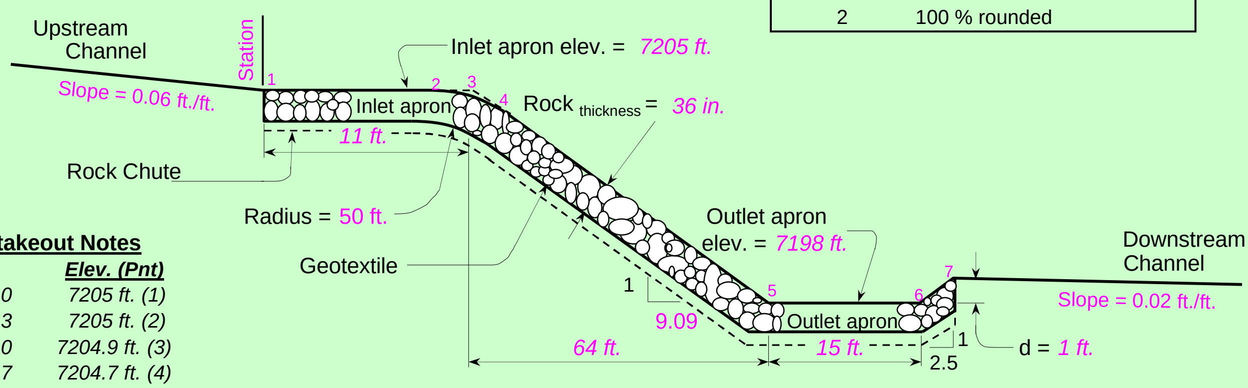
Quantities [a]

Rock =	391	yd^3
Geotextile (WCS-13)[b] =	522	yd^2
Bedding =	0	yd^3
Excavation =	0	yd^3
Earthfill =	0	yd^3
Seeding =	0.0	acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from the x-section below (neglect radius).*
[b] *Geotextile Class I (non-woven) shall be overlapped and anchored (18-in. min. along sides and 24-in. min. on the ends).*

Degree of angularity = 1

1	50% angular, 50% rounded
2	100 % rounded



Profile Along Centerline of Rock Chute

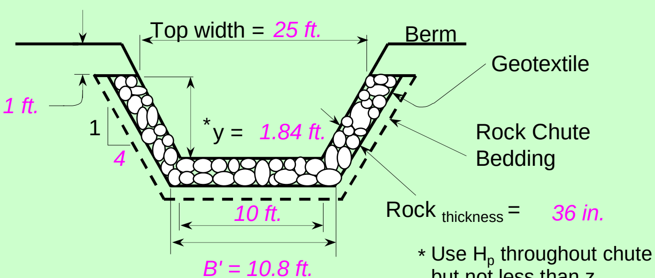
**** *Note* : *The outlet will function adequately***

Stakeout Notes

Sta.	*Elev. (Pnt)*
0+00.0	7205 ft. (1)
0+08.3	7205 ft. (2)
0+11.0	7204.9 ft. (3)
0+13.7	7204.7 ft. (4)
0+74.6	7198 ft. (5)
0+89.6	7198 ft. (6)
0+92.1	7199 ft. (7)

Class I non-woven

Rock gradation envelope can be met with Gradation printed



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Profile, Cross Sections, and Quantities

Rock Chute Cost Estimate

Unit	*Unit Cost*	*Cost*
Rock	$10.00 /$yd^3$	$3,910.00
Geotextile	$12.00 /$yd^2$	$6,264.00
Bedding	$12.00 /$yd^3$	$0.00
Excavation	$12.00 /$yd^3$	$0.00
Earthfill	$1.00 /$yd^3$	$0.00
Seeding	$2.00 /ac.	$0.00
	Total	**$10,174.00**

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview - Rock Chute 6 (WQ 2)
El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet __ of __

Rock Chute Design - Cut/Paste Plan

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 6 (WQ 2) **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/21/2022 **Date:**

Design Values

D_{50} dia. =	18.0 in.
$Rock_{chute}$ thickness =	36.0 in.
Inlet apron length =	11 ft.
Outlet apron length =	15 ft.
Radius =	50 ft.
Will bedding be used?	No

Rock Gradation Envelope

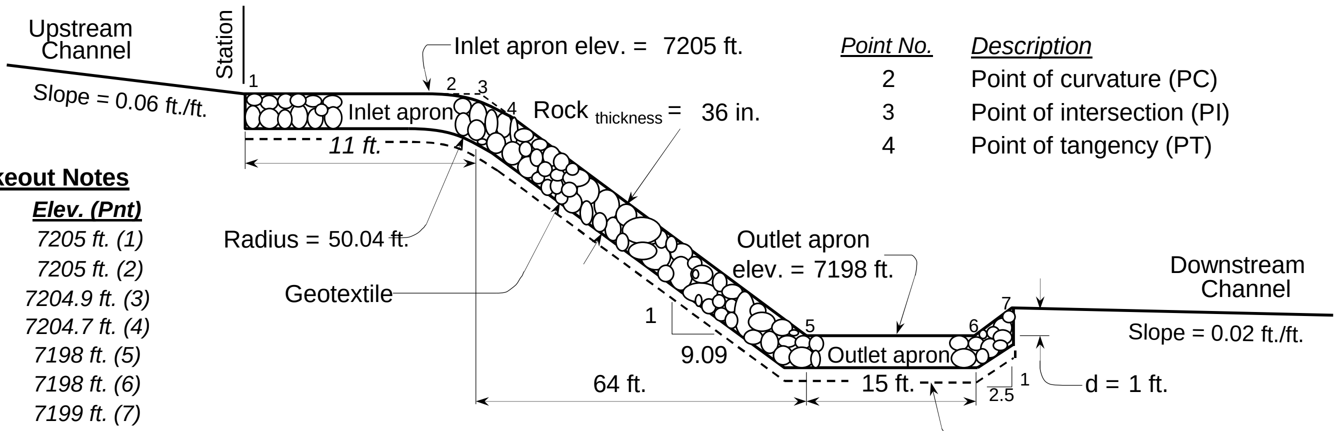
% Passing		*Diameter, in. (weight, lbs.)*
D_{100}	---------	27 - 36 (1393 - 3302)
D_{85}	---------	23 - 32 (907 - 2407)
D_{50}	---------	18 - 27 (413 - 1393)
D_{10}	---------	14 - 23 (211 - 907)

Coefficient of Uniformity, $(D_{60})/(D_{10}) < 1.7$

Quantities [a]

Rock =	391 yd^3
Geotextile (WCS-13)[b] =	522 yd^2
Bedding =	0 yd^3
Excavation =	0 yd^3
Earthfill =	0 yd^3
Seeding =	0.0 acres

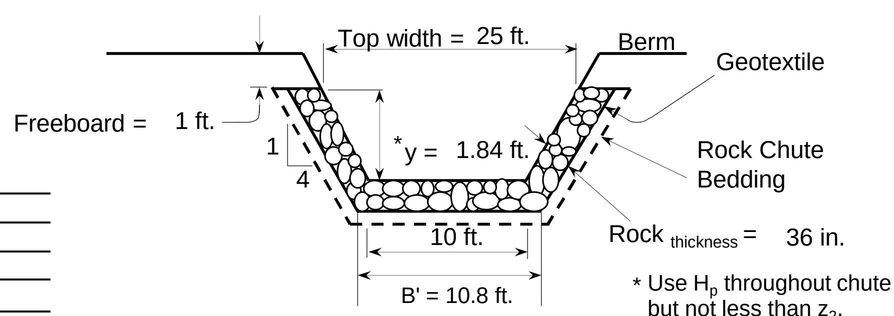
Notes: [a] *Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).*
[b] *Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.*



Profile Along Centerline of Rock Chute

Stakeout Notes

Sta.	Elev. (Pnt)
0+00.0	7205 ft. (1)
0+08.3	7205 ft. (2)
0+11.0	7204.9 ft. (3)
0+13.7	7204.7 ft. (4)
0+74.6	7198 ft. (5)
0+89.6	7198 ft. (6)
0+92.1	7199 ft. (7)



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Notes:
Rock gradation envelope can be met with
Gradation printed

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview - Rock Chute 6 (WQ 2)
El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet __ of __

Rock Chute Design Data

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 7 (WQ1-East) **County:** El Paso
Designer: TOS **Checked by:**
Date: December 21, 2022 **Date:**

Input Geometry:

Upstream Channel	Chute		Downstream Channel
Bw = 14.0 ft.	Bw = 14.0 ft.		Bw = 14.0 ft.
Side slopes = 4.0 (m:1)	Factor of safety = 1.60 (F_s)	1.2 Min	Side slopes = 4.0 (m:1)
Velocity n-value = 0.040	Side slopes = 3.0 (m:1)	2.0:1 max.	Velocity n-value = 0.040
Bed slope = 0.0030 ft./ft.	Bed slope (4:1) = 0.250 ft./ft	3.0:1 max.	Bed slope = 0.0050 ft./ft.
Note: n value = a) velocity n from waterway program	Freeboard = 1.0 ft.		
or b) computed mannings n for channel	Outlet apron depth, d = 1.0 ft.		Base flow = 0.0 cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = 7198.0 ft. ------- Outlet 7192.0 ft. --- (H_{drop} = 5 ft.)

***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*

Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410
Q_5 = Runofff from a 5-year,24-hour storm.

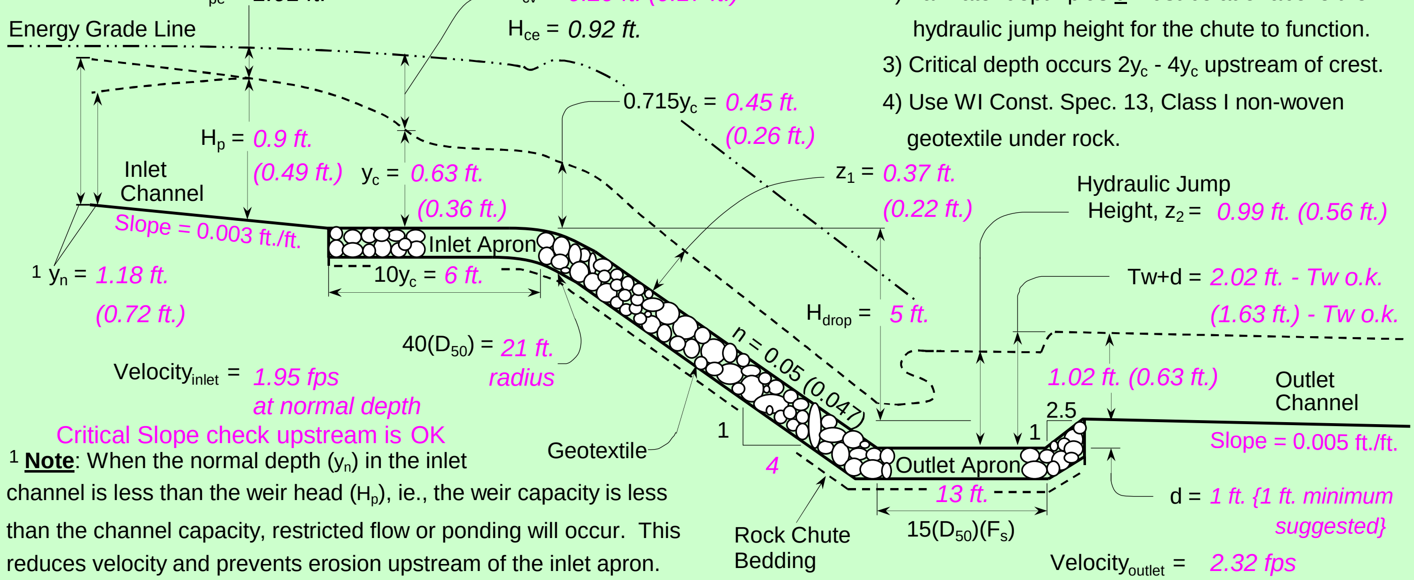
***Input tailwater (Tw)**:* 0.25 1.60

Q_{high} = 43.0 cfs High flow storm through chute → Tw (ft.) = Program
Q_5 = 18.0 cfs Low flow storm through chute → Tw (ft.) = Program

Profile and Cross Section (Output):

Starting Station = 0+00.0

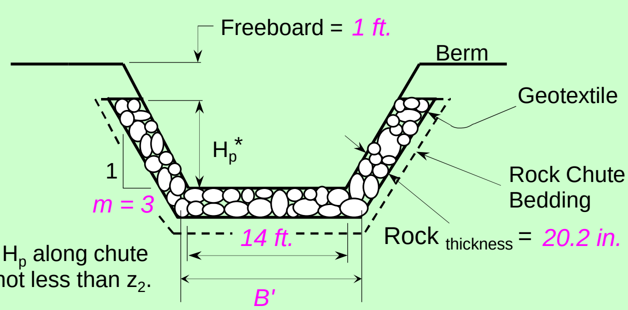
Notes:
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs $2y_c$ - $4y_c$ upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.



[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	2.86 cfs/ft.	Equivalent unit discharge
F_S =	1.60	Factor of safety (multiplier)
z_1 =	0.37 ft.	Normal depth in chute
n-value =	0.05	Manning's roughness coefficient
$D_{50}(F_s)$ =	10.1 in.	Minimum Design D50*
$2(D_{50})(F_s)$ =	20.2 in.	Rock chute thickness
Tw + d =	2.02 ft.	Tailwater above outlet apron
z_2 =	0.99 ft.	Hydraulic jump height
****** The outlet***	***will***	***function adequately***

High Flow Storm Information

Rock Chute Design - Plan Sheet

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 7 (WQ1-East) **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/21/2022 **Date:**

Minimum Design Values		***Enter Plan Values***
10.1 in.	D_{50} dia. =	12.00 in.
20.2 in.	$Rock_{chute}$ thickness =	24.00 in.
6 ft.	Inlet apron length =	10.00 ft.
13 ft.	Outlet apron length =	13.00 ft.
21 ft.	Radius =	*33* ft.

Will bedding be used? *No*

Rock Gradation Envelope

% Passing		*Diameter, in. (weight, lbs.)*
D_{100}	---------	18 - 24 (413 - 978)
D_{85}	---------	16 - 22 (269 - 713)
D_{50}	---------	12 - 18 (122 - 413)
D_{10}	---------	10 - 16 (63 - 269)

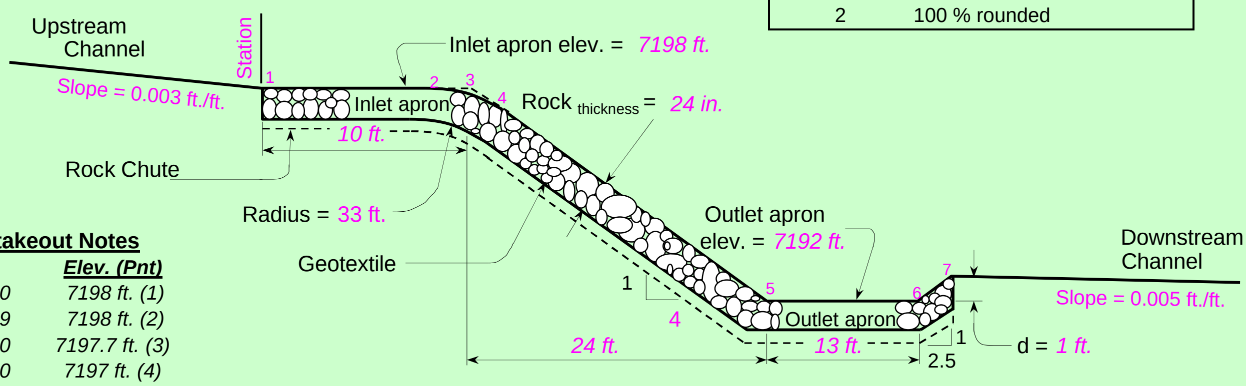
Quantities [a]

Rock =	101	yd^3
Geotextile (WCS-13)[b] =	188	yd^2
Bedding =	0	yd^3
Excavation =	*0*	yd^3
Earthfill =	*0*	yd^3
Seeding =	*0.0*	acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from the x-section below (neglect radius).*
[b] *Geotextile Class I (non-woven) shall be overlapped and anchored (18-in. min. along sides and 24-in. min. on the ends).*

Degree of angularity = 1

1	50% angular, 50% rounded
2	100 % rounded



Profile Along Centerline of Rock Chute

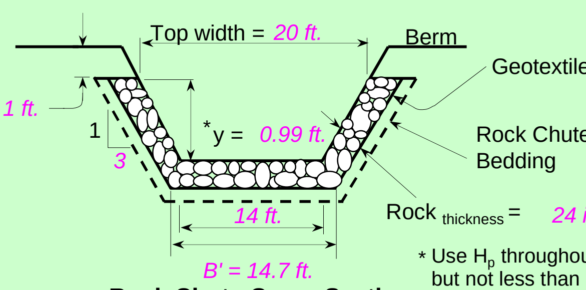
** ***Note*** ***: The outlet will function adequately***

Stakeout Notes

Sta.	***Elev. (Pnt)***
0+00.0	*7198 ft. (1)*
0+05.9	*7198 ft. (2)*
0+10.0	*7197.7 ft. (3)*
0+14.0	*7197 ft. (4)*
0+34.0	*7192 ft. (5)*
0+47.0	*7192 ft. (6)*
0+49.5	*7193 ft. (7)*

Class I non-woven

Rock gradation envelope can be met with DOT Extra Heavy riprap Gradation



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Rock Chute Cost Estimate

Unit	*Unit Cost*		*Cost*
Rock	*$10.00*	$/yd^3$	$1,010.00
Geotextile	*$12.00*	$/yd^2$	$2,256.00
Bedding	*$12.00*	$/yd^3$	$0.00
Excavation	*$12.00*	$/yd^3$	$0.00
Earthfill	*$1.00*	$/yd^3$	$0.00
Seeding	*$2.00*	/ac.	$0.00
	Total		**$3,266.00**

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview - Rock Chute 7 (WQ1-East)

El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name

Drawing Name

Sheet ___ of ___

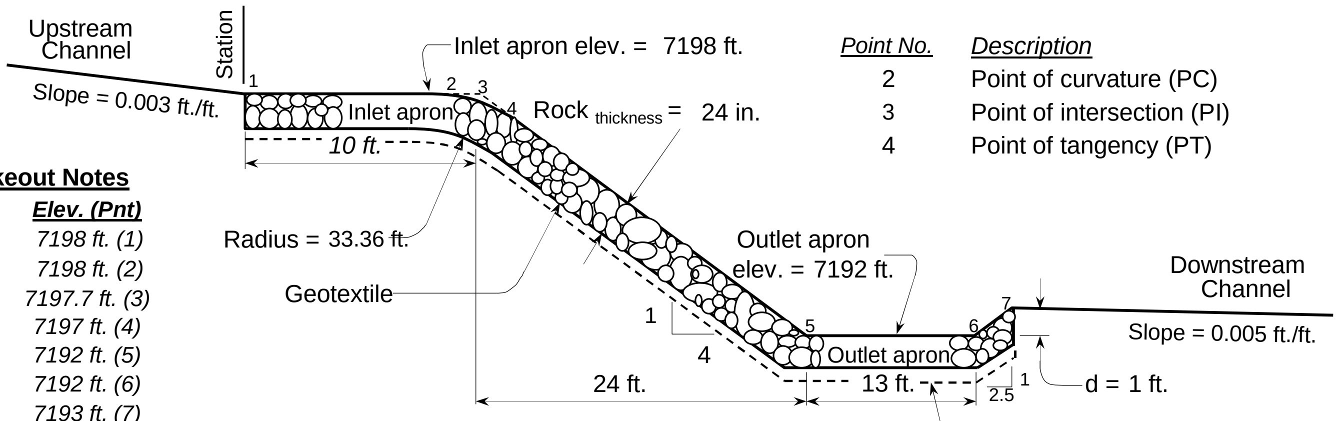
Rock Chute Design - Cut/Paste Plan

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 7 (WQ1-East) **County:** El Paso
Designer: TOS **Checked by:** ______
Date: 12/21/2022 **Date:** ______

Design Values		***Rock Gradation Envelope***		***Quantities*** [a]
D_{50} dia. = 12.0 in.		*% Passing*	*Diameter, in. (weight, lbs.)*	
$Rock_{chute}$ thickness = 24.0 in.		D_{100} ---------	18 - 24 (413 - 978)	Rock = 101 yd^3
Inlet apron length = 10 ft.		D_{85} ---------	16 - 22 (269 - 713)	Geotextile (WCS-13)[b] = 188 yd^2
Outlet apron length = 13 ft.		D_{50} ---------	12 - 18 (122 - 413)	Bedding = 0 yd^3
Radius = 33 ft.		D_{10} ---------	10 - 16 (63 - 269)	Excavation = 0 yd^3
Will bedding be used? No		*Coefficient of Uniformity, $(D_{60})/(D_{10}) < 1.7$*		Earthfill = 0 yd^3
				Seeding = 0.0 acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).*
[b] *Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.*

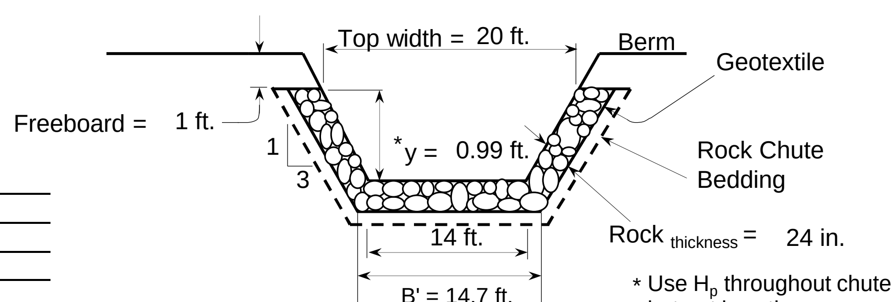


Point No.	Description
2	Point of curvature (PC)
3	Point of intersection (PI)
4	Point of tangency (PT)

Stakeout Notes

Sta.	*Elev. (Pnt)*
0+00.0	7198 ft. (1)
0+05.9	7198 ft. (2)
0+10.0	7197.7 ft. (3)
0+14.0	7197 ft. (4)
0+34.0	7192 ft. (5)
0+47.0	7192 ft. (6)
0+49.5	7193 ft. (7)

Profile Along Centerline of Rock Chute



Rock Chute Cross Section

Notes:
Rock gradation envelope can be met with
DOT Extra Heavy riprap Gradation

Profile, Cross Sections, and Quantities

NRCS Natural Resources Conservation Service, United States Department of Agriculture	Eagleview - Rock Chute 7 (WQ1-East) El Paso County		Date	File Name
		Designed TOS		Drawing Name
		Drawn		
		Checked		Sheet __ of __
		Approved		

Rock Chute Design Data

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: *Eagleview - Rock Chute 8 (WQ1-West)* **County:** *El Paso*
Designer: *TOS* **Checked by:**
Date: *December 21, 2022* **Date:**

Input Geometry:

Upstream Channel	Chute	Downstream Channel
Bw = 18.0 ft.	Bw = 18.0 ft.	Bw = 18.0 ft.
Side slopes = 4.0 (m:1)	Factor of safety = 1.60 (F_s) → **1.2 Min**	Side slopes = 4.0 (m:1)
Velocity n-value = 0.040	Side slopes = 3.0 (m:1) → **2.0:1 max.**	Velocity n-value = 0.040
Bed slope = 0.0030 ft./ft.	Bed slope (4:1) = 0.250 ft./ft → **3.0:1 max.**	Bed slope = 0.0050 ft./ft.
Note: n value = a) velocity n from waterway program	Freeboard = 1.0 ft.	
or b) computed mannings n for channel	Outlet apron depth, d = 1.0 ft.	Base flow = 0.0 cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = 7197.0 ft. ------- Outlet 7192.0 ft. --- (H_{drop} = 4 ft.)

Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410

Q_5 = Runofff from a 5-year,24-hour storm.

__Note__: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.

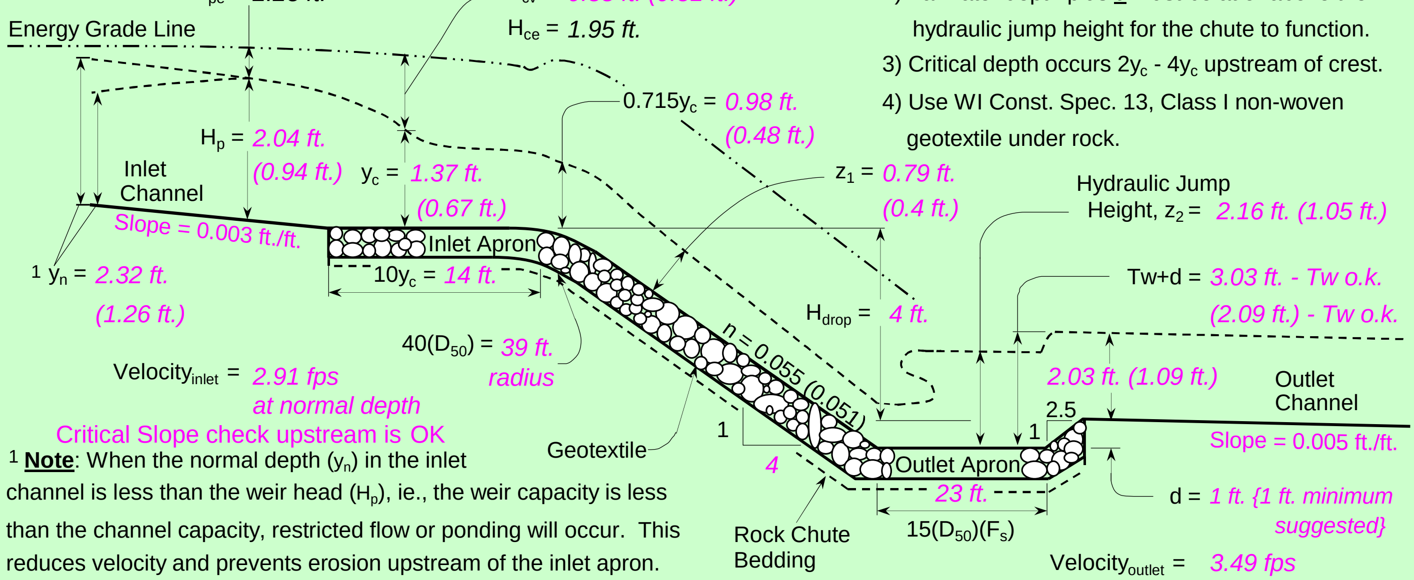
Input tailwater (Tw):

Q_{high} = 185.0 cfs High flow storm through chute → Tw (ft.) = *Program*

Q_5 = 60.0 cfs Low flow storm through chute → Tw (ft.) = *Program*

Profile and Cross Section (Output):

Starting Station = 0+00.0

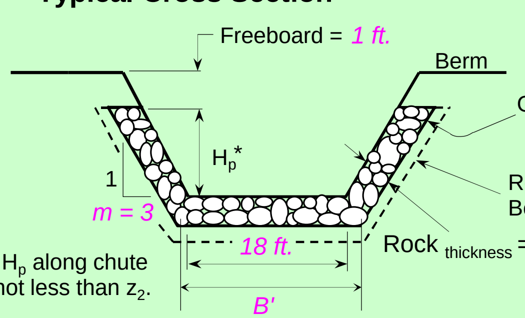


Notes:
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs 2y_c - 4y_c upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.

[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	9.11 cfs/ft.	Equivalent unit discharge
F_S =	1.60	Factor of safety (multiplier)
z_1 =	0.79 ft.	Normal depth in chute
n-value =	0.055	Manning's roughness coefficient
$D_{50}(F_s)$ =	18.7 in.	Minimum Design D50*
2(D_{50})(F_s) =	37.3 in.	Rock chute thickness
Tw + d =	3.03 ft.	Tailwater above outlet apron
z_2 =	2.16 ft.	Hydraulic jump height
****** The outlet***	***will***	***function adequately***

High Flow Storm Information

Rock Chute Design - Plan Sheet

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 8 (WQ1-West) **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/21/2022 **Date:**

Minimum Design Values		***Enter Plan Values***
18.7 in.	D_{50} dia. =	24.00 in.
37.3 in.	$Rock_{chute}$ thickness =	48.00 in.
14 ft.	Inlet apron length =	14.00 ft.
23 ft.	Outlet apron length =	23.00 ft.
39 ft.	Radius =	67 ft.

Will bedding be used? No

Rock Gradation Envelope

% Passing		*Diameter, in. (weight, lbs.)*
D_{100}	---------	36 - 48 (3302 - 7827)
D_{85}	---------	31 - 43 (2150 - 5706)
D_{50}	---------	24 - 36 (978 - 3302)
D_{10}	---------	19 - 31 (501 - 2150)

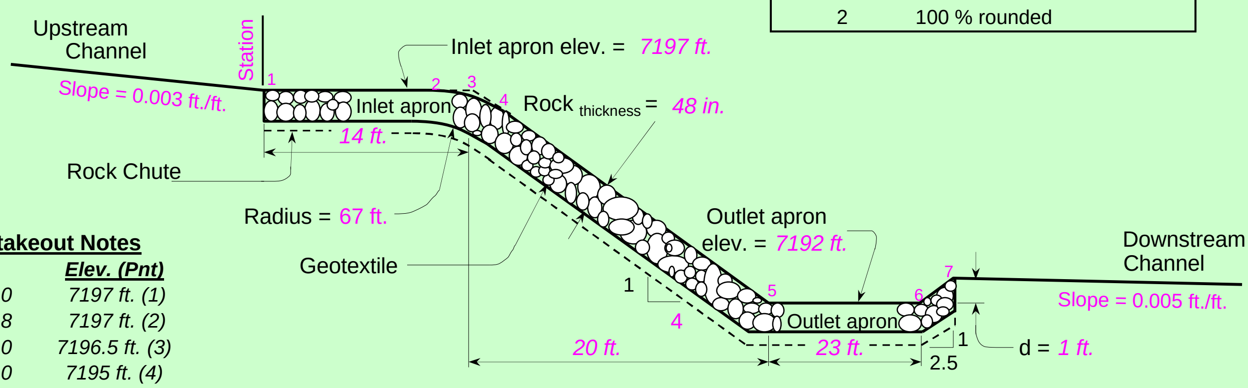
Quantities [a]

Rock =	402	yd^3
Geotextile (WCS-13)[b] =	390	yd^2
Bedding =	0	yd^3
Excavation =	0	yd^3
Earthfill =	0	yd^3
Seeding =	0.0	acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from the x-section below (neglect radius).*
[b] *Geotextile Class I (non-woven) shall be overlapped and anchored (18-in. min. along sides and 24-in. min. on the ends).*

Degree of angularity = 1

1	50% angular, 50% rounded
2	100 % rounded



Profile Along Centerline of Rock Chute

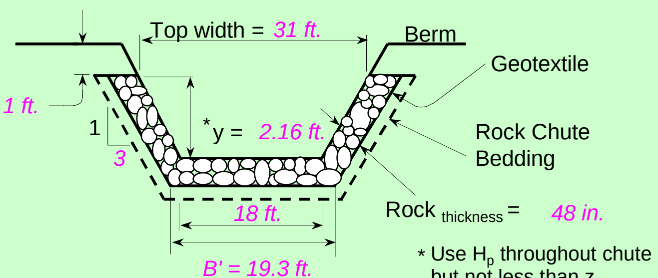
**** *Note*: *The outlet will function adequately***

Stakeout Notes

Sta.	*Elev. (Pnt)*
0+00.0	7197 ft. (1)
0+05.8	7197 ft. (2)
0+14.0	7196.5 ft. (3)
0+22.0	7195 ft. (4)
0+34.0	7192 ft. (5)
0+57.0	7192 ft. (6)
0+59.5	7193 ft. (7)

Class I non-woven

Rock gradation envelope can be met with Gradation printed



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Rock Chute Cost Estimate

Unit	*Unit Cost*	*Cost*
Rock	$10.00 /$yd^3$	$4,020.00
Geotextile	$12.00 /$yd^2$	$4,680.00
Bedding	$12.00 /$yd^3$	$0.00
Excavation	$12.00 /$yd^3$	$0.00
Earthfill	$1.00 /$yd^3$	$0.00
Seeding	$2.00 /ac.	$0.00
	Total	**$8,700.00**

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview - Rock Chute 8 (WQ1-West)
El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet ___ of ___

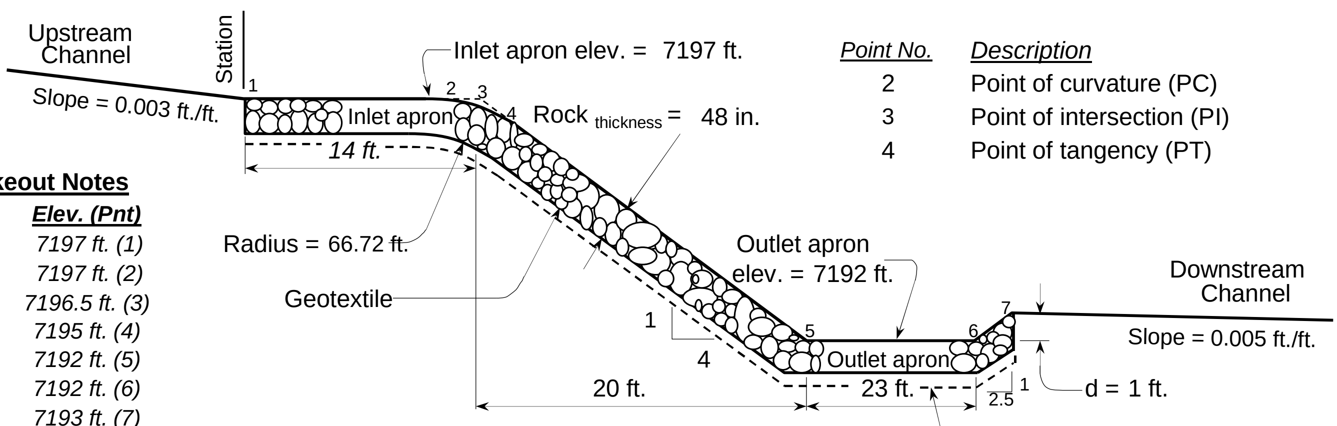
Rock Chute Design - Cut/Paste Plan

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 8 (WQ1-West) **County:** El Paso
Designer: TOS **Checked by:** ______
Date: 12/21/2022 **Date:** ______

Design Values		Rock Gradation Envelope			Quantities [a]
D_{50} dia. =	24.0 in.	% Passing		Diameter, in. (weight, lbs.)	
$Rock_{chute}$ thickness =	48.0 in.	D_{100}	---------	36 - 48 (3302 - 7827)	Rock = 402 yd^3
Inlet apron length =	14 ft.	D_{85}	---------	31 - 43 (2150 - 5706)	Geotextile (WCS-13)[b] = 390 yd^2
Outlet apron length =	23 ft.	D_{50}	---------	24 - 36 (978 - 3302)	Bedding = 0 yd^3
Radius =	67 ft.	D_{10}	---------	19 - 31 (501 - 2150)	Excavation = 0 yd^3
Will bedding be used?	No	Coefficient of Uniformity, $(D_{60})/(D_{10}) < 1.7$			Earthfill = 0 yd^3
					Seeding = 0.0 acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).*
[b] *Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.*

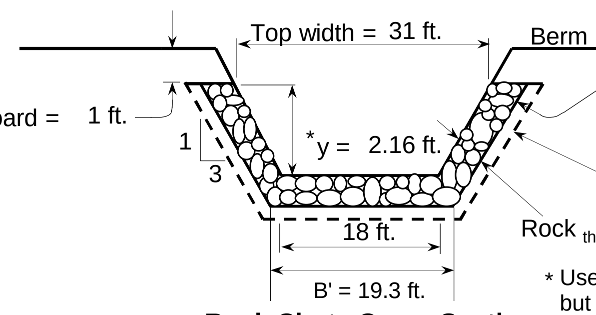


Point No.	Description
2	Point of curvature (PC)
3	Point of intersection (PI)
4	Point of tangency (PT)

Stakeout Notes

Sta.	*Elev. (Pnt)*
0+00.0	7197 ft. (1)
0+05.8	7197 ft. (2)
0+14.0	7196.5 ft. (3)
0+22.0	7195 ft. (4)
0+34.0	7192 ft. (5)
0+57.0	7192 ft. (6)
0+59.5	7193 ft. (7)

Profile Along Centerline of Rock Chute



* Use H_p throughout chute but not less than z_2.

Rock Chute Cross Section

Notes:
Rock gradation envelope can be met with
Gradation printed

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview - Rock Chute 8 (WQ1-West)

El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet __ of __

Rock Chute Design Data

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: *Eagleview - Rock Chute 9* **County:** *El Paso*
Designer: *TOS* **Checked by:**
Date: *December 21, 2022* **Date:**

Input Geometry:

Upstream Channel	Chute	Downstream Channel
Bw = *2.0* ft.	Bw = *2.0* ft.	Bw = *2.0* ft.
Side slopes = *4.0* (m:1)	Factor of safety = *1.60* (F_s) **1.2 Min**	Side slopes = *4.0* (m:1)
Velocity n-value = *0.040*	Side slopes = *4.0* (m:1) → **2.0:1 max.**	Velocity n-value = *0.040*
Bed slope = *0.1000* ft./ft.	Bed slope (3.3:1) = *0.300* ft./ft → **3.0:1 max.**	Bed slope = *0.0050* ft./ft.
Note: n value = a) velocity n from waterway program or b) computed mannings n for channel	Freeboard = *1.0* ft.	
	Outlet apron depth, d = *1.0* ft.	Base flow = *0.0* cfs

Design Storm Data (Table 2, FOTG, WI-NRCS Grade Stabilization Structure No. 410):

Apron elev. --- Inlet = *7217.0* ft. ------- Outlet *7208.0* ft. --- (H_{drop} = 8 ft.)

Q_{high} = Runoff from design storm capacity from Table 2, FOTG Standard 410
Q_5 = Runofff from a 5-year,24-hour storm.

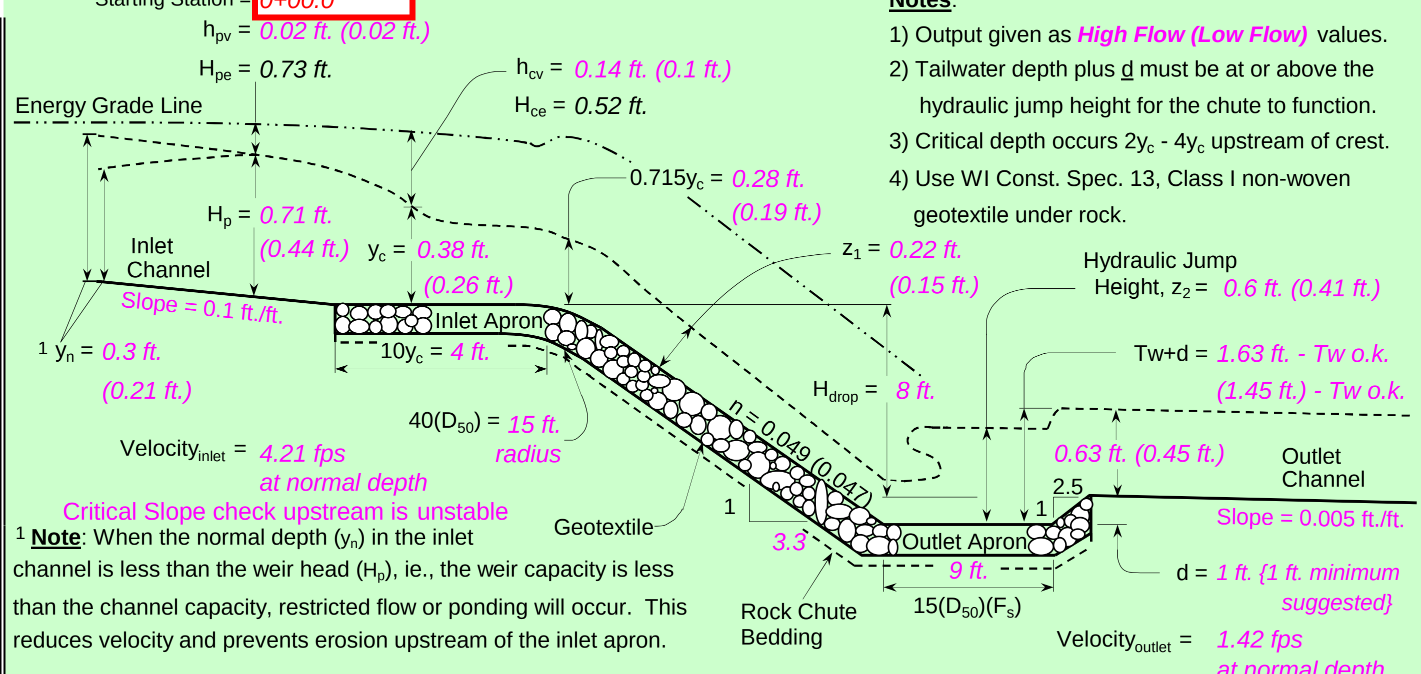
***Note**: The total required capacity is routed through the chute (principal spillway) or in combination with an auxiliary spillway.*

***Input tailwater (Tw)**:* 0.30 1.60

Q_{high} = *4.0* cfs High flow storm through chute → Tw (ft.) = *Program*
Q_5 = *2.0* cfs Low flow storm through chute → Tw (ft.) = *Program*

Profile and Cross Section (Output):

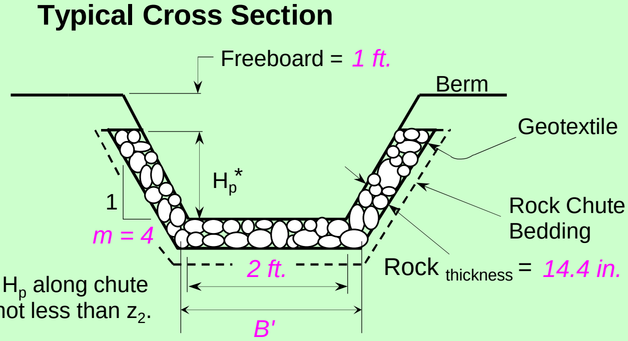
Notes:
1) Output given as ***High Flow (Low Flow)*** values.
2) Tailwater depth plus d must be at or above the hydraulic jump height for the chute to function.
3) Critical depth occurs $2y_c$ - $4y_c$ upstream of crest.
4) Use WI Const. Spec. 13, Class I non-woven geotextile under rock.



[1] **Note**: When the normal depth (y_n) in the inlet channel is less than the weir head (H_p), ie., the weir capacity is less than the channel capacity, restricted flow or ponding will occur. This reduces velocity and prevents erosion upstream of the inlet apron.

Profile Along Centerline of Chute

Typical Cross Section



* Use H_p along chute but not less than z_2.

	1.35 cfs/ft.	Equivalent unit discharge
F_S =	*1.60*	Factor of safety (multiplier)
z_1 =	*0.22 ft.*	Normal depth in chute
n-value =	*0.049*	Manning's roughness coefficient
$D_{50}(F_s)$ =	*7.2 in.*	Minimum Design D50*
$2(D_{50})(F_s)$ =	*14.4 in.*	Rock chute thickness
Tw + d =	*1.63 ft.*	Tailwater above outlet apron
z_2 =	*0.6 ft.*	Hydraulic jump height
****** The outlet***	***will***	***function adequately***

High Flow Storm Information

Rock Chute Design - Plan Sheet

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 9 **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/21/2022 **Date:**

Minimum Design Values		Enter Plan Values	
7.2 in.	D_{50} dia. =	9.00	in.
14.4 in.	Rock_{chute} thickness =	18.00	in.
4 ft.	Inlet apron length =	10.00	ft.
9 ft.	Outlet apron length =	9.00	ft.
15 ft.	Radius =	25	ft.

Will bedding be used? No

Rock Gradation Envelope

% Passing		Diameter, in. (weight, lbs.)
D_{100}	---------	14 - 18 (174 - 413)
D_{85}	---------	12 - 16 (113 - 301)
D_{50}	---------	9 - 14 (52 - 174)
D_{10}	---------	7 - 12 (26 - 113)

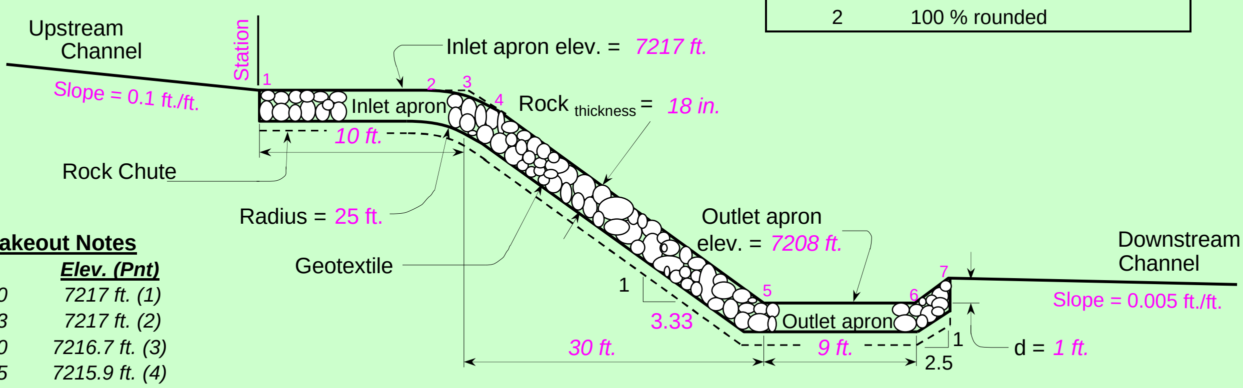
Quantities [a]

Rock =	42	yd^3
Geotextile (WCS-13)[b] =	122	yd^2
Bedding =	0	yd^3
Excavation =	0	yd^3
Earthfill =	0	yd^3
Seeding =	0.0	acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from the x-section below (neglect radius).*
[b] *Geotextile Class I (non-woven) shall be overlapped and anchored (18-in. min. along sides and 24-in. min. on the ends).*

Degree of angularity = 1

1	50% angular, 50% rounded
2	100 % rounded



Profile Along Centerline of Rock Chute

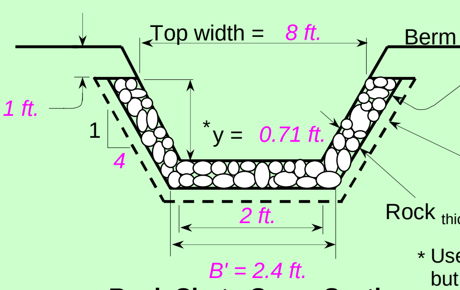
Stakeout Notes

Sta.	Elev. (Pnt)
0+00.0	7217 ft. (1)
0+06.3	7217 ft. (2)
0+10.0	7216.7 ft. (3)
0+13.5	7215.9 ft. (4)
0+40.0	7208 ft. (5)
0+49.0	7208 ft. (6)
0+51.5	7209 ft. (7)

*****Note: The outlet will function adequately***

Class I non-woven

Rock gradation envelope can be met with DOT Heavy riprap Gradation



Rock Chute Cross Section

Rock Chute Cost Estimate

Unit	Unit Cost		Cost
Rock	$10.00	/yd^3	$420.00
Geotextile	$12.00	/yd^2	$1,464.00
Bedding	$12.00	/yd^3	$0.00
Excavation	$12.00	/yd^3	$0.00
Earthfill	$1.00	/yd^3	$0.00
Seeding	$2.00	/ac.	$0.00
	Total		**$1,884.00**

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview - Rock Chute 9
El Paso County

		Date
Designed	TOS	
Drawn		
Checked		
Approved		

File Name
Drawing Name
Sheet ___ of ___

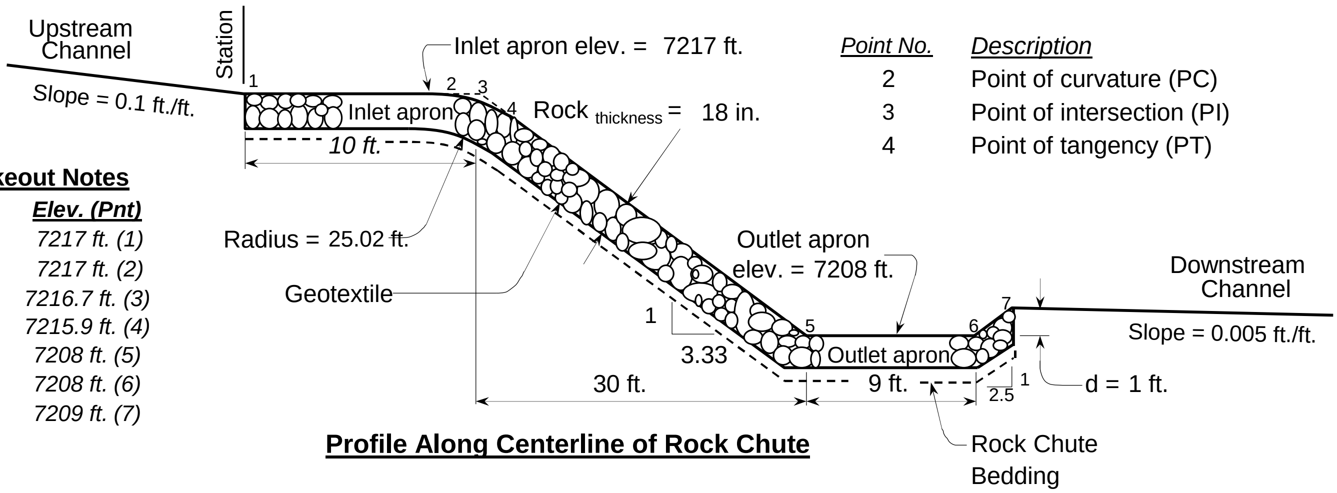
Rock Chute Design - Cut/Paste Plan

(Version WI-July-2010, Based on Design of Rock Chutes by Robinson, Rice, Kadavy, ASAE, 1998)

Project: Eagleview - Rock Chute 9 **County:** El Paso
Designer: TOS **Checked by:**
Date: 12/21/2022 **Date:**

Design Values		***Rock Gradation Envelope***		***Quantities*** [a]	
		% Passing	*Diameter, in. (weight, lbs.)*		
D_{50} dia. =	9.0 in.	D_{100} ---------	14 - 18 (174 - 413)	Rock =	42 yd^3
$Rock_{chute}$ thickness =	18.0 in.	D_{85} ---------	12 - 16 (113 - 301)	Geotextile (WCS-13)[b] =	122 yd^2
Inlet apron length =	10 ft.	D_{50} ---------	9 - 14 (52 - 174)	Bedding =	0 yd^3
Outlet apron length =	9 ft.	D_{10} ---------	7 - 12 (26 - 113)	Excavation =	0 yd^3
Radius =	25 ft.	*Coefficient of Uniformity, $(D_{60})/(D_{10}) < 1.7$*		Earthfill =	0 yd^3
Will bedding be used?	No			Seeding =	0.0 acres

Notes: [a] *Rock, bedding, and geotextile quantities are determined from x-section below (neglect radius).*
[b] *Geotextile Class I (Non-woven) shall be overlapped and anchored (18-in. minimum along sides and 24-in. minimum on the ends) --- quantity not included.*

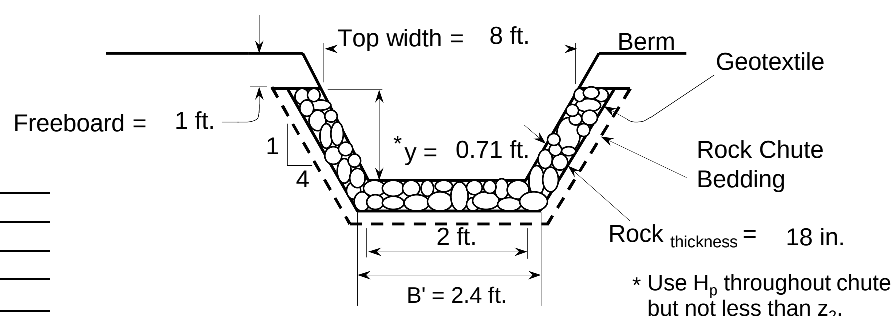


Point No.	*Description*
2	Point of curvature (PC)
3	Point of intersection (PI)
4	Point of tangency (PT)

Stakeout Notes

Sta.	***Elev. (Pnt)***
0+00.0	*7217 ft. (1)*
0+06.3	*7217 ft. (2)*
0+10.0	*7216.7 ft. (3)*
0+13.5	*7215.9 ft. (4)*
0+40.0	*7208 ft. (5)*
0+49.0	*7208 ft. (6)*
0+51.5	*7209 ft. (7)*

Profile Along Centerline of Rock Chute



Rock Chute Cross Section

Notes:
Rock gradation envelope can be met with
DOT Heavy riprap Gradation

Profile, Cross Sections, and Quantities

NRCS
Natural Resources Conservation Service
United States Department of Agriculture

Eagleview - Rock Chute 9

El Paso County

		Date	
Designed	TOS		File Name
Drawn			Drawing Name
Checked			
Approved			Sheet __ of __

possible for as much of the reach as possible to the maximum prudent values for the hydraulic parameters in the 100 year event. The designer should determine the return period where these parameters would be achieved and, with the owner and local jurisdiction, determine if the associated risks are acceptable.

On the other hand, if the recommendation to avoid floodplain filling is not followed and fill is proposed, this should only happen in floodplains where the maximum prudent values for the hydraulic parameters shown in Table 8-1 are not exceeded in the 100-year event.

Type B

Table 8-1. Maximum prudent values for natural channel hydraulic parameters

Design Parameter	Non-Cohesive Soils or Poor Vegetation	Cohesive Soils and Vegetation
Maximum flow velocity (average of section)	5 ft/s	7 ft/s
Maximum Froude number	0.6	0.8
Maximum tractive force (average of section)	0.60 lb/sf	1.0 lb/sf
Maximum depth outside bankfull channel	5 ft	5 ft

Stream Restoration Principle 8: Evaluate Hydraulics of Streams over a Range of Flows

Representative Design Tasks and Deliverables

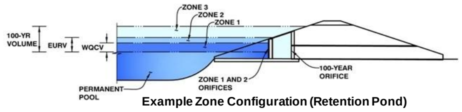
1. Document hydraulic analyses of the project reach following the guidance of Section 7.0.
2. Describe how hydraulic performance of the project reach compares to maximum prudent values for the hydraulic parameters shown in Table 8-1 for several return periods (including 2-, 10-, and 100-year events at a minimum). Describe any locations in the reach where these parameters are exceeded and discuss efforts made to improve hydraulics.
3. Confirm that hydraulic parameters of Table 8-1 are satisfied in for the100-year event in all locations where fill is proposed in the floodplain.

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: Eagleview

Basin ID: Sub Regional Pond 1 (Actual Area draining to the pond)



Example Zone Configuration (Retention Pond)

Watershed Information — Area > 1 sq.mi. for WQ Facility

Selected BMP Type =	EDB	
Watershed Area =	720.00	acres
Watershed Length =	9,000	ft
Watershed Length to Centroid =	4,500	ft
Watershed Slope =	0.030	ft/ft
Watershed Imperviousness =	8.10%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	3.351	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	5.390	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	8.598	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	19.938	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	31.391	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	52.246	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	66.269	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	86.656	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	123.537	acre-feet		inches
Approximate 2-yr Detention Volume =	3.365	acre-feet		
Approximate 5-yr Detention Volume =	5.375	acre-feet		
Approximate 10-yr Detention Volume =	12.300	acre-feet		
Approximate 25-yr Detention Volume =	17.741	acre-feet		
Approximate 50-yr Detention Volume =	18.433	acre-feet		
Approximate 100-yr Detention Volume =	24.105	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	3.351	acre-feet
Zone 2 Volume (EURV - Zone 1) =	2.038	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	18.715	acre-feet
Total Detention Basin Volume =	24.105	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

Depth Increment = 1.00 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	1,131	0.026		
7209	--	1.00	--	--	--	2,102	0.048	1,616	0.037
7210	--	2.00	--	--	--	7,401	0.170	6,368	0.146
7211	--	3.00	--	--	--	26,360	0.605	23,249	0.534
7212	--	4.00	--	--	--	57,884	1.329	65,371	1.501
7213	--	5.00	--	--	--	97,021	2.227	142,823	3.279
7214	--	6.00	--	--	--	127,623	2.930	255,145	5.857
7215	--	7.00	--	--	--	144,596	3.319	391,254	8.982
7216	--	8.00	--	--	--	155,516	3.570	541,310	12.427
7217	--	9.00	--	--	--	164,583	3.778	701,359	16.101
7218	--	10.00	--	--	--	173,517	3.983	870,409	19.982
7219	--	11.00	--	--	--	182,319	4.185	1,048,327	24.066
7220	--	12.00	--	--	--	192,855	4.427	1,235,914	28.373
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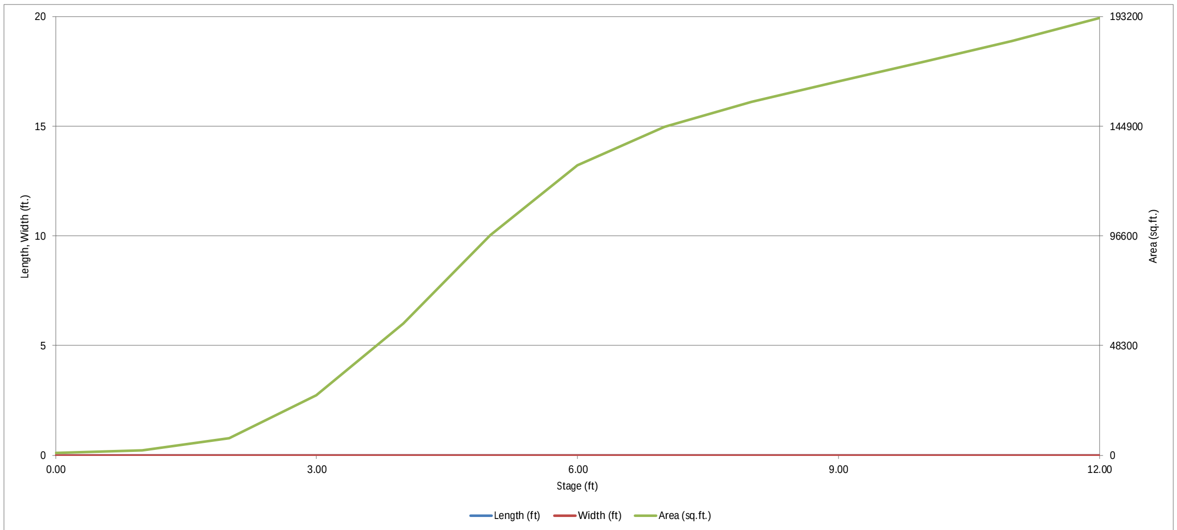
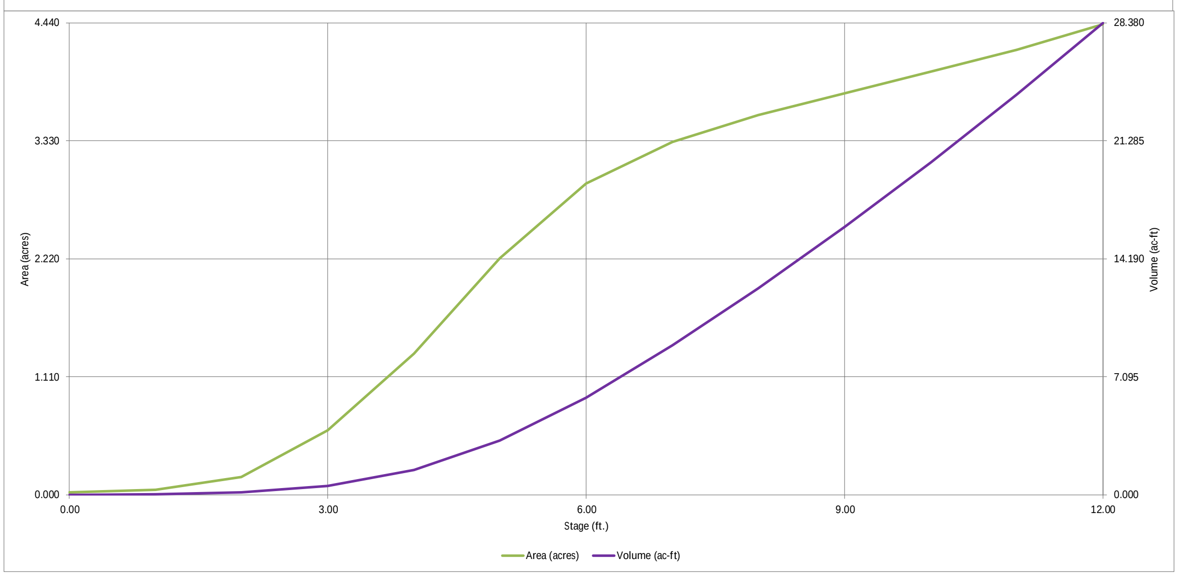

Length, Width (ft.)
Area (sq.ft.)
Stage (ft)
20
15
10
5
0
193200
144900
96600
48300
0
0.00
3.00
6.00
9.00
12.00
Length (ft)
Width (ft)
Area (sq.ft.)

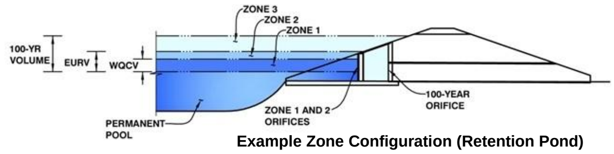

Area (acres)
Volume (ac-ft)
Stage (ft.)
4.440
3.330
2.220
1.110
0.000
28.380
21.285
14.190
7.095
0.000
0.00
3.00
6.00
9.00
12.00
Area (acres)
Volume (ac-ft)

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: Eagleview

Basin ID: Sub Regional Pond 1 (Actual Area draining to the pond)



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	5.04	3.351	Orifice Plate
Zone 2 (EURV)	5.84	2.038	Orifice Plate
Zone 3 (100-year)	11.01	18.715	Weir&Pipe (Restrict)
	Total (all zones)	24.105	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)
Underdrain Orifice Diameter =	N/A	inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	5.84	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	23.40	inches
Orifice Plate: Orifice Area per Row =	N/A	inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.95	3.89					
Orifice Area (sq. inches)	7.50	9.00	9.50					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	5.90	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	62.00	N/A	feet
Overflow Weir Grate Slope =	10.00	N/A	H:V
Horiz. Length of Weir Sides =	10.00	N/A	feet
Overflow Grate Type =	Type C Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	6.90	N/A	feet
Overflow Weir Slope Length =	10.05	N/A	feet
Grate Open Area / 100-yr Orifice Area =	14.31	N/A	
Overflow Grate Open Area w/o Debris =	433.67	N/A	ft^2
Overflow Grate Open Area w/ Debris =	216.84	N/A	ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.25	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	108.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	52.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	30.31	N/A	ft^2
Outlet Orifice Centroid =	2.50	N/A	feet
Half-Central Angle of Restrictor Plate on Pipe =	1.53	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	9.50	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	136.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=	1.48	feet
Stage at Top of Freeboard =	11.98	feet
Basin Area at Top of Freeboard =	4.42	acres
Basin Volume at Top of Freeboard =	28.28	acre-ft

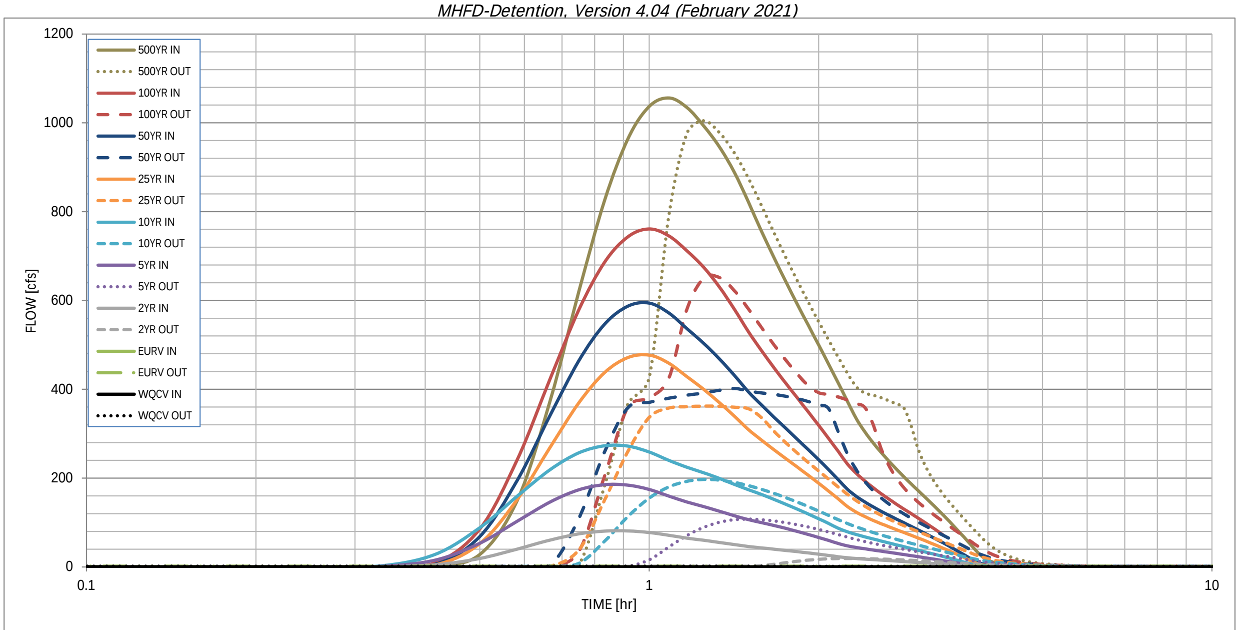
Routed Hydrograph Results

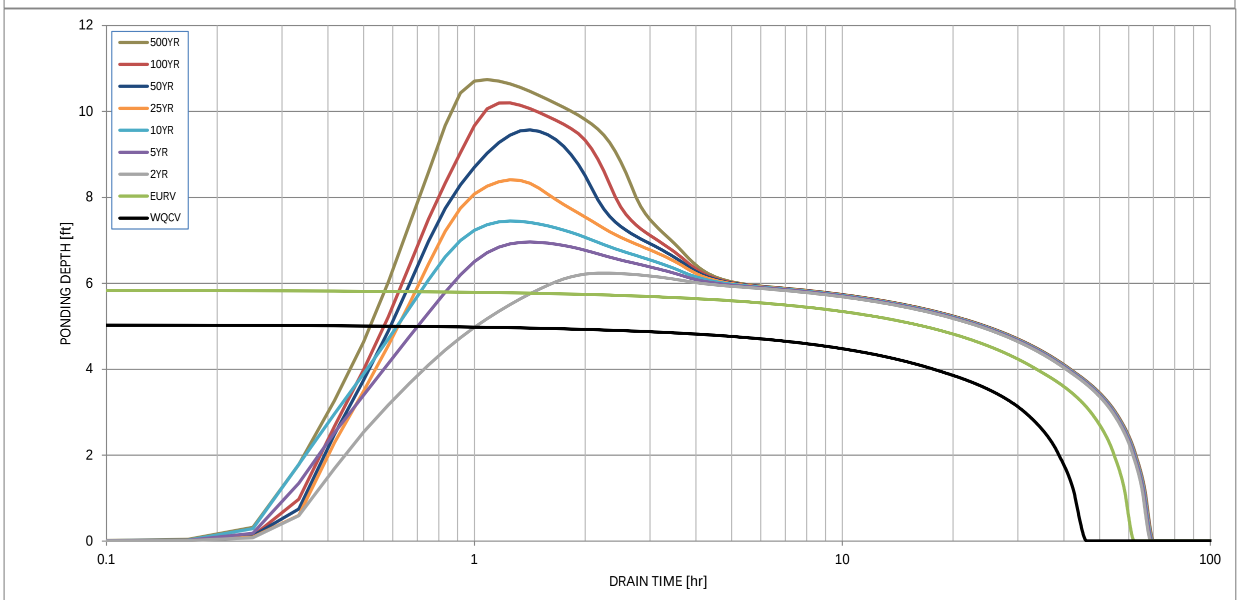
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

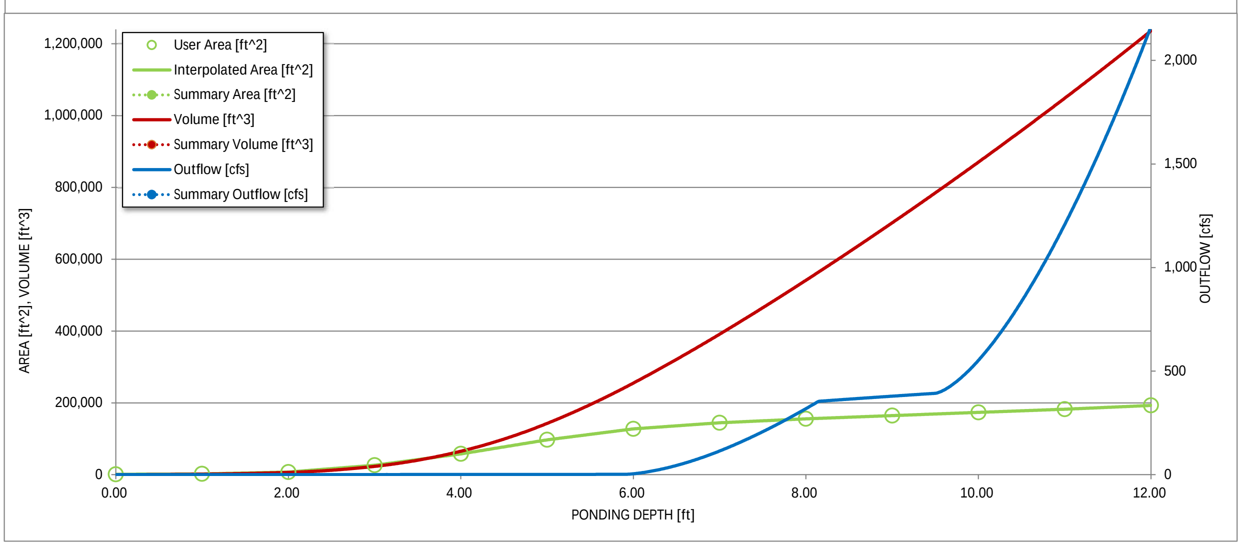
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	3.351	5.390	8.598	19.938	31.391	52.246	66.269	86.656	123.537
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	8.598	19.938	31.391	52.246	66.269	86.656	123.537
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	54.6	154.6	241.8	446.5	562.6	726.3	1020.0
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.08	0.21	0.34	0.62	0.78	1.01	1.42
Peak Inflow Q (cfs) =	N/A	N/A	81.1	185.1	272.6	477.1	594.1	760.9	1056.2
Peak Outflow Q (cfs) =	1.4	1.6	19.1	107.6	197.0	362.1	401.8	651.6	1004.7
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.7	0.8	0.8	0.7	0.9	1.0
Structure Controlling Flow =	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway	Spillway	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	0.04	0.2	0.5	0.8	0.9	0.9	1.0
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	40	54	59	54	49	41	36	30	21
Time to Drain 99% of Inflow Volume (hours) =	43	58	64	61	59	55	53	50	45
Maximum Ponding Depth (ft) =	5.04	5.84	6.24	6.96	7.45	8.41	9.57	10.19	10.74
Area at Maximum Ponding Depth (acres) =	2.26	2.82	3.02	3.30	3.43	3.65	3.89	4.02	4.13
Maximum Volume Stored (acre-ft) =	3.368	5.398	6.541	8.816	10.467	13.871	18.249	20.742	22.944

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)







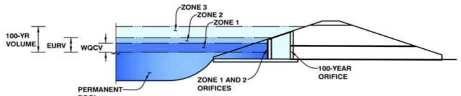
S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.05 (January 2022)

Project: Eagleview

Basin ID: Onsite Sub Regional Pond 1 (Watershed Area adjusted to match HEC-HMS Peak Q inflow)



Example Zone Configuration (Retention Pond)

Depth Increment = ft

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	508.00	acres
Watershed Length =	9,000	ft
Watershed Length to Centroid =	4,500	ft
Watershed Slope =	0.030	ft/ft
Watershed Imperviousness =	8.10%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	3.351	acre-feet	3.351	acre-feet
Excess Urban Runoff Volume (EURV) =	5.390	acre-feet	5.390	acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	6.066	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	14.065	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	22.143	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	36.852	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	46.742	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	61.121	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	87.132	acre-feet		inches
Approximate 2-yr Detention Volume =	2.374	acre-feet		
Approximate 5-yr Detention Volume =	3.792	acre-feet		
Approximate 10-yr Detention Volume =	8.678	acre-feet		
Approximate 25-yr Detention Volume =	12.517	acre-feet		
Approximate 50-yr Detention Volume =	13.006	acre-feet		
Approximate 100-yr Detention Volume =	17.007	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	3.351	acre-feet
Zone 2 Volume (EURV - Zone 1) =	2.039	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	11.617	acre-feet
Total Detention Basin Volume =	17.007	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	1,131	0.026		
7209	--	1.00	--	--	--	2,102	0.048	1,616	0.037
7210	--	2.00	--	--	--	7,401	0.170	6,368	0.146
7211	--	3.00	--	--	--	26,360	0.605	23,249	0.534
7212	--	4.00	--	--	--	57,884	1.329	65,371	1.501
7213	--	5.00	--	--	--	97,021	2.227	142,823	3.279
7214	--	6.00	--	--	--	127,623	2.930	255,145	5.857
7215	--	7.00	--	--	--	144,596	3.319	391,254	8.982
7216	--	8.00	--	--	--	155,516	3.570	541,310	12.427
7217	--	9.00	--	--	--	164,583	3.778	701,359	16.101
7218	--	10.00	--	--	--	173,517	3.983	870,409	19.982
7219	--	11.00	--	--	--	182,319	4.185	1,048,327	24.066
7220	--	12.00	--	--	--	192,855	4.427	1,235,914	28.373
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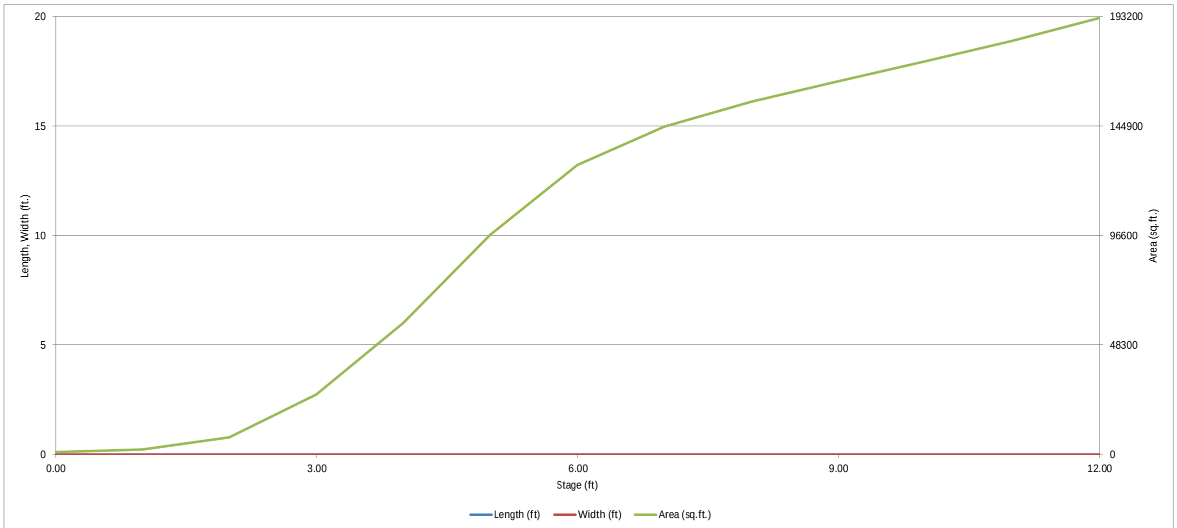
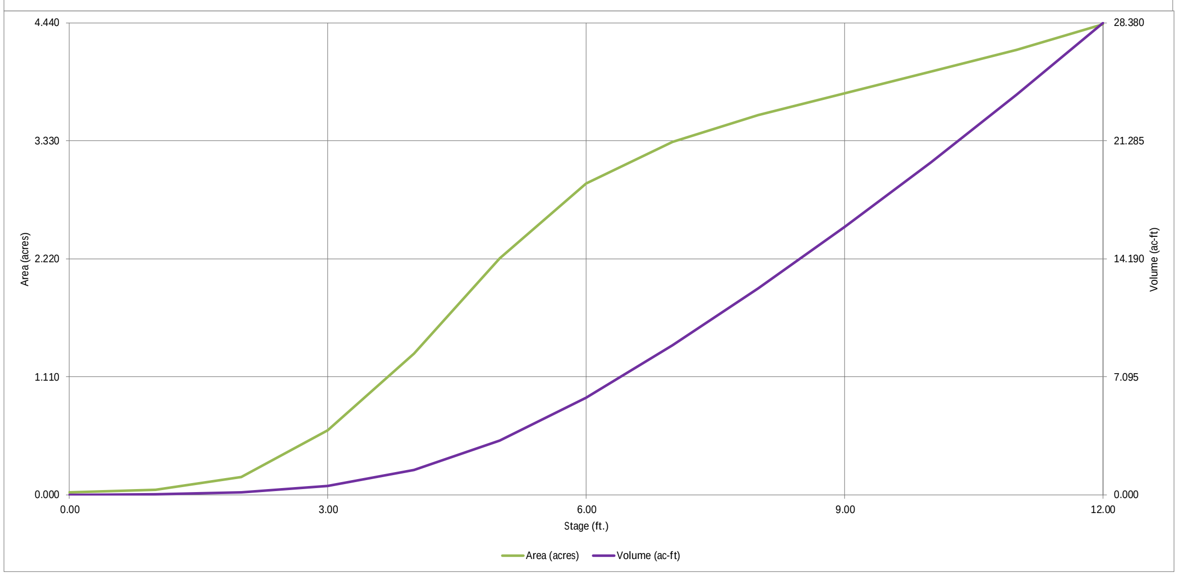
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.05 (January 2022)



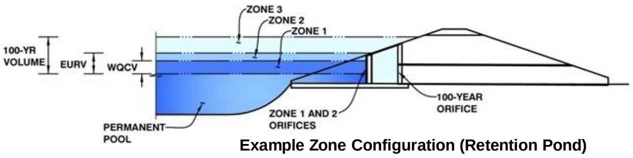


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)

Project: Eagleview

Basin ID: Onsite Sub Regional Pond 1 (Watershed Area adjusted to match HEC-HMS Peak Q inflow)



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	5.04	3.351	Orifice Plate
Zone 2 (EURV)	5.84	2.039	Orifice Plate
Zone 3 (100-year)	9.24	11.617	Weir&Pipe (Restrict)
Total (all zones)		17.007	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =		ft (distance below the filtration media surface)
Underdrain Orifice Diameter =		inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =		ft^2
Underdrain Orifice Centroid =		feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Centroid of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	5.84	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	21.80	inches
Orifice Plate: Orifice Area per Row =	N/A	sq. inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	1.95	3.89					
Orifice Area (sq. inches)	7.50	9.00	9.50					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =	N/A	N/A	inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =	N/A	N/A	ft^2
Vertical Orifice Centroid =	N/A	N/A	feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir and No Outlet Pipe)

	Zone 3 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	5.90	N/A	ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	62.00	N/A	feet
Overflow Weir Grate Slope =	10.00	N/A	H:V
Horiz. Length of Weir Sides =	10.00	N/A	feet
Overflow Grate Type =	Type C Grate	N/A	
Debris Clogging % =	50%	N/A	%

Calculated Parameters for Overflow Weir

	Zone 3 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	6.90	N/A	feet
Overflow Weir Slope Length =	10.05	N/A	feet
Grate Open Area / 100-yr Orifice Area =	14.31	N/A	
Overflow Grate Open Area w/o Debris =	433.67	N/A	ft^2
Overflow Grate Open Area w/ Debris =	216.84	N/A	ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected	
Depth to Invert of Outlet Pipe =	0.25	N/A	ft (distance below basin bottom at Stage = 0 ft)
Outlet Pipe Diameter =	108.00	N/A	inches
Restrictor Plate Height Above Pipe Invert =	52.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 3 Restrictor	Not Selected	
Outlet Orifice Area =	30.31	N/A	ft^2
Outlet Orifice Centroid =	2.50	N/A	feet
Restrictor Plate on Pipe =	1.53	N/A	radians

design does not match the construction plans. Does the second column function to model a second pipe?

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	9.50	ft (relative to basin bottom
Spillway Crest Length =	136.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

way Design Flow Depth=	1.11	feet
ge at Top of Freeboard =	11.61	feet
ea at Top of Freeboard =	4.33	acres
ne at Top of Freeboard =	26.66	acre-ft

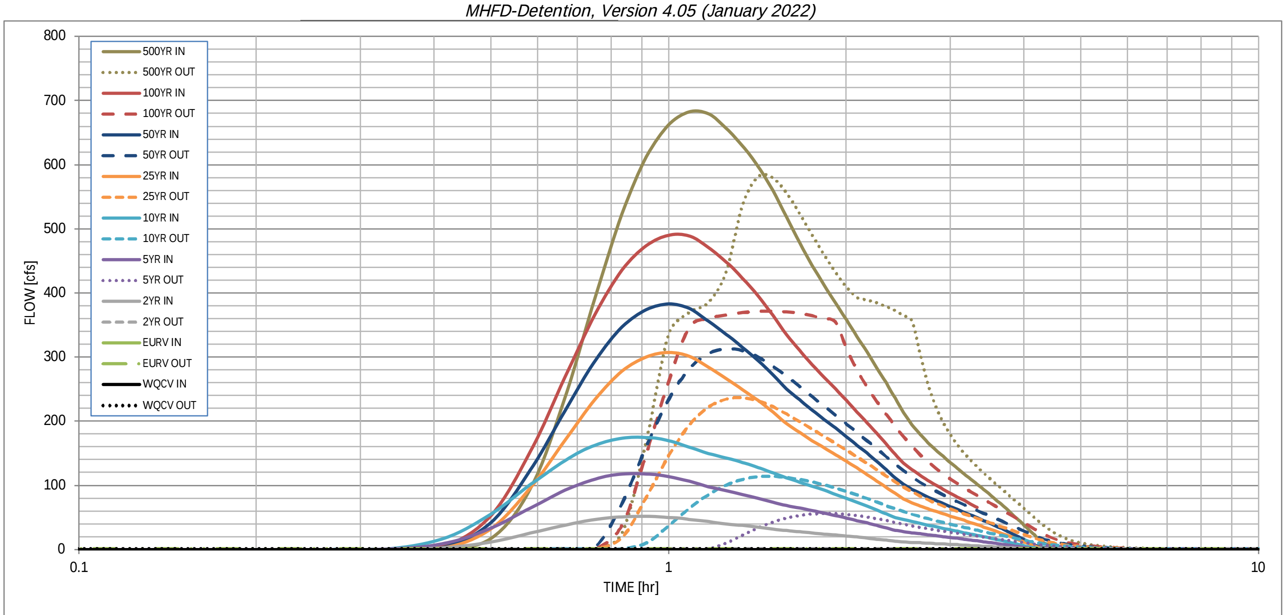
Routed Hydrograph Results

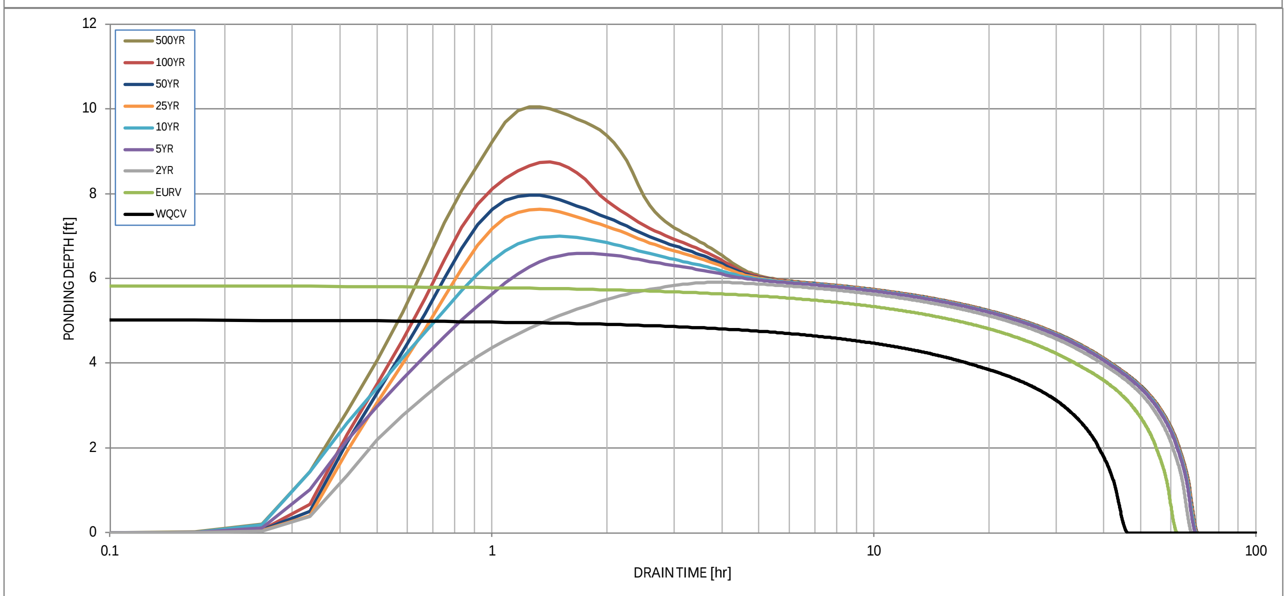
The user can override the default CUHP hydrog ues in the Inflow Hydrographs table (Columns W through AF).

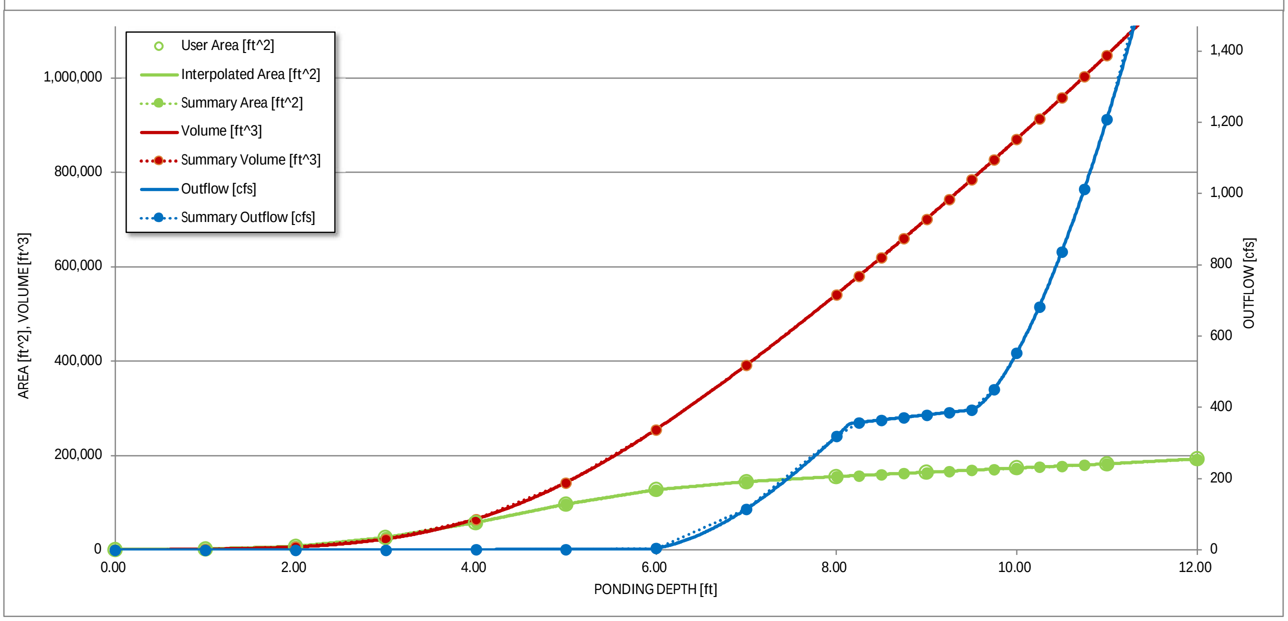
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	3.351	5.390	6.066	14.065	22.143	36.852	46.742	61.121	87.132
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	6.066	14.065	22.143	36.852	46.742	61.121	87.132
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	34.8	99.0	155.3	286.9	361.9	474.1	666.3
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.07	0.19	0.31	0.56	0.71	0.93	1.31
Peak Inflow Q (cfs) =	N/A	N/A	52.0	118.4	175.2	307.5	383.1	490.6	682.9
Peak Outflow Q (cfs) =	1.4	1.6	1.9	56.5	114.4	237.0	313.2	372.2	581.9
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.6	0.7	0.8	0.9	0.8	0.9
Structure Controlling Flow =	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1	Spillway
Max Velocity through Grate 1 (fps) =	N/A	N/A	0.00	0.1	0.3	0.5	0.7	0.9	0.9
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	40	54	60	57	53	47	43	38	31
Time to Drain 99% of Inflow Volume (hours) =	43	58	64	62	61	58	56	54	50
Maximum Ponding Depth (ft) =	5.04	5.84	5.92	6.60	7.00	7.64	7.98	8.75	10.06
Area at Maximum Ponding Depth (acres) =	2.26	2.82	2.87	3.16	3.32	3.48	3.56	3.73	4.00
Maximum Volume Stored (acre-ft) =	3.368	5.398	5.596	7.685	8.949	11.123	12.320	15.163	20.221

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.02
	0:15:00	0.00	0.00	0.06	0.10	0.12	0.08	0.12	0.10	0.19
	0:20:00	0.00	0.00	0.33	0.83	1.43	0.37	0.46	0.48	1.46
	0:25:00	0.00	0.00	2.98	9.70	17.90	2.93	3.81	5.70	17.65
	0:30:00	0.00	0.00	12.04	33.82	56.03	33.14	43.20	54.01	95.58
	0:35:00	0.00	0.00	25.64	65.53	101.53	96.93	124.51	154.14	237.70
	0:40:00	0.00	0.00	38.44	92.93	139.26	171.25	217.07	269.21	393.91
	0:45:00	0.00	0.00	47.23	110.42	163.23	234.84	295.04	367.89	524.44
	0:50:00	0.00	0.00	51.38	117.91	173.82	278.18	347.48	436.22	613.23
	0:55:00	0.00	0.00	52.00	118.41	175.23	300.75	374.68	474.30	662.57
	1:00:00	0.00	0.00	50.53	114.40	170.20	307.46	383.12	490.58	682.89
	1:05:00	0.00	0.00	47.45	106.62	159.90	301.45	376.27	489.43	679.83
	1:10:00	0.00	0.00	43.63	98.29	150.27	284.48	356.10	471.08	656.92
	1:15:00	0.00	0.00	40.44	91.75	142.98	266.89	335.98	448.81	629.58
	1:20:00	0.00	0.00	37.64	85.86	135.99	249.64	315.83	423.65	597.58
	1:25:00	0.00	0.00	34.91	79.96	128.20	232.26	294.87	395.23	559.93
	1:30:00	0.00	0.00	32.17	73.97	119.62	214.42	272.87	365.17	519.02
	1:35:00	0.00	0.00	29.69	68.89	112.10	197.03	251.13	335.33	478.60
	1:40:00	0.00	0.00	27.79	64.86	105.42	182.85	233.43	310.32	443.82
	1:45:00	0.00	0.00	26.10	60.99	98.94	170.31	217.59	288.34	412.76
	1:50:00	0.00	0.00	24.50	57.13	92.59	158.97	203.16	268.72	384.69
	1:55:00	0.00	0.00	22.92	53.24	86.38	148.13	189.38	250.24	358.21
	2:00:00	0.00	0.00	21.32	49.38	80.27	137.78	176.25	232.51	332.96
	2:05:00	0.00	0.00	19.71	45.50	74.13	127.56	163.29	215.20	308.28
	2:10:00	0.00	0.00	18.08	41.61	67.93	117.44	150.43	198.25	284.03
	2:15:00	0.00	0.00	16.44	37.72	61.72	107.42	137.67	181.68	260.21
	2:20:00	0.00	0.00	14.80	33.90	55.61	97.40	124.91	165.09	236.44
	2:25:00	0.00	0.00	13.29	30.57	50.49	87.53	112.36	148.80	213.71
	2:30:00	0.00	0.00	12.16	28.18	46.72	79.38	102.08	135.26	194.92
	2:35:00	0.00	0.00	11.37	26.41	43.67	73.29	94.34	124.83	180.07
	2:40:00	0.00	0.00	10.70	24.82	40.89	68.29	87.88	116.02	167.33
	2:45:00	0.00	0.00	10.07	23.33	38.29	63.88	82.14	108.18	155.92
	2:50:00	0.00	0.00	9.45	21.87	35.79	59.87	76.89	101.04	145.47
	2:55:00	0.00	0.00	8.85	20.46	33.36	56.11	71.98	94.39	135.73
	3:00:00	0.00	0.00	8.26	19.07	31.02	52.49	67.26	88.16	126.60
	3:05:00	0.00	0.00	7.68	17.70	28.76	49.00	62.75	82.35	118.09
	3:10:00	0.00	0.00	7.12	16.36	26.57	45.58	58.36	76.73	109.91
	3:15:00	0.00	0.00	6.55	15.04	24.45	42.20	54.03	71.15	101.86
	3:20:00	0.00	0.00	5.99	13.73	22.38	38.83	49.73	65.58	93.87
	3:25:00	0.00	0.00	5.43	12.44	20.32	35.48	45.46	60.02	85.89
	3:30:00	0.00	0.00	4.88	11.15	18.28	32.14	41.19	54.47	77.92
	3:35:00	0.00	0.00	4.32	9.87	16.24	28.80	36.93	48.92	69.97
	3:40:00	0.00	0.00	3.77	8.59	14.22	25.46	32.69	43.38	62.04
	3:45:00	0.00	0.00	3.22	7.32	12.20	22.13	28.45	37.84	54.12
	3:50:00	0.00	0.00	2.67	6.05	10.20	18.80	24.21	32.31	46.22
	3:55:00	0.00	0.00	2.12	4.78	8.20	15.47	19.99	26.79	38.33
	4:00:00	0.00	0.00	1.58	3.52	6.21	12.15	15.78	21.28	30.47
	4:05:00	0.00	0.00	1.05	2.28	4.26	8.84	11.58	15.78	22.65
	4:10:00	0.00	0.00	0.59	1.33	2.87	5.62	7.49	10.47	15.43
	4:15:00	0.00	0.00	0.34	0.86	2.12	3.43	4.77	6.81	10.48
	4:20:00	0.00	0.00	0.24	0.64	1.65	2.16	3.17	4.55	7.30
	4:25:00	0.00	0.00	0.19	0.50	1.31	1.40	2.16	3.02	5.06
	4:30:00	0.00	0.00	0.15	0.40	1.03	0.89	1.45	1.93	3.41
	4:35:00	0.00	0.00	0.12	0.31	0.80	0.58	0.99	1.18	2.22
	4:40:00	0.00	0.00	0.09	0.24	0.60	0.37	0.66	0.65	1.35
	4:45:00	0.00	0.00	0.07	0.18	0.43	0.23	0.43	0.33	0.79
	4:50:00	0.00	0.00	0.06	0.13	0.30	0.16	0.30	0.21	0.52
	4:55:00	0.00	0.00	0.05	0.10	0.21	0.11	0.22	0.16	0.37
	5:00:00	0.00	0.00	0.04	0.07	0.15	0.08	0.16	0.13	0.29
	5:05:00	0.00	0.00	0.03	0.05	0.11	0.06	0.12	0.10	0.23
	5:10:00	0.00	0.00	0.02	0.03	0.08	0.05	0.09	0.07	0.17
	5:15:00	0.00	0.00	0.01	0.02	0.06	0.03	0.07	0.05	0.12
	5:20:00	0.00	0.00	0.01	0.01	0.03	0.02	0.05	0.04	0.08
	5:25:00	0.00	0.00	0.01	0.01	0.02	0.01	0.03	0.02	0.05
	5:30:00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.03
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.05 (January 2022)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.
The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft ^{2}]	Area [acres]	Volume [ft ^{3}]	Volume [ac-ft]	Total Outflow [cfs]
	0.00	1,131	0.026	0	0.000	0.00
	1.00	2,102	0.048	1,616	0.037	0.25
	2.00	7,401	0.170	6,368	0.146	0.42
	3.00	26,360	0.605	23,249	0.534	0.74
	4.00	57,884	1.329	65,371	1.501	1.04
	5.00	97,021	2.227	142,823	3.279	1.42
	6.00	127,623	2.930	255,145	5.857	4.42
	7.00	144,596	3.319	391,254	8.982	114.53
	8.00	155,516	3.570	541,310	12.427	318.76
	8.25	157,783	3.622	580,472	13.326	357.48
	8.50	160,049	3.674	620,201	14.238	364.85
	8.75	162,316	3.726	660,497	15.163	372.07
	9.00	164,583	3.778	701,359	16.101	379.16
	9.25	166,816	3.830	742,784	17.052	386.12
	9.50	169,050	3.881	784,768	18.016	392.95
	9.75	171,283	3.932	827,309	18.992	450.97
	10.00	173,517	3.983	870,409	19.982	552.22
	10.25	175,717	4.034	914,063	20.984	682.46
	10.50	177,918	4.084	958,268	21.999	836.78
	10.75	180,119	4.135	1,003,022	23.026	1,012.45
	11.00	182,319	4.185	1,048,327	24.066	1,207.69
	12.00	192,855	4.427	1,235,914	28.373	2,163.32

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04
	0:15:00	0.00	0.00	0.09	0.16	0.19	0.13	0.18	0.16	0.30
	0:20:00	0.00	0.00	0.52	1.31	2.26	0.58	0.73	0.76	2.30
	0:25:00	0.00	0.00	4.72	15.34	28.30	4.63	6.03	9.02	27.90
	0:30:00	0.00	0.00	18.99	53.31	88.27	52.39	68.29	85.36	150.87
	0:35:00	0.00	0.00	40.37	103.14	159.81	152.65	196.08	242.76	374.31
	0:40:00	0.00	0.00	60.49	146.25	219.15	269.56	341.68	423.73	620.00
	0:45:00	0.00	0.00	74.30	173.73	256.81	369.56	464.31	578.97	825.29
	0:50:00	0.00	0.00	80.70	185.07	272.63	437.63	546.64	686.21	964.12
	0:55:00	0.00	0.00	81.12	184.18	271.97	471.58	587.37	743.47	1036.83
	1:00:00	0.00	0.00	77.49	174.42	258.73	477.07	594.08	760.90	1056.20
	1:05:00	0.00	0.00	71.22	159.64	239.90	458.72	572.07	745.61	1034.69
	1:10:00	0.00	0.00	64.88	146.33	224.52	428.63	536.78	711.91	992.87
	1:15:00	0.00	0.00	59.87	135.70	211.96	399.57	503.38	674.48	945.82
	1:20:00	0.00	0.00	55.07	125.34	199.18	369.91	468.37	630.29	888.73
	1:25:00	0.00	0.00	50.35	115.17	185.82	339.37	431.30	580.34	822.57
	1:30:00	0.00	0.00	46.13	106.59	174.10	309.67	394.73	530.12	755.64
	1:35:00	0.00	0.00	42.88	99.78	163.11	285.52	364.67	487.11	696.34
	1:40:00	0.00	0.00	39.90	93.20	151.97	263.73	337.13	448.24	641.62
	1:45:00	0.00	0.00	37.07	86.57	140.83	243.67	311.58	412.93	591.28
	1:50:00	0.00	0.00	34.28	79.83	129.86	224.67	287.37	380.45	544.58
	1:55:00	0.00	0.00	31.49	73.08	119.09	206.42	264.15	349.21	499.88
	2:00:00	0.00	0.00	28.69	66.31	108.48	188.47	241.43	318.90	456.74
	2:05:00	0.00	0.00	25.88	59.53	97.81	170.78	219.03	289.36	414.60
	2:10:00	0.00	0.00	23.06	52.83	87.24	153.26	196.81	260.38	373.25
	2:15:00	0.00	0.00	20.57	47.42	79.06	136.06	174.98	232.09	334.22
	2:20:00	0.00	0.00	18.87	43.77	73.03	123.27	158.93	210.59	304.18
	2:25:00	0.00	0.00	17.57	40.77	67.79	113.29	146.17	193.43	279.60
	2:30:00	0.00	0.00	16.40	38.01	62.93	104.90	135.27	178.50	257.91
	2:35:00	0.00	0.00	15.28	35.36	58.37	97.31	125.35	165.08	238.27
	2:40:00	0.00	0.00	14.19	32.82	53.97	90.44	116.33	152.78	220.22
	2:45:00	0.00	0.00	13.13	30.33	49.71	83.87	107.75	141.27	203.34
	2:50:00	0.00	0.00	12.09	27.89	45.60	77.55	99.53	130.50	187.55
	2:55:00	0.00	0.00	11.09	25.49	41.64	71.46	91.67	120.47	172.86
	3:00:00	0.00	0.00	10.09	23.14	37.82	65.46	83.95	110.58	158.49
	3:05:00	0.00	0.00	9.10	20.82	34.13	59.51	76.35	100.76	144.37
	3:10:00	0.00	0.00	8.11	18.52	30.49	53.59	68.80	90.95	130.30
	3:15:00	0.00	0.00	7.13	16.24	26.88	47.69	61.27	81.16	116.25
	3:20:00	0.00	0.00	6.15	13.97	23.28	41.80	53.76	71.38	102.23
	3:25:00	0.00	0.00	5.17	11.73	19.70	35.91	46.27	61.61	88.23
	3:30:00	0.00	0.00	4.20	9.48	16.13	30.04	38.79	51.85	74.27
	3:35:00	0.00	0.00	3.23	7.25	12.59	24.17	31.33	42.11	60.33
	3:40:00	0.00	0.00	2.27	5.03	9.10	18.32	23.89	32.39	46.46
	3:45:00	0.00	0.00	1.37	3.00	5.99	12.53	16.54	22.81	33.06
	3:50:00	0.00	0.00	0.72	1.75	4.20	7.48	10.22	14.55	22.04
	3:55:00	0.00	0.00	0.48	1.27	3.25	4.67	6.72	9.64	15.22
	4:00:00	0.00	0.00	0.36	0.99	2.56	2.99	4.52	6.46	10.63
	4:05:00	0.00	0.00	0.29	0.78	2.02	1.94	3.08	4.21	7.28
	4:10:00	0.00	0.00	0.23	0.61	1.59	1.23	2.06	2.63	4.83
	4:15:00	0.00	0.00	0.18	0.48	1.21	0.81	1.41	1.53	3.05
	4:20:00	0.00	0.00	0.14	0.36	0.89	0.51	0.93	0.79	1.80
	4:25:00	0.00	0.00	0.11	0.27	0.63	0.33	0.62	0.42	1.08
	4:30:00	0.00	0.00	0.09	0.19	0.43	0.24	0.44	0.32	0.77
	4:35:00	0.00	0.00	0.07	0.14	0.30	0.17	0.32	0.25	0.57
	4:40:00	0.00	0.00	0.05	0.10	0.22	0.12	0.25	0.20	0.45
	4:45:00	0.00	0.00	0.04	0.07	0.17	0.09	0.19	0.15	0.35
	4:50:00	0.00	0.00	0.03	0.04	0.12	0.07	0.14	0.11	0.26
	4:55:00	0.00	0.00	0.02	0.03	0.08	0.05	0.10	0.08	0.18
	5:00:00	0.00	0.00	0.01	0.02	0.04	0.03	0.06	0.05	0.12
	5:05:00	0.00	0.00	0.01	0.01	0.02	0.02	0.04	0.03	0.07
	5:10:00	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.01	0.03
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

IMPERVIOUS FACTOR CALCULATION TABLE - PROPOSED CONDITIONS

	Basin	Area (Acre)	Open Space (2%)	2.5 Acre Lot (100%)	Buildings (100%)	Paved Roadway (100%)	Gravel Roadway (80%)	Total % Check	Weighted Impervious
SR1	PB8	11.78	0%	99%	0%	1%	0%	100%	11%
	PB9	12.80	0%	98%	0%	2%	0%	100%	12%
	PB10	11.53	0%	98%	0%	2%	0%	100%	13%
	OB5	143.82	94%	0%	2%	1%	3%	100%	7%
	OB6	118.40	93%	0%	1%	2%	4%	100%	8%
	OB7	421.43	93%	0%	2%	1%	4%	100%	8%
Total		719.76							8.1%

Kimley»Horn

Project: Eagleview
Date: 12/22/2022

Emergency Overflow Weir Calculation - Onsite Regional Pond

Q (cfs) =	491	100-yr peak inflow (491 cfs)
C_{BCW} =	2.8	
Z =	4	
H =	1.17	
L (ft) =	134.82	(Proposing 136 feet)

$$Q = C_{BCW} L H^{1.5} + 2\left[\left(2/5\right) C_{BCW} Z H^{2.5}\right]$$

rearrange to solve for length:

$$L = \frac{Q - \left(4/5\right) C_{BCW} Z H^{2.5}}{C_{BCW} H^{1.5}}$$

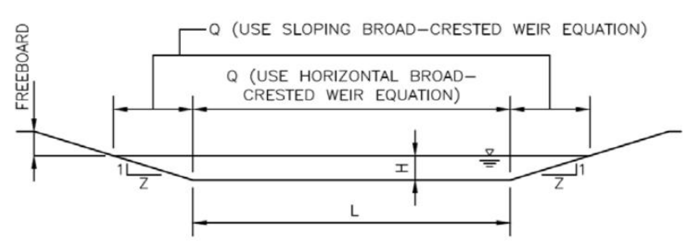


Figure 12-20. Sloping broad-crest weir

Horizontal Broad Crested Weir Equation (from USDCM Eqn. 12-8)

$$Q = C_{BCW} L H^{1.5} \qquad \text{Equation 12-8}$$

Where:

Q = discharge (cfs)

C_{BCW} = broad-crested weir coefficient (This ranges from 2.6 to 3.0. A value of 3.0 is often used in practice.) See Hydraulic Engineering Circular No. 22 for additional information.

L = broad-crested weir length (ft)

H = head above weir crest (ft)

Sloping Broad Crested Weir Equation (from USDCM Eqn. 12-9)

$$Q = \left(\frac{2}{5}\right) C_{BCW} Z H^{2.5} \qquad \text{Equation 12-9}$$

Where:

Q = discharge (cfs)

C_{BCW} = broad-crested weir coefficient (This ranges from 2.6 to 3.0. A value of 3.0 is often used in practice.) See Hydraulic Engineering Circular No. 22 for additional information.

Z = side slope (horizontal: vertical)

H = head above weir crest (ft)

Note that in order to calculate the total flow over the weir depicted in Figure 12-20, the results from Equation 12-8 must be added to two times the results from Equation 12-9.

Kimley»Horn

4582 S. Ulster Street - Suite 1500
Denver, Colorado 80237

Project:	Eagleview	Prepared By:	DM
Project Number:	196288000	Checked By:	BAH
Date:	12/13/2022		

Water Quality Capture Volume — Water Quality Feature 1

Water Quality Capture Volume

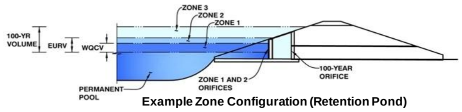
	UDFCD V3 Equation 3-1	WQ Watershed Inches = a*$(0.91i^3-1.19i^2+.78i)$	
		a_{12} = 0.8	(12-Hr Drain Time)
		a_{24} = 0.9	(24-Hr Drain Time)
		a_{40} = 1.0	(40-Hr Drain Time)
	UDFCD V3 Equation 3-3	WQCV = (WQCV/12)*(Area)	
WQCV Impervious (Site) =	100.0%		
a =	1.0		
WQ Watershed Inches (Site) =	0.50		
Area (Site) =	2.67	AC	
WQ Capture Volume (Site) =	0.111	AC-FT	
	4,850	FT^3	

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: Eagleview

Basin ID: Water Quality Feature 1



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB			
Watershed Area =	120.24	acres		
Watershed Length =	4,200	ft		
Watershed Length to Centroid =	1,900	ft		
Watershed Slope =	0.035	ft/ft		
Watershed Imperviousness =	10.30%	percent		
Percentage Hydrologic Soil Group A =	0.0%	percent		
Percentage Hydrologic Soil Group B =	100.0%	percent		
Percentage Hydrologic Soil Groups C/D =	0.0%	percent		
Target WQCV Drain Time =	40.0	hours		
Location for 1-hr Rainfall Depths =	User Input			

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.111	acre-feet	0.111	acre-feet
Excess Urban Runoff Volume (EURV) =	1.167	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	1.636	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	3.586	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	5.529	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	8.980	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	11.339	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	14.730	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	20.917	acre-feet		inches
Approximate 2-yr Detention Volume =	0.747	acre-feet		
Approximate 5-yr Detention Volume =	1.169	acre-feet		
Approximate 10-yr Detention Volume =	2.396	acre-feet		
Approximate 25-yr Detention Volume =	3.330	acre-feet		
Approximate 50-yr Detention Volume =	3.486	acre-feet		
Approximate 100-yr Detention Volume =	4.498	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.111	acre-feet
Select Zone 2 Storage Volume (Optional) =		acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =	0.111	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	

Total detention volume is less than 100-year volume.

Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

Depth Increment = 1.00 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	173	0.004		
7194	--	1.00	--	--	--	1,485	0.034	829	0.019
7195	--	2.00	--	--	--	3,717	0.085	3,430	0.079
7196	--	3.00	--	--	--	5,303	0.122	7,940	0.182
7197	--	4.00	--	--	--	7,015	0.161	14,099	0.324
7198	--	5.00	--	--	--	6,838	0.157	21,025	0.483
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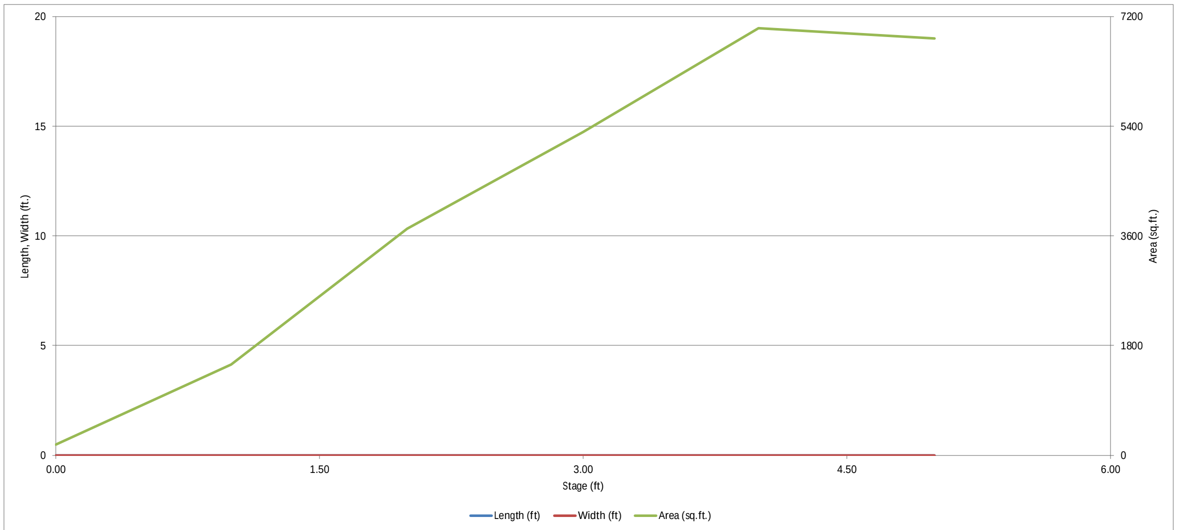
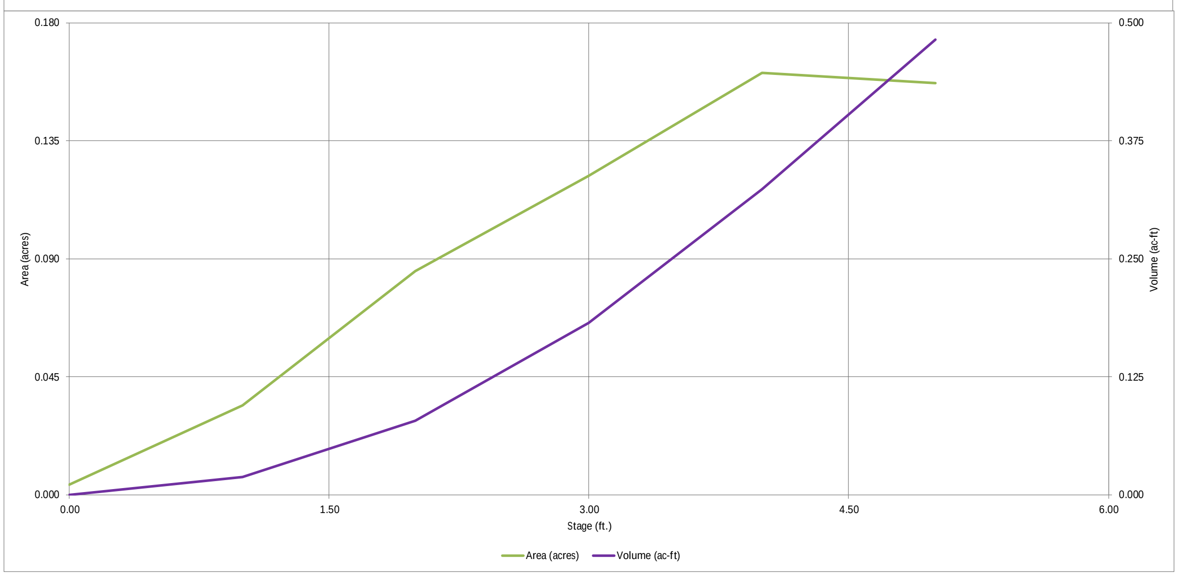
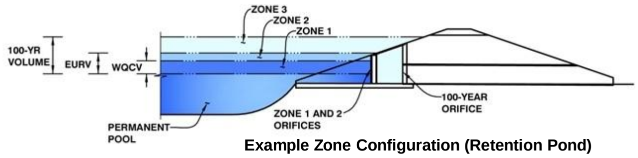

Length, Width (ft.)
Area (sq.ft.)
Stage (ft)
Length (ft)
Width (ft)
Area (sq.ft.)


Area (acres)
Volume (ac-ft)
Stage (ft.)
Area (acres)
Volume (ac-ft)

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: Eagleview
Basin ID: Water Quality Feature 1



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	2.36	0.111	Orifice Plate
Zone 2			Weir&Pipe (Circular)
Zone 3			
Total (all zones)		0.111	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =		ft (distance below the filtration media surface)
Underdrain Orifice Diameter =		inches

Calculated Parameters for Underdrain

Underdrain Orifice Area =		ft^2
Underdrain Orifice Centroid =		feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Orifice Plate =	2.36	ft (relative to basin bottom at Stage = 0 ft)
Orifice Plate: Orifice Vertical Spacing =	N/A	inches
Orifice Plate: Orifice Area per Row =	N/A	inches

Calculated Parameters for Plate

WQ Orifice Area per Row =	N/A	ft^2
Elliptical Half-Width =	N/A	feet
Elliptical Slot Centroid =	N/A	feet
Elliptical Slot Area =	N/A	ft^2

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.76	1.51					
Orifice Area (sq. inches)	0.45	0.51	0.51					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at Stage = 0 ft)
Vertical Orifice Diameter =			inches

Calculated Parameters for Vertical Orifice

	Not Selected	Not Selected	
Vertical Orifice Area =			ft^2
Vertical Orifice Centroid =			feet

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

	Zone 2 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	2.40		ft (relative to basin bottom at Stage = 0 ft)
Overflow Weir Front Edge Length =	5.00		feet
Overflow Weir Grate Slope =	0.00		H:V
Horiz. Length of Weir Sides =	5.00		feet
Overflow Grate Type =	Type C Grate		
Debris Clogging % =	50%		%

Calculated Parameters for Overflow Weir

	Zone 2 Weir	Not Selected	
Height of Grate Upper Edge, H_t =	2.40		feet
Overflow Weir Slope Length =	5.00		feet
Grate Open Area / 100-yr Orifice Area =	5.54		
Overflow Grate Open Area w/o Debris =	17.40		ft^2
Overflow Grate Open Area w/ Debris =	8.70		ft^2

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 2 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00		ft (distance below basin bottom at Stage = 0 ft)
Circular Orifice Diameter =	24.00		inches

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate

	Zone 2 Circular	Not Selected	
Outlet Orifice Area =	3.14		ft^2
Outlet Orifice Centroid =	1.00		feet
Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	4.00	ft (relative to basin bottom at Stage = 0 ft)
Spillway Crest Length =	35.00	feet
Spillway End Slopes =	4.00	H:V
Freeboard above Max Water Surface =	1.00	feet

Calculated Parameters for Spillway

Spillway Design Flow Depth=	1.20	feet
Stage at Top of Freeboard =	6.20	feet
Basin Area at Top of Freeboard =	0.16	acres
Basin Volume at Top of Freeboard =	0.48	acre-ft

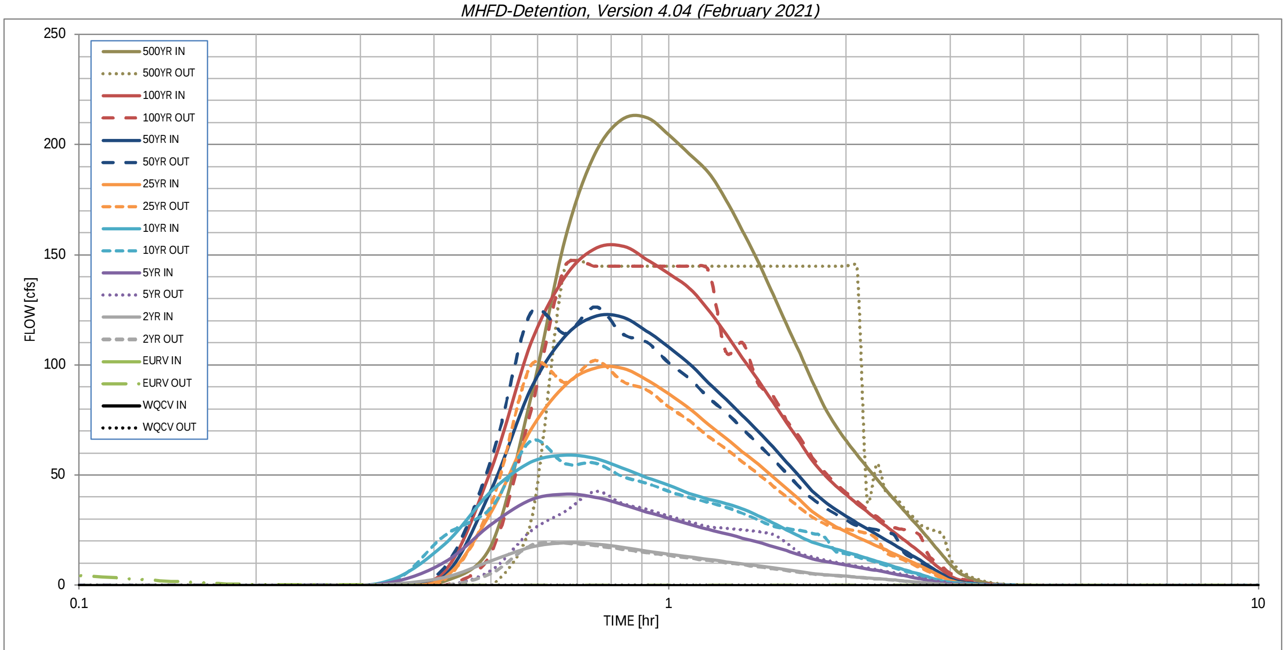
Routed Hydrograph Results

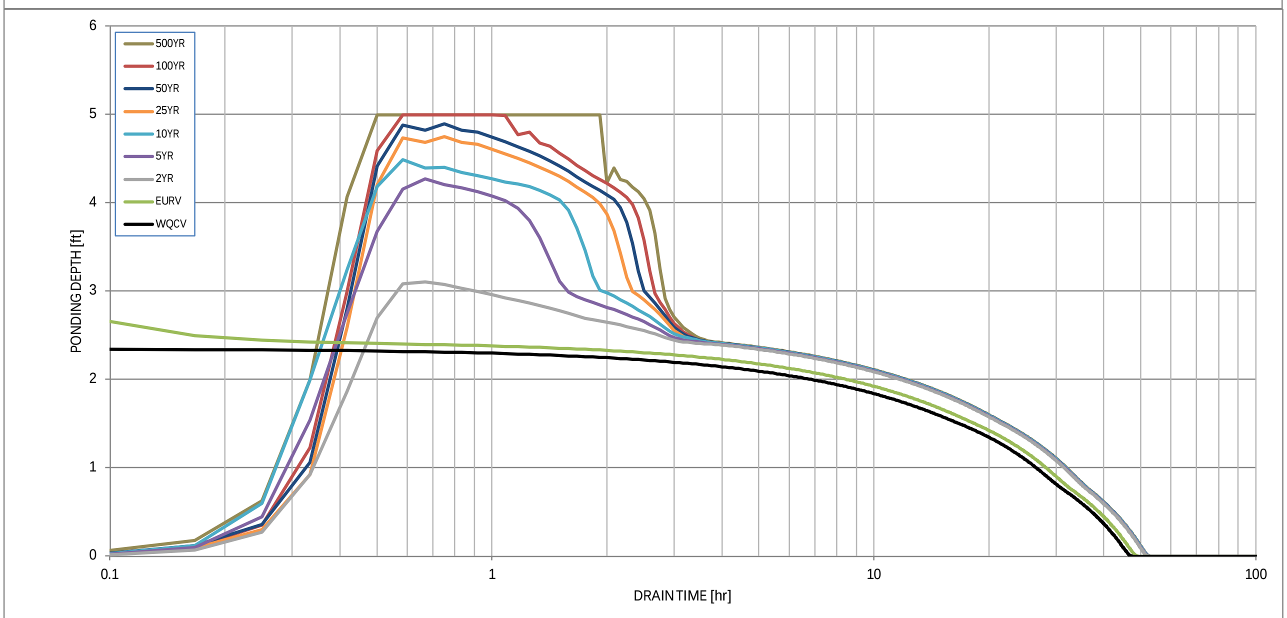
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

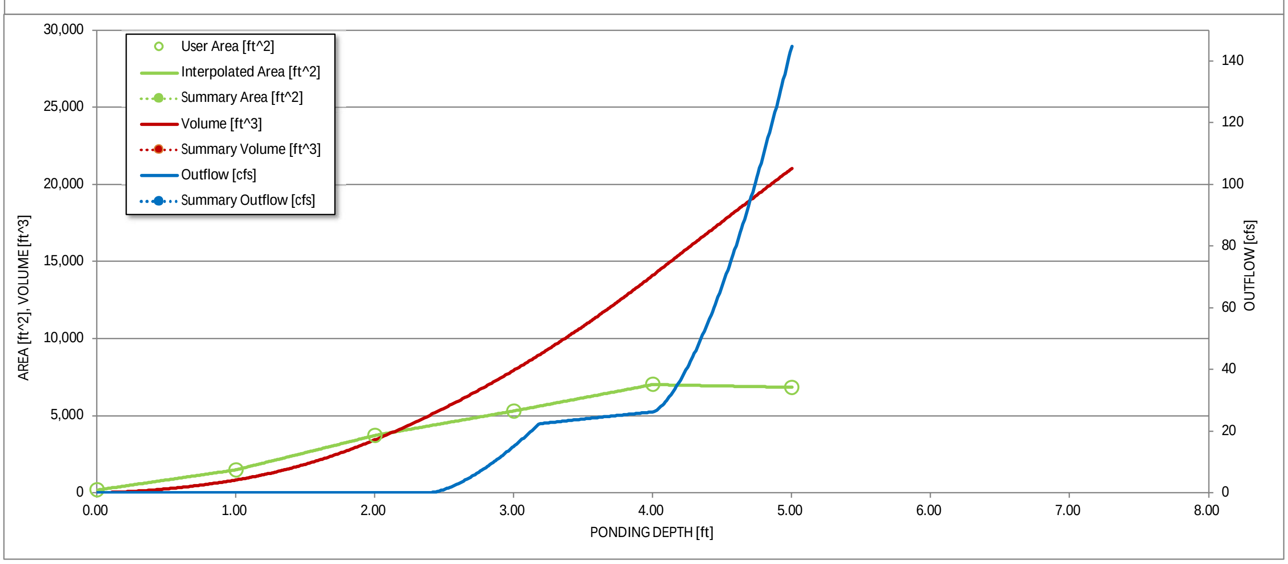
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	0.111	1.167	1.636	3.586	5.529	8.980	11.339	14.730	20.917
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	1.636	3.586	5.529	8.980	11.339	14.730	20.917
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	11.7	32.9	50.2	91.3	114.6	146.5	204.3
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.10	0.27	0.42	0.76	0.95	1.22	1.70
Peak Inflow Q (cfs) =	N/A	N/A	19.3	41.5	59.1	98.7	122.2	154.2	212.3
Peak Outflow Q (cfs) =	0.1	144.9	19.1	42.7	65.5	102.1	126.5	144.9	144.9
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	1.3	1.3	1.1	1.1	1.0	0.7
Structure Controlling Flow =	Plate	Overflow Weir 1	Overflow Weir 1	Spillway	Spillway	Spillway	Spillway	N/A	N/A
Max Velocity through Grate 1 (fps) =	N/A	0.34	1.08	1.6	1.6	1.7	1.7	1.7	1.7
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	40	28	20	6	2	2	2	1	2
Time to Drain 99% of Inflow Volume (hours) =	44	38	33	24	18	10	5	3	3
Maximum Ponding Depth (ft) =	2.36	2.72	3.10	4.27	4.49	4.75	4.90	5.00	5.00
Area at Maximum Ponding Depth (acres) =	0.10	0.11	0.13	0.16	0.16	0.16	0.16	0.16	0.16
Maximum Volume Stored (acre-ft) =	0.112	0.149	0.195	0.367	0.400	0.442	0.465	0.483	0.483

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.04
	0:15:00	0.00	0.00	0.10	0.17	0.21	0.14	0.19	0.17	0.29
	0:20:00	0.00	0.00	0.46	1.09	1.86	0.49	0.59	0.63	1.83
	0:25:00	0.00	0.00	3.70	10.61	18.83	3.58	4.65	6.67	18.55
	0:30:00	0.00	0.00	11.33	27.76	42.86	33.70	43.64	53.11	84.74
	0:35:00	0.00	0.00	17.34	38.78	55.90	70.39	89.16	109.51	157.30
	0:40:00	0.00	0.00	19.27	41.48	59.12	90.92	113.26	140.23	196.11
	0:45:00	0.00	0.00	18.90	40.09	57.61	98.66	122.18	152.97	211.55
	0:50:00	0.00	0.00	17.34	36.80	53.36	98.63	121.86	154.15	212.29
	0:55:00	0.00	0.00	15.64	33.45	49.11	93.40	115.58	148.12	204.53
	1:00:00	0.00	0.00	14.28	30.51	45.42	86.89	108.09	141.52	195.94
	1:05:00	0.00	0.00	13.01	27.68	41.87	80.43	100.61	135.04	187.43
	1:10:00	0.00	0.00	11.81	25.34	39.20	73.19	92.07	124.98	174.79
	1:15:00	0.00	0.00	10.78	23.44	37.15	66.61	84.36	113.96	160.96
	1:20:00	0.00	0.00	9.83	21.54	34.70	60.65	77.09	103.35	146.83
	1:25:00	0.00	0.00	8.90	19.62	31.69	54.96	69.92	92.98	132.34
	1:30:00	0.00	0.00	8.00	17.69	28.48	49.39	62.87	83.22	118.53
	1:35:00	0.00	0.00	7.10	15.78	25.26	44.01	56.07	74.08	105.48
	1:40:00	0.00	0.00	6.23	13.83	22.15	38.71	49.37	65.19	92.88
	1:45:00	0.00	0.00	5.47	12.16	19.75	33.61	42.96	56.79	81.33
	1:50:00	0.00	0.00	4.96	10.98	18.03	29.71	38.14	50.36	72.47
	1:55:00	0.00	0.00	4.57	10.06	16.57	26.75	34.44	45.35	65.44
	2:00:00	0.00	0.00	4.21	9.22	15.16	24.30	31.35	41.06	59.38
	2:05:00	0.00	0.00	3.84	8.39	13.77	22.05	28.46	37.14	53.74
	2:10:00	0.00	0.00	3.47	7.56	12.38	19.96	25.74	33.47	48.38
	2:15:00	0.00	0.00	3.11	6.76	11.03	17.97	23.14	30.03	43.32
	2:20:00	0.00	0.00	2.75	5.97	9.73	16.05	20.65	26.79	38.58
	2:25:00	0.00	0.00	2.41	5.21	8.48	14.21	18.27	23.79	34.18
	2:30:00	0.00	0.00	2.07	4.47	7.29	12.41	15.95	20.85	29.92
	2:35:00	0.00	0.00	1.74	3.73	6.14	10.62	13.68	17.95	25.73
	2:40:00	0.00	0.00	1.41	3.01	5.03	8.85	11.43	15.05	21.58
	2:45:00	0.00	0.00	1.09	2.30	3.92	7.10	9.20	12.17	17.46
	2:50:00	0.00	0.00	0.77	1.60	2.84	5.35	6.98	9.30	13.36
	2:55:00	0.00	0.00	0.48	0.99	1.92	3.64	4.80	6.49	9.46
	3:00:00	0.00	0.00	0.28	0.63	1.38	2.23	3.04	4.20	6.38
	3:05:00	0.00	0.00	0.20	0.47	1.08	1.42	2.04	2.81	4.45
	3:10:00	0.00	0.00	0.15	0.37	0.86	0.93	1.40	1.90	3.12
	3:15:00	0.00	0.00	0.12	0.30	0.68	0.62	0.97	1.25	2.15
	3:20:00	0.00	0.00	0.10	0.23	0.54	0.41	0.67	0.80	1.45
	3:25:00	0.00	0.00	0.08	0.18	0.41	0.28	0.47	0.48	0.94
	3:30:00	0.00	0.00	0.06	0.14	0.31	0.19	0.32	0.26	0.58
	3:35:00	0.00	0.00	0.05	0.11	0.22	0.13	0.22	0.16	0.37
	3:40:00	0.00	0.00	0.04	0.08	0.16	0.09	0.16	0.12	0.27
	3:45:00	0.00	0.00	0.03	0.06	0.11	0.07	0.12	0.09	0.21
	3:50:00	0.00	0.00	0.02	0.04	0.08	0.05	0.09	0.07	0.16
	3:55:00	0.00	0.00	0.02	0.03	0.06	0.04	0.07	0.06	0.13
	4:00:00	0.00	0.00	0.01	0.02	0.04	0.03	0.05	0.04	0.09
	4:05:00	0.00	0.00	0.01	0.01	0.03	0.02	0.04	0.03	0.06
	4:10:00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.02	0.04
	4:15:00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft ^{2}]	Area [acres]	Volume [ft ^{3}]	Volume [ac-ft]	Total Outflow [cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

Kimley»Horn

Project: Eagleview
Date: 10/26/2021

Emergency Overflow Weir Calculation - Water Quality Feature 1

Q (cfs) =	181	(100-yr peak inflow (181 cfs)
C_{BCW} =	2.8	
Z =	4	
H =	1.5	
L (ft) =	30.39	(Proposing 31 feet)

$$Q = C_{BCW}LH^{1.5} + 2\left[\left(2/5\right)C_{BCW}ZH^{2.5}\right]$$

rearrange to solve for length:

$$L = \frac{Q - \left(4/5\right)C_{BCW}ZH^{2.5}}{C_{BCW}H^{1.5}}$$

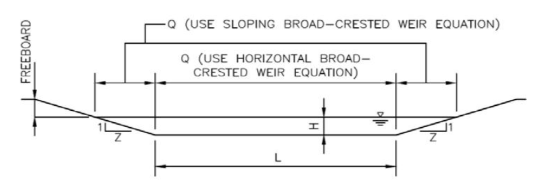


Figure 12-20. Sloping broad-crest weir

Horizontal Broad Crested Weir Equation (from USDCM Eqn. 12-8)

$$Q = C_{BCW} L H^{1.5} \qquad \text{Equation 12-8}$$

Where:

Q = discharge (cfs)

C_{BCW} = broad-crested weir coefficient (This ranges from 2.6 to 3.0. A value of 3.0 is often used in practice.) See Hydraulic Engineering Circular No. 22 for additional information.

L = broad-crested weir length (ft)

H = head above weir crest (ft)

Sloping Broad Crested Weir Equation (from USDCM Eqn. 12-9)

$$Q = \left(\frac{2}{5}\right) C_{BCW} Z H^{2.5} \qquad \text{Equation 12-9}$$

Where:

Q = discharge (cfs)

C_{BCW} = broad-crested weir coefficient (This ranges from 2.6 to 3.0. A value of 3.0 is often used in practice.) See Hydraulic Engineering Circular No. 22 for additional information.

Z = side slope (horizontal: vertical)

H = head above weir crest (ft)

Note that in order to calculate the total flow over the weir depicted in Figure 12-20, the results from Equation 12-8 must be added to two times the results from Equation 12-9.

Kimley»Horn

4582 S. Ulster Street - Suite 1500
Denver, Colorado 80237

Project:	Eagleview	Prepared By:	DM
Project Number:	196288000	Checked By:	BAH
Date:	12/12/2022		

Water Quality Capture Volume

Water Quality Feature 2

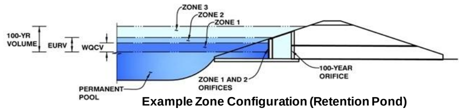
Water Quality Capture Volume			
	UDFCD V3 Equation 3-1	WQ Watershed Inches = a*(0.91i^3-1.19i^2+.78i)	
		a_{12} = 0.8	(12-Hr Drain Time)
		a_{24} = 0.9	(24-Hr Drain Time)
		a_{40} = 1.0	(40-Hr Drain Time)
	UDFCD V3 Equation 3-3	WQCV = (WQCV/12)*(Area)	
WQCV Impervious (Site) =	100.0%		
a =	1.0		
WQ Watershed Inches (Site) =	**0.50**		
Area (Site) =	0.92	**AC**	
WQ Capture Volume (Site) =	**0.038**	**AC-FT**	
	1,670	**FT^3**	

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: Eagleview

Basin ID: Water Quality Feature 2



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	52.77	acres
Watershed Length =	3,600	ft
Watershed Length to Centroid =	2,000	ft
Watershed Slope =	0.039	ft/ft
Watershed Imperviousness =	10.70%	percent
Percentage Hydrologic Soil Group A =	0.0%	percent
Percentage Hydrologic Soil Group B =	100.0%	percent
Percentage Hydrologic Soil Groups C/D =	0.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.038	acre-feet	0.038	acre-feet
Excess Urban Runoff Volume (EURV) =	0.534	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1.19 in.) =	0.736	acre-feet	1.19	inches
5-yr Runoff Volume (P1 = 1.5 in.) =	1.596	acre-feet	1.50	inches
10-yr Runoff Volume (P1 = 1.75 in.) =	2.451	acre-feet	1.75	inches
25-yr Runoff Volume (P1 = 2 in.) =	3.965	acre-feet	2.00	inches
50-yr Runoff Volume (P1 = 2.25 in.) =	5.001	acre-feet	2.25	inches
100-yr Runoff Volume (P1 = 2.52 in.) =	6.489	acre-feet	2.52	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	9.207	acre-feet		inches
Approximate 2-yr Detention Volume =	0.343	acre-feet		
Approximate 5-yr Detention Volume =	0.535	acre-feet		
Approximate 10-yr Detention Volume =	1.079	acre-feet		
Approximate 25-yr Detention Volume =	1.490	acre-feet		
Approximate 50-yr Detention Volume =	1.561	acre-feet		
Approximate 100-yr Detention Volume =	2.010	acre-feet		

Define Zones and Basin Geometry

Zone 1 Volume (WQCV) =	0.038	acre-feet
Select Zone 2 Storage Volume (Optional) =		acre-feet
Select Zone 3 Storage Volume (Optional) =		acre-feet
Total Detention Basin Volume =	0.038	acre-feet
Initial Surcharge Volume (ISV) =	user	ft^3
Initial Surcharge Depth (ISD) =	user	ft
Total Available Detention Depth (H_{total}) =	user	ft
Depth of Trickle Channel (H_{TC}) =	user	ft
Slope of Trickle Channel (S_{TC}) =	user	ft/ft
Slopes of Main Basin Sides (S_{main}) =	user	H:V
Basin Length-to-Width Ratio ($R_{L/W}$) =	user	
Initial Surcharge Area (A_{ISV}) =	user	ft^2
Surcharge Volume Length (L_{ISV}) =	user	ft
Surcharge Volume Width (W_{ISV}) =	user	ft
Depth of Basin Floor (H_{FLOOR}) =	user	ft
Length of Basin Floor (L_{FLOOR}) =	user	ft
Width of Basin Floor (W_{FLOOR}) =	user	ft
Area of Basin Floor (A_{FLOOR}) =	user	ft^2
Volume of Basin Floor (V_{FLOOR}) =	user	ft^3
Depth of Main Basin (H_{MAIN}) =	user	ft
Length of Main Basin (L_{MAIN}) =	user	ft
Width of Main Basin (W_{MAIN}) =	user	ft
Area of Main Basin (A_{MAIN}) =	user	ft^2
Volume of Main Basin (V_{MAIN}) =	user	ft^3
Calculated Total Basin Volume (V_{total}) =	user	acre-feet

Total detention volume is less than 100-year volume.

Depth Increment = 1.00 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	--	0.00	--	--	--	270	0.006		
7199	--	1.00	--	--	--	1,824	0.042	1,047	0.024
7200	--	2.00	--	--	--	2,873	0.066	3,395	0.078
7201	--	3.00	--	--	--	4,622	0.106	7,143	0.164
7202	--	4.00	--	--	--	4,897	0.112	11,902	0.273
7203	--	5.00	--	--	--	6,627	0.152		
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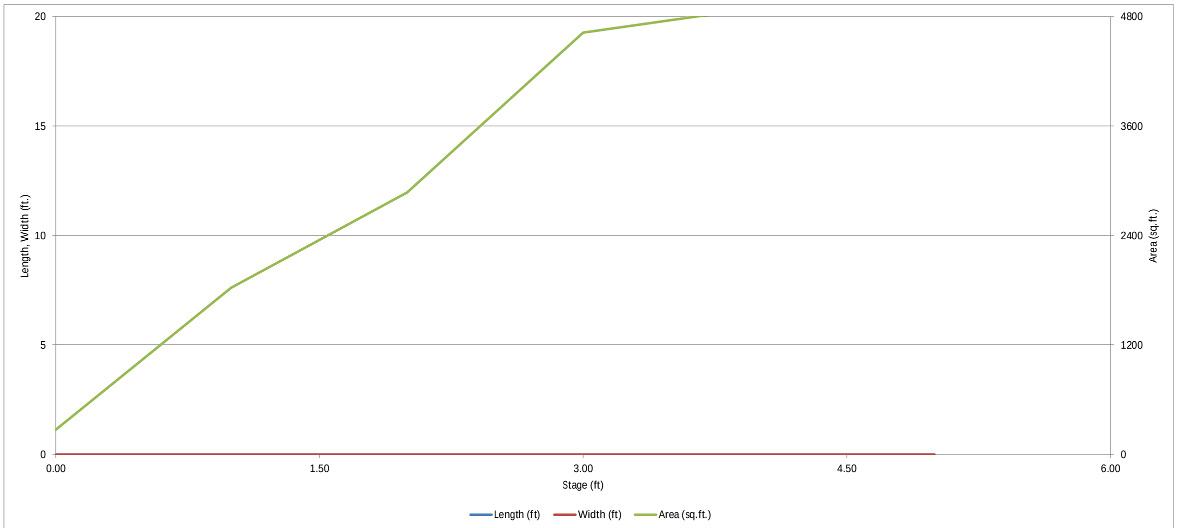
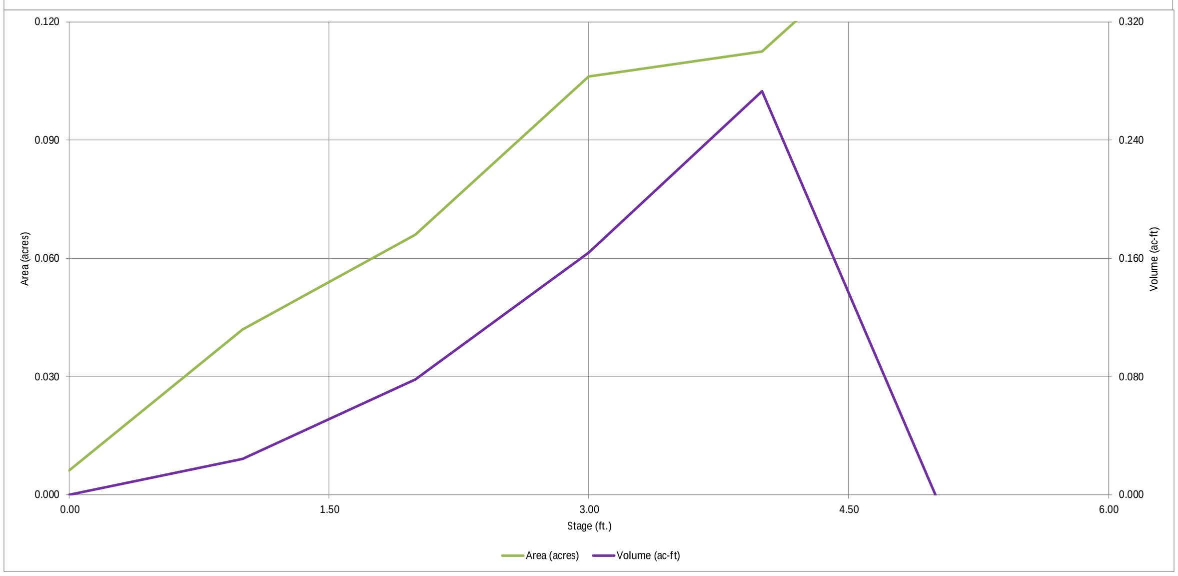
DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)



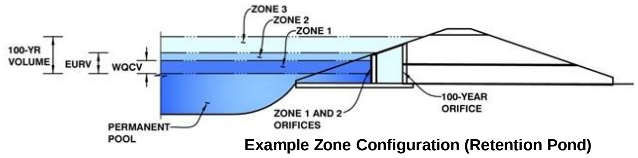


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: Eagleview

Basin ID: Water Quality Feature 2



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.31	0.038	Orifice Plate
Zone 2			Weir&Pipe (Circular)
Zone 3			
Total (all zones)		0.038	

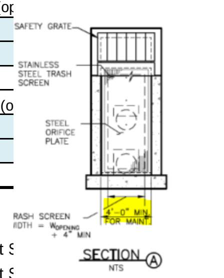
User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

				Calculated Parameters for Underdrain		
Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)		Underdrain Orifice Area =	N/A	ft^2
Underdrain Orifice Diameter =	N/A	inches		Underdrain Orifice Centroid =	N/A	feet

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

			Calculated Parameters for Plate		
Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft^2
Depth at top of Zone using Orifice Plate =	1.31	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	N/A	inches	...al Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	inches	...ptical Slot Area =	N/A	ft^2

T-12



User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (op...	...	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.43	0.86					
Orifice Area (sq. inches)	0.25	0.25	0.25					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (o...	...	...ow 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected		Calculated Parameters for Vertical Orifice	Not Selected	Not Selected	
Invert of Vertical Orifice =			ft (relative to basin bottom at S...	...al Orifice Area =			ft^2
Depth at top of Zone using Vertical Orifice =			ft (relative to basin bottom at S...	...rifice Centroid =			feet
Vertical Orifice Diameter =			inches				

Adjust minimum width to 4' for maintenance.

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rec...

	Zone 2 Weir	Not Selected		Calculated Parameters for Overflow Weir	Zone 2 Weir	Not Selected	
Overflow Weir Front Edge Height, Ho =	1.40		ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	1.40		feet
Overflow Weir Front Edge Length =	3.43		feet	Overflow Weir Slope Length =	2.79		feet
Overflow Weir Grate Slope =	0.00		H:V	Grate Open Area / 100-yr Orifice Area =	3.77		
Horiz. Length of Weir Sides =	2.79		feet	Overflow Grate Open Area w/o Debris =	6.66		ft^2
Overflow Grate Type =	Type C Grate			Overflow Grate Open Area w/ Debris =	3.33		ft^2
Debris Clogging % =	50%		%				

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 2 Circular	Not Selected		Calculated Parameters for Outlet Pipe w/ Flow Restriction Plate	Zone 2 Circular	Not Selected	
Depth to Invert of Outlet Pipe =	0.00		ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	1.77		ft^2
Circular Orifice Diameter =	18.00		inches	Outlet Orifice Centroid =	0.75		feet
				Half-Central Angle of Restrictor Plate on Pipe =	N/A	N/A	radians

User Input: Emergency Spillway (Rectangular or Trapezoidal)

			Calculated Parameters for Spillway		
Spillway Invert Stage=	2.75	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.75	feet
Spillway Crest Length =	25.00	feet	Stage at Top of Freeboard =	4.50	feet
Spillway End Slopes =	4.00	H:V	Basin Area at Top of Freeboard =	0.00	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	#VALUE!	acre-ft

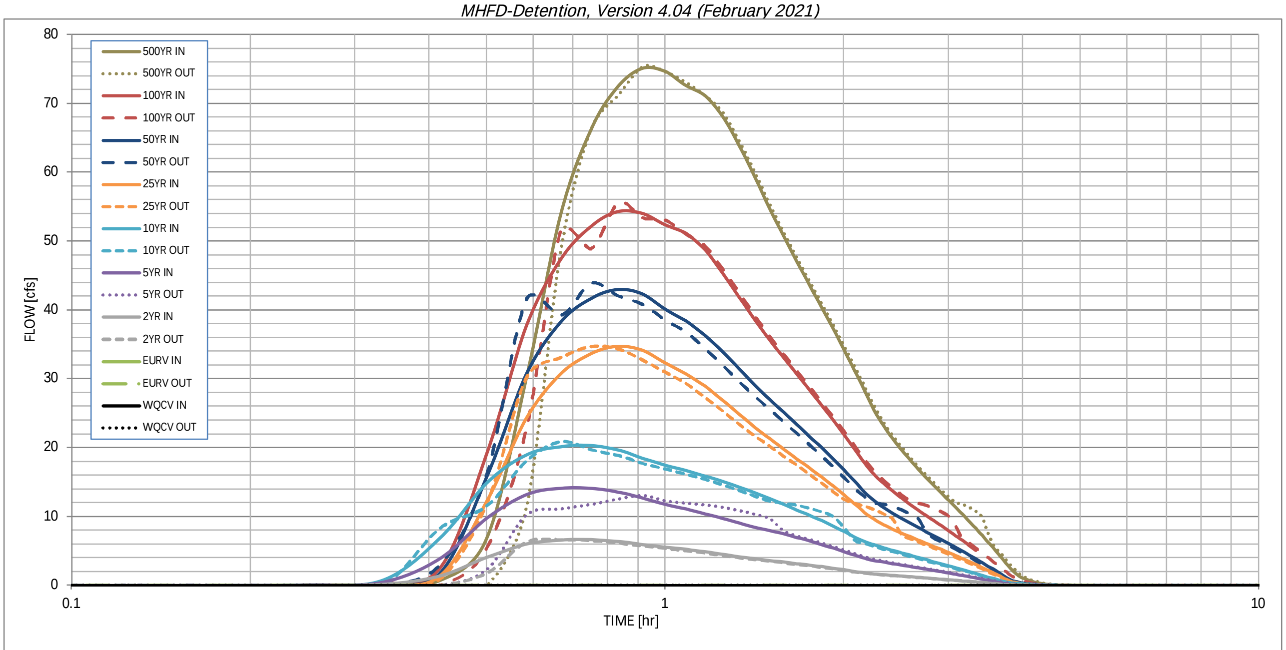
Routed Hydrograph Results

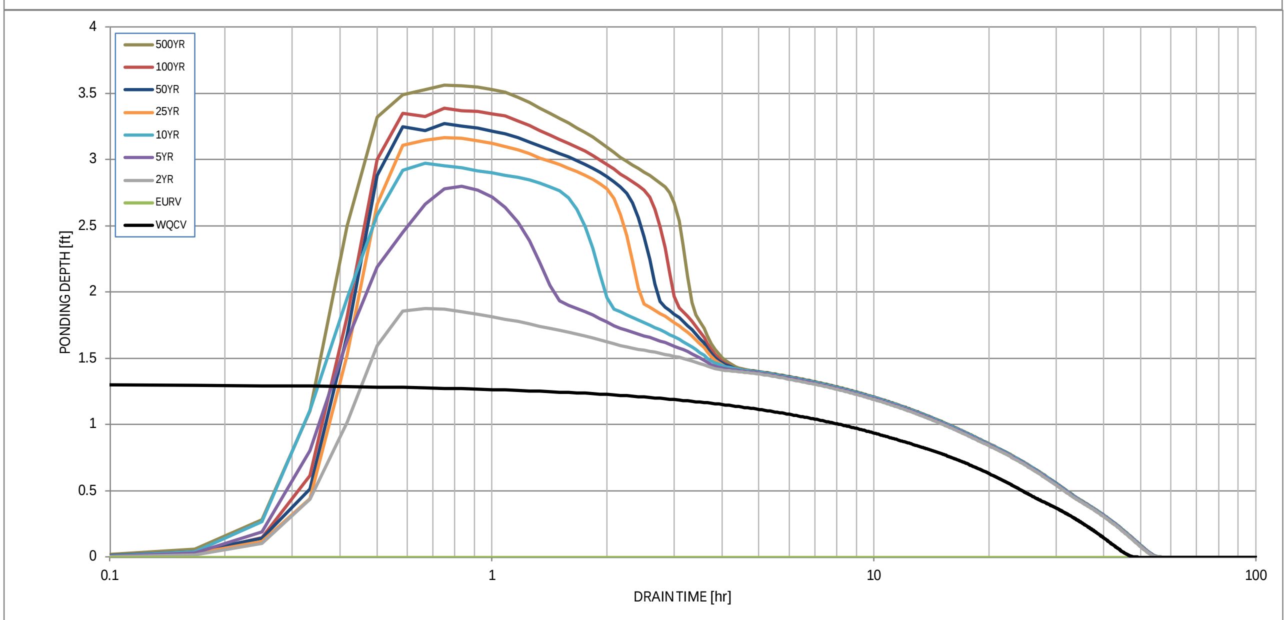
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

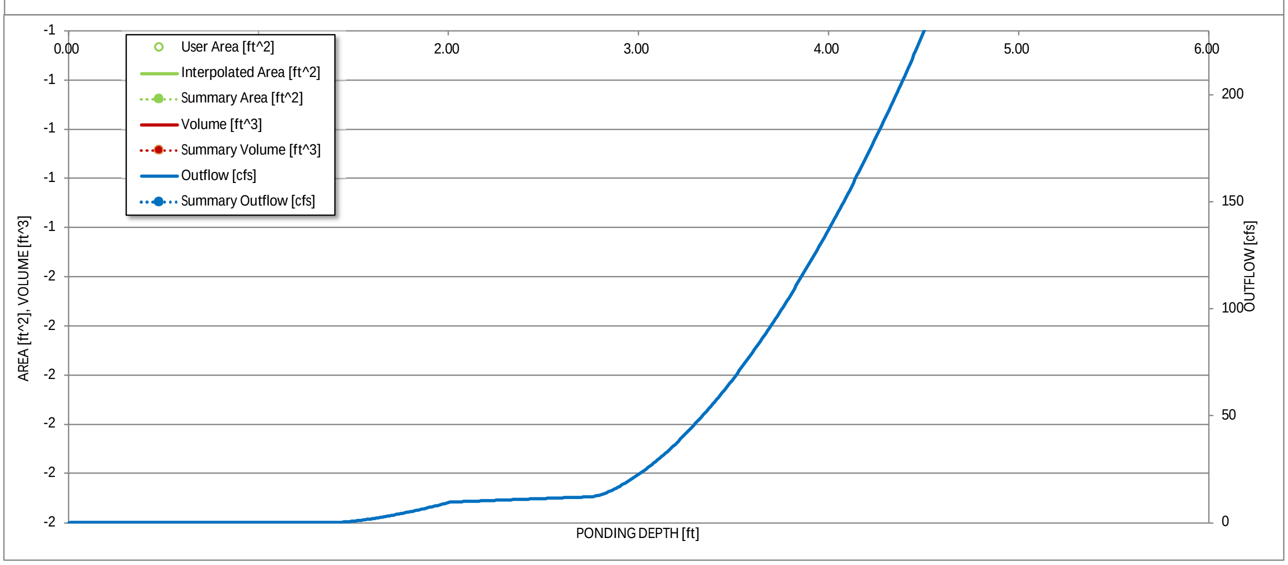
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year	500 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.19	1.50	1.75	2.00	2.25	2.52	3.14
CUHP Runoff Volume (acre-ft) =	0.038	0.534	0.736	1.596	2.451	3.965	5.001	6.489	9.207
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.736	1.596	2.451	3.965	5.001	6.489	9.207
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	3.9	11.1	17.2	31.5	39.5	51.0	71.4
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A							
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.07	0.21	0.33	0.60	0.75	0.97	1.35
Peak Inflow Q (cfs) =	N/A	N/A	6.7	14.1	20.3	34.8	43.0	54.3	75.1
Peak Outflow Q (cfs) =	0.0	86.8	6.7	13.1	20.9	34.7	43.9	55.5	75.3
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	1.2	1.2	1.1	1.1	1.1	1.1
Structure Controlling Flow =	Plate	Spillway	Overflow Weir 1	Spillway	Spillway	Spillway	Spillway	Spillway	Spillway
Max Velocity through Grate 1 (fps) =	N/A	2.30	1.00	1.8	1.9	2.0	2.0	2.1	2.1
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	41	0	17	4	2	2	2	1	1
Time to Drain 99% of Inflow Volume (hours) =	44	0	32	22	15	6	4	3	3
Maximum Ponding Depth (ft) =	1.31	4.01	1.88	2.80	2.97	3.17	3.27	3.39	3.57
Area at Maximum Ponding Depth (acres) =	0.05	0.00	0.06	0.10	0.10	0.11	0.11	0.11	0.11
Maximum Volume Stored (acre-ft) =	0.038	#VALUE!	0.070	0.144	0.161	0.181	0.193	0.206	0.224

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

<u>Inflow Hydrographs</u>

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	0:15:00	0.00	0.00	0.04	0.07	0.08	0.05	0.07	0.07	0.11
	0:20:00	0.00	0.00	0.18	0.42	0.70	0.19	0.22	0.25	0.69
	0:25:00	0.00	0.00	1.38	3.88	6.82	1.34	1.73	2.47	6.72
	0:30:00	0.00	0.00	4.06	9.73	14.87	12.13	15.69	19.02	29.98
	0:35:00	0.00	0.00	5.99	13.21	18.94	24.24	30.64	37.63	53.83
	0:40:00	0.00	0.00	6.62	14.14	20.16	30.76	38.26	47.37	66.31
	0:45:00	0.00	0.00	6.65	14.09	20.34	33.66	41.69	52.21	72.52
	0:50:00	0.00	0.00	6.38	13.55	19.67	34.76	43.01	54.31	75.13
	0:55:00	0.00	0.00	5.97	12.67	18.47	34.15	42.30	54.01	74.64
	1:00:00	0.00	0.00	5.55	11.79	17.47	32.29	40.14	52.35	72.63
	1:05:00	0.00	0.00	5.24	11.09	16.68	30.73	38.40	51.13	71.12
	1:10:00	0.00	0.00	4.90	10.43	15.91	28.93	36.33	48.74	68.12
	1:15:00	0.00	0.00	4.54	9.74	15.16	26.93	33.97	45.38	63.91
	1:20:00	0.00	0.00	4.18	9.05	14.30	24.87	31.46	41.88	59.27
	1:25:00	0.00	0.00	3.88	8.46	13.43	22.97	29.10	38.55	54.72
	1:30:00	0.00	0.00	3.63	7.96	12.59	21.32	27.04	35.66	50.70
	1:35:00	0.00	0.00	3.40	7.48	11.77	19.81	25.14	33.06	47.04
	1:40:00	0.00	0.00	3.18	6.98	10.97	18.41	23.37	30.68	43.66
	1:45:00	0.00	0.00	2.96	6.46	10.18	17.05	21.66	28.40	40.43
	1:50:00	0.00	0.00	2.74	5.94	9.41	15.74	20.01	26.20	37.31
	1:55:00	0.00	0.00	2.51	5.43	8.64	14.44	18.39	24.04	34.27
	2:00:00	0.00	0.00	2.28	4.91	7.84	13.17	16.79	21.94	31.30
	2:05:00	0.00	0.00	2.05	4.40	7.04	11.89	15.17	19.84	28.32
	2:10:00	0.00	0.00	1.84	3.96	6.38	10.62	13.57	17.78	25.46
	2:15:00	0.00	0.00	1.68	3.65	5.89	9.61	12.30	16.12	23.16
	2:20:00	0.00	0.00	1.56	3.40	5.48	8.84	11.33	14.82	21.31
	2:25:00	0.00	0.00	1.46	3.17	5.10	8.20	10.50	13.71	19.71
	2:30:00	0.00	0.00	1.37	2.96	4.75	7.63	9.76	12.71	18.26
	2:35:00	0.00	0.00	1.27	2.76	4.41	7.11	9.08	11.80	16.93
	2:40:00	0.00	0.00	1.18	2.56	4.08	6.61	8.45	10.95	15.69
	2:45:00	0.00	0.00	1.10	2.37	3.76	6.14	7.83	10.16	14.53
	2:50:00	0.00	0.00	1.01	2.18	3.45	5.68	7.25	9.41	13.45
	2:55:00	0.00	0.00	0.93	1.99	3.16	5.24	6.68	8.69	12.40
	3:00:00	0.00	0.00	0.84	1.81	2.87	4.80	6.12	7.97	11.37
	3:05:00	0.00	0.00	0.76	1.63	2.59	4.36	5.56	7.26	10.35
	3:10:00	0.00	0.00	0.68	1.45	2.32	3.93	5.01	6.55	9.33
	3:15:00	0.00	0.00	0.60	1.27	2.04	3.49	4.46	5.84	8.31
	3:20:00	0.00	0.00	0.52	1.10	1.77	3.06	3.91	5.13	7.30
	3:25:00	0.00	0.00	0.43	0.92	1.50	2.63	3.36	4.42	6.29
	3:30:00	0.00	0.00	0.35	0.75	1.23	2.19	2.81	3.71	5.28
	3:35:00	0.00	0.00	0.27	0.58	0.97	1.76	2.27	3.00	4.27
	3:40:00	0.00	0.00	0.20	0.41	0.70	1.33	1.72	2.30	3.27
	3:45:00	0.00	0.00	0.12	0.25	0.48	0.91	1.19	1.61	2.32
	3:50:00	0.00	0.00	0.07	0.16	0.35	0.56	0.76	1.04	1.57
	3:55:00	0.00	0.00	0.05	0.12	0.27	0.36	0.51	0.70	1.10
	4:00:00	0.00	0.00	0.04	0.10	0.22	0.24	0.35	0.48	0.78
	4:05:00	0.00	0.00	0.03	0.08	0.18	0.16	0.25	0.32	0.54
	4:10:00	0.00	0.00	0.03	0.06	0.14	0.11	0.17	0.20	0.36
	4:15:00	0.00	0.00	0.02	0.05	0.11	0.07	0.12	0.12	0.24
	4:20:00	0.00	0.00	0.02	0.04	0.08	0.05	0.08	0.07	0.15
	4:25:00	0.00	0.00	0.01	0.03	0.06	0.03	0.06	0.04	0.10
	4:30:00	0.00	0.00	0.01	0.02	0.04	0.03	0.04	0.03	0.07
	4:35:00	0.00	0.00	0.01	0.02	0.03	0.02	0.03	0.03	0.05
	4:40:00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.02	0.04
	4:45:00	0.00	0.00	0.01	0.01	0.02	0.01	0.02	0.02	0.03
	4:50:00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02
	4:55:00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft ^{2}]	Area [acres]	Volume [ft ^{3}]	Volume [ac-ft]	Total Outflow [cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

Kimley»Horn

Project: Eagleview
Date: 12/21/2022

Emergency Overflow Weir Calculation - Water Quality Feature 2

Q (cfs) =	79	(100-yr peak inflow (79 cfs)
C_{BCW} =	2.8	
Z =	4	
H =	1	
L (ft) =	25.05	(Proposing 25 feet)

$$Q = C_{BCW} L H^{1.5} + 2\left[\left(2/5\right) C_{BCW} Z H^{2.5}\right]$$

rearrange to solve for length:

$$L = \frac{Q - \left(4/5\right) C_{BCW} Z H^{2.5}}{C_{BCW} H^{1.5}}$$

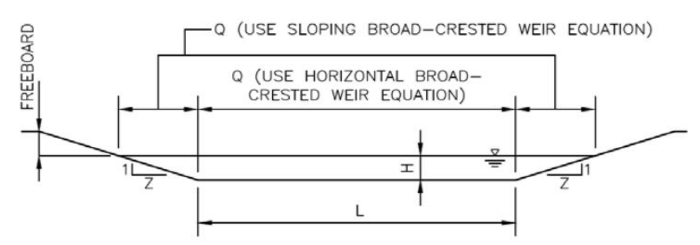


Figure 12-20. Sloping broad-crest weir

Horizontal Broad Crested Weir Equation (from USDCM Eqn. 12-8)

$$Q = C_{BCW} L H^{1.5}$$ Equation 12-8

Where:

Q = discharge (cfs)

C_{BCW} = broad-crested weir coefficient (This ranges from 2.6 to 3.0. A value of 3.0 is often used in practice.) See Hydraulic Engineering Circular No. 22 for additional information.

L = broad-crested weir length (ft)

H = head above weir crest (ft)

Sloping Broad Crested Weir Equation (from USDCM Eqn. 12-9)

$$Q = \left(\frac{2}{5}\right) C_{BCW} Z H^{2.5}$$ Equation 12-9

Where:

Q = discharge (cfs)

C_{BCW} = broad-crested weir coefficient (This ranges from 2.6 to 3.0. A value of 3.0 is often used in practice.) See Hydraulic Engineering Circular No. 22 for additional information.

Z = side slope (horizontal: vertical)

H = head above weir crest (ft)

Note that in order to calculate the total flow over the weir depicted in Figure 12-20, the results from Equation 12-8 must be added to two times the results from Equation 12-9.

SR1 Pond Spillway

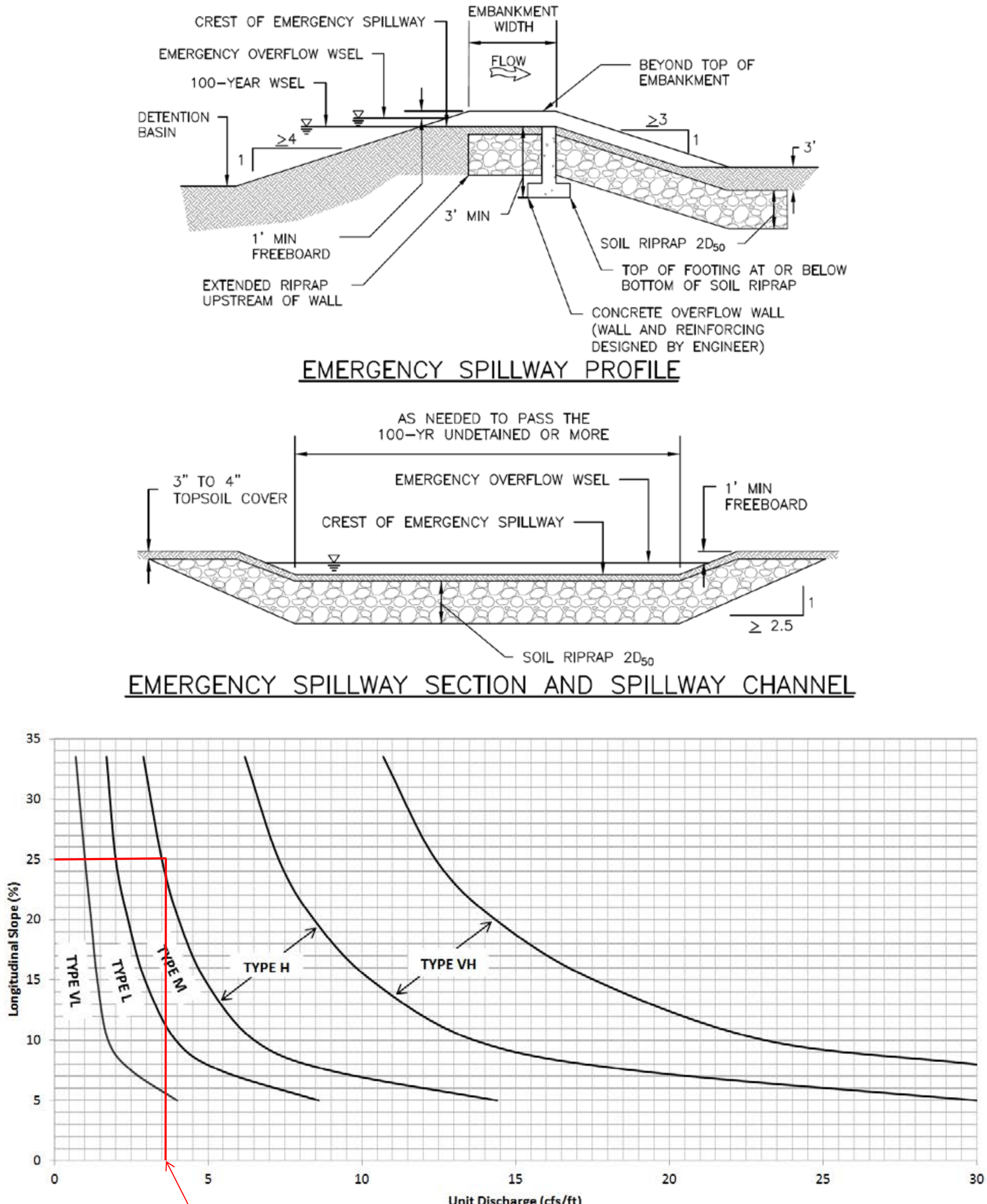


Figure 12-21. Embankment protection details and rock sizing chart (adapted from Arapahoe County)

491 cfs/136 ft = 3.61

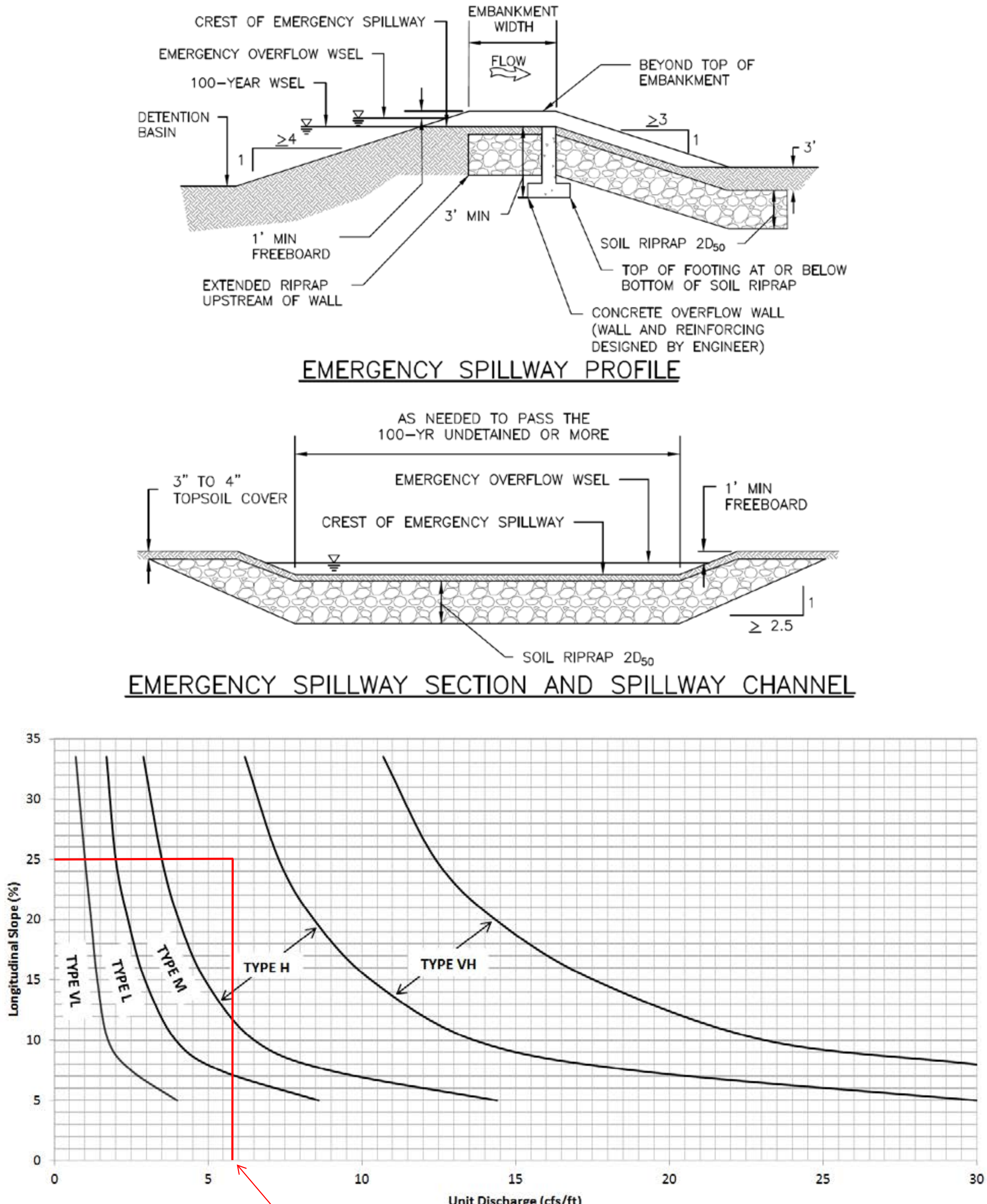


Figure 12-21. Embankment protection details and rock sizing chart (adapted from Arapahoe County)

181 cfs/31 ft = 5.83

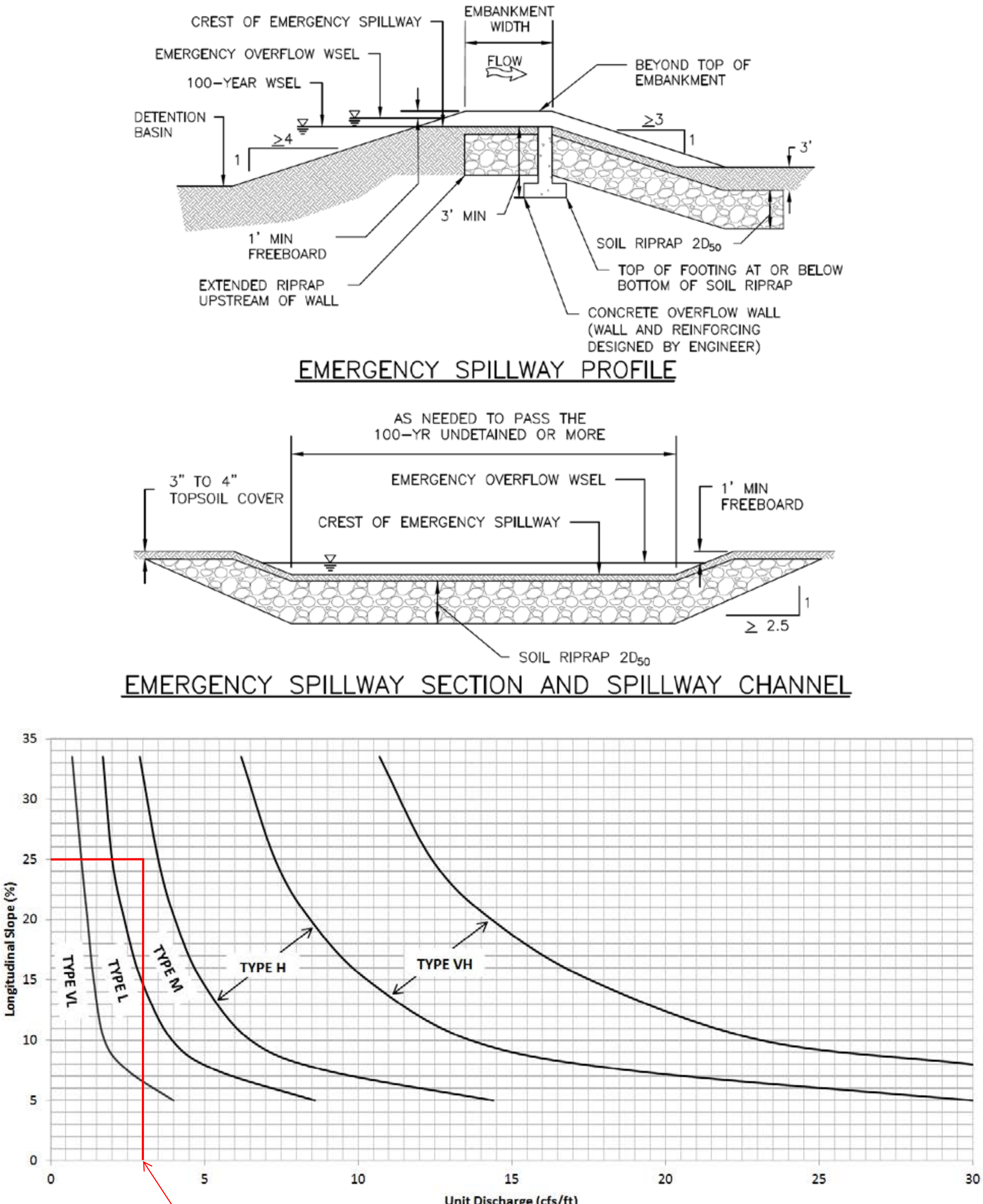


Figure 12-21. Embankment protection details and rock sizing chart (adapted from Arapahoe County)

79 cfs/25 ft = 3.00

Hydrograph Volume Check

Time (min)	Time (sec)	HEC-HMS Inflow Hydrograph to Pond (cfs)	Adjusted Outflow Hydrograph from Pond (cfs) [80% of inflow hydrograph]	Volume of Inflow [CU. FT.]	Volume of Inflow [AC-FT]	Volume of Outflow [AC-FT]	Volume of Outflow [AC-FT]	Volume Difference [AC-FT]
0:00	0.00	0	0	0.00	0.00	0.00	0.00	0.00
0:01	60.00	0	0	0.00	0.00	0.00	0.00	0.00
0:02	120.00	0	0	0.00	0.00	0.00	0.00	0.00
0:03	180.00	0	0	0.00	0.00	0.00	0.00	0.00
0:04	240.00	0	0	0.00	0.00	0.00	0.00	0.00
0:05	300.00	0	0	0.00	0.00	0.00	0.00	0.00
0:06	360.00	0	0	0.00	0.00	0.00	0.00	0.00
0:07	420.00	0	0	0.00	0.00	0.00	0.00	0.00
0:08	480.00	0	0	0.00	0.00	0.00	0.00	0.00
0:09	540.00	0.1	0.08	3.00	0.00	2.40	0.00	0.00
0:10	600.00	0.1	0.08	9.00	0.00	7.20	0.00	0.00
0:11	660.00	0.1	0.08	15.00	0.00	12.00	0.00	0.00
0:12	720.00	0.1	0.08	21.00	0.00	16.80	0.00	0.00
0:13	780.00	0.1	0.08	27.00	0.00	21.60	0.00	0.00
0:14	840.00	0.1	0.08	33.00	0.00	26.40	0.00	0.00
0:15	900.00	0.1	0.08	39.00	0.00	31.20	0.00	0.00
0:16	960.00	0.1	0.08	45.00	0.00	36.00	0.00	0.00
0:17	1020.00	0.1	0.08	51.00	0.00	40.80	0.00	0.00
0:18	1080.00	0.2	0.16	60.00	0.00	48.00	0.00	0.00
0:19	1140.00	0.2	0.16	72.00	0.00	57.60	0.00	0.00
0:20	1200.00	0.2	0.16	84.00	0.00	67.20	0.00	0.00
0:21	1260.00	0.2	0.16	96.00	0.00	76.80	0.00	0.00
0:22	1320.00	0.2	0.16	108.00	0.00	86.40	0.00	0.00
0:23	1380.00	0.2	0.16	120.00	0.00	96.00	0.00	0.00
0:24	1440.00	0.3	0.24	135.00	0.00	108.00	0.00	0.00
0:25	1500.00	0.3	0.24	153.00	0.00	122.40	0.00	0.00
0:26	1560.00	0.3	0.24	171.00	0.00	136.80	0.00	0.00
0:27	1620.00	0.3	0.24	189.00	0.00	151.20	0.00	0.00
0:28	1680.00	0.3	0.24	207.00	0.00	165.60	0.00	0.00
0:29	1740.00	0.4	0.32	228.00	0.01	182.40	0.00	0.00
0:30	1800.00	0.4	0.32	252.00	0.01	201.60	0.00	0.00
0:31	1860.00	0.4	0.32	276.00	0.01	220.80	0.01	0.00
0:32	1920.00	0.4	0.32	300.00	0.01	240.00	0.01	0.00
0:33	1980.00	0.4	0.32	324.00	0.01	259.20	0.01	0.00
0:34	2040.00	0.5	0.4	351.00	0.01	280.80	0.01	0.00
0:35	2100.00	0.5	0.4	381.00	0.01	304.80	0.01	0.00
0:36	2160.00	0.5	0.4	411.00	0.01	328.80	0.01	0.00
0:37	2220.00	0.5	0.4	441.00	0.01	352.80	0.01	0.00
0:38	2280.00	0.6	0.48	474.00	0.01	379.20	0.01	0.00
0:39	2340.00	0.6	0.48	510.00	0.01	408.00	0.01	0.00
0:40	2400.00	0.6	0.48	546.00	0.01	436.80	0.01	0.00
0:41	2460.00	0.7	0.56	585.00	0.01	468.00	0.01	0.00
0:42	2520.00	0.7	0.56	627.00	0.01	501.60	0.01	0.00
0:43	2580.00	0.8	0.64	672.00	0.02	537.60	0.01	0.00
0:44	2640.00	0.8	0.64	720.00	0.02	576.00	0.01	0.00
0:45	2700.00	0.8	0.64	768.00	0.02	614.40	0.01	0.00
0:46	2760.00	0.9	0.72	819.00	0.02	655.20	0.02	0.00
0:47	2820.00	0.9	0.72	873.00	0.02	698.40	0.02	0.00
0:48	2880.00	1	0.8	930.00	0.02	744.00	0.02	0.00
0:49	2940.00	1	0.8	990.00	0.02	792.00	0.02	0.00
0:50	3000.00	1	0.8	1050.00	0.02	840.00	0.02	0.00
0:51	3060.00	1.1	0.88	1113.00	0.03	890.40	0.02	0.01
0:52	3120.00	1.1	0.88	1179.00	0.03	943.20	0.02	0.01
0:53	3180.00	1.2	0.96	1248.00	0.03	998.40	0.02	0.01
0:54	3240.00	1.2	0.96	1320.00	0.03	1056.00	0.02	0.01
0:55	3300.00	1.2	0.96	1392.00	0.03	1113.60	0.03	0.01
0:56	3360.00	1.3	1.04	1467.00	0.03	1173.60	0.03	0.01
0:57	3420.00	1.3	1.04	1545.00	0.04	1236.00	0.03	0.01
0:58	3480.00	1.3	1.04	1623.00	0.04	1298.40	0.03	0.01
0:59	3540.00	1.4	1.12	1704.00	0.04	1363.20	0.03	0.01
1:00	3600.00	1.4	1.12	1788.00	0.04	1430.40	0.03	0.01
1:01	3660.00	1.5	1.2	1875.00	0.04	1500.00	0.03	0.01
1:02	3720.00	1.5	1.2	1965.00	0.05	1572.00	0.04	0.01
1:03	3780.00	1.5	1.2	2055.00	0.05	1644.00	0.04	0.01
1:04	3840.00	1.6	1.28	2148.00	0.05	1718.40	0.04	0.01
1:05	3900.00	1.6	1.28	2244.00	0.05	1795.20	0.04	0.01
1:06	3960.00	1.7	1.36	2343.00	0.05	1874.40	0.04	0.01
1:07	4020.00	1.7	1.36	2445.00	0.06	1956.00	0.04	0.01
1:08	4080.00	1.7	1.36	2547.00	0.06	2037.60	0.05	0.01
1:09	4140.00	1.8	1.44	2652.00	0.06	2121.60	0.05	0.01
1:10	4200.00	1.8	1.44	2760.00	0.06	2208.00	0.05	0.01
1:11	4260.00	1.8	1.44	2868.00	0.07	2294.40	0.05	0.01
1:12	4320.00	1.9	1.52	2979.00	0.07	2383.20	0.05	0.01
1:13	4380.00	1.9	1.52	3093.00	0.07	2474.40	0.06	0.01
1:14	4440.00	1.9	1.52	3207.00	0.07	2565.60	0.06	0.01
1:15	4500.00	2	1.6	3324.00	0.08	2659.20	0.06	0.02
1:16	4560.00	2	1.6	3444.00	0.08	2755.20	0.06	0.02
1:17	4620.00	2	1.6	3564.00	0.08	2851.20	0.07	0.02
1:18	4680.00	2.1	1.68	3687.00	0.08	2949.60	0.07	0.02
1:19	4740.00	2.1	1.68	3813.00	0.09	3050.40	0.07	0.02
1:20	4800.00	2.1	1.68	3939.00	0.09	3151.20	0.07	0.02
1:21	4860.00	2.2	1.76	4068.00	0.09	3254.40	0.07	0.02
1:22	4920.00	2.2	1.76	4200.00	0.10	3360.00	0.08	0.02
1:23	4980.00	2.2	1.76	4332.00	0.10	3465.60	0.08	0.02
1:24	5040.00	2.3	1.84	4467.00	0.10	3573.60	0.08	0.02
1:25	5100.00	2.3	1.84	4605.00	0.11	3684.00	0.08	0.02
1:26	5160.00	2.3	1.84	4743.00	0.11	3794.40	0.09	0.02
1:27	5220.00	2.4	1.92	4884.00	0.11	3907.20	0.09	0.02
1:28	5280.00	2.4	1.92	5028.00	0.12	4022.40	0.09	0.02
1:29	5340.00	2.4	1.92	5172.00	0.12	4137.60	0.09	0.02
1:30	5400.00	2.4	1.92	5316.00	0.12	4252.80	0.10	0.02
1:31	5460.00	2.5	2	5463.00	0.13	4370.40	0.10	0.03

1:32	5520.00	2.5	2	5613.00	0.13	4490.40	0.10	0.03
1:33	5580.00	2.5	2	5763.00	0.13	4610.40	0.11	0.03
1:34	5640.00	2.5	2	5913.00	0.14	4730.40	0.11	0.03
1:35	5700.00	2.5	2	6063.00	0.14	4850.40	0.11	0.03
1:36	5760.00	2.5	2	6213.00	0.14	4970.40	0.11	0.03
1:37	5820.00	2.6	2.08	6366.00	0.15	5092.80	0.12	0.03
1:38	5880.00	2.6	2.08	6522.00	0.15	5217.60	0.12	0.03
1:39	5940.00	2.6	2.08	6678.00	0.15	5342.40	0.12	0.03
1:40	6000.00	2.6	2.08	6834.00	0.16	5467.20	0.13	0.03
1:41	6060.00	2.6	2.08	6990.00	0.16	5592.00	0.13	0.03
1:42	6120.00	2.6	2.08	7146.00	0.16	5716.80	0.13	0.03
1:43	6180.00	2.6	2.08	7302.00	0.17	5841.60	0.13	0.03
1:44	6240.00	2.6	2.08	7458.00	0.17	5966.40	0.14	0.03
1:45	6300.00	2.7	2.16	7617.00	0.17	6093.60	0.14	0.03
1:46	6360.00	2.7	2.16	7779.00	0.18	6223.20	0.14	0.04
1:47	6420.00	2.7	2.16	7941.00	0.18	6352.80	0.15	0.04
1:48	6480.00	2.7	2.16	8103.00	0.19	6482.40	0.15	0.04
1:49	6540.00	2.7	2.16	8265.00	0.19	6612.00	0.15	0.04
1:50	6600.00	2.7	2.16	8427.00	0.19	6741.60	0.15	0.04
1:51	6660.00	2.7	2.16	8589.00	0.20	6871.20	0.16	0.04
1:52	6720.00	2.8	2.24	8754.00	0.20	7003.20	0.16	0.04
1:53	6780.00	2.8	2.24	8922.00	0.20	7137.60	0.16	0.04
1:54	6840.00	2.8	2.24	9090.00	0.21	7272.00	0.17	0.04
1:55	6900.00	2.8	2.24	9258.00	0.21	7406.40	0.17	0.04
1:56	6960.00	2.8	2.24	9426.00	0.22	7540.80	0.17	0.04
1:57	7020.00	2.9	2.32	9597.00	0.22	7677.60	0.18	0.04
1:58	7080.00	2.9	2.32	9771.00	0.22	7816.80	0.18	0.04
1:59	7140.00	2.9	2.32	9945.00	0.23	7956.00	0.18	0.05
2:00	7200.00	2.9	2.32	10119.00	0.23	8095.20	0.19	0.05
2:01	7260.00	2.9	2.32	10293.00	0.24	8234.40	0.19	0.05
2:02	7320.00	3	2.4	10470.00	0.24	8376.00	0.19	0.05
2:03	7380.00	3	2.4	10650.00	0.24	8520.00	0.20	0.05
2:04	7440.00	3	2.4	10830.00	0.25	8664.00	0.20	0.05
2:05	7500.00	3	2.4	11010.00	0.25	8808.00	0.20	0.05
2:06	7560.00	3	2.4	11190.00	0.26	8952.00	0.21	0.05
2:07	7620.00	3	2.4	11370.00	0.26	9096.00	0.21	0.05
2:08	7680.00	3	2.4	11550.00	0.27	9240.00	0.21	0.05
2:09	7740.00	3	2.4	11730.00	0.27	9384.00	0.22	0.05
2:10	7800.00	3	2.4	11910.00	0.27	9528.00	0.22	0.05
2:11	7860.00	3	2.4	12090.00	0.28	9672.00	0.22	0.06
2:12	7920.00	3.1	2.48	12273.00	0.28	9818.40	0.23	0.06
2:13	7980.00	3.1	2.48	12459.00	0.29	9967.20	0.23	0.06
2:14	8040.00	3.1	2.48	12645.00	0.29	10116.00	0.23	0.06
2:15	8100.00	3.1	2.48	12831.00	0.29	10264.80	0.24	0.06
2:16	8160.00	3.1	2.48	13017.00	0.30	10413.60	0.24	0.06
2:17	8220.00	3.1	2.48	13203.00	0.30	10562.40	0.24	0.06
2:18	8280.00	3.1	2.48	13389.00	0.31	10711.20	0.25	0.06
2:19	8340.00	3.1	2.48	13575.00	0.31	10860.00	0.25	0.06
2:20	8400.00	3.1	2.48	13761.00	0.32	11008.80	0.25	0.06
2:21	8460.00	3.1	2.48	13947.00	0.32	11157.60	0.26	0.06
2:22	8520.00	3.1	2.48	14133.00	0.32	11306.40	0.26	0.06
2:23	8580.00	3.1	2.48	14319.00	0.33	11455.20	0.26	0.07
2:24	8640.00	3.1	2.48	14505.00	0.33	11604.00	0.27	0.07
2:25	8700.00	3.1	2.48	14691.00	0.34	11752.80	0.27	0.07
2:26	8760.00	3.1	2.48	14877.00	0.34	11901.60	0.27	0.07
2:27	8820.00	3.1	2.48	15063.00	0.35	12050.40	0.28	0.07
2:28	8880.00	3.1	2.48	15249.00	0.35	12199.20	0.28	0.07
2:29	8940.00	3.1	2.48	15435.00	0.35	12348.00	0.28	0.07
2:30	9000.00	3.1	2.48	15621.00	0.36	12496.80	0.29	0.07
2:31	9060.00	3.1	2.48	15807.00	0.36	12645.60	0.29	0.07
2:32	9120.00	3.1	2.48	15993.00	0.37	12794.40	0.29	0.07
2:33	9180.00	3.1	2.48	16179.00	0.37	12943.20	0.30	0.07
2:34	9240.00	3.1	2.48	16365.00	0.38	13092.00	0.30	0.08
2:35	9300.00	3.2	2.56	16554.00	0.38	13243.20	0.30	0.08
2:36	9360.00	3.2	2.56	16746.00	0.38	13396.80	0.31	0.08
2:37	9420.00	3.2	2.56	16938.00	0.39	13550.40	0.31	0.08
2:38	9480.00	3.2	2.56	17130.00	0.39	13704.00	0.31	0.08
2:39	9540.00	3.2	2.56	17322.00	0.40	13857.60	0.32	0.08
2:40	9600.00	3.2	2.56	17514.00	0.40	14011.20	0.32	0.08
2:41	9660.00	3.2	2.56	17706.00	0.41	14164.80	0.33	0.08
2:42	9720.00	3.2	2.56	17898.00	0.41	14318.40	0.33	0.08
2:43	9780.00	3.2	2.56	18090.00	0.42	14472.00	0.33	0.08
2:44	9840.00	3.2	2.56	18282.00	0.42	14625.60	0.34	0.08
2:45	9900.00	3.2	2.56	18474.00	0.42	14779.20	0.34	0.08
2:46	9960.00	3.2	2.56	18666.00	0.43	14932.80	0.34	0.09
2:47	10020.00	3.2	2.56	18858.00	0.43	15086.40	0.35	0.09
2:48	10080.00	3.2	2.56	19050.00	0.44	15240.00	0.35	0.09
2:49	10140.00	3.2	2.56	19242.00	0.44	15393.60	0.35	0.09
2:50	10200.00	3.2	2.56	19434.00	0.45	15547.20	0.36	0.09
2:51	10260.00	3.2	2.56	19626.00	0.45	15700.80	0.36	0.09
2:52	10320.00	3.2	2.56	19818.00	0.45	15854.40	0.36	0.09
2:53	10380.00	3.2	2.56	20010.00	0.46	16008.00	0.37	0.09
2:54	10440.00	3.2	2.56	20202.00	0.46	16161.60	0.37	0.09
2:55	10500.00	3.2	2.56	20394.00	0.47	16315.20	0.37	0.09
2:56	10560.00	3.1	2.48	20583.00	0.47	16466.40	0.38	0.09
2:57	10620.00	3.1	2.48	20769.00	0.48	16615.20	0.38	0.10
2:58	10680.00	3.1	2.48	20955.00	0.48	16764.00	0.38	0.10
2:59	10740.00	3.1	2.48	21141.00	0.49	16912.80	0.39	0.10
3:00	10800.00	3.1	2.48	21327.00	0.49	17061.60	0.39	0.10
3:01	10860.00	3.1	2.48	21513.00	0.49	17210.40	0.40	0.10
3:02	10920.00	3.1	2.48	21699.00	0.50	17359.20	0.40	0.10
3:03	10980.00	3.1	2.48	21885.00	0.50	17508.00	0.40	0.10
3:04	11040.00	3.1	2.48	22071.00	0.51	17656.80	0.41	0.10
3:05	11100.00	3.1	2.48	22257.00	0.51	17805.60	0.41	0.10
3:06	11160.00	3.1	2.48	22443.00	0.52	17954.40	0.41	0.10
3:07	11220.00	3.1	2.48	22629.00	0.52	18103.20	0.42	0.10
3:08	11280.00	3.1	2.48	22815.00	0.52	18252.00	0.42	0.10
3:09	11340.00	3.1	2.48	23001.00	0.53	18400.80	0.42	0.11

3:10	11400.00	3.1	2.48	23187.00	0.53	18549.60	0.43	0.11
3:11	11460.00	3.1	2.48	23373.00	0.54	18698.40	0.43	0.11
3:12	11520.00	3.1	2.48	23559.00	0.54	18847.20	0.43	0.11
3:13	11580.00	3.1	2.48	23745.00	0.55	18996.00	0.44	0.11
3:14	11640.00	3.1	2.48	23931.00	0.55	19144.80	0.44	0.11
3:15	11700.00	3.1	2.48	24117.00	0.55	19293.60	0.44	0.11
3:16	11760.00	3.1	2.48	24303.00	0.56	19442.40	0.45	0.11
3:17	11820.00	3.1	2.48	24489.00	0.56	19591.20	0.45	0.11
3:18	11880.00	3.1	2.48	24675.00	0.57	19740.00	0.45	0.11
3:19	11940.00	3.1	2.48	24861.00	0.57	19888.80	0.46	0.11
3:20	12000.00	3.1	2.48	25047.00	0.58	20037.60	0.46	0.12
3:21	12060.00	3.1	2.48	25233.00	0.58	20186.40	0.46	0.12
3:22	12120.00	3.1	2.48	25419.00	0.58	20335.20	0.47	0.12
3:23	12180.00	3.1	2.48	25605.00	0.59	20484.00	0.47	0.12
3:24	12240.00	3.1	2.48	25791.00	0.59	20632.80	0.47	0.12
3:25	12300.00	3.1	2.48	25977.00	0.60	20781.60	0.48	0.12
3:26	12360.00	3.1	2.48	26163.00	0.60	20930.40	0.48	0.12
3:27	12420.00	3.1	2.48	26349.00	0.60	21079.20	0.48	0.12
3:28	12480.00	3.1	2.48	26535.00	0.61	21228.00	0.49	0.12
3:29	12540.00	3.1	2.48	26721.00	0.61	21376.80	0.49	0.12
3:30	12600.00	3.1	2.48	26907.00	0.62	21525.60	0.49	0.12
3:31	12660.00	3.1	2.48	27093.00	0.62	21674.40	0.50	0.12
3:32	12720.00	3.1	2.48	27279.00	0.63	21823.20	0.50	0.13
3:33	12780.00	3.1	2.48	27465.00	0.63	21972.00	0.50	0.13
3:34	12840.00	3.1	2.48	27651.00	0.63	22120.80	0.51	0.13
3:35	12900.00	3.1	2.48	27837.00	0.64	22269.60	0.51	0.13
3:36	12960.00	3.1	2.48	28023.00	0.64	22418.40	0.51	0.13
3:37	13020.00	3.1	2.48	28209.00	0.65	22567.20	0.52	0.13
3:38	13080.00	3.1	2.48	28395.00	0.65	22716.00	0.52	0.13
3:39	13140.00	3.1	2.48	28581.00	0.66	22864.80	0.52	0.13
3:40	13200.00	3.1	2.48	28767.00	0.66	23013.60	0.53	0.13
3:41	13260.00	3.1	2.48	28953.00	0.66	23162.40	0.53	0.13
3:42	13320.00	3.1	2.48	29139.00	0.67	23311.20	0.54	0.13
3:43	13380.00	3.1	2.48	29325.00	0.67	23460.00	0.54	0.13
3:44	13440.00	3.1	2.48	29511.00	0.68	23608.80	0.54	0.14
3:45	13500.00	3.1	2.48	29697.00	0.68	23757.60	0.55	0.14
3:46	13560.00	3.1	2.48	29883.00	0.69	23906.40	0.55	0.14
3:47	13620.00	3.1	2.48	30069.00	0.69	24055.20	0.55	0.14
3:48	13680.00	3.1	2.48	30255.00	0.69	24204.00	0.56	0.14
3:49	13740.00	3.1	2.48	30441.00	0.70	24352.80	0.56	0.14
3:50	13800.00	3.1	2.48	30627.00	0.70	24501.60	0.56	0.14
3:51	13860.00	3.1	2.48	30813.00	0.71	24650.40	0.57	0.14
3:52	13920.00	3.1	2.48	30999.00	0.71	24799.20	0.57	0.14
3:53	13980.00	3.1	2.48	31185.00	0.72	24948.00	0.57	0.14
3:54	14040.00	3.1	2.48	31371.00	0.72	25096.80	0.58	0.14
3:55	14100.00	3.2	2.56	31560.00	0.72	25248.00	0.58	0.14
3:56	14160.00	3.2	2.56	31752.00	0.73	25401.60	0.58	0.15
3:57	14220.00	3.2	2.56	31944.00	0.73	25555.20	0.59	0.15
3:58	14280.00	3.2	2.56	32136.00	0.74	25708.80	0.59	0.15
3:59	14340.00	3.2	2.56	32328.00	0.74	25862.40	0.59	0.15
4:00	14400.00	3.2	2.56	32520.00	0.75	26016.00	0.60	0.15
4:01	14460.00	3.2	2.56	32712.00	0.75	26169.60	0.60	0.15
4:02	14520.00	3.2	2.56	32904.00	0.76	26323.20	0.60	0.15
4:03	14580.00	3.2	2.56	33096.00	0.76	26476.80	0.61	0.15
4:04	14640.00	3.2	2.56	33288.00	0.76	26630.40	0.61	0.15
4:05	14700.00	3.3	2.64	33483.00	0.77	26786.40	0.61	0.15
4:06	14760.00	3.3	2.64	33681.00	0.77	26944.80	0.62	0.15
4:07	14820.00	3.3	2.64	33879.00	0.78	27103.20	0.62	0.16
4:08	14880.00	3.3	2.64	34077.00	0.78	27261.60	0.63	0.16
4:09	14940.00	3.3	2.64	34275.00	0.79	27420.00	0.63	0.16
4:10	15000.00	3.3	2.64	34473.00	0.79	27578.40	0.63	0.16
4:11	15060.00	3.3	2.64	34671.00	0.80	27736.80	0.64	0.16
4:12	15120.00	3.3	2.64	34869.00	0.80	27895.20	0.64	0.16
4:13	15180.00	3.3	2.64	35067.00	0.81	28053.60	0.64	0.16
4:14	15240.00	3.3	2.64	35265.00	0.81	28212.00	0.65	0.16
4:15	15300.00	3.4	2.72	35466.00	0.81	28372.80	0.65	0.16
4:16	15360.00	3.4	2.72	35670.00	0.82	28536.00	0.66	0.16
4:17	15420.00	3.4	2.72	35874.00	0.82	28699.20	0.66	0.16
4:18	15480.00	3.4	2.72	36078.00	0.83	28862.40	0.66	0.17
4:19	15540.00	3.4	2.72	36282.00	0.83	29025.60	0.67	0.17
4:20	15600.00	3.4	2.72	36486.00	0.84	29188.80	0.67	0.17
4:21	15660.00	3.4	2.72	36690.00	0.84	29352.00	0.67	0.17
4:22	15720.00	3.5	2.8	36897.00	0.85	29517.60	0.68	0.17
4:23	15780.00	3.5	2.8	37107.00	0.85	29685.60	0.68	0.17
4:24	15840.00	3.5	2.8	37317.00	0.86	29853.60	0.69	0.17
4:25	15900.00	3.5	2.8	37527.00	0.86	30021.60	0.69	0.17
4:26	15960.00	3.5	2.8	37737.00	0.87	30189.60	0.69	0.17
4:27	16020.00	3.5	2.8	37947.00	0.87	30357.60	0.70	0.17
4:28	16080.00	3.6	2.88	38160.00	0.88	30528.00	0.70	0.18
4:29	16140.00	3.6	2.88	38376.00	0.88	30700.80	0.70	0.18
4:30	16200.00	3.6	2.88	38592.00	0.89	30873.60	0.71	0.18
4:31	16260.00	3.6	2.88	38808.00	0.89	31046.40	0.71	0.18
4:32	16320.00	3.6	2.88	39024.00	0.90	31219.20	0.72	0.18
4:33	16380.00	3.7	2.96	39243.00	0.90	31394.40	0.72	0.18
4:34	16440.00	3.7	2.96	39465.00	0.91	31572.00	0.72	0.18
4:35	16500.00	3.7	2.96	39687.00	0.91	31749.60	0.73	0.18
4:36	16560.00	3.7	2.96	39909.00	0.92	31927.20	0.73	0.18
4:37	16620.00	3.7	2.96	40131.00	0.92	32104.80	0.74	0.18
4:38	16680.00	3.8	3.04	40356.00	0.93	32284.80	0.74	0.19
4:39	16740.00	3.8	3.04	40584.00	0.93	32467.20	0.75	0.19
4:40	16800.00	3.8	3.04	40812.00	0.94	32649.60	0.75	0.19
4:41	16860.00	3.8	3.04	41040.00	0.94	32832.00	0.75	0.19
4:42	16920.00	3.8	3.04	41268.00	0.95	33014.40	0.76	0.19
4:43	16980.00	3.9	3.12	41499.00	0.95	33199.20	0.76	0.19
4:44	17040.00	3.9	3.12	41733.00	0.96	33386.40	0.77	0.19
4:45	17100.00	3.9	3.12	41967.00	0.96	33573.60	0.77	0.19
4:46	17160.00	3.9	3.12	42201.00	0.97	33760.80	0.78	0.19
4:47	17220.00	3.9	3.12	42435.00	0.97	33948.00	0.78	0.19

4:48	17280.00	3.9	3.12	42669.00	0.98	34135.20	0.78	0.20
4:49	17340.00	4	3.2	42906.00	0.98	34324.80	0.79	0.20
4:50	17400.00	4	3.2	43146.00	0.99	34516.80	0.79	0.20
4:51	17460.00	4	3.2	43386.00	1.00	34708.80	0.80	0.20
4:52	17520.00	4	3.2	43626.00	1.00	34900.80	0.80	0.20
4:53	17580.00	4	3.2	43866.00	1.01	35092.80	0.81	0.20
4:54	17640.00	3.9	3.12	44103.00	1.01	35282.40	0.81	0.20
4:55	17700.00	3.9	3.12	44337.00	1.02	35469.60	0.81	0.20
4:56	17760.00	3.9	3.12	44571.00	1.02	35656.80	0.82	0.20
4:57	17820.00	3.9	3.12	44805.00	1.03	35844.00	0.82	0.21
4:58	17880.00	3.9	3.12	45039.00	1.03	36031.20	0.83	0.21
4:59	17940.00	3.9	3.12	45273.00	1.04	36218.40	0.83	0.21
5:00	18000.00	3.9	3.12	45507.00	1.04	36405.60	0.84	0.21
5:01	18060.00	3.9	3.12	45741.00	1.05	36592.80	0.84	0.21
5:02	18120.00	3.9	3.12	45975.00	1.06	36780.00	0.84	0.21
5:03	18180.00	3.9	3.12	46209.00	1.06	36967.20	0.85	0.21
5:04	18240.00	3.9	3.12	46443.00	1.07	37154.40	0.85	0.21
5:05	18300.00	3.9	3.12	46677.00	1.07	37341.60	0.86	0.21
5:06	18360.00	3.9	3.12	46911.00	1.08	37528.80	0.86	0.22
5:07	18420.00	3.9	3.12	47145.00	1.08	37716.00	0.87	0.22
5:08	18480.00	3.9	3.12	47379.00	1.09	37903.20	0.87	0.22
5:09	18540.00	3.9	3.12	47613.00	1.09	38090.40	0.87	0.22
5:10	18600.00	3.9	3.12	47847.00	1.10	38277.60	0.88	0.22
5:11	18660.00	4	3.2	48084.00	1.10	38467.20	0.88	0.22
5:12	18720.00	4	3.2	48324.00	1.11	38659.20	0.89	0.22
5:13	18780.00	4	3.2	48564.00	1.11	38851.20	0.89	0.22
5:14	18840.00	4	3.2	48804.00	1.12	39043.20	0.90	0.22
5:15	18900.00	4	3.2	49044.00	1.13	39235.20	0.90	0.23
5:16	18960.00	4	3.2	49284.00	1.13	39427.20	0.91	0.23
5:17	19020.00	4	3.2	49524.00	1.14	39619.20	0.91	0.23
5:18	19080.00	4	3.2	49764.00	1.14	39811.20	0.91	0.23
5:19	19140.00	4	3.2	50004.00	1.15	40003.20	0.92	0.23
5:20	19200.00	4	3.2	50244.00	1.15	40195.20	0.92	0.23
5:21	19260.00	4	3.2	50484.00	1.16	40387.20	0.93	0.23
5:22	19320.00	3.9	3.12	50721.00	1.16	40576.80	0.93	0.23
5:23	19380.00	3.9	3.12	50955.00	1.17	40764.00	0.94	0.23
5:24	19440.00	3.9	3.12	51189.00	1.18	40951.20	0.94	0.24
5:25	19500.00	3.9	3.12	51423.00	1.18	41138.40	0.94	0.24
5:26	19560.00	3.9	3.12	51657.00	1.19	41325.60	0.95	0.24
5:27	19620.00	3.9	3.12	51891.00	1.19	41512.80	0.95	0.24
5:28	19680.00	3.9	3.12	52125.00	1.20	41700.00	0.96	0.24
5:29	19740.00	3.9	3.12	52359.00	1.20	41887.20	0.96	0.24
5:30	19800.00	3.9	3.12	52593.00	1.21	42074.40	0.97	0.24
5:31	19860.00	3.9	3.12	52827.00	1.21	42261.60	0.97	0.24
5:32	19920.00	3.9	3.12	53061.00	1.22	42448.80	0.97	0.24
5:33	19980.00	3.9	3.12	53295.00	1.22	42636.00	0.98	0.24
5:34	20040.00	3.9	3.12	53529.00	1.23	42823.20	0.98	0.25
5:35	20100.00	3.9	3.12	53763.00	1.23	43010.40	0.99	0.25
5:36	20160.00	3.9	3.12	53997.00	1.24	43197.60	0.99	0.25
5:37	20220.00	3.9	3.12	54231.00	1.24	43384.80	1.00	0.25
5:38	20280.00	3.9	3.12	54465.00	1.25	43572.00	1.00	0.25
5:39	20340.00	3.9	3.12	54699.00	1.26	43759.20	1.00	0.25
5:40	20400.00	3.9	3.12	54933.00	1.26	43946.40	1.01	0.25
5:41	20460.00	3.9	3.12	55167.00	1.27	44133.60	1.01	0.25
5:42	20520.00	4	3.2	55404.00	1.27	44323.20	1.02	0.25
5:43	20580.00	4	3.2	55644.00	1.28	44515.20	1.02	0.26
5:44	20640.00	4	3.2	55884.00	1.28	44707.20	1.03	0.26
5:45	20700.00	4	3.2	56124.00	1.29	44899.20	1.03	0.26
5:46	20760.00	4	3.2	56364.00	1.29	45091.20	1.04	0.26
5:47	20820.00	4	3.2	56604.00	1.30	45283.20	1.04	0.26
5:48	20880.00	4.1	3.28	56847.00	1.31	45477.60	1.04	0.26
5:49	20940.00	4.1	3.28	57093.00	1.31	45674.40	1.05	0.26
5:50	21000.00	4.1	3.28	57339.00	1.32	45871.20	1.05	0.26
5:51	21060.00	4.1	3.28	57585.00	1.32	46068.00	1.06	0.26
5:52	21120.00	4.1	3.28	57831.00	1.33	46264.80	1.06	0.27
5:53	21180.00	4.1	3.28	58077.00	1.33	46461.60	1.07	0.27
5:54	21240.00	4.2	3.36	58326.00	1.34	46660.80	1.07	0.27
5:55	21300.00	4.2	3.36	58578.00	1.34	46862.40	1.08	0.27
5:56	21360.00	4.2	3.36	58830.00	1.35	47064.00	1.08	0.27
5:57	21420.00	4.2	3.36	59082.00	1.36	47265.60	1.09	0.27
5:58	21480.00	4.2	3.36	59334.00	1.36	47467.20	1.09	0.27
5:59	21540.00	4.2	3.36	59586.00	1.37	47668.80	1.09	0.27
6:00	21600.00	4.3	3.44	59841.00	1.37	47872.80	1.10	0.27
6:01	21660.00	4.3	3.44	60099.00	1.38	48079.20	1.10	0.28
6:02	21720.00	4.3	3.44	60357.00	1.39	48285.60	1.11	0.28
6:03	21780.00	4.3	3.44	60615.00	1.39	48492.00	1.11	0.28
6:04	21840.00	4.3	3.44	60873.00	1.40	48698.40	1.12	0.28
6:05	21900.00	4.3	3.44	61131.00	1.40	48904.80	1.12	0.28
6:06	21960.00	4.3	3.44	61389.00	1.41	49111.20	1.13	0.28
6:07	22020.00	4.3	3.44	61647.00	1.42	49317.60	1.13	0.28
6:08	22080.00	4.4	3.52	61908.00	1.42	49526.40	1.14	0.28
6:09	22140.00	4.4	3.52	62172.00	1.43	49737.60	1.14	0.29
6:10	22200.00	4.4	3.52	62436.00	1.43	49948.80	1.15	0.29
6:11	22260.00	4.4	3.52	62700.00	1.44	50160.00	1.15	0.29
6:12	22320.00	4.4	3.52	62964.00	1.45	50371.20	1.16	0.29
6:13	22380.00	4.4	3.52	63228.00	1.45	50582.40	1.16	0.29
6:14	22440.00	4.4	3.52	63492.00	1.46	50793.60	1.17	0.29
6:15	22500.00	4.4	3.52	63756.00	1.46	51004.80	1.17	0.29
6:16	22560.00	4.4	3.52	64020.00	1.47	51216.00	1.18	0.29
6:17	22620.00	4.4	3.52	64284.00	1.48	51427.20	1.18	0.30
6:18	22680.00	4.5	3.6	64551.00	1.48	51640.80	1.19	0.30
6:19	22740.00	4.5	3.6	64821.00	1.49	51856.80	1.19	0.30
6:20	22800.00	4.5	3.6	65091.00	1.49	52072.80	1.20	0.30
6:21	22860.00	4.5	3.6	65361.00	1.50	52288.80	1.20	0.30
6:22	22920.00	4.5	3.6	65631.00	1.51	52504.80	1.21	0.30
6:23	22980.00	4.5	3.6	65901.00	1.51	52720.80	1.21	0.30
6:24	23040.00	4.5	3.6	66171.00	1.52	52936.80	1.22	0.30
6:25	23100.00	4.5	3.6	66441.00	1.53	53152.80	1.22	0.31

6:26	23160.00	4.5	3.6	66711.00	1.53	53368.80	1.23	0.31
6:27	23220.00	4.5	3.6	66981.00	1.54	53584.80	1.23	0.31
6:28	23280.00	4.5	3.6	67251.00	1.54	53800.80	1.24	0.31
6:29	23340.00	4.5	3.6	67521.00	1.55	54016.80	1.24	0.31
6:30	23400.00	4.5	3.6	67791.00	1.56	54232.80	1.25	0.31
6:31	23460.00	4.6	3.68	68064.00	1.56	54451.20	1.25	0.31
6:32	23520.00	4.6	3.68	68340.00	1.57	54672.00	1.26	0.31
6:33	23580.00	4.6	3.68	68616.00	1.58	54892.80	1.26	0.32
6:34	23640.00	4.6	3.68	68892.00	1.58	55113.60	1.27	0.32
6:35	23700.00	4.6	3.68	69168.00	1.59	55334.40	1.27	0.32
6:36	23760.00	4.6	3.68	69444.00	1.59	55555.20	1.28	0.32
6:37	23820.00	4.6	3.68	69720.00	1.60	55776.00	1.28	0.32
6:38	23880.00	4.6	3.68	69996.00	1.61	55996.80	1.29	0.32
6:39	23940.00	4.6	3.68	70272.00	1.61	56217.60	1.29	0.32
6:40	24000.00	4.6	3.68	70548.00	1.62	56438.40	1.30	0.32
6:41	24060.00	4.7	3.76	70827.00	1.63	56661.60	1.30	0.33
6:42	24120.00	4.7	3.76	71109.00	1.63	56887.20	1.31	0.33
6:43	24180.00	4.7	3.76	71391.00	1.64	57112.80	1.31	0.33
6:44	24240.00	4.7	3.76	71673.00	1.65	57338.40	1.32	0.33
6:45	24300.00	4.7	3.76	71955.00	1.65	57564.00	1.32	0.33
6:46	24360.00	4.7	3.76	72237.00	1.66	57789.60	1.33	0.33
6:47	24420.00	4.7	3.76	72519.00	1.66	58015.20	1.33	0.33
6:48	24480.00	4.7	3.76	72801.00	1.67	58240.80	1.34	0.33
6:49	24540.00	4.7	3.76	73083.00	1.68	58466.40	1.34	0.34
6:50	24600.00	4.8	3.84	73368.00	1.68	58694.40	1.35	0.34
6:51	24660.00	4.8	3.84	73656.00	1.69	58924.80	1.35	0.34
6:52	24720.00	4.8	3.84	73944.00	1.70	59155.20	1.36	0.34
6:53	24780.00	4.8	3.84	74232.00	1.70	59385.60	1.36	0.34
6:54	24840.00	4.8	3.84	74520.00	1.71	59616.00	1.37	0.34
6:55	24900.00	4.8	3.84	74808.00	1.72	59846.40	1.37	0.34
6:56	24960.00	4.8	3.84	75096.00	1.72	60076.80	1.38	0.34
6:57	25020.00	4.8	3.84	75384.00	1.73	60307.20	1.38	0.35
6:58	25080.00	4.8	3.84	75672.00	1.74	60537.60	1.39	0.35
6:59	25140.00	4.8	3.84	75960.00	1.74	60768.00	1.40	0.35
7:00	25200.00	4.8	3.84	76248.00	1.75	60998.40	1.40	0.35
7:01	25260.00	4.8	3.84	76536.00	1.76	61228.80	1.41	0.35
7:02	25320.00	4.9	3.92	76827.00	1.76	61461.60	1.41	0.35
7:03	25380.00	4.9	3.92	77121.00	1.77	61696.80	1.42	0.35
7:04	25440.00	4.9	3.92	77415.00	1.78	61932.00	1.42	0.36
7:05	25500.00	4.9	3.92	77709.00	1.78	62167.20	1.43	0.36
7:06	25560.00	4.9	3.92	78003.00	1.79	62402.40	1.43	0.36
7:07	25620.00	4.9	3.92	78297.00	1.80	62637.60	1.44	0.36
7:08	25680.00	4.9	3.92	78591.00	1.80	62872.80	1.44	0.36
7:09	25740.00	4.9	3.92	78885.00	1.81	63108.00	1.45	0.36
7:10	25800.00	5	4	79182.00	1.82	63345.60	1.45	0.36
7:11	25860.00	5	4	79482.00	1.82	63585.60	1.46	0.36
7:12	25920.00	5	4	79782.00	1.83	63825.60	1.47	0.37
7:13	25980.00	5	4	80082.00	1.84	64065.60	1.47	0.37
7:14	26040.00	5	4	80382.00	1.85	64305.60	1.48	0.37
7:15	26100.00	5	4	80682.00	1.85	64545.60	1.48	0.37
7:16	26160.00	5	4	80982.00	1.86	64785.60	1.49	0.37
7:17	26220.00	5	4	81282.00	1.87	65025.60	1.49	0.37
7:18	26280.00	5	4	81582.00	1.87	65265.60	1.50	0.37
7:19	26340.00	5.1	4.08	81885.00	1.88	65508.00	1.50	0.38
7:20	26400.00	5.1	4.08	82191.00	1.89	65752.80	1.51	0.38
7:21	26460.00	5.1	4.08	82497.00	1.89	65997.60	1.52	0.38
7:22	26520.00	5.1	4.08	82803.00	1.90	66242.40	1.52	0.38
7:23	26580.00	5.1	4.08	83109.00	1.91	66487.20	1.53	0.38
7:24	26640.00	5.1	4.08	83415.00	1.91	66732.00	1.53	0.38
7:25	26700.00	5.1	4.08	83721.00	1.92	66976.80	1.54	0.38
7:26	26760.00	5.2	4.16	84030.00	1.93	67224.00	1.54	0.39
7:27	26820.00	5.2	4.16	84342.00	1.94	67473.60	1.55	0.39
7:28	26880.00	5.2	4.16	84654.00	1.94	67723.20	1.55	0.39
7:29	26940.00	5.2	4.16	84966.00	1.95	67972.80	1.56	0.39
7:30	27000.00	5.2	4.16	85278.00	1.96	68222.40	1.57	0.39
7:31	27060.00	5.2	4.16	85590.00	1.96	68472.00	1.57	0.39
7:32	27120.00	5.2	4.16	85902.00	1.97	68721.60	1.58	0.39
7:33	27180.00	5.2	4.16	86214.00	1.98	68971.20	1.58	0.40
7:34	27240.00	5.2	4.16	86526.00	1.99	69220.80	1.59	0.40
7:35	27300.00	5.2	4.16	86838.00	1.99	69470.40	1.59	0.40
7:36	27360.00	5.2	4.16	87150.00	2.00	69720.00	1.60	0.40
7:37	27420.00	5.2	4.16	87462.00	2.01	69969.60	1.61	0.40
7:38	27480.00	5.2	4.16	87774.00	2.02	70219.20	1.61	0.40
7:39	27540.00	5.2	4.16	88086.00	2.02	70468.80	1.62	0.40
7:40	27600.00	5.2	4.16	88398.00	2.03	70718.40	1.62	0.41
7:41	27660.00	5.2	4.16	88710.00	2.04	70968.00	1.63	0.41
7:42	27720.00	5.2	4.16	89022.00	2.04	71217.60	1.63	0.41
7:43	27780.00	5.2	4.16	89334.00	2.05	71467.20	1.64	0.41
7:44	27840.00	5.3	4.24	89649.00	2.06	71719.20	1.65	0.41
7:45	27900.00	5.3	4.24	89967.00	2.07	71973.60	1.65	0.41
7:46	27960.00	5.3	4.24	90285.00	2.07	72228.00	1.66	0.41
7:47	28020.00	5.3	4.24	90603.00	2.08	72482.40	1.66	0.42
7:48	28080.00	5.3	4.24	90921.00	2.09	72736.80	1.67	0.42
7:49	28140.00	5.3	4.24	91239.00	2.09	72991.20	1.68	0.42
7:50	28200.00	5.3	4.24	91557.00	2.10	73245.60	1.68	0.42
7:51	28260.00	5.3	4.24	91875.00	2.11	73500.00	1.69	0.42
7:52	28320.00	5.3	4.24	92193.00	2.12	73754.40	1.69	0.42
7:53	28380.00	5.3	4.24	92511.00	2.12	74008.80	1.70	0.42
7:54	28440.00	5.3	4.24	92829.00	2.13	74263.20	1.70	0.43
7:55	28500.00	5.3	4.24	93147.00	2.14	74517.60	1.71	0.43
7:56	28560.00	5.3	4.24	93465.00	2.15	74772.00	1.72	0.43
7:57	28620.00	5.3	4.24	93783.00	2.15	75026.40	1.72	0.43
7:58	28680.00	5.3	4.24	94101.00	2.16	75280.80	1.73	0.43
7:59	28740.00	5.3	4.24	94419.00	2.17	75535.20	1.73	0.43
8:00	28800.00	5.3	4.24	94737.00	2.17	75789.60	1.74	0.43
8:01	28860.00	5.3	4.24	95055.00	2.18	76044.00	1.75	0.44
8:02	28920.00	5.3	4.24	95373.00	2.19	76298.40	1.75	0.44
8:03	28980.00	5.3	4.24	95691.00	2.20	76552.80	1.76	0.44

8:04	29040.00	5.3	4.24	96009.00	2.20	76807.20	1.76	0.44
8:05	29100.00	5.3	4.24	96327.00	2.21	77061.60	1.77	0.44
8:06	29160.00	5.3	4.24	96645.00	2.22	77316.00	1.77	0.44
8:07	29220.00	5.3	4.24	96963.00	2.23	77570.40	1.78	0.45
8:08	29280.00	5.3	4.24	97281.00	2.23	77824.80	1.79	0.45
8:09	29340.00	5.4	4.32	97602.00	2.24	78081.60	1.79	0.45
8:10	29400.00	5.4	4.32	97926.00	2.25	78340.80	1.80	0.45
8:11	29460.00	5.4	4.32	98250.00	2.26	78600.00	1.80	0.45
8:12	29520.00	5.4	4.32	98574.00	2.26	78859.20	1.81	0.45
8:13	29580.00	5.4	4.32	98898.00	2.27	79118.40	1.82	0.45
8:14	29640.00	5.4	4.32	99222.00	2.28	79377.60	1.82	0.46
8:15	29700.00	5.4	4.32	99546.00	2.29	79636.80	1.83	0.46
8:16	29760.00	5.4	4.32	99870.00	2.29	79896.00	1.83	0.46
8:17	29820.00	5.4	4.32	100194.00	2.30	80155.20	1.84	0.46
8:18	29880.00	5.4	4.32	100518.00	2.31	80414.40	1.85	0.46
8:19	29940.00	5.4	4.32	100842.00	2.32	80673.60	1.85	0.46
8:20	30000.00	5.4	4.32	101166.00	2.32	80932.80	1.86	0.46
8:21	30060.00	5.4	4.32	101490.00	2.33	81192.00	1.86	0.47
8:22	30120.00	5.4	4.32	101814.00	2.34	81451.20	1.87	0.47
8:23	30180.00	5.4	4.32	102138.00	2.34	81710.40	1.88	0.47
8:24	30240.00	5.4	4.32	102462.00	2.35	81969.60	1.88	0.47
8:25	30300.00	5.5	4.4	102789.00	2.36	82231.20	1.89	0.47
8:26	30360.00	5.5	4.4	103119.00	2.37	82495.20	1.89	0.47
8:27	30420.00	5.5	4.4	103449.00	2.37	82759.20	1.90	0.47
8:28	30480.00	5.5	4.4	103779.00	2.38	83023.20	1.91	0.48
8:29	30540.00	5.5	4.4	104109.00	2.39	83287.20	1.91	0.48
8:30	30600.00	5.5	4.4	104439.00	2.40	83551.20	1.92	0.48
8:31	30660.00	5.5	4.4	104769.00	2.41	83815.20	1.92	0.48
8:32	30720.00	5.5	4.4	105099.00	2.41	84079.20	1.93	0.48
8:33	30780.00	5.6	4.48	105432.00	2.42	84345.60	1.94	0.48
8:34	30840.00	5.6	4.48	105768.00	2.43	84614.40	1.94	0.49
8:35	30900.00	5.6	4.48	106104.00	2.44	84883.20	1.95	0.49
8:36	30960.00	5.6	4.48	106440.00	2.44	85152.00	1.95	0.49
8:37	31020.00	5.6	4.48	106776.00	2.45	85420.80	1.96	0.49
8:38	31080.00	5.7	4.56	107115.00	2.46	85692.00	1.97	0.49
8:39	31140.00	5.7	4.56	107457.00	2.47	85965.60	1.97	0.49
8:40	31200.00	5.7	4.56	107799.00	2.47	86239.20	1.98	0.49
8:41	31260.00	5.7	4.56	108141.00	2.48	86512.80	1.99	0.50
8:42	31320.00	5.7	4.56	108483.00	2.49	86786.40	1.99	0.50
8:43	31380.00	5.8	4.64	108828.00	2.50	87062.40	2.00	0.50
8:44	31440.00	5.8	4.64	109176.00	2.51	87340.80	2.01	0.50
8:45	31500.00	5.8	4.64	109524.00	2.51	87619.20	2.01	0.50
8:46	31560.00	5.8	4.64	109872.00	2.52	87897.60	2.02	0.50
8:47	31620.00	5.9	4.72	110223.00	2.53	88178.40	2.02	0.51
8:48	31680.00	5.9	4.72	110577.00	2.54	88461.60	2.03	0.51
8:49	31740.00	5.9	4.72	110931.00	2.55	88744.80	2.04	0.51
8:50	31800.00	5.9	4.72	111285.00	2.55	89028.00	2.04	0.51
8:51	31860.00	6	4.8	111642.00	2.56	89313.60	2.05	0.51
8:52	31920.00	6	4.8	112002.00	2.57	89601.60	2.06	0.51
8:53	31980.00	6.1	4.88	112365.00	2.58	89892.00	2.06	0.52
8:54	32040.00	6.1	4.88	112731.00	2.59	90184.80	2.07	0.52
8:55	32100.00	6.1	4.88	113097.00	2.60	90477.60	2.08	0.52
8:56	32160.00	6.2	4.96	113466.00	2.60	90772.80	2.08	0.52
8:57	32220.00	6.2	4.96	113838.00	2.61	91070.40	2.09	0.52
8:58	32280.00	6.2	4.96	114210.00	2.62	91368.00	2.10	0.52
8:59	32340.00	6.3	5.04	114585.00	2.63	91668.00	2.10	0.53
9:00	32400.00	6.3	5.04	114963.00	2.64	91970.40	2.11	0.53
9:01	32460.00	6.4	5.12	115344.00	2.65	92275.20	2.12	0.53
9:02	32520.00	6.4	5.12	115728.00	2.66	92582.40	2.13	0.53
9:03	32580.00	6.4	5.12	116112.00	2.67	92889.60	2.13	0.53
9:04	32640.00	6.5	5.2	116499.00	2.67	93199.20	2.14	0.53
9:05	32700.00	6.5	5.2	116889.00	2.68	93511.20	2.15	0.54
9:06	32760.00	6.6	5.28	117282.00	2.69	93825.60	2.15	0.54
9:07	32820.00	6.6	5.28	117678.00	2.70	94142.40	2.16	0.54
9:08	32880.00	6.6	5.28	118074.00	2.71	94459.20	2.17	0.54
9:09	32940.00	6.6	5.28	118470.00	2.72	94776.00	2.18	0.54
9:10	33000.00	6.7	5.36	118869.00	2.73	95095.20	2.18	0.55
9:11	33060.00	6.7	5.36	119271.00	2.74	95416.80	2.19	0.55
9:12	33120.00	6.8	5.44	119676.00	2.75	95740.80	2.20	0.55
9:13	33180.00	6.8	5.44	120084.00	2.76	96067.20	2.21	0.55
9:14	33240.00	6.8	5.44	120492.00	2.77	96393.60	2.21	0.55
9:15	33300.00	6.9	5.52	120903.00	2.78	96722.40	2.22	0.56
9:16	33360.00	6.9	5.52	121317.00	2.79	97053.60	2.23	0.56
9:17	33420.00	6.9	5.52	121731.00	2.79	97384.80	2.24	0.56
9:18	33480.00	7	5.6	122148.00	2.80	97718.40	2.24	0.56
9:19	33540.00	7	5.6	122568.00	2.81	98054.40	2.25	0.56
9:20	33600.00	7.1	5.68	122991.00	2.82	98392.80	2.26	0.56
9:21	33660.00	7.1	5.68	123417.00	2.83	98733.60	2.27	0.57
9:22	33720.00	7.2	5.76	123846.00	2.84	99076.80	2.27	0.57
9:23	33780.00	7.2	5.76	124278.00	2.85	99422.40	2.28	0.57
9:24	33840.00	7.3	5.84	124713.00	2.86	99770.40	2.29	0.57
9:25	33900.00	7.3	5.84	125151.00	2.87	100120.80	2.30	0.57
9:26	33960.00	7.4	5.92	125592.00	2.88	100473.60	2.31	0.58
9:27	34020.00	7.5	6	126039.00	2.89	100831.20	2.31	0.58
9:28	34080.00	7.5	6	126489.00	2.90	101191.20	2.32	0.58
9:29	34140.00	7.6	6.08	126942.00	2.91	101553.60	2.33	0.58
9:30	34200.00	7.6	6.08	127398.00	2.92	101918.40	2.34	0.58
9:31	34260.00	7.7	6.16	127857.00	2.94	102285.60	2.35	0.59
9:32	34320.00	7.7	6.16	128319.00	2.95	102655.20	2.36	0.59
9:33	34380.00	7.8	6.24	128784.00	2.96	103027.20	2.37	0.59
9:34	34440.00	7.9	6.32	129255.00	2.97	103404.00	2.37	0.59
9:35	34500.00	7.9	6.32	129729.00	2.98	103783.20	2.38	0.60
9:36	34560.00	8	6.4	130206.00	2.99	104164.80	2.39	0.60
9:37	34620.00	8	6.4	130686.00	3.00	104548.80	2.40	0.60
9:38	34680.00	8.1	6.48	131169.00	3.01	104935.20	2.41	0.60
9:39	34740.00	8.2	6.56	131658.00	3.02	105326.40	2.42	0.60
9:40	34800.00	8.2	6.56	132150.00	3.03	105720.00	2.43	0.61
9:41	34860.00	8.3	6.64	132645.00	3.05	106116.00	2.44	0.61

9:42	34920.00	8.3	6.64	133143.00	3.06	106514.40	2.45	0.61
9:43	34980.00	8.4	6.72	133644.00	3.07	106915.20	2.45	0.61
9:44	35040.00	8.5	6.8	134151.00	3.08	107320.80	2.46	0.62
9:45	35100.00	8.5	6.8	134661.00	3.09	107728.80	2.47	0.62
9:46	35160.00	8.6	6.88	135174.00	3.10	108139.20	2.48	0.62
9:47	35220.00	8.7	6.96	135693.00	3.12	108554.40	2.49	0.62
9:48	35280.00	8.7	6.96	136215.00	3.13	108972.00	2.50	0.63
9:49	35340.00	8.8	7.04	136740.00	3.14	109392.00	2.51	0.63
9:50	35400.00	8.9	7.12	137271.00	3.15	109816.80	2.52	0.63
9:51	35460.00	8.9	7.12	137805.00	3.16	110244.00	2.53	0.63
9:52	35520.00	9	7.2	138342.00	3.18	110673.60	2.54	0.64
9:53	35580.00	9.1	7.28	138885.00	3.19	111108.00	2.55	0.64
9:54	35640.00	9.2	7.36	139434.00	3.20	111547.20	2.56	0.64
9:55	35700.00	9.2	7.36	139986.00	3.21	111988.80	2.57	0.64
9:56	35760.00	9.3	7.44	140541.00	3.23	112432.80	2.58	0.65
9:57	35820.00	9.4	7.52	141102.00	3.24	112881.60	2.59	0.65
9:58	35880.00	9.5	7.6	141669.00	3.25	113335.20	2.60	0.65
9:59	35940.00	9.6	7.68	142242.00	3.27	113793.60	2.61	0.65
10:00	36000.00	9.6	7.68	142818.00	3.28	114254.40	2.62	0.66
10:01	36060.00	9.7	7.76	143397.00	3.29	114717.60	2.63	0.66
10:02	36120.00	9.8	7.84	143982.00	3.31	115185.60	2.64	0.66
10:03	36180.00	9.9	7.92	144573.00	3.32	115658.40	2.66	0.66
10:04	36240.00	10	8	145170.00	3.33	116136.00	2.67	0.67
10:05	36300.00	10.1	8.08	145773.00	3.35	116618.40	2.68	0.67
10:06	36360.00	10.2	8.16	146382.00	3.36	117105.60	2.69	0.67
10:07	36420.00	10.3	8.24	146997.00	3.37	117597.60	2.70	0.67
10:08	36480.00	10.4	8.32	147618.00	3.39	118094.40	2.71	0.68
10:09	36540.00	10.5	8.4	148245.00	3.40	118596.00	2.72	0.68
10:10	36600.00	10.6	8.48	148878.00	3.42	119102.40	2.73	0.68
10:11	36660.00	10.7	8.56	149517.00	3.43	119613.60	2.75	0.69
10:12	36720.00	10.8	8.64	150162.00	3.45	120129.60	2.76	0.69
10:13	36780.00	10.9	8.72	150813.00	3.46	120650.40	2.77	0.69
10:14	36840.00	11.1	8.88	151473.00	3.48	121178.40	2.78	0.70
10:15	36900.00	11.2	8.96	152142.00	3.49	121713.60	2.79	0.70
10:16	36960.00	11.3	9.04	152817.00	3.51	122253.60	2.81	0.70
10:17	37020.00	11.4	9.12	153498.00	3.52	122798.40	2.82	0.70
10:18	37080.00	11.5	9.2	154185.00	3.54	123348.00	2.83	0.71
10:19	37140.00	11.6	9.28	154878.00	3.56	123902.40	2.84	0.71
10:20	37200.00	11.7	9.36	155577.00	3.57	124461.60	2.86	0.71
10:21	37260.00	11.9	9.52	156285.00	3.59	125028.00	2.87	0.72
10:22	37320.00	12	9.6	157002.00	3.60	125601.60	2.88	0.72
10:23	37380.00	12.1	9.68	157725.00	3.62	126180.00	2.90	0.72
10:24	37440.00	12.2	9.76	158454.00	3.64	126763.20	2.91	0.73
10:25	37500.00	12.3	9.84	159189.00	3.65	127351.20	2.92	0.73
10:26	37560.00	12.5	10	159933.00	3.67	127946.40	2.94	0.73
10:27	37620.00	12.6	10.08	160686.00	3.69	128548.80	2.95	0.74
10:28	37680.00	12.7	10.16	161445.00	3.71	129156.00	2.97	0.74
10:29	37740.00	12.9	10.32	162213.00	3.72	129770.40	2.98	0.74
10:30	37800.00	13	10.4	162990.00	3.74	130392.00	2.99	0.75
10:31	37860.00	13.1	10.48	163773.00	3.76	131018.40	3.01	0.75
10:32	37920.00	13.3	10.64	164565.00	3.78	131652.00	3.02	0.76
10:33	37980.00	13.4	10.72	165366.00	3.80	132292.80	3.04	0.76
10:34	38040.00	13.6	10.88	166176.00	3.81	132940.80	3.05	0.76
10:35	38100.00	13.7	10.96	166995.00	3.83	133596.00	3.07	0.77
10:36	38160.00	13.9	11.12	167823.00	3.85	134258.40	3.08	0.77
10:37	38220.00	14.1	11.28	168663.00	3.87	134930.40	3.10	0.77
10:38	38280.00	14.3	11.44	169515.00	3.89	135612.00	3.11	0.78
10:39	38340.00	14.5	11.6	170379.00	3.91	136303.20	3.13	0.78
10:40	38400.00	14.7	11.76	171255.00	3.93	137004.00	3.15	0.79
10:41	38460.00	14.8	11.84	172140.00	3.95	137712.00	3.16	0.79
10:42	38520.00	15	12	173034.00	3.97	138427.20	3.18	0.79
10:43	38580.00	15.2	12.16	173940.00	3.99	139152.00	3.19	0.80
10:44	38640.00	15.4	12.32	174858.00	4.01	139886.40	3.21	0.80
10:45	38700.00	15.6	12.48	175788.00	4.04	140630.40	3.23	0.81
10:46	38760.00	15.8	12.64	176730.00	4.06	141384.00	3.25	0.81
10:47	38820.00	16.1	12.88	177687.00	4.08	142149.60	3.26	0.82
10:48	38880.00	16.3	13.04	178659.00	4.10	142927.20	3.28	0.82
10:49	38940.00	16.5	13.2	179643.00	4.12	143714.40	3.30	0.82
10:50	39000.00	16.8	13.44	180642.00	4.15	144513.60	3.32	0.83
10:51	39060.00	17	13.6	181656.00	4.17	145324.80	3.34	0.83
10:52	39120.00	17.3	13.84	182685.00	4.19	146148.00	3.36	0.84
10:53	39180.00	17.6	14.08	183732.00	4.22	146985.60	3.37	0.84
10:54	39240.00	17.8	14.24	184794.00	4.24	147835.20	3.39	0.85
10:55	39300.00	18.1	14.48	185871.00	4.27	148696.80	3.41	0.85
10:56	39360.00	18.4	14.72	186966.00	4.29	149572.80	3.43	0.86
10:57	39420.00	18.7	14.96	188079.00	4.32	150463.20	3.45	0.86
10:58	39480.00	19	15.2	189210.00	4.34	151368.00	3.47	0.87
10:59	39540.00	19.3	15.44	190359.00	4.37	152287.20	3.50	0.87
11:00	39600.00	19.6	15.68	191526.00	4.40	153220.80	3.52	0.88
11:01	39660.00	19.9	15.92	192711.00	4.42	154168.80	3.54	0.88
11:02	39720.00	20.2	16.16	193914.00	4.45	155131.20	3.56	0.89
11:03	39780.00	20.6	16.48	195138.00	4.48	156110.40	3.58	0.90
11:04	39840.00	20.9	16.72	196383.00	4.51	157106.40	3.61	0.90
11:05	39900.00	21.3	17.04	197649.00	4.54	158119.20	3.63	0.91
11:06	39960.00	21.6	17.28	198936.00	4.57	159148.80	3.65	0.91
11:07	40020.00	22	17.6	200244.00	4.60	160195.20	3.68	0.92
11:08	40080.00	22.3	17.84	201573.00	4.63	161258.40	3.70	0.93
11:09	40140.00	22.7	18.16	202923.00	4.66	162338.40	3.73	0.93
11:10	40200.00	23.1	18.48	204297.00	4.69	163437.60	3.75	0.94
11:11	40260.00	23.5	18.8	205695.00	4.72	164556.00	3.78	0.94
11:12	40320.00	23.9	19.12	207117.00	4.75	165693.60	3.80	0.95
11:13	40380.00	24.3	19.44	208563.00	4.79	166850.40	3.83	0.96
11:14	40440.00	24.7	19.76	210033.00	4.82	168026.40	3.86	0.96
11:15	40500.00	25.1	20.08	211527.00	4.86	169221.60	3.88	0.97
11:16	40560.00	25.6	20.48	213048.00	4.89	170438.40	3.91	0.98
11:17	40620.00	26	20.8	214596.00	4.93	171676.80	3.94	0.99
11:18	40680.00	26.5	21.2	216171.00	4.96	172936.80	3.97	0.99
11:19	40740.00	26.9	21.52	217773.00	5.00	174218.40	4.00	1.00

11:20	40800.00	27.4	21.92	219402.00	5.04	175521.60	4.03	1.01
11:21	40860.00	28	22.4	221064.00	5.07	176851.20	4.06	1.01
11:22	40920.00	28.5	22.8	222759.00	5.11	178207.20	4.09	1.02
11:23	40980.00	29.1	23.28	224487.00	5.15	179589.60	4.12	1.03
11:24	41040.00	29.6	23.68	226248.00	5.19	180998.40	4.16	1.04
11:25	41100.00	30.2	24.16	228042.00	5.24	182433.60	4.19	1.05
11:26	41160.00	30.7	24.56	229869.00	5.28	183895.20	4.22	1.06
11:27	41220.00	31.3	25.04	231729.00	5.32	185383.20	4.26	1.06
11:28	41280.00	31.9	25.52	233625.00	5.36	186900.00	4.29	1.07
11:29	41340.00	32.5	26	235557.00	5.41	188445.60	4.33	1.08
11:30	41400.00	33.1	26.48	237525.00	5.45	190020.00	4.36	1.09
11:31	41460.00	33.7	26.96	239529.00	5.50	191623.20	4.40	1.10
11:32	41520.00	34.4	27.52	241572.00	5.55	193257.60	4.44	1.11
11:33	41580.00	35.2	28.16	243660.00	5.59	194928.00	4.47	1.12
11:34	41640.00	36.3	29.04	245805.00	5.64	196644.00	4.51	1.13
11:35	41700.00	37.6	30.08	248022.00	5.69	198417.60	4.56	1.14
11:36	41760.00	39.2	31.36	250326.00	5.75	200260.80	4.60	1.15
11:37	41820.00	40.9	32.72	252729.00	5.80	202183.20	4.64	1.16
11:38	41880.00	42.6	34.08	255234.00	5.86	204187.20	4.69	1.17
11:39	41940.00	44.4	35.52	257844.00	5.92	206275.20	4.74	1.18
11:40	42000.00	46.3	37.04	260565.00	5.98	208452.00	4.79	1.20
11:41	42060.00	48.1	38.48	263397.00	6.05	210717.60	4.84	1.21
11:42	42120.00	50.1	40.08	266343.00	6.11	213074.40	4.89	1.22
11:43	42180.00	52.1	41.68	269409.00	6.18	215527.20	4.95	1.24
11:44	42240.00	54.2	43.36	272598.00	6.26	218078.40	5.01	1.25
11:45	42300.00	56.4	45.12	275916.00	6.33	220732.80	5.07	1.27
11:46	42360.00	58.7	46.96	279369.00	6.41	223495.20	5.13	1.28
11:47	42420.00	61.3	49.04	282969.00	6.50	226375.20	5.20	1.30
11:48	42480.00	64.5	51.6	286743.00	6.58	229394.40	5.27	1.32
11:49	42540.00	68.4	54.72	290730.00	6.67	232584.00	5.34	1.33
11:50	42600.00	73.4	58.72	294984.00	6.77	235987.20	5.42	1.35
11:51	42660.00	79.1	63.28	299559.00	6.88	239647.20	5.50	1.38
11:52	42720.00	85.2	68.16	304488.00	6.99	243590.40	5.59	1.40
11:53	42780.00	91.8	73.44	309798.00	7.11	247838.40	5.69	1.42
11:54	42840.00	98.6	78.88	315510.00	7.24	252408.00	5.79	1.45
11:55	42900.00	105.7	84.56	321639.00	7.38	257311.20	5.91	1.48
11:56	42960.00	113.1	90.48	328203.00	7.53	262562.40	6.03	1.51
11:57	43020.00	120.9	96.72	335223.00	7.70	268178.40	6.16	1.54
11:58	43080.00	129.1	103.28	342723.00	7.87	274178.40	6.29	1.57
11:59	43140.00	137.7	110.16	350727.00	8.05	280581.60	6.44	1.61
12:00	43200.00	146.9	117.52	359265.00	8.25	287412.00	6.60	1.65
12:01	43260.00	156.5	125.2	368367.00	8.46	294693.60	6.77	1.69
12:02	43320.00	166.3	133.04	378051.00	8.68	302440.80	6.94	1.74
12:03	43380.00	175.8	140.64	388314.00	8.91	310651.20	7.13	1.78
12:04	43440.00	184.4	147.52	399120.00	9.16	319296.00	7.33	1.83
12:05	43500.00	192.1	153.68	410415.00	9.42	328332.00	7.54	1.88
12:06	43560.00	199.4	159.52	422160.00	9.69	337728.00	7.75	1.94
12:07	43620.00	206.7	165.36	434343.00	9.97	347474.40	7.98	1.99
12:08	43680.00	214.4	171.52	446976.00	10.26	357580.80	8.21	2.05
12:09	43740.00	222.8	178.24	460092.00	10.56	368073.60	8.45	2.11
12:10	43800.00	231.8	185.44	473730.00	10.88	378984.00	8.70	2.18
12:11	43860.00	241.4	193.12	487926.00	11.20	390340.80	8.96	2.24
12:12	43920.00	251.3	201.04	502707.00	11.54	402165.60	9.23	2.31
12:13	43980.00	261.5	209.2	518091.00	11.89	414472.80	9.51	2.38
12:14	44040.00	272	217.6	534096.00	12.26	427276.80	9.81	2.45
12:15	44100.00	282.6	226.08	550734.00	12.64	440587.20	10.11	2.53
12:16	44160.00	293.4	234.72	568014.00	13.04	454411.20	10.43	2.61
12:17	44220.00	304.4	243.52	585948.00	13.45	468758.40	10.76	2.69
12:18	44280.00	315.5	252.4	604545.00	13.88	483636.00	11.10	2.78
12:19	44340.00	326.5	261.2	623805.00	14.32	499044.00	11.46	2.86
12:20	44400.00	337.5	270	643725.00	14.78	514980.00	11.82	2.96
12:21	44460.00	348.4	278.72	664302.00	15.25	531441.60	12.20	3.05
12:22	44520.00	359.1	287.28	685527.00	15.74	548421.60	12.59	3.15
12:23	44580.00	369.7	295.76	707391.00	16.24	565912.80	12.99	3.25
12:24	44640.00	380.2	304.16	729888.00	16.76	583910.40	13.40	3.35
12:25	44700.00	390.5	312.4	753009.00	17.29	602407.20	13.83	3.46
12:26	44760.00	400.4	320.32	776736.00	17.83	621388.80	14.27	3.57
12:27	44820.00	410	328	801048.00	18.39	640838.40	14.71	3.68
12:28	44880.00	419.1	335.28	825921.00	18.96	660736.80	15.17	3.79
12:29	44940.00	427.8	342.24	851328.00	19.54	681062.40	15.64	3.91
12:30	45000.00	436	348.8	877242.00	20.14	701793.60	16.11	4.03
12:31	45060.00	443.7	354.96	903633.00	20.74	722906.40	16.60	4.15
12:32	45120.00	450.8	360.64	930468.00	21.36	744374.40	17.09	4.27
12:33	45180.00	457.3	365.84	957711.00	21.99	766168.80	17.59	4.40
12:34	45240.00	463.2	370.56	985326.00	22.62	788260.80	18.10	4.52
12:35	45300.00	468.5	374.8	1013277.00	23.26	810621.60	18.61	4.65
12:36	45360.00	473.1	378.48	1041525.00	23.91	833220.00	19.13	4.78
12:37	45420.00	477.3	381.84	1070037.00	24.56	856029.60	19.65	4.91
12:38	45480.00	480.9	384.72	1098783.00	25.22	879026.40	20.18	5.04
12:39	45540.00	483.9	387.12	1127727.00	25.89	902181.60	20.71	5.18
12:40	45600.00	486.3	389.04	1156833.00	26.56	925466.40	21.25	5.31
12:41	45660.00	488.1	390.48	1186065.00	27.23	948852.00	21.78	5.45
12:42	45720.00	489.4	391.52	1215390.00	27.90	972312.00	22.32	5.58
12:43	45780.00	490.2	392.16	1244778.00	28.58	995822.40	22.86	5.72
12:44	45840.00	490.6	392.48	1274202.00	29.25	1019361.60	23.40	5.85
12:45	45900.00	490.5	392.4	1303635.00	29.93	1042908.00	23.94	5.99
12:46	45960.00	489.9	391.92	1333047.00	30.60	1066437.60	24.48	6.12
12:47	46020.00	488.9	391.12	1362411.00	31.28	1089928.80	25.02	6.26
12:48	46080.00	487.5	390	1391703.00	31.95	1113362.40	25.56	6.39
12:49	46140.00	485.7	388.56	1420899.00	32.62	1136719.20	26.10	6.52
12:50	46200.00	483.5	386.8	1449975.00	33.29	1159980.00	26.63	6.66
12:51	46260.00	481	384.8	1478910.00	33.95	1183128.00	27.16	6.79
12:52	46320.00	478	382.4	1507680.00	34.61	1206144.00	27.69	6.92
12:53	46380.00	474.8	379.84	1536264.00	35.27	1229011.20	28.21	7.05
12:54	46440.00	471.3	377.04	1564647.00	35.92	1251717.60	28.74	7.18
12:55	46500.00	467.7	374.16	1592817.00	36.57	1274253.60	29.25	7.31
12:56	46560.00	463.9	371.12	1620765.00	37.21	1296612.00	29.77	7.44
12:57	46620.00	459.9	367.92	1648479.00	37.84	1318783.20	30.28	7.57

12:58	46680.00	455.7	364.56	1675947.00	38.47	1340757.60	30.78	7.69
12:59	46740.00	451.3	361.04	1703157.00	39.10	1362525.60	31.28	7.82
13:00	46800.00	446.8	357.44	1730100.00	39.72	1384080.00	31.77	7.94
13:01	46860.00	442.1	353.68	1756767.00	40.33	1405413.60	32.26	8.07
13:02	46920.00	437.3	349.84	1783149.00	40.94	1426519.20	32.75	8.19
13:03	46980.00	432.3	345.84	1809237.00	41.53	1447389.60	33.23	8.31
13:04	47040.00	427.2	341.76	1835022.00	42.13	1468017.60	33.70	8.43
13:05	47100.00	421.9	337.52	1860495.00	42.71	1488396.00	34.17	8.54
13:06	47160.00	416.6	333.28	1885650.00	43.29	1508520.00	34.63	8.66
13:07	47220.00	411.2	328.96	1910484.00	43.86	1528387.20	35.09	8.77
13:08	47280.00	405.7	324.56	1934991.00	44.42	1547992.80	35.54	8.88
13:09	47340.00	400.2	320.16	1959168.00	44.98	1567334.40	35.98	9.00
13:10	47400.00	394.7	315.76	1983015.00	45.52	1586412.00	36.42	9.10
13:11	47460.00	389.1	311.28	2006529.00	46.06	1605223.20	36.85	9.21
13:12	47520.00	383.5	306.8	2029707.00	46.60	1623765.60	37.28	9.32
13:13	47580.00	377.9	302.32	2052549.00	47.12	1642039.20	37.70	9.42
13:14	47640.00	372.3	297.84	2075055.00	47.64	1660044.00	38.11	9.53
13:15	47700.00	366.7	293.36	2097225.00	48.15	1677780.00	38.52	9.63
13:16	47760.00	361	288.8	2119056.00	48.65	1695244.80	38.92	9.73
13:17	47820.00	355.3	284.24	2140545.00	49.14	1712436.00	39.31	9.83
13:18	47880.00	349.5	279.6	2161689.00	49.63	1729351.20	39.70	9.93
13:19	47940.00	343.8	275.04	2182488.00	50.10	1745990.40	40.08	10.02
13:20	48000.00	338	270.4	2202942.00	50.57	1762353.60	40.46	10.11
13:21	48060.00	332.3	265.84	2223051.00	51.03	1778440.80	40.83	10.21
13:22	48120.00	326.6	261.28	2242818.00	51.49	1794254.40	41.19	10.30
13:23	48180.00	320.9	256.72	2262243.00	51.93	1809794.40	41.55	10.39
13:24	48240.00	315.3	252.24	2281329.00	52.37	1825063.20	41.90	10.47
13:25	48300.00	309.8	247.84	2300082.00	52.80	1840065.60	42.24	10.56
13:26	48360.00	304.4	243.52	2318508.00	53.23	1854806.40	42.58	10.65
13:27	48420.00	299.1	239.28	2336613.00	53.64	1869290.40	42.91	10.73
13:28	48480.00	293.9	235.12	2354403.00	54.05	1883522.40	43.24	10.81
13:29	48540.00	288.8	231.04	2371884.00	54.45	1897507.20	43.56	10.89
13:30	48600.00	283.9	227.12	2389065.00	54.85	1911252.00	43.88	10.97
13:31	48660.00	279.1	223.28	2405955.00	55.23	1924764.00	44.19	11.05
13:32	48720.00	274.5	219.6	2422563.00	55.61	1938050.40	44.49	11.12
13:33	48780.00	270	216	2438898.00	55.99	1951118.40	44.79	11.20
13:34	48840.00	265.5	212.4	2454963.00	56.36	1963970.40	45.09	11.27
13:35	48900.00	261.2	208.96	2470764.00	56.72	1976611.20	45.38	11.34
13:36	48960.00	257	205.6	2486310.00	57.08	1989048.00	45.66	11.42
13:37	49020.00	252.9	202.32	2501607.00	57.43	2001285.60	45.94	11.49
13:38	49080.00	248.9	199.12	2516661.00	57.77	2013328.80	46.22	11.55
13:39	49140.00	244.9	195.92	2531475.00	58.11	2025180.00	46.49	11.62
13:40	49200.00	241.1	192.88	2546055.00	58.45	2036844.00	46.76	11.69
13:41	49260.00	237.3	189.84	2560407.00	58.78	2048325.60	47.02	11.76
13:42	49320.00	233.7	186.96	2574537.00	59.10	2059629.60	47.28	11.82
13:43	49380.00	230.1	184.08	2588451.00	59.42	2070760.80	47.54	11.88
13:44	49440.00	226.6	181.28	2602152.00	59.74	2081721.60	47.79	11.95
13:45	49500.00	223.2	178.56	2615646.00	60.05	2092516.80	48.04	12.01
13:46	49560.00	219.9	175.92	2628939.00	60.35	2103151.20	48.28	12.07
13:47	49620.00	216.6	173.28	2642034.00	60.65	2113627.20	48.52	12.13
13:48	49680.00	213.5	170.8	2654937.00	60.95	2123949.60	48.76	12.19
13:49	49740.00	210.4	168.32	2667654.00	61.24	2134123.20	48.99	12.25
13:50	49800.00	207.3	165.84	2680185.00	61.53	2144148.00	49.22	12.31
13:51	49860.00	204.4	163.52	2692536.00	61.81	2154028.80	49.45	12.36
13:52	49920.00	201.5	161.2	2704713.00	62.09	2163770.40	49.67	12.42
13:53	49980.00	198.6	158.88	2716716.00	62.37	2173372.80	49.89	12.47
13:54	50040.00	195.9	156.72	2728551.00	62.64	2182840.80	50.11	12.53
13:55	50100.00	193.2	154.56	2740224.00	62.91	2192179.20	50.33	12.58
13:56	50160.00	190.5	152.4	2751735.00	63.17	2201388.00	50.54	12.63
13:57	50220.00	187.9	150.32	2763087.00	63.43	2210469.60	50.75	12.69
13:58	50280.00	185.3	148.24	2774283.00	63.69	2219426.40	50.95	12.74
13:59	50340.00	182.7	146.16	2785323.00	63.94	2228258.40	51.15	12.79
14:00	50400.00	180.2	144.16	2796210.00	64.19	2236968.00	51.35	12.84
14:01	50460.00	177.7	142.16	2806947.00	64.44	2245557.60	51.55	12.89
14:02	50520.00	175.3	140.24	2817537.00	64.68	2254029.60	51.75	12.94
14:03	50580.00	172.9	138.32	2827983.00	64.92	2262386.40	51.94	12.98
14:04	50640.00	170.6	136.48	2838288.00	65.16	2270630.40	52.13	13.03
14:05	50700.00	168.3	134.64	2848455.00	65.39	2278764.00	52.31	13.08
14:06	50760.00	166	132.8	2858484.00	65.62	2286787.20	52.50	13.12
14:07	50820.00	163.8	131.04	2868378.00	65.85	2294702.40	52.68	13.17
14:08	50880.00	161.6	129.28	2878140.00	66.07	2302512.00	52.86	13.21
14:09	50940.00	159.4	127.52	2887770.00	66.29	2310216.00	53.04	13.26
14:10	51000.00	157.3	125.84	2897271.00	66.51	2317816.80	53.21	13.30
14:11	51060.00	155.2	124.16	2906646.00	66.73	2325316.80	53.38	13.35
14:12	51120.00	153.2	122.56	2915898.00	66.94	2332718.40	53.55	13.39
14:13	51180.00	151.2	120.96	2925030.00	67.15	2340024.00	53.72	13.43
14:14	51240.00	149.3	119.44	2934045.00	67.36	2347236.00	53.89	13.47
14:15	51300.00	147.4	117.92	2942946.00	67.56	2354356.80	54.05	13.51
14:16	51360.00	145.6	116.48	2951736.00	67.76	2361388.80	54.21	13.55
14:17	51420.00	143.8	115.04	2960418.00	67.96	2368334.40	54.37	13.59
14:18	51480.00	142.1	113.68	2968995.00	68.16	2375196.00	54.53	13.63
14:19	51540.00	140.4	112.32	2977470.00	68.35	2381976.00	54.68	13.67
14:20	51600.00	138.6	110.88	2985840.00	68.55	2388672.00	54.84	13.71
14:21	51660.00	136.9	109.52	2994105.00	68.74	2395284.00	54.99	13.75
14:22	51720.00	135.3	108.24	3002271.00	68.92	2401816.80	55.14	13.78
14:23	51780.00	133.6	106.88	3010338.00	69.11	2408270.40	55.29	13.82
14:24	51840.00	132	105.6	3018306.00	69.29	2414644.80	55.43	13.86
14:25	51900.00	130.4	104.32	3026178.00	69.47	2420942.40	55.58	13.89
14:26	51960.00	128.8	103.04	3033954.00	69.65	2427163.20	55.72	13.93
14:27	52020.00	127.3	101.84	3041637.00	69.83	2433309.60	55.86	13.97
14:28	52080.00	125.8	100.64	3049230.00	70.00	2439384.00	56.00	14.00
14:29	52140.00	124.3	99.44	3056733.00	70.17	2445386.40	56.14	14.03
14:30	52200.00	122.9	98.32	3064149.00	70.34	2451319.20	56.27	14.07
14:31	52260.00	121.4	97.12	3071478.00	70.51	2457182.40	56.41	14.10
14:32	52320.00	120	96	3078720.00	70.68	2462976.00	56.54	14.14
14:33	52380.00	118.6	94.88	3085878.00	70.84	2468702.40	56.67	14.17
14:34	52440.00	117.3	93.84	3092955.00	71.00	2474364.00	56.80	14.20
14:35	52500.00	116	92.8	3099954.00	71.17	2479963.20	56.93	14.23

14:36	52560.00	114.7	91.76	3106875.00	71.32	2485500.00	57.06	14.26
14:37	52620.00	113.4	90.72	3113718.00	71.48	2490974.40	57.18	14.30
14:38	52680.00	112.2	89.76	3120486.00	71.64	2496388.80	57.31	14.33
14:39	52740.00	110.9	88.72	3127179.00	71.79	2501743.20	57.43	14.36
14:40	52800.00	109.7	87.76	3133797.00	71.94	2507037.60	57.55	14.39
14:41	52860.00	108.6	86.88	3140346.00	72.09	2512276.80	57.67	14.42
14:42	52920.00	107.4	85.92	3146826.00	72.24	2517460.80	57.79	14.45
14:43	52980.00	106.2	84.96	3153234.00	72.39	2522587.20	57.91	14.48
14:44	53040.00	105.1	84.08	3159573.00	72.53	2527658.40	58.03	14.51
14:45	53100.00	104	83.2	3165846.00	72.68	2532676.80	58.14	14.54
14:46	53160.00	102.9	82.32	3172053.00	72.82	2537642.40	58.26	14.56
14:47	53220.00	101.8	81.44	3178194.00	72.96	2542555.20	58.37	14.59
14:48	53280.00	100.8	80.64	3184272.00	73.10	2547417.60	58.48	14.62
14:49	53340.00	99.7	79.76	3190287.00	73.24	2552229.60	58.59	14.65
14:50	53400.00	98.7	78.96	3196239.00	73.38	2556991.20	58.70	14.68
14:51	53460.00	97.6	78.08	3202128.00	73.51	2561702.40	58.81	14.70
14:52	53520.00	96.6	77.28	3207954.00	73.64	2566363.20	58.92	14.73
14:53	53580.00	95.6	76.48	3213720.00	73.78	2570976.00	59.02	14.76
14:54	53640.00	94.6	75.68	3219426.00	73.91	2575540.80	59.13	14.78
14:55	53700.00	93.7	74.96	3225075.00	74.04	2580060.00	59.23	14.81
14:56	53760.00	92.7	74.16	3230667.00	74.17	2584533.60	59.33	14.83
14:57	53820.00	91.8	73.44	3236202.00	74.29	2588961.60	59.43	14.86
14:58	53880.00	90.9	72.72	3241683.00	74.42	2593346.40	59.54	14.88
14:59	53940.00	90.1	72.08	3247113.00	74.54	2597690.40	59.63	14.91
15:00	54000.00	89.2	71.36	3252492.00	74.67	2601993.60	59.73	14.93
15:01	54060.00	88.4	70.72	3257820.00	74.79	2606256.00	59.83	14.96
15:02	54120.00	87.6	70.08	3263100.00	74.91	2610480.00	59.93	14.98
15:03	54180.00	86.8	69.44	3268332.00	75.03	2614665.60	60.02	15.01
15:04	54240.00	86.1	68.88	3273519.00	75.15	2618815.20	60.12	15.03
15:05	54300.00	85.3	68.24	3278661.00	75.27	2622928.80	60.21	15.05
15:06	54360.00	84.6	67.68	3283758.00	75.38	2627006.40	60.31	15.08
15:07	54420.00	83.9	67.12	3288813.00	75.50	2631050.40	60.40	15.10
15:08	54480.00	83.2	66.56	3293826.00	75.62	2635060.80	60.49	15.12
15:09	54540.00	82.5	66	3298797.00	75.73	2639037.60	60.58	15.15
15:10	54600.00	81.8	65.44	3303726.00	75.84	2642980.80	60.67	15.17
15:11	54660.00	81.1	64.88	3308613.00	75.96	2646890.40	60.76	15.19
15:12	54720.00	80.5	64.4	3313461.00	76.07	2650768.80	60.85	15.21
15:13	54780.00	79.9	63.92	3318273.00	76.18	2654618.40	60.94	15.24
15:14	54840.00	79.2	63.36	3323046.00	76.29	2658436.80	61.03	15.26
15:15	54900.00	78.6	62.88	3327780.00	76.40	2662224.00	61.12	15.28
15:16	54960.00	78	62.4	3332478.00	76.50	2665982.40	61.20	15.30
15:17	55020.00	77.4	61.92	3337140.00	76.61	2669712.00	61.29	15.32
15:18	55080.00	76.9	61.52	3341769.00	76.72	2673415.20	61.37	15.34
15:19	55140.00	76.3	61.04	3346365.00	76.82	2677092.00	61.46	15.36
15:20	55200.00	75.7	60.56	3350925.00	76.93	2680740.00	61.54	15.39
15:21	55260.00	75.2	60.16	3355452.00	77.03	2684361.60	61.62	15.41
15:22	55320.00	74.6	59.68	3359946.00	77.13	2687956.80	61.71	15.43
15:23	55380.00	74.1	59.28	3364407.00	77.24	2691525.60	61.79	15.45
15:24	55440.00	73.5	58.8	3368835.00	77.34	2695068.00	61.87	15.47
15:25	55500.00	73	58.4	3373230.00	77.44	2698584.00	61.95	15.49
15:26	55560.00	72.5	58	3377595.00	77.54	2702076.00	62.03	15.51
15:27	55620.00	72	57.6	3381930.00	77.64	2705544.00	62.11	15.53
15:28	55680.00	71.5	57.2	3386235.00	77.74	2708988.00	62.19	15.55
15:29	55740.00	71	56.8	3390510.00	77.84	2712408.00	62.27	15.57
15:30	55800.00	70.6	56.48	3394758.00	77.93	2715806.40	62.35	15.59
15:31	55860.00	70.1	56.08	3398979.00	78.03	2719183.20	62.42	15.61
15:32	55920.00	69.6	55.68	3403170.00	78.13	2722536.00	62.50	15.63
15:33	55980.00	69.2	55.36	3407334.00	78.22	2725867.20	62.58	15.64
15:34	56040.00	68.7	54.96	3411471.00	78.32	2729176.80	62.65	15.66
15:35	56100.00	68.2	54.56	3415578.00	78.41	2732462.40	62.73	15.68
15:36	56160.00	67.8	54.24	3419658.00	78.50	2735726.40	62.80	15.70
15:37	56220.00	67.3	53.84	3423711.00	78.60	2738968.80	62.88	15.72
15:38	56280.00	66.8	53.44	3427734.00	78.69	2742187.20	62.95	15.74
15:39	56340.00	66.4	53.12	3431730.00	78.78	2745384.00	63.03	15.76
15:40	56400.00	65.9	52.72	3435699.00	78.87	2748559.20	63.10	15.77
15:41	56460.00	65.5	52.4	3439641.00	78.96	2751712.80	63.17	15.79
15:42	56520.00	65.1	52.08	3443559.00	79.05	2754847.20	63.24	15.81
15:43	56580.00	64.6	51.68	3447450.00	79.14	2757960.00	63.31	15.83
15:44	56640.00	64.2	51.36	3451314.00	79.23	2761051.20	63.39	15.85
15:45	56700.00	63.8	51.04	3455154.00	79.32	2764123.20	63.46	15.86
15:46	56760.00	63.4	50.72	3458970.00	79.41	2767176.00	63.53	15.88
15:47	56820.00	63	50.4	3462762.00	79.49	2770209.60	63.60	15.90
15:48	56880.00	62.6	50.08	3466530.00	79.58	2773224.00	63.66	15.92
15:49	56940.00	62.3	49.84	3470277.00	79.67	2776221.60	63.73	15.93
15:50	57000.00	61.9	49.52	3474003.00	79.75	2779202.40	63.80	15.95
15:51	57060.00	61.6	49.28	3477708.00	79.84	2782166.40	63.87	15.97
15:52	57120.00	61.3	49.04	3481395.00	79.92	2785116.00	63.94	15.98
15:53	57180.00	60.9	48.72	3485061.00	80.01	2788048.80	64.00	16.00
15:54	57240.00	60.6	48.48	3488706.00	80.09	2790964.80	64.07	16.02
15:55	57300.00	60.3	48.24	3492333.00	80.17	2793866.40	64.14	16.03
15:56	57360.00	60	48	3495942.00	80.26	2796753.60	64.20	16.05
15:57	57420.00	59.6	47.68	3499530.00	80.34	2799624.00	64.27	16.07
15:58	57480.00	59.3	47.44	3503097.00	80.42	2802477.60	64.34	16.08
15:59	57540.00	59	47.2	3506646.00	80.50	2805316.80	64.40	16.10
16:00	57600.00	58.7	46.96	3510177.00	80.58	2808141.60	64.47	16.12
16:01	57660.00	58.4	46.72	3513690.00	80.66	2810952.00	64.53	16.13
16:02	57720.00	58	46.4	3517182.00	80.74	2813745.60	64.59	16.15
16:03	57780.00	57.7	46.16	3520653.00	80.82	2816522.40	64.66	16.16
16:04	57840.00	57.4	45.92	3524106.00	80.90	2819284.80	64.72	16.18
16:05	57900.00	57.1	45.68	3527541.00	80.98	2822032.80	64.78	16.20
16:06	57960.00	56.8	45.44	3530958.00	81.06	2824766.40	64.85	16.21
16:07	58020.00	56.5	45.2	3534357.00	81.14	2827485.60	64.91	16.23
16:08	58080.00	56.2	44.96	3537738.00	81.22	2830190.40	64.97	16.24
16:09	58140.00	55.9	44.72	3541101.00	81.29	2832880.80	65.03	16.26
16:10	58200.00	55.6	44.48	3544446.00	81.37	2835556.80	65.10	16.27
16:11	58260.00	55.3	44.24	3547773.00	81.45	2838218.40	65.16	16.29
16:12	58320.00	55.1	44.08	3551085.00	81.52	2840868.00	65.22	16.30
16:13	58380.00	54.8	43.84	3554382.00	81.60	2843505.60	65.28	16.32

16:14	58440.00	54.6	43.68	3557664.00	81.67	2846131.20	65.34	16.33
16:15	58500.00	54.3	43.44	3560931.00	81.75	2848744.80	65.40	16.35
16:16	58560.00	54.1	43.28	3564183.00	81.82	2851346.40	65.46	16.36
16:17	58620.00	53.9	43.12	3567423.00	81.90	2853938.40	65.52	16.38
16:18	58680.00	53.7	42.96	3570651.00	81.97	2856520.80	65.58	16.39
16:19	58740.00	53.5	42.8	3573867.00	82.04	2859093.60	65.64	16.41
16:20	58800.00	53.3	42.64	3577071.00	82.12	2861656.80	65.69	16.42
16:21	58860.00	53.1	42.48	3580263.00	82.19	2864210.40	65.75	16.44
16:22	58920.00	53	42.4	3583446.00	82.26	2866756.80	65.81	16.45
16:23	58980.00	52.8	42.24	3586620.00	82.34	2869296.00	65.87	16.47
16:24	59040.00	52.7	42.16	3589785.00	82.41	2871828.00	65.93	16.48
16:25	59100.00	52.5	42	3592941.00	82.48	2874352.80	65.99	16.50
16:26	59160.00	52.4	41.92	3596088.00	82.55	2876870.40	66.04	16.51
16:27	59220.00	52.3	41.84	3599229.00	82.63	2879383.20	66.10	16.53
16:28	59280.00	52.2	41.76	3602364.00	82.70	2881891.20	66.16	16.54
16:29	59340.00	52.1	41.68	3605493.00	82.77	2884394.40	66.22	16.55
16:30	59400.00	52	41.6	3608616.00	82.84	2886892.80	66.27	16.57
16:31	59460.00	51.9	41.52	3611733.00	82.91	2889386.40	66.33	16.58
16:32	59520.00	51.8	41.44	3614844.00	82.99	2891875.20	66.39	16.60
16:33	59580.00	51.8	41.44	3617952.00	83.06	2894361.60	66.45	16.61
16:34	59640.00	51.7	41.36	3621057.00	83.13	2896845.60	66.50	16.63
16:35	59700.00	51.6	41.28	3624156.00	83.20	2899324.80	66.56	16.64
16:36	59760.00	51.5	41.2	3627249.00	83.27	2901799.20	66.62	16.65
16:37	59820.00	51.4	41.12	3630336.00	83.34	2904268.80	66.67	16.67
16:38	59880.00	51.3	41.04	3633417.00	83.41	2906733.60	66.73	16.68
16:39	59940.00	51.3	41.04	3636495.00	83.48	2909196.00	66.79	16.70
16:40	60000.00	51.2	40.96	3639570.00	83.55	2911656.00	66.84	16.71
16:41	60060.00	51.1	40.88	3642639.00	83.62	2914111.20	66.90	16.72
16:42	60120.00	51.1	40.88	3645705.00	83.69	2916564.00	66.96	16.74
16:43	60180.00	51	40.8	3648768.00	83.76	2919014.40	67.01	16.75
16:44	60240.00	50.9	40.72	3651825.00	83.83	2921460.00	67.07	16.77
16:45	60300.00	50.9	40.72	3654879.00	83.90	2923903.20	67.12	16.78
16:46	60360.00	50.8	40.64	3657930.00	83.97	2926344.00	67.18	16.79
16:47	60420.00	50.7	40.56	3660975.00	84.04	2928780.00	67.24	16.81
16:48	60480.00	50.7	40.56	3664017.00	84.11	2931213.60	67.29	16.82
16:49	60540.00	50.6	40.48	3667056.00	84.18	2933644.80	67.35	16.84
16:50	60600.00	50.5	40.4	3670089.00	84.25	2936071.20	67.40	16.85
16:51	60660.00	50.4	40.32	3673116.00	84.32	2938492.80	67.46	16.86
16:52	60720.00	50.3	40.24	3676137.00	84.39	2940909.60	67.51	16.88
16:53	60780.00	50.3	40.24	3679155.00	84.46	2943324.00	67.57	16.89
16:54	60840.00	50.2	40.16	3682170.00	84.53	2945736.00	67.62	16.91
16:55	60900.00	50.1	40.08	3685179.00	84.60	2948143.20	67.68	16.92
16:56	60960.00	50	40	3688182.00	84.67	2950545.60	67.74	16.93
16:57	61020.00	49.9	39.92	3691179.00	84.74	2952943.20	67.79	16.95
16:58	61080.00	49.7	39.76	3694167.00	84.81	2955333.60	67.85	16.96
16:59	61140.00	49.6	39.68	3697146.00	84.87	2957716.80	67.90	16.97
17:00	61200.00	49.5	39.6	3700119.00	84.94	2960095.20	67.95	16.99
17:01	61260.00	49.4	39.52	3703086.00	85.01	2962468.80	68.01	17.00
17:02	61320.00	49.2	39.36	3706044.00	85.08	2964835.20	68.06	17.02
17:03	61380.00	49.1	39.28	3708993.00	85.15	2967194.40	68.12	17.03
17:04	61440.00	49	39.2	3711936.00	85.21	2969548.80	68.17	17.04
17:05	61500.00	48.9	39.12	3714873.00	85.28	2971898.40	68.23	17.06
17:06	61560.00	48.7	38.96	3717801.00	85.35	2974240.80	68.28	17.07
17:07	61620.00	48.6	38.88	3720720.00	85.42	2976576.00	68.33	17.08
17:08	61680.00	48.5	38.8	3723633.00	85.48	2978906.40	68.39	17.10
17:09	61740.00	48.4	38.72	3726540.00	85.55	2981232.00	68.44	17.11
17:10	61800.00	48.3	38.64	3729441.00	85.62	2983552.80	68.49	17.12
17:11	61860.00	48.2	38.56	3732336.00	85.68	2985868.80	68.55	17.14
17:12	61920.00	48	38.4	3735222.00	85.75	2988177.60	68.60	17.15
17:13	61980.00	47.9	38.32	3738099.00	85.81	2990479.20	68.65	17.16
17:14	62040.00	47.8	38.24	3740970.00	85.88	2992776.00	68.70	17.18
17:15	62100.00	47.6	38.08	3743832.00	85.95	2995065.60	68.76	17.19
17:16	62160.00	47.5	38	3746685.00	86.01	2997348.00	68.81	17.20
17:17	62220.00	47.4	37.92	3749532.00	86.08	2999625.60	68.86	17.22
17:18	62280.00	47.3	37.84	3752373.00	86.14	3001898.40	68.91	17.23
17:19	62340.00	47.1	37.68	3755205.00	86.21	3004164.00	68.97	17.24
17:20	62400.00	46.9	37.52	3758025.00	86.27	3006420.00	69.02	17.25
17:21	62460.00	46.8	37.44	3760836.00	86.34	3008668.80	69.07	17.27
17:22	62520.00	46.6	37.28	3763638.00	86.40	3010910.40	69.12	17.28
17:23	62580.00	46.5	37.2	3766431.00	86.47	3013144.80	69.17	17.29
17:24	62640.00	46.3	37.04	3769215.00	86.53	3015372.00	69.22	17.31
17:25	62700.00	46.2	36.96	3771990.00	86.59	3017592.00	69.27	17.32
17:26	62760.00	46	36.8	3774756.00	86.66	3019804.80	69.33	17.33
17:27	62820.00	45.9	36.72	3777513.00	86.72	3022010.40	69.38	17.34
17:28	62880.00	45.7	36.56	3780261.00	86.78	3024208.80	69.43	17.36
17:29	62940.00	45.6	36.48	3783000.00	86.85	3026400.00	69.48	17.37
17:30	63000.00	45.5	36.4	3785733.00	86.91	3028586.40	69.53	17.38
17:31	63060.00	45.4	36.32	3788460.00	86.97	3030768.00	69.58	17.39
17:32	63120.00	45.3	36.24	3791181.00	87.03	3032944.80	69.63	17.41
17:33	63180.00	45.2	36.16	3793896.00	87.10	3035116.80	69.68	17.42
17:34	63240.00	45.1	36.08	3796605.00	87.16	3037284.00	69.73	17.43
17:35	63300.00	45	36	3799308.00	87.22	3039446.40	69.78	17.44
17:36	63360.00	44.9	35.92	3802005.00	87.28	3041604.00	69.83	17.46
17:37	63420.00	44.8	35.84	3804696.00	87.34	3043756.80	69.88	17.47
17:38	63480.00	44.7	35.76	3807381.00	87.41	3045904.80	69.92	17.48
17:39	63540.00	44.7	35.76	3810063.00	87.47	3048050.40	69.97	17.49
17:40	63600.00	44.6	35.68	3812742.00	87.53	3050193.60	70.02	17.51
17:41	63660.00	44.5	35.6	3815415.00	87.59	3052332.00	70.07	17.52
17:42	63720.00	44.4	35.52	3818082.00	87.65	3054465.60	70.12	17.53
17:43	63780.00	44.4	35.52	3820746.00	87.71	3056596.80	70.17	17.54
17:44	63840.00	44.3	35.44	3823407.00	87.77	3058725.60	70.22	17.55
17:45	63900.00	44.2	35.36	3826062.00	87.83	3060849.60	70.27	17.57
17:46	63960.00	44.1	35.28	3828711.00	87.90	3062968.80	70.32	17.58
17:47	64020.00	44.1	35.28	3831357.00	87.96	3065085.60	70.36	17.59
17:48	64080.00	44	35.2	3834000.00	88.02	3067200.00	70.41	17.60
17:49	64140.00	43.9	35.12	3836637.00	88.08	3069309.60	70.46	17.62
17:50	64200.00	43.8	35.04	3839268.00	88.14	3071414.40	70.51	17.63
17:51	64260.00	43.7	34.96	3841893.00	88.20	3073514.40	70.56	17.64

17:52	64320.00	43.6	34.88	3844512.00	88.26	3075609.60	70.61	17.65
17:53	64380.00	43.5	34.8	3847125.00	88.32	3077700.00	70.65	17.66
17:54	64440.00	43.4	34.72	3849732.00	88.38	3079785.60	70.70	17.68
17:55	64500.00	43.3	34.64	3852333.00	88.44	3081866.40	70.75	17.69
17:56	64560.00	43.2	34.56	3854928.00	88.50	3083942.40	70.80	17.70
17:57	64620.00	43.1	34.48	3857517.00	88.56	3086013.60	70.85	17.71
17:58	64680.00	43	34.4	3860100.00	88.62	3088080.00	70.89	17.72
17:59	64740.00	42.9	34.32	3862677.00	88.67	3090141.60	70.94	17.73
18:00	64800.00	42.7	34.16	3865245.00	88.73	3092196.00	70.99	17.75
18:01	64860.00	42.6	34.08	3867804.00	88.79	3094243.20	71.03	17.76
18:02	64920.00	42.5	34	3870357.00	88.85	3096285.60	71.08	17.77
18:03	64980.00	42.4	33.92	3872904.00	88.91	3098323.20	71.13	17.78
18:04	65040.00	42.3	33.84	3875445.00	88.97	3100356.00	71.17	17.79
18:05	65100.00	42.2	33.76	3877980.00	89.03	3102384.00	71.22	17.81
18:06	65160.00	42.1	33.68	3880509.00	89.08	3104407.20	71.27	17.82
18:07	65220.00	41.9	33.52	3883029.00	89.14	3106423.20	71.31	17.83
18:08	65280.00	41.8	33.44	3885540.00	89.20	3108432.00	71.36	17.84
18:09	65340.00	41.7	33.36	3888045.00	89.26	3110436.00	71.41	17.85
18:10	65400.00	41.6	33.28	3890544.00	89.31	3112435.20	71.45	17.86
18:11	65460.00	41.5	33.2	3893037.00	89.37	3114429.60	71.50	17.87
18:12	65520.00	41.4	33.12	3895524.00	89.43	3116419.20	71.54	17.89
18:13	65580.00	41.2	32.96	3898002.00	89.49	3118401.60	71.59	17.90
18:14	65640.00	41.1	32.88	3900471.00	89.54	3120376.80	71.63	17.91
18:15	65700.00	41	32.8	3902934.00	89.60	3122347.20	71.68	17.92
18:16	65760.00	40.9	32.72	3905391.00	89.66	3124312.80	71.72	17.93
18:17	65820.00	40.8	32.64	3907842.00	89.71	3126273.60	71.77	17.94
18:18	65880.00	40.7	32.56	3910287.00	89.77	3128229.60	71.81	17.95
18:19	65940.00	40.6	32.48	3912726.00	89.82	3130180.80	71.86	17.96
18:20	66000.00	40.5	32.4	3915159.00	89.88	3132127.20	71.90	17.98
18:21	66060.00	40.4	32.32	3917586.00	89.94	3134068.80	71.95	17.99
18:22	66120.00	40.3	32.24	3920007.00	89.99	3136005.60	71.99	18.00
18:23	66180.00	40.2	32.16	3922422.00	90.05	3137937.60	72.04	18.01
18:24	66240.00	40.1	32.08	3924831.00	90.10	3139864.80	72.08	18.02
18:25	66300.00	40	32	3927234.00	90.16	3141787.20	72.13	18.03
18:26	66360.00	39.9	31.92	3929631.00	90.21	3143704.80	72.17	18.04
18:27	66420.00	39.8	31.84	3932022.00	90.27	3145617.60	72.21	18.05
18:28	66480.00	39.7	31.76	3934407.00	90.32	3147525.60	72.26	18.06
18:29	66540.00	39.6	31.68	3936786.00	90.38	3149428.80	72.30	18.08
18:30	66600.00	39.5	31.6	3939159.00	90.43	3151327.20	72.34	18.09
18:31	66660.00	39.4	31.52	3941526.00	90.48	3153220.80	72.39	18.10
18:32	66720.00	39.3	31.44	3943887.00	90.54	3155109.60	72.43	18.11
18:33	66780.00	39.2	31.36	3946242.00	90.59	3156993.60	72.47	18.12
18:34	66840.00	39.1	31.28	3948591.00	90.65	3158872.80	72.52	18.13
18:35	66900.00	39	31.2	3950934.00	90.70	3160747.20	72.56	18.14
18:36	66960.00	39	31.2	3953274.00	90.75	3162619.20	72.60	18.15
18:37	67020.00	38.9	31.12	3955611.00	90.81	3164488.80	72.65	18.16
18:38	67080.00	38.8	31.04	3957942.00	90.86	3166353.60	72.69	18.17
18:39	67140.00	38.7	30.96	3960267.00	90.92	3168213.60	72.73	18.18
18:40	67200.00	38.6	30.88	3962586.00	90.97	3170068.80	72.77	18.19
18:41	67260.00	38.6	30.88	3964902.00	91.02	3171921.60	72.82	18.20
18:42	67320.00	38.5	30.8	3967215.00	91.07	3173772.00	72.86	18.21
18:43	67380.00	38.4	30.72	3969522.00	91.13	3175617.60	72.90	18.23
18:44	67440.00	38.3	30.64	3971823.00	91.18	3177458.40	72.94	18.24
18:45	67500.00	38.3	30.64	3974121.00	91.23	3179296.80	72.99	18.25
18:46	67560.00	38.2	30.56	3976416.00	91.29	3181132.80	73.03	18.26
18:47	67620.00	38.2	30.56	3978708.00	91.34	3182966.40	73.07	18.27
18:48	67680.00	38.1	30.48	3980997.00	91.39	3184797.60	73.11	18.28
18:49	67740.00	38	30.4	3983280.00	91.44	3186624.00	73.15	18.29
18:50	67800.00	37.9	30.32	3985557.00	91.50	3188445.60	73.20	18.30
18:51	67860.00	37.8	30.24	3987828.00	91.55	3190262.40	73.24	18.31
18:52	67920.00	37.7	30.16	3990093.00	91.60	3192074.40	73.28	18.32
18:53	67980.00	37.6	30.08	3992352.00	91.65	3193881.60	73.32	18.33
18:54	68040.00	37.5	30	3994605.00	91.70	3195684.00	73.36	18.34
18:55	68100.00	37.4	29.92	3996852.00	91.76	3197481.60	73.40	18.35
18:56	68160.00	37.3	29.84	3999093.00	91.81	3199274.40	73.45	18.36
18:57	68220.00	37.2	29.76	4001328.00	91.86	3201062.40	73.49	18.37
18:58	68280.00	37	29.6	4003554.00	91.91	3202843.20	73.53	18.38
18:59	68340.00	36.9	29.52	4005771.00	91.96	3204616.80	73.57	18.39
19:00	68400.00	36.8	29.44	4007982.00	92.01	3206385.60	73.61	18.40
19:01	68460.00	36.7	29.36	4010187.00	92.06	3208149.60	73.65	18.41
19:02	68520.00	36.6	29.28	4012386.00	92.11	3209908.80	73.69	18.42
19:03	68580.00	36.5	29.2	4014579.00	92.16	3211663.20	73.73	18.43
19:04	68640.00	36.4	29.12	4016766.00	92.21	3213412.80	73.77	18.44
19:05	68700.00	36.3	29.04	4018947.00	92.26	3215157.60	73.81	18.45
19:06	68760.00	36.2	28.96	4021122.00	92.31	3216897.60	73.85	18.46
19:07	68820.00	36.1	28.88	4023291.00	92.36	3218632.80	73.89	18.47
19:08	68880.00	36.1	28.88	4025457.00	92.41	3220365.60	73.93	18.48
19:09	68940.00	36	28.8	4027620.00	92.46	3222096.00	73.97	18.49
19:10	69000.00	35.9	28.72	4029777.00	92.51	3223821.60	74.01	18.50
19:11	69060.00	35.8	28.64	4031928.00	92.56	3225542.40	74.05	18.51
19:12	69120.00	35.7	28.56	4034073.00	92.61	3227258.40	74.09	18.52
19:13	69180.00	35.6	28.48	4036212.00	92.66	3228969.60	74.13	18.53
19:14	69240.00	35.5	28.4	4038345.00	92.71	3230676.00	74.17	18.54
19:15	69300.00	35.4	28.32	4040472.00	92.76	3232377.60	74.21	18.55
19:16	69360.00	35.3	28.24	4042593.00	92.81	3234074.40	74.24	18.56
19:17	69420.00	35.1	28.08	4044705.00	92.85	3235764.00	74.28	18.57
19:18	69480.00	35	28	4046808.00	92.90	3237446.40	74.32	18.58
19:19	69540.00	34.9	27.92	4048905.00	92.95	3239124.00	74.36	18.59
19:20	69600.00	34.8	27.84	4050996.00	93.00	3240796.80	74.40	18.60
19:21	69660.00	34.7	27.76	4053081.00	93.05	3242464.80	74.44	18.61
19:22	69720.00	34.6	27.68	4055160.00	93.09	3244128.00	74.47	18.62
19:23	69780.00	34.4	27.52	4057230.00	93.14	3245784.00	74.51	18.63
19:24	69840.00	34.3	27.44	4059291.00	93.19	3247432.80	74.55	18.64
19:25	69900.00	34.2	27.36	4061346.00	93.24	3249076.80	74.59	18.65
19:26	69960.00	34.1	27.28	4063395.00	93.28	3250716.00	74.63	18.66
19:27	70020.00	34	27.2	4065438.00	93.33	3252350.40	74.66	18.67
19:28	70080.00	33.9	27.12	4067475.00	93.38	3253980.00	74.70	18.68
19:29	70140.00	33.8	27.04	4069506.00	93.42	3255604.80	74.74	18.68

19:30	70200.00	33.7	26.96	4071531.00	93.47	3257224.80	74.78	18.69
19:31	70260.00	33.6	26.88	4073550.00	93.52	3258840.00	74.81	18.70
19:32	70320.00	33.5	26.8	4075563.00	93.56	3260450.40	74.85	18.71
19:33	70380.00	33.5	26.8	4077573.00	93.61	3262058.40	74.89	18.72
19:34	70440.00	33.4	26.72	4079580.00	93.65	3263664.00	74.92	18.73
19:35	70500.00	33.4	26.72	4081584.00	93.70	3265267.20	74.96	18.74
19:36	70560.00	33.3	26.64	4083585.00	93.75	3266868.00	75.00	18.75
19:37	70620.00	33.3	26.64	4085583.00	93.79	3268466.40	75.03	18.76
19:38	70680.00	33.2	26.56	4087578.00	93.84	3270062.40	75.07	18.77
19:39	70740.00	33.2	26.56	4089570.00	93.88	3271656.00	75.11	18.78
19:40	70800.00	33.2	26.56	4091562.00	93.93	3273249.60	75.14	18.79
19:41	70860.00	33.1	26.48	4093551.00	93.98	3274840.80	75.18	18.80
19:42	70920.00	33.1	26.48	4095537.00	94.02	3276429.60	75.22	18.80
19:43	70980.00	33.1	26.48	4097523.00	94.07	3278018.40	75.25	18.81
19:44	71040.00	33.1	26.48	4099509.00	94.11	3279607.20	75.29	18.82
19:45	71100.00	33.1	26.48	4101495.00	94.16	3281196.00	75.33	18.83
19:46	71160.00	33.2	26.56	4103484.00	94.20	3282787.20	75.36	18.84
19:47	71220.00	33.2	26.56	4105476.00	94.25	3284380.80	75.40	18.85
19:48	71280.00	33.2	26.56	4107468.00	94.29	3285974.40	75.44	18.86
19:49	71340.00	33.2	26.56	4109460.00	94.34	3287568.00	75.47	18.87
19:50	71400.00	33.2	26.56	4111452.00	94.39	3289161.60	75.51	18.88
19:51	71460.00	33.1	26.48	4113441.00	94.43	3290752.80	75.55	18.89
19:52	71520.00	33.1	26.48	4115427.00	94.48	3292341.60	75.58	18.90
19:53	71580.00	33.1	26.48	4117413.00	94.52	3293930.40	75.62	18.90
19:54	71640.00	33.1	26.48	4119399.00	94.57	3295519.20	75.65	18.91
19:55	71700.00	33.1	26.48	4121385.00	94.61	3297108.00	75.69	18.92
19:56	71760.00	33	26.4	4123368.00	94.66	3298694.40	75.73	18.93
19:57	71820.00	33	26.4	4125348.00	94.70	3300278.40	75.76	18.94
19:58	71880.00	33	26.4	4127328.00	94.75	3301862.40	75.80	18.95
19:59	71940.00	33	26.4	4129308.00	94.80	3303446.40	75.84	18.96
20:00	72000.00	33	26.4	4131288.00	94.84	3305030.40	75.87	18.97
20:01	72060.00	32.9	26.32	4133265.00	94.89	3306612.00	75.91	18.98
20:02	72120.00	32.9	26.32	4135239.00	94.93	3308191.20	75.95	18.99
20:03	72180.00	32.9	26.32	4137213.00	94.98	3309770.40	75.98	19.00
20:04	72240.00	32.9	26.32	4139187.00	95.02	3311349.60	76.02	19.00
20:05	72300.00	32.9	26.32	4141161.00	95.07	3312928.80	76.05	19.01
20:06	72360.00	32.9	26.32	4143135.00	95.11	3314508.00	76.09	19.02
20:07	72420.00	32.9	26.32	4145109.00	95.16	3316087.20	76.13	19.03
20:08	72480.00	32.9	26.32	4147083.00	95.20	3317666.40	76.16	19.04
20:09	72540.00	32.9	26.32	4149057.00	95.25	3319245.60	76.20	19.05
20:10	72600.00	32.9	26.32	4151031.00	95.29	3320824.80	76.24	19.06
20:11	72660.00	32.9	26.32	4153005.00	95.34	3322404.00	76.27	19.07
20:12	72720.00	32.9	26.32	4154979.00	95.39	3323983.20	76.31	19.08
20:13	72780.00	32.8	26.24	4156950.00	95.43	3325560.00	76.34	19.09
20:14	72840.00	32.8	26.24	4158918.00	95.48	3327134.40	76.38	19.10
20:15	72900.00	32.8	26.24	4160886.00	95.52	3328708.80	76.42	19.10
20:16	72960.00	32.8	26.24	4162854.00	95.57	3330283.20	76.45	19.11
20:17	73020.00	32.7	26.16	4164819.00	95.61	3331855.20	76.49	19.12
20:18	73080.00	32.7	26.16	4166781.00	95.66	3333424.80	76.52	19.13
20:19	73140.00	32.6	26.08	4168740.00	95.70	3334992.00	76.56	19.14
20:20	73200.00	32.5	26	4170693.00	95.75	3336554.40	76.60	19.15
20:21	73260.00	32.4	25.92	4172640.00	95.79	3338112.00	76.63	19.16
20:22	73320.00	32.3	25.84	4174581.00	95.84	3339664.80	76.67	19.17
20:23	73380.00	32.2	25.76	4176516.00	95.88	3341212.80	76.70	19.18
20:24	73440.00	32.1	25.68	4178445.00	95.92	3342756.00	76.74	19.18
20:25	73500.00	32	25.6	4180368.00	95.97	3344294.40	76.77	19.19
20:26	73560.00	31.9	25.52	4182285.00	96.01	3345828.00	76.81	19.20
20:27	73620.00	31.8	25.44	4184196.00	96.06	3347356.80	76.84	19.21
20:28	73680.00	31.7	25.36	4186101.00	96.10	3348880.80	76.88	19.22
20:29	73740.00	31.6	25.28	4188000.00	96.14	3350400.00	76.91	19.23
20:30	73800.00	31.5	25.2	4189893.00	96.19	3351914.40	76.95	19.24
20:31	73860.00	31.4	25.12	4191780.00	96.23	3353424.00	76.98	19.25
20:32	73920.00	31.2	24.96	4193658.00	96.27	3354926.40	77.02	19.25
20:33	73980.00	31.1	24.88	4195527.00	96.32	3356421.60	77.05	19.26
20:34	74040.00	31.1	24.88	4197393.00	96.36	3357914.40	77.09	19.27
20:35	74100.00	31	24.8	4199256.00	96.40	3359404.80	77.12	19.28
20:36	74160.00	30.9	24.72	4201113.00	96.44	3360890.40	77.16	19.29
20:37	74220.00	30.9	24.72	4202967.00	96.49	3362373.60	77.19	19.30
20:38	74280.00	30.8	24.64	4204818.00	96.53	3363854.40	77.22	19.31
20:39	74340.00	30.8	24.64	4206666.00	96.57	3365332.80	77.26	19.31
20:40	74400.00	30.7	24.56	4208511.00	96.61	3366808.80	77.29	19.32
20:41	74460.00	30.7	24.56	4210353.00	96.66	3368282.40	77.33	19.33
20:42	74520.00	30.6	24.48	4212192.00	96.70	3369753.60	77.36	19.34
20:43	74580.00	30.6	24.48	4214028.00	96.74	3371222.40	77.39	19.35
20:44	74640.00	30.5	24.4	4215861.00	96.78	3372688.80	77.43	19.36
20:45	74700.00	30.5	24.4	4217691.00	96.82	3374152.80	77.46	19.36
20:46	74760.00	30.4	24.32	4219518.00	96.87	3375614.40	77.49	19.37
20:47	74820.00	30.4	24.32	4221342.00	96.91	3377073.60	77.53	19.38
20:48	74880.00	30.3	24.24	4223163.00	96.95	3378530.40	77.56	19.39
20:49	74940.00	30.3	24.24	4224981.00	96.99	3379984.80	77.59	19.40
20:50	75000.00	30.2	24.16	4226796.00	97.03	3381436.80	77.63	19.41
20:51	75060.00	30.1	24.08	4228605.00	97.08	3382884.00	77.66	19.42
20:52	75120.00	30	24	4230408.00	97.12	3384326.40	77.69	19.42
20:53	75180.00	29.9	23.92	4232205.00	97.16	3385764.00	77.73	19.43
20:54	75240.00	29.8	23.84	4233996.00	97.20	3387196.80	77.76	19.44
20:55	75300.00	29.7	23.76	4235781.00	97.24	3388624.80	77.79	19.45
20:56	75360.00	29.6	23.68	4237560.00	97.28	3390048.00	77.82	19.46
20:57	75420.00	29.5	23.6	4239333.00	97.32	3391466.40	77.86	19.46
20:58	75480.00	29.4	23.52	4241100.00	97.36	3392880.00	77.89	19.47
20:59	75540.00	29.3	23.44	4242861.00	97.40	3394288.80	77.92	19.48
21:00	75600.00	29.3	23.44	4244619.00	97.44	3395695.20	77.95	19.49
21:01	75660.00	29.2	23.36	4246374.00	97.48	3397099.20	77.99	19.50
21:02	75720.00	29.1	23.28	4248123.00	97.52	3398498.40	78.02	19.50
21:03	75780.00	29	23.2	4249866.00	97.56	3399892.80	78.05	19.51
21:04	75840.00	28.9	23.12	4251603.00	97.60	3401282.40	78.08	19.52
21:05	75900.00	28.9	23.12	4253337.00	97.64	3402669.60	78.11	19.53
21:06	75960.00	28.8	23.04	4255068.00	97.68	3404054.40	78.15	19.54
21:07	76020.00	28.7	22.96	4256793.00	97.72	3405434.40	78.18	19.54

21:08	76080.00	28.7	22.96	4258515.00	97.76	3406812.00	78.21	19.55
21:09	76140.00	28.6	22.88	4260234.00	97.80	3408187.20	78.24	19.56
21:10	76200.00	28.5	22.8	4261947.00	97.84	3409557.60	78.27	19.57
21:11	76260.00	28.4	22.72	4263654.00	97.88	3410923.20	78.30	19.58
21:12	76320.00	28.4	22.72	4265358.00	97.92	3412286.40	78.34	19.58
21:13	76380.00	28.3	22.64	4267059.00	97.96	3413647.20	78.37	19.59
21:14	76440.00	28.2	22.56	4268754.00	98.00	3415003.20	78.40	19.60
21:15	76500.00	28.1	22.48	4270443.00	98.04	3416354.40	78.43	19.61
21:16	76560.00	28.1	22.48	4272129.00	98.07	3417703.20	78.46	19.61
21:17	76620.00	28	22.4	4273812.00	98.11	3419049.60	78.49	19.62
21:18	76680.00	27.9	22.32	4275489.00	98.15	3420391.20	78.52	19.63
21:19	76740.00	27.8	22.24	4277160.00	98.19	3421728.00	78.55	19.64
21:20	76800.00	27.8	22.24	4278828.00	98.23	3423062.40	78.58	19.65
21:21	76860.00	27.7	22.16	4280493.00	98.27	3424394.40	78.61	19.65
21:22	76920.00	27.7	22.16	4282155.00	98.30	3425724.00	78.64	19.66
21:23	76980.00	27.6	22.08	4283814.00	98.34	3427051.20	78.67	19.67
21:24	77040.00	27.6	22.08	4285470.00	98.38	3428376.00	78.70	19.68
21:25	77100.00	27.5	22	4287123.00	98.42	3429698.40	78.74	19.68
21:26	77160.00	27.5	22	4288773.00	98.46	3431018.40	78.77	19.69
21:27	77220.00	27.4	21.92	4290420.00	98.49	3432336.00	78.80	19.70
21:28	77280.00	27.4	21.92	4292064.00	98.53	3433651.20	78.83	19.71
21:29	77340.00	27.3	21.84	4293705.00	98.57	3434964.00	78.86	19.71
21:30	77400.00	27.2	21.76	4295340.00	98.61	3436272.00	78.89	19.72
21:31	77460.00	27.2	21.76	4296972.00	98.64	3437577.60	78.92	19.73
21:32	77520.00	27.1	21.68	4298601.00	98.68	3438880.80	78.95	19.74
21:33	77580.00	27.1	21.68	4300227.00	98.72	3440181.60	78.98	19.74
21:34	77640.00	27	21.6	4301850.00	98.76	3441480.00	79.01	19.75
21:35	77700.00	26.9	21.52	4303467.00	98.79	3442773.60	79.04	19.76
21:36	77760.00	26.8	21.44	4305078.00	98.83	3444062.40	79.06	19.77
21:37	77820.00	26.7	21.36	4306683.00	98.87	3445346.40	79.09	19.77
21:38	77880.00	26.6	21.28	4308282.00	98.90	3446625.60	79.12	19.78
21:39	77940.00	26.5	21.2	4309875.00	98.94	3447900.00	79.15	19.79
21:40	78000.00	26.4	21.12	4311462.00	98.98	3449169.60	79.18	19.80
21:41	78060.00	26.4	21.12	4313046.00	99.01	3450436.80	79.21	19.80
21:42	78120.00	26.3	21.04	4314627.00	99.05	3451701.60	79.24	19.81
21:43	78180.00	26.2	20.96	4316202.00	99.09	3452961.60	79.27	19.82
21:44	78240.00	26.2	20.96	4317774.00	99.12	3454219.20	79.30	19.82
21:45	78300.00	26.1	20.88	4319343.00	99.16	3455474.40	79.33	19.83
21:46	78360.00	26.1	20.88	4320909.00	99.19	3456727.20	79.36	19.84
21:47	78420.00	26	20.8	4322472.00	99.23	3457977.60	79.38	19.85
21:48	78480.00	26	20.8	4324032.00	99.27	3459225.60	79.41	19.85
21:49	78540.00	26	20.8	4325592.00	99.30	3460473.60	79.44	19.86
21:50	78600.00	25.9	20.72	4327149.00	99.34	3461719.20	79.47	19.87
21:51	78660.00	25.9	20.72	4328703.00	99.37	3462962.40	79.50	19.87
21:52	78720.00	25.9	20.72	4330257.00	99.41	3464205.60	79.53	19.88
21:53	78780.00	25.9	20.72	4331811.00	99.44	3465448.80	79.56	19.89
21:54	78840.00	25.8	20.64	4333362.00	99.48	3466689.60	79.58	19.90
21:55	78900.00	25.8	20.64	4334910.00	99.52	3467928.00	79.61	19.90
21:56	78960.00	25.8	20.64	4336458.00	99.55	3469166.40	79.64	19.91
21:57	79020.00	25.8	20.64	4338006.00	99.59	3470404.80	79.67	19.92
21:58	79080.00	25.8	20.64	4339554.00	99.62	3471643.20	79.70	19.92
21:59	79140.00	25.7	20.56	4341099.00	99.66	3472879.20	79.73	19.93
22:00	79200.00	25.7	20.56	4342641.00	99.69	3474112.80	79.75	19.94
22:01	79260.00	25.7	20.56	4344183.00	99.73	3475346.40	79.78	19.95
22:02	79320.00	25.6	20.48	4345722.00	99.76	3476577.60	79.81	19.95
22:03	79380.00	25.6	20.48	4347258.00	99.80	3477806.40	79.84	19.96
22:04	79440.00	25.6	20.48	4348794.00	99.83	3479035.20	79.87	19.97
22:05	79500.00	25.6	20.48	4350330.00	99.87	3480264.00	79.90	19.97
22:06	79560.00	25.6	20.48	4351866.00	99.91	3481492.80	79.92	19.98
22:07	79620.00	25.6	20.48	4353402.00	99.94	3482721.60	79.95	19.99
22:08	79680.00	25.6	20.48	4354938.00	99.98	3483950.40	79.98	20.00
22:09	79740.00	25.6	20.48	4356474.00	100.01	3485179.20	80.01	20.00
22:10	79800.00	25.6	20.48	4358010.00	100.05	3486408.00	80.04	20.01
22:11	79860.00	25.5	20.4	4359543.00	100.08	3487634.40	80.07	20.02
22:12	79920.00	25.5	20.4	4361073.00	100.12	3488858.40	80.09	20.02
22:13	79980.00	25.5	20.4	4362603.00	100.15	3490082.40	80.12	20.03
22:14	80040.00	25.5	20.4	4364133.00	100.19	3491306.40	80.15	20.04
22:15	80100.00	25.5	20.4	4365663.00	100.22	3492530.40	80.18	20.04
22:16	80160.00	25.5	20.4	4367193.00	100.26	3493754.40	80.21	20.05
22:17	80220.00	25.5	20.4	4368723.00	100.29	3494978.40	80.23	20.06
22:18	80280.00	25.4	20.32	4370250.00	100.33	3496200.00	80.26	20.07
22:19	80340.00	25.4	20.32	4371774.00	100.36	3497419.20	80.29	20.07
22:20	80400.00	25.4	20.32	4373298.00	100.40	3498638.40	80.32	20.08
22:21	80460.00	25.3	20.24	4374819.00	100.43	3499855.20	80.35	20.09
22:22	80520.00	25.3	20.24	4376337.00	100.47	3501069.60	80.37	20.09
22:23	80580.00	25.2	20.16	4377852.00	100.50	3502281.60	80.40	20.10
22:24	80640.00	25.2	20.16	4379364.00	100.54	3503491.20	80.43	20.11
22:25	80700.00	25.2	20.16	4380876.00	100.57	3504700.80	80.46	20.11
22:26	80760.00	25.1	20.08	4382385.00	100.61	3505908.00	80.48	20.12
22:27	80820.00	25.1	20.08	4383891.00	100.64	3507112.80	80.51	20.13
22:28	80880.00	25.1	20.08	4385397.00	100.67	3508317.60	80.54	20.13
22:29	80940.00	25.1	20.08	4386903.00	100.71	3509522.40	80.57	20.14
22:30	81000.00	25.1	20.08	4388409.00	100.74	3510727.20	80.60	20.15
22:31	81060.00	25.1	20.08	4389915.00	100.78	3511932.00	80.62	20.16
22:32	81120.00	25.1	20.08	4391421.00	100.81	3513136.80	80.65	20.16
22:33	81180.00	25.1	20.08	4392927.00	100.85	3514341.60	80.68	20.17
22:34	81240.00	25.1	20.08	4394433.00	100.88	3515546.40	80.71	20.18
22:35	81300.00	25.2	20.16	4395942.00	100.92	3516753.60	80.73	20.18
22:36	81360.00	25.2	20.16	4397454.00	100.95	3517963.20	80.76	20.19
22:37	81420.00	25.3	20.24	4398969.00	100.99	3519175.20	80.79	20.20
22:38	81480.00	25.4	20.32	4400490.00	101.02	3520392.00	80.82	20.20
22:39	81540.00	25.4	20.32	4402014.00	101.06	3521611.20	80.85	20.21
22:40	81600.00	25.5	20.4	4403541.00	101.09	3522832.80	80.87	20.22
22:41	81660.00	25.6	20.48	4405074.00	101.13	3524059.20	80.90	20.23
22:42	81720.00	25.7	20.56	4406613.00	101.16	3525290.40	80.93	20.23
22:43	81780.00	25.7	20.56	4408155.00	101.20	3526524.00	80.96	20.24
22:44	81840.00	25.8	20.64	4409700.00	101.23	3527760.00	80.99	20.25
22:45	81900.00	25.9	20.72	4411251.00	101.27	3529000.80	81.01	20.25

22:46	81960.00	25.9	20.72	4412805.00	101.30	3530244.00	81.04	20.26
22:47	82020.00	26	20.8	4414362.00	101.34	3531489.60	81.07	20.27
22:48	82080.00	26.1	20.88	4415925.00	101.38	3532740.00	81.10	20.28
22:49	82140.00	26.1	20.88	4417491.00	101.41	3533992.80	81.13	20.28
22:50	82200.00	26.1	20.88	4419057.00	101.45	3535245.60	81.16	20.29
22:51	82260.00	26.1	20.88	4420623.00	101.48	3536498.40	81.19	20.30
22:52	82320.00	26.1	20.88	4422189.00	101.52	3537751.20	81.22	20.30
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22:56	82560.00	26.2	20.96	4428468.00	101.66	3542774.40	81.33	20.33
22:57	82620.00	26.2	20.96	4430040.00	101.70	3544032.00	81.36	20.34
22:58	82680.00	26.2	20.96	4431612.00	101.74	3545289.60	81.39	20.35
22:59	82740.00	26.2	20.96	4433184.00	101.77	3546547.20	81.42	20.35
23:00	82800.00	26.2	20.96	4434756.00	101.81	3547804.80	81.45	20.36
23:01	82860.00	26.2	20.96	4436328.00	101.84	3549062.40	81.48	20.37
23:02	82920.00	26.3	21.04	4437903.00	101.88	3550322.40	81.50	20.38
23:03	82980.00	26.3	21.04	4439481.00	101.92	3551584.80	81.53	20.38
23:04	83040.00	26.3	21.04	4441059.00	101.95	3552847.20	81.56	20.39
23:05	83100.00	26.3	21.04	4442637.00	101.99	3554109.60	81.59	20.40
23:06	83160.00	26.3	21.04	4444215.00	102.03	3555372.00	81.62	20.41
23:07	83220.00	26.3	21.04	4445793.00	102.06	3556634.40	81.65	20.41
23:08	83280.00	26.4	21.12	4447374.00	102.10	3557899.20	81.68	20.42
23:09	83340.00	26.4	21.12	4448958.00	102.13	3559166.40	81.71	20.43
23:10	83400.00	26.4	21.12	4450542.00	102.17	3560433.60	81.74	20.43
23:11	83460.00	26.4	21.12	4452126.00	102.21	3561700.80	81.77	20.44
23:12	83520.00	26.4	21.12	4453710.00	102.24	3562968.00	81.79	20.45
23:13	83580.00	26.4	21.12	4455294.00	102.28	3564235.20	81.82	20.46
23:14	83640.00	26.4	21.12	4456878.00	102.32	3565502.40	81.85	20.46
23:15	83700.00	26.4	21.12	4458462.00	102.35	3566769.60	81.88	20.47
23:16	83760.00	26.4	21.12	4460046.00	102.39	3568036.80	81.91	20.48
23:17	83820.00	26.3	21.04	4461627.00	102.42	3569301.60	81.94	20.48
23:18	83880.00	26.3	21.04	4463205.00	102.46	3570564.00	81.97	20.49
23:19	83940.00	26.3	21.04	4464783.00	102.50	3571826.40	82.00	20.50
23:20	84000.00	26.3	21.04	4466361.00	102.53	3573088.80	82.03	20.51
23:21	84060.00	26.3	21.04	4467939.00	102.57	3574351.20	82.06	20.51
23:22	84120.00	26.3	21.04	4469517.00	102.61	3575613.60	82.08	20.52
23:23	84180.00	26.3	21.04	4471095.00	102.64	3576876.00	82.11	20.53
23:24	84240.00	26.3	21.04	4472673.00	102.68	3578138.40	82.14	20.54
23:25	84300.00	26.3	21.04	4474251.00	102.71	3579400.80	82.17	20.54
23:26	84360.00	26.3	21.04	4475829.00	102.75	3580663.20	82.20	20.55
23:27	84420.00	26.3	21.04	4477407.00	102.79	3581925.60	82.23	20.56
23:28	84480.00	26.3	21.04	4478985.00	102.82	3583188.00	82.26	20.56
23:29	84540.00	26.3	21.04	4480563.00	102.86	3584450.40	82.29	20.57
23:30	84600.00	26.3	21.04	4482141.00	102.90	3585712.80	82.32	20.58
23:31	84660.00	26.2	20.96	4483716.00	102.93	3586972.80	82.35	20.59
23:32	84720.00	26.2	20.96	4485288.00	102.97	3588230.40	82.37	20.59
23:33	84780.00	26.2	20.96	4486860.00	103.00	3589488.00	82.40	20.60
23:34	84840.00	26.1	20.88	4488429.00	103.04	3590743.20	82.43	20.61
23:35	84900.00	26.1	20.88	4489995.00	103.08	3591996.00	82.46	20.62
23:36	84960.00	26	20.8	4491558.00	103.11	3593246.40	82.49	20.62
23:37	85020.00	26	20.8	4493118.00	103.15	3594494.40	82.52	20.63
23:38	85080.00	25.9	20.72	4494675.00	103.18	3595740.00	82.55	20.64
23:39	85140.00	25.8	20.64	4496226.00	103.22	3596980.80	82.58	20.64
23:40	85200.00	25.8	20.64	4497774.00	103.25	3598219.20	82.60	20.65
23:41	85260.00	25.7	20.56	4499319.00	103.29	3599455.20	82.63	20.66
23:42	85320.00	25.7	20.56	4500861.00	103.33	3600688.80	82.66	20.67
23:43	85380.00	25.7	20.56	4502403.00	103.36	3601922.40	82.69	20.67
23:44	85440.00	25.6	20.48	4503942.00	103.40	3603153.60	82.72	20.68
23:45	85500.00	25.6	20.48	4505478.00	103.43	3604382.40	82.75	20.69
23:46	85560.00	25.6	20.48	4507014.00	103.47	3605611.20	82.77	20.69
23:47	85620.00	25.6	20.48	4508550.00	103.50	3606840.00	82.80	20.70
23:48	85680.00	25.6	20.48	4510086.00	103.54	3608068.80	82.83	20.71
23:49	85740.00	25.5	20.4	4511619.00	103.57	3609295.20	82.86	20.71
23:50	85800.00	25.5	20.4	4513149.00	103.61	3610519.20	82.89	20.72
23:51	85860.00	25.5	20.4	4514679.00	103.64	3611743.20	82.91	20.73
23:52	85920.00	25.5	20.4	4516209.00	103.68	3612967.20	82.94	20.74
23:53	85980.00	25.5	20.4	4517739.00	103.71	3614191.20	82.97	20.74
23:54	86040.00	25.5	20.4	4519269.00	103.75	3615415.20	83.00	20.75
23:55	86100.00	25.5	20.4	4520799.00	103.78	3616639.20	83.03	20.76
23:56	86160.00	25.5	20.4	4522329.00	103.82	3617863.20	83.05	20.76
23:57	86220.00	25.5	20.4	4523859.00	103.85	3619087.20	83.08	20.77
23:58	86280.00	25.5	20.4	4525389.00	103.89	3620311.20	83.11	20.78
23:59	86340.00	25.5	20.4	4526919.00	103.92	3621535.20	83.14	20.78
24.00	86400.00	25.5	20.4	4528449.00	103.96	3622759.20	83.17	20.79

APPENDIX D: REFERENCES

Preliminary Drainage Report

Eagleview Subdivision
El Paso County, Colorado

Prepared for:
Joe DesJardin
PT Eagleview LLC
1864 Woodmoor Drive, Suite 100
Monument, CO 80132

Prepared by:
Kimley-Horn and Associates, Inc.
2 North Nevada Avenue, Suite 300
Colorado Springs, Colorado 80903
(719) 453-0180
Contact: Brice Hammersland, P.E.

Project #: 196288000

PCD Filing No.: SP216

Prepared: October 28, 2022

Kimley»Horn

CERTIFICATION

DESIGN ENGINEER'S STATEMENT

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

SIGNATURE (Affix Seal): ______________________ 10/28/2022

Brice Hammersland, P.E.
Colorado P.E. No. 56012

Date

COLORADO REGISTERED PROFESSIONAL ENGINEER BRICE HAMMERSLAND 56012 10/28/2022

OWNER/DEVELOPER'S STATEMENT

I, the developer, have read and will comply with all of the requirements specified in this Drainage Report and Plan.

____

PT Eagleview LLC

Joseph W. DesJardin 10/28/2022

Authorized Signature Date

____

Joseph W. DesJardin

____

Director of Entitlements

____

Address:
1864 Woodmoor Drive
Monument, CO 80132

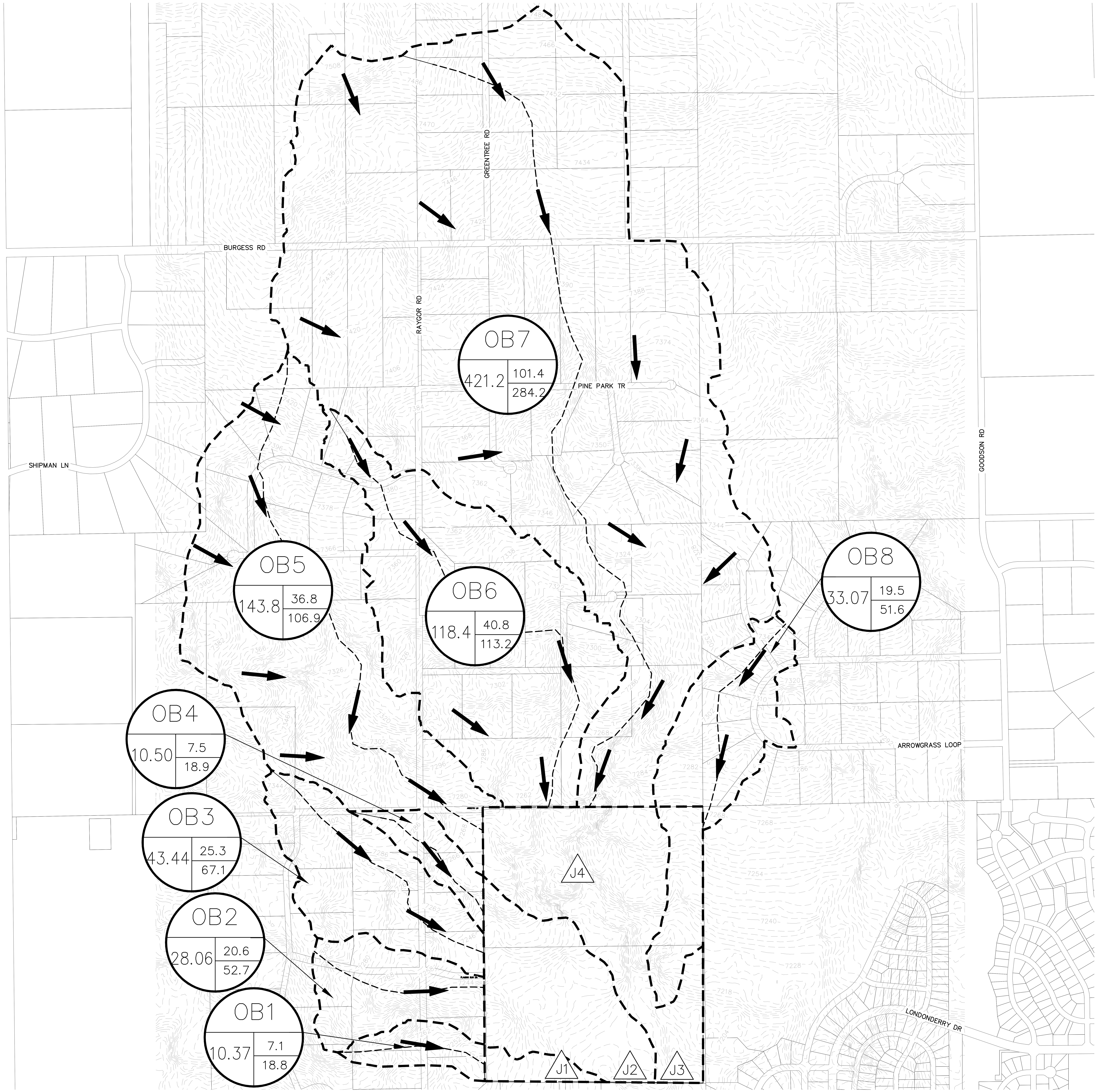
EL PASO COUNTY

Filed in accordance with the requirements of the Drainage Criteria Manual, Volumes 1 and 2, El Paso County Engineering Criteria Manual and Land Development Code as amended.

______________________ ______________________

Josh Palmer, P.E. Date
County Engineer/ ECM Administrator

Conditions:



LEGEND

- DRAINAGE BASIN AREAS
- A – HEC-HMS BASINS
- B – BASIN ACREAGE
- C – 5-YR RUNOFF
- D – 100-YR RUNOFF
- E0 DESIGN POINT
- EXISTING CONTOURS
- PROPERTY BOUNDARY
- FLOW ARROW
- FLOW PATH
- PARCEL LINE

HEC-HMS - EXISTING RUNOFF TABLE						
DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE DIRECT 5-YR RUNOFF (CFS)	CUMULATIVE DIRECT 100-YR RUNOFF (CFS)
	B1	5.55	3.0	8.5	-	-
J1	OB1	10.37	7.1	18.8	10.1	27.3
	B2	41.43	15.4	48.5	-	-
	OB2	28.06	20.6	52.7	-	-
	OB3	43.44	25.3	67.1	-	-
J2	OB4	10.50	7.5	18.9	67.5	183.8
	OB5	143.82	36.8	106.9	-	-
	OB6	118.40	40.8	113.2	-	-
J4	OB7	421.43	101.4	284.2	169.2	478.0
	B3	59.54	36.4	110.0	-	-
	B4	14.68	5.4	18.2	-	-
J3	OB8	33.07	19.5	51.6	183.1	515.5

NORTH

GRAPHIC SCALE IN FEET
0 250 500 1000

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn

2 North Nevada Avenue Suite 300
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: MK
DRAWN BY: RS
CHECKED BY: KK
DATE: 04/08/2022

EAGLEVIEW
EL PASO COUNTY, COLORADO
PRE DEVELOPMENT DRAINAGE MAP

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
196288000

SHEET
1

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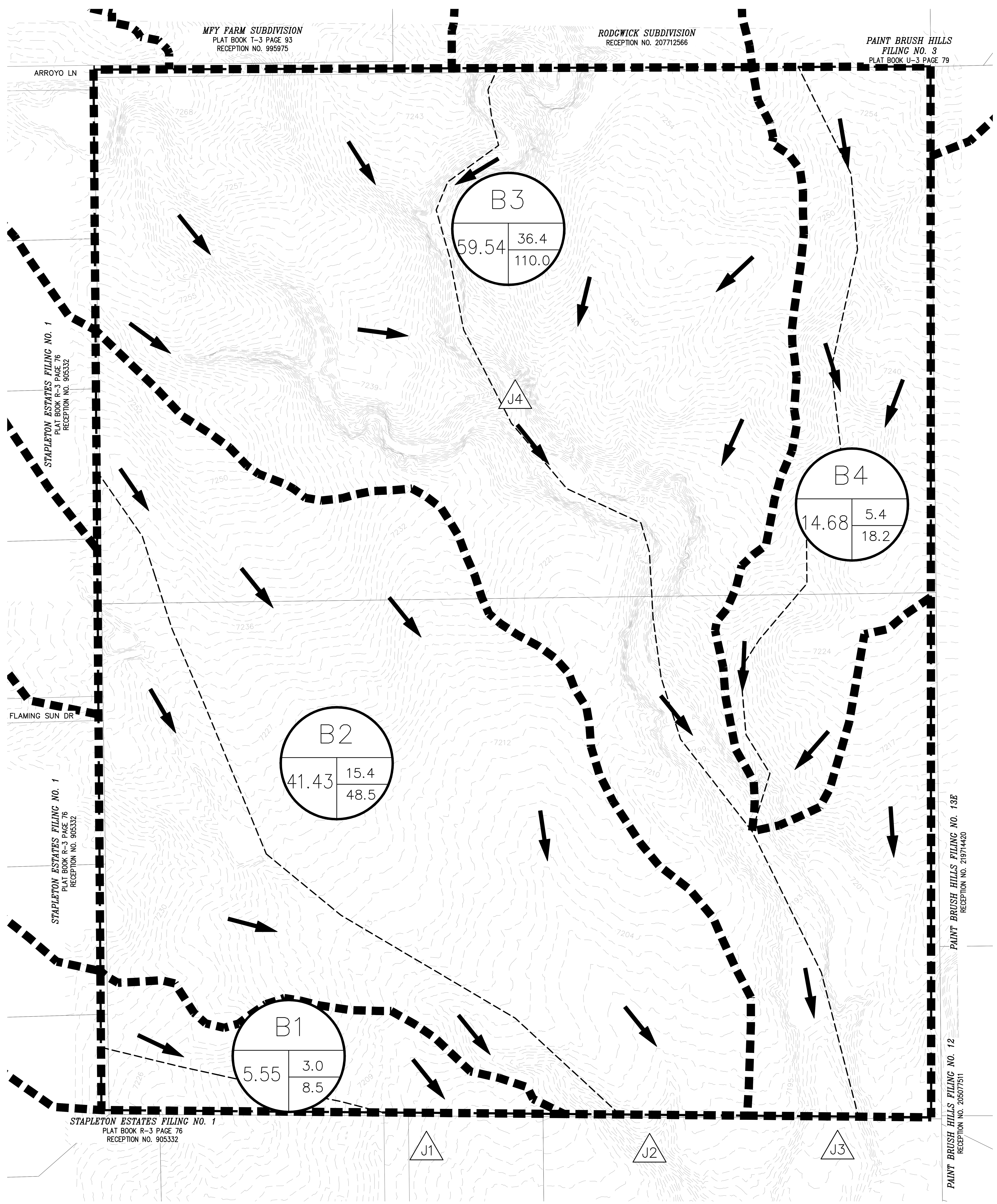

LEGEND

- DRAINAGE BASIN AREAS
- A – HEC-HMS BASINS
- B – BASIN ACREAGE
- C – 5-YR RUNOFF
- D – 100-YR RUNOFF
- DESIGN POINT
- EXISTING CONTOURS
- PROPERTY BOUNDARY
- FLOW ARROW
- FLOW PATH

HEC-HMS - EXISTING RUNOFF TABLE						
DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE DIRECT 5-YR RUNOFF (CFS)	CUMULATIVE DIRECT 100-YR RUNOFF (CFS)
	B1	5.55	3.0	8.5	-	-
J1	OB1	10.37	7.1	18.8	10.1	27.3
	B2	41.43	15.4	48.5	-	-
	OB2	28.06	20.6	52.7	-	-
	OB3	43.44	25.3	67.1	-	-
J2	OB4	10.50	7.5	18.9	67.5	183.8
	OB5	143.82	36.8	106.9	-	-
	OB6	118.40	40.8	113.2	-	-
J4	OB7	421.43	101.4	284.2	169.2	478.0
	B3	59.54	36.4	110.0	-	-
	B4	14.68	5.4	18.2	-	-
J3	OB8	33.07	19.5	51.6	183.1	515.5

NORTH

GRAPHIC SCALE IN FEET
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NO. | REVISION | BY | DATE | APPR.

Kimley»Horn
© 2022 KIMLEY-HORN AND ASSOCIATES, INC.
2 North Nevada Avenue Suite 300
Colorado Springs, Colorado 80903 (719) 453-0180

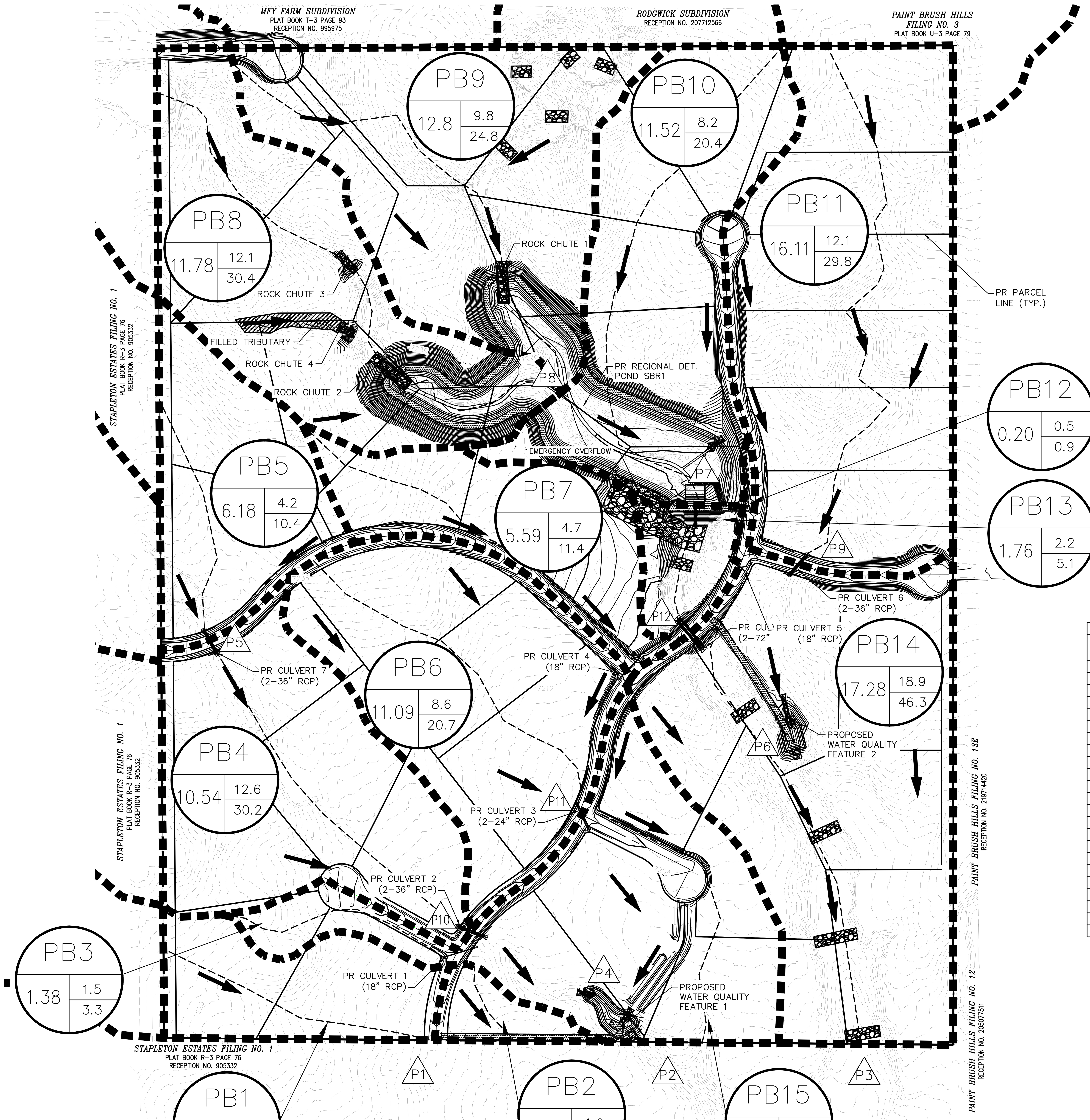
DESIGNED BY: MK
DRAWN BY: RS
CHECKED BY: KK
DATE: 04/08/2022

EAGLEVIEW
EL PASO COUNTY, COLORADO
PRE DEVELOPMENT DRAINAGE MAP

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
196288000

SHEET
2



LEGEND

- DRAINAGE BASIN AREAS
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- C – 5-YR RUNOFF
- D – 100-YR RUNOFF
- E0 DESIGN POINT
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY BOUNDARY
- FLOW ARROW
- FLOW PATH
- DROP STRUCTURE

HEC-HMS - DEVELOPED RUNOFF BASIN TABLE			
BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)
OB1	10.37	7.1	18.8
OB2	28.06	20.6	52.7
OB3	43.44	25.3	67.1
OB4	10.50	7.5	18.9
OB5	143.82	36.8	106.9
OB6	118.40	42.1	114.9
OB7	421.43	101.4	284.3
OB8	33.07	19.0	51.0
PB1	4.25	3.0	7.7
PB2	1.08	1.0	2.4
PB3	1.38	1.5	3.3
PB4	10.54	12.6	30.2
PB5	6.18	4.2	10.4
PB6	11.09	8.6	20.7
PB7	5.59	4.7	11.4
PB8	11.78	12.1	30.4
PB9	12.80	9.8	24.8
PB10	11.52	8.2	20.4
PB11	16.11	12.1	29.8
PB12	0.20	0.5	0.9
PB13	1.76	2.2	5.1
PB14	17.28	18.9	46.3
PB15	9.63	11.0	26.3

HEC-HMS - DEVELOPED RUNOFF DESIGN POINT TABLE				
DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (ACRES)	CUMULATIVE 5-YR FLOW (CFS)	CUMULATIVE 100-YR FLOW (CFS)
P1	OB1, PB1	14.62	10.1	26.4
P2	OB2, OB3, OB4, PB3, PB4, PB5, PB6, PB7, PB15	126.42	74.1	189.1
P3	OB5, OB6, OB7, OB8, PB8, PB9, PB10, PB11, PB12, PB13, PB14	787.97	131.8	437.7
P4	OB2, OB3, OB4, PB3, PB4, PB5, PB6, PB7	116.79	72.2	184.6
P5 (CULVERT 7)	OB3, OB4, PB5	60.12	36.8	95.9
P6	OB8, PB11, PB12	49.38	29.9	78.5
P7 (POND SR1)	OB5, OB6, OB7, PB8, PB9, PB10	719.49	131.7	420.1
P8	OB5, OB6, OB7, PB8, PB9, PB10	707.97	173.4	486.7
P9 (CULVERT 6)	OB8, PB11	49.18	29.8	78.4
P10 (CULVERT 2)	OB2, OB3, OB4, PB4, PB5	98.72	57.9	150.1
P11 (CULVERT 3)	PB6, PB7	16.68	13.2	31.9
P12 (CULVERT 8)	OB5, OB6, OB7, PB8, PB9, PB10, PB13	721.28	137.9	420.3

NOTES:
1. LOCATION OF DROP STRUCTURES IS APPROXIMATE AND WILL BE FINALIZED IN THE FINAL DRAINAGE REPORT.

NORTH

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NO. | REVISION | BY | DATE | APPR.

Kimley»Horn

2 North Nevada Avenue Suite 300
Colorado Springs, Colorado 80903 (719) 453-0180

DESIGNED BY: MK
DRAWN BY: RS
CHECKED BY: KK
DATE: 04/08/2022

EAGLEVIEW
EL PASO COUNTY, COLORADO
POST DEVELOPMENT DRAINAGE MAP

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PROJECT NO. 196288000

SHEET
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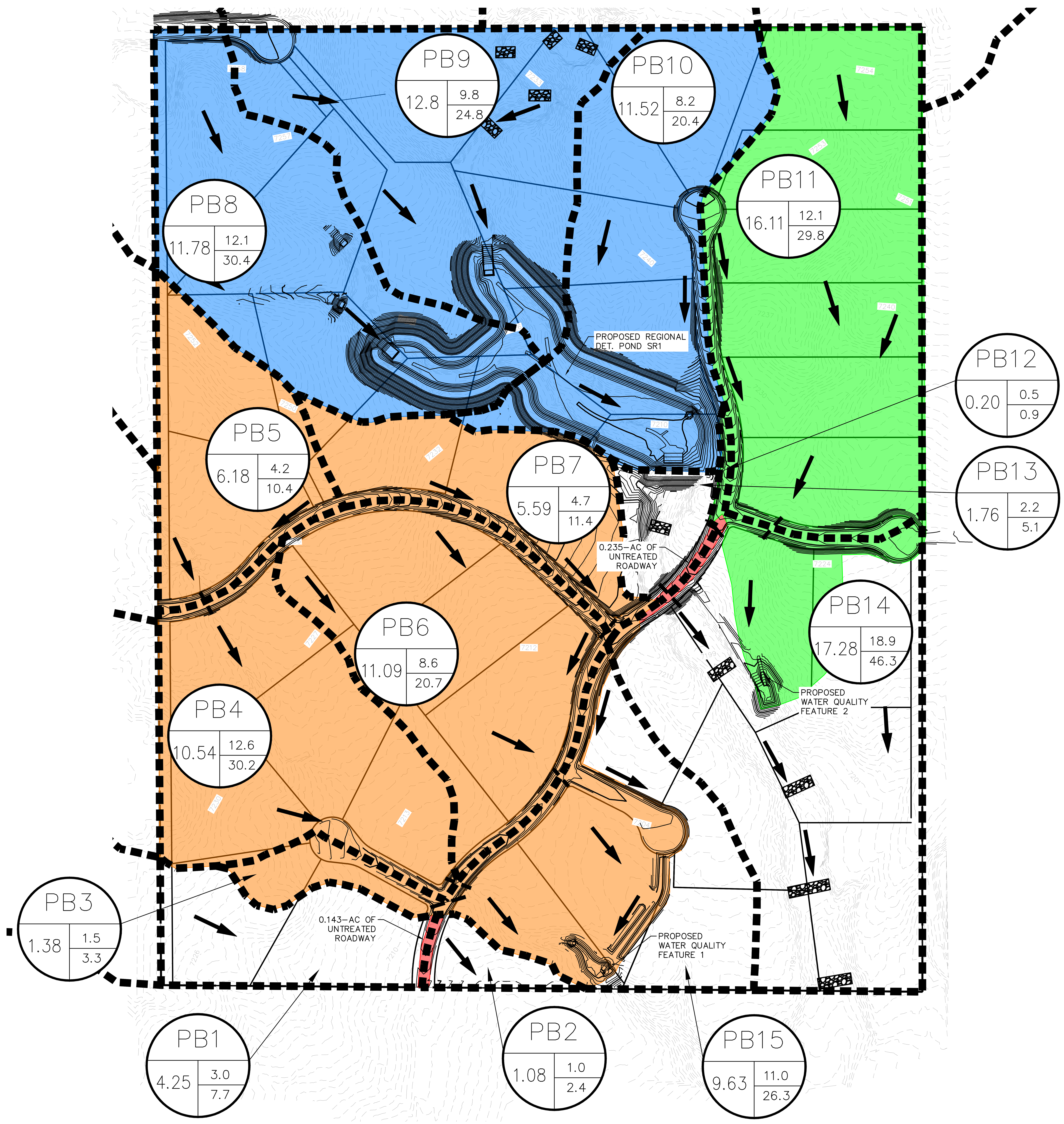

LEGEND

- DRAINAGE BASIN AREAS
- A – HEC-HMS BASINS
- B – BASIN ACREAGE
- C – 5-YR RUNOFF
- D – 100-YR RUNOFF
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY BOUNDARY
- FLOW ARROW
- FLOW PATH
- AREA TRIBUTARY TO SR1
- AREA TRIBUTARY TO WQF1
- AREA TRIBUTARY TO WQF2
- ROADWAY AREA NOT TREATED

NOTES:
1. NON-ROADWAY AREAS NOT TREATED BY A PBMP ARE EXCLUDED BASED ON ECM APP I.7.1.B.5.
2. ROADWAY AREA NOT TREATED BY A PBMP TOTALS 0.39 ACRES AND IS EXCLUDED BASED ON ECM APP I.7.1.C.1.

NORTH

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DESIGNED BY: MK
DRAWN BY: RS
CHECKED BY: KK
DATE: 04/08/2022

EAGLEVIEW
EL PASO COUNTY, COLORADO
OVERVIEW MAP - PBMP TRIBUTARY AREAS

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4

I.7. - POST-CONSTRUCTION STORMWATER MANAGEMENT

I.7.1. Post-Construction Stormwater Management Planning

[Replaces DCM2 Section 4.1, pages 4-1 through "Other BMPs" continued on 4-5]

A. **Overview.** This chapter contains requirements and procedures for the selection, installation, implementation and maintenance of permanent stormwater quality control measures that will remain in operation after construction for new development and significant redevelopment. All applicable development sites must have operational permanent stormwater quality control measures at the completion of the site, unless excluded from the requirements of an applicable development site as described in Section I.7.1.C. All permanent control measures for applicable development sites shall meet one of the "base design standards" described in Section 1.71.D.

In the case where permanent water quality control measures are part of future phasing, the permittee must have a mechanism to ensure that all control measures will be implemented, regardless of completion of future phases or site ownership. In such cases, temporary water quality control measures must be implemented as feasible and maintained until removed or modified. All temporary water quality control measure must meet one of the "base design standards" described in Section I.7.1.D.

A procedure is provided within the context of a flow chart and a four-step process that shall be followed for all applicable development sites. Detailed descriptions, sizing and design criteria, and design procedures for control measures are provided in the New Development BMP Factsheets found in Section 4.2 of the DCMV2.

It is recommended that discussions and collaboration regarding proposed BMPs occur early in each project between the developer's planner and engineer, County Stormwater and County Planning and Community Development staff.

The analysis of the requirements, exclusions and base design standards presented in this Section I.7 shall be incorporated into existing ECM Administrator submittals for review and acceptance including Preliminary/Final Drainage Reports and construction plans, or as otherwise specified by the ECM Administrator.

B. **Applicable Development Sites: Excluded Sites.** The following types of sites and associated land disturbances are excluded from the requirements of this Section 1.7. Although a site may qualify for an exclusion to Section 1.7 below, the site may still be considered an applicable construction activity subject to the requirements of an ESQCP or BESQCP.

1. **Pavement Management Sites.** Sites, or portions of sites, for the rehabilitation, maintenance, and reconstruction of roadway pavement, which includes roadway resurfacing, mill and overlay, white topping, black topping, curb and gutter replacement, concrete panel replacement, and pothole repair. The purpose of the site must be to provide additional years of service life and optimize service and safety. The site also must be limited to the repair and replacement of pavement in a manner that does not result in an increased impervious area, and the infrastructure must not substantially change. The types of sites covered under this exclusion include day-to-day maintenance activities, rehabilitation, and reconstruction of pavement. "Roadways" include roads and bridges that are improved, designed or ordinarily used for vehicular travel and contiguous areas or that are improved, designed or ordinarily used for pedestrian or bicycle traffic, drainage for the roadway, and/or parking along the roadway. Areas primarily used for parking or access to parking are not roadways.

2. **Excluded Roadway Redevelopment.** Redevelopment sites for existing roadways, when 1 of the following cri
   1) The site adds less than 1 acre of paved area per mile of roadway to an existing roadway, or
   2) The site does not add more than 8.25 feet of paved width at any location to the existing roadway.
3. **Excluded Existing Roadway Areas.** For redevelopment sites for existing roadways, only the area of the existing roadway is excluded from the requirements of an applicable development site when the site does not increase the width by 2 times or more, on average, of the original roadway area. The entire site is not excluded from being considered an applicable development site for this exclusion. The area of the site that is part of the added new roadway area is still an applicable development site.
4. **Aboveground and Underground Utilities.** Activities for installation or maintenance of underground utilities or infrastructure that does not permanently alter the terrain, ground cover, or drainage patterns from those present prior to the construction activity. This exclusion includes, but is not limited to, activities to install, replace, or maintain utilities under roadways or other paved areas that return the surface to the same condition.
5. **Large Lot Single Family Sites.** A single-family residential lot, or agricultural zoned lands, greater than or equal to 2.5 acres in size per dwelling and having a total lot impervious area of less than 10 percent. A total lot imperviousness greater than 10 percent is allowed when a study specific to the watershed and/or MS4 shows that expected soil and vegetation conditions are suitable for infiltration/filtration of the WQCV for a typical site, and the permittee accepts such study as applicable within its MS4 boundaries. The maximum total lot impervious covered under this exclusion shall be 20 percent.
6. **Non-Residential and Non-Commercial Infiltration Conditions.** This exclusion does not apply to residential or commercial sites for buildings. This exclusion applies to applicable development sites for which post-development surface conditions do not result in concentrated stormwater flow during the 80th percentile stormwater runoff event. In addition, post-development surface conditions must not be projected to result in a surface water discharge from the 80th percentile stormwater runoff events. Specifically, the 80th percentile event must be infiltrated and not discharged as concentrated flow. For this exclusion to apply, a study specific to the site, watershed and/or MS4 must be conducted. The study must show rainfall and soil conditions present within the project area, must include allowable slopes, surface conditions, and ratios of impervious area to pervious area, and the County must accept such study as applicable within its MS4 boundaries.
7. **Sites with Land Disturbance to Undeveloped Land that will Remain Undeveloped.** Sites with land disturbance to undeveloped land (land with no human-made structures such as buildings or pavement) that will remain undeveloped after the site. Typical examples of this type of site are trails, parks and open space without structures.
8. **Stream Stabilization Sites.** Construction activity that is solely for the purpose of stream stabilization.
9. **Trails.** Bike and pedestrian trails. Bike lanes for roadways are not included in this exclusion, unless attached to a roadway that qualifies under another exclusion in this section.
10. **Oil and Gas Exploration.** Facilities associated with oil and gas exploration, production, processing, or treatment operations, or transmission facilities, including activities necessary to prepare a site for drilling and for the movement and placement of drilling equipment, whether or not such field activities or operations may be considered to be an applicable construction activity.
11. **County Growth Areas.** The County may exclude the following when they occur within the county growth areas:

a. Agricultural facilities and structures on agricultural zoned lands (e.g., barn, stables).

b. Residential development site or larger common plans of development for which associated construction activities results in a land disturbance of less than or equal to 10 acres and have a proposed density of less than 1,000 people per square mile.

c. Commercial or industrial development site or larger common plans of development for which associated construction activities results in a land disturbance of less than or equal to 10 acres.

C. **Base Design Standard Requirements.** The "base design standard" is the minimum design standard for new and redevelopment before applying any exclusions or alternative standards. The control measures for applicable development sites shall meet one of the following base design standards:

1. **Water Quality Capture Volume (WQCV) Standard.** The control measures is designed to provide treatment and/or infiltration of the WQCV and:

   a. 100% of the applicable development site is captured, except the County may exclude up to 20 percent, not to exceed 1 acre, of the applicable development site area when the County has determined that it is not practicable to capture runoff from portions of the site that will not drain towards control measures. In addition, the County must also determine that the implementation of a separate control measure for that portion of the site is not practicable (e.g., driveway access that drains directly to street).

   b. Evaluation of the minimum drain time shall be based on the pollutant removal mechanism and functionality of the control measure implemented. Consideration of drain time shall include maintaining vegetation necessary for operation of the control measure (e.g., wetland vegetation).

2. **Pollutant Removal Standard.** The control measures is designed to treat at a minimum the 80th percentile storm event. The control measures shall be designed to treat stormwater runoff in a manner expected to reduce the event mean concentration of total suspended solids (TSS) to a median value of 30 mg/L or less.

   100% of the applicable development site must be captured, except the County may exclude up to 20 percent not to exceed 1 acre of the applicable development site area when the County has determined that it is not practicable to capture runoff from portions of the site that will not drain towards control measures. In addition, the County must also determine that the implementation of a separate control measure for that portion of the site is not practicable (e.g., driveway access that drains directly to street).

3. **Runoff Reduction Standard.** The control measures is designed to infiltrate into the ground where site geology permits, evaporate, or evapotranspire a quantity of water equal to 60% of what the calculated WQCV would be if all impervious area for the applicable development site discharged without infiltration. This base design standard can be met through practices such as green infrastructure. "Green infrastructure" generally refers to control measures that use vegetation, soils, and natural processes or mimic natural processes to manage stormwater. Green infrastructure can be used in place of or in addition to low impact development principles.

4. **Applicable Development Site Draining to a Regional WQCV Control Measure.** The regional WQCV control measure must be designed to accept the drainage from the applicable development site. Stormwater from the site must not discharge to a water of the state before being discharged to the regional WQCV control measure. The regional WQCV control measure must meet the requirements of the WQCV in Part I.7.C.1.

5. **Applicable Development Site Draining to a Regional WQCV Facility.** The regional WQCV facility is

designed to accept drainage from the applicable development site. Stormwater from the site may discharge to a water of the state before being discharged to the regional WQCV facility. Before discharging to a water of the state, at least 20 percent of the upstream imperviousness of the applicable development site must be disconnected from the storm drainage system and drain through a receiving pervious area control measure comprising a footprint of at least 10 percent of the upstream disconnected impervious area of the applicable development site. The control measure must be designed in accordance with a design manual identified by the permittee. In addition, the stream channel between the discharge point of the applicable development site and the regional WQCV facility must be stabilized. The regional WQCV facility must meet the following requirements:

a. The regional WQCV facility must be implemented, functional, and maintained following good engineering, hydrologic and pollution control practices.
b. The regional WQCV facility must be designed and maintained for 100% WQCV for its entire drainage area.
c. The regional WQCV facility must have capacity to accommodate the drainage from the applicable development site.
d. The regional WQCV facility must be designed and built to comply with all assumptions for the development activities planned by the County within its drainage area, including the imperviousness of its drainage area and the applicable development site.
e. Evaluation of the minimum drain time shall be based on the pollutant removal mechanism and functionality of the facility. Consideration of drain time shall include maintaining vegetation necessary for operation of the facility (e.g., wetland vegetation).
f. The County shall require site plans and perform a site plan review consistent with the requirements of this ECM to ensure the regional WQCV facility and control measures for the applicable development site plans include:
    i. Design details for all structural control measures implemented to meet the requirements of Part I.E.4.
    ii. A narrative reference for all non-structural control measures for the site, if applicable. "Non-structural control measures" are control measures that are not structural control measures and include, but are not limited to, control measures that prevent or reduce pollutants being introduced to water or that prevent or reduce the generation of runoff or illicit discharges.
    iii. Documentation of operation and maintenance procedures to ensure the long term observation, maintenance, and operation of the control measures. The documentation shall include frequencies for routine inspections and maintenance activities.
    iv. Documentation regarding easements or other legal means for access of the control measure sites for operation, maintenance, and inspection of control measures.
    v. Confirmation that control measures meet the requirements of section I.7.C
    vi. Confirmation that site plans meet the requirements of County's site plan review and approval requirements
g. The regional WQCV facility must be subject to the County's authority consistent with requirements and actions for a Control Measure in accordance with a base design standard.
h. Regional Facilities must be designed and implemented with flood control or water quality as the primary use. Recreational ponds and reservoirs may not be considered Regional Facilities. Water

bodies listed by name in surface water quality classifications and standards regulations (5 CCR 1002-32 through 5 CCR 1002-38) may not be considered regional facilities.

6. **Constrained Redevelopment Sites Design Standard.** The constrained redevelopment sites standard applies to redevelopment sites meeting the following criteria:
   (a) The applicable redevelopment site is for a site that has greater than 75% impervious area, and
   (b) The County must determine that it is not practicable to meet any of the base design standards in section I.7.1.C (1), (2), or (3). The County's determination shall include an evaluation of the applicable redevelopment site's ability to install a control measure without reducing surface area covered with the structures.

   The control measures is designed to meet one of the following:

   (a) Provide treatment of the WQCV for the area captured. The captured area shall be 50% or more of the impervious area of the applicable redevelopment site. Evaluation of the minimum drain time shall be based on the pollutant removal mechanism and functionality of the control measure implemented,
   (b) The control measures is designed to provide for treatment of the 80th percentile storm event. The control measures shall be designed to treat stormwater runoff in a manner expected to reduce the event mean concentration of total suspended solids (TSS) to a median value of 30 mg/L or less.

       A minimum of 50% of the applicable development area including 50% or more of the impervious area of the applicable development area shall drain to the control measures. This standard does not require that 100% of the applicable redevelopment site area be directed to a control measures as long as the overall removal goal is met or exceeded (e.g., providing increased removal for a smaller area), or

   (c) Infiltrate, evaporate, or evapotranspirate, through practices such as green infrastructure, a quantity of water equal to 30% of what the calculated WQCV would be if all impervious area for the applicable redevelopment site discharged without infiltration.

I.7.2. BMP Selection

The selection of appropriate BMPs is based on the characteristics of the site and potential pollutants. The Four-Step Process provides a method of going through the selection process. Figure I.1 and Figure I.2 with annotations covers site-specific issues to be considered in selecting an effective BMP for each site.

A. **Four-Step Process.** The following four-step process is recommended for selecting structural BMPs in newly developing and redeveloping urban areas:

   Step 1: Employ Runoff Reduction Practices

   To reduce runoff peaks and volumes from urbanizing areas, employ a practice generally termed "minimizing directly connected impervious areas" (MDCIA). The principal behind MDCIA is twofold — to reduce impervious areas and to route runoff from impervious surfaces over grassy areas to slow down runoff and promote infiltration. The benefits are less runoff, less stormwater pollution, and less cost for drainage infrastructure. There are several approaches to reduce the effective imperviousness of a development site:

   Reduced Pavement Area

Sometimes, creative site layout can reduce the extent of paved areas including parking, thereby saving on initial capital cost of pavement and then saving on pavement maintenance, repair, and replacement over time.

Porous Pavement

The use of modular block porous pavement or reinforced turf in low-traffic zones such as parking areas and low use service drives such as fire lanes can significantly reduce site imperviousness. This practice may reduce the extent and size of the downstream storm sewers and detention.

Grass Buffers

Draining impervious areas over grass buffers slows down runoff and encourages infiltration, in effect reducing the impact of the impervious area.

Grass Swales

The use of grass swales instead of storm sewers slows down runoff, promotes infiltration, and also reducing effective imperviousness. It also may reduce the size and cost of downstream storm sewers and detention.

Implementing these approaches on a new development site is discussed further in the DCM2 section titled Employing Runoff Reduction Techniques. This section provides a procedure for estimating a reduced imperviousness based on the use of grass buffers and swales. The latter three of the approaches for reducing imperviousness are structural BMPs and are described in detail in Section 4.2 of DCM2 (New Development BMP Factsheets):

- Grass Buffer.
- Grass Swale.
- Modular Block Porous Pavement (or Stabilized-Grass Porous Pavement).

Step 2: Stabilize Drainageways

Drainageway, natural and manmade, erosion can be a major source of sediment and associated constituents, such as phosphorus. Natural drainageways are often subject to bed and bank erosion when urbanizing areas increase the frequency, rate, and volume of runoff. Therefore, drainageways are required to be stabilized. One of three basic methods of stabilization may be selected.

Constructed Grass, Riprap, or Concrete-Lined Channel

These methods of channel stabilization have been in practice for some time. The water quality benefit associated with these channels is the reduction of severe bed and bank erosion that can occur in the absence of a stabilized channel. On the other hand, the hard-lined low flow channels that are often used do not offer much in the way of water quality enhancement or wetland habitat. The use of riprap or concrete lined flood conveyance channels is not recommended, unless hydraulic or physical conditions require such an alternative. Rock lined low-flow channels in many cases may be a better alternative.

Stabilized Natural Channel

> In practice, many natural drainageways in and adjacent to new developments are frequently left in an undisturbed condition. While this may be positive in terms of retaining desirable riparian vegetation and habitat, urban development may cause the channel to become destabilized. When degradation occurs in these drainageways, significant erosion, loss of riparian and aquatic habitat, and elevated levels of sediment and associated pollutants can result. Therefore, it is recommended that some level of stream stabilization always be considered. Small grade control structures sized for a 5-year or larger runoff event are often an effective means of establishing a mild slope for the baseflow channel and arresting stream degradation. Severe bends or cut banks may also need to be stabilized. Such efforts to stabilize a natural waterway also preserve and promote natural riparian vegetation which can provide paybacks in terms of enhanced aesthetics, habitat, and water quality.

One additional method of drainageway stabilization gives special attention to stormwater quality and is described in Section 4.2 (New Development BMP Factsheets):

- Constructed Wetland Channel.

Step 3: Provide Water Quality Capture Volume (WQCV)

All applicable development sites must have operational permanent stormwater quality control measures at the completion of construction. Designing structures that provide the WQCV is a common preferred approach in El Paso County. Other base design standards discussed earlier may be used if applicable, however. One or more of six types of water quality basins, each draining slowly to provide for long-term settling of sediment particles, may be selected. Information on selecting and configuring for a site one or more of the WQCV facilities listed below is provided in the Section 4.2 of the DCMV2. These six BMPs are also described in detail in the New Development BMP Factsheets found in the DCMV2 Section 4.2.

- Porous Pavement Detention.
- Porous Landscape Detention.
- Extended Detention Basin.
- Sand Filter Extended Detention Basin.
- Constructed Wetland Basin.
- Retention Pond.

Full Spectrum Detention is a newer approach to providing the WQCV. Details on the use, sizing, configuration and maintenance of Full Spectrum Detention structures are located in the DCMV1 update of 2014, sections of which are incorporated by reference into this ECM.

Step 4: Consider Need for Industrial and Commercial BMPs

If a new development or significant redevelopment activity is planned for an industrial or commercial site, the need for specialized BMPs must be considered. Two approaches are described in the New Development BMP Factsheets:

- Covering of Storage/Handling Areas
- Spill Containment and Control

Other Specialized BMPs may also be required

B. **Other Specialized BMPs.** The Technical Advisory Committee (TAC) selected the above structural BMPs after a comprehensive screening of known structural BMPs. The members of TAC included representatives from many County agencies and individuals from the development community. Final selection by TAC was based on the rev documentation on potential effectiveness in a semiarid climate, local applicability, maintenance considerations,

Development and evaluation of permanent BMPs are continuing processes. Better designs of the BMPs included in DCM2 and designs of new BMPs, including manufactured (proprietary) BMPs, will be developed and tested. To allow for this progress, additional BMPs will be considered on a case-by-case basis by County Stormwater Staff. Design and sizing details and results of independent testing of the BMP in conditions similar to those at the site will be submitted demonstrating that the BMP will meet or exceed the performance of approved BMPs for the site.

To promote improvement in stormwater protection, County Stormwater Staff may approve promising BMPs on an experimental basis. A performance monitoring program to be pre-approved by County Stormwater Staff and an agreement to replace the Experimental System with an approved system should it not function to the required level of performance, both at the owner's expense, will be required. A request to use an "experimental system" must be submitted to El Paso County in the form of a Request for a Deviation from these standards, submitted consistent with the criteria and process described Chapters 1 and 5, respectively. Design of any "experimental system" shall not commence until a Request for Deviation is submitted to and approved by the County.

C. **Guidance for Selecting and Locating WQCV Facilities.**

[The following section replaces DCM2 Section 4.1 pages 4-19 through 4-23]

Laying out WQCV facilities within a development site and watershed requires thought and planning. This planning and decision-making should occur during a master drainage planning process (Drainage Basin Planning Study or Master Development Drainage Plan) undertaken by local jurisdictions or a developer's engineer. Such plans, studies or other reports may depict a recommended approach for implementing WQCV on a watershed basis. Such reports may call for a few large regional WQCV facilities, smaller sub-regional facilities, or alternatively an onsite approach. It is always a good idea to find out if a master planning study has been completed that addresses water quality and to attempt to follow the Plan's recommendations.

If the master drainage planning process addresses water quality, the following provides supplemental information on the BMPs. If the existing master drainage planning process has not addressed water quality, or if a new master drainage process is underway, this will direct the water quality evaluation.

D. **Post-Construction Stormwater Quality Control Measure Selection Process.** The BMP selection process is illustrated in Figure I-1 and Figure I-2. These two figures shall be used for all projects except those that are strictly highway/roadway projects; that is, projects with no plans for building pad sites. Projects that are strictly highway/roadway projects are discussed in a separate section below.

The following process references the use of the permanent control measures (BMPs) and other practices outlined in DCM2 and this Appendix. The use of DCM2 BMPs will promote consistency between the City and County. These BMPs are commonly found in manuals and other literature from municipalities across the country, and they are the accepted best industry practices in stormwater quality control.

As described below, other control measures (which may be relatively new to the field of stormwater management) are acceptable if they can be shown to meet performance criteria provided in this Section 1.7. A Request for a Deviation from these standards submitted consistent with the criteria and process described

Chapters 1 and 5, respectively, must be submitted and approved by the County prior to the use of an permanent control measure not included in this ECM, DCMV1, DCMV2 and the DCMV1 Update of 2014.

The following items explain the decision points (i.e., the Boxes) in Figure I-1 and Figure I-2:

Box 1: For all sites, the possibility of incorporating runoff reduction practices must be investigated. Impervious area should be reduced to the maximum extent practicable, per DCM2. DCM2 also provides guidance for MDCIA by routing runoff to pervious areas. This is Step 1 in the Four-Step Process.

Box 2: All drainageways, ditches, and channels shall be stabilized with one of three methods included in Step 2, which include the use of appropriate methods for the type of drainageway as described in the DCM1. Drainageways include:

- Tributaries to creeks that have been left in a relatively natural state,
- Tributaries, channels, and drainageways that are graded or regraded and may include drop or check structures, side slope stabilization, and low-flow channels.
- Roadside ditches that are completely man-made and should only be used to convey runoff from roads and roadway right-of-ways (ROWs).

Box 3: It must be determined if the development and/or redevelopment disturbs an area of land that is 1 acre or larger (or planned to be 1 acre or larger) when all phases are complete.

Box 4: Sites tributary to sensitive waters should consider specialized BMPs to address the parameter of concern as shown in Table I-5. At this time, no special BMPs are required until the County develops an overall strategy to address the parameters of concern, probably if and when a Total Maximum Daily Load (TMDL) is determined.

Figure I-1. BMP Requirements Flowchart for New Development and Redevelopment Sites—For Selecting Post-Construction BMPs in Compliance with El Paso County's Stormwater NPDES Permit

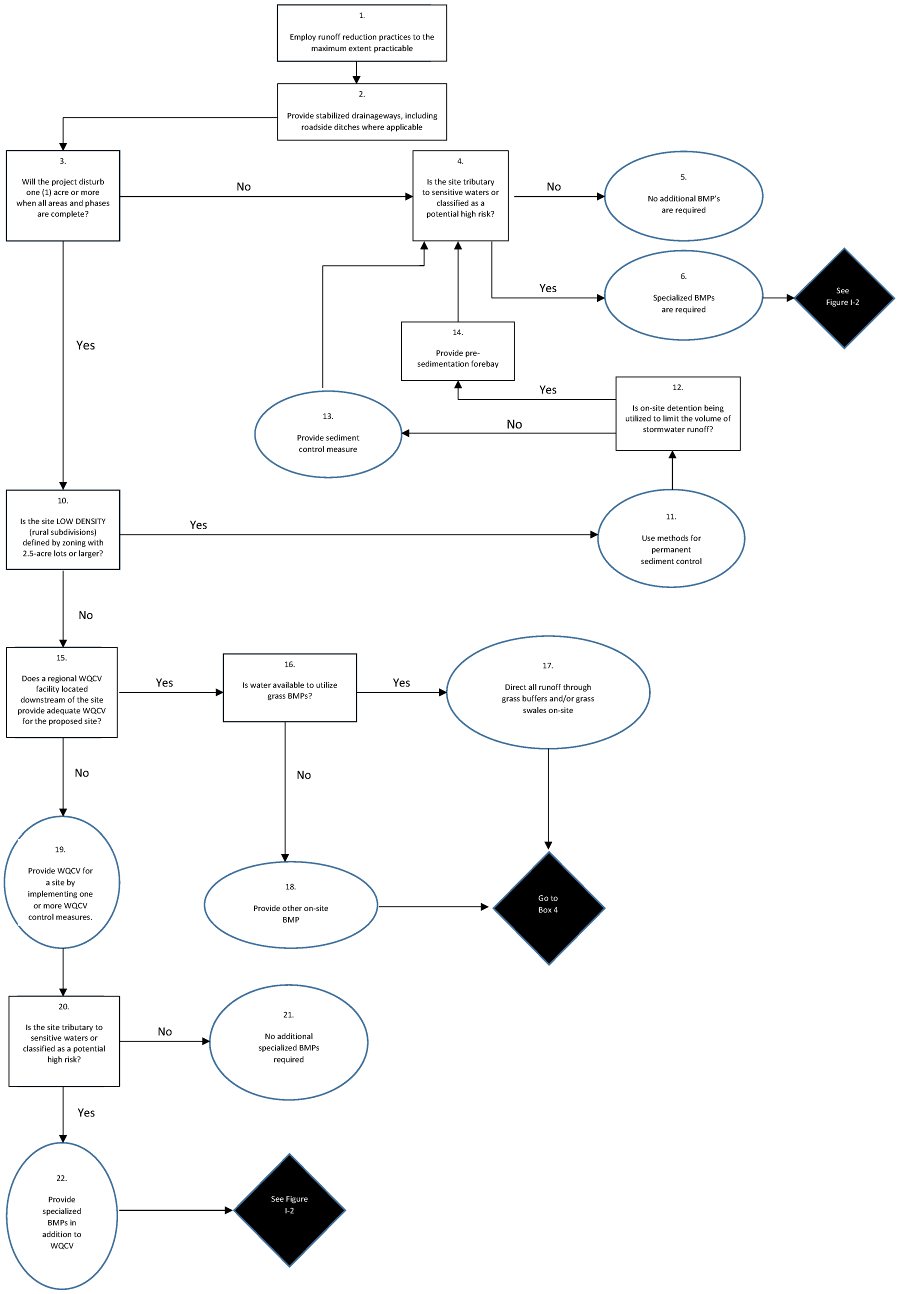


Figure I-2. BMP Requirements Flowchart for New Development and Redevelopment Sites—For Selecting Post-Construction BMPs in Compliance with El Paso County's Stormwater NPDES Permit

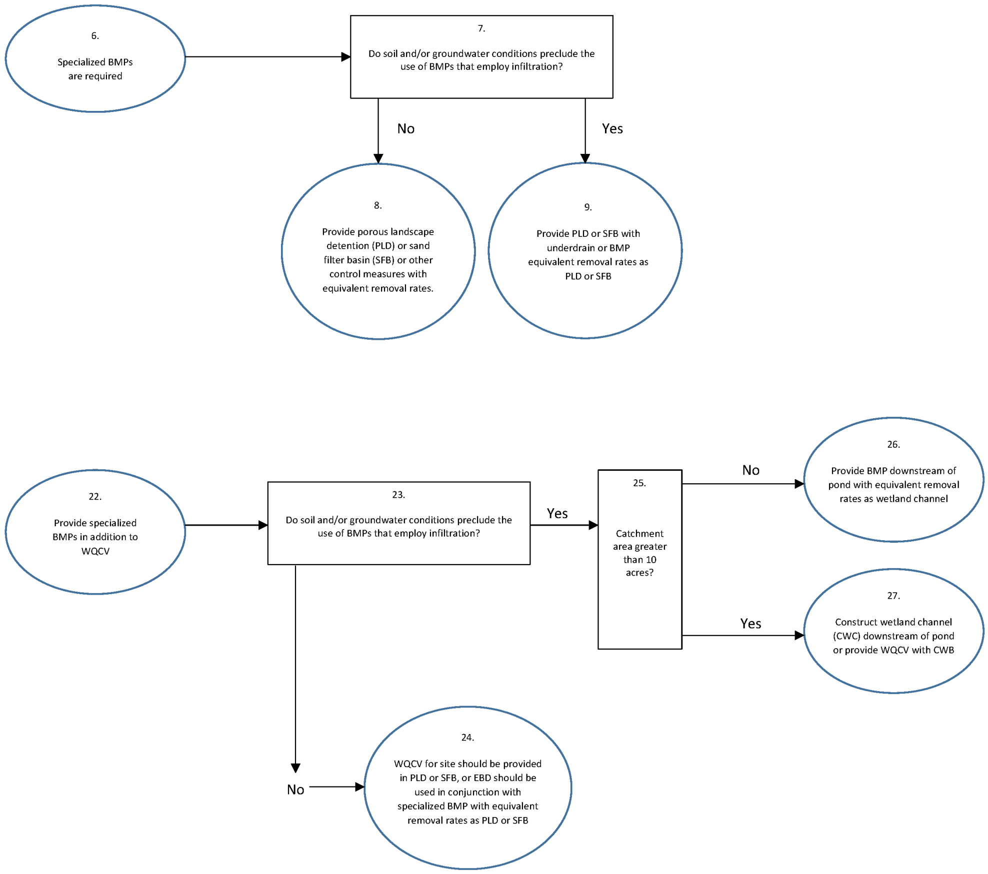


Table I-4. Best Management Practices Abbreviations

Abbreviation	Best Management Practice
CWB	Constructed Wetlands Basin
CWC	Constructed Wetlands Channel - Sedimentation Facility
EDB	Extended Detention Basin - Sedimentation Facility
PLD	Porous Landscape Detention
RP	Retention Pond - Sedimentation Facility
SFB	Sand Filter Extended Detention Basin
WQCV	Water Quality Capture Volume
GB	Grass Buffer
GS	Grass Swale

MBP	Modular Block Porous Pavement
PPD	Porous Pavement Detention

Table I-5. El Paso County Sensitive[1]Waters

Stream and Segment	Parameter of Concern	Specialized BMPs Required
Fountain Creek and tributaries above Monument Creek	E. coli and Se	None at this time
Fountain Creek from Monument Creek to Highway 47	E. coli	None at this time
Monument Creek from National Forest to Fountain Creek	Se	None at this time
Willow Springs Pond #1 and #2	PCE	None at this time
[1] CDPHE 2006 303(d) list. Standard agreement forms for Private Detention Basins are in Appendix G. [This list may change in the future. The 303(d) list or equivalent in effect at the time of permitting will apply.]		

Potential high-risk sites must also incorporate specialized BMPs. High-risk sites are defined by two factors:

- Sites with land uses involving the potential for significant deposition of pollutants.
- Sites without practices to eliminate exposure of pollutants to stormwater.

Land uses involving the potential for significant deposition of pollutants include, but are not limited to:

- Vehicle maintenance facilities,
- Gas stations,
- Automobile salvage yards and junk yards,
- Commercial sites with high levels of "in and out" traffic such as fast-food restaurants and convenience stores.

Many industrial facilities are required to obtain coverage under an industrial stormwater permit; these facilities include automobile salvage yards. Practices to eliminate exposure of pollutants to stormwater may or may not be part of an industrial stormwater permit. These practices include coverage of material storage areas, berms around tanks, spill control plans, and other "good housekeeping" measures. For industrial sites where stormwater is not exposed to pollutants, structural BMPs, including detention ponds for water quality and other BMPs discussed below, may not be required.

Because stormwater pollutants are often transported with sediment, erosion protection and sediment control are necessary for stormwater quality protection. This is very important in the County because of the sandy soils in the region. In particular, discharges that may impact sensitive waters or that come from potentially high-risk sites should have a high level of sediment protection. Thus, in addition to the specialized BMPs, sediment control practices such as revegetation, grading to prevent steep side slopes, check dams, slope drains, and sediment basins should be employed where practical.

Box 5: No BMPs are required other than stabilized drainageways and possibly MDCIA.

Box 6: Specialized BMPs are required and therefore proceed to Box 7 on Table I-1.

Box 7: BMPs that employ infiltration include porous landscape detention and sand filter basins without underdrains. Certain conditions preclude the use of these types of BMPs, including close proximity of groundwater or relatively impervious soils to the bottom of the facility. Groundwater levels should be characterized during the season with the highest levels (often late Spring or early Summer). Impervious soils include bedrock as well as soil types C and D. The term "close proximity" means 5 feet or less. If there is less than 5 feet, a study of the hydraulic conductivity of the soils must be conducted to show that excessive groundwater mounding or direct groundwater contamination will not result from the use of BMPs that employ infiltration.

Box 8: If groundwater or relatively impervious soils are not within 5 feet of the surface, implement porous landscape detention (PLD) or a sand filter basin (SFB) from DCM2. Alternative BMPs can be used if shown to be equally effective as PLD or SFB (see discussion below).

Box 9: Implement PLDs or SFBs with underdrains, or implement a BMP with removal rates equivalent to PLDs or SFBs, including qualifying manufactured BMPs. Qualifying manufactured BMPs are those that have undergone independent tests to verify that the installation, flow volumes, and removal rates will work for the site under consideration.

Box 10: If the site disturbance is larger than one acre and is low density residential, then no WQCV may be required provided the site meets criteria presented in Section I.7.1. If WQCV is not required, the need for a permanent sediment control measure must still be evaluated. If the site is located near and will discharge to a sensitive water, then a "jump" to Box 4 is required for continued evaluation.

Box 11: Sediment is best controlled at the source. That is, rather than using structures to collect soil after it is suspended in stormwater, it is preferable to stabilize soil to prevent suspension from occurring. Sediment source controls must be implemented for all low-density developments and include (but are not limited to):

- Adequately established vegetation per DCM1 criteria,
- Side slopes that are 3 horizontal to 1 vertical or flatter or the use of benched side slopes when slopes are steeper than 3 horizontal to 1 vertical,
- The use of erosion control blankets to aid establishment of vegetation,
- Check dams,

- Slope drains.

Temporary irrigation and maintenance of vegetation until adequately established may be required.

Box 12: In low density (rural) subdivisions, a method for permanent sediment control must be provided. If a detention pond is used, the forebay is to be sized according to the criteria for Extended Detention Basins. If a detention pond/Extended Detention Pond is not required, a sediment basin as described in DCM2, page 3-32 may be used. It should be sized to collect 1,800 cubic feet per acre of disturbed area. Drainage area above a sediment basin can be reduced by use of vegetated swales, buffers, or contour berms.

Box 13: If there are no detention ponds, separate sediment control measure must be located to catch all runoff leaving the disturbed area of the site.

Box 14: In cases where a detention pond is already required for controlling the volume of runoff, a sediment basin can take the form of a forebay to this pond.

Box 15: Regional WQCV facilities may only be used if they meet the requirements of Section I.7.1.C.

Box 16: The site is required to direct all runoff through grass buffers and/or grass swales or provide a similar BMP. (Note that this is required in accordance with the CDPHE guidance manual to afford some protection to state waters in between the site and the downstream WQCV BMP.)

Box 17: Grass buffers require irrigation in almost all cases in the County; swales sometimes require irrigation.

Box 18: "Dry" alternatives may be used if they are shown to have equivalent removal rates as buffers and swales. All of the structural treatment BMPs in DCM2 (Section 4.2) have equivalent removal rates and may be used. The covering of storage/handling areas and spill containment and control are not structural treatment BMPs, and thus are not substitutes for grass buffers and swales.

Box 19: If there is no regional WQCV facility downstream with adequate capacity to provide the WQCV for the proposed site, then a WQCV control measure must be provided for the site. Examples of potentially acceptable control measures include Extended Detention Basin, Full Spectrum Detention Basin, Sand Filter Basin, Constructed Wetland Basin, or a Retention Pond. For all ponds, issues related to dam construction and potential groundwater infiltration must be considered. Retention Ponds must be considered in the context of additional issues including safety and health (e.g., drowning and mosquito/West Nile virus) and water rights. For all structures that may hold water for more than 72 hours with an exposed water surface, water storage rights must be obtained before a structure (e.g. retention pond) can be proposed for a site. See Sections 3.2.5.F and 3.3.7 of this ECM for additional information regarding water right and permanent stormwater quality control measures.

Box 20: Sites tributary to sensitive waters must meet the requirements as outlined in Table I-5, and potential high-risk sites must have specialized BMPs.

Box 21: No additional BMPs are required other than WQCV-based BMPs. Also, as always, drainageways must be stabilized and runoff should be reduced as much as possible (Boxes 1 and 2).

Box 22: When specialized BMPs are required, proceed to Box 23 on Figure I-2.

Box 23: Two situations apply, one where conditions preclude the installation of BMPS that employ infiltration, and one where they do not. (See Box 7.) If conditions preclude the installation of BMPS that employ infiltration then proceed to Box 25; otherwise proceed to Box 24.

Box 24: Where soil and groundwater conditions are not prohibitive (that is, groundwater or relatively impervious soils are not within 5 feet of the surface), implement PLD or SFB from DCM2. Alternative BMPs can be used if shown to be equally effective as PLD or SFB (see discussion below).

Box 25: Constructed wetlands (either channels or basins) are an effective BMP for sites with drainage areas greater than 10 acres.

Box 26: Provide a BMP downstream of the pond with equivalent removal rates as a wetland channel; this could be a qualifying manufactured BMP or other BMP that meets the criteria below.

Box 27: If the catchment area is greater than 10 acres, provide a constructed wetland channel (CWC) downstream of pond or provide WQCV with CWB.

E. **Projects that are Strictly Roadway Construction.** For projects that entail highway or other roadway construction, there are three basic questions for the applicant:

- Is the road urban or rural?
- That is, does the road have curb and gutter or does it utilize roadside ditches?
- For rural roads, do the ditches require "water turnouts"?
- Is the road a "hot spot" or does it discharge to sensitive waters?

For road construction projects, the applicant must determine if the roadway project is an applicable development site as defined in Section I.7.1.B. Excluded sites do not need to comply with the requirements of this Section I.7. If a roadway construction project is an applicable development site, then the owner must determine which base design standard is appropriate for the project and must design and implement water quality improvement with the project. Requirements for roadway projects included in the DCMV1 may be used provided they do not conflict with other provisions of this Section I.7.

Rural roads, i.e. those roads which utilize roadside ditches for conveyance of runoff from the roadway, do not have sufficient capacity in the roadside ditches to convey much more runoff than that which runs off the road itself. Rural roads (which by definition have roadside ditches) must be stabilized with one of three methods included in DCM2 on pages 4-3 and 4-4. These methods are described in DCMV1. "Water turnouts," which function as spillways which direct flow out of the ditches onto property adjacent to the ROW, are frequently required as a result. Design for the "water turnout" should ensure the turnout discharges into a "suitable outfall" as described in DCM1 along the roadway such as a natural swale. A drainage easement for this runoff must be acquired at these locations. A possible consequence of "water turnouts" is the loading of sediment onto private property. If "water turnouts" will be utilized for the ditches, sediment basins shall be used at these locations. However, there must be sufficient space in the ROW for both the structure itself and for maintenance access, or a specific drainage easement must be provided for the feature and access. Sediment basins can be designed in accordance with the guidelines in DCM2 in the section for construction BMPs. The basin shall be sized to collect 1,800 cubic feet of sediment per acre of drainage area of the roadway.

The term "high risk site" can be defined by traffic volume for a section of roadway. If the road will experience traffic volume of 30,000 average daily traffic (ADT) or more it is likely to contribute high levels of pollutants. For these situations, additional BMPs are required and selection must follow Boxes 6, 7, 8, and 9 in Figure 1b. Additional BMPs may also be required for discharge to sensitive waters. As described above for the general developments (with building pads), these additional requirements will depend on the TMDL process.

F. **Additional Guidelines for BMP Selection.** Additional Guidelines for selecting among the appropriate BMPs dete from Figure I-1 and Figure I-2. Figure I-3 (Figure ND-7 in DCM2) depicts a decision tree for selecting one of the si BMPs based on drainage catchment area and whether water is available to satisfy evapotranspiration requirem Porous pavement and porous landscape detention are generally suited for small drainage areas (i.e. much less t acres); however, larger subwatersheds can be subdivided into individual drainage sub-catchment areas meeting criteria shown in Figure I-3 for these BMPs.

   WQCV control measures and Regional WQCV control measures shall be located prior to the stormwater runoff being discharged to State Waters. When using a Regional WQCV facility for a site, the site may discharge to a water of the state before being discharged to the Regional WQCV facility; however, the conditions in Section I.7.1.C.5 shall be met.

   Figure I-4 (Figure ND-8 in DCM2) provides an illustration of selection and location options for WQCV facilities based on the principles discussed above.

   Figure I-6 (Table ND-1 in DCM2) indicates the BMP options for the four watershed areas shown in Figure I-4.

I.7.3. Incorporating WQCV into Stormwater Detention Structures

Wherever possible, it is recommended that WQCV facilities be incorporated into stormwater quantity detention facilities. This is relatively straightforward for an extended detention basin, constructed wetland basin, and a retention pond. When combined, the 2, 5, 10, and 100-year detention levels are provided above the WQCV and the outlet structure is designed to control two or three different releases. Stormwater quantity detention could be provided above the WQCV for porous pavement and landscape detention provided the drain times for the larger events are kept short.

The following approaches are to be implemented when incorporating WQCV into stormwater quantity detention facilities:

1. **Water Quality.** The full WQCV is to be provided according to the design procedures documented in the New Development BMP Factsheets.
2. **Minor Storm.** The full WQCV plus the full minor storm quantity detention volume is to be provided.
3. **100-Year Storm.** One-half the WQCV plus the full 100-year detention volume is to be provided.

For linear projects and projects with limited space available for permanent water quality control measures, WQCV may be included in the design of underground detention structures such as sand filter basins (SFB) and proprietary underground detention structures. These systems rely on appropriate soil conditions to infiltrate or evapotranspire the WQCV.

It is extremely important that high sediment loading and compaction of underlying soils in the area to be used for infiltration be controlled to the maximum extent practicable. These structures are best suited to being brought on line at the end of the construction phase where disturbed ground has been stabilized with pavement or vegetation.

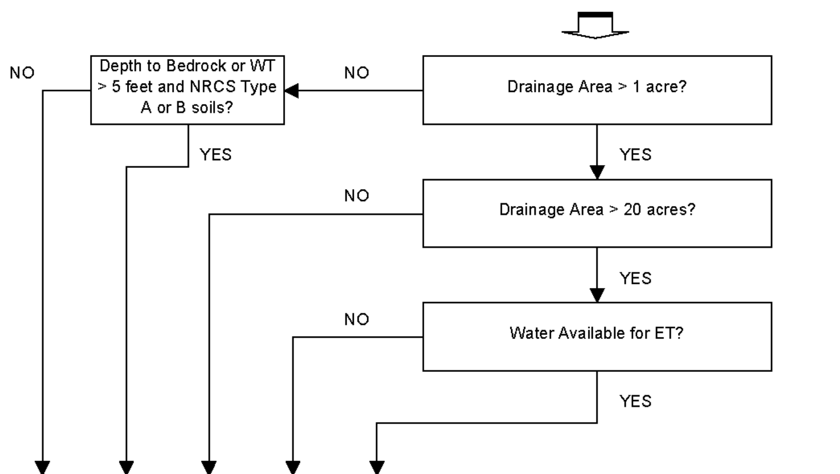
Any underground detention facilities proposed for use in the County must meet the good engineering, hydrologic and pollution control practices as defined in this Section I.7. The design of underground detention that incorporates WQCV shall not commence until a Request for Deviation is submitted for review and approved by the ECM Administrator. In addition to the approval criteria for a deviation request provide in Chapters 1 and 5 of this ECM, the owner or authorized agent must provide a structure-specific Operation and Maintenance (O&M)

Manual and maintenance agreement for the structures. The Operation and Maintenance Manual shall include specific procedures and equipment that will be used by the owner or authorized representative to operate and maintain the structures. A specification sheet or generic O&M manual provided by the vendor will not satisfy the O&M Manual requirement.

I.7.4. Separate Presedimentation Facilities

The design criteria shown in the New Development BMP Factsheets section shows presedimentation forebays at the upstream end of the extended detention basin, constructed wetland basin, and retention pond. The purpose of the forebay is to settle out coarse sediment and skim off floatables prior to the main body of the facility. An option to this approach is to install a separate facility upstream from the main WQCV facility. If this option is selected, the recommended size is at least 20 percent of the WQCV and the recommended drain time is 1 hour for the presedimentation forebay volume only. Using this approach, any requirement for sediment storage in the main facility may be reduced consistent with the storage capacity of the separated presedimentation forebay, and the forebay within the main facility may be eliminated.

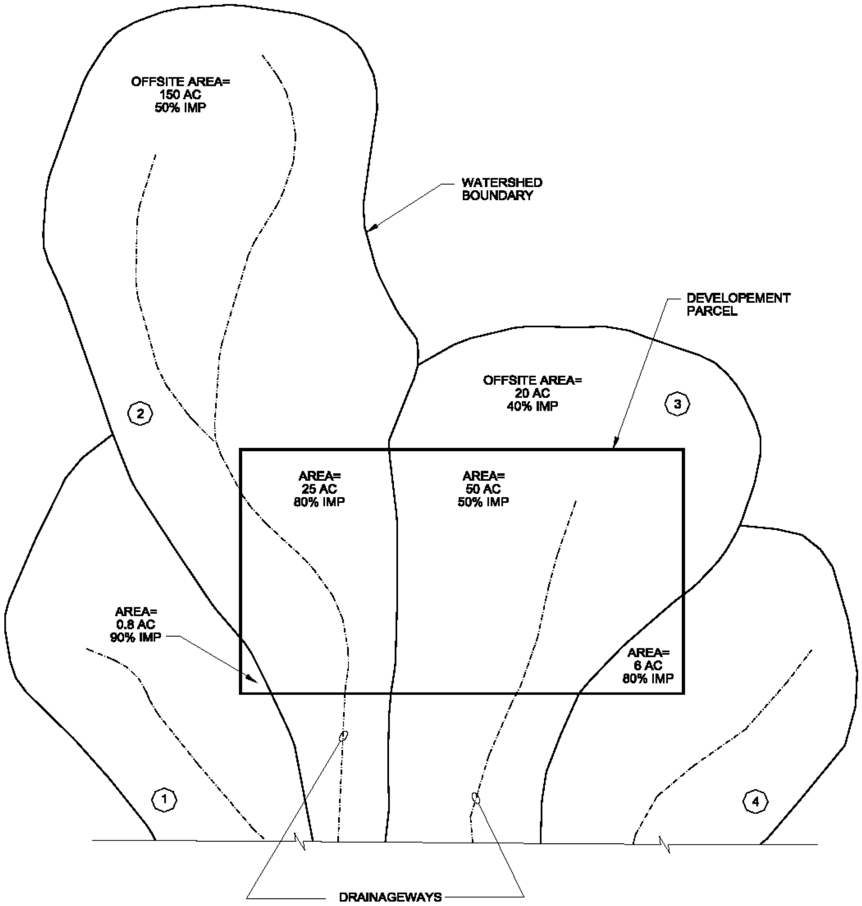
Figure I-3. Decision Tree for WQCV BMP Selection



					Suitable WQCV BMP
o					Porous Pavement Detention (PPD) with Underdrain
	o				Porous Pavement Detention (PPD) with Infiltration
o					Porous Landscape Detention (PLD) with Underdrain
	o				Porous Landscape Detention (PLD) with Infiltration
		o	o	o	Extended Detention Basin (EDB)
		o			Sand Filter Extended Detention Basin (SFB)
				o	Construction Wetland Basin (CWB)
				o	Retention Pond (RP)

Note: Large drainage areas may be subdivided into areas < 20 acres for use of SFB or < 1 acre for use of PPD or PLD.

Figure I-4. Illustration of Selection and Location Options for WQCV Facilities



Note: For this example, sufficient make-up water exists for constructed wetlands and retention pond for the watershed areas > 50 acres through irrigation return flows.

Table I-7. Illustration of Selection and Location Options for WQCV Facilities for the Development Parcel on Figure I.4

Watershed Number	Onstream or Offstream	BMP Options	Minimum Number of BMP Installations	Average Drainage Area for Sizing each BMP, acre
1	Offstream	Porous Pavement Detention Porous Landscape Detention	1 1	0.8 0.8
2	Offstream	Porous Pavement Detention Porous Landscape Detention Extended Detention Basin Sand Filter Extended Detention Basin	24 24 2 2	1 1 12 12

3	Offstream	Porous Pavement Detention Porous Landscape Detention Extended Detention Basin Sand Filter Extended Detention Basin	49 49 2 3	1 1 24 16
	Onstream	Extended Detention Basin Constructed Wetland Basin Retention Pond	1 1 1	70 70 70
4	Offstream	Porous Pavement Detention Porous Landscape Detention Extended Detention Basin Sand Filter Extended Detention Basin	6 6 1 1	1 1 6 6

I.7.5. Structural BMP Effectiveness

Table I-7 (Table ND-2 in DCM2) indicates ranges of removal efficiencies reported in literature for a number of structural BMPs. Although combinations of nonstructural/structural BMPs can improve the overall water quality of the runoff, the effectiveness of several BMPs in their ability to reduce influent pollutant concentrations as a group are not directly additive. Table I-7 also shows a most probable range of removal efficiencies for structural BMPs.

I.7.6. Separation Distances

To reduce potential for surface and ground water contamination, permanent water quality BMPs will be located away from wells and Individual Sewage Disposal Systems (ISDS). Rules for separation distances and grouting depths for wells and BMPs will be based on distances between wells and "sources of contamination" in Colorado's Rules and Regulations for Water Well Construction, Pump Installation, and Monitoring and Observation Hole/Well Construction. Permanent BMPs and ISDS will be separated by the same distances specified between the components of the ISDS and "waterways" in the El Paso County ISDS regulations. Additional separation distance may be required when a permanent stormwater quality control measure is located near a water of the state and relies on a vegetated buffer strip as part of the strategy to address WQCV prior to discharge to waters of the state.

Table I-8. BMP Pollutant Removal Ranges for Stormwater Runoff and Most Probable Range for BMPs

Type of BMP	(1)	TSS	TP	TN	TZ	TPb	BOD	Bacteria

Grass Buffer	LRR: EPR	10-50 10-20	0-30 0-10	0-10 0-10	0-10 0-10	N/A N/A	N/A N/A	N/A N/A
Grass Swale	LRR: EPR	20-60 20-40	0-40 0-15	0-30 0-15	0-40 0-20	N/A N/A	N/A N/A	N/A N/A
Modular Block Porous Pavement	LRR: EPR	80-95 70-90	65 40-55	75-85 10-20	98 40-80	80 60-70	80 N/A	N/A N/A
Porous Pavement Detention	LRR: EPR	8-96 70-90	5-92 40-55	-130-85 10-20	10-98 40-80	60-80 60-70	60-80 N/A	N/A N/A
Porous Landscape Detention	LRR: EPR	8-96 70-90	5-92 40-55	-100-85 20-55	10-98 50-80	60-90 60-80	60-80 N/A	N/A N/A
Extended Detention Basin	LRR: EPR	50-70 55-75	10-20 45-55	10-20 10-20	30-60 30-60	75-90 55-80	N/A N/A	50-90 N/A
Constructed Wetland Basin	LRR: EPR	40-94 50-60	-4-90 40-80	21 20-50	-29-82 30-80	27-94 40-80	18 N/A	N/A N/A
Retention Pond	LRR: EPR	70-91 80-90	0-79 45-70	0-80 20-60	0-71 20-60	9-95 60-80	0-69 N/A	N/A N/A
Sand Filter Extended Detention	LRR: EPR	8-96 80-90	5-92 45-55	-129-84 35-55	10-98 50-80	60-80 60-80	60-80 60-80	N/A N/A
Constructed Wetland Channel*	LRR: EPR	20-60 30-50	0-40 20-40	0-30 10-30	0-40 20-40	N/A 20-40	N/A N/A	N/A N/A
Ref: Bell et al. (1996), Colorado (1990), Harper & Herr (1992), Lakatos & McNemer (1987), Schueler (1987), Southwest (1995), Strecker et al. (1990), USGS (1986), US EPA (1983), Veenhuis et al. (1989), Whipple and Hunter (1981), Urbonas (1997.								
(1) LRR Literature reported range, EPR—expected probable range of annual performance by DCM2 BMPs.								
N/A Insufficient data to make an assessment.								

* The EPR rates for a Constructed Wetland Channel assume the wetland surface area is equal or greater than 0.5% of the tributary total impervious area.

I.7.7. Operation and Maintenance of Best Management Practices

A. **Long-term Operation and Maintenance of Post-Construction Stormwater Management Structures.** The El Paso County Phase II MS4 Permit requires the County to ensure the long-term operation and maintenance of all post-construction stormwater management control measures constructed by an applicable development site. Part I E.4.a.vi of MS4 permit states:

"vi. Construction Inspection and Acceptance: The County must implement inspection and acceptance procedures to ensure that control measures are installed and implemented in accordance with the site plan and include the following:

(A) Confirmation that the completed control measure operates in accordance with the approved site plan.

(B) All applicable development sites must have operational permanent water quality control measures at the completion of the site. In the case where permanent water quality control measures are part of future phasing, the County must have a mechanism to ensure that all control measures will be implemented, regardless of completion of future phases or site ownership. In such cases, temporary water quality control measures must be implemented as feasible and maintained until removed or modified. All temporary water quality control measure must meet one of the design standards in Part I.E.4.a.iv.

For the purpose of this section, completion of a site or phase shall be determined by the issuance of a certificate of occupancy, use of the completed site area according to the site plan, payment marking the completion of a site control measure, the nature of the selected control measure or equivalent determination of completion as appropriate to the nature of the site."

For all structures approved by El Paso County which are not public improvements, the property owner or authorized agent shall be responsible for the operation and maintenance of all permanent stormwater quality control measures. All temporary control measures required during construction shall be removed after construction activity on the site has been completed and final stabilization of the site is achieved.

Prior to approval of a subdivision, issuance of a Certificate of Occupancy, or closure of the ESQCP for sites that did not go through the subdivision review process that have permanent post-construction stormwater quality control measures, a signed private maintenance agreement for permanent BMPs must be submitted to and recorded by the County. El Paso County uses these agreements as the primary mechanism to ensure the long-term operation and maintenance of post construction stormwater quality control measures. Agreement templates are found in Appendix G.

During construction a County Stormwater Inspector will inspect structures for conformance with approved construction plans and the SWMP. Once the structure has been accepted into the County Permanent Stormwater Quality Control Measure Inventory consistent with Chapter 5, control measures will be inspected at minimum once every five (5) years. All inspections will be conducted as described in Section I.5.

Confirmation that post-construction stormwater quality control measures operate according to approved plans occurs through the use of an inflow hydrograph routed through a basin model. This analysis and the resulting hydrograph shall be performed by the Engineer of Record for the owner or authorized agent of the applicable development site and provided with Final Drainage Report included in the development plan submitted to the County. If the ECM Administrator determines that significant changes to the approved plans are identified in the "as-built" drawings provided in conformance with Section 5.10.6, an additional inflow hydrograph based on the "as-built" changes shall be provided to the County to confirm that the changes made during construction did not negatively alter the effective operation of the control measure.

If during an inspection of a post-construction stormwater quality control structure it is determined and documented by a County Stormwater Inspector that any owner or authorized agent failed to adequately operate and maintain a permanent stormwater quality control measures or remove the temporary control measures, an enforcement action described in Section I.6 shall be pursued.

B. **Operation and Maintenance Manual.** A detailed Operation and Maintenance Manual covering inspections, operation and maintenance of permanent BMPs will be provided to the party who holds the Private Maintenance Agreement for Permanent BMPs. The Operation and Maintenance Manual will include specifics on frequency of inspections and maintenance; standards for vegetation or structures, such as species of vegetation, mowing height, revegetation of worn or eroded areas, cleaning methods; depth of sediment requiring removal; replacement frequencies; and other relevant topics.

(Res. No. 19-245 , 7-2-19)

Falcon DBPS

Subbasin Properties

Subbasin ID	Area (mi²)[2]	Existing % Impervious[3]	Curve Number[3]			Lag Time (min)		
			Historical	Existing	Future	Historical[4]	Existing[2]	Future[5]
ET010	0.15	21.72%	61	69	72	33.64	25.23	18.92
ET020	0.21	19.07%	61	68	73	23.15	17.37	13.02
ET030	0.20	27.31%	41	71	72	42.61	31.96	23.97
ET040	0.15	20.35%	42	69	69	29.71	22.28	22.28
ET050	0.12	19.07%	39	68	68	10.36	7.77	7.77
ET060	0.29	21.94%	39	69	69	7.38	5.54	5.54
ET070	0.25	26.60%	39	71	71	10.51	7.88	7.88
ET080	0.29	37.81%	39	75	76	25.98	19.49	14.61
ET090	0.12	12.34%	39	61	74	54.90	41.18	30.88
ET100	0.05	3.12%	39	48	63	10.67	8.00	6.00
ET110[1]	0.23	1.49%	39	54	61	25.68	25.68	19.26
ET120	0.11	6.79%	39	60	61	38.28	28.71	21.53
ET130	0.13	6.57%	39	61	63	61.63	46.22	34.67
ET140	0.27	3.21%	39	61	63	92.13	69.09	51.82
ET150[1]	0.18	1.79%	39	62	62	25.39	25.39	25.39
ET160	0.19	3.36%	42	64	64	41.04	30.78	30.78
FS010	0.12	1.16%	44	49	56	41.23	30.92	23.19
MT010	0.29	6.99%	45	64	64	42.16	31.62	31.62
MT020[1]	0.09	1.48%	57	62	68	12.94	12.94	9.71
MT030	0.16	13.35%	54	66	67	19.92	14.94	11.21
MT040	0.31	7.07%	55	64	75	35.44	26.58	19.93
MT050	0.12	16.00%	39	67	67	34.84	26.13	26.13
MT060[1]	0.19	1.83%	39	55	66	27.90	27.90	20.93
MT070	0.20	5.68%	42	59	67	54.09	40.57	30.42
MT080	0.06	63.24%	48	86	87	6.91	5.18	3.88
MT090	0.04	60.08%	39	83	85	4.92	3.69	2.77
MT100	0.06	13.21%	39	67	70	21.19	15.89	11.92
MT110	0.12	18.56%	39	68	68	32.51	24.38	24.38
WT010[1]	0.14	2.31%	56	58	58	24.38	24.38	24.38
WT020[1]	0.07	2.39%	56	59	59	27.95	27.95	27.95
WT030	0.08	3.57%	57	59	59	17.99	13.49	13.49
WT040[1]	0.19	2.72%	56	58	58	34.99	34.99	34.99
WT050[1]	0.19	1.60%	60	62	62	26.99	26.99	26.99
WT060	0.20	2.35%	59	61	61	44.53	33.40	33.40
WT070[1]	0.17	1.31%	56	58	58	18.77	18.77	18.77
WT080[1]	0.07	1.95%	60	62	62	17.52	17.52	17.52
WT090[1]	0.15	0.66%	61	62	63	21.52	21.52	16.14
WT100[1]	0.19	1.28%	61	62	69	13.65	13.65	10.24
WT110[1]	0.19	2.04%	60	61	63	29.57	29.57	22.18
WT120[1]	0.05	2.96%	43	54	63	19.24	19.24	14.43

Falcon DBPS

Subbasin Properties

Subbasin ID	Area (mi²)[2]	Existing % Impervious[3]	Curve Number[3]			Lag Time (min)		
			Historical	Existing	Future	Historical[4]	Existing[2]	Future[5]
WT130	0.10	28.51%	60	72	72	15.26	11.44	11.44
WT140[1]	0.13	1.68%	61	62	70	21.46	21.46	16.09
WT150	0.23	9.68%	61	65	74	54.71	41.04	30.78
WT160	0.11	20.33%	61	69	69	10.10	7.58	7.58
WT170[1]	0.12	2.54%	55	58	64	18.61	18.61	13.96
WT180[1]	0.10	0.12%	39	41	61	38.49	38.49	28.87
WT190	0.06	7.96%	39	64	64	15.16	11.37	11.37
WT200	0.30	4.15%	39	57	64	67.27	50.45	37.84
WT210	0.27	12.12%	40	56	70	77.09	57.82	43.37
WT220	0.19	12.58%	47	61	72	35.69	26.77	20.08
WT230	0.20	26.68%	51	70	73	21.17	15.88	11.91
WT240	0.08	27.03%	58	71	74	11.27	8.45	6.34
WT250	0.15	17.91%	53	67	73	13.46	10.10	7.57
WT260	0.14	5.48%	59	63	63	54.23	40.67	40.67
WT270	0.03	18.71%	47	67	71	17.02	12.76	9.57
WT280	0.27	2.41%	61	63	63	26.29	19.72	19.72
WT290[1]	0.10	2.45%	51	63	63	16.05	16.05	16.05
WT300	0.10	4.24%	58	63	63	26.25	19.69	19.69
WT310	0.28	1.45%	46	60	62	36.15	27.12	20.34
WT320	0.21	2.03%	41	61	63	33.29	24.97	18.72
WT330[1]	0.33	2.03%	40	58	63	36.05	36.05	27.03
WT340	0.28	2.24%	42	63	63	57.87	43.40	43.40
WT350	0.30	3.10%	48	62	64	39.68	29.76	22.32
WT360	0.07	2.82%	47	62	62	29.93	22.45	22.45
WT370	0.21	1.34%	40	45	52	33.48	25.11	18.83

Notes:

[1] Based on observation Longest Flow Path delineation and Time of Concentration Calculation are not impacted by development for Existing conditions.

[2] Calculated in Geo-HMS

[3] Calculated in GIS

[4] Calculated value by setting the decrease in lag time to existing conditions equal to 25%. Only applied to basins that are developed in existing conditions.

[5] Calculated value by decreasing the existing lag time by 25%. Only applied to subbasins where additional development occurred in the future condition.

Falcon DBPS
Curve Numbers

Historical Curve Numbers

Land Use	Hydrologic Soil Group			
	A	B	C	D
Rangeland Good Condition	39	61	74	80
Woods Good Condition	30	55	70	77
Water	98	98	98	98

Notes:

1 Rangeland Good Condition values from Aerawide Urban Runoff Conrol Manual, Pg. 26-27

2 Other values from TR55, Table 2-2

Existing Curve Numbers

Land Use	Hydrologic Soil Group			
	A[1]	B	C	D
Rangeland Good Condition	39	61	74	80
Woods Good Condition	30	55	70	77
Open Space Good Condition	39	61	74	80
Gravel Roads	76	85	89	91
Water	98	98	98	98
Impervious Area	98	98	98	98

Notes:

[1] All HSG Type A soils that have been graded shall be considered HSG Type B soils

2 Rangeland Good Condition values from Aerawide Urban Runoff Conrol Manual, Pg. 26-27

3 Other values from TR55, Table 2-2

Future Curve Numbers

Land Use	Average CN
0.50 Acre Residential	71
2.5 Acre Rural Residentail	64
5 Acre Rural Residentail - Woods	58
5 Acre Rural Residential - Rangeland	62
Community Commercial/Service Commercial	81
Light Industrial	96
Single Family Urban	79

Notes:

1 Values represent the average CN values that were developed for Existing Conditions for each corresponding land use

Falcon DBPS

Ia Adjustment

Subbasin ID	Historical CN	Ia (in)	Existing CN	Ia (in)	Future CN	Ia (in)
ET010	61	0.64	69	0.45	72	0.39
ET020	61	0.64	68	0.47	73	0.37
ET030	41	1.44	71	0.41	72	0.39
ET040	42	1.38	69	0.45	69	0.45
ET050	39	1.56	68	0.47	68	0.47
ET060	39	1.56	69	0.45	69	0.45
ET070	39	1.56	71	0.41	71	0.41
ET080	39	1.56	75	0.33	76	0.32
ET090	39	1.56	61	0.64	74	0.35
ET100	39	1.56	48	1.08	63	0.59
ET110	39	1.56	54	0.85	61	0.64
ET120	39	1.56	60	0.67	61	0.64
ET130	39	1.56	61	0.64	63	0.59
ET140	39	1.56	61	0.64	63	0.59
ET150	39	1.56	62	0.61	62	0.61
ET160	42	1.38	64	0.56	64	0.56
FS010	44	1.27	49	1.04	56	0.79
MT010	45	1.22	64	0.56	64	0.56
MT020	57	0.75	62	0.61	68	0.47
MT030	54	0.85	66	0.52	67	0.49
MT040	55	0.82	64	0.56	75	0.33
MT050	39	1.56	67	0.49	67	0.49
MT060	39	1.56	55	0.82	66	0.52
MT070	42	1.38	59	0.69	67	0.49
MT080	48	1.08	86	0.16	87	0.15
MT090	39	1.56	83	0.20	85	0.18
MT100	39	1.56	67	0.49	70	0.43
MT110	39	1.56	68	0.47	68	0.47
WT010	56	0.79	58	0.72	58	0.72
WT020	56	0.79	59	0.69	59	0.69
WT030	57	0.75	59	0.69	59	0.69
WT040	56	0.79	58	0.72	58	0.72
WT050	60	0.67	62	0.61	62	0.61
WT060	59	0.69	61	0.64	61	0.64
WT070	56	0.79	58	0.72	58	0.72
WT080	60	0.67	62	0.61	62	0.61
WT090	61	0.64	62	0.61	63	0.59
WT100	61	0.64	62	0.61	69	0.45
WT110	60	0.67	61	0.64	63	0.59
WT120	43	1.33	54	0.85	63	0.59
WT130	60	0.67	72	0.39	72	0.39
WT140	61	0.64	62	0.61	70	0.43
WT150	61	0.64	65	0.54	74	0.35

Falcon DBPS

Ia Adjustment

Subbasin ID	Historical CN	Ia (in)	Existing CN	Ia (in)	Future CN	Ia (in)
WT160	61	0.64	69	0.45	69	0.45
WT170	55	0.82	58	0.72	64	0.56
WT180	39	1.56	41	1.44	61	0.64
WT190	39	1.56	64	0.56	64	0.56
WT200	39	1.56	57	0.75	64	0.56
WT210	40	1.50	56	0.79	70	0.43
WT220	47	1.13	61	0.64	72	0.39
WT230	51	0.96	70	0.43	73	0.37
WT240	58	0.72	71	0.41	74	0.35
WT250	53	0.89	67	0.49	73	0.37
WT260	59	0.69	63	0.59	63	0.59
WT270	47	1.13	67	0.49	71	0.41
WT280	61	0.64	63	0.59	63	0.59
WT290	51	0.96	63	0.59	63	0.59
WT300	58	0.72	63	0.59	63	0.59
WT310	46	1.17	60	0.67	62	0.61
WT320	41	1.44	61	0.64	63	0.59
WT330	40	1.50	58	0.72	63	0.59
WT340	42	1.38	63	0.59	63	0.59
WT350	48	1.08	62	0.61	64	0.56
WT360	47	1.13	62	0.61	62	0.61
WT370	40	1.50	45	1.22	52	0.92

Notes:

[1] Ia (in) = 0.10*(1000/CN)-10

Falcon DBPS

Existing Time of Concentration Calculations

Worksheet for computation of time of travel according to TR-55 methodology

Blue - GIS defined, Green - user specified, White and yellow - calculated, Red - final result

Watershed Name	WT060	WT050	WT080	WT090	WT110	WT100	ET070	WT150	WT140	MT010	ET060	WT170
Watershed ID	**177**	**66**	**342**	**69**	**70**	**71**	**83**	**332**	**146**	**151**	**210**	**282**
Sheet Flow Characteristics												
Manning's Roughness Coefficient	0.4	0.15	0.15	0.15	0.4	0.011	0.011	0.011	0.15	0.15	0.011	0.15
Flow Length (ft)	100	297	152	131	125	47.4265	100	100	252.4879	220.7734	44.6252	120.7109
Two-Year 24-hour Rainfall (in)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Land Slope (ft/ft)	0.0776	0.0316	0.0712	0.0669	0.0937	0.0401	0.0437	0.0174	0.0715	0.0874	0.1261	0.0224
Sheet Flow Tt (hr)	0.26	0.40	0.17	0.15	0.29	0.01	0.02	0.03	0.25	0.21	0.01	0.22
Shallow Concentrated Flow Characteristics												
Surface Description (1 - unpaved, 2 - paved)	1	1	1	1	1	1	1	1	1	1	1	1
Flow Length (ft)	629	630	921	4216	2838	625.1232	564.9179	0	340.5642	3491.1034	278.3003	723.4077
Watercourse Slope (ft/ft)	0.0429	0.0401	0.0474	0.0339	0.034	0.0471	0.0115	0	0.0301	0.0267	0.0446	0.0168
Average Velocity - computed (ft/s)	3.34	3.23	3.51	2.97	2.98	3.50	1.73	0.00	2.80	2.64	3.41	2.09
Shallow Concentrated Flow Tt (hr)	0.05	0.05	0.07	0.39	0.26	0.05	0.09	0.00	0.03	0.37	0.02	0.10
Channel Flow Characterisitics												
Cross-sectional Flow Area (ft2)	3.82	102.48	26.55	41.73	5.37	112.64	9.62	9	3.47	60.78	15.9	76.89
Wetted Perimeter (ft)	12.23	70.06	41.28	84.92	11.19	110.27	11	14.04	12.11	77.26	14.14	58.7
Hydraulic Radius - computed (ft)	0.31	1.46	0.64	0.49	0.48	1.02	0.87	0.64	0.29	0.79	1.12	1.31
Channel Slope (ft/ft)	0.0344	0.024	0.0247	0.012	0.0219	0.021	0.013	0.0036	0.0255	0.0226	0.0132	0.0184
Manning's Roughness Coefficient	0.06	0.05	0.05	0.03	0.05	0.05	0.013	0.05	0.05	0.05	0.013	0.05
Average Velocity - computed (ft/s)	2.12	5.95	3.49	3.39	2.70	4.38	11.95	1.33	2.07	3.82	14.24	4.84
Flow Length (ft)	4722	6298	3073	604	2635	5032.4692	4731.5554	5328.7401	2294.7909	4121.0832	6400.2723	3430.8373
Channel Flow Tt (hr)	0.62	0.29	0.24	0.05	0.27	0.32	0.11	1.11	0.31	0.30	0.12	0.20
Watershed Time of travel (hr)	**0.93**	**0.75**	**0.49**	**0.60**	**0.82**	**0.38**	**0.22**	**1.14**	**0.60**	**0.88**	**0.15**	**0.52**
Watershed Lag Time (min)	**33.40**	**26.99**	**17.52**	**21.52**	**29.57**	**13.65**	**7.88**	**41.04**	**21.46**	**31.62**	**5.54**	**18.61**

Number of watersheds	64
MXD Path	Falcon_DBPS.mxd
Stored workbook	
$AVHOME directory	
Name of the table to store the results of the calculation	Subbasin1
Workspace path	C:\GeoHMS\Falcon_DBPS\Falcon_DBPS.mdb

Notes:

[1] Sheet Flow Manning's n values from Table 3-1 in TR55

[2] For LFP's with no Shallow Concentrated Flow length, slopes were manually changed from NaN (default) to 0 and Shallow Concentrated Flow Tc was changed to 0 so Watershed Time of Travel could be computed.

[3] Channel Flow Manning's n values were selected from multiple sources and are documented in the Manning's n Value Selection Quality Assurance packet

[4] Watershed Lag Time = 0.6*Watershed Time of Travel

Falcon DBPS

Existing Time of Concentration Calculations

Worksheet for computation of time of travel according to TR-55 methodology

Blue - GIS defined, Green - user specified, White and yellow - calculated, Red - final result

Watershed Name	WT120	ET030	WT160	ET150	MT100	MT090	MT080	MT030	MT060	ET080	MT070	MT110	WT310	WT300
Watershed ID	284	303	298	551	612	608	613	633	643	94	157	167	171	173
Sheet Flow Characteristics														
Manning's Roughness Coefficient	0.15	0.011	0.011	0.15	0.15	0.011	0.011	0.15	0.011	0.24	0.15	0.011	0.011	0.15
Flow Length (ft)	191.3389	20.537	26.2133	100	142.9726	100	119.91	88.6543	43.2844	141.055	145.5913	54.54	37.3701	292.2798
Two-Year 24-hour Rainfall (in)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Land Slope (ft/ft)	0.057	0.0182	0.0352	0.0443	0.0452	0.0054	0.0008	0.0979	0.0326	0.0316	0.0154	0.067	0.0459	0.0418
Sheet Flow Tt (hr)	0.22	0.01	0.01	0.15	0.19	0.04	0.10	0.10	0.01	0.32	0.30	0.01	0.01	0.35
Shallow Concentrated Flow Characteristics														
Surface Description (1 - unpaved, 2 - paved)	1	1	2	1	1	2	2	1	1	1	1	1	1	1
Flow Length (ft)	515.1666	710.4925	0	2978.6929	0	259.7955	0	1309.2521	6116.429	844.1173	6399.686	3391.19	1766.78	883.1998
Watercourse Slope (ft/ft)	0.021	0.0337	0	0.0221	0	0.0253	0	0.032	0.0194	0.0183	0.0204	0.012	0.0273	0.0351
Average Velocity - computed (ft/s)	2.34	2.96	0.00	2.40	0.00	3.23	0.00	2.89	2.25	2.18	2.30	1.77	2.67	3.02
Shallow Concentrated Flow Tt (hr)	0.06	0.07	0.00	0.34	0.00	0.02	0.00	0.13	0.76	0.11	0.77	0.53	0.18	0.08
Channel Flow Characterisitics														
Cross-sectional Flow Area (ft2)	39.43	20.5	4.39	18.39	6.31	25.13	64	19.13	19.69	15.9	4.9	19.9	6.02	3.64
Wetted Perimeter (ft)	101.84	42.22	23.26	32.36	22.61	25.13	32	49.99	35.22	14.14	26.77	39.66	24.31	13.97
Hydraulic Radius - computed (ft)	0.39	0.49	0.19	0.57	0.28	1.00	2.00	0.38	0.56	1.12	0.18	0.50	0.25	0.26
Channel Slope (ft/ft)	0.0154	0.0093	0.0249	0.0094	0.0105	0.0093	0.014	0.0207	0.0355	0.0124	0.012	0.013	0.015	0.0239
Manning's Roughness Coefficient	0.03	0.07	0.013	0.05	0.03	0.013	0.013	0.03	0.06	0.013	0.03	0.07	0.06	0.03
Average Velocity - computed (ft/s)	3.27	1.27	5.95	1.98	2.17	11.05	21.53	3.77	3.18	13.80	1.75	1.53	1.20	3.13
Flow Length (ft)	2950.9478	3715.1193	4363.7964	1523.8687	1939.0988	1519.2867	3055.11	2604.7205	97.6779	5559.793	335.5838	744.17	2422.127	1259.995
Channel Flow Tt (hr)	0.25	0.81	0.20	0.21	0.25	0.04	0.04	0.19	0.01	0.11	0.05	0.13	0.56	0.11
Watershed Time of travel (hr)	0.53	0.89	0.21	0.71	0.44	0.10	0.14	0.42	0.78	0.54	1.13	0.68	0.75	0.55
Watershed Lag Time (min)	19.24	31.96	7.58	25.39	15.89	3.69	5.18	14.94	27.90	19.49	40.56	24.38	27.12	19.69

Number of watersheds
MXD Path
Stored workbook
$AVHOME directory
Name of the table to store the results of the calculation
Workspace path

Falcon DBPS

Existing Time of Concentration Calculations

Worksheet for computation of time of travel according to TR-55 methodology

Blue - GIS defined, Green - user specified, White and yellow - calculated, Red - final result

Watershed Name	**WT010**	**WT280**	**ET140**	**ET130**	**WT230**	**WT040**	**MT020**	**MT050**	**WT240**	**WT250**	**ET110**	**ET100**	**WT220**	**WT370**	**WT350**	**WT340**	**WT330**
Watershed ID	**183**	**247**	**351**	**353**	**407**	**588**	**635**	**649**	**663**	**667**	**681**	**682**	**267**	**114**	**214**	**116**	**123**
Sheet Flow Characteristics																	
Manning's Roughness Coefficient	0.4	0.15	0.15	0.15	0.24	0.4	0.15	0.24	0.011	0.011	0.15	0.011	0.011	0.15	0.15	0.15	0.15
Flow Length (ft)	146.5688	68.6391	118.6398	119.4977	45.0001	128.3412	16.2369	167.7821	54	110.7786	296.0756	48.2844	56.2392	148.5814	199.706	296.2138	298.7012
Two-Year 24-hour Rainfall (in)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Land Slope (ft/ft)	0.0766	0.0321	0.0214	0.0243	0.1104	0.0443	0.0215	0.0209	0.037	0.0125	0.0362	0.1191	0.019	0.0363	0.024	0.0345	0.05
Sheet Flow Tt (hr)	0.35	0.12	0.22	0.22	0.08	0.39	0.05	0.44	0.01	0.03	0.38	0.01	0.02	0.22	0.33	0.39	0.34
Shallow Concentrated Flow Characteristics																	
Surface Description (1 - unpaved, 2 - paved)	1	1	1	1	2	1	1	2	2	2	1	1	1	1	1	1	1
Flow Length (ft)	742.1945	1860.327	1172.282	828.555	181.5689	984.9924	3260.587	275.2087	0	0	2365.505	762.0473	5060.256	0	3420.637	4497.88	5188.524
Watercourse Slope (ft/ft)	0.04	0.0259	0.0172	0.0128	0.0228	0.0516	0.032	0.0239	0	0	0.0271	0.0225	0.021	0	0.0467	0.0237	0.0225
Average Velocity - computed (ft/s)	3.23	2.60	2.12	1.83	3.07	3.67	2.89	3.14	0.00	0.00	2.66	2.42	2.34	0.00	3.49	2.48	2.42
Shallow Concentrated Flow Tt (hr)	0.06	0.20	0.15	0.13	0.02	0.07	0.31	0.02	0.00	0.00	0.25	0.09	0.60	0.00	0.27	0.50	0.60
Channel Flow Characterisitics																	
Cross-sectional Flow Area (ft2)	3.99	2.43	25.47	21.02	4.39	8.4	20.97	2.91	4.39	4.39	39.65	4.58	6.73	30.81	59.79	6.55	12.59
Wetted Perimeter (ft)	15.4	9.26	84.23	169.15	23.26	26.23	40.88	6.68	23.26	23.26	105.42	8.91	12.27	26.96	38.47	17.42	25.95
Hydraulic Radius - computed (ft)	0.26	0.26	0.30	0.12	0.19	0.32	0.51	0.44	0.19	0.19	0.38	0.51	0.55	1.14	1.55	0.38	0.49
Channel Slope (ft/ft)	0.0324	0.0179	0.0113	0.0144	0.009	0.026	0	0.0173	0.0175	0.0112	0.0114	0.0119	0.0108	0.0119	0.0088	0.0209	0.0119
Manning's Roughness Coefficient	0.06	0.03	0.06	0.05	0.013	0.05	0.05	0.03	0.013	0.013	0.03	0.03	0.03	0.05	0.05	0.03	0.05
Average Velocity - computed (ft/s)	1.82	2.72	1.19	0.89	3.58	2.25	0.00	3.75	4.99	3.99	2.76	3.48	3.46	3.55	3.75	3.74	2.01
Flow Length (ft)	1719.181	2209.347	6595.197	3022.555	4460.603	4086.883	0	3582.906	4002.366	3560.407	866.4156	1602.548	1573.016	6132.815	3083.294	4257.557	508.9379
Channel Flow Tt (hr)	0.26	0.23	1.54	0.94	0.35	0.50	0.00	0.27	0.22	0.25	0.09	0.13	0.13	0.48	0.23	0.32	0.07
Watershed Time of travel (hr)	**0.68**	**0.55**	**1.92**	**1.28**	**0.44**	**0.97**	**0.36**	**0.73**	**0.23**	**0.28**	**0.71**	**0.22**	**0.74**	**0.70**	**0.83**	**1.21**	**1.00**
Watershed Lag Time (min)	**24.38**	**19.72**	**69.09**	**46.22**	**15.88**	**34.99**	**12.94**	**26.13**	**8.45**	**10.10**	**25.68**	**8.00**	**26.77**	**25.11**	**29.76**	**43.40**	**36.05**
Number of watersheds																	
MXD Path																	
Stored workbook																	
$AVHOME directory																	
Name of the table to store the results of the calculation																	
Workspace path																	

Falcon DBPS

Existing Time of Concentration Calculations

Worksheet for computation of time of travel according to TR-55 methodology

Blue - GIS defined, Green - user specified, White and yellow - calculated, Red - final result

Watershed Name	**WT030**	**WT020**	**WT210**	**ET160**	**WT360**	**WT260**	**WT290**	**WT270**	**ET120**	**ET090**	**WT180**	**MT040**	**WT200**	**WT190**	**WT130**	**WT320**	**ET010**
Watershed ID	**187**	**189**	**199**	**221**	**227**	**256**	**238**	**242**	**252**	**262**	**848**	**272**	**276**	**278**	**288**	**308**	**318**
Sheet Flow Characteristics																	
Manning's Roughness Coefficient	0.15	0.4	0.15	0.15	0.011	0.15	0.011	0.011	0.011	0.24	0.25	0.15	0.15	0.011	0.15	0.15	0.15
Flow Length (ft)	141.2626	266.2251	285.0006	80.005	87.4266	100	100	40.3554	61.2133	138.9952	296	75.2183	183.5462	100	88.7973	261.2747	78
Two-Year 24-hour Rainfall (in)	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Land Slope (ft/ft)	0.103	0.1066	0.0231	0.0189	0.0402	0.0508	0.0513	0.0274	0.0332	0.0589	0.027	0.0608	0.0297	0.0174	0.0421	0.0858	0.0256
Sheet Flow Tt (hr)	0.14	0.50	0.44	0.17	0.02	0.14	0.02	0.01	0.01	0.25	0.64	0.10	0.28	0.03	0.14	0.24	0.15
Shallow Concentrated Flow Characteristics																	
Surface Description (1 - unpaved, 2 - paved)	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1
Flow Length (ft)	432.1399	295.3505	4198.315	3912.236	2241.548	1133.028	267.4881	0	5817.561	0	4489.17	3144.352	9180.05	0	0	2919.894	528
Watercourse Slope (ft/ft)	0.0424	0.0619	0.0198	0.0146	0.0171	0.0154	0.0196	0	0.0164	0	0.024	0.03	0.0209	0	0	0.0372	0.0303
Average Velocity - computed (ft/s)	3.32	4.01	2.27	1.95	2.11	2.00	2.26	0.00	2.07	0.00	3.15	2.79	2.33	0.00	0.00	3.11	2.81
Shallow Concentrated Flow Tt (hr)	0.04	0.02	0.51	0.56	0.30	0.16	0.03	0.00	0.78	0.00	0.40	0.31	1.09	0.00	0.00	0.26	0.05
Channel Flow Characterisitics																	
Cross-sectional Flow Area (ft2)	6.12	8.51	39.77	22.37	10.27	0.82	41.59	9.66	25.13	9.72	163.44	4.32	25.69	3.88	4.39	28.9	15.97
Wetted Perimeter (ft)	11.83	29.87	160.6	24.5	37.46	3.97	114.48	33.28	25.13	31.92	140.79	7.39	57.74	14.09	23.26	26.6	31.94
Hydraulic Radius - computed (ft)	0.52	0.28	0.25	0.91	0.27	0.21	0.36	0.29	1.00	0.30	1.16	0.58	0.44	0.28	0.19	1.09	0.50
Channel Slope (ft/ft)	0.0224	0.0271	0.0145	0.0093	0.0083	0.0082	0.0107	0.0147	0.005	0.0096	0.0135	0.0172	0.0316	0.0232	0.0249	0.0101	0.0217
Manning's Roughness Coefficient	0.05	0.06	0.06	0.03	0.05	0.06	0.05	0.03	0.013	0.03	0.05	0.03	0.05	0.03	0.013	0.05	0.05
Average Velocity - computed (ft/s)	2.87	1.77	1.18	4.51	1.15	0.79	1.57	2.64	8.10	2.20	3.82	4.55	3.09	3.20	5.95	3.17	2.77
Flow Length (ft)	2076.623	1662.612	2770.435	2028.925	1285.17	2358.52	2236.363	3268.233	47.5001	7102.49	443	5292.631	316	3336.891	3894.055	2166.302	4966.49
Channel Flow Tt (hr)	0.20	0.26	0.65	0.13	0.31	0.83	0.40	0.34	0.00	0.90	0.03	0.32	0.03	0.29	0.18	0.19	0.50
Watershed Time of travel (hr)	**0.37**	**0.78**	**1.61**	**0.85**	**0.62**	**1.13**	**0.45**	**0.35**	**0.80**	**1.14**	**1.07**	**0.74**	**1.40**	**0.32**	**0.32**	**0.69**	**0.70**
Watershed Lag Time (min)	**13.49**	**27.95**	**57.82**	**30.78**	**22.45**	**40.67**	**16.05**	**12.76**	**28.71**	**41.18**	**38.49**	**26.58**	**50.45**	**11.37**	**11.44**	**24.97**	**25.23**

Number of watersheds
MXD Path
Stored workbook
$AVHOME directory
Name of the table to store the results of the calculation
Workspace path

Falcon DBPS

Existing Time of Concentration Calculations

Worksheet for computation of time of travel according to TR-55 methodology

Blue - GIS defined, Green - user specified, White and yellow - calculated, Red - final result

Watershed Name	ET020	WT070	ET050	ET040	FS010
Watershed ID	328	343	467	468	5
Sheet Flow Characteristics					
Manning's Roughness Coefficient	0.15	0.4	0.011	0.011	0.011
Flow Length (ft)	43.6613	45.0001	47.0712	301.3711	29
Two-Year 24-hour Rainfall (in)	2.1	2.1	2.1	2.1	2.1
Land Slope (ft/ft)	0.1105	0.0566	0.0263	0.052	0.0552
Sheet Flow Tt (hr)	0.05	0.15	0.01	0.04	0.01
Shallow Concentrated Flow Characteristics					
Surface Description (1 - unpaved, 2 - paved)	2	1	1	1	1
Flow Length (ft)	0	861.3369	1478.833	0	0
Watercourse Slope (ft/ft)	0	0.0441	0.0202	0	0
Average Velocity - computed (ft/s)	0.00	3.39	2.29	0.00	0.00
Shallow Concentrated Flow Tt (hr)	0.00	0.07	0.18	0.00	0.00
Channel Flow Characterisitics					
Cross-sectional Flow Area (ft2)	3.55	13.56	12.57	2.07	10
Wetted Perimeter (ft)	9.58	20.48	12.57	6.76	40.01
Hydraulic Radius - computed (ft)	0.37	0.66	1.00	0.31	0.25
Channel Slope (ft/ft)	0.0211	0.0236	0.0125	0.0171	0.0208
Manning's Roughness Coefficient	0.03	0.05	0.013	0.03	0.06
Average Velocity - computed (ft/s)	3.72	3.48	12.81	2.95	1.42
Flow Length (ft)	5760.795	3717.648	1130.583	6137.448	4362
Channel Flow Tt (hr)	0.43	0.30	0.02	0.58	0.85
Watershed Time of travel (hr)	0.48	0.52	0.22	0.62	0.86
Watershed Lag Time (min)	17.37	18.77	7.77	22.28	30.92
Number of watersheds					1
MXD Path					Falcon_DBPS.mxd
Stored workbook					
$AVHOME directory					
Name of the table to store the results of the calculation					Subbasin3
Workspace path					C:\GeoHMS\Falcon_DBPS_South\Falcon_DBPS_South.mdb

Falcon DBPS

Manning's n Values

Manning's n Description	Selected Value
Vegetated Roadside Ditch	**0.03**
Grass Swale	**0.06**
Channel - Sand	**0.03**
Channel - Grass	**0.05**
Channel - Willow	**0.07**
Floodplain - Grass	**0.08**
Floodplain - Willow	**0.15**

References:

1 Guide for Selecting Manning's Roughness Coefficients for Natural Channels and Floodplains, USGS Water Supply Paper 2339

2 City of Colorado Springs DCM

3 CDOT DCM

4 UDFCD DCM

5 Guide for Selecting Roughness Coefficient "n" Values For Channels, NRCS (SCS), 1963

6 Cottonwood Creek DBPS

Falcon DBPS

Routing Description

Reach	Length (ft)	Slope (ft/ft)	Manning's n	Invert (ft)	Shape	Diameter (ft)	Width (ft)	Side Slope (h:v)	L.B. Manning's n	R.B. Manning's n
RET020	3063.9	0.0186036	0.05	7113.75	Eight Point	--	--	--	0.08	0.08
RET030	5307.2	0.0146972	0.07	7019.43	Eight Point	--	--	--	0.08	0.08
RET040	1951	0.0194768	0.07	6958.54	Eight Point	--	--	--	0.15	0.15
RET050	1877.3	0.0207744	0.07	6938.26	Eight Point	--	--	--	0.08	0.08
RET060	1866	0.0117898	0.05	6896.01	Eight Point	--	--	--	0.08	0.08
RET070	2209.2	0.0185584	0.07	6868.86	Eight Point	--	--	--	0.08	0.08
RET080	1569.2	0.0044608	0.07	6855.75	Eight Point	--	--	--	0.15	0.15
RET090	378.7	0.0052812	0.07	6854.04	Eight Point	--	--	--	0.15	0.15
RET100	1916.5	0.0203494	0.03	6832.6	Eight Point	--	--	--	0.08	0.08
RET110	2956.5	0.0145443	0.03	6780.51	Eight Point	--	--	--	0.08	0.08
RET120	1474.5	0.0047475	0.03	6766.26	Eight Point	--	--	--	0.08	0.08
RET140	4052.5	0.0134575	0.03	6779.63	Eight Point	--	--	--	0.08	0.08
RET152	2217.2	0.0175895	0.03	6755.38	Eight Point	--	--	--	0.08	0.08
RET154	2358.2	0.0132409	0.05	6743.88	Eight Point	--	--	--	0.08	0.08
RET156	1006.8	0.0079457	0.03	6727.09	Eight Point	--	--	--	0.08	0.08
RET162	3410.6	0.0108486	0.05	6699.33	Eight Point	--	--	--	0.08	0.08
RET164	2094.9	0.0124114	0.03	6671.23	Eight Point	--	--	--	0.08	0.08
RMT030	3636.4	0.0202839	0.03	7033.46	Eight Point	--	--	--	0.08	0.08
RMT040	1310.1	0.0091599	0.03	6984	Eight Point	--	--	--	0.08	0.08
RMT050	1567.7	0.0191364	0.03	6965.39	Eight Point	--	--	--	0.08	0.08
RMT062	6001.9	0.0201602	0.05	6928.82	Eight Point	--	--	--	0.08	0.08
RMT064	3355.9	0.0160912	0.05	6911.23	Eight Point	--	--	--	0.08	0.08
RMT070	1118.3	0.0107303	0.05	6881.93	Eight Point	--	--	--	0.08	0.08
RMT080	2187.7	0.0118848	0.013		Rectangle	--	8	--		
RMT090	284.64	0.0105	0.013		Circle	3	--	--		
RMT102	1101.3	0.0208837	0.07	6840.11	Eight Point	--	--	--	0.15	0.15
RMT104	866.69	0.015	0.05	6846	Eight Point	--	--	--	0.08	0.08
RMT106	234.5	0.0042644	0.07	6831.79	Eight Point	--	--	--	0.15	0.15
RMT112	3556.1	0.0143416	0.07	6802.15	Eight Point	--	--	--	0.15	0.15
RMT114	1760.2	0.0170437	0.05	6758.55	Eight Point	--	--	--	0.08	0.08
RWT030	2078.5	0.0232	0.05	7392.86	Eight Point	--	--	--	0.08	0.08
RWT042	1561.2	0.0263708	0.05	7366.57	Eight Point	--	--	--	0.08	0.08
RWT044	2369.4	0.0291215	0.05	7367.84	Eight Point	--	--	--	0.08	0.08
RWT046	2587.6	0.0212553	0.05	7294.2	Eight Point	--	--	--	0.08	0.08
RWT054	2699.213562	0.021117	0.05	7267.87	Eight Point	--	--	--	0.08	0.08
RWT080	3461.5	0.0271559	0.05	7253.59	Eight Point	--	--	--	0.08	0.08
RWT092	651.99	0.0184053	0.03	7224.51	Eight Point	--	--	--	0.08	0.08
RWT094	2357.7	0.0114517	0.03	7190.23	Eight Point	--	--	--	0.08	0.08
RWT122	561.63	0.0124637	0.03	7184.96	Eight Point	--	--	--	0.08	0.08
RWT124	2423.9	0.0165024	0.03	7153.3	Eight Point	--	--	--	0.08	0.08
RWT150	2608	0.019	0.05	7174.97	Eight Point	--	--	--	0.08	0.08
RWT160	1565.7	0.0204375	0.05	7114.22	Eight Point	--	--	--	0.08	0.08
RWT172	3101.9	0.0190205	0.05	7114.4	Eight Point	--	--	--	0.08	0.08

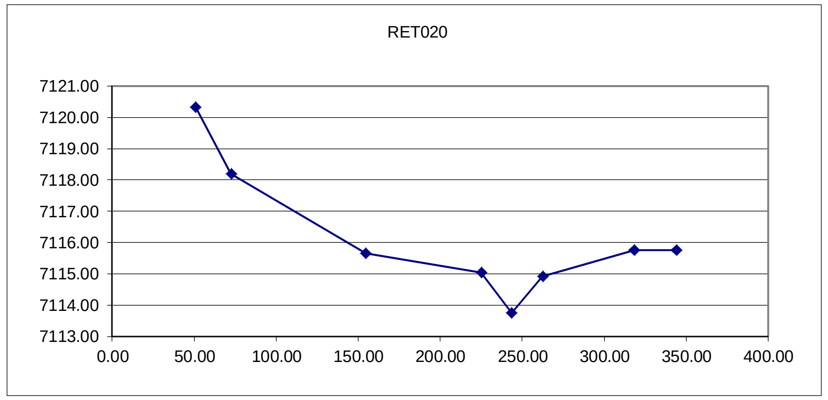
Falcon DBPS

Routing Description

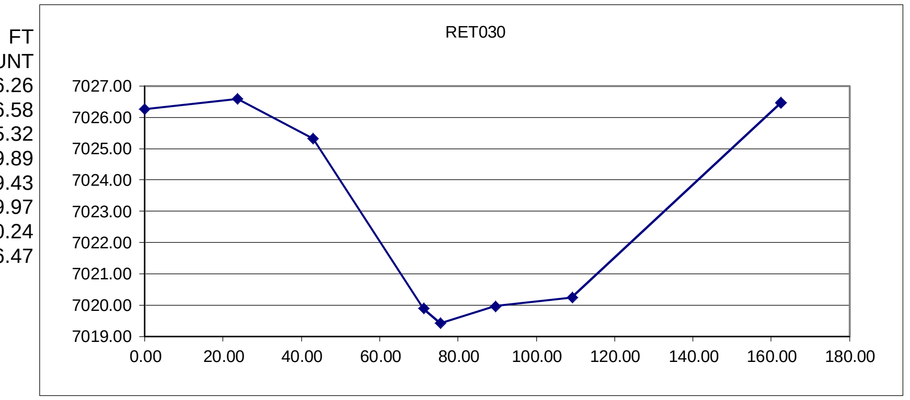
Reach	Length (ft)	Slope (ft/ft)	Manning's n	Invert (ft)	Shape	Diameter (ft)	Width (ft)	Side Slope (h:v)	L.B. Manning's n	R.B. Manning's n
RWT174	1869.6	0.0160463	0.05	7105.07	Eight Point	--	--	--	0.08	0.08
RWT176	326.42	0.0122541	0.03	7079.07	Eight Point	--	--	--	0.08	0.08
RWT180	3727.614345	0.0204	0.05	7015.13	Eight Point	--	--	--	0.08	0.08
RWT202	3011.790196	0.0212	0.05	6953.23	Eight Point	--	--	--	0.08	0.08
RWT204	3538.4	0.0218	0.05	6952	Eight Point	--	--	--	0.08	0.08
RWT210	2914.7	0.0133803	0.03	6906.35	Eight Point	--	--	--	0.08	0.08
RWT232	2180	0.0178898	0.05	6861.66	Eight Point	--	--	--	0.08	0.08
RWT234	2126.1	0.0201117	0.05	6860	Eight Point	--	--	--	0.08	0.08
RWT236	124.98	0.008	0.013		Rectangle		42		--	--
RWT240	1044	0.013	0.05	6837.41	Eight Point	--	--	--	0.08	0.08
RWT240_Diversion Reach	929	0.013	0.07	6826	Eight Point	--	--	--	0.15	0.15
RWT250	184.35	0.0054245	0.07	6818.14	Eight Point	--	--	--	0.15	0.15
RWT260	2371.1	0.015183	0.05	6800.68	Eight Point	--	--	--	0.08	0.08
RWT291	986.55	0.0223001	0.05	6780.96	Eight Point	--	--	--	0.08	0.08
RWT292	733.2	0.0165	0.05	6779.41	Eight Point	--	--	--	0.08	0.08
RWT294	536.02	0.0149	0.05	6772.93	Eight Point	--	--	--	0.08	0.08
RWT295	217	0.0091575	0.05	6763.06	Eight Point	--	--	--	0.08	0.08
RWT296	1202.594155	0.0091575	0.05	6763.06	Eight Point	--	--	--	0.08	0.08
RWT312	3295.8	0.0265	0.05	6731.53	Eight Point	--	--	--	0.08	0.08
RWT314	2428.7	0.0148227	0.05	6734.64	Eight Point	--	--	--	0.08	0.08
RWT320	2459.5	0.0093515	0.05	6692.49	Eight Point	--	--	--	0.08	0.08
RWT344	1380.563492	0.010865	0.03	6666	Eight Point	--	--	--	0.08	0.08
RWT352	3134.2	0.0121	0.05	6662.01	Eight Point	--	--	--	0.08	0.08
RWT354	14.142	0.0121	0.05	6658.11	Eight Point	--	--	--	0.08	0.08
RWT372	1466.3	0.0184133	0.07	6642.65	Eight Point	--	--	--	0.15	0.15
RWT374	2309.9	0.016	0.05	6659.99	Eight Point	--	--	--	0.08	0.08
RWT376	2601.5	0.0103788	0.05	6623.3	Eight Point	--	--	--	0.08	0.08

Falcon DBPS
Routing Sections

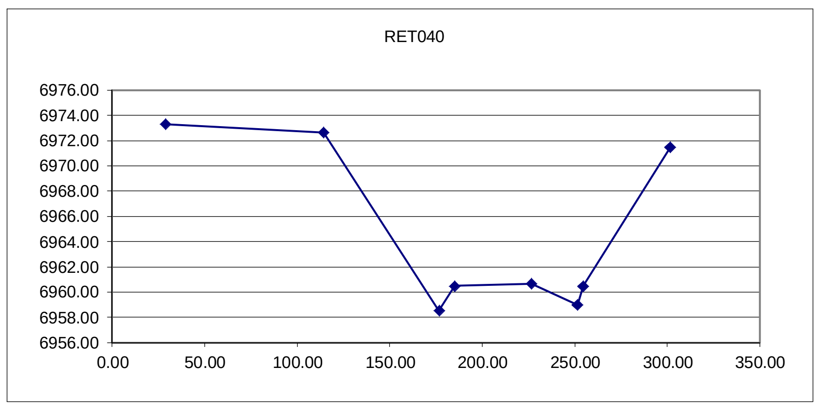
Labels	RET020	
Units	FT	FT
Type	UNT	UNT
1	50.81	7120.32
2	72.59	7118.20
3	154.56	7115.65
4	225.04	7115.04
5	243.61	7113.75
6	262.48	7114.93
7	318.49	7115.76
8	344.20	7115.76



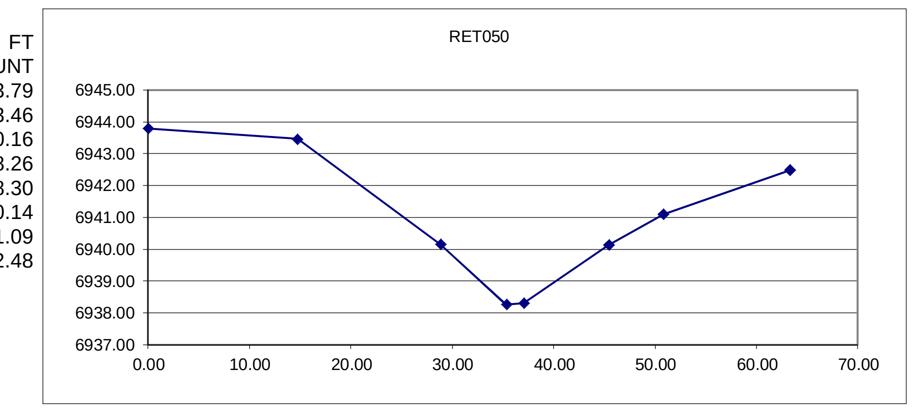
Labels	RET030	
Units	FT	FT
Type	UNT	UNT
1	0.00	7026.26
2	23.68	7026.58
3	42.94	7025.32
4	71.15	7019.89
5	75.55	7019.43
6	89.59	7019.97
7	109.14	7020.24
8	162.48	7026.47



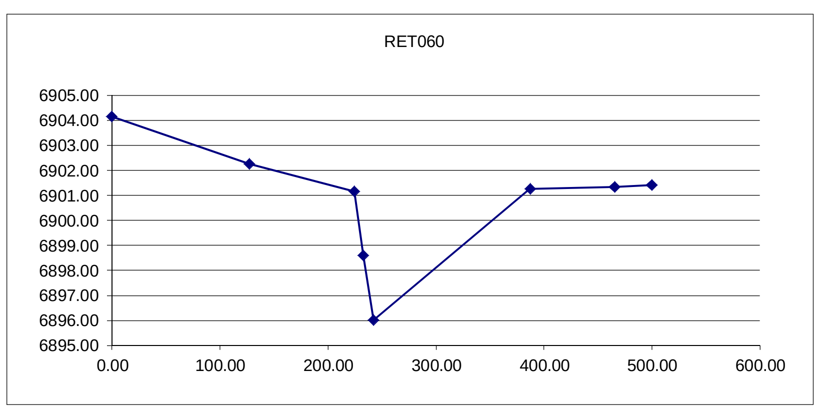
Labels	RET040	
Units	FT	FT
Type	UNT	UNT
1	28.99	6973.29
2	114.15	6972.63
3	176.67	6958.54
4	185.20	6960.48
5	226.47	6960.65
6	251.46	6958.99
7	254.60	6960.48
8	301.51	6971.47



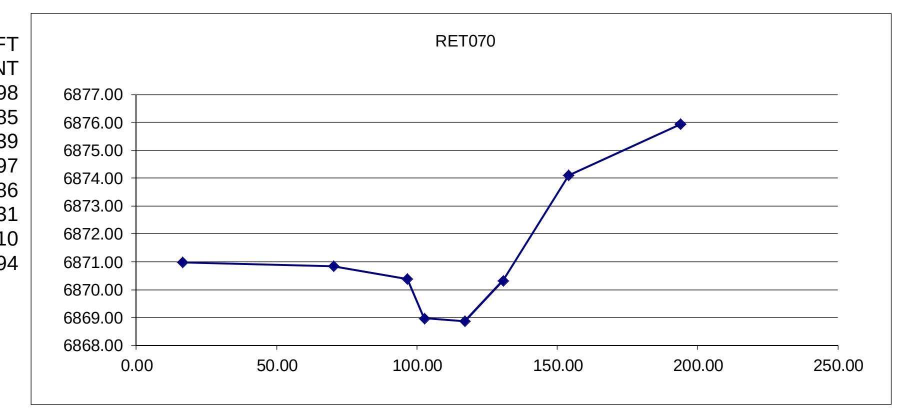
Labels	RET050	
Units	FT	FT
Type	UNT	UNT
1	0.00	6943.79
2	14.74	6943.46
3	28.85	6940.16
4	35.34	6938.26
5	37.06	6938.30
6	45.44	6940.14
7	50.83	6941.09
8	63.32	6942.48



Labels	RET060	
Units	FT	FT
Type	UNT	UNT
1	0.00	6904.16
2	127.10	6902.26
3	224.45	6901.16
4	232.40	6898.60
5	242.02	6896.01
6	386.92	6901.27
7	465.15	6901.33
8	500.00	6901.42

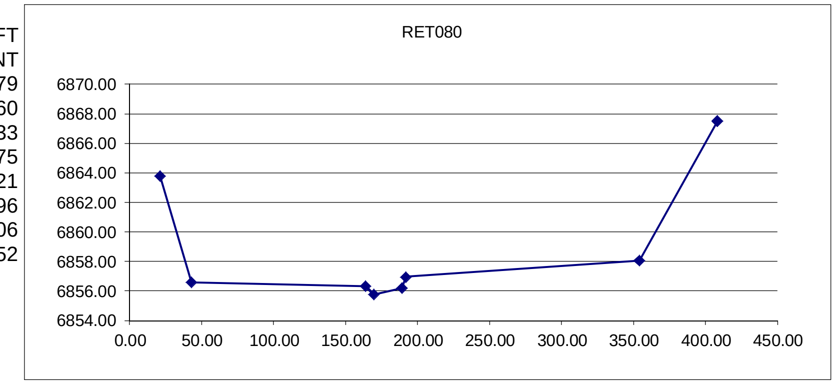


Labels	RET070	
Units	FT	FT
Type	UNT	UNT
1	16.60	6870.98
2	70.22	6870.85
3	96.52	6870.39
4	102.62	6868.97
5	117.03	6868.86
6	130.63	6870.31
7	154.05	6874.10
8	193.94	6875.94

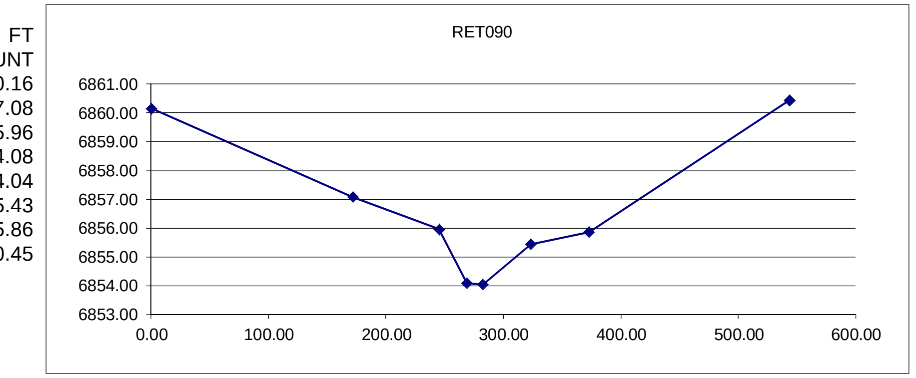


Falcon DBPS
Routing Sections

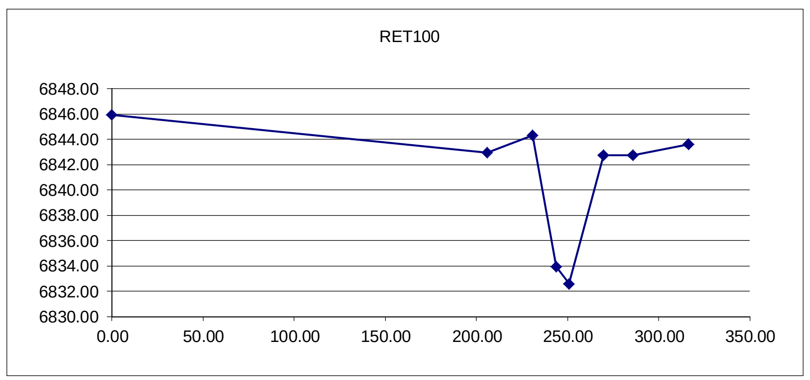
Labels	**RET080**	
Units	FT	FT
Type	UNT	UNT
1	21.35	6863.79
2	43.06	6856.60
3	163.93	6856.33
4	169.39	6855.75
5	189.29	6856.21
6	191.64	6856.96
7	354.03	6858.06
8	408.08	6867.52



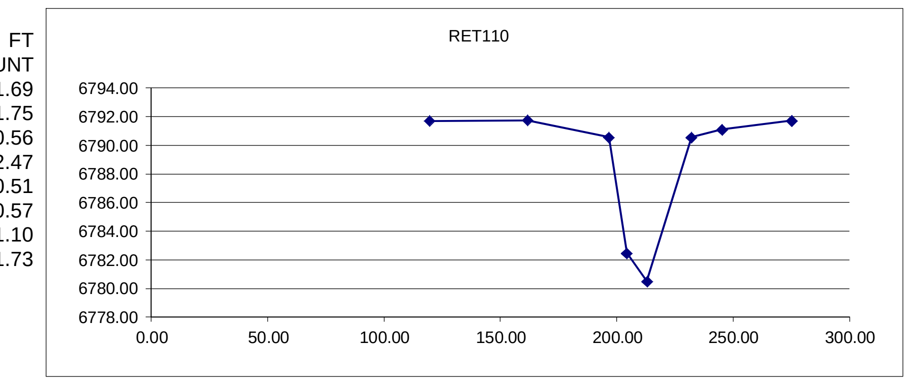
Labels	**RET090**	
Units	FT	FT
Type	UNT	UNT
1	0.00	6860.16
2	171.56	6857.08
3	245.14	6855.96
4	268.81	6854.08
5	282.37	6854.04
6	323.31	6855.43
7	372.89	6855.86
8	543.83	6860.45



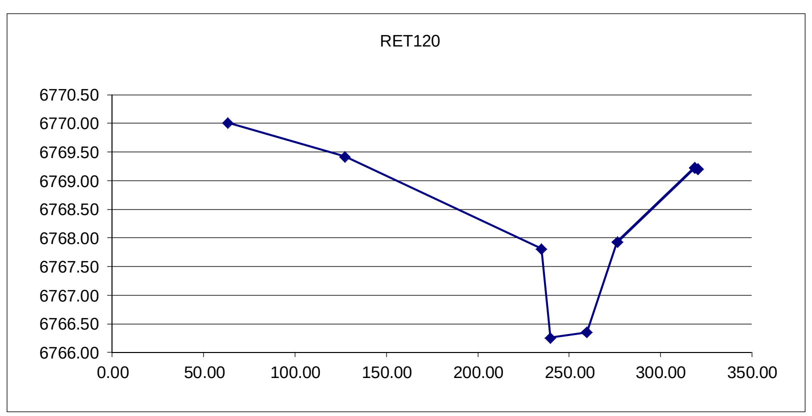
Labels	**RET100**	
Units	FT	FT
Type	UNT	UNT
1	0.00	6845.96
2	205.92	6842.96
3	230.83	6844.31
4	243.63	6833.94
5	250.79	6832.60
6	269.64	6842.77
7	285.91	6842.76
8	316.17	6843.61



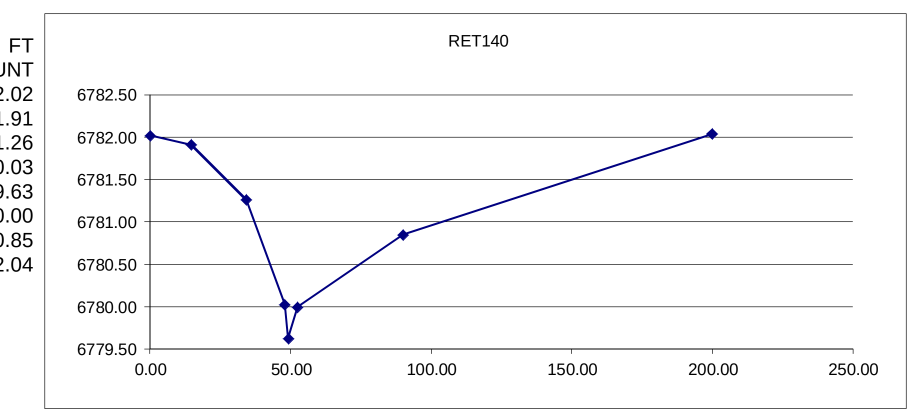
Labels	**RET110**	
Units	FT	FT
Type	UNT	UNT
1	119.58	6791.69
2	161.68	6791.75
3	196.52	6790.56
4	204.34	6782.47
5	212.97	6780.51
6	232.09	6790.57
7	245.15	6791.10
8	275.25	6791.73



Labels	**RET120**	
Units	FT	FT
Type	UNT	UNT
1	63.05	6770.01
2	127.34	6769.42
3	234.80	6767.81
4	239.61	6766.26
5	259.64	6766.35
6	276.25	6767.93
7	318.89	6769.23
8	320.54	6769.20

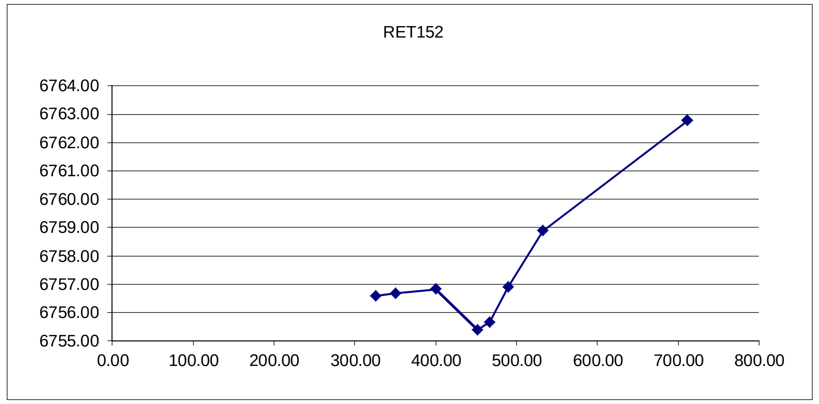


Labels	**RET140**	
Units	FT	FT
Type	UNT	UNT
1	0.00	6782.02
2	14.66	6781.91
3	34.31	6781.26
4	47.95	6780.03
5	49.22	6779.63
6	52.49	6780.00
7	90.03	6780.85
8	199.95	6782.04

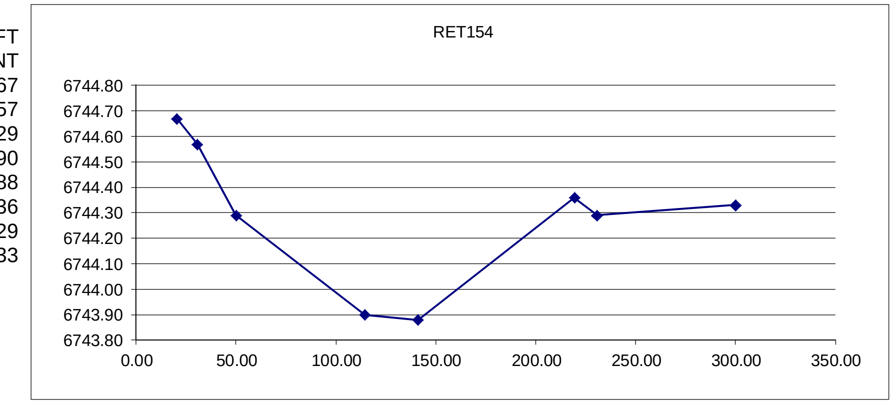


Falcon DBPS
Routing Sections

Labels	RET152	
Units	FT	FT
Type	UNT	UNT
1	325.91	6756.58
2	350.21	6756.68
3	400.45	6756.82
4	451.87	6755.39
5	466.44	6755.66
6	489.70	6756.90
7	532.40	6758.88
8	711.47	6762.77

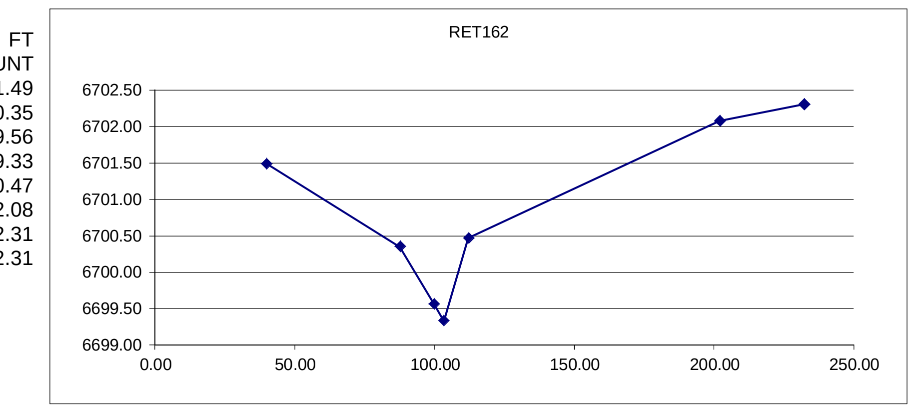


Labels	RET154	
Units	FT	FT
Type	UNT	UNT
1	20.28	6744.67
2	30.64	6744.57
3	50.01	6744.29
4	114.41	6743.90
5	141.03	6743.88
6	219.26	6744.36
7	230.63	6744.29
8	300.00	6744.33

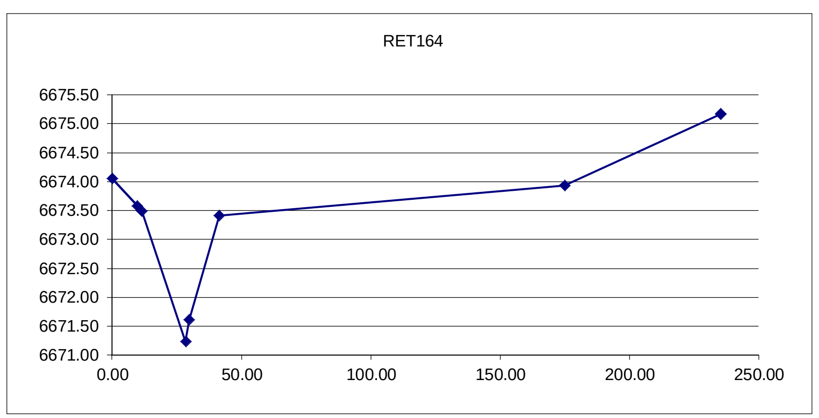


Labels	RET156	
Units	FT	FT
Type	UNT	UNT
1	75.39	6729.33
2	133.64	6729.22
3	217.76	6728.12
4	251.52	6727.09
5	258.63	6727.63
6	293.28	6728.47
7	386.01	6734.67
8	465.04	6737.07

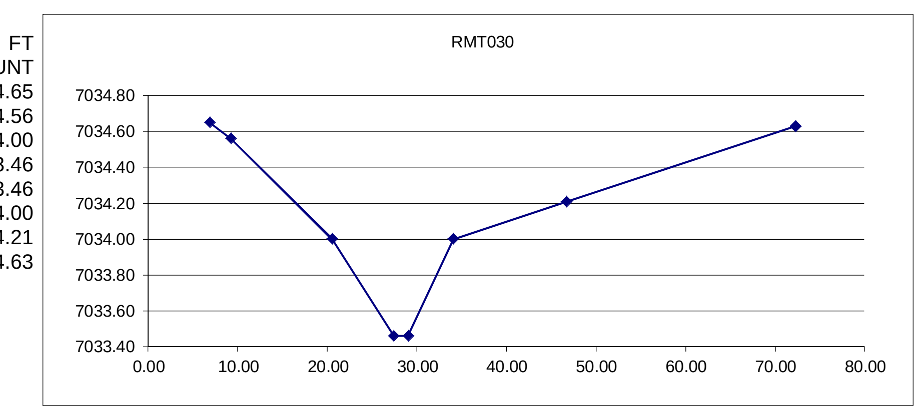
Labels	RET162	
Units	FT	FT
Type	UNT	UNT
1	39.95	6701.49
2	87.67	6700.35
3	99.86	6699.56
4	103.34	6699.33
5	112.17	6700.47
6	202.10	6702.08
7	232.27	6702.31
8	232.27	6702.31



Labels	RET164	
Units	FT	FT
Type	UNT	UNT
1	0.00	6674.05
2	9.86	6673.58
3	11.48	6673.49
4	28.47	6671.23
5	29.93	6671.61
6	41.40	6673.41
7	174.93	6673.93
8	235.34	6675.17

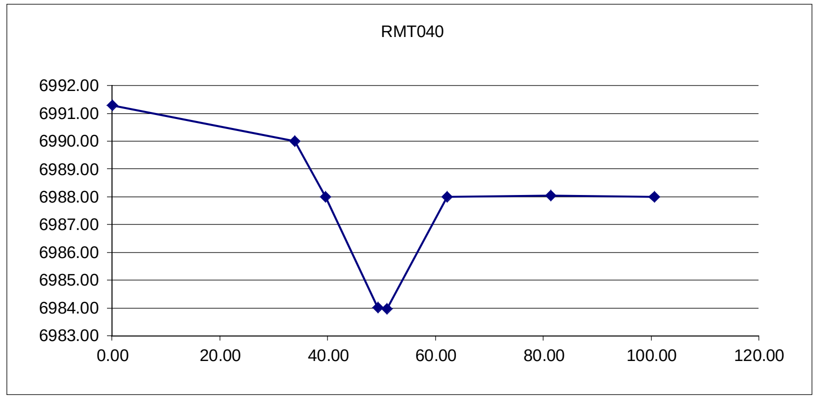


Labels	RMT030	
Units	FT	FT
Type	UNT	UNT
1	6.87	7034.65
2	9.27	7034.56
3	20.57	7034.00
4	27.43	7033.46
5	29.03	7033.46
6	34.08	7034.00
7	46.71	7034.21
8	72.27	7034.63

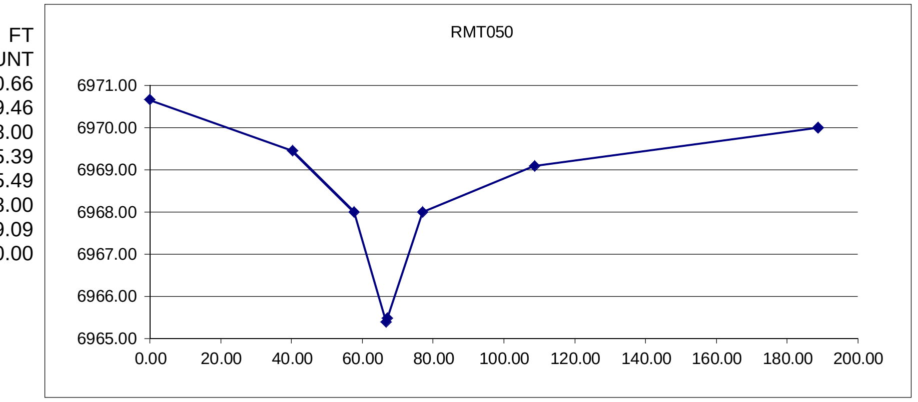


Falcon DBPS
Routing Sections

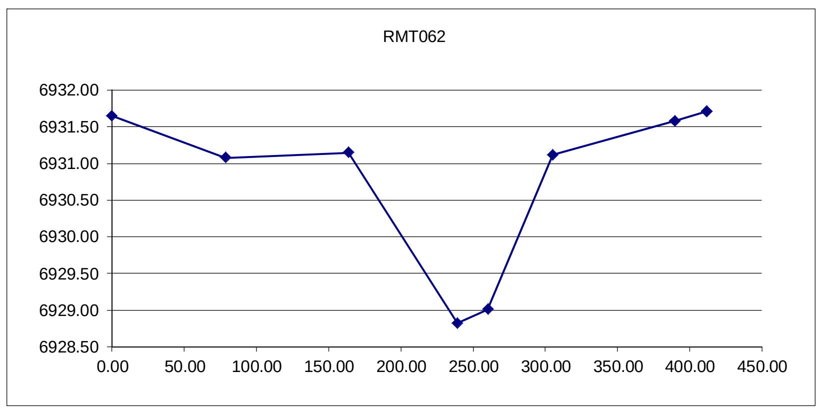
Labels	RMT040	
Units	FT	FT
Type	UNT	UNT
1	0.00	6991.29
2	33.94	6990.00
3	39.61	6988.00
4	49.34	6984.00
5	50.96	6983.96
6	62.12	6988.00
7	81.42	6988.04
8	100.64	6988.00



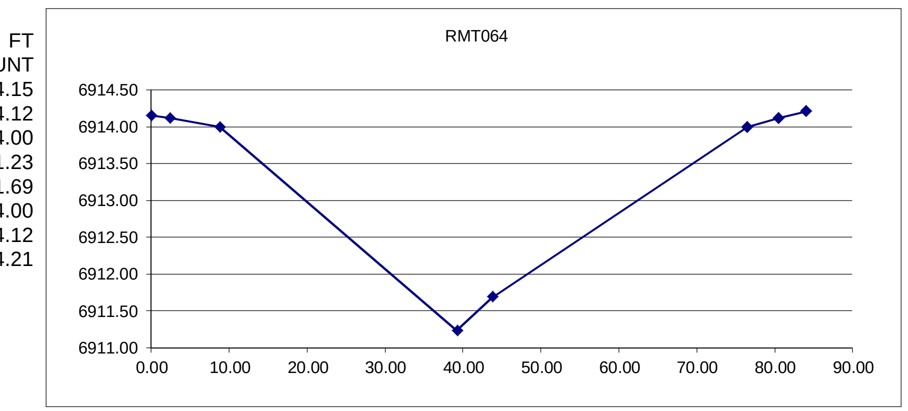
Labels	RMT050	
Units	FT	FT
Type	UNT	UNT
1	0.00	6970.66
2	40.22	6969.46
3	57.69	6968.00
4	66.66	6965.39
5	67.06	6965.49
6	77.04	6968.00
7	108.54	6969.09
8	188.80	6970.00



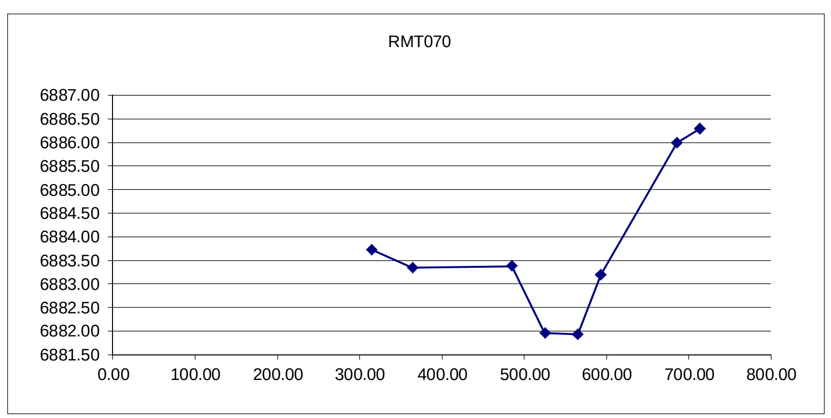
Labels	RMT062	
Units	FT	FT
Type	UNT	UNT
1	0.00	6931.65
2	78.73	6931.08
3	163.58	6931.15
4	239.02	6928.82
5	260.11	6929.01
6	305.00	6931.12
7	389.85	6931.58
8	412.03	6931.71



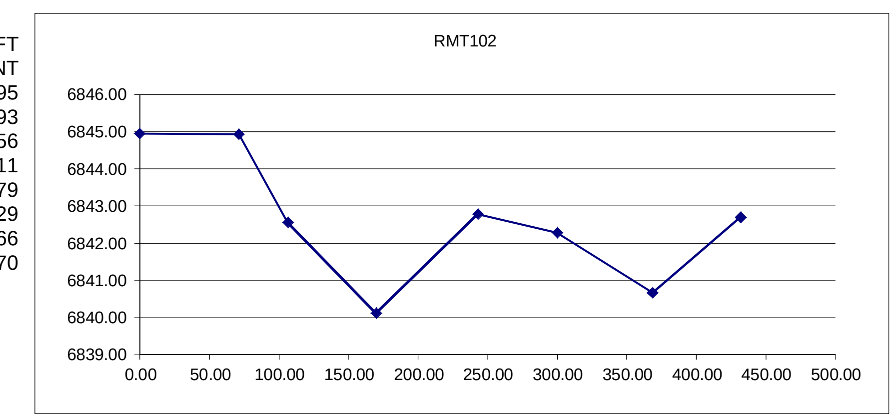
Labels	RMT064	
Units	FT	FT
Type	UNT	UNT
1	0.00	6914.15
2	2.40	6914.12
3	8.83	6914.00
4	39.25	6911.23
5	43.83	6911.69
6	76.48	6914.00
7	80.52	6914.12
8	83.98	6914.21



Labels	RMT070	
Units	FT	FT
Type	UNT	UNT
1	314.71	6883.72
2	364.02	6883.35
3	484.74	6883.38
4	524.98	6881.96
5	565.22	6881.93
6	593.09	6883.20
7	685.93	6886.00
8	713.63	6886.30

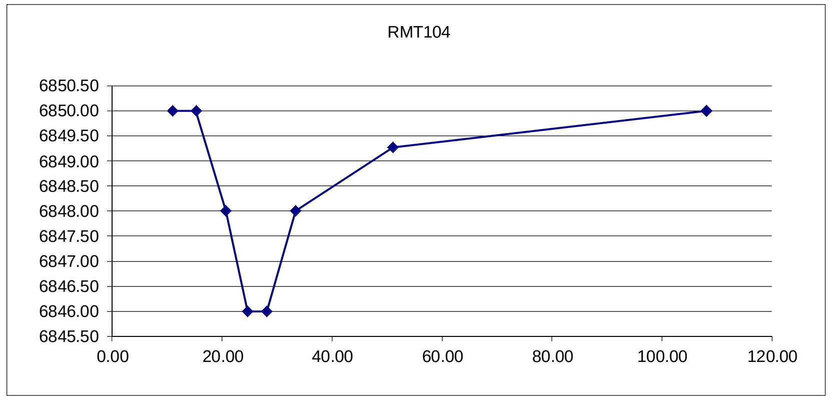


Labels	RMT102	
Units	FT	FT
Type	UNT	UNT
1	0.00	6844.95
2	71.02	6844.93
3	106.33	6842.56
4	169.73	6840.11
5	242.89	6842.79
6	299.76	6842.29
7	368.42	6840.66
8	431.85	6842.70

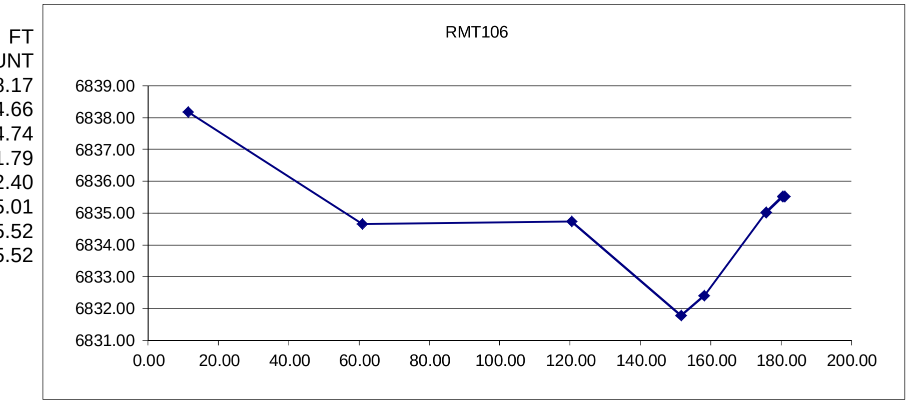


Falcon DBPS
Routing Sections

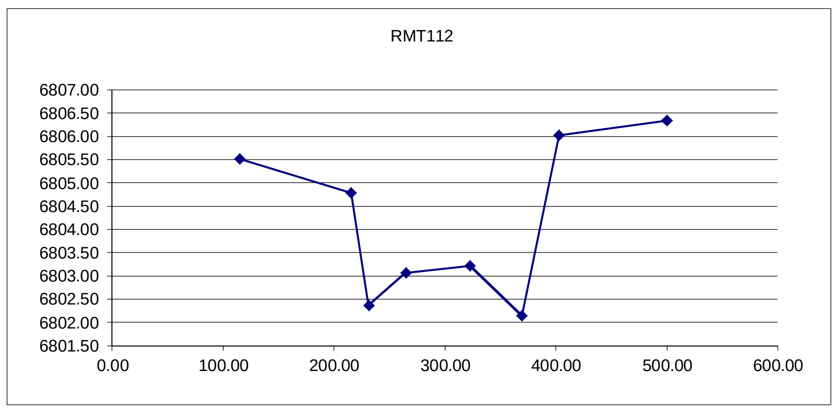
Labels	RMT104	
Units	FT	FT
Type	UNT	UNT
1	11.03	6850.00
2	15.26	6850.00
3	20.69	6848.00
4	24.60	6846.00
5	28.11	6846.00
6	33.39	6848.00
7	51.05	6849.27
8	108.05	6850.00



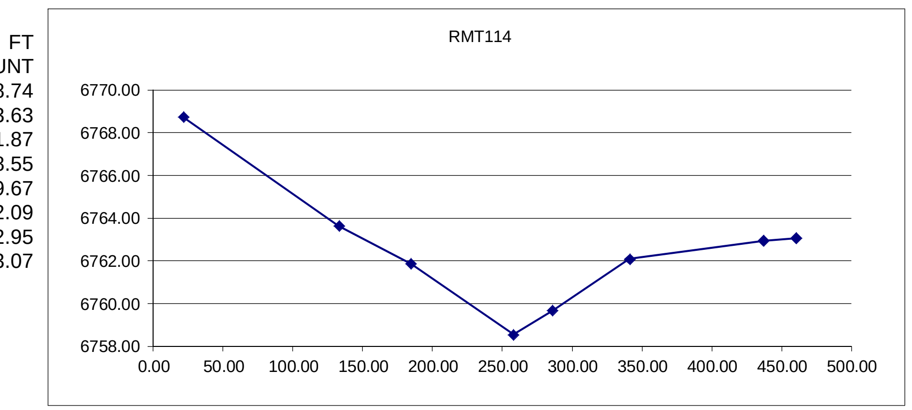
Labels	RMT106	
Units	FT	FT
Type	UNT	UNT
1	11.44	6838.17
2	60.93	6834.66
3	120.44	6834.74
4	151.63	6831.79
5	158.12	6832.40
6	175.71	6835.01
7	180.42	6835.52
8	180.98	6835.52



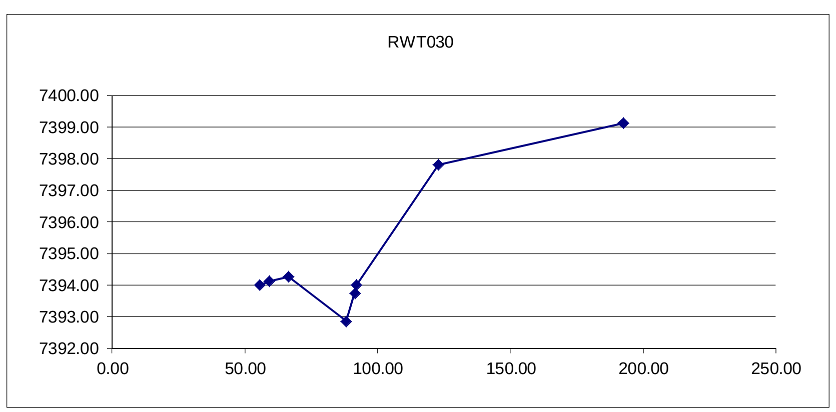
Labels	RMT112	
Units	FT	FT
Type	UNT	UNT
1	115.00	6805.51
2	215.31	6804.79
3	231.24	6802.36
4	264.69	6803.07
5	322.79	6803.22
6	369.32	6802.15
7	402.94	6806.02
8	500.00	6806.34



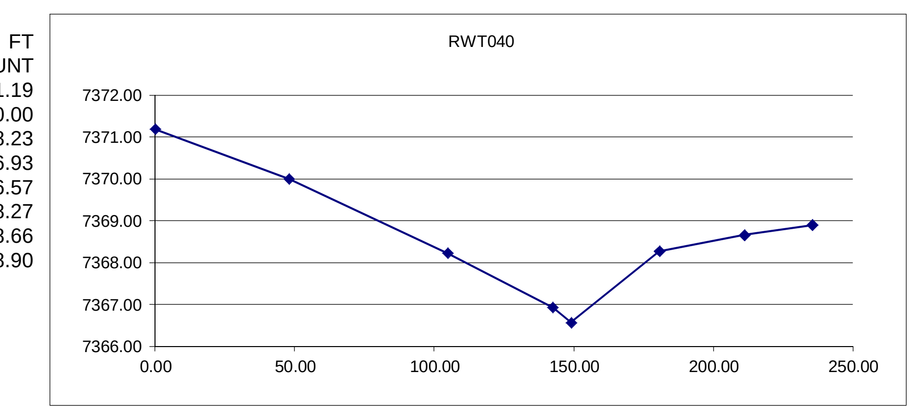
Labels	RMT114	
Units	FT	FT
Type	UNT	UNT
1	21.65	6768.74
2	133.02	6763.63
3	184.62	6761.87
4	257.87	6758.55
5	285.86	6759.67
6	341.26	6762.09
7	437.17	6762.95
8	460.35	6763.07



Labels	RWT030	
Units	FT	FT
Type	UNT	UNT
1	55.54	7394.00
2	59.18	7394.12
3	66.45	7394.27
4	88.20	7392.86
5	91.40	7393.75
6	92.02	7394.00
7	122.98	7397.80
8	192.58	7399.12

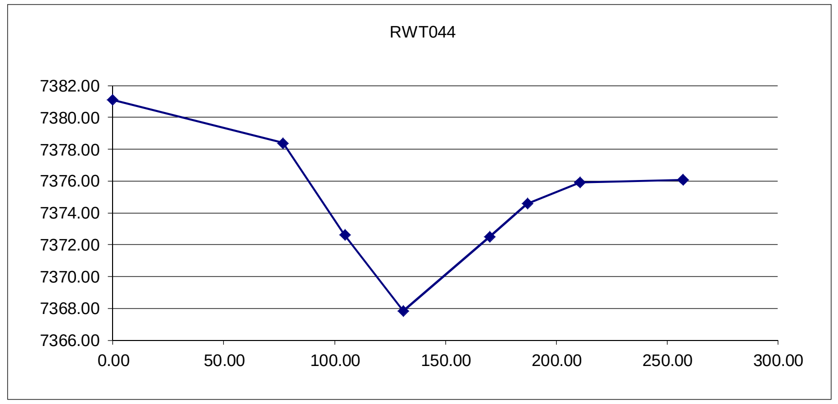


Labels	RWT042	
Units	FT	FT
Type	UNT	UNT
1	0.00	7371.19
2	48.11	7370.00
3	104.78	7368.23
4	142.47	7366.93
5	149.01	7366.57
6	180.68	7368.27
7	211.25	7368.66
8	235.51	7368.90

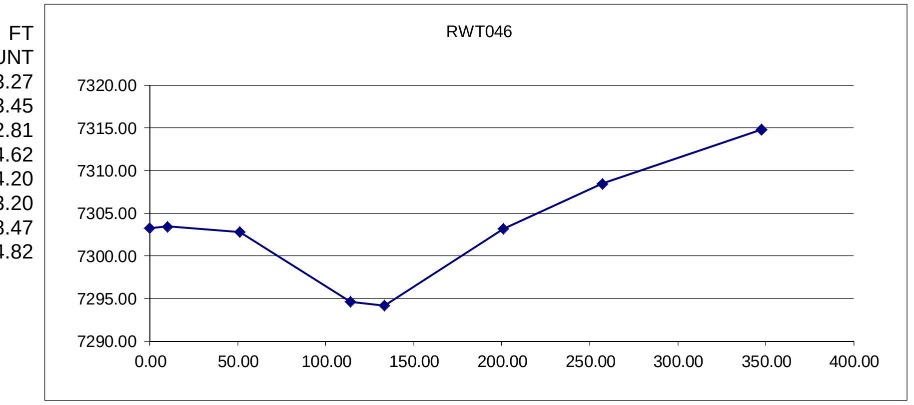


Falcon DBPS
Routing Sections

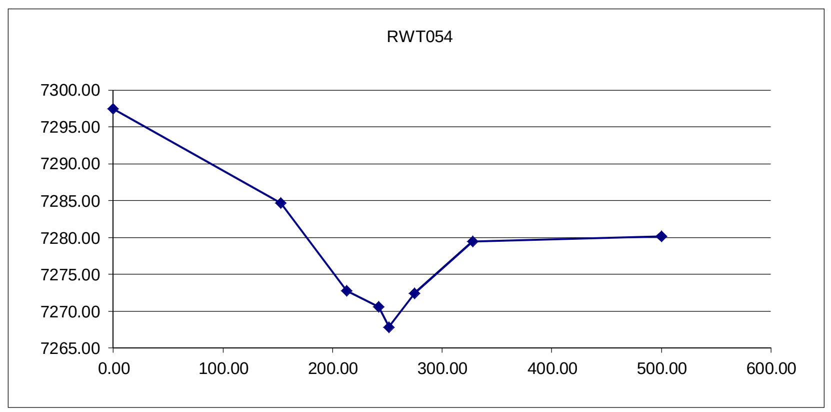
Labels	**RWT044**	
Units	FT	FT
Type	UNT	UNT
1	0.00	7381.10
2	76.67	7378.39
3	104.57	7372.63
4	131.04	7367.84
5	170.08	7372.49
6	186.94	7374.58
7	210.82	7375.91
8	257.15	7376.07



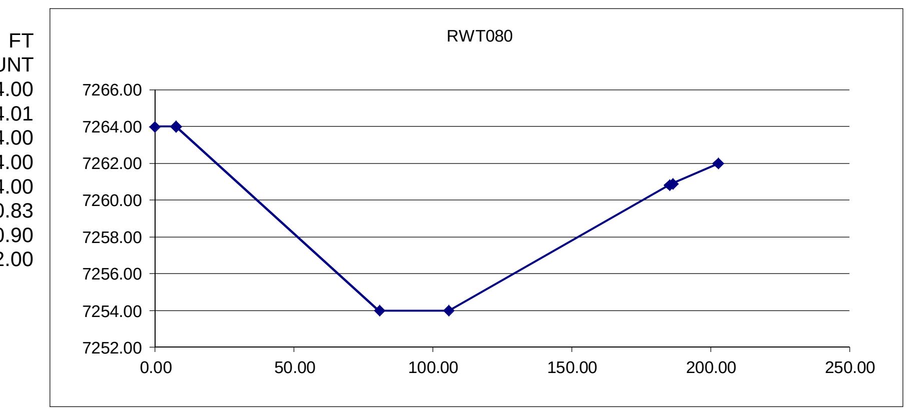
Labels	**RWT046**	
Units	FT	FT
Type	UNT	UNT
1	0.00	7303.27
2	10.13	7303.45
3	51.06	7302.81
4	114.03	7294.62
5	133.23	7294.20
6	200.77	7303.20
7	257.27	7308.47
8	347.47	7314.82



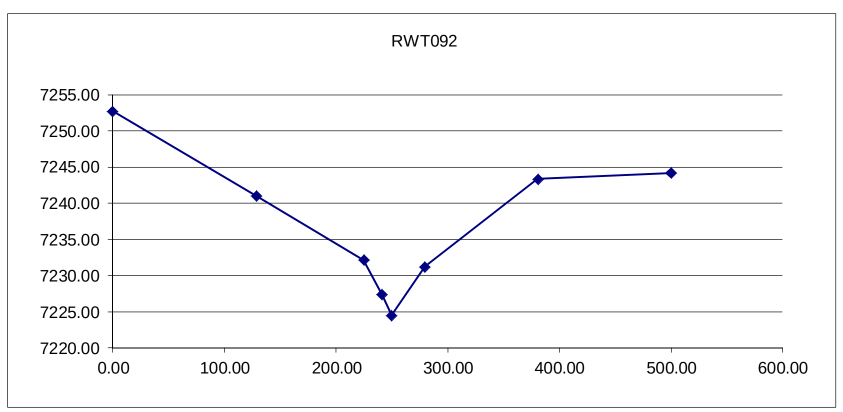
Labels	**RWT054**	
Units	FT	FT
Type	UNT	UNT
1	0.00	7297.47
2	152.96	7284.67
3	212.83	7272.79
4	242.00	7270.60
5	251.51	7267.87
6	275.00	7272.46
7	328.13	7279.47
8	500.00	7280.15



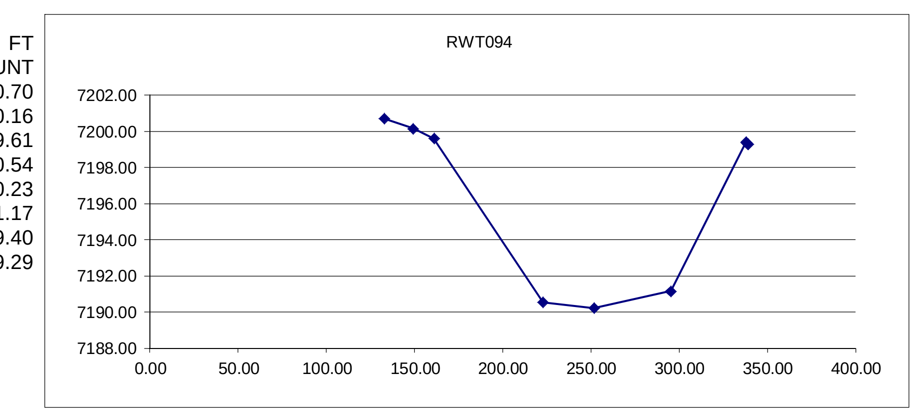
Labels	**RWT080**	
Units	FT	FT
Type	UNT	UNT
1	0.00	7264.00
2	7.43	7264.01
3	7.61	7264.00
4	80.74	7254.00
5	105.68	7254.00
6	185.19	7260.83
7	186.28	7260.90
8	202.74	7262.00



Labels	**RWT092**	
Units	FT	FT
Type	UNT	UNT
1	0.00	7252.72
2	128.77	7241.03
3	224.78	7232.15
4	240.99	7227.40
5	249.93	7224.51
6	279.49	7231.23
7	380.70	7243.36
8	500.00	7244.21

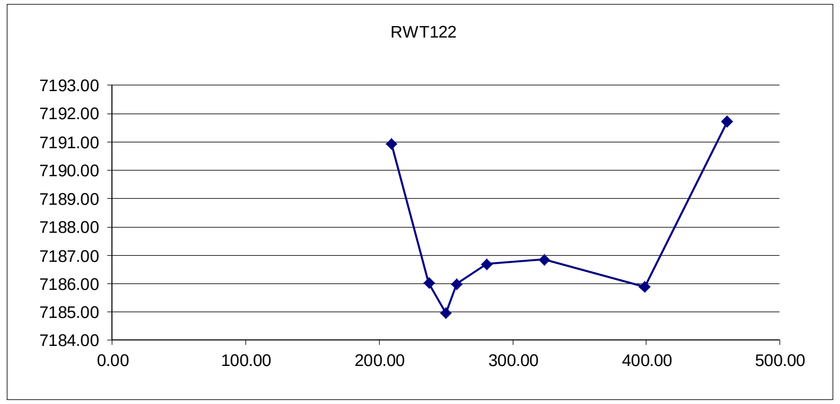


Labels	**RWT094**	
Units	FT	FT
Type	UNT	UNT
1	133.00	7200.70
2	149.09	7200.16
3	160.98	7199.61
4	222.84	7190.54
5	251.66	7190.23
6	295.32	7191.17
7	337.86	7199.40
8	339.13	7199.29

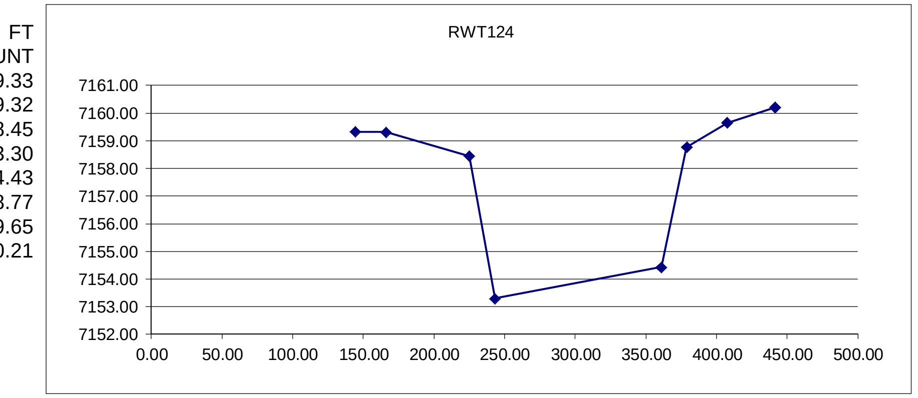


Falcon DBPS
Routing Sections

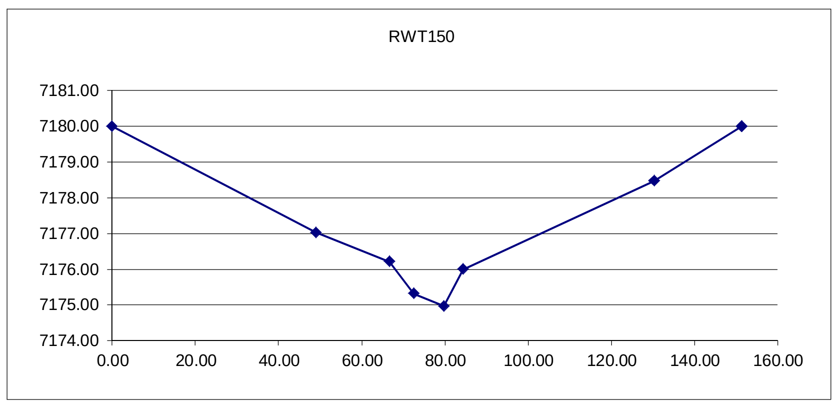
Labels	RWT122	
Units	FT	FT
Type	UNT	UNT
1	209.10	7190.94
2	237.22	7186.03
3	249.83	7184.96
4	257.88	7185.99
5	280.40	7186.70
6	323.40	7186.85
7	398.76	7185.89
8	460.81	7191.73



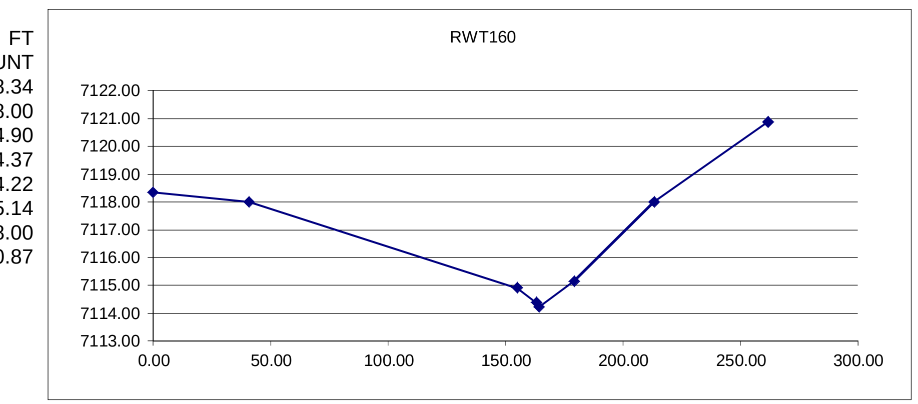
Labels	RWT124	
Units	FT	FT
Type	UNT	UNT
1	144.47	7159.33
2	165.81	7159.32
3	225.00	7158.45
4	243.03	7153.30
5	360.96	7154.43
6	378.91	7158.77
7	407.54	7159.65
8	441.39	7160.21



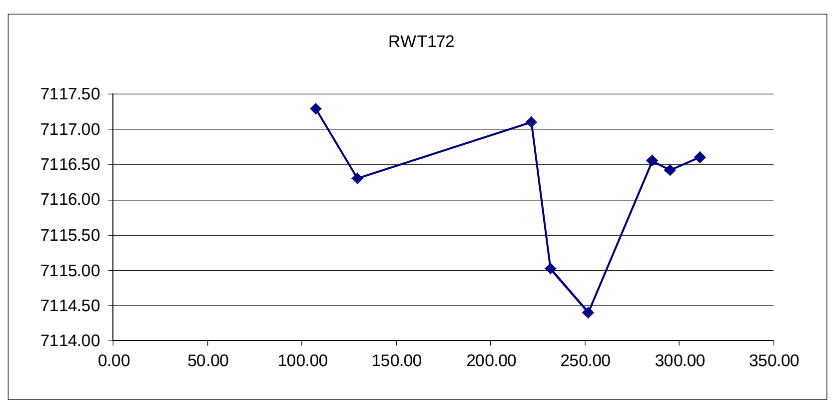
Labels	RWT150	
Units	FT	FT
Type	UNT	UNT
1	0.00	7180.00
2	48.99	7177.03
3	66.68	7176.21
4	72.56	7175.32
5	79.79	7174.97
6	84.31	7176.00
7	130.24	7178.47
8	151.42	7180.00



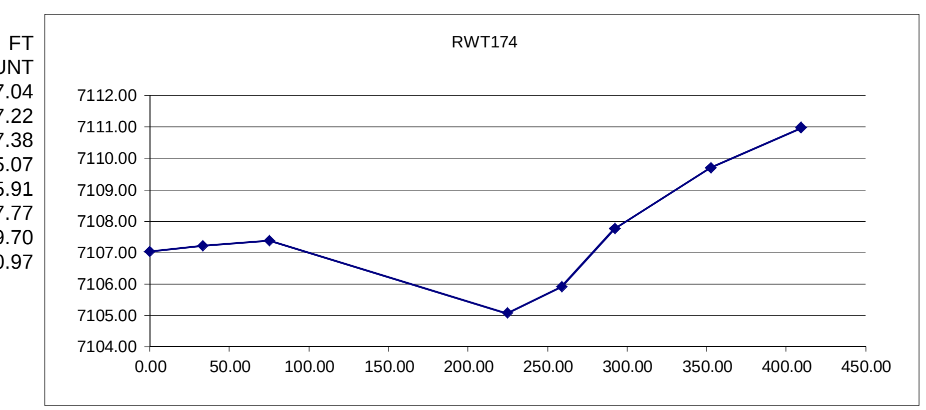
Labels	RWT160	
Units	FT	FT
Type	UNT	UNT
1	0.00	7118.34
2	40.85	7118.00
3	155.00	7114.90
4	163.26	7114.37
5	164.31	7114.22
6	179.11	7115.14
7	213.16	7118.00
8	261.68	7120.87



Labels	RWT172	
Units	FT	FT
Type	UNT	UNT
1	107.33	7117.29
2	129.47	7116.30
3	221.61	7117.10
4	231.82	7115.02
5	251.70	7114.40
6	285.48	7116.55
7	295.13	7116.42
8	310.80	7116.60

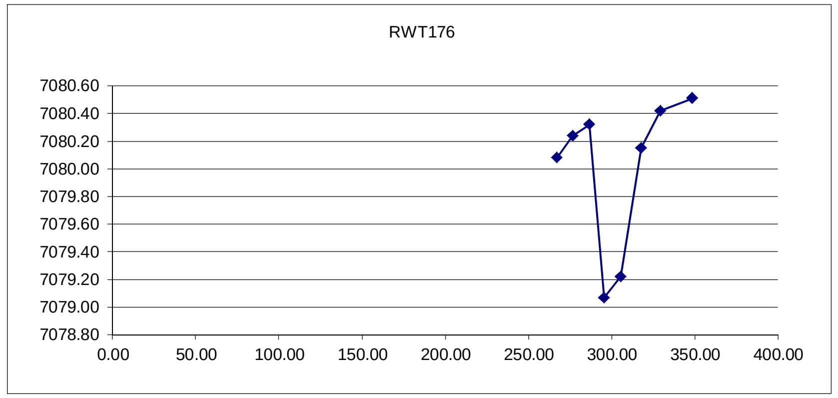


Labels	RWT174	
Units	FT	FT
Type	UNT	UNT
1	0.00	7107.04
2	33.35	7107.22
3	75.19	7107.38
4	224.47	7105.07
5	259.06	7105.91
6	292.24	7107.77
7	352.43	7109.70
8	409.42	7110.97

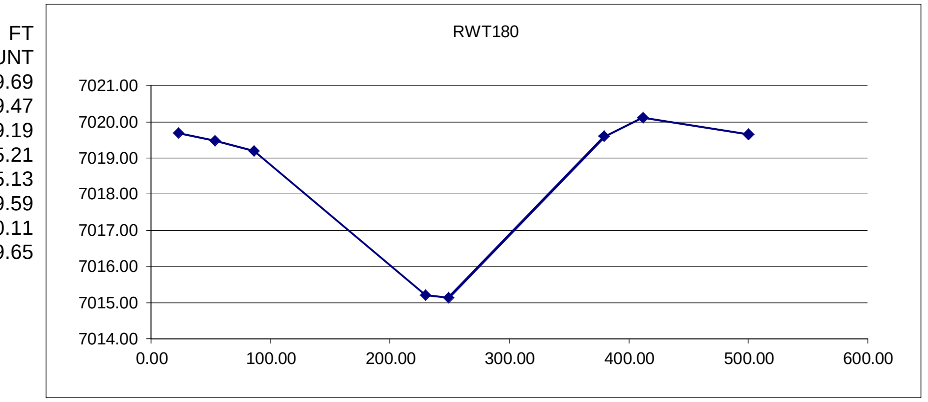


Falcon DBPS
Routing Sections

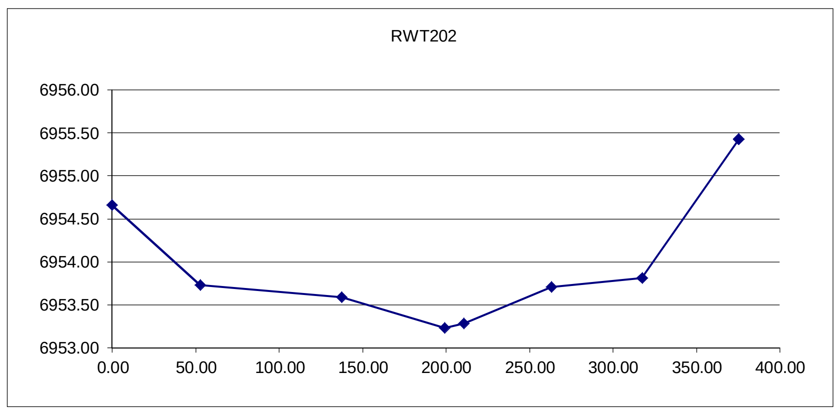
Labels	RWT176	
Units	FT	FT
Type	UNT	UNT
1	267.13	7080.08
2	276.58	7080.24
3	286.54	7080.32
4	295.48	7079.07
5	305.44	7079.22
6	317.77	7080.15
7	329.21	7080.42
8	348.60	7080.51



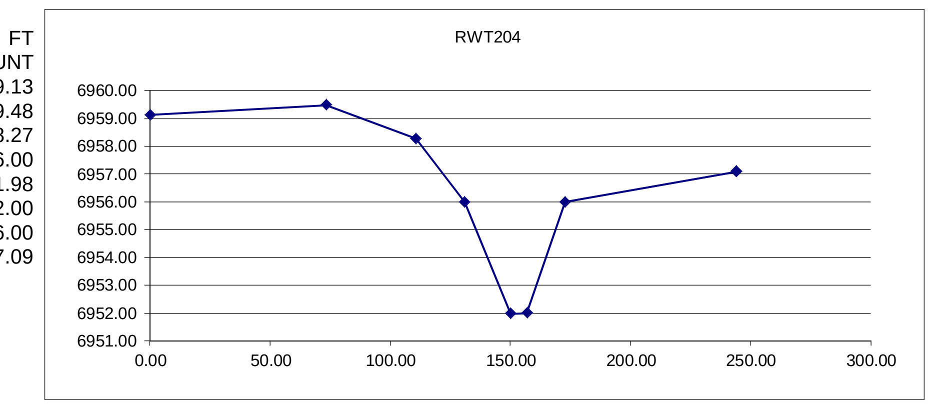
Labels	RWT180	
Units	FT	FT
Type	UNT	UNT
1	22.49	7019.69
2	53.48	7019.47
3	86.04	7019.19
4	229.71	7015.21
5	248.86	7015.13
6	379.12	7019.59
7	411.68	7020.11
8	500.00	7019.65



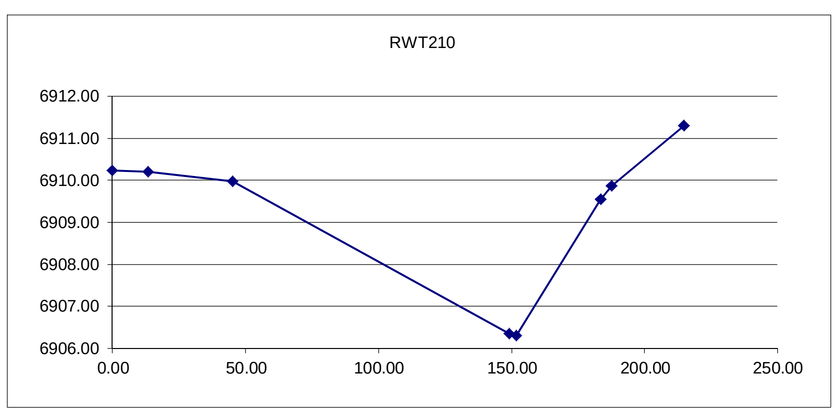
Labels	RWT202	
Units	FT	FT
Type	UNT	UNT
1	0.00	6954.66
2	52.88	6953.73
3	137.42	6953.59
4	199.08	6953.23
5	210.51	6953.28
6	263.05	6953.71
7	317.37	6953.81
8	375.41	6955.43



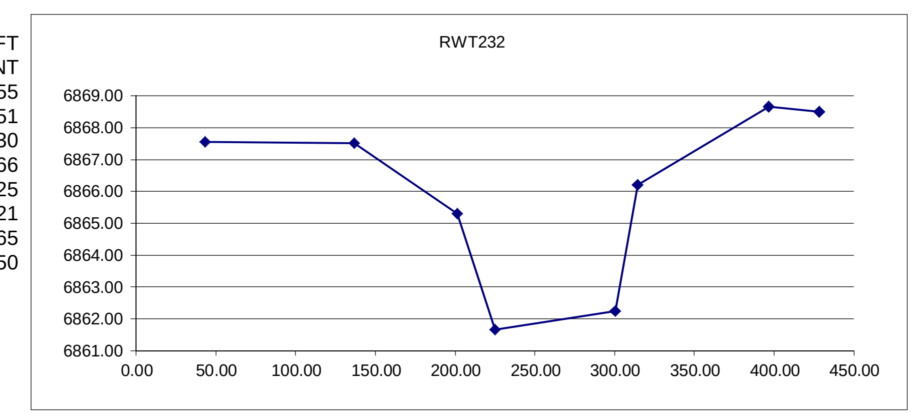
Labels	RWT204	
Units	FT	FT
Type	UNT	UNT
1	0.00	6959.13
2	73.39	6959.48
3	110.74	6958.27
4	130.93	6956.00
5	150.09	6951.98
6	156.89	6952.00
7	172.71	6956.00
8	243.93	6957.09



Labels	RWT210	
Units	FT	FT
Type	UNT	UNT
1	0.00	6910.23
2	13.30	6910.20
3	45.11	6909.98
4	149.18	6906.35
5	151.75	6906.30
6	183.44	6909.54
7	187.60	6909.87
8	214.75	6911.30

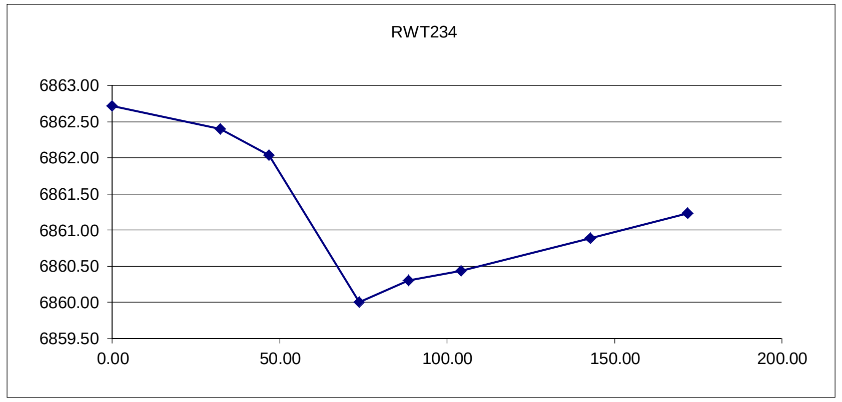


Labels	RWT232	
Units	FT	FT
Type	UNT	UNT
1	43.28	6867.55
2	136.55	6867.51
3	201.23	6865.30
4	224.94	6861.66
5	300.27	6862.25
6	314.50	6866.21
7	396.66	6868.65
8	428.43	6868.50

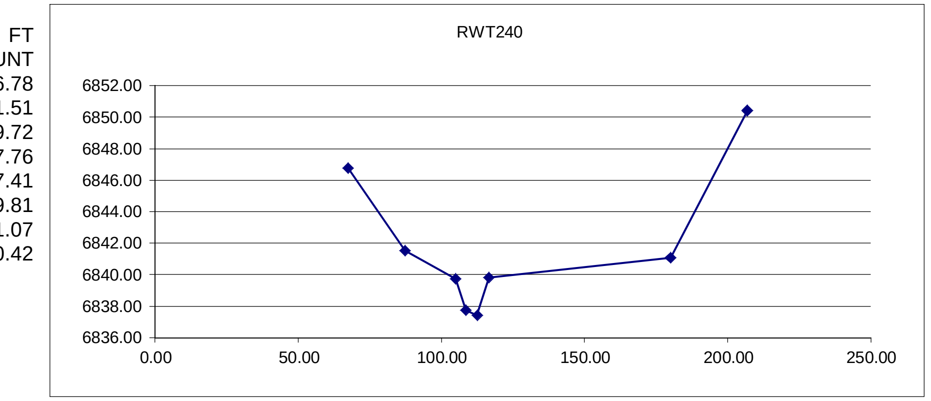


Falcon DBPS
Routing Sections

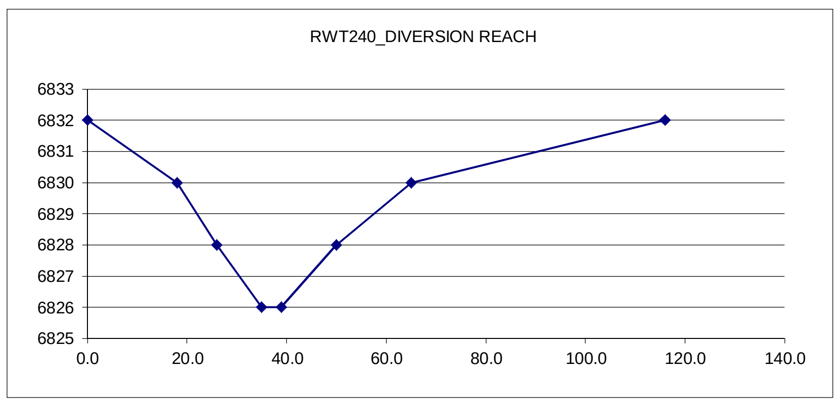
Labels	RWT234	
Units	FT	FT
Type	UNT	UNT
1	0.00	6862.72
2	32.34	6862.40
3	46.74	6862.04
4	73.82	6860.00
5	88.41	6860.30
6	104.15	6860.44
7	142.84	6860.89
8	171.85	6861.23



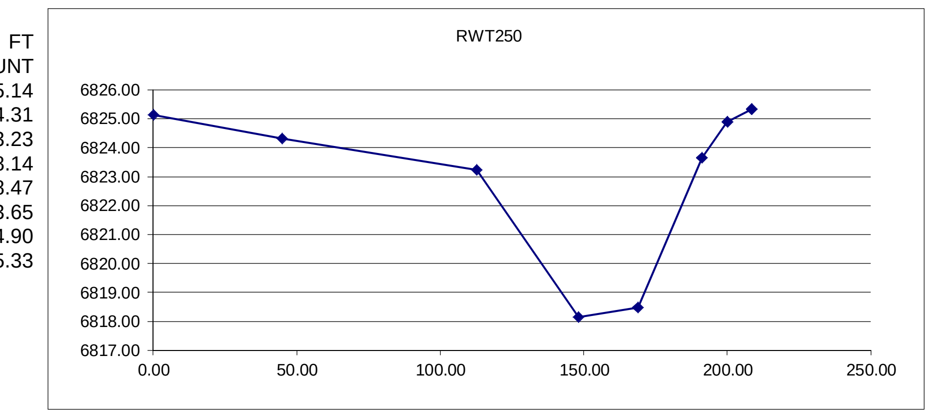
Labels	RWT240	
Units	FT	FT
Type	UNT	UNT
1	67.35	6846.78
2	87.29	6841.51
3	104.93	6839.72
4	108.60	6837.76
5	112.48	6837.41
6	116.52	6839.81
7	180.04	6841.07
8	206.93	6850.42



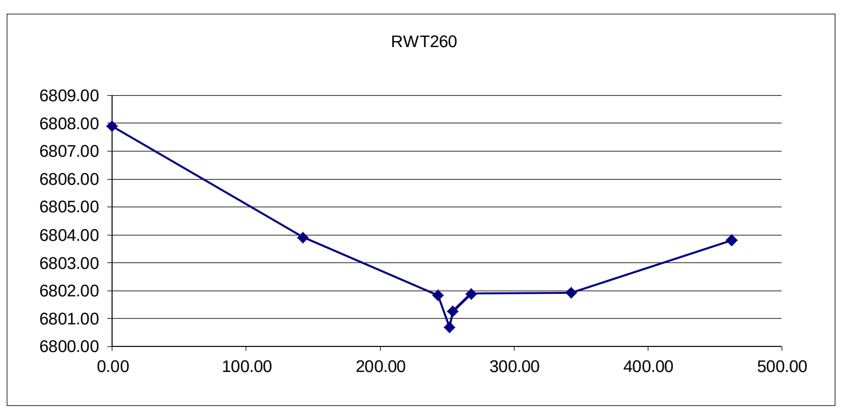
Labels	RWT240_DIVERSION REACH	
Units	FT	FT
Type	UNT	UNT
1	0.0	6832
2	18.0	6830
3	26.0	6828
4	35.0	6826
5	39.0	6826
6	50.0	6828
7	65.0	6830
8	116.0	6832



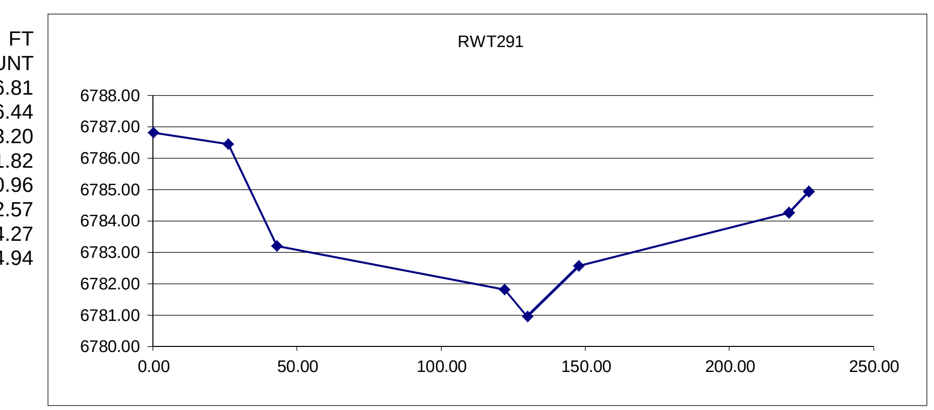
Labels	RWT250	
Units	FT	FT
Type	UNT	UNT
1	0.00	6825.14
2	44.98	6824.31
3	112.76	6823.23
4	148.21	6818.14
5	168.90	6818.47
6	191.15	6823.65
7	199.99	6824.90
8	208.51	6825.33



Labels	RWT260	
Units	FT	FT
Type	UNT	UNT
1	0.00	6807.90
2	142.25	6803.91
3	243.13	6801.84
4	252.00	6800.68
5	254.28	6801.25
6	267.95	6801.89
7	342.53	6801.93
8	462.54	6803.81

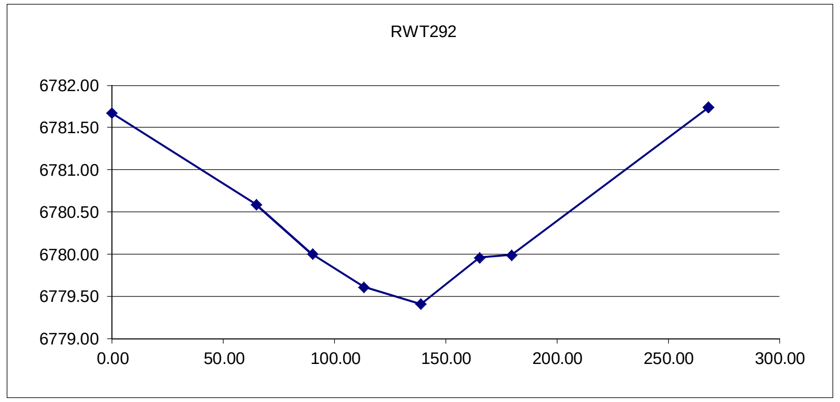


Labels	RWT291	
Units	FT	FT
Type	UNT	UNT
1	0.00	6786.81
2	26.18	6786.44
3	42.93	6783.20
4	121.98	6781.82
5	129.83	6780.96
6	147.77	6782.57
7	220.67	6784.27
8	227.58	6784.94

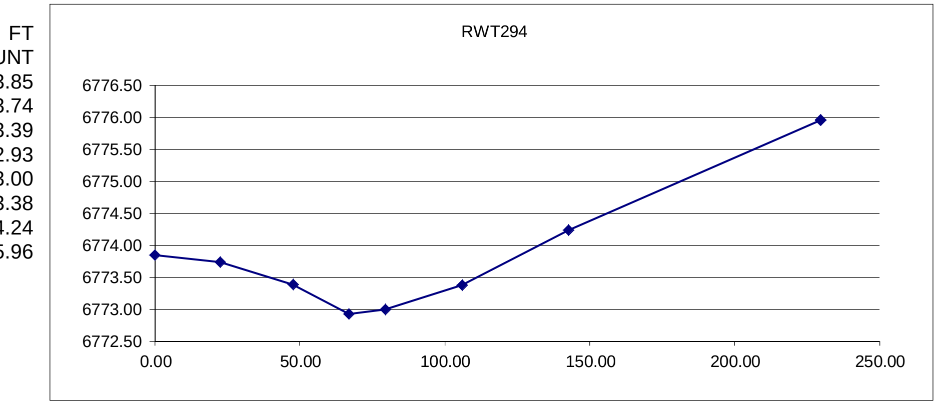


Falcon DBPS
Routing Sections

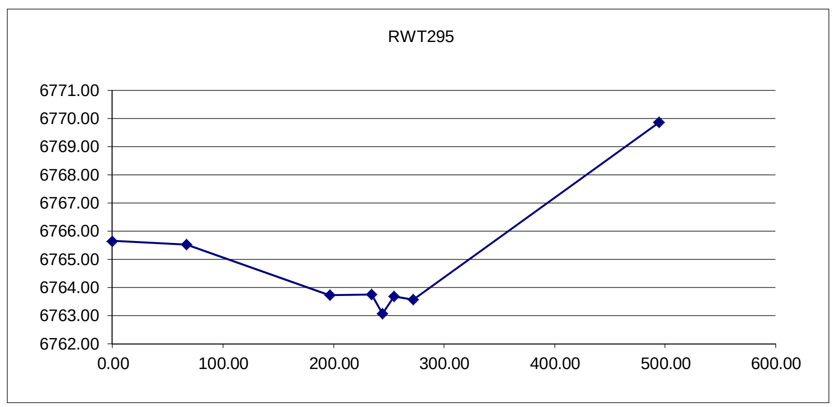
Labels	RWT292	
Units	FT	FT
Type	UNT	UNT
1	0.00	6781.67
2	64.69	6780.59
3	90.00	6780.00
4	113.05	6779.61
5	138.68	6779.41
6	165.15	6779.96
7	179.52	6779.99
8	267.99	6781.74



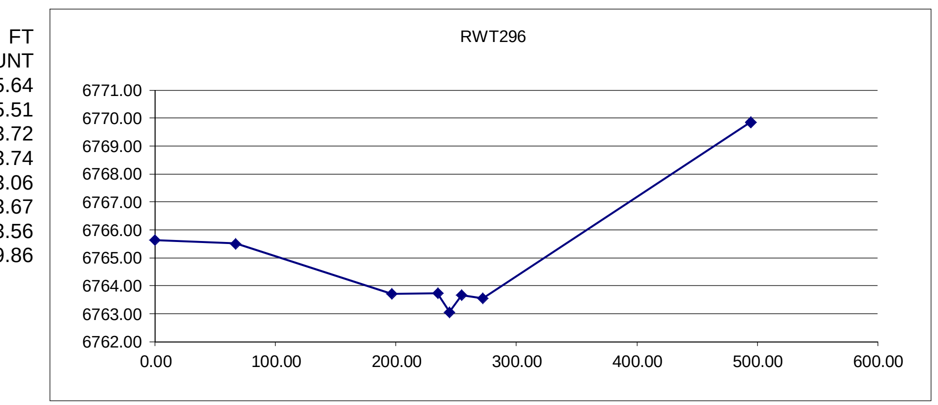
Labels	RWT294	
Units	FT	FT
Type	UNT	UNT
1	0.00	6773.85
2	22.39	6773.74
3	47.54	6773.39
4	66.92	6772.93
5	79.37	6773.00
6	105.84	6773.38
7	142.64	6774.24
8	229.72	6775.96



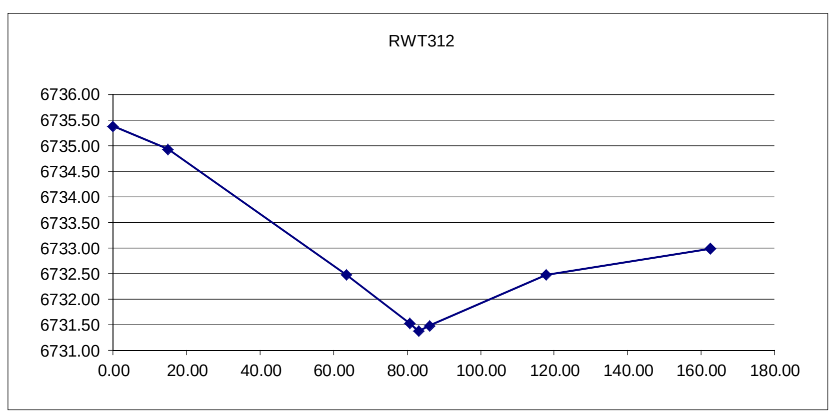
Labels	RWT295	
Units	FT	FT
Type	UNT	UNT
1	0.00	6765.64
2	66.75	6765.51
3	196.45	6763.72
4	234.63	6763.74
5	244.49	6763.06
6	254.51	6763.67
7	271.86	6763.56
8	494.62	6769.86



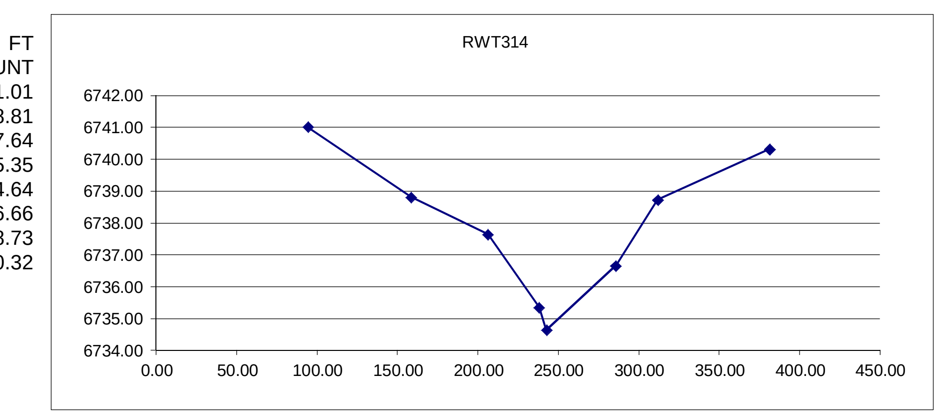
Labels	RWT296	
Units	FT	FT
Type	UNT	UNT
1	0.00	6765.64
2	66.75	6765.51
3	196.45	6763.72
4	234.63	6763.74
5	244.49	6763.06
6	254.51	6763.67
7	271.86	6763.56
8	494.62	6769.86



Labels	RWT312	
Units	FT	FT
Type	UNT	UNT
1	0.00	6735.38
2	14.86	6734.93
3	63.48	6732.48
4	80.76	6731.53
5	83.13	6731.38
6	86.19	6731.49
7	117.80	6732.48
8	162.53	6732.99

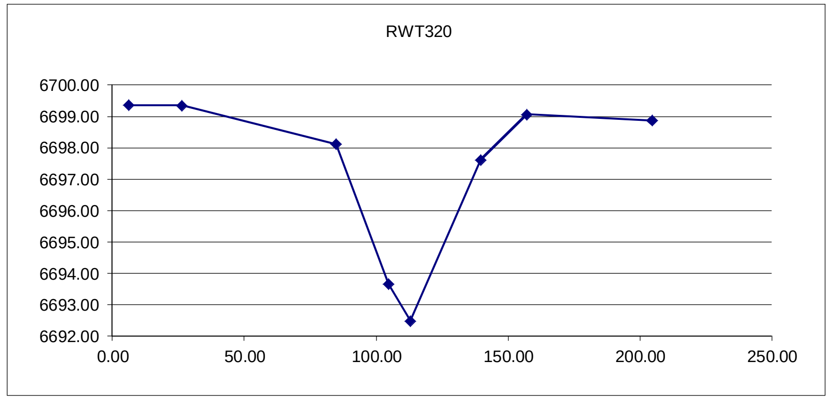


Labels	RWT314	
Units	FT	FT
Type	UNT	UNT
1	94.28	6741.01
2	158.66	6738.81
3	206.30	6737.64
4	237.96	6735.35
5	242.69	6734.64
6	285.80	6736.66
7	311.84	6738.73
8	381.41	6740.32

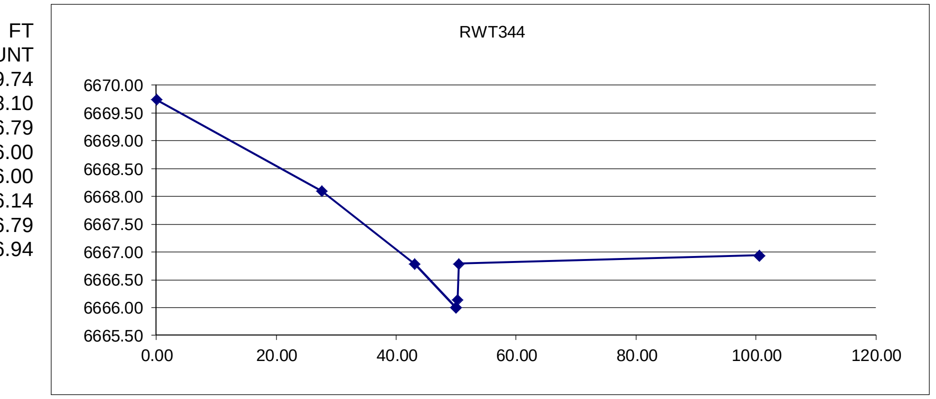


Falcon DBPS
Routing Sections

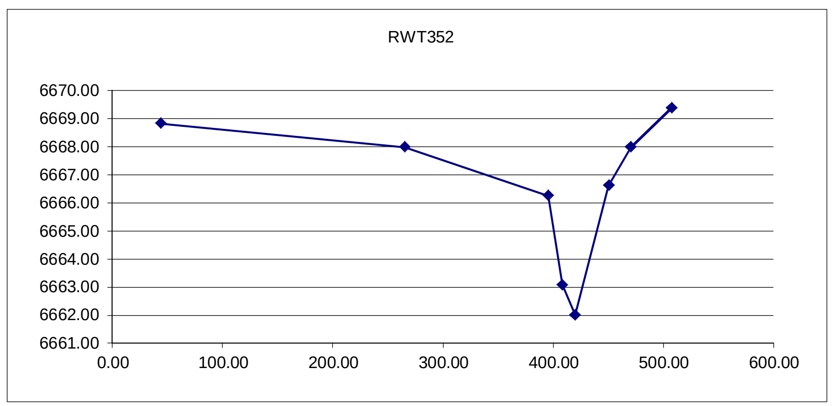
Labels	RWT320	
Units	FT	FT
Type	UNT	UNT
1	6.12	6699.36
2	26.38	6699.35
3	84.74	6698.12
4	104.75	6693.66
5	112.85	6692.49
6	139.61	6697.62
7	157.07	6699.07
8	204.59	6698.87



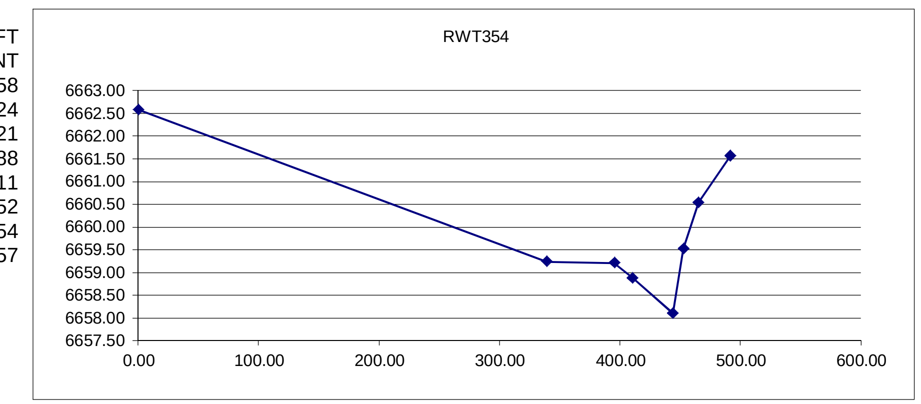
Labels	RWT344	
Units	FT	FT
Type	UNT	UNT
1	0.00	6669.74
2	27.58	6668.10
3	43.00	6666.79
4	49.89	6666.00
5	49.98	6666.00
6	50.20	6666.14
7	50.46	6666.79
8	100.52	6666.94



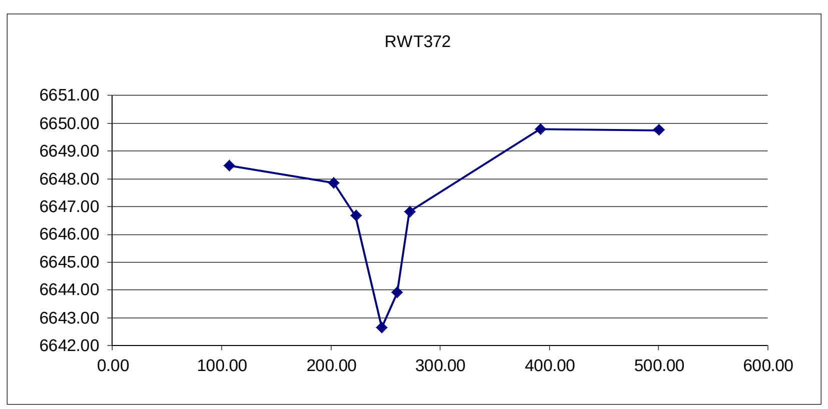
Labels	RWT352	
Units	FT	FT
Type	UNT	UNT
1	44.22	6668.83
2	265.35	6667.98
3	395.49	6666.25
4	408.32	6663.08
5	419.88	6662.01
6	450.31	6666.62
7	470.17	6667.98
8	507.52	6669.38



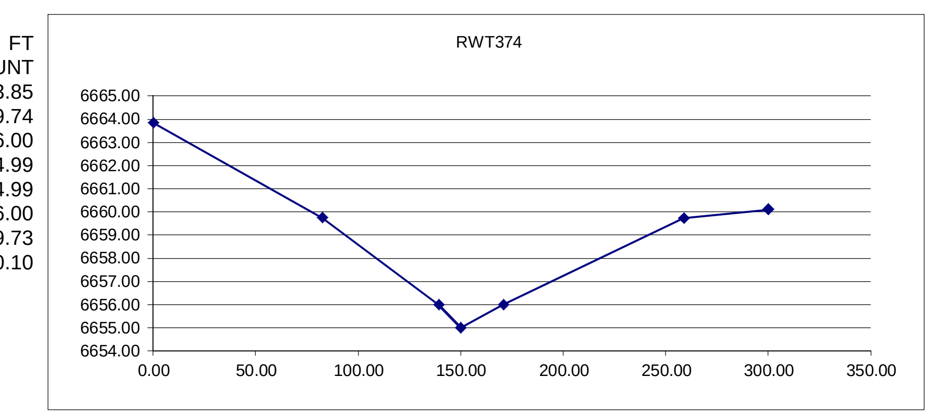
Labels	RWT354	
Units	FT	FT
Type	UNT	UNT
1	0.00	6662.58
2	339.24	6659.24
3	395.35	6659.21
4	410.56	6658.88
5	443.90	6658.11
6	452.55	6659.52
7	465.25	6660.54
8	491.74	6661.57



Labels	RWT372	
Units	FT	FT
Type	UNT	UNT
1	106.79	6648.47
2	202.67	6647.85
3	222.74	6646.66
4	246.49	6642.65
5	260.41	6643.90
6	272.03	6646.81
7	391.59	6649.78
8	500.00	6649.75

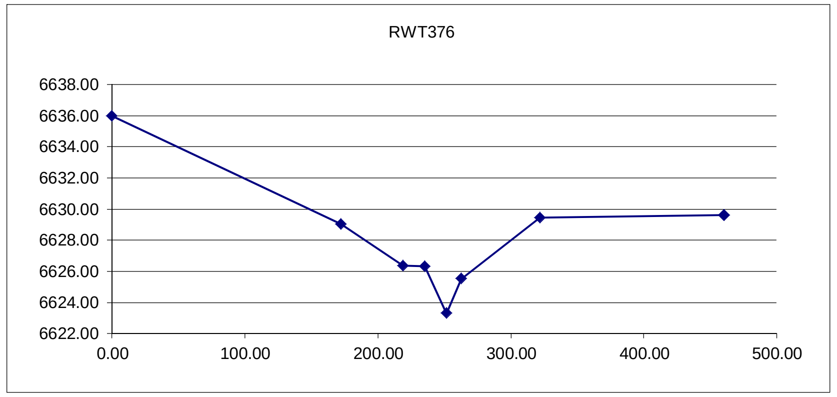


Labels	RWT374	
Units	FT	FT
Type	UNT	UNT
1	0.00	6663.85
2	82.61	6659.74
3	139.17	6656.00
4	149.91	6654.99
5	150.00	6654.99
6	170.74	6656.00
7	258.71	6659.73
8	300.00	6660.10



Falcon DBPS
Routing Sections

Labels	RWT376	
Units	FT	FT
Type	UNT	UNT
1	0.00	6635.98
2	172.25	6629.03
3	219.02	6626.37
4	235.16	6626.32
5	251.45	6623.30
6	262.65	6625.52
7	322.01	6629.45
8	460.28	6629.62



Matrix Design Group, Inc.
An Employee Owned Company

Project: Falcon DBPS
Subject: Diversion @ JWT174

Job. No.
Date: 6 / 22 / 11
Sheet: 1 of 1
By: GTB

Diversion Channel Dimensions (Measured w/ Topo + Aerial in GIS)

Bottom Width = 16 FT

$Z_L = 3.25 : 1$

$Z_R = 8.5 : 1$

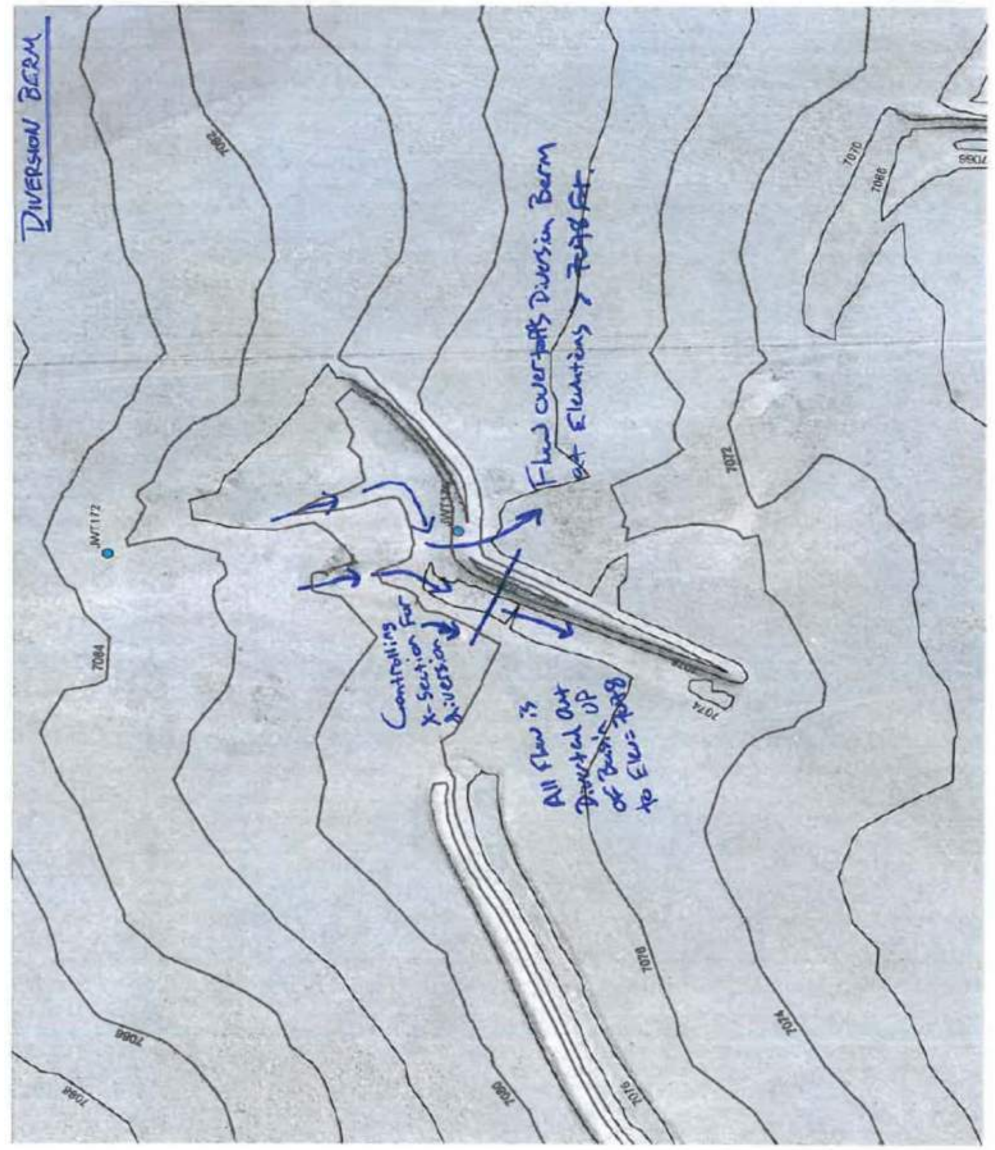
Longitudinal Slope = 0.009 Ft/Ft

Max Elevation before Diversion Berm is Overtopped = 7078 FT

Diversion Invert = 7076 FT

n = 0.05 (Previously Determined)

Normal Depth Capacity = 195 cfs (FlowMaster)



Worksheet for Diversion Channel Capacity Calculation

Project Description			
Friction Method	Manning Formula		
Solve For	Discharge		
Input Data			
Roughness Coefficient		0.050	
Channel Slope		0.00900	ft/ft
Normal Depth		2.00	ft
Left Side Slope		3.25	ft/ft (H:V)
Right Side Slope		8.50	ft/ft (H:V)
Bottom Width		16.00	ft
Results			
Discharge		194.92	ft³/s
Flow Area		55.50	ft²
Wetted Perimeter		39.92	ft
Top Width		39.50	ft
Critical Depth		1.39	ft
Critical Slope		0.03638	ft/ft
Velocity		3.51	ft/s
Velocity Head		0.19	ft
Specific Energy		2.19	ft
Froude Number		0.52	
Flow Type	Subcritical		
GVF Input Data			
Downstream Depth		0.00	ft
Length		0.00	ft
Number Of Steps		0	
GVF Output Data			
Upstream Depth		0.00	ft
Profile Description			
Profile Headloss		0.00	ft
Downstream Velocity		Infinity	ft/s
Upstream Velocity		Infinity	ft/s
Normal Depth		2.00	ft
Critical Depth		1.39	ft
Channel Slope		0.00900	ft/ft
Critical Slope		0.03638	ft/ft

6/22/2011 11:12:32 AM — Bentley Systems, Inc. Haestad Methods Solution Center, 27 Siemons Company Drive Suite 200 W Watertown, CT 06795 USA +1-203-755-1666 — Bentley FlowMaster [08.01.071.00] Page 1 of 1

Stage Storage Discharge

Data for spillway and embankment: Woodmen Hills Pond #1 North

References: Topo, field survey, and FDR

Spillway Length (ft) =	20
Spillway Elevation (ft) =	6960.0
Spillway C_d[1] =	0.56
Embankment Length (ft) =	361
Embankment Elevation (ft) =	6962.0
Embankment C_d[1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d[1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation[2] (ft)*	*Top Elevation[3] (ft)*
Orifice 1 :	Circular			72	0.6	28.27	6955.00	6952.00	6958.00
Orifice 2:	Circular			72	0.6	28.27	6955.00	6952.00	6958.00
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Check Dimen Check Dimensions

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d[1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	None Selected				0.6	0.00		0.00

Stage			*Storage*				*Discharge*								*Total Flow[6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume[4]*		*Spillway[5] (cfs)*	*Embankment[5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*		
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*			
	6952.0	0.0	7633	0.18	0.00	0.00	-	-	-	-	-	-	-		-
	6954.0	2.0	23810	0.55	0.72	0.72	-	-	48.28	48.28	-	-	-		96.55
	6956.0	4.0	36215	0.83	1.38	2.10	-	-	136.14	136.14	-	-	-		272.28
	6958.0	6.0	54552	1.25	2.08	4.18	-	-	235.80	235.80	-	-	-		471.60
	6960.0	8.0	73999	1.70	2.95	7.13	-	-	304.42	304.42	-	-	-		608.84
	6962.0	10.0	91244	2.09	3.79	10.93	169.48	-	360.19	360.19	-	-	-		889.87
	6964.0	12.0	115044	2.64	4.74	15.66	479.36	3,059.09	408.42	408.42	-	-	-		4,355.29

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3 C_d (2g)^{0.5} L H^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Woodmen Hills Pond #1 South

References: Topo, field survey, and FDR

Spillway Length (ft) =	21
Spillway Elevation (ft) =	6954.0
Spillway C_d [1] =	0.56
Embankment Length (ft) =	625
Embankment Elevation (ft) =	6956.0
Embankment C_d [1] =	0.56
Acceleration due to Gravity, g (ft/s ^{2}) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d [1]*	*Area (ft ^{2})*	*Centerline Elevation (ft)*	*Bottom Elevation [2] (ft)*	*Top Elevation [3] (ft)*
Orifice 1 :	Circular			12	0.6	0.79	6948.50	6948.00	6949.00
Orifice 2:	None Selected					0.00		0.00	0.00
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d [1]*	*Area (ft ^{2})*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	Circular			2.0	0.6	3.14	6951.0	6.28

Stage			*Storage*				*Discharge*							
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume [4]*		*Spillway [5] (cfs)*	*Embankment [5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	*Total Flow [6] (cfs)*
			(ft ^{2})	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	6948.0	0.0	23810	0.55	0.00	0.00	-	-	-	-	-	-	-	-
	6950.0	2.0	61448	1.41	1.96	1.96	-	-	4.63	-	-	-	-	4.63
	6952.0	4.0	76242	1.75	3.16	5.12	-	-	7.07	-	-	-	15.13	22.20
	6954.0	6.0	83106	1.91	3.66	8.78	-	-	8.87	-	-	-	26.20	35.07
	6956.0	8.0	89660	2.06	3.97	12.74	177.95	-	10.36	-	-	-	33.82	222.13
	6958.0	10.0	117602	2.70	4.76	17.50	503.33	5,296.20	11.66	-	-	-	40.02	5,851.21

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Woodmen Hills Pond #2

References: Topo and field survey

Spillway Length (ft) =	20
Spillway Elevation (ft) =	6930.0
Spillway C_d[1] =	0.56
Embankment Length (ft) =	630
Embankment Elevation (ft) =	6932.0
Embankment C_d[1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d[1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation[2] (ft)*	*Top Elevation[3] (ft)*
Orifice 1 :	None Selected				0.6	0.00		0.00	0.00
Orifice 2:	None Selected					0.00		0.00	0.00
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d[1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	Circular			1.5	0.6	1.77	6929.0	4.71

Stage			*Storage*				*Discharge*							*Total Flow[6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume[4]*		*Spillway[5] (cfs)*	*Embankment[5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	6926.0	0.0	68500	1.57	0.00	0.00	-	-	-	-	-	-	-	-
	6928.0	2.0	105743	2.43	4.00	4.00	-	-	-	-	-	-	-	-
	6930.0	4.0	119783	2.75	5.18	9.18	-	-	-	-	-	-	8.51	8.51
	6932.0	6.0	147832	3.39	6.14	15.32	169.48	-	-	-	-	-	14.74	184.22
	6934.0	8.0	190507	4.37	7.77	23.09	479.36	5,338.57	-	-	-	-	19.03	5,836.96

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q=^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Woodmen Hills Pond #3

References: Topo and field survey

Spillway Length (ft) =	120
Spillway Elevation (ft) =	6902.0
Spillway C_d[1] =	0.56
Embankment Length (ft) =	400
Embankment Elevation (ft) =	6904.0
Embankment C_d[1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d[1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation[2] (ft)*	*Top Elevation[3] (ft)*
Orifice 1 :	Circular			42	0.6	9.62	6901.75	6900.00	6903.50
Orifice 2:	Circular			42	0.6	9.62	6901.75	6900.00	6903.50
Orifice 3:	Circular			12	0.6	0.79	6900.50	6900.00	6901.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d[1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	None Selected				0.6	0.00		0.00

Stage			***Storage***				***Discharge***							***Total Flow[6] (cfs)***
Stage	***Elevation (ft)***	***Height (ft)***	***Area***		***Volume[4]***		***Spillway[5] (cfs)***	***Embankment[5] (cfs)***	***Orifice (max outflow cfs)***				***Grate (max outflow cfs)***	
			(ft^2)	***(acres)***	***(ac-ft)***	***(cum ac-ft)***			***1***	***2***	***3***	***4***		
	6900.0	0.0	125010	2.87	0.00	0.00	-	-	-	-	-	-	-	-
	6902.0	2.0	238533	5.48	8.35	8.35	-	-	23.16	23.16	4.63	-	-	50.96
	6904.0	4.0	289267	6.64	12.12	20.46	1,016.87	-	69.49	69.49	7.07	-	-	1,162.92

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^{2}/_{3}C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Data for spillway and embankment: Woodmen Hills Pond #4

References: Topo and field survey

Spillway Length (ft) =	44
Spillway Elevation (ft) =	6860.0
Spillway C_d[1] =	0.56
Embankment Length (ft) =	870
Embankment Elevation (ft) =	6862.0
Embankment C_d[1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d[1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation[2] (ft)*	*Top Elevation[3] (ft)*
Orifice 1 :	None Selected				0.6	0.00		0.00	0.00
Orifice 2:	None Selected					0.00		0.00	0.00
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d[1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate 1:	Circular			3.0	0.6	7.07	6858.00	9.42
Grate 2:	Circular			3.0	0.6	7.07	6859.00	9.42
Grate 3:	Circular			3.0	0.6	7.07	6859.50	9.42

Stage			*Storage*				*Discharge*									*Total Flow[6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume[4]*		*Spillway[5] (cfs)*	*Embankment[5] (cfs)*	*Orifice (max outflow cfs)*				*Grate 1 (max outflow cfs)*	*Grate 2 (max outflow cfs)*	*Grate 3 (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*				
	6856.0	0.0	95635	2.20	0.00	0.00	-	-	-	-	-	-	-	-	-	-
	6858.0	2.0	254580	5.84	8.04	8.04	-	-	-	-	-	-	-	-	-	-
	6860.0	4.0	354329	8.13	13.98	22.02	-	-	-	-	-	-	48.13	30.25	10.70	89.08
	6862.0	6.0	448586	10.30	18.43	40.45	372.85	-	-	-	-	-	68.07	58.95	53.81	553.69

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Woodmen Hills Pond 5

References: Topo and field survey

Spillway Length (ft) =	55
Spillway Elevation (ft) =	6854.0
Spillway C_d [1] =	0.56
Embankment Length (ft) =	590
Embankment Elevation (ft) =	6856.0
Embankment C_d [1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d [1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation [2] (ft)*	*Top Elevation [3] (ft)*
Orifice 1 :	Circular			12	0.6	0.79	6850.50	6850.00	6851.00
Orifice 2:	None Selected					0.00		0.00	0.00
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d [1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate 1:	Circular			1.0	0.6	0.79	6851.50	3.14
Grate 2:	Circular			2.0	0.6	3.14	6851.50	6.28

Stage			*Storage*				*Discharge*								*Total Flow [6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume [4]*		*Spillway [5] (cfs)*	*Embankment [5] (cfs)*	*Orifice (max outflow cfs)*				*Grate 1 (max outflow cfs)*	*Grate 2 (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*			
	6850.0	0.0	14889	0.34	0.00	0.00	-	-	-	-	-	-	-	-	-
	6852.0	2.0	48165	1.11	1.45	1.45	-	-	4.63	-	-	-	2.67	7.13	14.44
	6854.0	4.0	67245	1.54	2.65	4.10	-	-	7.07	-	-	-	5.98	23.92	36.97
	6856.0	6.0	77625	1.78	3.33	7.42	466.07	-	8.87	-	-	-	8.02	32.09	515.05

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Woodmen Hills Pond H

References: Topo and field survey

Spillway Length (ft) =	67
Spillway Elevation (ft) =	6976.0
Spillway C_d[1] =	0.56
Embankment Length (ft) =	475
Embankment Elevation (ft) =	6978.0
Embankment C_d[1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d[1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation[2] (ft)*	*Top Elevation[3] (ft)*
Orifice 1 :	Rectangular	1.33	1.5		0.6	2.00	6972.75	6972.00	6973.50
Orifice 2:	Rectangular	1.33	1.5		0.6	2.00	6973.83	6973.08	6974.58
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d[1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate 1:	Circular			2.0	0.6	3.14	6974.17	6.28
Grate 2:	Circular			3.0	0.6	7.07	6975.25	9.42

Stage			*Storage*				*Discharge*								*Total Flow*[6] *(cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume*[4]		*Spillway*[5] *(cfs)*	*Embankment*[5] *(cfs)*	*Orifice (max outflow cfs)*				*Grate 1 (max outflow cfs)*	*Grate 2 (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*			
	6972.0	0.0	4746	0.11	0.00	0.00	-	-	-	-	-	-	-	-	-
	6974.0	2.0	33814	0.78	0.89	0.89	-	-	10.74	3.77	-	-	-	-	14.51
	6976.0	4.0	43393	1.00	1.77	2.66	-	-	17.32	14.15	-	-	20.46	19.65	71.58
	6978.0	6.0	50875	1.17	2.16	4.82	567.75	-	22.01	19.62	-	-	29.60	56.44	695.42
	6980.0	8.0	61092	1.40	2.57	7.39	1,605.85	4,025.12	25.86	23.86	-	-	36.52	74.18	5,791.39

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: The Meadows Pond #1

References: Topo, field survey, FDR

Spillway Length (ft) =	321
Spillway Elevation (ft) =	7015.0
Spillway C_d [1] =	0.56
Embankment Length (ft) =	
Embankment Elevation (ft) =	
Embankment C_d [1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d [1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation [2] (ft)*	*Top Elevation [3] (ft)*
Orifice 1 :	Circular			18	0.6	1.77	7010.75	7010.00	7011.50
Orifice 2:	Rectangular	5	1.5		0.6	7.50	7013.25	7012.50	7014.00
Orifice 3:	Rectangular	5	1.5		0.6	7.50	7013.25	7012.50	7014.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d [1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	Rectangular	4.0	5.0		0.6	20.00	7014.5	18.00

Stage			*Storage*				*Discharge*							*Total Flow [6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume [4]*		*Spillway [5] (cfs)*	*Embankment [5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	7010.0	0.0	2872	0.07	0.00	0.00	-	-	-	-	-	-	-	-
	7012.0	2.0	23756	0.55	0.61	0.61	-	-	9.51	-	-	-	-	9.51
	7014.0	4.0	43274	0.99	1.54	2.15	-	-	15.34	29.49	29.49	-	-	74.31
	7016.0	6.0	61765	1.42	2.41	4.56	961.71	-	19.50	59.89	59.89	-	106.15	1,207.13

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: The Meadows Pond #2

References: Topo and field survey

Spillway Length (ft) =	115
Spillway Elevation (ft) =	7011.0
Spillway C_d [1] =	0.56
Embankment Length (ft) =	625
Embankment Elevation (ft) =	7012.0
Embankment C_d [1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d [1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation [2] (ft)*	*Top Elevation [3] (ft)*
Orifice 1 :	Rectangular	5	1.75		0.6	8.75	7009.30	7008.43	7010.18
Orifice 2:	Rectangular	5	1.75		0.6	8.75	7009.30	7008.43	7010.18
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d [1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	Rectangular	5.5	7.5		0.6	41.25	7011.0	26.00

Stage			*Storage*				*Discharge*							*Total Flow [6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume [4]*		*Spillway [5] (cfs)*	*Embankment [5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	7004.0	0.0	1202	0.03	0.00	0.00	-	-	-	-	-	-	-	-
	7006.0	2.0	46729	1.07	1.10	1.10	-	-	-	-	-	-	-	-
	7008.0	4.0	55287	1.27	2.34	3.44	-	-	-	-	-	-	-	-
	7010.0	6.0	67516	1.55	2.82	6.26	-	-	31.72	31.72	-	-	-	63.45
	7012.0	8.0	90179	2.07	3.62	9.88	344.54	-	69.23	69.23	-	-	83.46	566.45

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Regional Pond WU North

References: Topo and field survey

Spillway Length (ft) =	6
Spillway Elevation (ft) =	6836.0
Spillway C_d[1] =	0.56
Embankment Length (ft) =	461
Embankment Elevation (ft) =	6840.0
Embankment C_d[1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d[1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation[2] (ft)*	*Top Elevation[3] (ft)*
Orifice 1 :	Circular			18	0.6	1.77	6835.25	6834.50	6836.00
Orifice 2:	Circular			18	0.6	1.77	6835.25	6834.50	6836.00
Orifice 3:	Circular			18	0.6	1.77	6834.75	6834.00	6835.50
Orifice 4:	None Selected					0.00		0.00	0.00

Check Dimen Check Dimensions Check Dimensions

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d[1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	None Selected				0.6	0.00		0.00

Stage			*Storage*				*Discharge*							
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume[4]*		*Spillway[5] (cfs)*	*Embankment[5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	*Total Flow[6] (cfs)*
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	6834.0	0.0	32248	0.74	0.00	0.00	-	-	-	-	-	-	-	-
	6836.0	2.0	51729	1.19	1.93	1.93	-	-	7.37	7.37	9.51	-	-	24.25
	6838.0	4.0	83226	1.91	3.10	5.03	50.84	-	14.11	14.11	15.34	-	-	94.40
	6840.0	6.0	171170	3.93	5.84	10.87	143.81	-	18.54	18.54	19.50	-	-	200.39
	6842.0	8.0	256231	5.88	9.81	20.68	264.19	3,906.48	22.11	22.11	22.91	-	-	4,237.79

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Regional Pond WU South

References: Topo and field survey

Spillway Length (ft) =	238
Spillway Elevation (ft) =	6832.0
Spillway C_d [1] =	0.56
Embankment Length (ft) =	1400
Embankment Elevation (ft) =	6834.0
Embankment C_d [1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d* [1]	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation* [2] *(ft)*	*Top Elevation* [3] *(ft)*
Orifice 1:	Circular			12	0.6	0.79	6824.00	6823.50	6824.50
Orifice 2:	Circular			24	0.6	3.14	6823.00	6822.00	6824.00
Orifice 3:	Circular			24	0.6	3.14	6823.00	6822.00	6824.00
Orifice 4:	Circular			12	0.6	0.79	6824.00	6823.50	6824.50
Orifice 5:	Circular			48	0.6	12.57	6824.00	6822.00	6826.00
Orifice 6:	Circular			60	0.6	19.63	6824.50	6822.00	6827.00
Orifice 7:	Circular			60	0.6	19.63	6824.50	6822.00	6827.00
Orifice 8:	Circular			60	0.6	19.63	6824.50	6822.00	6827.00

Stage			*Storage*				*Discharge*								*Total Flow* [6] *(cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume* [4]		*Spillway* [5] *(cfs)*	*Embankment* [5] *(cfs)*	*Low Flow Orifices (max outflow cfs)*				*Weir Flow (max outflow cfs)*	*Major Orifices (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*			
	6822.0	0.0	21261	0.49	0.00	0.00	-	-	-	-	-	-	-	-	-
	6822.2	0.2	31330	0.72	0.12	0.12	-	-	-	0.51	0.51	-	-	4.83	1.02
	6822.4	0.4	41399	0.95	0.17	0.29	-	-	-	1.44	1.44	-	-	13.67	2.88
	6822.6	0.6	51468	1.18	0.21	0.50	-	-	-	2.64	2.64	-	-	25.12	5.29
	6822.8	0.8	61537	1.41	0.26	0.76	-	-	-	4.07	4.07	-	-	38.68	8.14
	6823.0	1.0	71607	1.64	0.31	1.07	-	-	-	5.69	5.69	-	-	54.05	11.38
	6823.2	1.2	81676	1.88	0.35	1.42	-	-	-	6.76	6.76	-	-	71.05	13.53
	6823.4	1.4	91745	2.11	0.40	1.82	-	-	-	9.42	9.42	-	-	89.54	18.85
	6823.6	1.6	101814	2.34	0.44	2.26	-	-	0.09	11.51	11.51	0.09	-	109.39	23.21
	6823.8	1.8	111883	2.57	0.49	2.75	-	-	0.47	13.53	13.53	0.47	-	130.53	27.99
	6824.0	2.0	121952	2.80	0.54	3.29	-	-	1.01	15.13	15.13	1.01	-	152.88	32.26
	6824.2	2.2	128920	2.96	0.58	3.86	-	-	1.67	16.57	16.57	1.67	-	166.30	36.47
	6824.4	2.4	135889	3.12	0.61	4.47	-	-	2.39	17.90	17.90	2.39	-	196.92	40.58
	6824.6	2.6	142858	3.28	0.64	5.11	-	-	2.93	19.13	19.13	2.93	-	136.56	44.13
	6824.8	2.8	149826	3.44	0.67	5.78	-	-	3.38	20.29	20.29	3.38	-	208.66	47.35
	6825.0	3.0	156795	3.60	0.70	6.49	-	-	3.78	21.39	21.39	3.78	-	259.68	50.35
	6825.2	3.2	163763	3.76	0.74	7.22	-	-	4.14	22.44	22.44	4.14	-	302.44	53.16
	6825.4	3.4	170731	3.92	0.77	7.99	-	-	4.47	23.43	23.43	4.47	-	338.86	55.82
	6825.6	3.6	177700	4.08	0.80	8.79	-	-	4.78	24.39	24.39	4.78	-	368.01	58.35
	6825.8	3.8	184669	4.24	0.83	9.62	-	-	5.07	25.31	25.31	5.07	-	397.27	60.77
	6826.0	4.0	191637	4.40	0.86	10.49	-	-	5.35	26.20	26.20	5.35	-	426.94	63.10
	6826.2	4.2	192989	4.43	0.88	11.37	-	-	5.61	27.06	27.06	5.61	-	457.04	65.34
	6826.4	4.4	194341	4.46	0.89	12.26	-	-	5.86	27.89	27.89	5.86	-	484.69	67.50
	6826.6	4.6	195693	4.49	0.90	13.15	-	-	6.10	28.70	28.70	6.10	10.02	508.58	79.62
	6826.8	4.8	197045	4.52	0.90	14.06	-	-	6.33	29.49	29.49	6.33	31.47	531.39	103.10
	6827.0	5.0	198397	4.55	0.91	14.96	-	-	6.55	30.25	30.25	6.55	60.74	553.25	134.34
	6827.2	5.2	199749	4.59	0.91	15.88	-	-	6.76	31.00	31.00	6.76	96.88	574.28	172.41
	6827.4	5.4	201101	4.62	0.92	16.80	-	-	6.97	31.73	31.73	6.97	139.48	594.57	216.89
	6827.6	5.6	202453	4.65	0.93	17.72	-	-	7.18	32.44	32.44	7.18	188.32	614.18	267.55
	6827.8	5.8	203805	4.68	0.93	18.66	-	-	7.37	33.14	33.14	7.37	243.25	633.18	324.28
	6828.0	6.0	205157	4.71	0.94	19.60	-	-	7.56	33.82	33.82	7.56	304.24	651.63	387.01
	6828.2	6.2	206367	4.74	0.94	20.54	-	-	7.75	34.49	34.49	7.75	371.25	669.57	455.74
	6828.4	6.4	207577	4.77	0.95	21.49	-	-	7.93	35.15	35.15	7.93	444.29	687.04	530.46
	6828.6	6.6	208786	4.79	0.96	22.45	-	-	8.11	35.80	35.80	8.11	523.38	704.07	611.19
	6828.8	6.8	209996	4.82	0.96	23.41	-	-	8.29	36.43	36.43	8.29	608.55	720.70	697.98
	6829.0	7.0	211206	4.85	0.97	24.38	-	-	8.46	37.05	37.05	8.46	699.85	736.96	736.96
	6829.2	7.2	212416	4.88	0.97	25.35	-	-	8.62	37.67	37.67	8.62	797.33	752.86	752.86
	6829.4	7.4	213626	4.90	0.98	26.33	-	-	8.79	38.27	38.27	8.79	901.05	768.44	862.55
	6829.6	7.6	214835	4.93	0.98	27.31	-	-	8.95	38.86	38.86	8.95	1,011.06	783.70	879.32
	6829.8	7.8	216045	4.96	0.99	28.30	-	-	9.11	39.45	39.45	9.11	1,127.43	798.67	895.78
	6830.0	8.0	217255	4.99	0.99	29.29	-	-	9.26	40.02	40.02	9.26	1,250.22	813.37	911.94
	6830.2	8.2	218455	5.02	1.00	30.29	-	-	9.42	40.59	40.59	9.42	-	827.81	927.82
	6830.4	8.4	219654	5.04	1.01	31.30	-	-	9.57	41.15	41.15	9.57	-	842.00	943.43
	6830.6	8.6	220854	5.07	1.01	32.31	-	-	9.72	41.70	41.70	9.72	-	855.95	958.78
	6830.8	8.8	222053	5.10	1.02	33.33	-	-	9.86	42.25	42.25	9.86	-	869.68	973.89
	6831.0	9.0	223253	5.13	1.02	34.35	-	-	10.01	42.78	42.78	10.01	-	883.19	988.77
	6831.2	9.2	224453	5.15	1.03	35.38	-	-	10.15	43.32	43.32	10.15	-	896.50	1,003.43
	6831.4	9.4	225652	5.18	1.03	36.41	-	-	10.29	43.84	43.84	10.29	-	909.62	1,017.88
	6831.6	9.6	226852	5.21	1.04	37.45	-	-	10.43	44.36	44.36	10.43	-	922.55	1,032.12
	6831.8	9.8	228051	5.24	1.04	38.49	-	-	10.56	44.87	44.87	10.56	-	935.30	1,046.17
	6832.0	10.0	229251	5.26	1.05	39.54	-	-	10.70	45.38	45.38	10.70	-	947.88	1,060.03
	6832.2	10.2	230593	5.29	1.06	40.60	63.78	-	10.83	45.88	45.88	10.83	-	960.29	1,137.49
	6832.4	10.4	231935	5.32	1.06	41.66	180.39	-	10.96	46.38	46.38	10.96	-	972.55	1,267.61
	6832.6	10.6	233277	5.36	1.07	42.73	331.39	-	11.09	46.87	46.87	11.09	-	984.65	1,431.96
	6832.8	10.8	234619	5.39	1.07	43.80	510.21	-	11.22	47.35	47.35	11.22	-	996.61	1,623.97
	6833.0	11.0	235961	5.42	1.08	44.88	713.04	-	11.35	47.83	47.83	11.35	-	1,008.42	1,839.83
	6833.2	11.2	237302	5.45	1.09	45.97	937.32	-	11.47	48.31	48.31	11.47	-	1,020.10	2,076.99
	6833.4	11.4	238644	5.48	1.09	47.06	1,181.16	-	11.59	48.78	48.78	11.59	-	1,031.65	2,333.56
	6833.6	11.6	239986	5.51	1.10	48.16	1,443.10	-	11.72	49.25	49.25	11.72	-	1,043.06	2,608.10
	6833.8	11.8	241328	5.54	1.10	49.27	1,721.97	-	11.84	49.71	49.71	11.84	-	1,054.36	2,899.43
	6834.0	12.0	242670	5.57	1.11	50.38	2,016.79	-	11.96	50.17	50.17	11.96	-	1,065.53	3,206.58

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q=^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Regional Pond MN

References: Topo and field survey

Spillway Length (ft) =	252
Spillway Elevation (ft) =	6854.0
Spillway C_d[1] =	0.56
Embankment Length (ft) =	308
Embankment Elevation (ft) =	6856.0
Embankment C_d[1] =	0.56
Acceleration due to Gravity, g (ft/s[2]) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d[1]*	*Area (ft[2])*	*Centerline Elevation (ft)*	*Bottom Elevation[2] (ft)*	*Top Elevation[3] (ft)*
Orifice 1 :	Rectangular	1.5	2.5		0.6	3.75	6851.25	6850.00	6852.50
Orifice 2:	Rectangular	15.42	2.29		0.6	35.31	6853.65	6852.50	6854.79
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d[1]*	*Area (ft[2])*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	Rectangular	20.0	6.8		0.6	135.00	6855.8	53.50

Stage			*Storage*				*Discharge*							*Total Flow[6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume[4]*		*Spillway[5] (cfs)*	*Embankment[5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	
			(ft[2])	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	6850.0	0.0	72765	1.67	0.00	0.00	-	-	-	-	-	-	-	-
	6852.0	2.0	81967	1.88	3.55	3.55	-	-	13.62	-	-	-	-	13.62
	6854.0	4.0	91240	2.09	3.98	7.53	-	-	29.94	90.93	-	-	-	120.88
	6856.0	6.0	100323	2.30	4.40	11.93	2,135.43	-	39.35	260.92	-	-	12.04	2,447.74

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:

1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Paint Brush Hills Pond #4

References: Topo and field survey

Spillway Length (ft) =	14
Spillway Elevation (ft) =	7134.0
Spillway C_d [1] =	0.56
Embankment Length (ft) =	700
Embankment Elevation (ft) =	7136.0
Embankment C_d [1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d [1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation [2] (ft)*	*Top Elevation [3] (ft)*
Orifice 1 :	Circular			42	0.6	9.62	7131.75	7130.00	7133.50
Orifice 2:	None Selected					0.00		0.00	0.00
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Check Dimen

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d [1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	None Selected				0.6	0.00		0.00

Stage			*Storage*				*Discharge*							*Total Flow [6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume [4]*		*Spillway [5] (cfs)*	*Embankment [5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	7130.0	0.0	49	0.00	0.00	0.00	-	-	-	-	-	-	-	-
	7132.0	2.0	8991	0.21	0.21	0.21	-	-	23.16	-	-	-	-	23.16
	7134.0	4.0	40420	0.93	1.13	1.34	-	-	69.49	-	-	-	-	69.49
	7136.0	6.0	73961	1.70	2.63	3.97	118.63	-	95.50	-	-	-	-	214.14

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Paint Brush Hills Pond A

References: Topo and field survey

Spillway Length (ft) =	27
Spillway Elevation (ft) =	7148.0
Spillway C_d [1] =	0.56
Embankment Length (ft) =	420
Embankment Elevation (ft) =	7150.0
Embankment C_d [1] =	0.56
Acceleration due to Gravity, g (ft/s [2]) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d [1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation [2] (ft)*	*Top Elevation [3] (ft)*
Orifice 1 :	Circular			18	0.6	1.77	7144.75	7144.00	7145.50
Orifice 2:	None Selected					0.00		0.00	0.00
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d [1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	Circular			3.0	0.6	7.07	7147.3	9.42

Stage			*Storage*				*Discharge*								
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume [4]*		*Spillway [5] (cfs)*	*Embankment [5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	*Total Flow [6] (cfs)*
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	7144.0	0.0	2301	0.05	0.00	0.00	-	-	-	-	-	-	-	-
	7146.0	2.0	32617	0.75	0.80	0.80	-	-	9.51	-	-	-	-	9.51
	7148.0	4.0	46611	1.07	1.82	2.62	-	-	15.34	-	-	-	16.59	31.93
	7150.0	6.0	52403	1.20	2.27	4.89	228.80	-	19.50	-	-	-	55.61	303.91

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3C_d(2g)^{0.5}LH^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Paint Brush Hills Pond B1

References: Topo and field survey

Spillway Length (ft) =	60
Spillway Elevation (ft) =	7158.0
Spillway C_d[1] =	0.56
Embankment Length (ft) =	663
Embankment Elevation (ft) =	7160.0
Embankment C_d[1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d[1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation[2] (ft)*	*Top Elevation[3] (ft)*
Orifice 1 :	Circular			42	0.6	9.62	7151.75	7150.00	7153.50
Orifice 2:	Circular			42	0.6	9.62	7151.75	7150.00	7153.50
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Check Dimen Check Dimensions

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d[1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	None Selected				0.6	0.00		0.00

Stage			*Storage*				*Discharge*							*Total Flow[6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume[4]*		*Spillway[5] (cfs)*	*Embankment[5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	7150.0	0.0	27719	0.64	0.00	0.00	-	-	-	-	-	-	-	-
	7152.0	2.0	42805	0.98	1.62	1.62	-	-	23.16	23.16	-	-	-	46.33
	7154.0	4.0	50226	1.15	2.14	3.75	-	-	69.49	69.49	-	-	-	138.98
	7156.0	6.0	58005	1.33	2.48	6.24	-	-	95.50	95.50	-	-	-	191.00
	7158.0	8.0	69547	1.60	2.93	9.17	-	-	115.81	115.81	-	-	-	231.63
	7160.0	10.0	97375	2.24	3.83	13.00	508.44	-	133.06	133.06	-	-	-	774.56

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:

1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systemsby R.S. Gupta, 2001, page 303

2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft

3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft

4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft

5) Weir equation for Embankment and Spillway is fromHydrology and Hydraulic Systemsby R.S. Gupta, 2001, equation 6.22: $Q={}^{2}/_{3}C_d(2g)^{0.5}LH^{1.5}$

6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Paint Brush Hills Pond B2

References: Topo and field survey

Spillway Length (ft) =	25
Spillway Elevation (ft) =	7148.0
Spillway C_d [1] =	0.56
Embankment Length (ft) =	600
Embankment Elevation (ft) =	7150.0
Embankment C_d [1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d [1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation [2] (ft)*	*Top Elevation [3] (ft)*
Orifice 1 :	Circular			18	0.6	1.77	7140.75	7140.00	7141.50
Orifice 2:	None Selected					0.00		0.00	0.00
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d [1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	Circular			5.0	0.6	19.63	7146.5	15.71

Stage			*Storage*				*Discharge*							*Total Flow [6] (cfs)*
Stage	*Elevation (ft)*	*Height (ft)*	*Area*		*Volume [4]*		*Spillway [5] (cfs)*	*Embankment [5] (cfs)*	*Orifice (max outflow cfs)*				*Grate (max outflow cfs)*	
			(ft^2)	*(acres)*	*(ac-ft)*	*(cum ac-ft)*			*1*	*2*	*3*	*4*		
	7140.0	0.0	6171	0.14	0.00	0.00	-	-	-	-	-	-	-	-
	7142.0	2.0	33600	0.77	0.91	0.91	-	-	9.51	-	-	-	-	9.51
	7144.0	4.0	72649	1.67	2.44	3.35	-	-	15.34	-	-	-	-	15.34
	7146.0	6.0	99742	2.29	3.96	7.31	-	-	19.50	-	-	-	-	19.50
	7148.0	8.0	108583	2.49	4.78	12.09	-	-	22.91	-	-	-	92.63	115.54
	7150.0	10.0	117383	2.69	5.19	17.28	211.85	-	25.88	-	-	-	176.87	414.60
	7152.0	12.0	125020	2.87	5.56	22.84	599.20	5,084.36	28.54	-	-	-	221.72	5,933.81

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:

1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303

2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft

3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft

4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft

5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q={}^2/_3 C_d (2g)^{0.5} L H^{1.5}$

6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

Stage Storage Discharge

Data for spillway and embankment: Paint Brush Hills Pond C

References: Topo and field survey

Spillway Length (ft) =	57
Spillway Elevation (ft) =	7200.0
Spillway C_d [1] =	0.56
Embankment Length (ft) =	515
Embankment Elevation (ft) =	7202.0
Embankment C_d [1] =	0.56
Acceleration due to Gravity, g (ft/s^2) =	32.2

Data for outlet pipe and grate:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (in)*	*C_d [1]*	*Area (ft^2)*	*Centerline Elevation (ft)*	*Bottom Elevation [2] (ft)*	*Top Elevation [3] (ft)*
Orifice 1 :	Circular			18	0.6	1.77	7194.75	7194.00	7195.50
Orifice 2:	None Selected					0.00		0.00	0.00
Orifice 3:	None Selected					0.00		0.00	0.00
Orifice 4:	None Selected					0.00		0.00	0.00

Stand Pipe Dimensions:

	Type	*Width (ft)*	*Height (ft)*	*Diameter (ft)*	*C_d [1]*	*Area (ft^2)*	*Elevation (ft)*	*Perimeter (ft)*
Grate :	Circular			5.5	0.6	23.76	7199.0	17.28

Stage			***Storage***				***Discharge***							
Stage	***Elevation (ft)***	***Height (ft)***	***Area***		***Volume [4]***		***Spillway [5] (cfs)***	***Embankment [5] (cfs)***	***Orifice (max outflow cfs)***				***Grate (max outflow cfs)***	***Total Flow [6] (cfs)***
			(ft^2)	***(acres)***	***(ac-ft)***	***(cum ac-ft)***			***1***	***2***	***3***	***4***		
	7194.0	0.0	3524	0.08	0.00	0.00	-	-	-	-	-	-	-	-
	7196.0	2.0	34432	0.79	0.87	0.87	-	-	9.51	-	-	-	-	9.51
	7198.0	4.0	70646	1.62	2.41	3.28	-	-	15.34	-	-	-	-	15.34
	7200.0	6.0	81277	1.87	3.49	6.77	-	-	19.50	-	-	-	55.46	74.96
	7202.0	8.0	94041	2.16	4.02	10.80	483.01	-	22.91	-	-	-	198.14	704.06

DO NOT INCLUDE WATER QUALITY CAPTURE VOLUME IN THIS STORAGE AREA.

Notes:
1) Coefficient of discharge, C_d, taken from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, page 303
2) Bottom Elevation is the Centerline Elevation minus half the Height or the Diameter, example: 6132.25ft-0.5*30in/(12ft/in)=6131.00ft
3) Top Elevation is the Centerline Elevation plus half the Height of the Diameter, example: 6132.25ft+0.5*30in/(12ft/in)=6133.50ft
4) Volume for each elevation is calculated using the average end area and then accumulated, example: (5ft-3ft)(16.8ac+15.78ac)*0.5=64.43ac-ft
5) Weir equation for Embankment and Spillway is from Hydrology and Hydraulic Systems by R.S. Gupta, 2001, equation 6.22: $Q = {}^{2}/_{3} C_d (2g)^{0.5} L H^{1.5}$
6) Total Flow is the sum of the folws through the Embankment, Spillway, and Culvert (Does not account for outlet capacity, this needs to be checked seperately.)

Calculated by: BAS
Date:
Checked by:
Date:

24-hr Rainfall Depths

Recurrence Interval	NOAA Depth (in)[1]	Adjusted Depth (in)
2-yr	2	1.96
5-yr	2.6	2.55
10-yr	3	2.94
25-yr	3.8	3.72
50-yr	4.2	4.12
100-yr	4.6	4.51
	Areal Reduction	**0.98**

DA=10.6 mi²

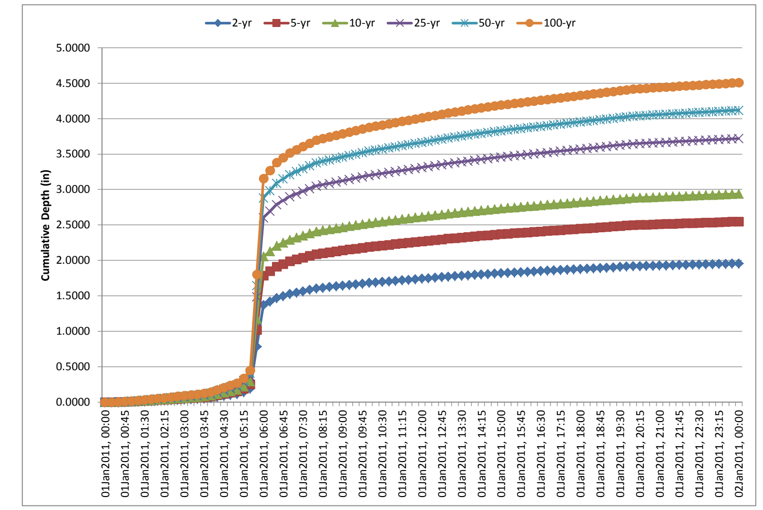
Notes:

[1] NOAA Atlas 2 Vol. III

Falcon DBPS

TypeIIA Rainfall Distribution

Ordinate	Date/Time	Type IIa Cumulative Precipitation (in)	Recurrence 2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
1	01Jan2011, 00:00	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	01Jan2011, 00:15	0.0005	0.0010	0.0013	0.0015	0.0019	0.0021	0.0023
3	01Jan2011, 00:30	0.0015	0.0029	0.0038	0.0044	0.0056	0.0062	0.0068
4	01Jan2011, 00:45	0.0030	0.0059	0.0077	0.0088	0.0112	0.0124	0.0135
5	01Jan2011, 01:00	0.0045	0.0088	0.0115	0.0132	0.0167	0.0185	0.0203
6	01Jan2011, 01:15	0.0060	0.0118	0.0153	0.0176	0.0223	0.0247	0.0271
7	01Jan2011, 01:30	0.0080	0.0157	0.0204	0.0235	0.0298	0.0330	0.0361
8	01Jan2011, 01:45	0.0100	0.0196	0.0255	0.0294	0.0372	0.0412	0.0451
9	01Jan2011, 02:00	0.0120	0.0235	0.0306	0.0353	0.0446	0.0494	0.0541
10	01Jan2011, 02:15	0.0143	0.0280	0.0365	0.0420	0.0532	0.0589	0.0645
11	01Jan2011, 02:30	0.0165	0.0323	0.0421	0.0485	0.0614	0.0680	0.0744
12	01Jan2011, 02:45	0.0188	0.0368	0.0479	0.0553	0.0699	0.0775	0.0848
13	01Jan2011, 03:00	0.0210	0.0412	0.0536	0.0617	0.0781	0.0865	0.0947
14	01Jan2011, 03:15	0.0233	0.0457	0.0594	0.0685	0.0867	0.0960	0.1051
15	01Jan2011, 03:30	0.0255	0.0500	0.0650	0.0750	0.0949	0.1051	0.1150
16	01Jan2011, 03:45	0.0278	0.0545	0.0709	0.0817	0.1034	0.1145	0.1254
17	01Jan2011, 04:00	0.0320	0.0627	0.0816	0.0941	0.1190	0.1318	0.1443
18	01Jan2011, 04:15	0.0390	0.0764	0.0995	0.1147	0.1451	0.1607	0.1759
19	01Jan2011, 04:30	0.0460	0.0902	0.1173	0.1352	0.1711	0.1895	0.2075
20	01Jan2011, 04:45	0.0530	0.1039	0.1352	0.1558	0.1972	0.2184	0.2390
21	01Jan2011, 05:00	0.0600	0.1176	0.1530	0.1764	0.2232	0.2472	0.2706
22	01Jan2011, 05:15	0.0750	0.1470	0.1913	0.2205	0.2790	0.3090	0.3383
23	01Jan2011, 05:30	0.1000	0.1960	0.2550	0.2940	0.3720	0.4120	0.4510
24	01Jan2011, 05:45	0.4000	0.7840	1.0200	1.1760	1.4880	1.6480	1.8040
25	01Jan2011, 06:00	0.7000	1.3720	1.7850	2.0580	2.6040	2.8840	3.1570
26	01Jan2011, 06:15	0.7250	1.4210	1.8488	2.1315	2.6970	2.9870	3.2698
27	01Jan2011, 06:30	0.7500	1.4700	1.9125	2.2050	2.7900	3.0900	3.3825
28	01Jan2011, 06:45	0.7650	1.4994	1.9508	2.2491	2.8458	3.1518	3.4502
29	01Jan2011, 07:00	0.7800	1.5288	1.9890	2.2932	2.9016	3.2136	3.5178
30	01Jan2011, 07:15	0.7900	1.5484	2.0145	2.3226	2.9388	3.2548	3.5629
31	01Jan2011, 07:30	0.8000	1.5680	2.0400	2.3520	2.9760	3.2960	3.6080
32	01Jan2011, 07:45	0.8100	1.5876	2.0655	2.3814	3.0132	3.3372	3.6531
33	01Jan2011, 08:00	0.8200	1.6072	2.0910	2.4108	3.0504	3.3784	3.6982
34	01Jan2011, 08:15	0.8250	1.6170	2.1038	2.4255	3.0690	3.3990	3.7208
35	01Jan2011, 08:30	0.8300	1.6268	2.1165	2.4402	3.0876	3.4196	3.7433
36	01Jan2011, 08:45	0.8350	1.6366	2.1293	2.4549	3.1062	3.4402	3.7659
37	01Jan2011, 09:00	0.8400	1.6464	2.1420	2.4696	3.1248	3.4608	3.7884
38	01Jan2011, 09:15	0.8450	1.6562	2.1548	2.4843	3.1434	3.4814	3.8110
39	01Jan2011, 09:30	0.8500	1.6660	2.1675	2.4990	3.1620	3.5020	3.8335
40	01Jan2011, 09:45	0.8550	1.6758	2.1803	2.5137	3.1806	3.5226	3.8561
41	01Jan2011, 10:00	0.8600	1.6856	2.1930	2.5284	3.1992	3.5432	3.8786
42	01Jan2011, 10:15	0.8638	1.6930	2.2027	2.5396	3.2133	3.5589	3.8957
43	01Jan2011, 10:30	0.8675	1.7003	2.2121	2.5505	3.2271	3.5741	3.9124
44	01Jan2011, 10:45	0.8713	1.7077	2.2218	2.5616	3.2412	3.5898	3.9296
45	01Jan2011, 11:00	0.8750	1.7150	2.2313	2.5725	3.2550	3.6050	3.9463
46	01Jan2011, 11:15	0.8788	1.7224	2.2409	2.5837	3.2691	3.6207	3.9634
47	01Jan2011, 11:30	0.8825	1.7297	2.2504	2.5946	3.2829	3.6359	3.9801
48	01Jan2011, 11:45	0.8863	1.7371	2.2601	2.6057	3.2970	3.6516	3.9972
49	01Jan2011, 12:00	0.8900	1.7444	2.2695	2.6166	3.3108	3.6668	4.0139
50	01Jan2011, 12:15	0.8938	1.7518	2.2792	2.6278	3.3249	3.6825	4.0310
51	01Jan2011, 12:30	0.8975	1.7591	2.2886	2.6387	3.3387	3.6977	4.0477
52	01Jan2011, 12:45	0.9013	1.7665	2.2983	2.6498	3.3528	3.7134	4.0649
53	01Jan2011, 13:00	0.9050	1.7738	2.3078	2.6607	3.3666	3.7286	4.0816
54	01Jan2011, 13:15	0.9083	1.7803	2.3162	2.6704	3.3789	3.7422	4.0964
55	01Jan2011, 13:30	0.9115	1.7865	2.3243	2.6798	3.3908	3.7554	4.1109
56	01Jan2011, 13:45	0.9148	1.7930	2.3327	2.6895	3.4031	3.7690	4.1257
57	01Jan2011, 14:00	0.9180	1.7993	2.3409	2.6989	3.4150	3.7822	4.1402
58	01Jan2011, 14:15	0.9210	1.8052	2.3486	2.7077	3.4261	3.7945	4.1537
59	01Jan2011, 14:30	0.9240	1.8110	2.3562	2.7166	3.4373	3.8069	4.1672
60	01Jan2011, 14:45	0.9270	1.8169	2.3639	2.7254	3.4484	3.8192	4.1808
61	01Jan2011, 15:00	0.9300	1.8228	2.3715	2.7342	3.4596	3.8316	4.1943
62	01Jan2011, 15:15	0.9325	1.8277	2.3779	2.7416	3.4689	3.8419	4.2056
63	01Jan2011, 15:30	0.9350	1.8326	2.3843	2.7489	3.4782	3.8522	4.2169
64	01Jan2011, 15:45	0.9375	1.8375	2.3906	2.7563	3.4875	3.8625	4.2281
65	01Jan2011, 16:00	0.9400	1.8424	2.3970	2.7636	3.4968	3.8728	4.2394
66	01Jan2011, 16:15	0.9425	1.8473	2.4034	2.7710	3.5061	3.8831	4.2507
67	01Jan2011, 16:30	0.9450	1.8522	2.4098	2.7783	3.5154	3.8934	4.2620
68	01Jan2011, 16:45	0.9475	1.8571	2.4161	2.7857	3.5247	3.9037	4.2732
69	01Jan2011, 17:00	0.9500	1.8620	2.4225	2.7930	3.5340	3.9140	4.2845
70	01Jan2011, 17:15	0.9525	1.8669	2.4289	2.8004	3.5433	3.9243	4.2958
71	01Jan2011, 17:30	0.9550	1.8718	2.4353	2.8077	3.5526	3.9346	4.3071
72	01Jan2011, 17:45	0.9575	1.8767	2.4416	2.8151	3.5619	3.9449	4.3183
73	01Jan2011, 18:00	0.9600	1.8816	2.4480	2.8224	3.5712	3.9552	4.3296
74	01Jan2011, 18:15	0.9625	1.8865	2.4544	2.8298	3.5805	3.9655	4.3409
75	01Jan2011, 18:30	0.9650	1.8914	2.4608	2.8371	3.5898	3.9758	4.3522
76	01Jan2011, 18:45	0.9675	1.8963	2.4671	2.8445	3.5991	3.9861	4.3634
77	01Jan2011, 19:00	0.9700	1.9012	2.4735	2.8518	3.6084	3.9964	4.3747
78	01Jan2011, 19:15	0.9725	1.9061	2.4799	2.8592	3.6177	4.0067	4.3860
79	01Jan2011, 19:30	0.9750	1.9110	2.4863	2.8665	3.6270	4.0170	4.3973
80	01Jan2011, 19:45	0.9775	1.9159	2.4926	2.8739	3.6363	4.0273	4.4085
81	01Jan2011, 20:00	0.9800	1.9208	2.4990	2.8812	3.6456	4.0376	4.4198
82	01Jan2011, 20:15	0.9813	1.9233	2.5023	2.8850	3.6504	4.0430	4.4257
83	01Jan2011, 20:30	0.9825	1.9257	2.5054	2.8886	3.6549	4.0479	4.4311
84	01Jan2011, 20:45	0.9838	1.9282	2.5087	2.8924	3.6597	4.0533	4.4369
85	01Jan2011, 21:00	0.9850	1.9306	2.5118	2.8959	3.6642	4.0582	4.4424
86	01Jan2011, 21:15	0.9863	1.9331	2.5151	2.8997	3.6690	4.0636	4.4482
87	01Jan2011, 21:30	0.9875	1.9355	2.5181	2.9033	3.6735	4.0685	4.4536
88	01Jan2011, 21:45	0.9888	1.9380	2.5214	2.9071	3.6783	4.0739	4.4595
89	01Jan2011, 22:00	0.9900	1.9404	2.5245	2.9106	3.6828	4.0788	4.4649
90	01Jan2011, 22:15	0.9913	1.9429	2.5278	2.9144	3.6876	4.0842	4.4708
91	01Jan2011, 22:30	0.9925	1.9453	2.5309	2.9180	3.6921	4.0891	4.4762
92	01Jan2011, 22:45	0.9938	1.9478	2.5342	2.9218	3.6969	4.0945	4.4820
93	01Jan2011, 23:00	0.9950	1.9502	2.5373	2.9253	3.7014	4.0994	4.4875
94	01Jan2011, 23:15	0.9963	1.9527	2.5406	2.9291	3.7062	4.1048	4.4933
95	01Jan2011, 23:30	0.9975	1.9551	2.5436	2.9327	3.7107	4.1097	4.4987
96	01Jan2011, 23:45	0.9988	1.9576	2.5469	2.9365	3.7155	4.1151	4.5046
97	02Jan2011, 00:00	1.0000	1.9600	2.5500	2.9400	3.7200	4.1200	4.5100



Falcon DBPS
Peak Flow Results

Hydrologic Element	Area (sq mi)	Historical Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
ET010	0.15	10	22	32	57	71	86
ET020	0.21	20	44	63	110	140	170
ET030	0.20	0	2	5	14	21	28
ET040	0.15	0	2	5	16	22	30
ET050	0.12	0	1	5	18	27	38
ET060	0.29	0	4	15	54	80	110
ET070	0.25	0	3	10	38	58	79
ET080	0.29	0	2	6	23	35	49
ET090	0.12	0	1	2	6	9	12
ET100	0.05	0	1	2	7	11	15
ET110	0.23	0	1	5	18	27	38
ET120	0.11	0	1	2	6	10	14
ET130	0.13	0	1	2	6	8	12
ET140	0.27	0	1	3	8	12	17
ET150	0.18	0	1	4	14	22	30
ET160	0.19	0	2	6	15	22	30
FS010	0.12	0	2	5	12	17	23
JET010	0.15	10	22	32	57	71	86
JET020	0.36	20	45	67	130	160	200
JET030	0.56	20	46	71	140	180	230
JET040	0.71	19	48	74	150	190	240
JET050	0.83	19	48	75	150	200	250
JET060	1.11	19	48	77	150	200	260
JET070	1.36	19	49	79	160	210	260
JET080	1.66	17	46	74	150	200	250
JET090	1.78	17	47	75	150	200	260
JET100	1.83	17	47	75	150	200	260
JET110	2.05	17	47	76	160	210	260
JET120	2.16	17	47	77	160	210	270
JET130	0.13	0	1	2	6	8	12
JET140	0.40	0	2	4	14	21	29
JET152	2.57	17	49	81	170	230	290
JET154	2.74	17	49	82	170	230	300
JET160	2.93	18	48	81	180	240	300
JFS010_OUTLET	0.12	0	2	5	12	17	23
JMT010	0.29	1	7	13	32	44	57
JMT020	0.09	8	20	30	54	68	83
JMT030	0.25	15	38	58	100	130	160
JMT040	0.56	24	65	99	180	230	290
JMT050	0.67	24	65	100	190	240	300
JMT060	1.16	24	66	100	200	260	330
JMT070	1.36	24	67	110	210	280	350
JMT080	1.42	24	68	110	210	280	350
JMT090	0.04	0	1	3	10	14	19
JMT102	1.46	24	68	110	220	280	360
JMT104	0.04	0	1	3	10	14	19
JMT106	1.52	24	68	110	210	280	360
JMT110	1.64	22	63	120	220	290	360
JWT010	0.14	7	18	27	51	65	80
JWT020	0.07	3	8	12	23	29	36
JWT030	0.14	6	15	23	46	60	75
JWT042	0.28	12	32	50	97	120	160
JWT044	0.46	19	49	77	150	190	240
JWT050	0.85	33	87	140	260	330	410
JWT070	0.17	10	27	42	77	99	120
JWT080	1.09	40	110	170	330	420	510
JWT090	1.43	49	120	200	380	500	610
JWT110	1.63	56	150	220	440	580	720
JWT120	1.77	58	150	230	460	600	750
JWT140	0.13	13	28	40	70	88	110
JWT150	0.36	21	44	64	110	140	170
JWT160	0.47	23	50	71	120	160	190
JWT172	2.24	79	200	300	580	750	930
JWT174	2.36	81	200	310	590	760	950
JWT180	2.46	81	200	310	600	770	960

Hydrologic Element	Area (sq mi)	Existing Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
ET010	0.15	25	47	64	100	130	150
ET020	0.21	44	84	110	180	220	260
ET030	0.20	34	62	84	130	160	190
ET040	0.15	28	53	72	120	140	170
ET050	0.12	37	67	89	140	170	200
ET060	0.29	110	190	250	380	450	530
ET070	0.25	94	160	220	330	400	460
ET080	0.29	91	160	210	320	380	440
ET090	0.12	7	16	24	41	52	63
ET100	0.05	1	6	10	21	27	34
ET110	0.23	8	24	38	73	94	120
ET120	0.11	8	18	26	46	57	70
ET130	0.13	7	16	23	41	51	62
ET140	0.27	11	23	34	59	73	89
ET150	0.18	17	37	53	91	110	140
ET160	0.19	19	39	55	92	110	140
FS010	0.12	2	6	11	24	32	41
JET010	0.15	23	37	49	80	99	120
JET020	0.36	44	85	120	190	240	280
JET030	0.56	65	130	190	310	380	460
JET040	0.71	23	59	110	260	390	480
JET050	0.83	7	32	67	170	260	410
JET060	1.11	13	28	45	180	240	340
JET070	1.36	94	170	220	350	420	490
JET080	1.66	14	36	55	170	230	320
JET090	1.78	15	39	64	170	270	370
JET100	1.83	15	40	65	170	270	380
JET110	2.05	16	43	76	180	300	410
JET120	2.16	17	48	84	190	320	430
JET130	0.13	7	16	23	41	51	62
JET140	0.40	18	39	57	99	120	150
JET152	2.57	28	86	140	290	430	570
JET154	2.74	31	91	140	300	450	590
JET160	2.93	32	96	150	320	470	620
JFS010_OUTLET	0.12	2	6	11	24	32	41
JMT010	0.29	1	11	25	62	120	160
JMT020	0.09	14	29	41	70	86	100
JMT030	0.25	34	74	100	160	200	240
JMT040	0.56	40	120	190	320	400	470
JMT050	0.67	50	150	230	390	490	580
JMT060	1.16	54	160	250	450	560	670
JMT070	1.36	61	180	280	510	630	760
JMT080	1.42	40	110	260	510	640	770
JMT090	0.04	8	13	16	23	27	30
JMT102	1.46	44	110	270	530	660	790
JMT104	0.04	8	13	16	23	27	30
JMT106	1.52	45	120	260	530	660	800
JMT110	1.64	46	120	260	540	680	820
JWT010	0.14	9	21	32	58	73	89
JWT020	0.07	4	10	15	27	34	42
JWT030	0.14	9	20	30	55	69	85
JWT042	0.28	15	37	57	110	140	170
JWT044	0.46	24	59	89	170	210	260
JWT050	0.85	43	110	170	310	390	480
JWT070	0.17	14	33	49	87	110	130
JWT080	1.09	54	140	210	400	500	610
JWT090	1.43	67	160	250	470	600	740
JWT110	1.63	76	180	280	540	700	850
JWT120	1.77	84	190	300	570	740	910
JWT140	0.13	14	30	43	74	92	110
JWT150	0.36	11	15	17	43	66	91
JWT160	0.47	35	64	85	130	160	180
JWT172	2.24	90	210	320	600	760	930
JWT174	2.36	92	210	320	610	780	960
JWT174 Diversion	2.36	0	15	130	410	580	760

Hydrologic Element	Area (sq mi)	Future Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
ET010	0.15	38	67	90	140	170	200
ET020	0.21	73	130	170	260	310	360
ET030	0.20	45	81	110	170	210	240
ET040	0.15	28	53	72	120	140	170
ET050	0.12	37	67	89	140	170	200
ET060	0.29	110	190	250	380	450	530
ET070	0.25	94	160	220	330	400	460
ET080	0.29	110	190	250	380	450	520
ET090	0.12	26	46	61	95	110	130
ET100	0.05	11	22	31	50	61	72
ET110	0.23	24	53	76	130	160	200
ET120	0.11	11	24	34	59	74	89
ET130	0.13	11	23	33	57	71	85
ET140	0.27	16	33	48	82	100	120
ET150	0.18	17	37	53	91	110	140
ET160	0.19	19	39	55	92	110	140
FS010	0.12	6	17	26	48	61	75
JET010	0.15	29	49	64	110	130	150
JET020	0.36	74	130	170	270	330	390
JET030	0.56	97	180	250	410	500	580
JET040	0.71	27	85	140	380	500	570
JET050	0.83	11	38	88	210	380	530
JET060	1.11	13	32	68	210	300	430
JET070	1.36	94	170	220	350	420	480
JET080	1.66	15	38	61	200	270	350
JET090	1.78	26	47	81	200	290	390
JET100	1.83	27	49	83	200	290	390
JET110	2.05	40	85	120	210	320	440
JET120	2.16	49	110	160	270	340	450
JET130	0.13	11	23	33	57	71	85
JET140	0.40	26	55	80	140	170	200
JET152	2.57	51	120	180	350	500	650
JET154	2.74	62	140	200	370	530	680
JET160	2.93	66	150	230	410	550	710
JFS010_OUTLET	0.12	6	17	26	48	61	75
JMT010	0.29	1	11	25	62	120	160
JMT020	0.09	26	47	64	100	120	140
JMT030	0.25	50	94	130	200	250	290
JMT040	0.56	110	240	330	520	620	750
JMT050	0.67	120	280	380	590	710	850
JMT060	1.16	130	310	430	700	850	1,000
JMT070	1.36	150	350	490	800	980	1,200
JMT080	1.42	86	330	490	810	980	1,200
JMT090	0.04	9	15	18	25	29	32
JMT102	1.46	91	330	500	820	1,000	1,200
JMT104	0.04	9	15	18	25	29	32
JMT106	1.52	92	320	490	820	1,000	1,200
JMT110	1.64	94	320	500	830	1,000	1,200
JWT010	0.14	9	21	32	58	73	89
JWT020	0.07	4	10	15	27	34	42
JWT030	0.14	9	20	30	55	69	85
JWT042	0.28	15	37	57	110	140	170
JWT044	0.46	24	59	89	170	210	260
JWT050	0.85	43	110	170	310	390	480
JWT070	0.17	14	33	49	87	110	130
JWT080	1.09	54	140	210	400	500	610
JWT090	1.43	68	160	250	480	610	730
JWT110	1.63	77	170	280	530	690	840
JWT120	1.77	85	190	300	570	730	920
JWT140	0.13	32	59	80	130	150	180
JWT150	0.36	15	19	39	97	140	170
JWT160	0.47	35	64	85	130	160	190
JWT172	2.24	99	210	320	600	760	960
JWT174	2.36	100	210	330	610	780	990
JWT180	2.46	100	220	330	620	800	1,000

Falcon DBPS
Peak Flow Results

Hydrologic Element	Area (sq mi)	Historical Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
JWT190	0.06	0	0	2	7	10	14
JWT200	2.82	80	200	310	610	790	990
JWT210	3.09	80	200	320	620	810	1,000
JWT220	0.19	1	7	12	28	38	49
JWT232	3.28	81	210	320	630	830	1,000
JWT234	3.47	82	210	330	640	840	1,100
JWT240	3.55	83	210	330	650	840	1,100
JWT250	3.70	84	210	330	650	850	1,100
JWT260	3.84	86	220	340	670	870	1,100
JWT270	0.03	0	2	4	8	11	15
JWT280	0.27	22	50	72	130	160	190
JWT292	3.87	86	220	340	670	870	1,100
JWT294	4.13	89	220	350	690	900	1,100
JWT296	5.88	110	290	420	860	1,100	1,400
JWT300	0.10	6	14	22	39	50	61
JWT310	6.25	110	290	430	870	1,100	1,500
JWT320	6.46	110	290	430	880	1,100	1,500
JWT330	0.33	0	3	7	23	34	47
JWT352	9.69	110	300	460	970	1,300	1,600
JWT354	10.30	110	310	470	990	1,300	1,700
JWT360	0.07	1	3	5	11	15	20
JWT372	10.36	110	310	470	990	1,300	1,700
JWT374_OUTLET	10.58	110	310	470	990	1,300	1,700
MT010	0.29	1	7	13	32	44	57
MT020	0.09	8	20	30	54	68	83
MT030	0.16	7	20	32	61	78	97
MT040	0.31	10	28	43	82	110	130
MT050	0.12	0	1	2	7	11	16
MT060	0.19	0	1	4	14	22	31
MT070	0.20	0	2	5	13	19	25
MT080	0.06	2	8	14	29	38	48
MT090	0.04	0	1	3	10	14	19
MT100	0.06	0	0	1	5	8	11
MT110	0.12	0	1	2	8	12	16
RET020	0.15	10	22	32	57	71	82
RET030	0.36	19	44	67	120	160	200
RET040	0.56	19	46	71	140	180	230
RET050	0.71	19	47	74	150	190	240
RET060	0.83	19	47	75	150	190	250
RET070	1.11	19	48	77	150	200	250
RET080	1.36	17	45	72	140	190	240
RET090	1.66	17	46	74	150	200	250
RET100	1.78	17	47	75	150	200	260
RET110	1.83	17	47	75	150	200	260
RET120	2.05	17	47	76	160	210	260
RET140	0.13	0	1	2	6	8	12
RET152	2.16	17	47	77	160	210	270
RET154	0.40	0	2	4	14	21	29
RET156	2.57	17	49	81	170	230	290
RET162	2.74	17	48	80	170	230	300
RET164	2.93	18	48	81	180	240	300
RMT030	0.09	8	20	30	54	67	82
RMT040	0.25	14	38	57	100	130	160
RMT050	0.56	24	65	99	180	230	290
RMT062	0.29	1	7	13	31	44	57
RMT064	0.67	24	65	100	190	240	300
RMT070	1.16	24	66	100	200	260	330
RMT080	1.36	24	67	110	210	280	350
RMT090	0.04	0	1	3	10	14	19
RMT102	1.42	24	68	110	210	280	350
RMT104	0.04	0	1	3	10	14	19
RMT106	1.46	24	67	110	210	280	350
RMT112	1.52	22	62	120	210	280	360
RMT114	1.64	22	63	110	220	290	360
RWT030	0.07	3	8	12	23	29	36

Hydrologic Element	Area (sq mi)	Existing Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
JWT174 Diversion_OUTLET	0.00	92	200	200	200	200	200
JWT180	2.46	0	15	130	420	590	770
JWT190	0.06	4	7	12	26	35	43
JWT200	2.82	14	32	150	470	670	880
JWT210	3.09	21	50	170	510	720	950
JWT220	0.19	16	35	50	88	110	130
JWT232	3.28	27	64	180	530	750	990
JWT234	3.47	50	93	180	540	760	1,000
JWT240	3.55	26	54	86	410	670	890
JWT250	3.70	39	75	100	420	680	890
JWT260	3.84	47	92	130	420	690	910
JWT270	0.03	8	14	20	31	38	45
JWT280	0.27	33	70	100	170	210	250
JWT292	3.87	49	97	130	430	690	910
JWT294	4.13	71	140	200	440	700	930
JWT296	5.88	94	190	350	700	1,000	1,300
JWT300	0.10	12	26	36	62	76	92
JWT310	6.25	120	230	370	730	1,000	1,300
JWT320	6.46	120	250	370	740	1,000	1,300
JWT330	0.33	16	38	57	100	130	160
JWT352	9.69	160	320	520	1,000	1,400	1,900
JWT354	10.30	190	400	590	1,100	1,400	1,900
JWT360	0.07	7	15	21	37	46	55
JWT372	10.36	190	400	600	1,200	1,500	1,900
JWT374_OUTLET	10.58	190	400	600	1,200	1,500	1,900
MT010	0.29	28	58	82	140	170	210
MT020	0.09	14	29	41	70	86	100
MT030	0.16	30	59	82	130	160	190
MT040	0.31	34	70	100	170	210	250
MT050	0.12	17	33	46	76	92	110
MT060	0.19	8	21	33	62	80	99
MT070	0.20	10	23	34	61	77	93
MT080	0.06	58	86	110	140	170	190
MT090	0.04	36	54	67	94	110	120
MT100	0.06	11	22	30	49	59	70
MT110	0.12	19	36	50	81	99	120
Paint Brush Hills Pond #4	0.15	23	37	49	80	99	120
Paint Brush Hills Pond A	0.10	10	18	24	64	97	130
Paint Brush Hills Pond B1	0.36	23	46	70	120	150	170
Paint Brush Hills Pond B2	0.36	11	15	17	43	66	91
Paint Brush Hills Pond C	0.19	7	11	13	30	45	60
Regional Pond MN	1.42	40	110	260	510	640	770
Regional Pond WU Diversion	3.55	14	46	97	510	730	970
Regional Pond WU North	3.55	30	69	130	550	770	1,000
Regional Pond WU South	3.55	10	32	57	370	630	850
RET020	0.15	23	37	49	79	98	120
RET030	0.36	43	83	110	190	230	280
RET040	0.56	62	130	190	310	380	460
RET050	0.71	23	59	110	260	380	480
RET060	0.83	7	32	67	170	260	400
RET070	1.11	13	28	45	180	240	340
RET080	1.36	65	120	160	270	340	420
RET090	1.66	14	36	55	170	230	320
RET100	1.78	15	39	64	170	270	370
RET110	1.83	15	40	65	170	270	380
RET120	2.05	16	43	76	180	300	410
RET140	0.13	7	16	23	41	51	62
RET152	2.16	17	48	84	190	320	430
RET154	0.40	18	39	57	99	120	150
RET156	2.57	28	86	140	290	430	570
RET162	2.74	30	91	140	300	450	590
RET164	2.93	32	96	150	310	470	620
RMT030	0.09	14	29	41	69	85	100
RMT040	0.25	33	73	100	160	200	240
RMT050	0.56	40	120	190	320	400	470

Hydrologic Element	Area (sq mi)	Future Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
JWT190	0.06	4	7	12	26	35	43
JWT200	2.82	110	230	360	690	890	1,200
JWT210	3.09	120	250	400	760	990	1,300
JWT220	0.19	47	85	110	180	210	250
JWT232	3.28	120	260	410	790	1,000	1,400
JWT234	3.47	130	270	420	810	1,000	1,400
JWT240	3.55	83	200	380	770	940	1,100
JWT250	3.70	85	210	390	780	950	1,100
JWT260	3.84	86	210	390	790	970	1,100
JWT270	0.03	11	20	27	41	49	57
JWT280	0.27	33	70	100	170	210	250
JWT292	3.87	86	210	390	790	970	1,100
JWT294	4.13	96	210	400	800	990	1,100
JWT296	5.88	160	410	620	1,100	1,400	1,700
JWT300	0.10	12	26	36	62	76	92
JWT310	6.25	160	420	640	1,100	1,400	1,700
JWT320	6.46	160	410	630	1,100	1,400	1,700
JWT330	0.33	32	68	98	170	210	250
JWT352	9.69	210	530	820	1,400	2,000	2,400
JWT354	10.30	230	560	870	1,500	2,000	2,500
JWT360	0.07	7	15	21	37	46	55
JWT372	10.36	230	560	860	1,500	2,000	2,500
JWT374_OUTLET	10.58	230	560	860	1,500	2,000	2,500
MT010	0.29	28	58	82	140	170	210
MT020	0.09	26	47	64	100	120	140
MT030	0.16	39	73	100	160	190	230
MT040	0.31	95	160	220	330	390	460
MT050	0.12	17	33	46	76	92	110
MT060	0.19	30	59	83	140	170	200
MT070	0.20	25	50	69	110	140	170
MT080	0.06	62	92	110	150	170	190
MT090	0.04	40	59	73	100	110	130
MT100	0.06	17	30	40	63	75	88
MT110	0.12	19	36	50	81	99	120
Paint Brush Hills Pond #4	0.15	29	49	64	110	130	150
Paint Brush Hills Pond A	0.10	10	18	24	64	97	130
Paint Brush Hills Pond B1	0.36	51	100	140	190	210	270
Paint Brush Hills Pond B2	0.36	15	19	39	97	140	170
Paint Brush Hills Pond C	0.19	11	14	23	56	74	160
Regional Pond MN	1.42	86	330	490	810	980	1,200
Regional Pond WU Diversion	3.55	83	230	380	770	1,000	1,300
Regional Pond WU North	3.55	110	270	420	810	1,100	1,400
Regional Pond WU South	3.55	55	170	340	730	900	1,000
RET020	0.15	29	49	64	100	130	150
RET030	0.36	71	130	170	270	320	380
RET040	0.56	95	180	250	400	490	580
RET050	0.71	27	85	140	370	490	570
RET060	0.83	11	38	88	210	370	530
RET070	1.11	13	32	68	210	300	430
RET080	1.36	65	120	170	270	340	420
RET090	1.66	15	38	61	200	270	350
RET100	1.78	26	47	81	200	290	390
RET110	1.83	27	49	83	200	290	390
RET120	2.05	39	84	120	210	320	430
RET140	0.13	11	23	33	57	70	85
RET152	2.16	49	110	150	270	340	450
RET154	0.40	26	55	80	140	170	200
RET156	2.57	50	120	180	350	500	650
RET162	2.74	59	130	200	360	530	680
RET164	2.93	66	150	230	410	550	710
RMT030	0.09	25	47	63	100	120	140
RMT040	0.25	49	93	130	200	250	290
RMT050	0.56	110	240	330	520	620	750
RMT062	0.29	1	11	25	62	110	160
RMT064	0.67	120	270	370	590	710	850

Falcon DBPS
Peak Flow Results

Hydrologic Element	Area (sq mi)	Historical Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
RWT042	0.14	6	15	23	46	60	75
RWT044	0.14	7	18	27	51	65	80
RWT046	0.28	12	32	50	97	120	150
RWT054	0.46	18	49	77	150	190	240
RWT080	0.17	10	27	42	77	98	120
RWT092	0.85	33	87	140	260	330	410
RWT094	1.09	40	110	170	330	420	510
RWT122	1.43	48	120	200	380	500	610
RWT124	1.63	56	140	220	440	580	720
RWT150	0.13	13	28	40	70	87	110
RWT160	0.36	21	44	64	110	140	170
RWT172	1.77	58	150	230	460	600	750
RWT174	0.47	23	49	71	120	160	190
RWT176	2.24	79	200	300	580	750	930
RWT180	2.36	81	200	310	590	760	950
RWT202	2.46	80	200	310	600	770	960
RWT204	0.06	0	0	2	7	10	14
RWT210	2.82	80	200	310	610	790	990
RWT232	3.09	80	200	320	620	810	1,000
RWT234	0.19	1	7	12	28	38	49
RWT236	3.28	81	210	320	630	830	1,000
RWT240	3.47	82	210	330	640	840	1,100
RWT250	3.55	83	210	330	650	840	1,100
RWT260	3.70	84	210	330	650	850	1,100
RWT291	3.84	86	220	340	670	870	1,100
RWT292	0.03	0	2	4	8	11	15
RWT294	0.27	22	50	72	130	160	190
RWT295	3.87	86	220	340	670	870	1,100
RWT296	4.13	88	220	350	680	890	1,100
RWT312	0.10	6	14	22	39	49	60
RWT314	5.88	110	290	420	860	1,100	1,400
RWT320	6.25	110	290	430	870	1,100	1,500
RWT344	0.33	0	3	7	23	34	47
RWT352	6.46	110	290	430	870	1,100	1,500
RWT354	9.69	110	300	460	970	1,300	1,600
RWT372	10.30	110	310	470	990	1,300	1,700
RWT374	0.07	1	3	5	11	15	20
RWT376	10.36	110	310	470	990	1,300	1,700
WT010	0.14	7	18	27	51	65	80
WT020	0.07	3	8	12	23	29	36
WT030	0.08	6	14	21	38	48	59
WT040	0.19	7	18	28	53	68	83
WT050	0.19	14	32	47	83	100	130
WT060	0.20	9	21	31	55	70	85
WT070	0.17	10	27	42	77	99	120
WT080	0.07	7	16	23	41	51	62
WT090	0.15	15	33	48	83	100	130
WT100	0.19	25	55	78	130	170	200
WT110	0.19	13	30	45	79	100	120
WT120	0.05	0	1	3	8	11	15
WT130	0.10	11	25	37	64	80	97
WT140	0.13	13	28	40	70	88	110
WT150	0.23	11	24	35	61	77	93
WT160	0.11	17	36	51	86	110	130
WT170	0.12	7	18	28	52	67	82
WT180	0.10	0	1	2	6	9	12
WT190	0.06	0	0	2	7	10	14
WT200	0.30	0	1	4	12	18	25
WT210	0.27	0	2	4	11	16	21
WT220	0.19	1	7	12	28	38	49
WT230	0.20	5	18	29	60	79	99
WT240	0.08	9	20	29	52	64	78
WT250	0.15	7	22	35	68	88	110
WT260	0.14	6	13	19	33	42	51
WT270	0.03	0	2	4	8	11	15

Hydrologic Element	Area (sq mi)	Existing Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
RMT062	0.29	1	11	25	62	110	160
RMT064	0.67	50	140	230	390	490	580
RMT070	1.16	54	150	250	440	560	670
RMT080	1.36	61	180	280	500	630	760
RMT090	0.04	8	13	16	23	27	30
RMT102	1.42	40	110	260	510	640	770
RMT104	0.04	8	13	16	23	27	30
RMT106	1.46	44	110	250	520	650	780
RMT112	1.52	44	120	250	520	650	790
RMT114	1.64	46	120	260	540	670	820
RWT030	0.07	4	10	15	27	34	42
RWT042	0.14	9	20	30	54	69	85
RWT044	0.14	9	21	32	57	73	89
RWT046	0.28	15	37	57	110	140	170
RWT054	0.46	24	59	89	170	210	260
RWT080	0.17	14	33	48	87	110	130
RWT092	0.85	43	110	170	310	390	480
RWT094	1.09	54	140	210	400	500	610
RWT122	1.43	66	160	250	470	600	740
RWT124	1.63	76	180	280	540	700	850
RWT150	0.13	14	30	43	74	92	110
RWT160	0.36	11	15	17	43	66	91
RWT172	1.77	84	190	300	570	730	900
RWT174	0.47	35	62	84	130	160	180
RWT176	2.24	90	210	320	600	760	930
RWT180	2.36	0	14	130	410	580	760
RWT202	2.46	0	14	130	420	590	770
RWT204	0.06	4	7	12	26	34	43
RWT210	2.82	14	32	150	470	670	880
RWT232	3.09	20	50	170	510	720	950
RWT234	0.19	16	35	50	88	110	130
RWT236	3.28	27	64	180	530	750	990
RWT240	3.47	50	93	180	540	760	1,000
RWT240_Diversion Reach	0.00	16	23	31	38	38	39
RWT250	3.55	26	54	86	410	670	880
RWT260	3.70	38	73	100	410	670	890
RWT291	3.84	46	91	130	420	690	910
RWT292	0.03	8	14	19	31	38	45
RWT294	0.27	33	70	100	170	210	250
RWT295	3.87	49	97	130	430	690	910
RWT296	4.13	70	140	200	440	700	920
RWT312	0.10	12	25	36	61	76	91
RWT314	5.88	93	190	350	700	1,000	1,300
RWT320	6.25	120	230	360	720	1,000	1,300
RWT344	0.33	16	38	57	100	130	160
RWT352	6.46	120	240	360	730	1,000	1,300
RWT354	9.69	160	320	520	1,000	1,400	1,900
RWT372	10.30	190	400	590	1,100	1,400	1,900
RWT374	0.07	7	15	21	36	45	55
RWT376	10.36	190	400	600	1,100	1,500	1,900
The Meadows Pond #1	0.06	4	7	12	26	35	43
The Meadows Pond #2	0.29	1	11	25	62	120	160
Woodmen Hills Pond #1 North	0.71	59	130	190	320	400	480
Woodmen Hills Pond #1 South	0.71	23	59	110	260	390	480
Woodmen Hills Pond #2	0.83	7	32	67	170	260	410
Woodmen Hills Pond #3	1.11	13	28	45	180	240	340
Woodmen Hills Pond #4	1.66	14	36	55	170	230	320
Woodmen Hills Pond #5	0.04	8	13	16	23	27	30
Woodmen Hills Pond H	0.56	40	120	190	320	400	470
WT010	0.14	9	21	32	58	73	89
WT020	0.07	4	10	15	27	34	42
WT030	0.08	9	20	29	50	62	75
WT040	0.19	9	22	33	60	76	93
WT050	0.19	17	37	54	93	120	140
WT060	0.20	14	30	44	77	96	120

Hydrologic Element	Area (sq mi)	Future Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
RMT070	1.16	130	310	430	690	840	1,000
RMT080	1.36	150	350	490	800	980	1,200
RMT090	0.04	9	15	18	25	29	32
RMT102	1.42	86	320	490	800	980	1,200
RMT104	0.04	9	15	18	25	29	32
RMT106	1.46	91	320	490	810	990	1,200
RMT112	1.52	92	310	490	810	990	1,200
RMT114	1.64	94	320	500	830	1,000	1,200
RWT030	0.07	4	10	15	27	34	42
RWT042	0.14	9	20	30	54	69	85
RWT044	0.14	9	21	32	57	73	89
RWT046	0.28	15	37	57	110	140	170
RWT054	0.46	24	59	89	170	210	260
RWT080	0.17	14	33	48	87	110	130
RWT092	0.85	43	110	170	310	390	480
RWT094	1.09	54	140	210	400	500	610
RWT122	1.43	68	160	250	480	610	730
RWT124	1.63	77	170	280	530	690	840
RWT150	0.13	32	59	79	130	150	180
RWT160	0.36	15	19	39	97	140	170
RWT172	1.77	85	190	300	570	730	920
RWT174	0.47	35	63	84	130	160	180
RWT176	2.24	98	210	320	600	760	960
RWT180	2.36	100	210	330	610	780	990
RWT202	2.46	100	220	330	620	800	1,000
RWT204	0.06	4	7	12	26	34	43
RWT210	2.82	110	230	360	690	890	1,200
RWT232	3.09	120	250	400	760	990	1,300
RWT234	0.19	47	84	110	180	210	250
RWT236	3.28	120	260	410	790	1,000	1,400
RWT240	3.47	130	270	420	810	1,000	1,400
RWT240_Diversion Reach	0.00	30	37	38	38	39	39
RWT250	3.55	83	200	380	770	940	1,100
RWT260	3.70	85	210	380	780	950	1,100
RWT291	3.84	86	210	390	790	970	1,100
RWT292	0.03	11	20	26	41	49	57
RWT294	0.27	33	70	100	170	210	250
RWT295	3.87	86	210	390	790	970	1,100
RWT296	4.13	94	210	400	800	990	1,100
RWT312	0.10	12	25	36	61	76	91
RWT314	5.88	160	400	620	1,100	1,400	1,700
RWT320	6.25	160	400	620	1,100	1,400	1,700
RWT344	0.33	32	68	97	170	210	250
RWT352	6.46	160	400	620	1,100	1,400	1,700
RWT354	9.69	210	530	820	1,400	2,000	2,400
RWT372	10.30	230	560	860	1,500	2,000	2,500
RWT374	0.07	7	15	21	36	45	55
RWT376	10.36	230	550	850	1,500	2,000	2,500
The Meadows Pond #1	0.06	4	7	12	26	35	43
The Meadows Pond #2	0.29	1	11	25	62	120	160
Woodmen Hills Pond #1 North	0.71	88	180	260	420	500	570
Woodmen Hills Pond #1 South	0.71	27	85	140	380	500	570
Woodmen Hills Pond #2	0.83	11	38	88	210	380	530
Woodmen Hills Pond #3	1.11	13	32	68	210	300	430
Woodmen Hills Pond #4	1.66	15	38	61	200	270	350
Woodmen Hills Pond #5	0.04	9	15	18	25	29	32
Woodmen Hills Pond H	0.56	110	240	330	520	620	750
WT010	0.14	9	21	32	58	73	89
WT020	0.07	4	10	15	27	34	42
WT030	0.08	9	20	29	50	62	75
WT040	0.19	9	22	33	60	76	93
WT050	0.19	17	37	54	93	120	140
WT060	0.20	14	30	44	77	96	120
WT070	0.17	14	33	49	87	110	130
WT080	0.07	9	19	27	45	56	67

Falcon DBPS
Peak Flow Results

Hydrologic Element	Area (sq mi)	Historical Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
WT280	0.27	22	50	72	130	160	190
WT290	0.10	3	11	19	38	50	62
WT300	0.10	6	14	22	39	50	61
WT310	0.28	2	8	16	37	51	67
WT320	0.21	0	2	6	17	26	35
WT330	0.33	0	3	7	23	34	47
WT340	0.28	0	3	6	17	25	34
WT350	0.30	3	12	21	45	61	78
WT360	0.07	1	3	5	11	15	20
WT370	0.21	0	2	5	16	24	33

Sig Figs (<10cfs) 1
Sig Figs (>10cfs) 2

Hydrologic Element	Area (sq mi)	Existing Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
WT070	0.17	14	33	49	87	110	130
WT080	0.07	9	19	27	45	56	67
WT090	0.15	17	36	51	88	110	130
WT100	0.19	28	59	83	140	170	210
WT110	0.19	15	33	48	84	110	130
WT120	0.03	2	6	10	19	23	31
WT130	0.10	35	61	81	120	150	170
WT140	0.13	14	30	43	74	92	110
WT150	0.23	20	40	56	95	120	140
WT160	0.11	35	64	85	130	160	180
WT170	0.12	10	23	35	62	79	96
WT180	0.10	0	1	3	7	11	15
WT190	0.06	11	23	31	51	63	75
WT200	0.30	10	25	37	69	87	110
WT210	0.27	7	18	27	51	65	80
WT220	0.19	16	35	50	88	110	130
WT230	0.20	50	92	120	200	240	280
WT240	0.08	28	49	65	100	120	140
WT250	0.15	39	72	98	160	190	220
WT260	0.14	10	21	30	52	64	78
WT270	0.03	8	14	20	31	38	45
WT280	0.27	33	70	100	170	210	250
WT290	0.10	15	31	44	75	92	110
WT300	0.10	12	26	36	62	76	92
WT310	0.28	20	47	68	120	150	180
WT320	0.21	18	40	58	100	130	150
WT330	0.33	16	38	57	100	130	160
WT340	0.28	19	40	57	98	120	150
WT350	0.30	26	55	80	140	170	210
WT360	0.07	7	15	21	37	46	55
WT370	0.21	1	7	14	35	49	64

Hydrologic Element	Area (sq mi)	Future Peak Flows (cfs)					
		2-year	5-year	10-year	25-year	50-year	100-year
WT090	0.15	22	46	65	110	140	160
WT100	0.19	56	100	140	210	260	300
WT110	0.19	22	47	67	110	140	170
WT120	0.03	8	16	22	37	46	55
WT130	0.10	35	61	81	120	150	170
WT140	0.13	32	59	80	130	150	180
WT150	0.23	49	86	110	180	210	250
WT160	0.11	35	64	85	130	160	180
WT170	0.12	21	43	60	99	120	140
WT180	0.10	8	17	25	43	54	66
WT190	0.06	11	23	31	51	63	75
WT200	0.30	25	52	74	130	160	190
WT210	0.27	32	60	81	130	160	190
WT220	0.19	47	85	110	180	210	250
WT230	0.20	71	120	160	250	300	350
WT240	0.08	36	61	79	120	140	160
WT250	0.15	63	110	140	210	250	290
WT260	0.14	10	21	30	52	64	78
WT270	0.03	11	20	27	41	49	57
WT280	0.27	33	70	100	170	210	250
WT290	0.10	15	31	44	75	92	110
WT300	0.10	12	26	36	62	76	92
WT310	0.28	31	67	96	170	210	250
WT320	0.21	27	56	80	140	170	200
WT330	0.33	32	68	98	170	210	250
WT340	0.28	19	40	57	98	120	150
WT350	0.30	38	79	110	190	230	280
WT360	0.07	7	15	21	37	46	55
WT370	0.21	7	23	38	76	99	120

Falcon DBPS

Peak Flow Volume Results

Hydrologic Element	Area (sq mi)	Historical Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
ET010	0.15	2	3	5	8	9	11
ET020	0.21	3	5	7	11	14	17
ET030	0.20	0	1	2	3	5	6
ET040	0.15	0	1	1	3	4	5
ET050	0.12	0	0	1	2	2	3
ET060	0.29	0	1	2	4	6	7
ET070	0.25	0	1	2	4	5	6
ET080	0.29	0	1	2	4	6	7
ET090	0.12	0	0	1	2	2	3
ET100	0.05	0	0	0	1	1	1
ET110	0.23	0	1	1	3	4	6
ET120	0.11	0	0	1	2	2	3
ET130	0.13	0	0	1	2	3	3
ET140	0.27	0	1	2	4	5	7
ET150	0.18	0	1	1	3	3	4
ET160	0.19	0	1	2	3	5	6
FS010	0.12	0	1	1	3	3	4
JET010	0.15	2	3	5	8	9	11
JET020	0.36	4	8	12	19	23	28
JET030	0.56	4	9	13	22	28	33
JET040	0.71	5	10	14	25	31	38
JET050	0.83	5	10	15	26	33	41
JET060	1.11	5	11	17	30	39	48
JET070	1.36	5	12	18	34	44	54
JET080	1.66	5	13	19	37	49	60
JET090	1.78	5	13	20	39	51	63
JET100	1.83	5	13	20	40	52	64
JET110	2.05	5	14	22	43	56	70
JET120	2.16	5	14	22	44	58	73
JET130	0.13	0	0	1	2	3	3
JET140	0.40	0	1	2	5	8	10
JET152	2.57	5	15	24	50	65	82
JET154	2.74	5	16	25	52	69	86
JET160	2.93	5	16	27	55	73	92
JFS010_OUTLET	0.12	0	1	1	3	3	4
JMT010	0.29	1	2	3	7	9	11
JMT020	0.09	1	2	2	4	5	6
JMT030	0.25	2	4	6	10	13	15
JMT040	0.56	4	9	13	22	28	34
JMT050	0.67	4	9	14	24	30	37
JMT060	1.16	5	12	18	33	42	52
JMT070	1.36	5	13	19	37	47	58
JMT080	1.42	5	13	20	38	49	61
JMT090	0.04	0	0	0	1	1	1
JMT102	1.46	5	13	21	39	50	62
JMT104	0.04	0	0	0	1	1	1
JMT106	1.52	5	14	21	40	51	63
JMT110	1.64	5	14	22	41	53	66
JWT010	0.14	1	2	3	6	7	9
JWT020	0.07	1	1	2	3	4	4
JWT030	0.14	1	3	4	6	8	9
JWT042	0.28	2	5	7	12	15	18
JWT044	0.46	4	8	11	20	25	30
JWT050	0.85	8	16	23	39	48	58
JWT070	0.17	1	3	4	7	9	11
JWT080	1.09	10	21	29	50	61	74
JWT090	1.43	14	29	40	68	84	100
JWT110	1.63	16	33	46	77	96	110
JWT120	1.77	17	35	50	83	100	120
JWT140	0.13	2	3	4	7	8	10
JWT150	0.36	4	8	12	19	23	28
JWT160	0.47	6	11	15	25	30	36
JWT172	2.24	23	46	64	110	130	160
JWT174	2.36	24	48	67	110	140	170
JWT180	2.46	24	48	67	110	140	170

Hydrologic Element	Area (sq mi)	Existing Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
ET010	0.15	3	5	7	11	13	15
ET020	0.21	4	7	10	15	18	21
ET030	0.20	5	8	11	16	19	22
ET040	0.15	3	5	7	11	13	15
ET050	0.12	2	4	5	8	10	12
ET060	0.29	6	10	14	21	25	29
ET070	0.25	6	10	13	20	24	27
ET080	0.29	8	14	18	27	31	36
ET090	0.12	2	3	4	7	8	10
ET100	0.05	0	0	1	1	2	2
ET110	0.23	2	3	5	9	11	13
ET120	0.11	1	2	3	6	7	8
ET130	0.13	2	3	4	7	9	10
ET140	0.27	3	6	9	14	17	21
ET150	0.18	2	4	6	10	12	14
ET160	0.19	3	5	7	11	14	16
FS010	0.12	1	1	2	4	5	6
JET010	0.15	3	5	7	11	13	15
JET020	0.36	7	12	16	26	31	36
JET030	0.56	12	20	27	42	50	58
JET040	0.71	13	24	32	50	60	70
JET050	0.83	8	19	28	49	61	73
JET060	1.11	12	27	40	67	83	99
JET070	1.36	18	37	52	87	110	130
JET080	1.66	16	40	58	100	120	150
JET090	1.78	17	42	62	110	130	160
JET100	1.83	17	43	63	110	130	160
JET110	2.05	19	46	67	120	140	170
JET120	2.16	20	48	70	120	150	180
JET130	0.13	2	3	4	7	9	10
JET140	0.40	5	9	13	21	26	31
JET152	2.57	24	57	83	140	170	210
JET154	2.74	27	61	89	150	190	220
JET160	2.93	29	65	95	160	200	240
JFS010_OUTLET	0.12	1	1	2	4	5	6
JMT010	0.29	1	5	7	14	18	22
JMT020	0.09	1	2	3	5	6	7
JMT030	0.25	4	7	10	15	18	22
JMT040	0.56	8	15	21	34	41	48
JMT050	0.67	10	19	26	42	50	59
JMT060	1.16	13	27	38	63	78	92
JMT070	1.36	15	31	43	73	89	110
JMT080	1.42	16	34	47	78	96	110
JMT090	0.04	2	3	4	5	6	7
JMT102	1.46	18	36	50	83	100	120
JMT104	0.04	2	3	4	5	6	7
JMT106	1.52	19	38	53	87	110	130
JMT110	1.64	21	41	58	94	120	140
JWT010	0.14	1	3	4	6	8	9
JWT020	0.07	1	1	2	3	4	5
JWT030	0.14	2	3	4	7	9	10
JWT042	0.28	3	6	8	13	16	20
JWT044	0.46	5	9	13	22	27	32
JWT050	0.85	9	18	26	43	53	63
JWT070	0.17	2	3	5	8	10	12
JWT080	1.09	12	24	33	55	67	80
JWT090	1.43	16	32	44	73	90	110
JWT110	1.63	19	36	51	84	100	120
JWT120	1.77	21	41	57	94	110	140
JWT140	0.13	2	3	4	7	9	10
JWT150	0.36	5	10	13	21	26	31
JWT160	0.47	7	13	18	29	35	41
JWT172	2.24	28	54	75	120	150	180
JWT174	2.36	30	57	78	130	160	190
JWT174 Diversion	2.36	0	0	6	28	45	64

Hydrologic Element	Area (sq mi)	Future Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
ET010	0.15	4	6	8	12	14	16
ET020	0.21	5	9	12	18	21	25
ET030	0.20	5	8	11	17	20	23
ET040	0.15	3	5	7	11	13	15
ET050	0.12	2	4	5	8	10	12
ET060	0.29	6	10	14	21	25	29
ET070	0.25	6	10	13	20	24	27
ET080	0.29	9	14	18	27	32	37
ET090	0.12	3	6	7	11	13	15
ET100	0.05	1	1	2	3	3	4
ET110	0.23	3	5	7	12	15	18
ET120	0.11	1	3	4	6	7	9
ET130	0.13	2	4	5	8	10	11
ET140	0.27	4	7	10	15	19	22
ET150	0.18	2	4	6	10	12	14
ET160	0.19	3	5	7	11	14	16
FS010	0.12	1	2	3	5	6	8
JET010	0.15	4	6	8	12	14	16
JET020	0.36	9	15	20	30	35	41
JET030	0.56	14	23	31	46	55	64
JET040	0.71	15	27	35	55	65	76
JET050	0.83	10	22	32	54	66	78
JET060	1.11	14	30	43	72	88	100
JET070	1.36	19	40	56	92	110	130
JET080	1.66	18	43	62	110	130	150
JET090	1.78	21	48	69	120	140	170
JET100	1.83	22	50	71	120	140	170
JET110	2.05	24	55	78	130	160	190
JET120	2.16	25	57	81	140	170	200
JET130	0.13	2	4	5	8	10	11
JET140	0.40	6	10	14	23	28	33
JET152	2.57	31	67	95	160	190	230
JET154	2.74	33	71	100	170	210	240
JET160	2.93	35	76	110	180	220	260
JFS010_OUTLET	0.12	1	2	3	5	6	8
JMT010	0.29	1	5	7	14	18	22
JMT020	0.09	2	3	4	6	8	9
JMT030	0.25	5	8	11	17	21	24
JMT040	0.56	13	23	29	45	53	62
JMT050	0.67	15	26	35	53	63	73
JMT060	1.16	19	37	50	79	96	110
JMT070	1.36	23	43	58	93	110	130
JMT080	1.42	25	46	62	98	120	140
JMT090	0.04	2	3	4	5	6	7
JMT102	1.46	27	49	65	100	120	150
JMT104	0.04	2	3	4	5	6	7
JMT106	1.52	28	51	68	110	130	150
JMT110	1.64	30	54	73	110	140	160
JWT010	0.14	1	3	4	6	8	9
JWT020	0.07	1	1	2	3	4	5
JWT030	0.14	2	3	4	7	9	10
JWT042	0.28	3	6	8	13	16	20
JWT044	0.46	5	9	13	22	27	32
JWT050	0.85	9	18	26	43	53	63
JWT070	0.17	2	3	5	8	10	12
JWT080	1.09	12	24	33	55	67	80
JWT090	1.43	18	34	47	77	94	110
JWT110	1.63	20	39	54	88	110	130
JWT120	1.77	23	44	61	99	120	140
JWT140	0.13	3	5	6	10	12	14
JWT150	0.36	9	15	20	30	35	41
JWT160	0.47	11	19	25	37	44	51
JWT172	2.24	34	63	85	140	160	190
JWT174	2.36	36	66	90	140	170	200
JWT180	2.46	37	68	93	150	180	210

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Peak Flow Volume Results

Hydrologic Element	Area (sq mi)	Historical Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
JWT190	0.06	0	0	0	1	1	1
JWT200	2.82	24	49	69	120	150	180
JWT210	3.09	24	49	71	120	150	180
JWT220	0.19	1	2	3	5	6	8
JWT232	3.28	24	51	73	130	160	190
JWT234	3.47	25	53	77	130	170	200
JWT240	3.55	26	55	79	140	170	210
JWT250	3.70	27	57	82	140	180	210
JWT260	3.84	28	59	85	150	190	220
JWT270	0.03	0	0	0	1	1	1
JWT280	0.27	3	6	9	14	17	21
JWT292	3.87	28	60	86	150	190	220
JWT294	4.13	31	66	94	160	200	250
JWT296	5.88	37	80	120	210	260	320
JWT300	0.10	1	2	3	5	6	7
JWT310	6.25	38	84	120	220	270	330
JWT320	6.46	38	85	120	220	280	340
JWT330	0.33	0	1	2	5	7	9
JWT352	9.69	44	100	150	280	360	440
JWT354	10.30	45	110	160	290	370	460
JWT360	0.07	0	1	1	2	2	3
JWT372	10.36	45	110	160	290	380	460
JWT374_OUTLET	10.58	45	110	160	300	380	470
MT010	0.29	1	2	3	7	9	11
MT020	0.09	1	2	2	4	5	6
MT030	0.16	1	2	3	6	8	9
MT040	0.31	2	5	7	12	16	19
MT050	0.12	0	0	1	2	2	3
MT060	0.19	0	1	1	3	4	5
MT070	0.20	0	1	2	4	5	6
MT080	0.06	0	1	1	2	2	3
MT090	0.04	0	0	0	1	1	1
MT100	0.06	0	0	0	1	1	1
MT110	0.12	0	0	1	2	2	3
RET020	0.15	2	3	5	8	9	11
RET030	0.36	4	8	11	19	23	27
RET040	0.56	4	9	13	22	28	33
RET050	0.71	5	10	14	25	31	38
RET060	0.83	5	10	15	26	33	41
RET070	1.11	5	11	16	30	39	48
RET080	1.36	5	12	18	33	43	53
RET090	1.66	5	13	19	37	49	60
RET100	1.78	5	13	20	39	51	63
RET110	1.83	5	13	20	40	52	64
RET120	2.05	5	14	22	43	56	70
RET140	0.13	0	0	1	2	3	3
RET152	2.16	5	14	22	44	58	72
RET154	0.40	0	1	2	5	7	10
RET156	2.57	5	15	24	49	65	82
RET162	2.74	5	15	25	52	68	86
RET164	2.93	5	16	27	55	72	92
RMT030	0.09	1	2	2	4	5	6
RMT040	0.25	2	4	6	10	13	15
RMT050	0.56	4	9	13	22	28	34
RMT062	0.29	1	2	3	6	8	11
RMT064	0.67	4	9	14	24	30	37
RMT070	1.16	5	12	18	33	42	52
RMT080	1.36	5	13	19	37	47	58
RMT090	0.04	0	0	0	1	1	1
RMT102	1.42	5	13	20	38	49	61
RMT104	0.04	0	0	0	1	1	1
RMT106	1.46	5	13	21	39	50	62
RMT112	1.52	5	13	21	40	51	63
RMT114	1.64	5	14	21	41	53	66
RWT030	0.07	1	1	2	3	4	4

Hydrologic Element	Area (sq mi)	Existing Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
JWT174 Diversion_OUTLET	0.00	30	56	72	100	110	120
JWT180	2.46	0	1	7	29	47	67
JWT190	0.06	1	2	2	3	4	5
JWT200	2.82	4	8	17	46	68	92
JWT210	3.09	6	12	23	57	82	110
JWT220	0.19	2	4	6	10	12	15
JWT232	3.28	8	17	29	67	94	120
JWT234	3.47	12	24	39	82	110	140
JWT240	3.55	14	26	42	87	120	150
JWT250	3.70	16	31	48	97	130	160
JWT260	3.84	18	35	53	110	140	180
JWT270	0.03	1	1	1	2	3	3
JWT280	0.27	4	7	10	15	19	22
JWT292	3.87	19	36	55	110	140	180
JWT294	4.13	22	43	64	120	160	200
JWT296	5.88	44	86	120	220	280	350
JWT300	0.10	1	3	4	6	7	8
JWT310	6.25	49	95	140	240	310	370
JWT320	6.46	51	99	140	250	320	390
JWT330	0.33	3	6	9	15	19	23
JWT352	9.69	83	170	250	430	540	650
JWT354	10.30	90	180	270	460	580	700
JWT360	0.07	1	2	2	4	5	5
JWT372	10.36	90	190	270	460	580	700
JWT374_OUTLET	10.58	90	190	270	470	580	710
MT010	0.29	4	8	11	18	21	25
MT020	0.09	1	2	3	5	6	7
MT030	0.16	3	5	6	10	12	15
MT040	0.31	5	9	12	19	23	27
MT050	0.12	2	4	5	8	10	11
MT060	0.19	1	3	5	8	10	12
MT070	0.20	2	4	6	10	12	14
MT080	0.06	3	5	6	8	10	11
MT090	0.04	2	3	4	5	6	7
MT100	0.06	1	2	2	4	5	5
MT110	0.12	2	4	5	8	10	12
Paint Brush Hills Pond #4	0.15	3	5	7	11	13	15
Paint Brush Hills Pond A	0.10	2	4	5	8	10	11
Paint Brush Hills Pond B1	0.36	5	10	13	22	26	31
Paint Brush Hills Pond B2	0.36	5	10	13	21	26	31
Paint Brush Hills Pond C	0.19	2	5	6	10	13	15
Regional Pond MN	1.42	16	34	47	78	96	110
Regional Pond WU Diversion	3.55	6	14	25	65	93	120
Regional Pond WU North	3.55	14	27	42	88	120	150
Regional Pond WU South	3.55	5	14	25	64	92	120
RET020	0.15	3	5	7	11	13	15
RET030	0.36	7	12	16	26	31	36
RET040	0.56	12	20	27	41	50	58
RET050	0.71	13	24	32	50	60	70
RET060	0.83	8	19	28	49	60	72
RET070	1.11	12	27	39	67	83	98
RET080	1.36	17	36	51	85	100	120
RET090	1.66	16	39	58	100	120	150
RET100	1.78	17	42	62	110	130	160
RET110	1.83	17	42	62	110	130	160
RET120	2.05	19	45	67	120	140	170
RET140	0.13	2	3	4	7	9	10
RET152	2.16	20	48	70	120	150	180
RET154	0.40	5	9	13	21	26	31
RET156	2.57	24	57	83	140	170	210
RET162	2.74	26	60	88	150	190	220
RET164	2.93	29	65	94	160	200	240
RMT030	0.09	1	2	3	5	6	7
RMT040	0.25	4	7	10	15	18	22
RMT050	0.56	8	15	21	34	41	48

Hydrologic Element	Area (sq mi)	Future Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
JWT190	0.06	1	2	2	3	4	5
JWT200	2.82	42	78	110	170	210	240
JWT210	3.09	47	87	120	190	230	270
JWT220	0.19	5	8	10	16	18	21
JWT232	3.28	52	95	130	200	250	290
JWT234	3.47	57	100	140	220	270	310
JWT240	3.55	57	100	140	220	270	320
JWT250	3.70	61	110	150	240	280	330
JWT260	3.84	63	110	150	240	290	340
JWT270	0.03	1	1	2	3	3	4
JWT280	0.27	4	7	10	15	19	22
JWT292	3.87	63	110	150	240	300	350
JWT294	4.13	67	120	160	260	310	370
JWT296	5.88	98	180	240	380	460	540
JWT300	0.10	1	3	4	6	7	8
JWT310	6.25	100	190	250	400	480	570
JWT320	6.46	100	190	260	410	500	580
JWT330	0.33	5	9	12	19	23	27
JWT352	9.69	140	270	380	610	740	870
JWT354	10.30	150	290	400	640	780	920
JWT360	0.07	1	2	2	4	5	5
JWT372	10.36	150	290	400	640	780	920
JWT374_OUTLET	10.58	150	290	400	650	790	930
MT010	0.29	4	8	11	18	21	25
MT020	0.09	2	3	4	6	8	9
MT030	0.16	3	5	7	11	13	15
MT040	0.31	9	15	19	28	33	38
MT050	0.12	2	4	5	8	10	11
MT060	0.19	3	6	8	13	15	18
MT070	0.20	4	6	9	14	16	19
MT080	0.06	3	5	6	9	10	11
MT090	0.04	2	3	4	6	6	7
MT100	0.06	1	2	3	4	5	6
MT110	0.12	2	4	5	8	10	12
Paint Brush Hills Pond #4	0.15	4	6	8	12	14	16
Paint Brush Hills Pond A	0.10	2	4	5	8	10	11
Paint Brush Hills Pond B1	0.36	9	15	20	30	36	41
Paint Brush Hills Pond B2	0.36	9	15	20	30	35	41
Paint Brush Hills Pond C	0.19	4	7	9	14	16	19
Regional Pond MN	1.42	25	46	62	98	120	140
Regional Pond WU Diversion	3.55	34	73	110	190	230	280
Regional Pond WU North	3.55	58	110	140	230	270	320
Regional Pond WU South	3.55	34	73	110	180	230	270
RET020	0.15	4	6	8	12	14	16
RET030	0.36	9	15	20	30	35	41
RET040	0.56	14	23	31	46	55	64
RET050	0.71	15	27	35	55	65	76
RET060	0.83	9	22	32	53	66	78
RET070	1.11	14	30	43	72	88	100
RET080	1.36	19	39	55	90	110	130
RET090	1.66	18	43	62	110	130	150
RET100	1.78	21	48	69	120	140	170
RET110	1.83	21	49	71	120	140	170
RET120	2.05	24	54	78	130	160	190
RET140	0.13	2	4	5	8	9	11
RET152	2.16	25	57	81	140	170	200
RET154	0.40	5	10	14	23	28	33
RET156	2.57	30	67	95	160	190	230
RET162	2.74	32	70	100	170	200	240
RET164	2.93	35	75	110	180	220	260
RMT030	0.09	2	3	4	6	8	9
RMT040	0.25	5	8	11	17	21	24
RMT050	0.56	13	23	29	45	53	62
RMT062	0.29	1	4	7	14	18	21
RMT064	0.67	15	26	34	53	63	73

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Peak Flow Volume Results

Hydrologic Element	Area (sq mi)	Historical Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
RWT042	0.14	1	3	4	6	8	9
RWT044	0.14	1	2	3	6	7	9
RWT046	0.28	2	5	7	12	15	18
RWT054	0.46	4	8	11	20	25	30
RWT080	0.17	1	3	4	7	9	11
RWT092	0.85	8	16	23	39	48	58
RWT094	1.09	10	21	29	49	61	74
RWT122	1.43	14	29	40	68	83	100
RWT124	1.63	16	33	46	77	95	110
RWT150	0.13	2	3	4	7	8	10
RWT160	0.36	4	8	12	19	23	28
RWT172	1.77	17	35	49	83	100	120
RWT174	0.47	6	11	15	25	30	36
RWT176	2.24	23	46	64	110	130	160
RWT180	2.36	24	48	67	110	140	170
RWT202	2.46	23	48	67	110	140	170
RWT204	0.06	0	0	0	1	1	1
RWT210	2.82	24	49	69	120	150	180
RWT232	3.09	24	49	71	120	150	180
RWT234	0.19	1	2	3	5	6	8
RWT236	3.28	24	51	73	130	160	190
RWT240	3.47	25	53	77	130	170	200
RWT250	3.55	26	55	79	140	170	210
RWT260	3.70	27	56	81	140	180	210
RWT291	3.84	28	59	85	150	180	220
RWT292	0.03	0	0	0	1	1	1
RWT294	0.27	3	6	9	14	17	21
RWT295	3.87	28	59	86	150	190	220
RWT296	4.13	31	65	94	160	200	250
RWT312	0.10	1	2	3	5	6	7
RWT314	5.88	37	80	120	210	260	320
RWT320	6.25	38	84	120	220	270	330
RWT344	0.33	0	1	2	5	7	9
RWT352	6.46	38	84	120	220	280	340
RWT354	9.69	44	100	150	280	360	440
RWT372	10.30	45	110	160	290	370	460
RWT374	0.07	0	1	1	2	2	3
RWT376	10.36	44	110	160	290	370	460
WT010	0.14	1	2	3	6	7	9
WT020	0.07	1	1	2	3	4	4
WT030	0.08	1	1	2	3	4	5
WT040	0.19	2	3	5	8	10	12
WT050	0.19	2	4	6	10	12	14
WT060	0.20	2	4	6	10	12	14
WT070	0.17	1	3	4	7	9	11
WT080	0.07	1	2	2	4	4	5
WT090	0.15	2	4	5	8	10	12
WT100	0.19	2	4	6	10	12	15
WT110	0.19	2	4	6	10	12	15
WT120	0.05	0	0	0	1	1	2
WT130	0.10	1	2	3	5	6	8
WT140	0.13	2	3	4	7	8	10
WT150	0.23	3	5	7	12	15	18
WT160	0.11	1	3	3	6	7	8
WT170	0.12	1	2	3	5	6	7
WT180	0.10	0	0	1	1	2	2
WT190	0.06	0	0	0	1	1	1
WT200	0.30	0	1	2	4	6	7
WT210	0.27	0	1	2	4	5	7
WT220	0.19	1	2	3	5	6	8
WT230	0.20	1	2	4	7	8	10
WT240	0.08	1	2	2	4	4	5
WT250	0.15	1	2	3	5	7	8
WT260	0.14	1	3	4	7	8	10
WT270	0.03	0	0	0	1	1	1

Hydrologic Element	Area (sq mi)	Existing Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
RMT062	0.29	1	4	7	14	18	21
RMT064	0.67	10	19	26	42	50	59
RMT070	1.16	12	27	38	63	78	92
RMT080	1.36	15	31	43	73	89	110
RMT090	0.04	2	3	4	5	6	7
RMT102	1.42	16	33	47	78	95	110
RMT104	0.04	2	3	4	5	6	7
RMT106	1.46	18	36	50	83	100	120
RMT112	1.52	19	38	52	86	110	130
RMT114	1.64	21	41	57	94	120	140
RWT030	0.07	1	1	2	3	4	5
RWT042	0.14	2	3	4	7	9	10
RWT044	0.14	1	3	4	6	8	9
RWT046	0.28	3	6	8	13	16	20
RWT054	0.46	5	9	13	22	27	32
RWT080	0.17	2	3	5	8	10	12
RWT092	0.85	9	18	26	43	53	63
RWT094	1.09	12	23	33	55	67	80
RWT122	1.43	16	32	44	73	90	110
RWT124	1.63	18	36	50	84	100	120
RWT150	0.13	2	3	4	7	9	10
RWT160	0.36	5	10	13	21	26	30
RWT172	1.77	21	41	57	93	110	140
RWT174	0.47	7	13	18	29	35	41
RWT176	2.24	28	54	75	120	150	180
RWT180	2.36	0	0	6	28	45	64
RWT202	2.46	0	1	7	30	47	67
RWT204	0.06	1	2	2	3	4	5
RWT210	2.82	4	8	17	46	68	92
RWT232	3.09	6	12	23	57	82	110
RWT234	0.19	2	4	6	10	12	15
RWT236	3.28	8	17	29	67	94	120
RWT240	3.47	12	24	39	82	110	140
RWT240_Diversion Reach	0.00	8	13	17	23	25	27
RWT250	3.55	14	26	42	87	120	150
RWT260	3.70	16	31	48	97	130	160
RWT291	3.84	18	35	53	100	140	180
RWT292	0.03	1	1	1	2	3	3
RWT294	0.27	4	7	10	15	19	22
RWT295	3.87	19	36	54	110	140	180
RWT296	4.13	22	42	64	120	160	200
RWT312	0.10	1	3	3	6	7	8
RWT314	5.88	44	86	120	220	280	350
RWT320	6.25	48	94	140	240	310	370
RWT344	0.33	3	6	9	15	19	23
RWT352	6.46	50	99	140	250	320	390
RWT354	9.69	83	170	250	430	540	650
RWT372	10.30	89	180	270	460	580	700
RWT374	0.07	1	2	2	4	4	5
RWT376	10.36	90	190	270	460	580	700
The Meadows Pond #1	0.06	1	2	2	3	4	5
The Meadows Pond #2	0.29	1	5	7	14	18	22
Woodmen Hills Pond #1 North	0.71	15	25	34	52	63	73
Woodmen Hills Pond #1 South	0.71	13	24	32	50	60	70
Woodmen Hills Pond #2	0.83	8	19	28	49	61	73
Woodmen Hills Pond #3	1.11	12	27	40	67	83	99
Woodmen Hills Pond #4	1.66	16	40	58	100	120	150
Woodmen Hills Pond #5	0.04	2	3	4	5	6	7
Woodmen Hills Pond H	0.56	8	15	21	34	41	48
WT010	0.14	1	3	4	6	8	9
WT020	0.07	1	1	2	3	4	5
WT030	0.08	1	2	2	4	5	6
WT040	0.19	2	4	5	9	11	13
WT050	0.19	2	5	7	11	13	15
WT060	0.20	2	5	6	10	13	15

Hydrologic Element	Area (sq mi)	Future Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
RMT070	1.16	19	37	50	79	95	110
RMT080	1.36	23	43	58	93	110	130
RMT090	0.04	2	3	4	5	6	7
RMT102	1.42	24	45	61	98	120	140
RMT104	0.04	2	3	4	5	6	7
RMT106	1.46	27	49	65	100	120	150
RMT112	1.52	28	50	68	110	130	150
RMT114	1.64	30	54	73	110	140	160
RWT030	0.07	1	1	2	3	4	5
RWT042	0.14	2	3	4	7	9	10
RWT044	0.14	1	3	4	6	8	9
RWT046	0.28	3	6	8	13	16	20
RWT054	0.46	5	9	13	22	27	32
RWT080	0.17	2	3	5	8	10	12
RWT092	0.85	9	18	26	43	53	63
RWT094	1.09	12	23	33	55	67	80
RWT122	1.43	18	34	47	77	94	110
RWT124	1.63	20	39	54	88	110	130
RWT150	0.13	3	5	6	10	12	14
RWT160	0.36	9	15	20	30	35	41
RWT172	1.77	23	44	61	99	120	140
RWT174	0.47	11	19	24	37	44	51
RWT176	2.24	34	63	85	140	160	190
RWT180	2.36	36	66	89	140	170	200
RWT202	2.46	37	68	92	150	180	210
RWT204	0.06	1	2	2	3	4	5
RWT210	2.82	42	78	110	170	200	240
RWT232	3.09	47	87	120	190	230	270
RWT234	0.19	5	8	10	15	18	21
RWT236	3.28	52	95	130	200	250	290
RWT240	3.47	57	100	140	220	270	310
RWT240_Diversion Reach	0.00	24	32	35	40	42	44
RWT250	3.55	57	100	140	220	270	320
RWT260	3.70	61	110	150	230	280	330
RWT291	3.84	63	110	150	240	290	340
RWT292	0.03	1	1	2	3	3	4
RWT294	0.27	4	7	10	15	19	22
RWT295	3.87	63	110	150	240	290	350
RWT296	4.13	67	120	160	260	310	370
RWT312	0.10	1	3	3	6	7	8
RWT314	5.88	97	180	240	380	460	540
RWT320	6.25	100	190	250	400	480	570
RWT344	0.33	5	9	12	19	23	27
RWT352	6.46	100	190	260	410	500	580
RWT354	9.69	140	270	380	610	740	870
RWT372	10.30	150	290	400	640	780	920
RWT374	0.07	1	2	2	4	4	5
RWT376	10.36	150	290	400	640	780	920
The Meadows Pond #1	0.06	1	2	2	3	4	5
The Meadows Pond #2	0.29	1	5	7	14	18	22
Woodmen Hills Pond #1 North	0.71	17	29	38	57	68	79
Woodmen Hills Pond #1 South	0.71	15	27	35	55	65	76
Woodmen Hills Pond #2	0.83	10	22	32	54	66	78
Woodmen Hills Pond #3	1.11	14	30	43	72	88	100
Woodmen Hills Pond #4	1.66	18	43	62	110	130	150
Woodmen Hills Pond #5	0.04	2	3	4	5	6	7
Woodmen Hills Pond H	0.56	13	23	29	45	53	62
WT010	0.14	1	3	4	6	8	9
WT020	0.07	1	1	2	3	4	5
WT030	0.08	1	2	2	4	5	6
WT040	0.19	2	4	5	9	11	13
WT050	0.19	2	5	7	11	13	15
WT060	0.20	2	5	6	10	13	15
WT070	0.17	2	3	5	8	10	12
WT080	0.07	1	2	2	4	5	6

Falcon DBPS

Peak Flow Volume Results

Hydrologic Element	Area (sq mi)	Historical Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
WT280	0.27	3	6	9	14	17	21
WT290	0.10	1	1	2	3	4	5
WT300	0.10	1	2	3	5	6	7
WT310	0.28	1	2	3	7	9	11
WT320	0.21	0	1	2	3	5	6
WT330	0.33	0	1	2	5	7	9
WT340	0.28	0	1	2	5	7	8
WT350	0.30	1	3	4	8	11	13
WT360	0.07	0	1	1	2	2	3
WT370	0.21	0	1	1	3	4	6

Sig Figs (<10cfs) 1
Sig Figs (>10cfs) 2

Hydrologic Element	Area (sq mi)	Existing Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
WT070	0.17	2	3	5	8	10	12
WT080	0.07	1	2	2	4	5	6
WT090	0.15	2	4	5	9	10	12
WT100	0.19	2	5	6	11	13	15
WT110	0.19	2	5	6	10	13	15
WT120	0.05	0	1	1	2	2	3
WT130	0.10	2	4	5	8	10	11
WT140	0.13	2	3	4	7	9	10
WT150	0.23	4	7	9	15	18	21
WT160	0.11	2	4	5	8	9	11
WT170	0.12	1	2	3	6	7	8
WT180	0.10	0	0	1	2	2	3
WT190	0.06	1	2	2	4	4	5
WT200	0.30	3	6	8	13	17	20
WT210	0.27	2	5	6	11	14	17
WT220	0.19	2	4	6	10	12	15
WT230	0.20	4	7	10	15	18	21
WT240	0.08	2	3	4	6	7	8
WT250	0.15	3	5	6	10	12	14
WT260	0.14	2	4	5	8	10	12
WT270	0.03	1	1	1	2	3	3
WT280	0.27	4	7	10	15	19	22
WT290	0.10	1	3	4	6	7	9
WT300	0.10	1	3	4	6	7	8
WT310	0.28	3	6	9	14	17	21
WT320	0.21	3	5	7	11	13	16
WT330	0.33	3	6	9	15	19	23
WT340	0.28	4	7	10	16	20	23
WT350	0.30	4	8	10	17	21	24
WT360	0.07	1	2	2	4	5	5
WT370	0.21	1	2	2	5	6	8

Hydrologic Element	Area (sq mi)	Future Peak Flow Volume (ac ft)					
		2-year	5-year	10-year	25-year	50-year	100-year
WT090	0.15	2	4	6	9	11	13
WT100	0.19	4	7	9	14	17	19
WT110	0.19	3	5	7	11	14	16
WT120	0.05	1	1	2	3	3	4
WT130	0.10	2	4	5	8	10	11
WT140	0.13	3	5	6	10	12	14
WT150	0.23	6	10	14	20	24	28
WT160	0.11	2	4	5	8	9	11
WT170	0.12	2	3	5	7	9	11
WT180	0.10	1	2	3	5	6	8
WT190	0.06	1	2	2	4	4	5
WT200	0.30	4	8	11	18	22	26
WT210	0.27	6	10	13	20	24	28
WT220	0.19	5	8	10	16	18	21
WT230	0.20	5	9	11	17	20	23
WT240	0.08	2	3	5	7	8	9
WT250	0.15	4	6	8	13	15	17
WT260	0.14	2	4	5	8	10	12
WT270	0.03	1	1	2	3	3	4
WT280	0.27	4	7	10	15	19	22
WT290	0.10	1	3	4	6	7	9
WT300	0.10	1	3	4	6	7	8
WT310	0.28	4	7	10	15	19	22
WT320	0.21	3	5	7	12	15	17
WT330	0.33	5	9	12	19	23	27
WT340	0.28	4	7	10	16	20	23
WT350	0.30	5	8	11	18	22	26
WT360	0.07	1	2	2	4	5	5
WT370	0.21	1	3	4	7	9	12

Falcon DBPS

Peak Flows at Points of Interest

Location	HEC-HMS Element	Area	Historical Flows (cfs)				Existing Flows (cfs)				Future Flows (cfs)			
		(sq mi)	2-year	5-year	10-year	100-year	2-year	5-year	10-year	100-year	2-year	5-year	10-year	100-year
West Tributary														
Raygor Rd.	JWT030	0.14	6	15	23	75	9	20	30	85	9	20	30	85
Stapleton Rd.	JWT120	1.77	58	150	230	750	84	190	300	910	85	190	300	920
Woodmen Rd.	JWT210	3.09	80	200	320	1,000	21	50	170	950	120	250	400	1,300
HWY 24	JWT250	3.70	84	210	330	1,100	39	75	100	890	85	210	390	1,100
Falcon Hwy.	JWT260	3.84	86	220	340	1,100	47	92	130	910	86	210	390	1,100
Garrett Rd.	JWT320	6.46	110	290	430	1,500	120	250	370	1,300	160	410	630	1,700
East Blaney Rd.	JWT354	10.30	110	310	470	1,700	190	400	590	1,900	230	560	870	2,500
Upstream of Bennett Ranch Tributary	JWT374_Outlet	10.58	110	310	470	1,700	190	400	600	1,900	230	560	860	2,500
Middle Tributary														
Woodmen Hills Dr.	JMT010	0.29	1	7	13	57	1	11	25	160	1	11	25	160
Woodmen Rd.	JMT070	1.36	24	67	110	350	61	180	280	760	150	350	490	1,200
Hwy. 24	JMT106	1.52	24	68	110	360	45	120	260	800	92	320	490	1,200
Falcon Hwy.	JMT110	1.64	22	63	120	360	46	120	260	820	94	320	500	1,200
Confluence with West Tributary	RMT114	1.64	22	63	110	360	46	120	260	820	94	320	500	1,200
East Tributary														
Stapleton Dr.	JET020	0.36	20	45	67	200	44	85	120	280	74	130	170	390
Woodmen Hills Dr.	JET040	0.71	19	48	74	240	23	59	110	480	27	85	140	570
Eastonville Rd.	JET060	1.11	19	48	77	260	13	28	45	340	13	32	68	430
Hwy. 24	JET090	1.78	17	47	75	260	15	39	64	370	26	47	81	390
Pinto Pony Rd.	JET100	1.83	17	47	75	260	15	40	65	380	27	49	83	390
Falcon Hwy.	JET120	2.16	17	47	77	270	17	48	84	430	49	110	160	450
Garrett Rd.	JET160	2.93	18	48	81	300	32	96	150	620	66	150	230	710
Confluence with West Tributary	RET164	2.93	18	48	81	300	32	96	150	620	66	150	230	710

Falcon DBPS

Peak Flow Volumes at Points of Interest

Location	HEC-HMS Element	Area	Historical Flows (ac ft)				Existing Flows (ac ft)				Future Flows (ac ft)			
		(sq mi)	2-year	5-year	10-year	100-year	2-year	5-year	10-year	100-year	2-year	5-year	10-year	100-year
West Tributary														
Raygor Rd.	JWT030	0.14	1	3	4	9	2	3	4	10	2	3	4	10
Stapleton Rd.	JWT120	1.77	17	35	50	120	21	41	57	140	23	44	61	140
Woodmen Rd.	JWT210	3.09	24	49	71	180	6	12	23	110	47	87	120	270
HWY 24	JWT250	3.70	27	57	82	210	16	31	48	160	61	110	150	330
Falcon Hwy.	JWT260	3.84	28	59	85	220	18	35	53	180	63	110	150	340
Garrett Rd.	JWT320	6.46	38	85	120	340	51	99	140	390	100	190	260	580
East Blaney Rd.	JWT354	10.30	45	110	160	460	90	180	270	700	150	290	400	920
Upstream of Bennett Ranch Tributary	JWT374_Outlet	10.58	45	110	160	470	90	190	270	710	150	290	400	930
Middle Tributary														
Woodmen Hills Dr.	JMT010	0.29	1	2	3	11	1	5	7	22	1	5	7	22
Woodmen Rd.	JMT070	1.36	5	13	19	58	15	31	43	110	23	43	58	130
Hwy. 24	JMT106	1.52	5	14	21	63	19	38	53	130	28	51	68	150
Falcon Hwy.	JMT110	1.64	5	14	22	66	21	41	58	140	30	54	73	160
Confluence with West Tributary	RMT114	1.64	5	14	21	66	21	41	57	140	30	54	73	160
East Tributary														
Stapleton Dr.	JET020	0.36	4	8	12	28	7	12	16	36	9	15	20	41
Woodmen Hills Dr.	JET040	0.71	5	10	14	38	13	24	32	70	15	27	35	76
Eastonville Rd.	JET060	1.11	5	11	17	48	12	27	40	99	14	30	43	100
Hwy. 24	JET090	1.78	5	13	20	63	17	42	62	160	21	48	69	170
Pinto Pony Rd.	JET100	1.83	5	13	20	64	17	43	63	160	22	50	71	170
Falcon Hwy.	JET120	2.16	5	14	22	73	20	48	70	180	25	57	81	200
Garrett Rd.	JET160	2.93	5	16	27	92	29	65	95	240	35	76	110	260
Confluence with West Tributary	RET164	2.93	5	16	27	92	29	65	94	240	35	75	110	260

Falcon DBPS

Flood Summary for the Falcon Watershed Outlet

Annual Percent Chance Flood Event	Recurrence Interval	Peak Flow (cfs)					
		Matrix HEC-HMS[1]		URS DBPS[2]		USGS Regression Analysis[3]	CWCB Regression Analysis[4]
		Existing	Future	Existing	Future		
50%	2-year	190	230	--	--	100	--
20%	5-year	400	560	222	458	500	--
10%	10-year	600	860	--	--	900	--
4%	25-year	1,200	1,500	--	--	1,800	--
2%	50-year	1,500	2,000	--	--	2,800	--
1%	100-year	1,900	2,500	2,935	3,303	4,100	5,300

Notes:

[1] Existing and Future peak flows from the Matrix HEC-HMS model prepared as a part of the Falcon DBPS

[2] Existing and Future peak flows from the 2000 Falcon DBPS prepared by URS

[3] USGS Regression Analysis equations are from "Analysis of the Magnitude and Frequency of Floods in Colorado" Water-Resources Investigations Report 99-4190. The Plains Region covers the entire portion of the Falcon Watershed. Drainage areas for the study ranged from 5 to 1,000 mi2. $Q2=39.0(A)^{0.486}$, $Q5=195.8(A)^{0.399}$, $Q10=364.6(A)^{0.400}$, $Q25=725.3(A)^{0.395}$, $Q50=1116(A)^{0.392}$, $Q100=1640(A)^{0.388}$

[4] CWCB Regression Analysis equations are from the "Guidelines for Determining 100-Year Flood Flows for Approximated Floodplains in Colorado" by the Department of Natural Resources Colorado Water Conservation Board, June 2004. ARK-5 includes tributaries east of Monument Creek, including the Black Squirrel Creek based east of Colorado Springs, for tributaries between 4 and 75 mi2. Q=1343.4(A)0.578. Where A=Drainage Area (mi2).

Flood Summary at LOMR Locations

Annual Percent Chance Flood Event	Recurrence Interval	Peak Flow (cfs)		
		Matrix HEC-HMS[1]		LOMR
		Existing	Future	
Middle Tributary Confluence with West Tributary[1]				
50%	2-year	46	94	--
20%	5-year	120	320	--
10%	10-year	260	500	--
4%	25-year	540	830	--
2%	50-year	670	1,000	--
1%	100-year	820	1,200	675
West Tributary at Woodmen Road[2]				
50%	2-year	21	120	--
20%	5-year	50	250	--
10%	10-year	170	400	--
4%	25-year	510	760	--
2%	50-year	720	990	--
1%	100-year	950	1,300	1,482
West Tributary at HWY 24[3]				
50%	2-year	39	85	--
20%	5-year	75	210	--
10%	10-year	100	390	--
4%	25-year	420	780	--
2%	50-year	680	950	--
1%	100-year	890	1,100	1,225

Notes:

[1] FEMA LOMR 01-08-226P-080059

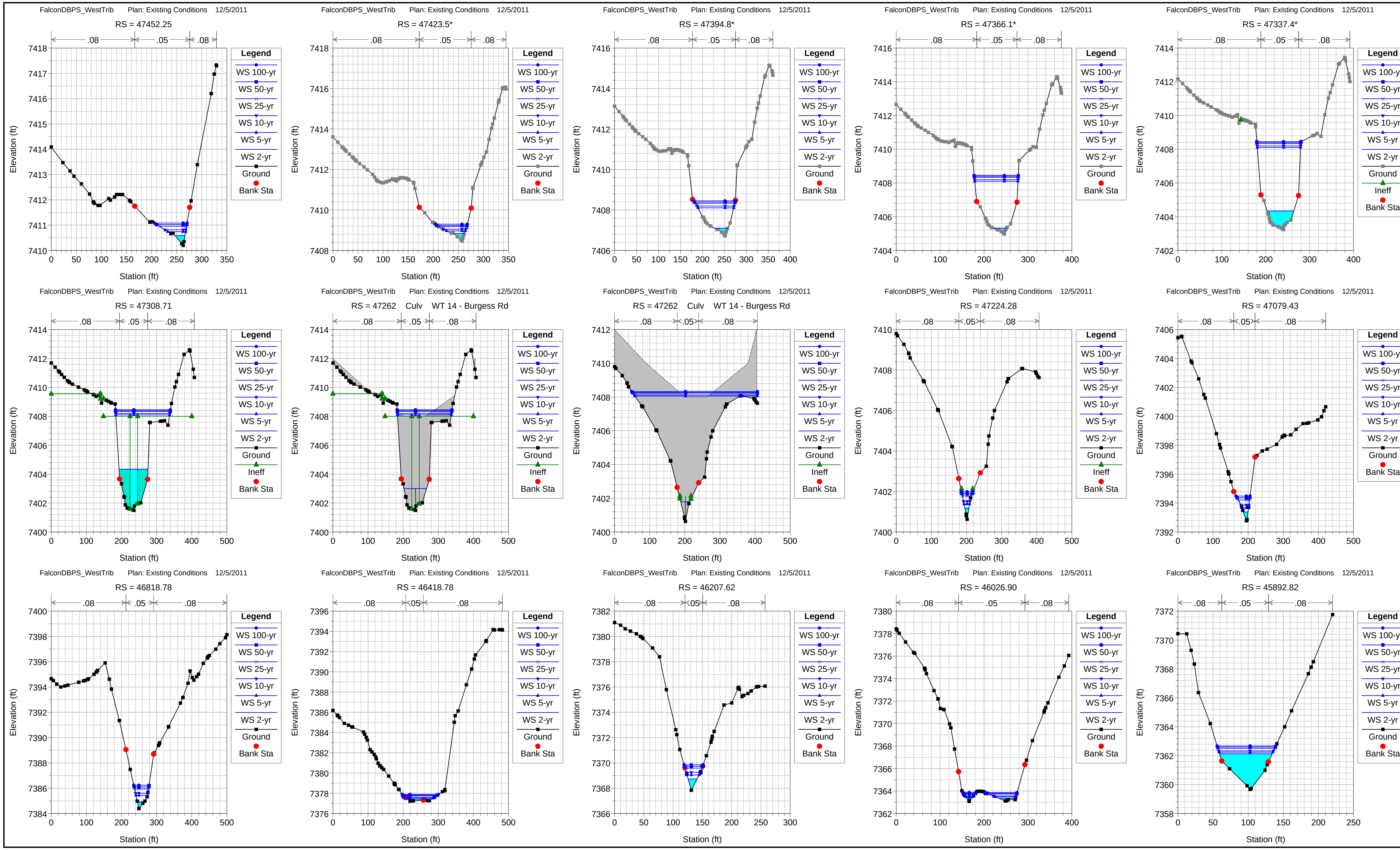
[2] FEMA LOMR 03-08-0385P-080059

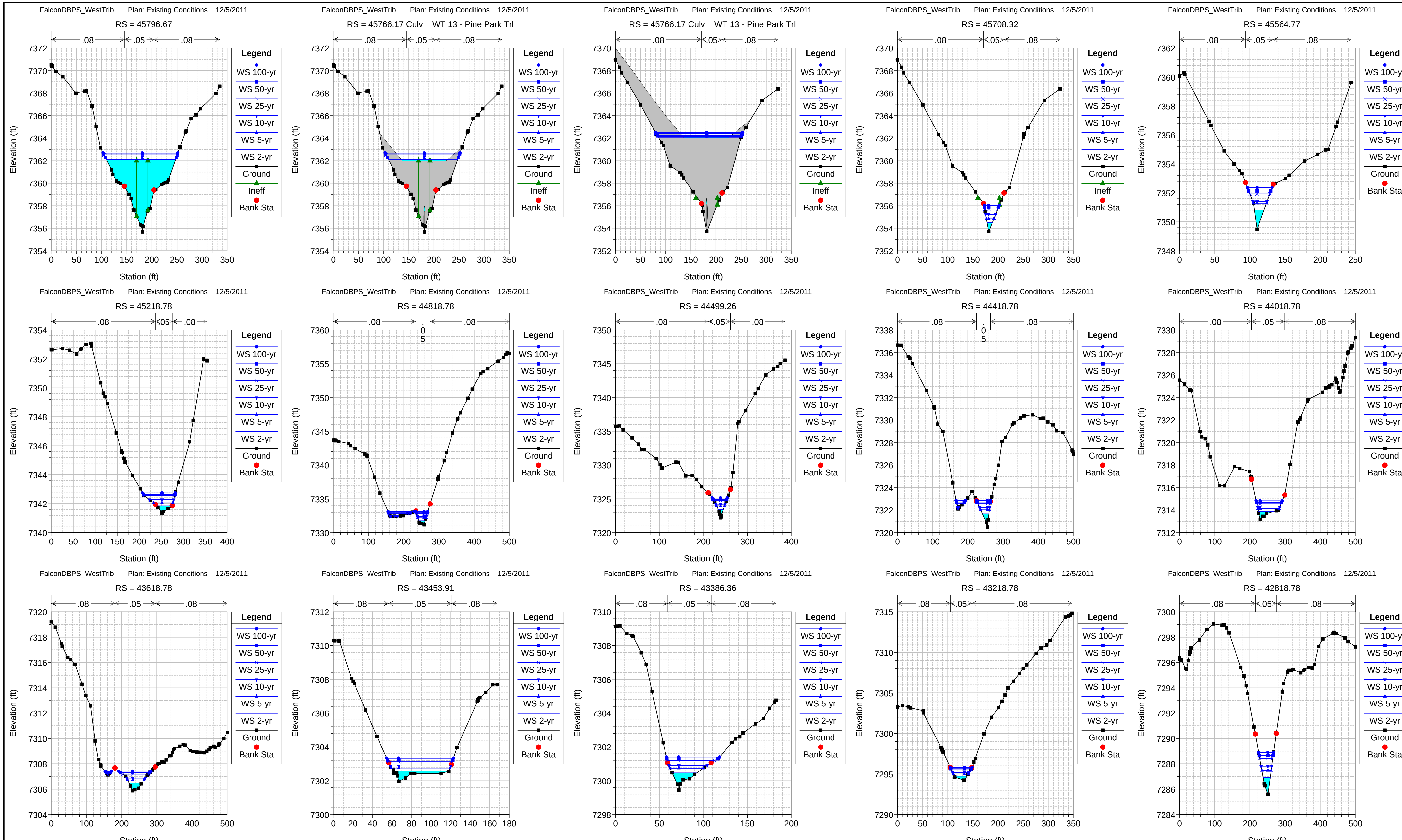
[3] FEMA LOMR 07-08-0324P-080059

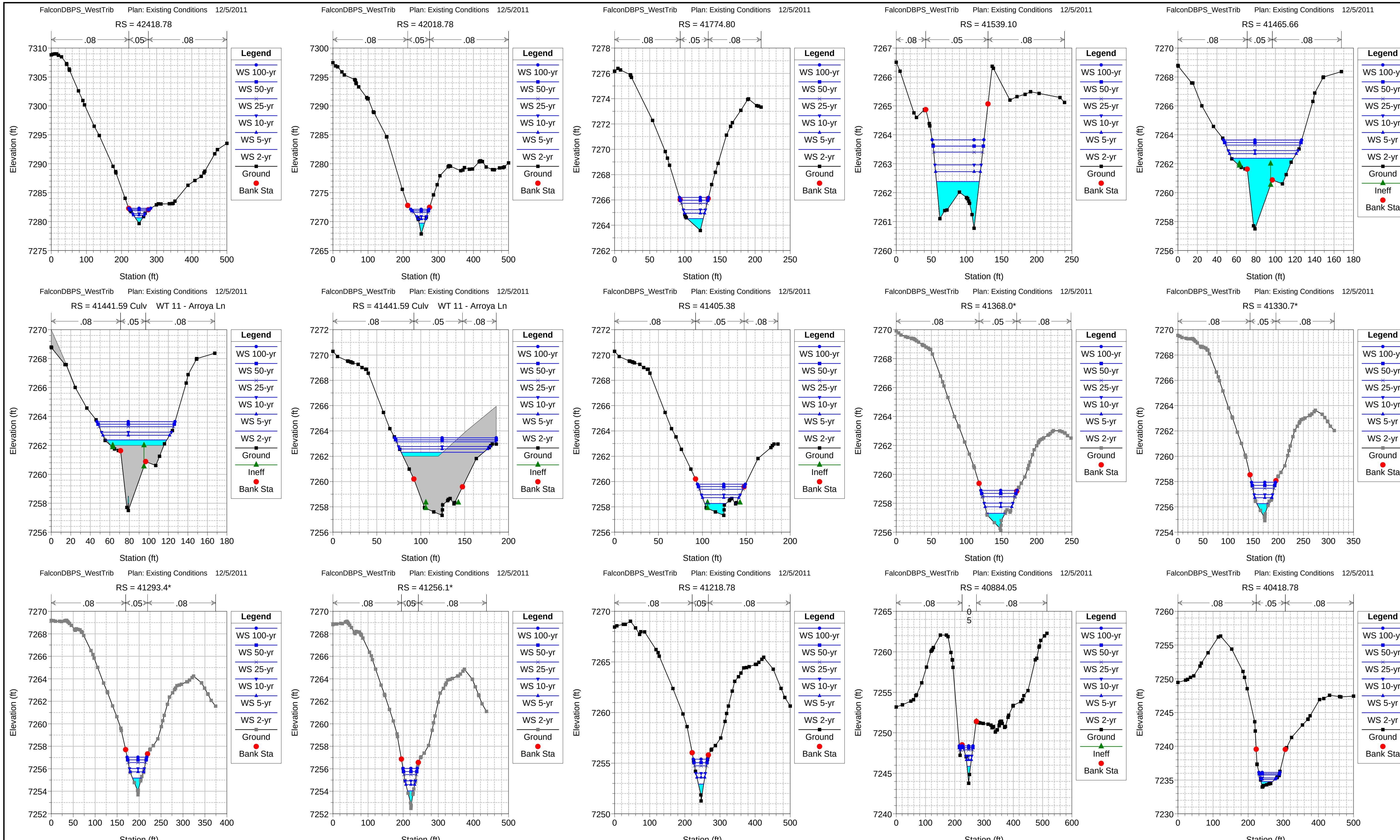
West Tributary – Existing Conditions

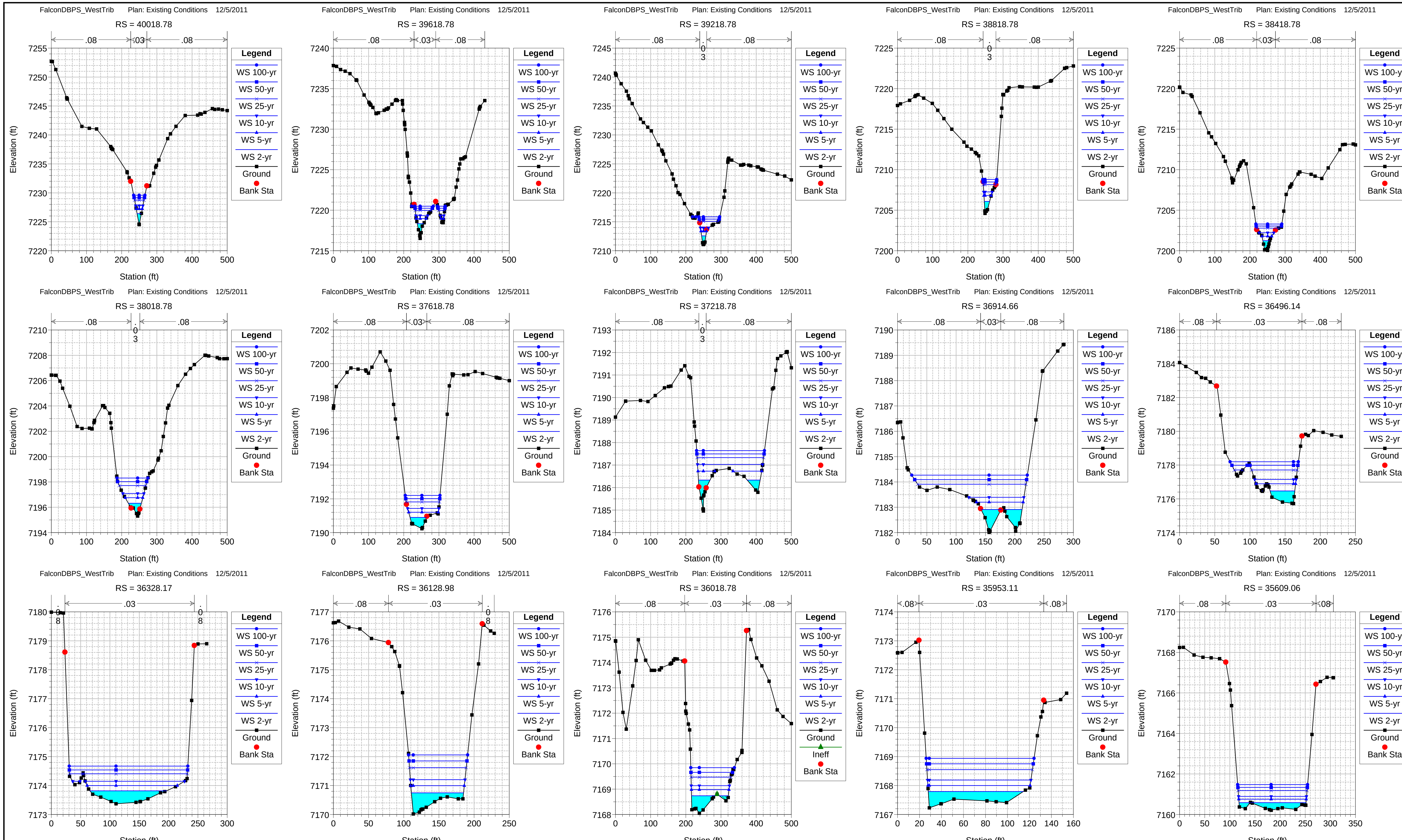
Provide an existing and proposed HEC-RAS Map showing the cross section cuts.

Contact the review engineer to discuss. Is the HEC-RAS included from the DBPS? Is there going to be a separate modeling specific to the proposed improvements?
Not clear why this is included in the report. It seems this can be removed.


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 47452.25
RS = 47423.5*
RS = 47394.8*
RS = 47366.1*
RS = 47337.4*
RS = 47308.71
RS = 47262 Culv WT 14 - Burgess Rd
RS = 47262 Culv WT 14 - Burgess Rd
RS = 47224.28
RS = 47079.43
RS = 46818.78
RS = 46418.78
RS = 46207.62
RS = 46026.90
RS = 45892.82
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
.08
.05


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 45796.67
RS = 45766.17 Culv WT 13 - Pine Park Trl
RS = 45766.17 Culv WT 13 - Pine Park Trl
RS = 45708.32
RS = 45564.77
RS = 45218.78
RS = 44818.78
RS = 44499.26
RS = 44418.78
RS = 44018.78
RS = 43618.78
RS = 43453.91
RS = 43386.36
RS = 43218.78
RS = 42818.78
.08
.05
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 42418.78
RS = 42018.78
RS = 41774.80
RS = 41539.10
RS = 41465.66
RS = 41441.59 Culv WT 11 - Arroya Ln
RS = 41441.59 Culv WT 11 - Arroya Ln
RS = 41405.38
RS = 41368.0*
RS = 41330.7*
RS = 41293.4*
RS = 41256.1*
RS = 41218.78
RS = 40884.05
RS = 40418.78
.08
.05
.08
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 40018.78
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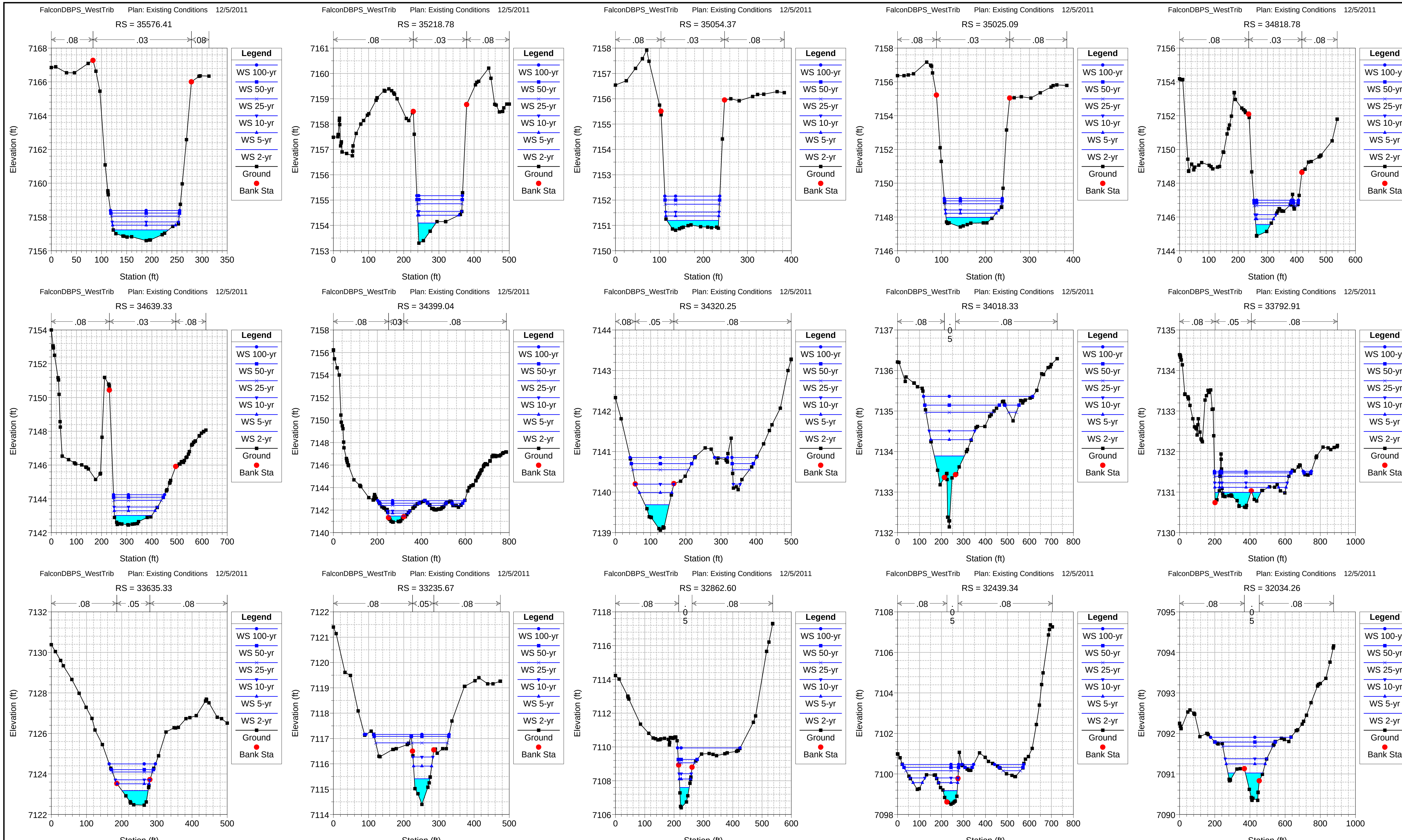
RS = 39618.78
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 39218.78
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 38818.78
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 38418.78
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 38018.78
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 37618.78
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 37218.78
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 36914.66
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 36496.14
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 36328.17
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 36128.98
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 36018.78
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 35953.11
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 35609.06
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)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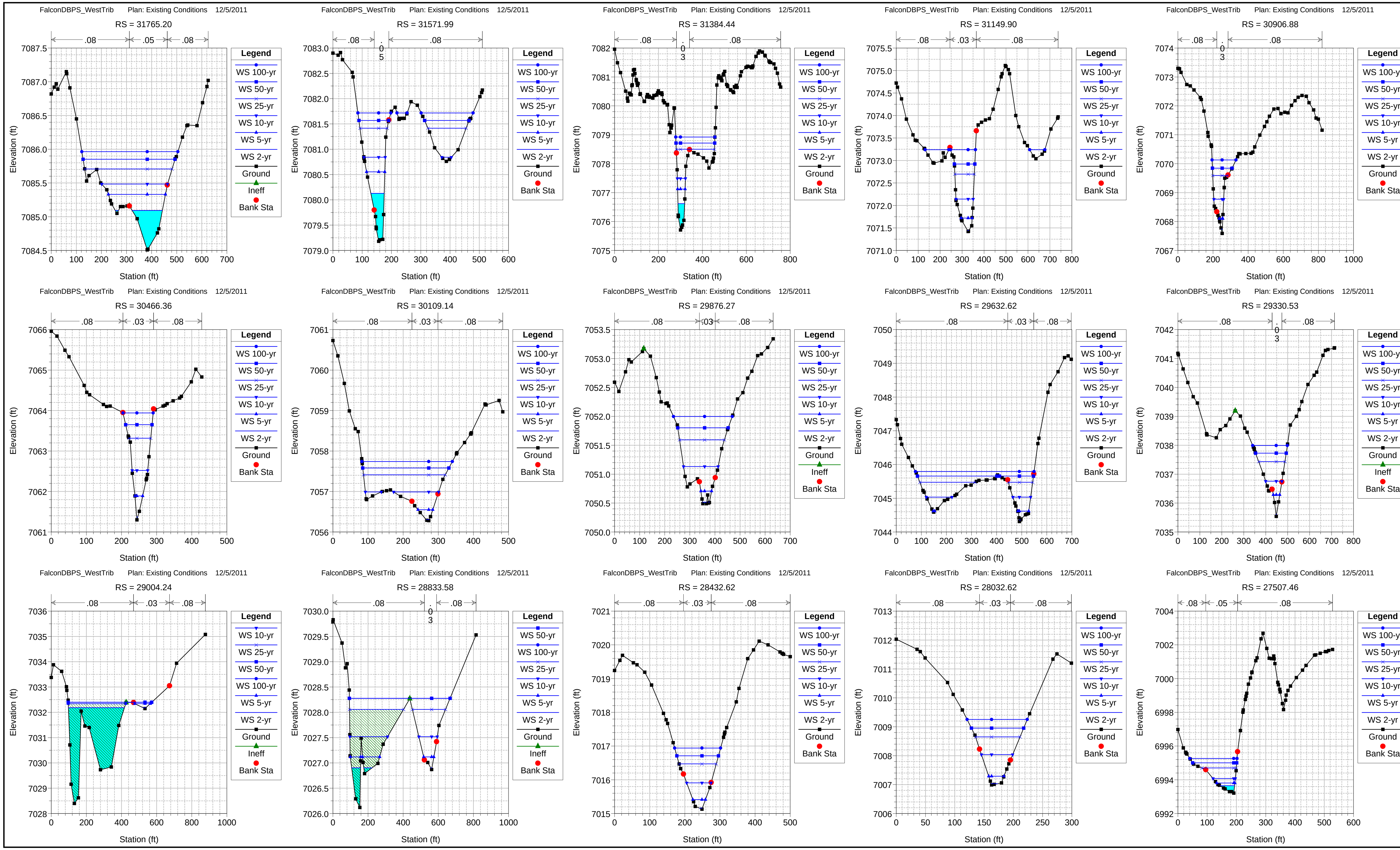
RS = 35576.41
RS = 35218.78
RS = 35054.37
RS = 35025.09
RS = 34818.78
RS = 34639.33
RS = 34399.04
RS = 34320.25
RS = 34018.23
RS = 33792.91
RS = 33635.33
RS = 33235.67
RS = 32862.60
RS = 32439.34
RS = 32034.26
.08
.03
.05
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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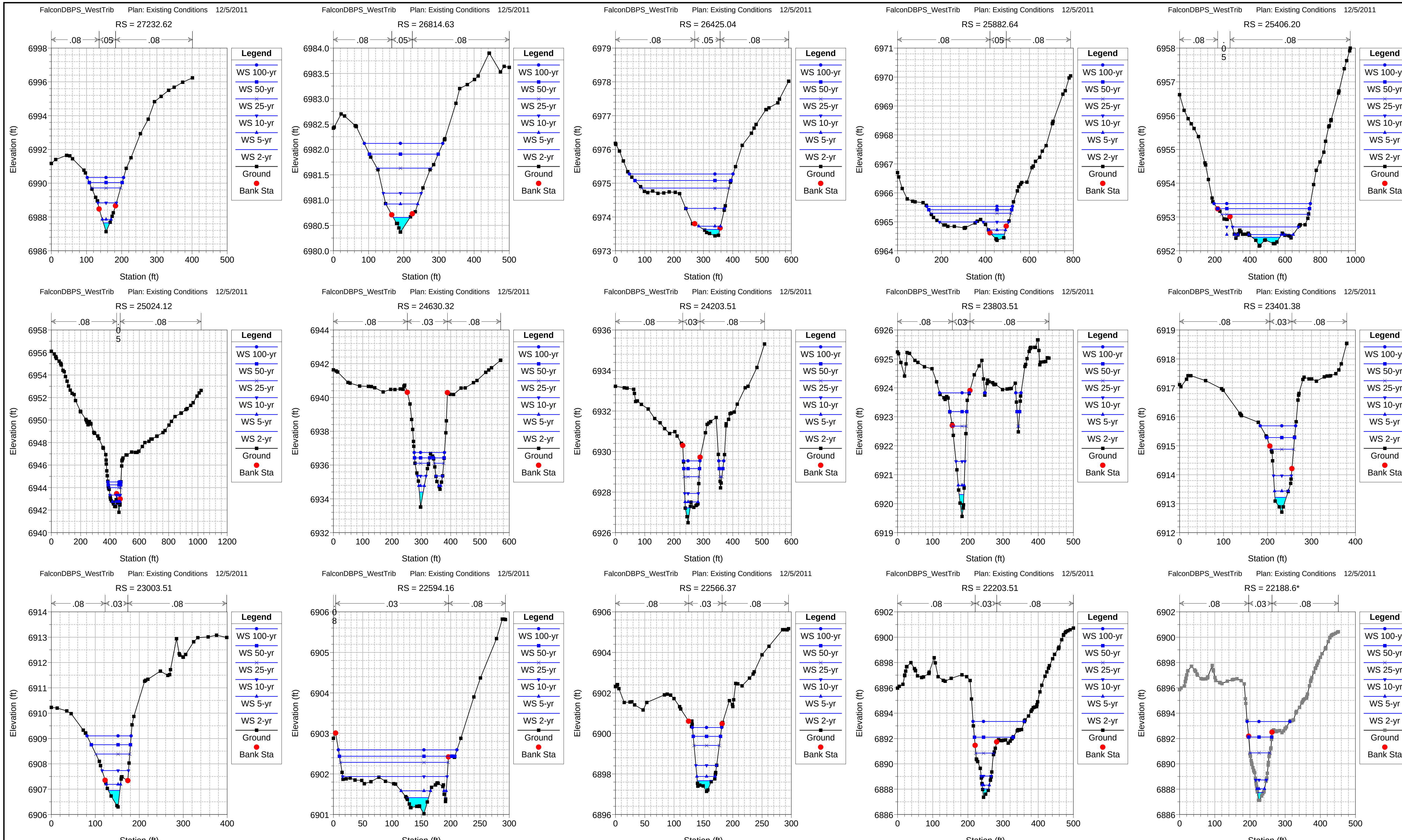
RS = 31765.20
RS = 31571.99
RS = 31384.44
RS = 31149.90
RS = 30906.88
RS = 30466.36
RS = 30109.14
RS = 29876.27
RS = 29632.62
RS = 29330.53
RS = 29004.24
RS = 28833.58
RS = 28432.62
RS = 28032.62
RS = 27507.46
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)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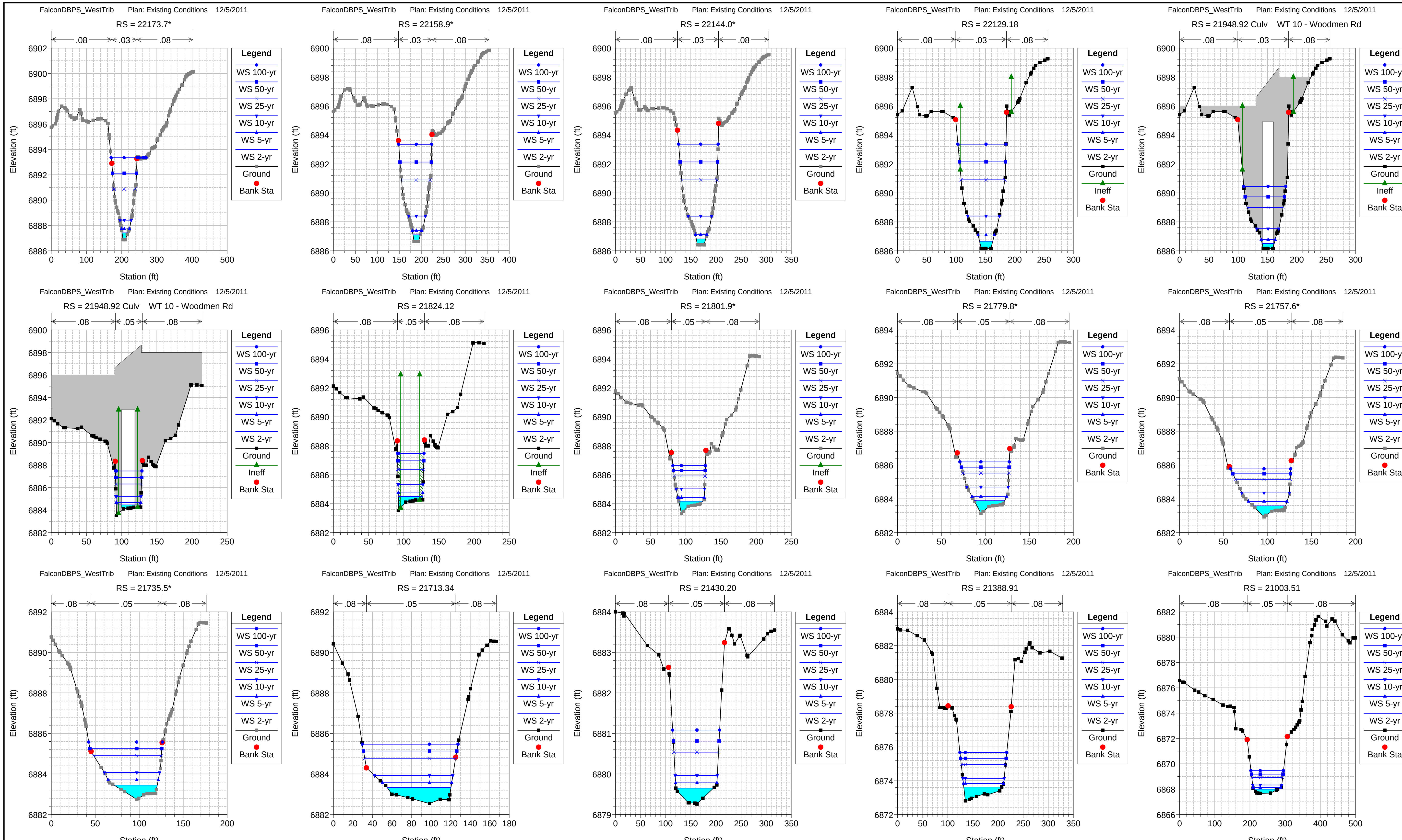
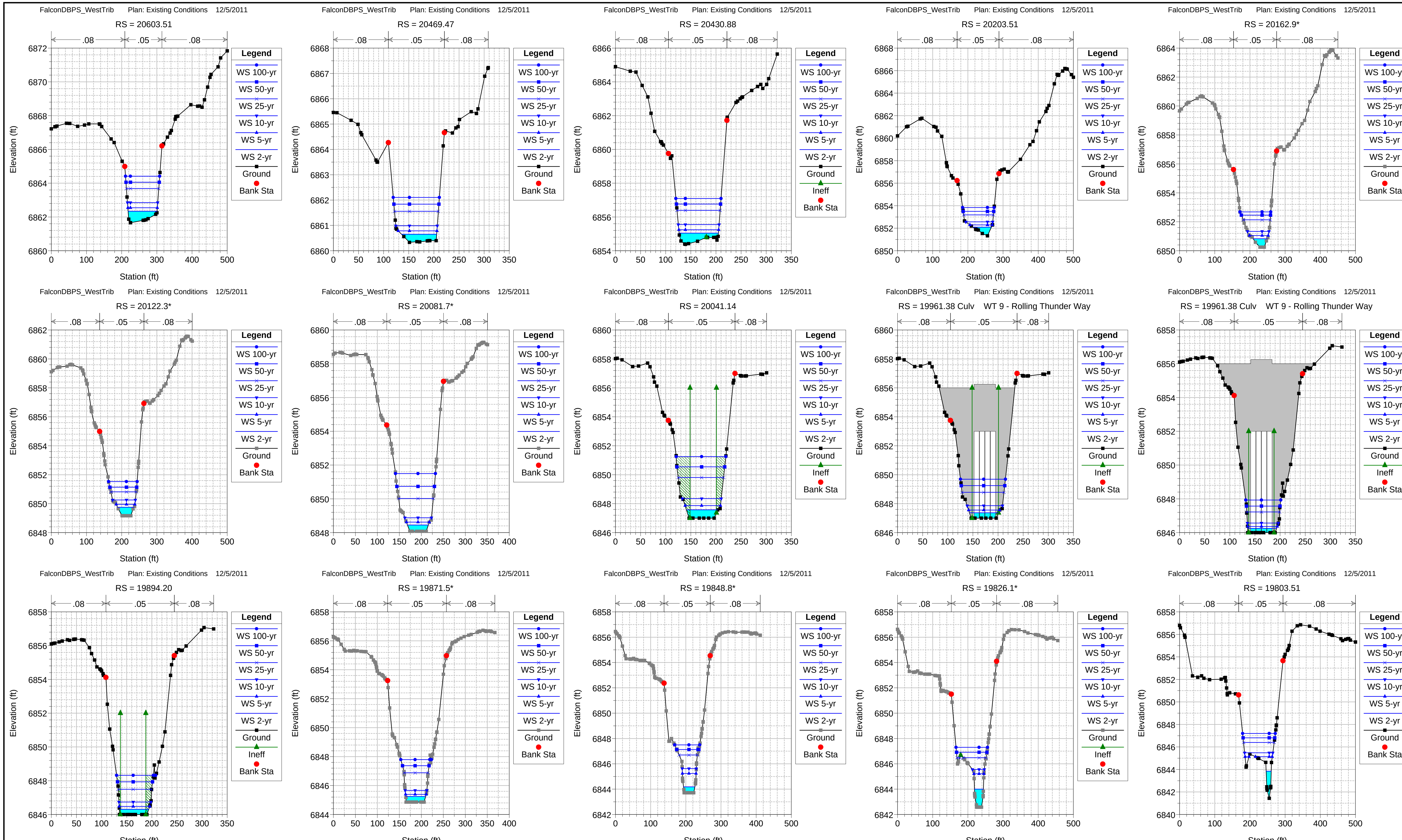
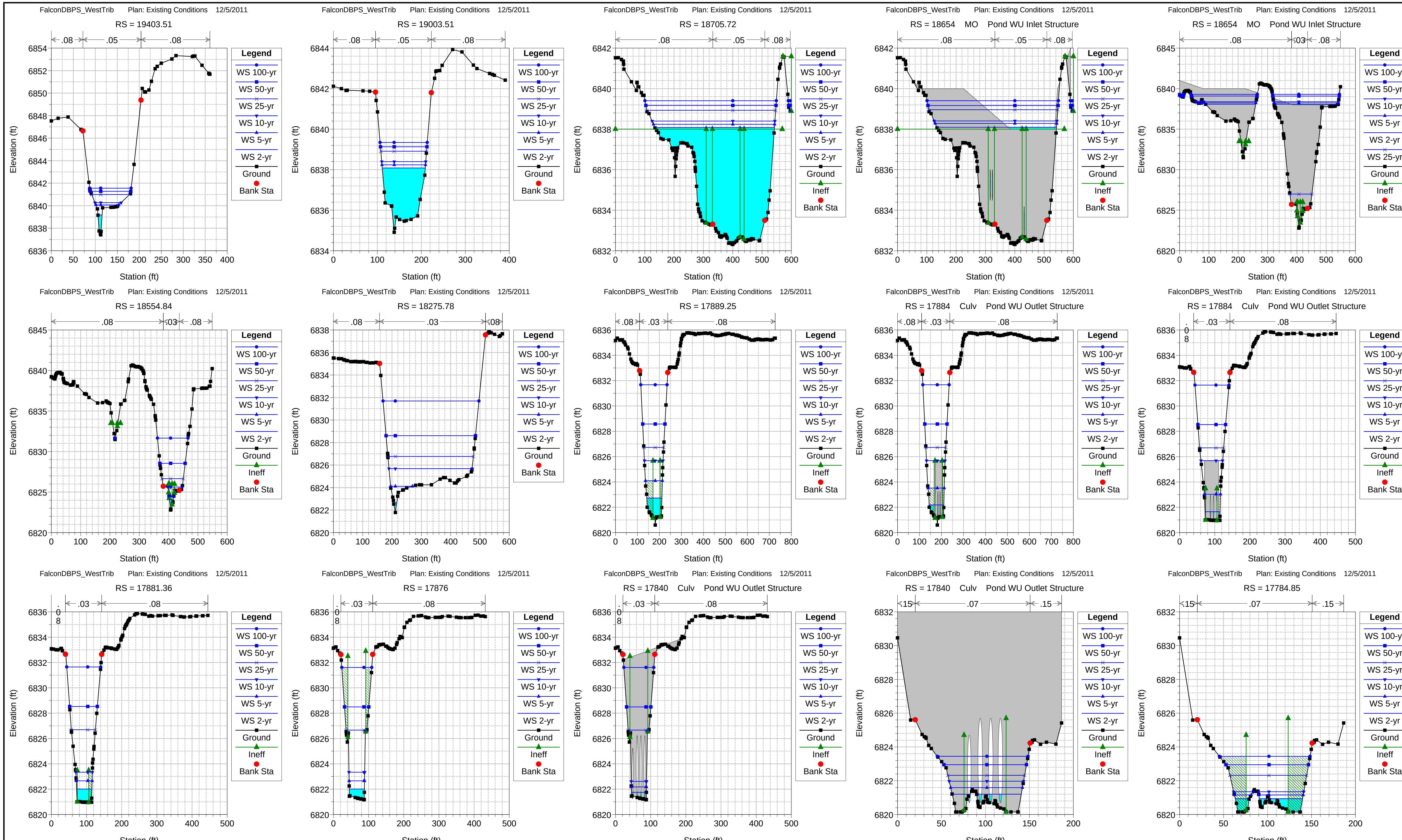
RS = 27232.62
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 26814.63
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 26425.04
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 25882.64
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 25406.20
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 25024.12
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 24630.32
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 24203.51
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 23803.51
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 23401.38
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 23003.51
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 22594.16
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 22566.37
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 22203.51
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 22188.6*
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta

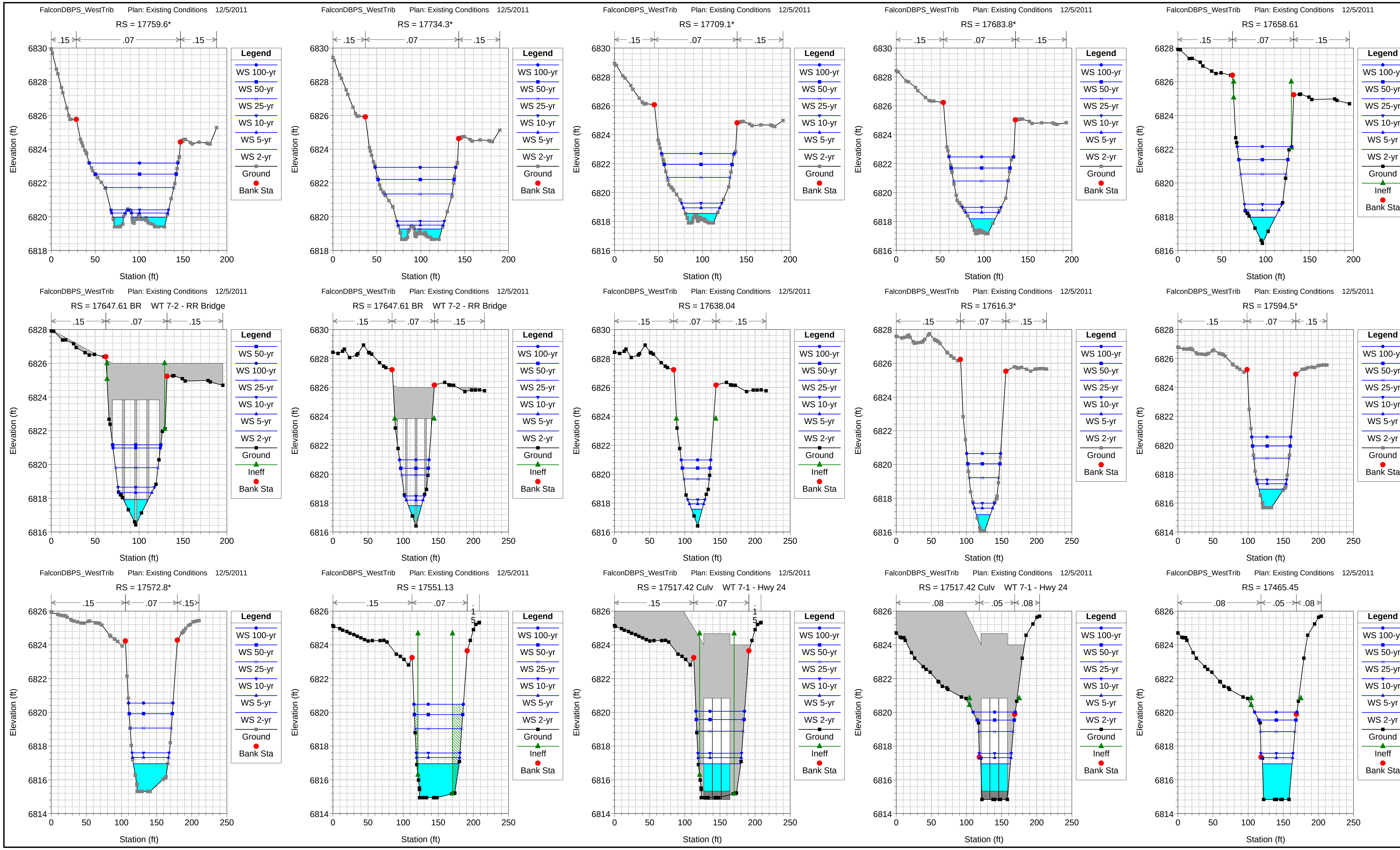


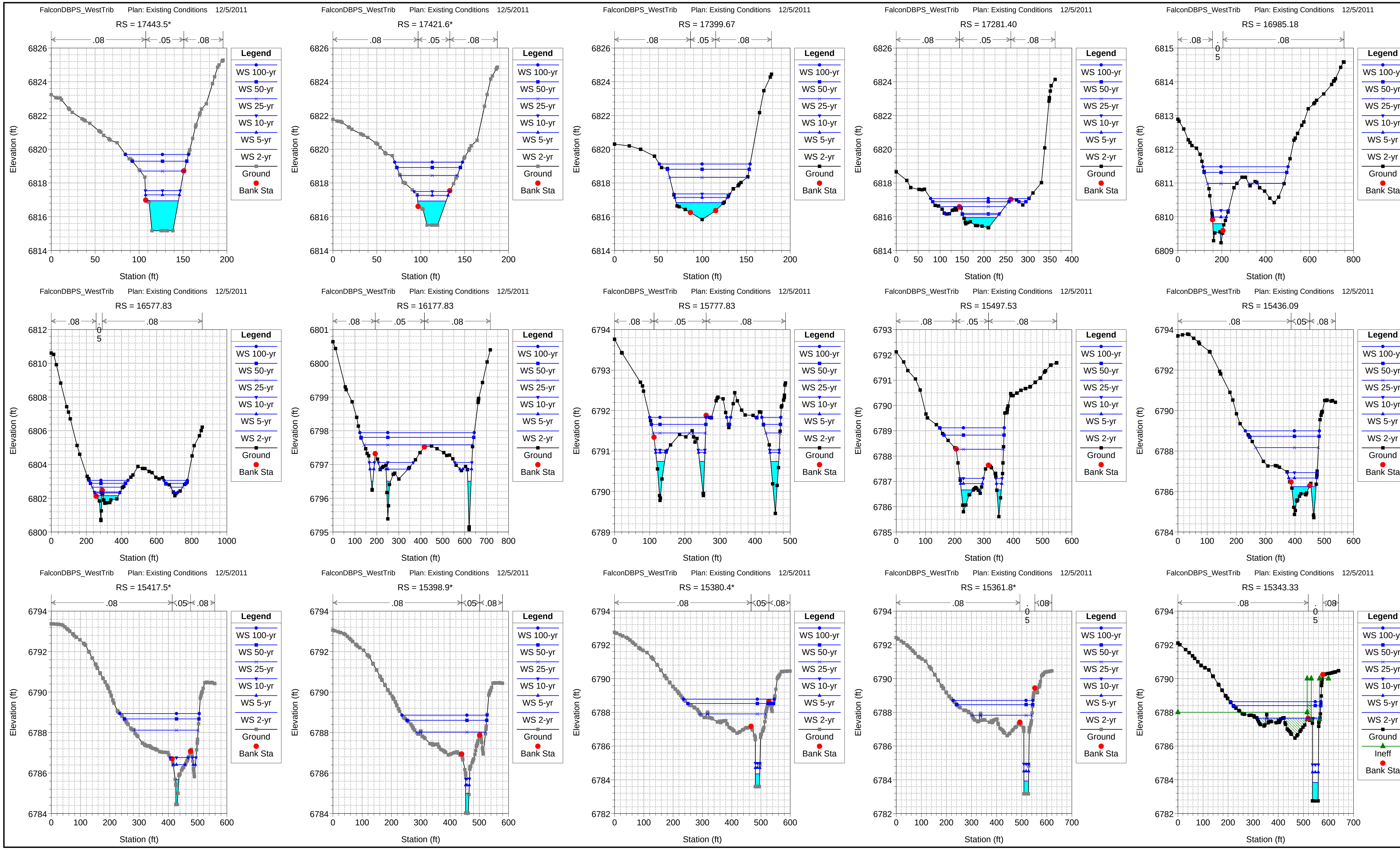
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 22173.7*
RS = 22158.9*
RS = 22144.0*
RS = 22129.18
RS = 21948.92 Culv WT 10 - Woodmen Rd
RS = 21948.92 Culv WT 10 - Woodmen Rd
RS = 21824.12
RS = 21801.9*
RS = 21779.8*
RS = 21757.6*
RS = 21735.5*
RS = 21713.34
RS = 21430.20
RS = 21388.91
RS = 21003.51
.08
.03
.05
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

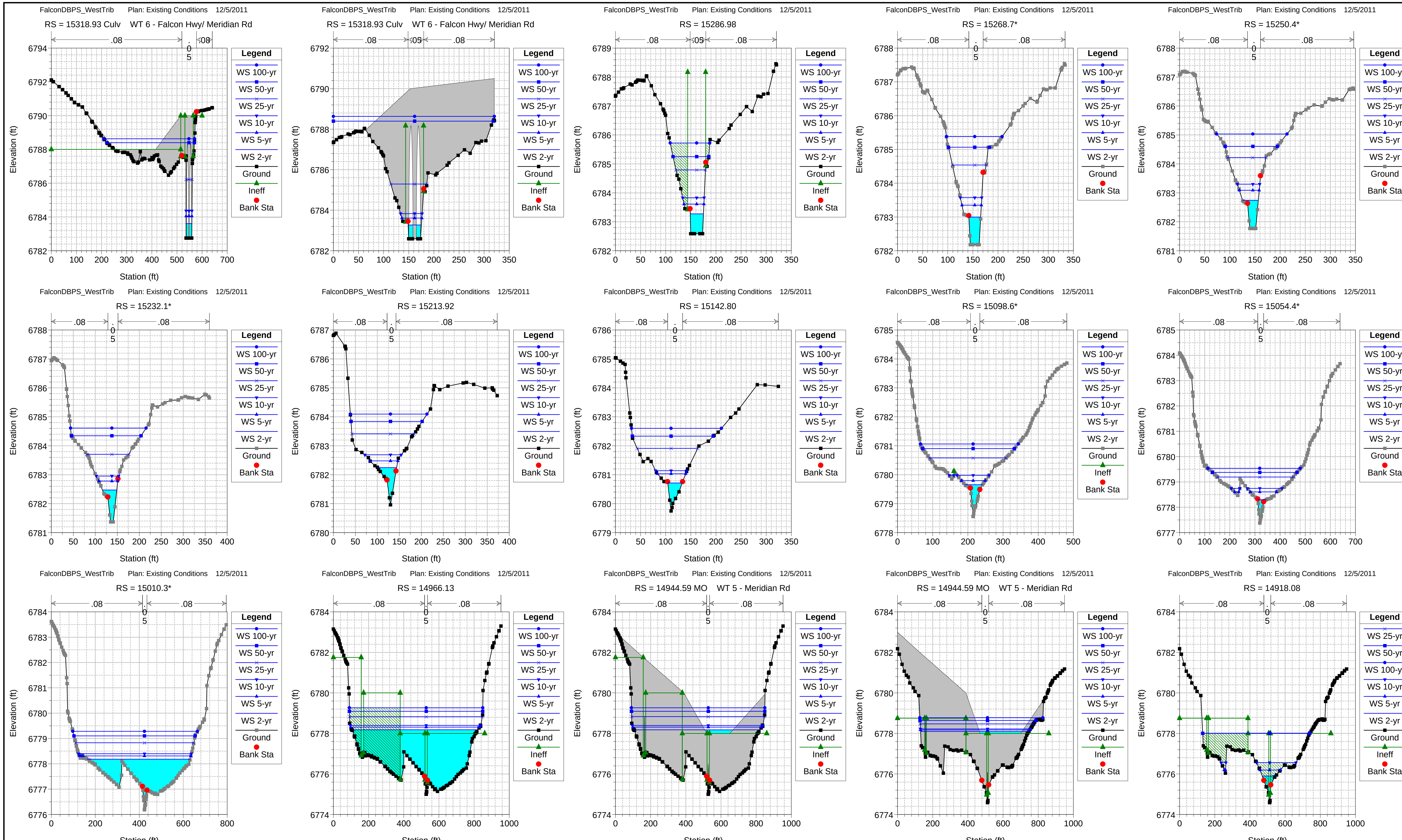

FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 20603.51
RS = 20469.47
RS = 20430.88
RS = 20203.51
RS = 20162.9*
RS = 20122.3*
RS = 20081.7*
RS = 20041.14
RS = 19961.38 Culv WT 9 - Rolling Thunder Way
RS = 19894.20
RS = 19871.5*
RS = 19848.8*
RS = 19826.1*
RS = 19803.51
.08
.05
.08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta

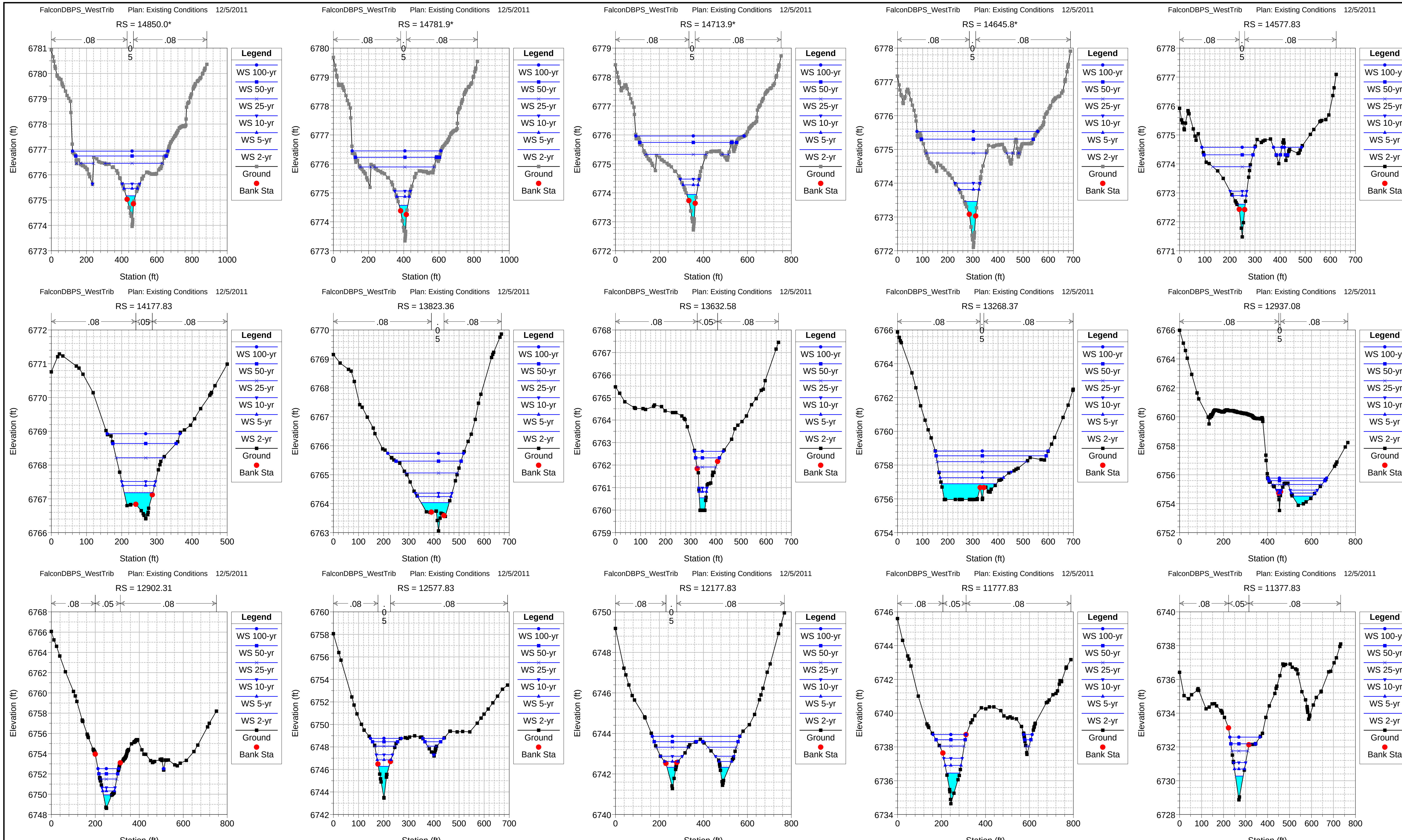


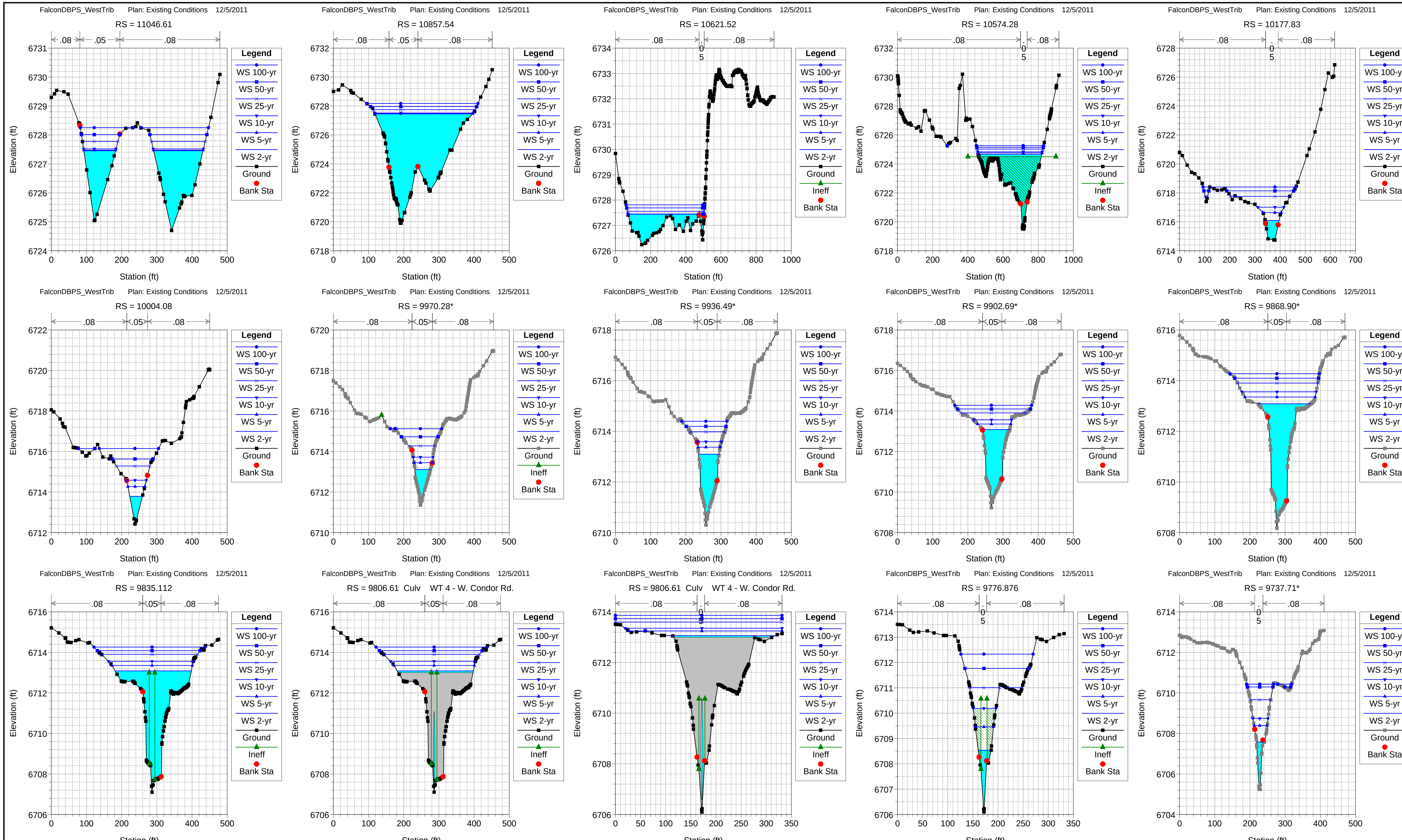
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 19403.51
RS = 19003.51
RS = 18705.72
RS = 18654 MO Pond WU Inlet Structure
RS = 18654 MO Pond WU Inlet Structure
RS = 18554.84
RS = 18275.78
RS = 17889.25
RS = 17884 Culv Pond WU Outlet Structure
RS = 17884 Culv Pond WU Outlet Structure
RS = 17881.36
RS = 17876
RS = 17840 Culv Pond WU Outlet Structure
RS = 17840 Culv Pond WU Outlet Structure
RS = 17784.85
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 17759.6*
RS = 17734.3*
RS = 17709.1*
RS = 17683.8*
RS = 17658.61
RS = 17647.61 BR WT 7-2 - RR Bridge
RS = 17647.61 BR WT 7-2 - RR Bridge
RS = 17638.04
RS = 17616.3*
RS = 17594.5*
RS = 17572.8*
RS = 17551.13
RS = 17517.42 Culv WT 7-1 - Hwy 24
RS = 17517.42 Culv WT 7-1 - Hwy 24
RS = 17465.45
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 17443.5*
RS = 17421.6*
RS = 17399.67
RS = 17281.40
RS = 16985.18
RS = 16577.83
RS = 16177.83
RS = 15777.83
RS = 15497.53
RS = 15436.09
RS = 15417.5*
RS = 15398.9*
RS = 15380.4*
RS = 15361.8*
RS = 15343.33
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 15318.93 Culv WT 6 - Falcon Hwy/ Meridian Rd
RS = 15318.93 Culv WT 6 - Falcon Hwy/ Meridian Rd
RS = 15286.98
RS = 15268.7*
RS = 15250.4*
RS = 15232.1*
RS = 15213.92
RS = 15142.80
RS = 15098.6*
RS = 15054.4*
RS = 15010.3*
RS = 14966.13
RS = 14944.59 MO WT 5 - Meridian Rd
RS = 14944.59 MO WT 5 - Meridian Rd
RS = 14918.08
.08
.05
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 14850.0*
RS = 14781.9*
RS = 14713.9*
RS = 14645.8*
RS = 14577.83
RS = 14177.83
RS = 13823.36
RS = 13632.58
RS = 13268.37
RS = 12937.08
RS = 12902.31
RS = 12577.83
RS = 12177.83
RS = 11777.83
RS = 11377.83
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)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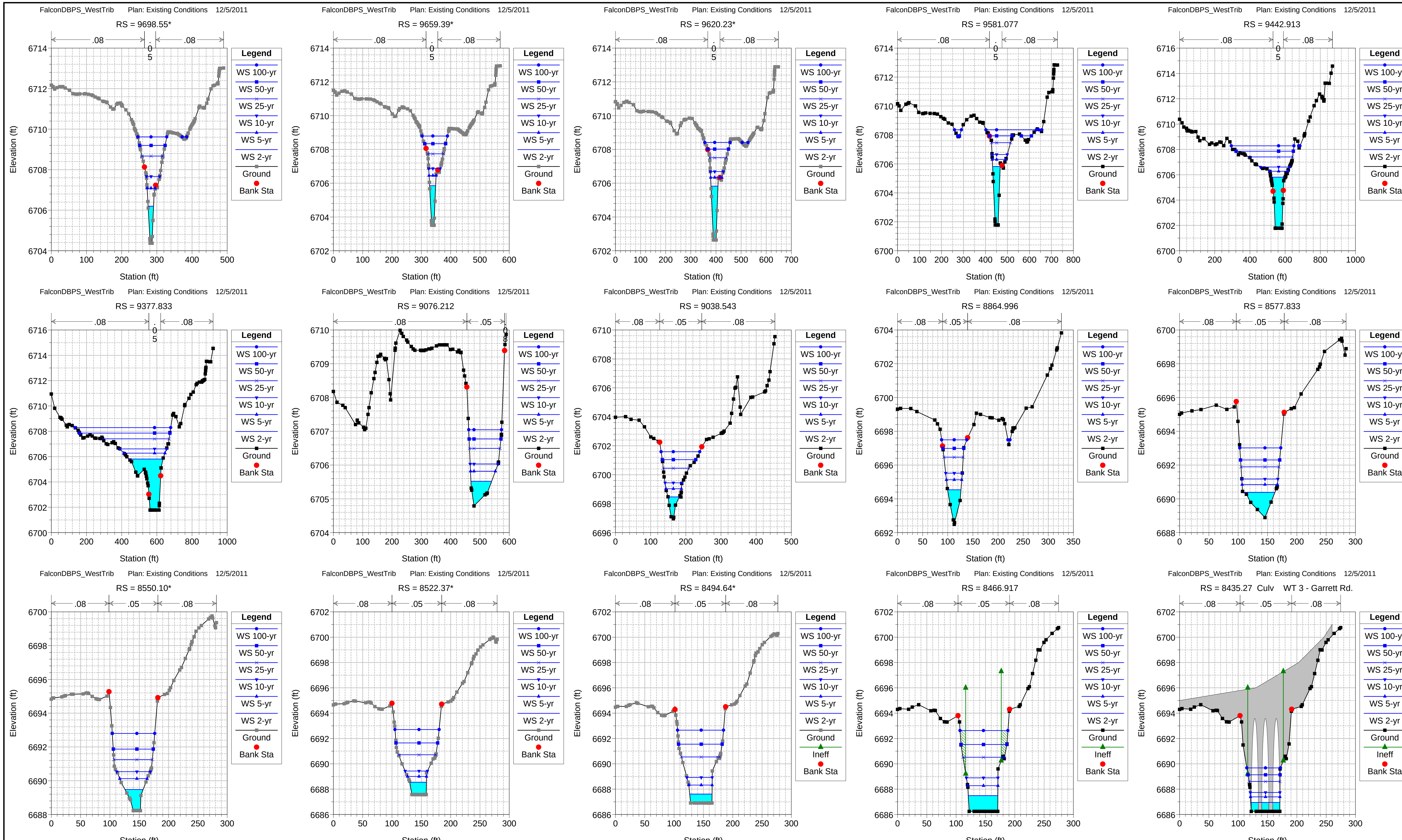
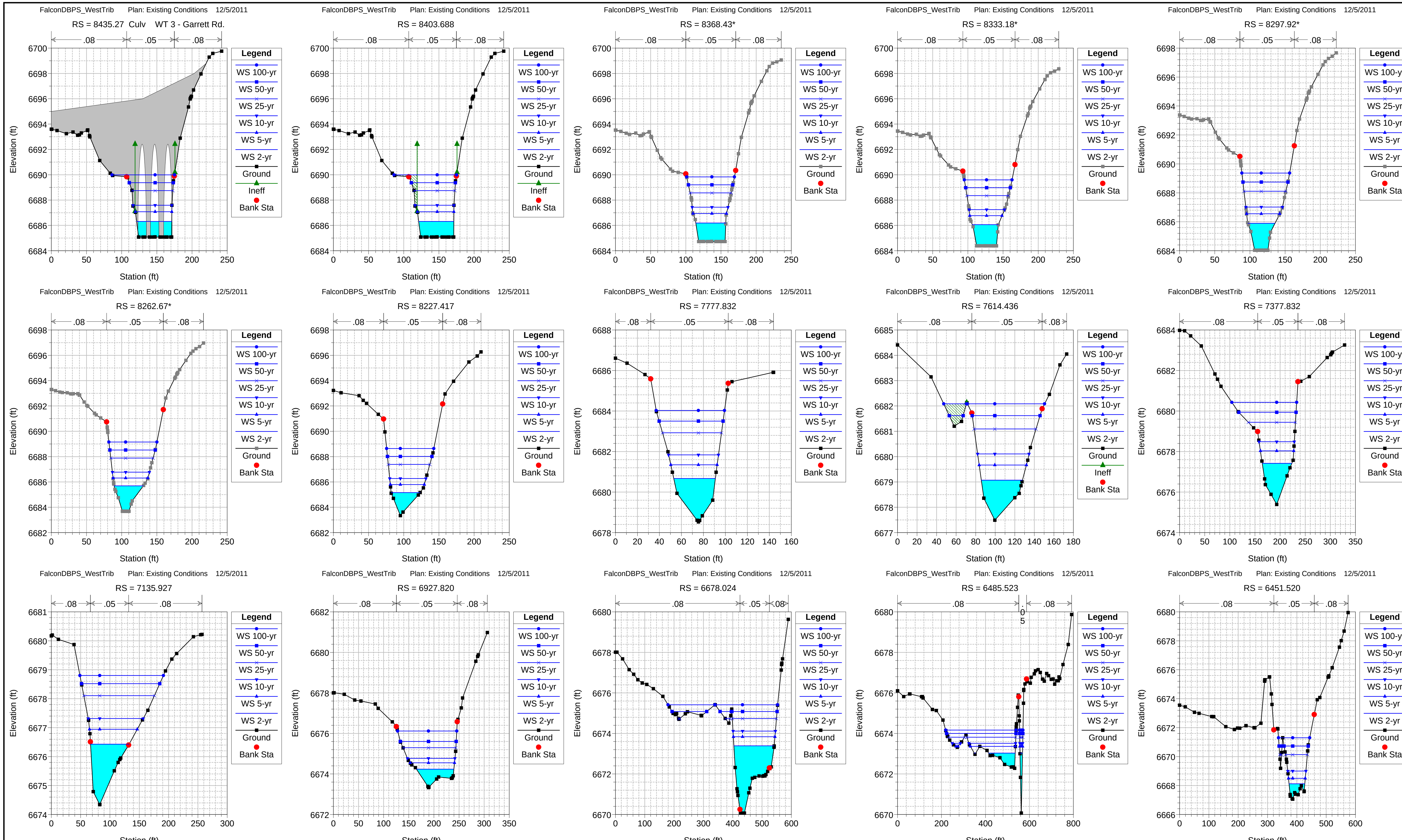
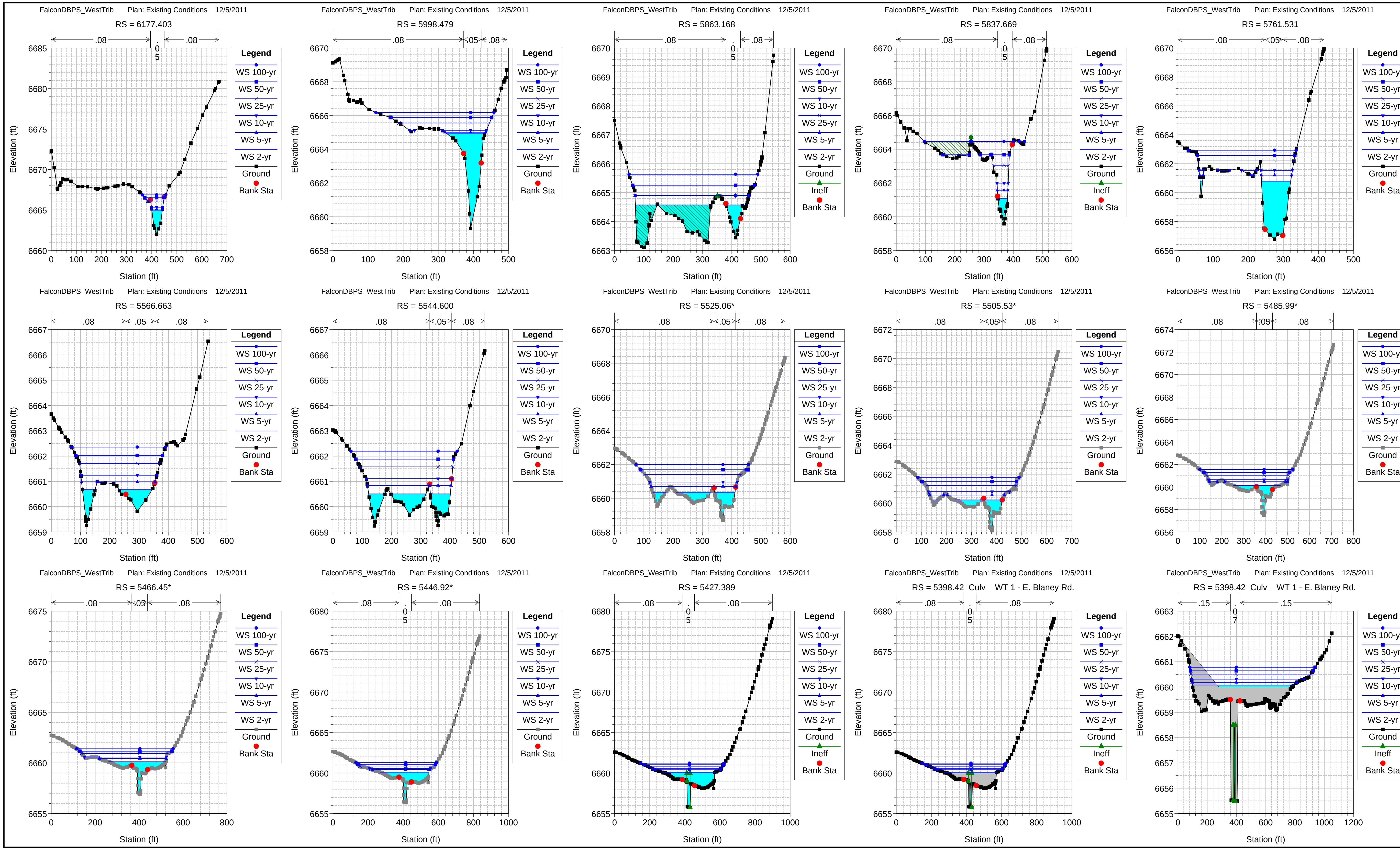
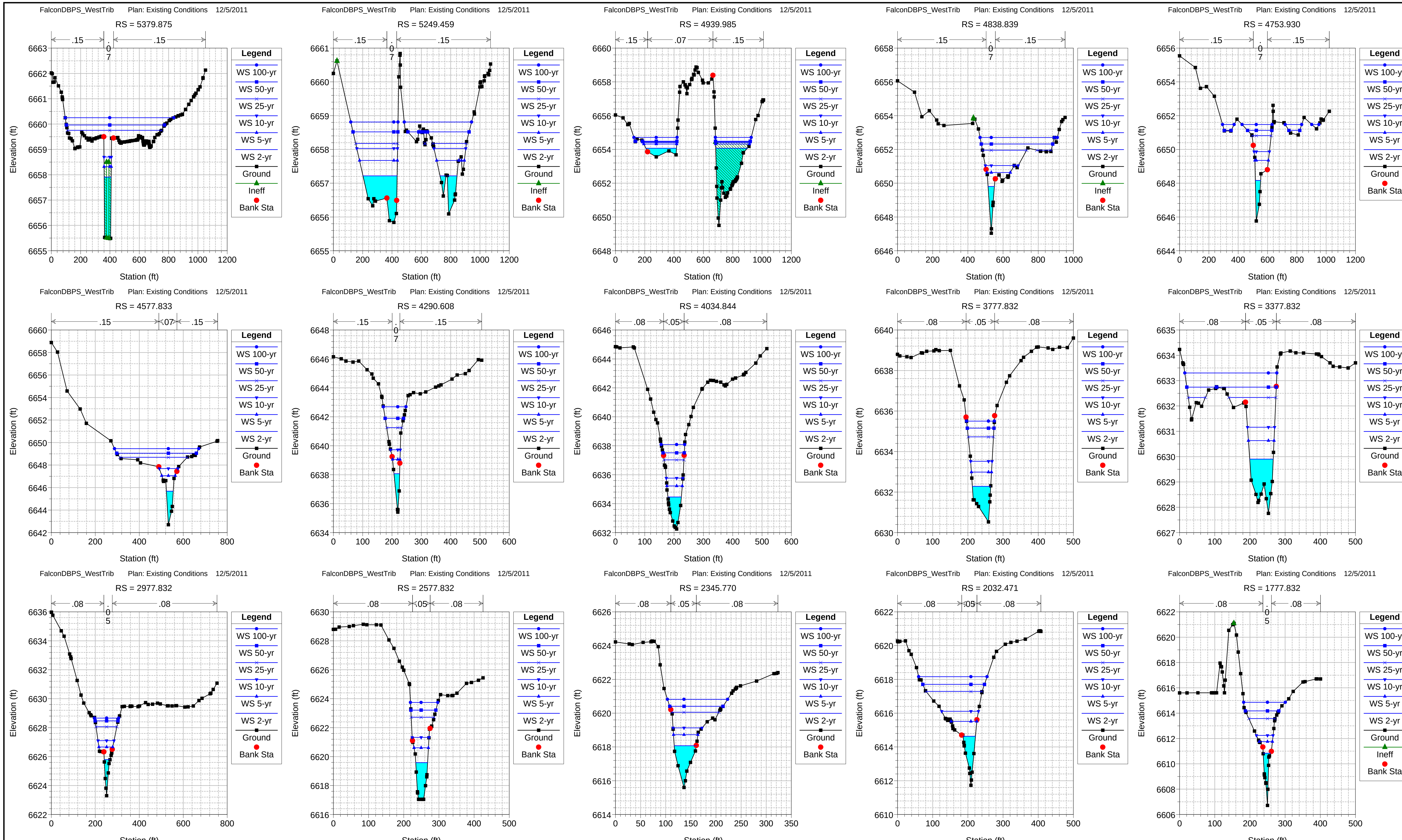
RS = 11046.61
RS = 10857.54
RS = 10621.52
RS = 10574.28
RS = 10177.83
RS = 10004.08
RS = 9970.28*
RS = 9936.49*
RS = 9902.69*
RS = 9868.90*
RS = 9835.112
RS = 9806.61 Culv WT 4 - W. Condor Rd.
RS = 9806.61 Culv WT 4 - W. Condor Rd.
RS = 9776.876
RS = 9737.71*
.08
.05
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

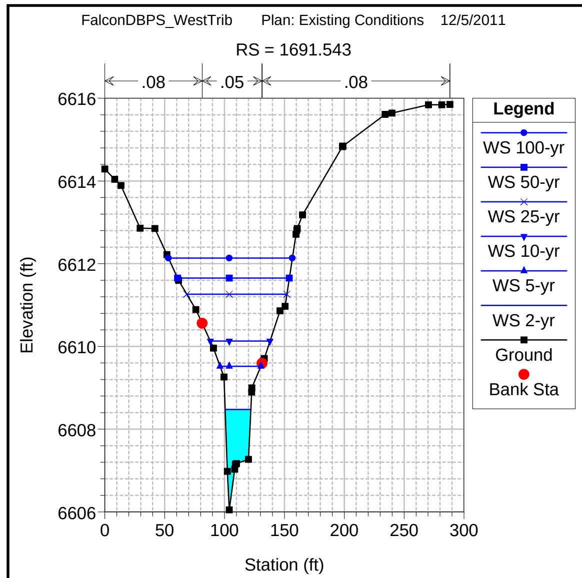


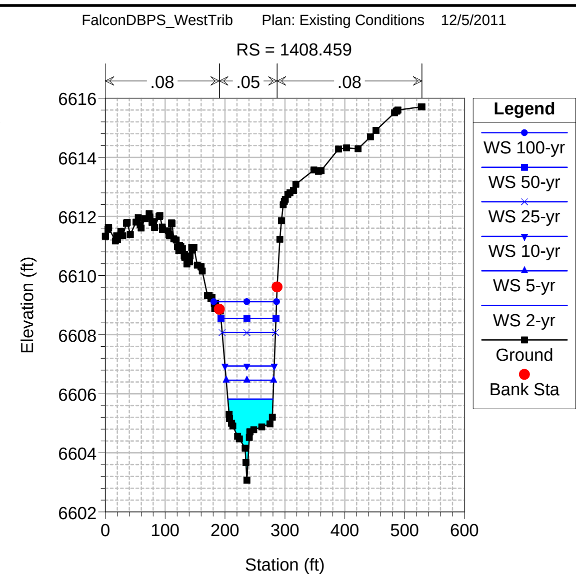
FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 9698.55*
RS = 9659.39*
RS = 9620.23*
RS = 9581.077
RS = 9442.913
RS = 9377.833
RS = 9076.212
RS = 9038.543
RS = 8864.996
RS = 8577.833
RS = 8550.10*
RS = 8522.37*
RS = 8494.64*
RS = 8466.917
RS = 8435.27 Culv WT 3 - Garrett Rd.
.08
.05
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

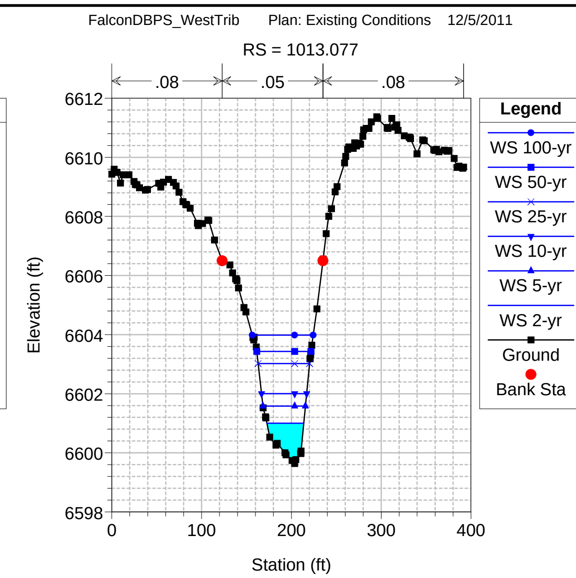

FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 8435.27 Culv WT 3 - Garrett Rd.
RS = 8403.688
RS = 8368.43*
RS = 8333.18*
RS = 8297.92*
RS = 8262.67*
RS = 8227.417
RS = 7777.832
RS = 7614.436
RS = 7377.832
RS = 7135.927
RS = 6927.820
RS = 6678.024
RS = 6485.523
RS = 6451.520
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

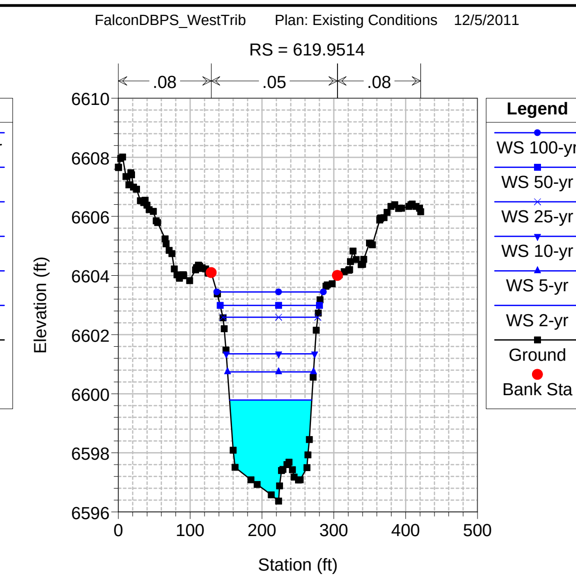

FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 6177.403
RS = 5998.479
RS = 5863.168
RS = 5837.669
RS = 5761.531
RS = 5566.663
RS = 5544.600
RS = 5525.06*
RS = 5505.53*
RS = 5485.99*
RS = 5466.45*
RS = 5446.92*
RS = 5427.389
RS = 5398.42 Culv WT 1 - E. Blaney Rd.
RS = 5398.42 Culv WT 1 - E. Blaney Rd.
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 5379.875
RS = 5249.459
RS = 4939.985
RS = 4838.839
RS = 4753.930
RS = 4577.833
RS = 4290.608
RS = 4034.844
RS = 3777.832
RS = 3377.832
RS = 2977.832
RS = 2577.832
RS = 2345.770
RS = 2032.471
RS = 1777.832
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 1691.543
.08
.05
.08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 1408.459
.08
.05
.08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 1013.077
.08
.05
.08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta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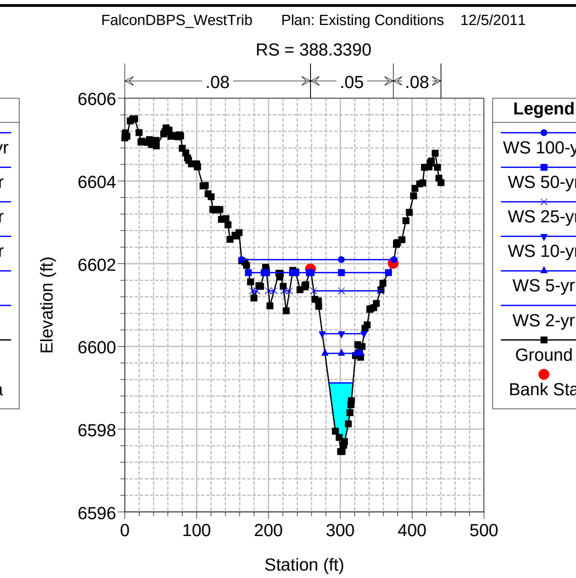
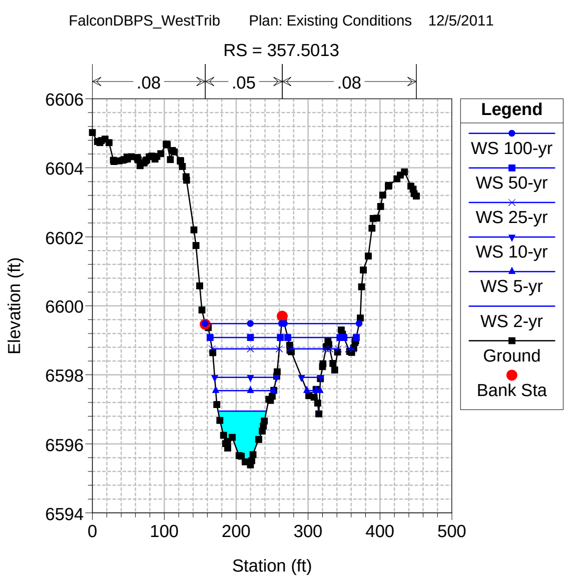
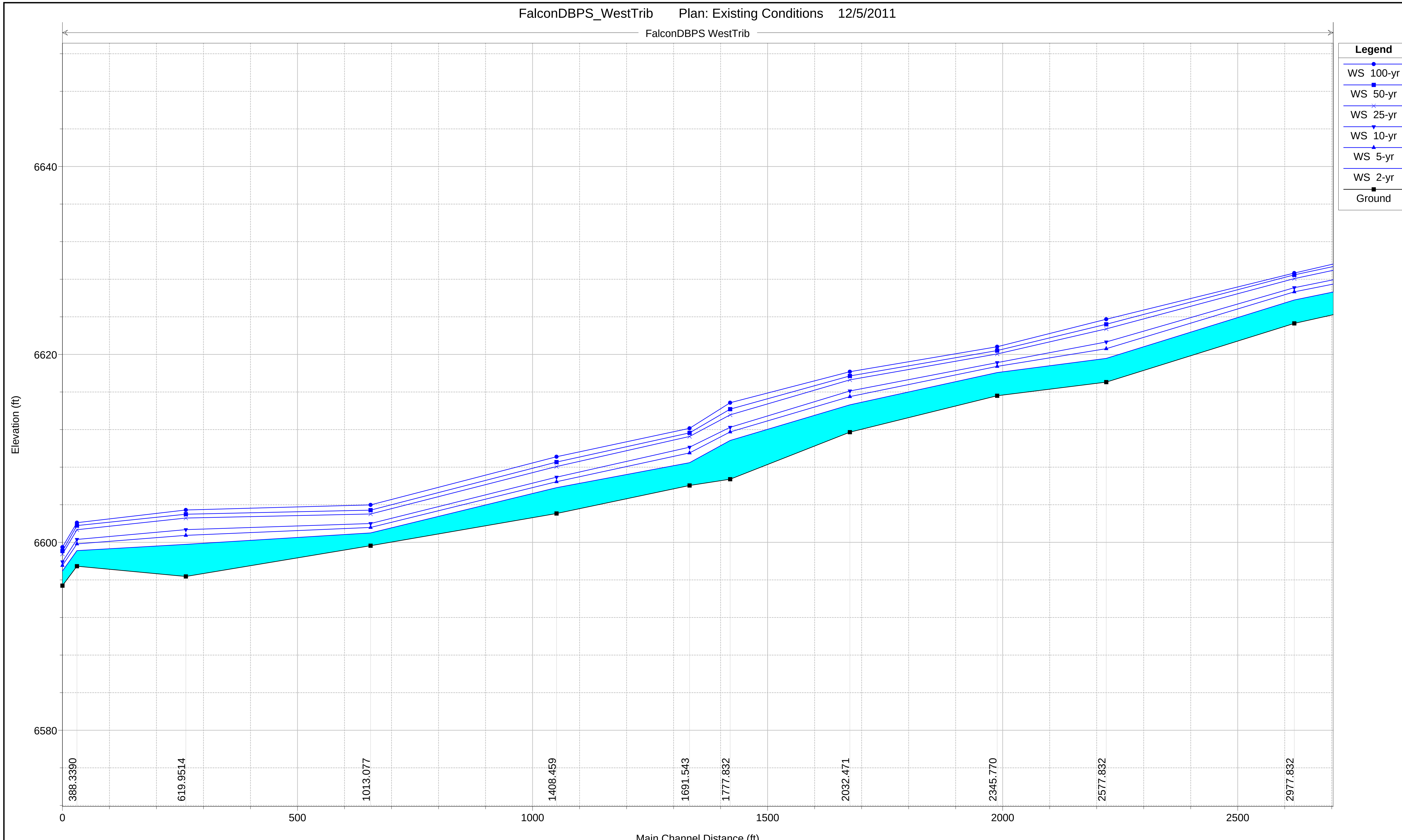
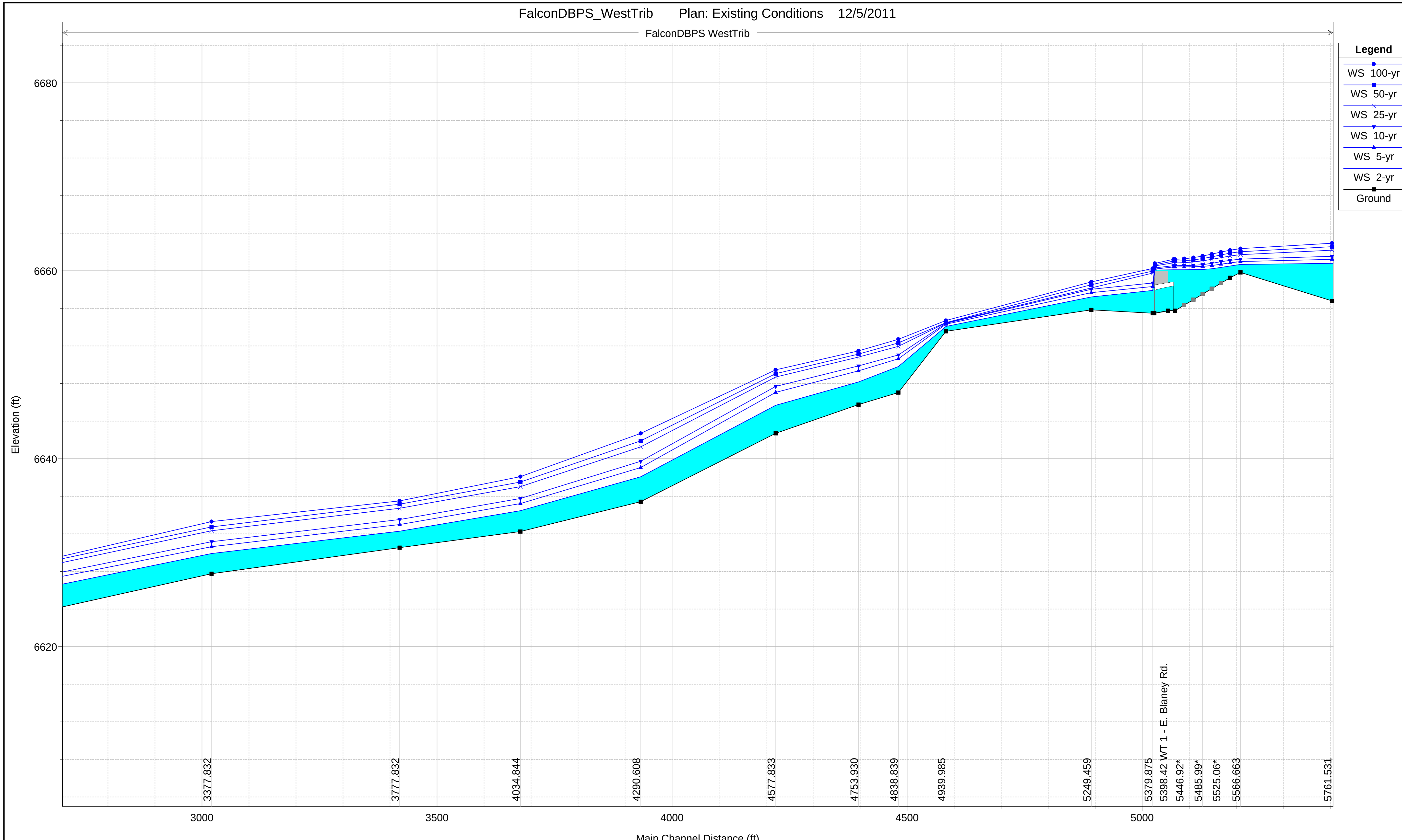
RS = 619.9514
.08
.05
.08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 388.3390
.08
.05
.08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta

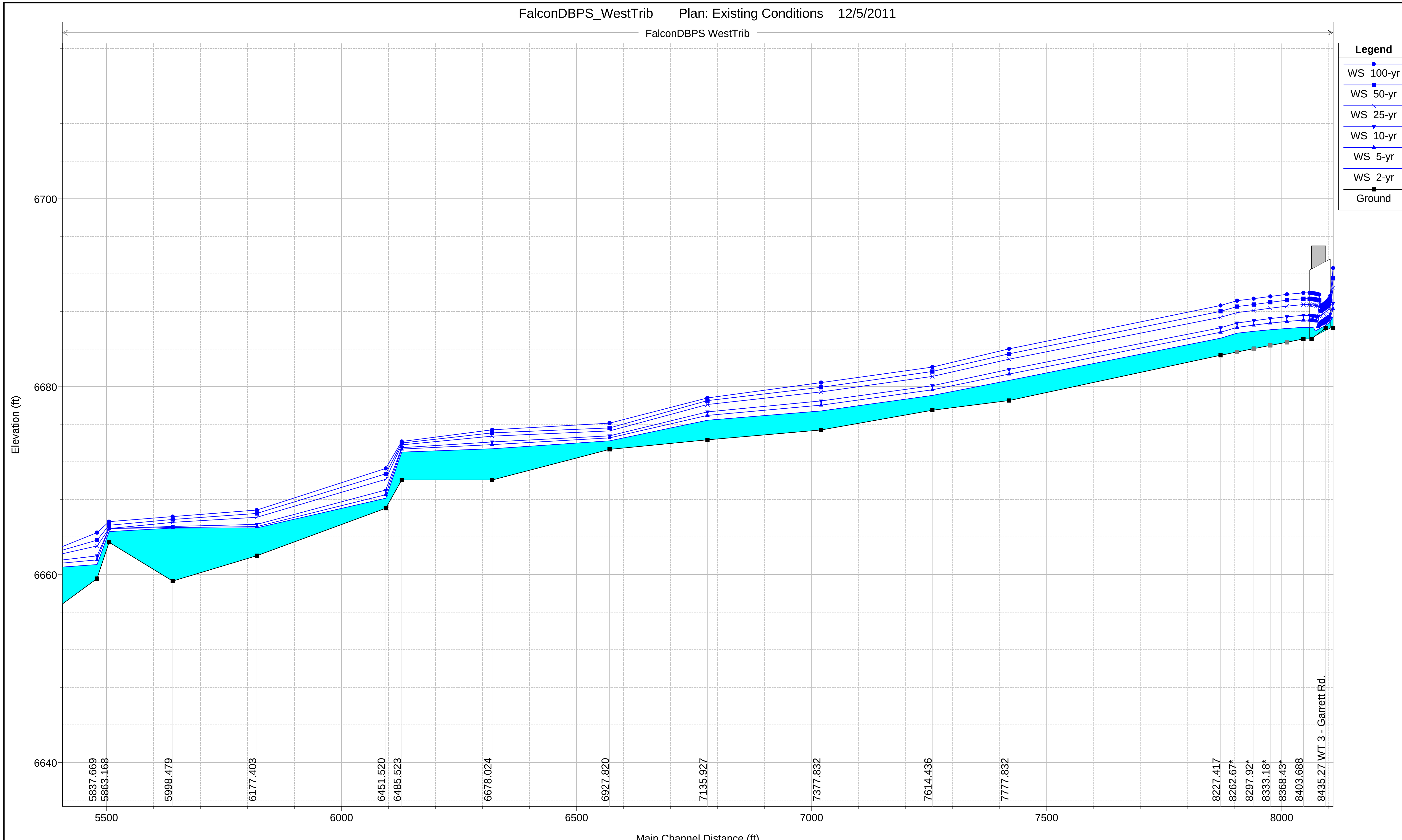

FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
RS = 357.5013
.08
.05
.08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta



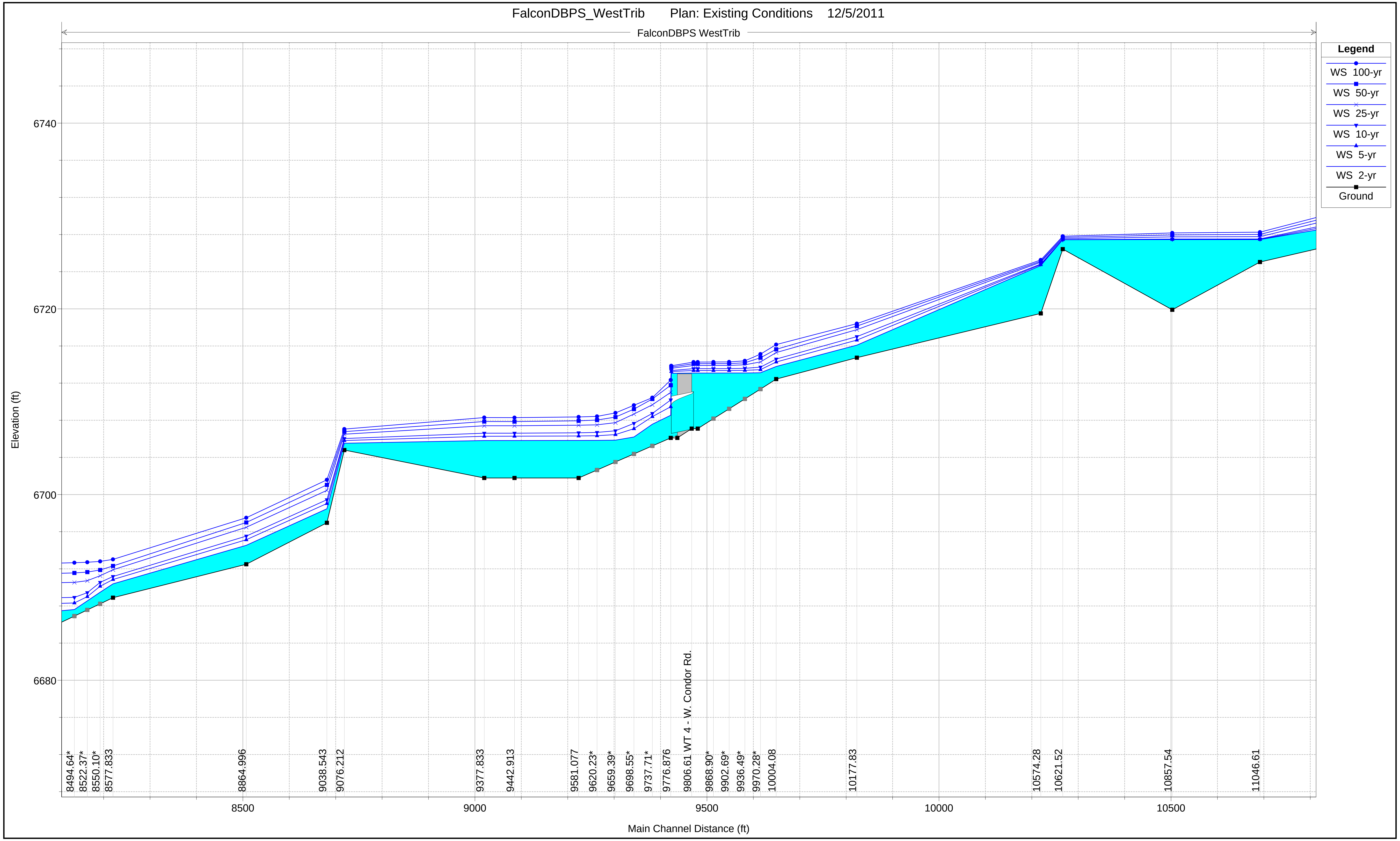
1 in Horiz. = 200 ft 1 in Vert. = 10 ft

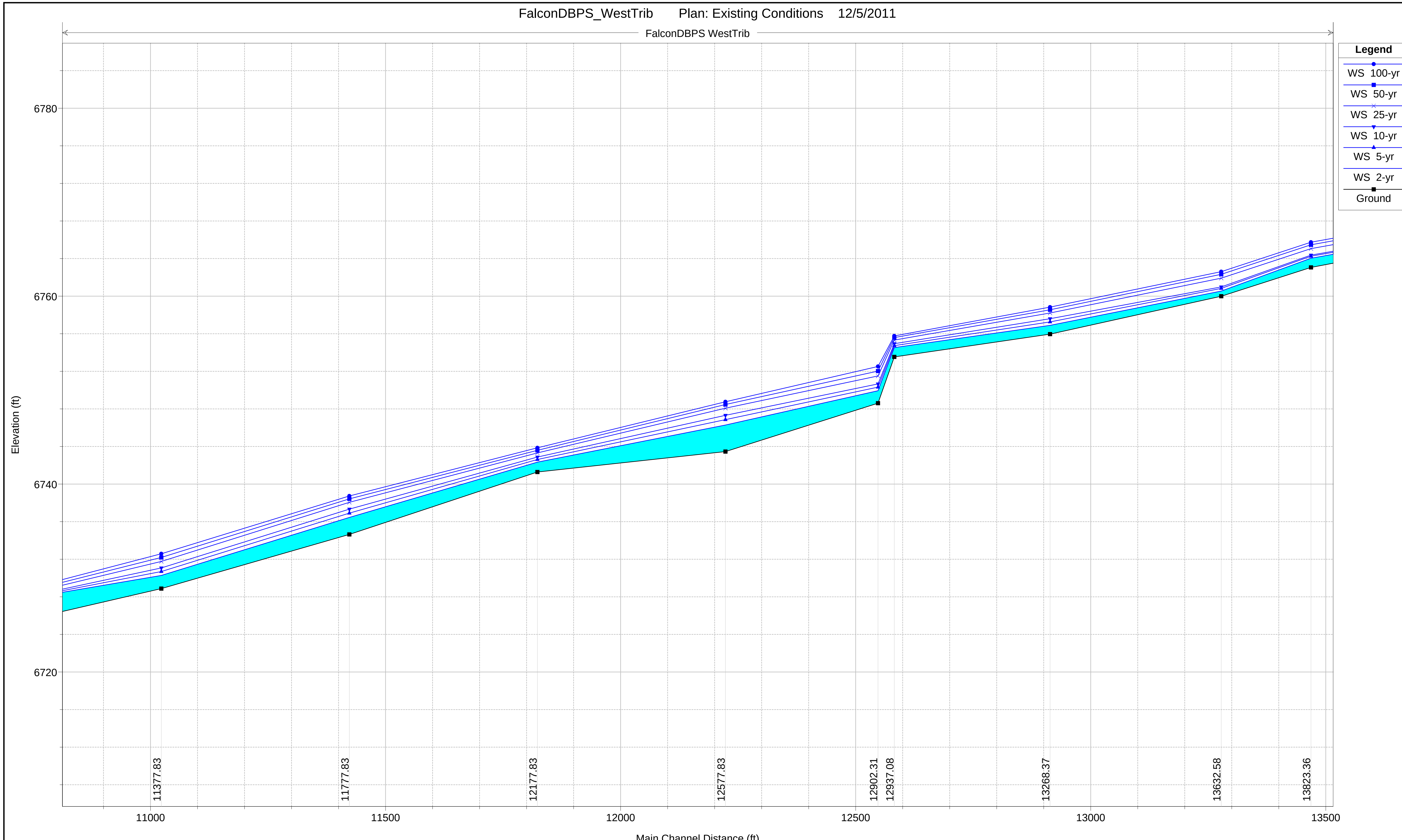


1 in Horiz. = 200 ft 1 in Vert. = 10 ft

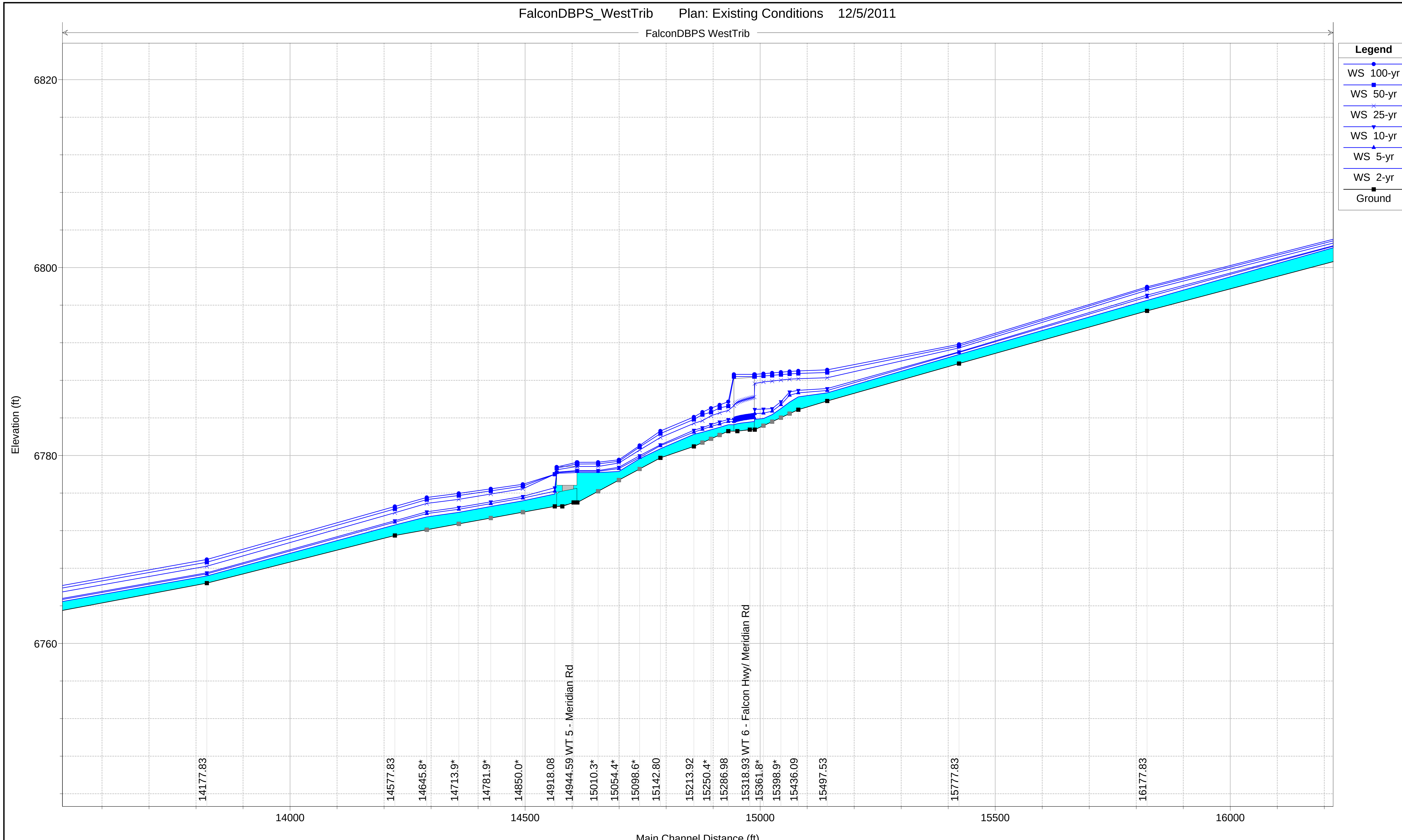


1 in Horiz. = 200 ft 1 in Vert. = 10 ft

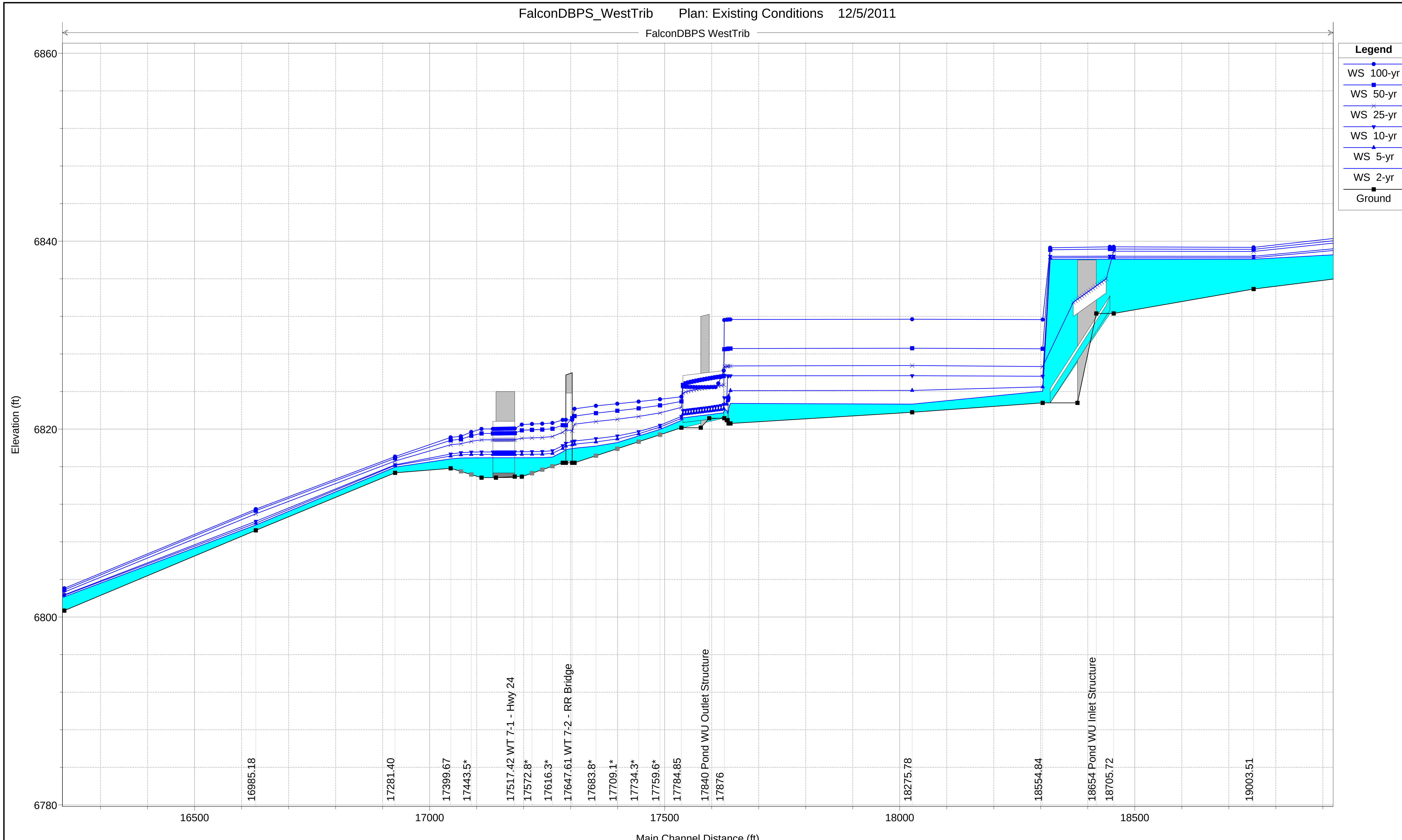

FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
FalconDBPS WestTrib
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Elevation (ft)
6740
6720
6700
6680
8494.64*
8522.37*
8550.10*
8577.833
8864.996
9038.543
9076.212
9377.833
9442.913
9581.077
9620.23*
9659.39*
9698.55*
9737.71*
9776.876
9806.61 WT 4 - W. Condor Rd.
9868.90*
9902.69*
9936.49*
9970.28*
10004.08
10177.83
10574.28
10621.52
10857.54
11046.61
8500
9000
9500
10000
10500
Main Channel Distance (ft)
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



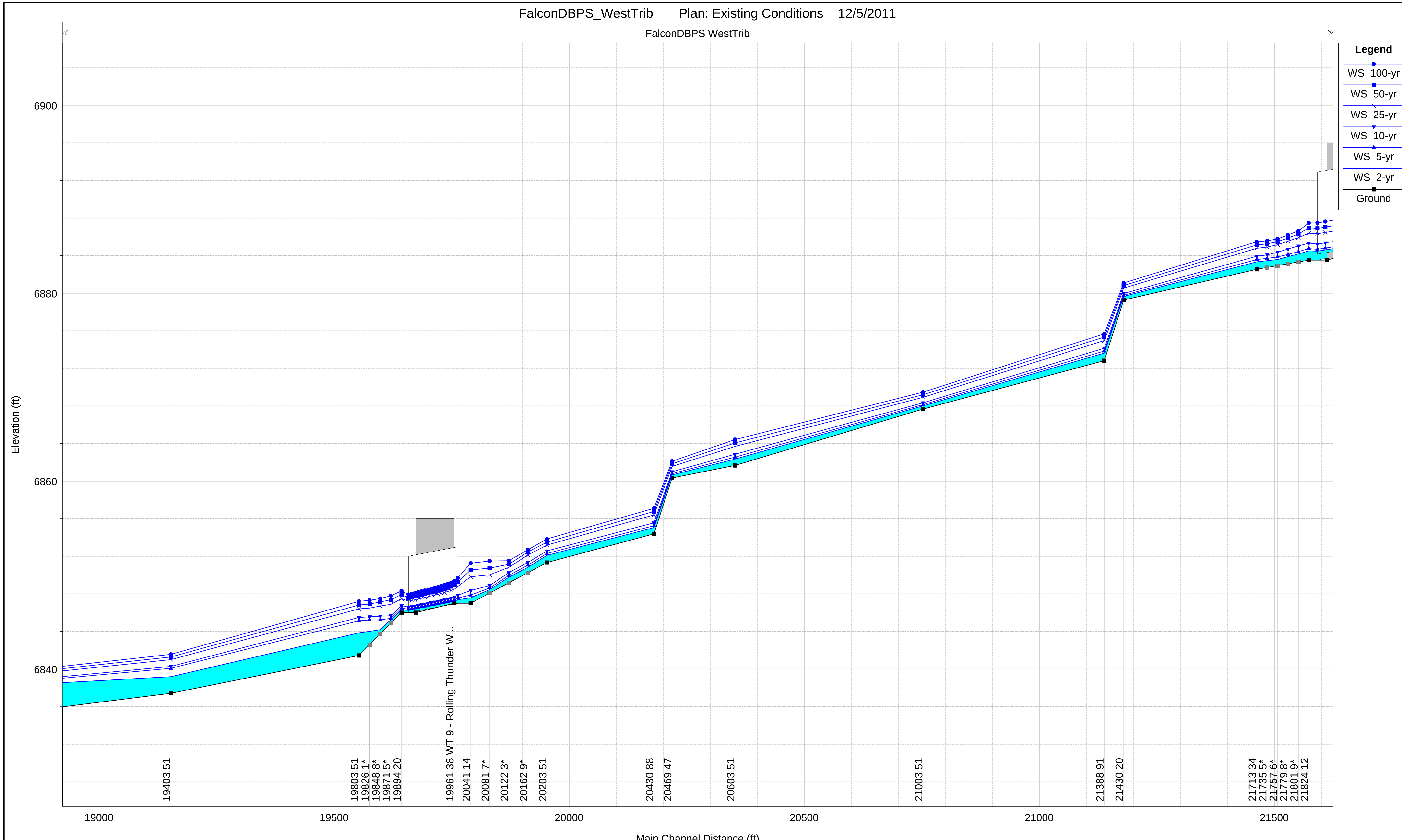
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



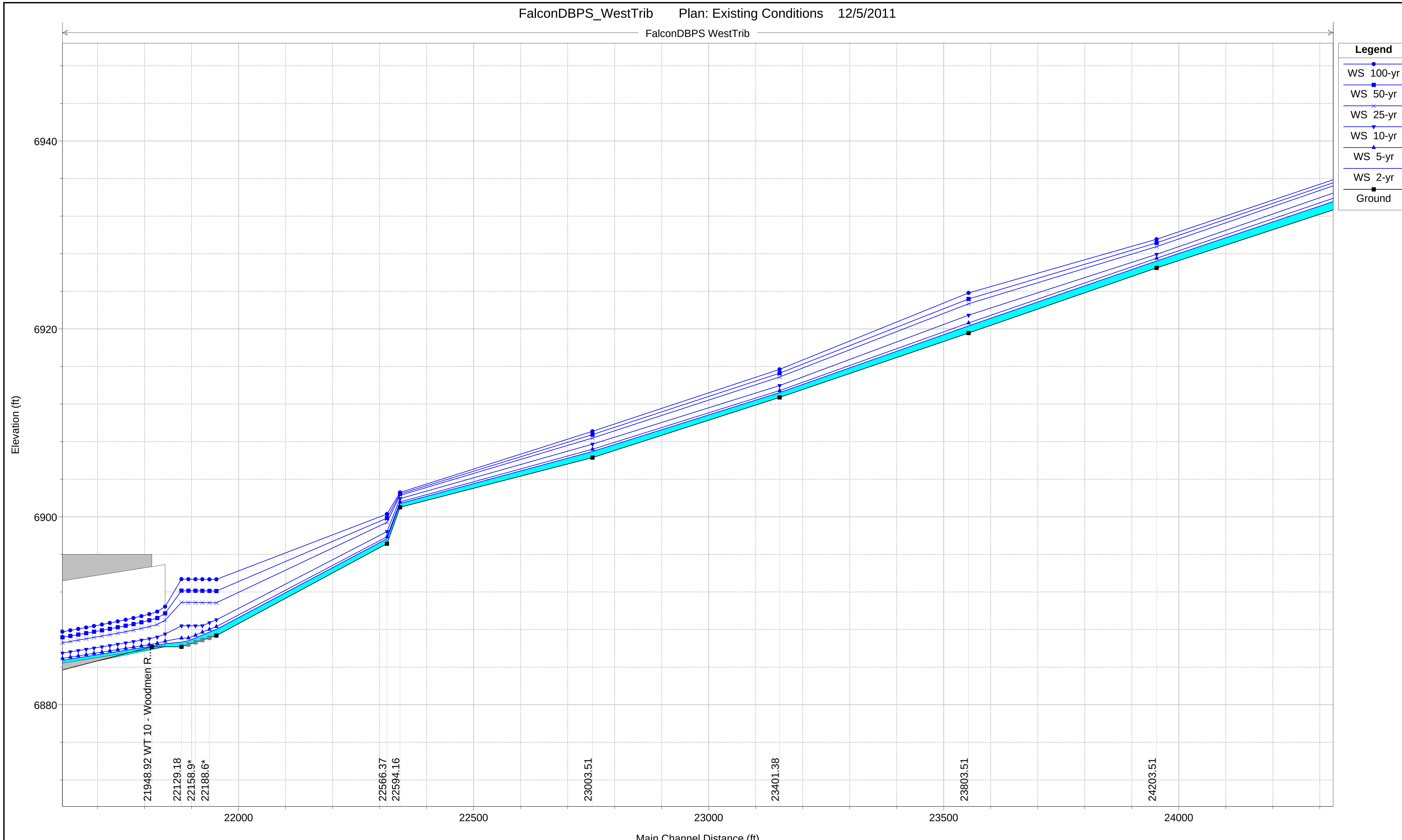
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



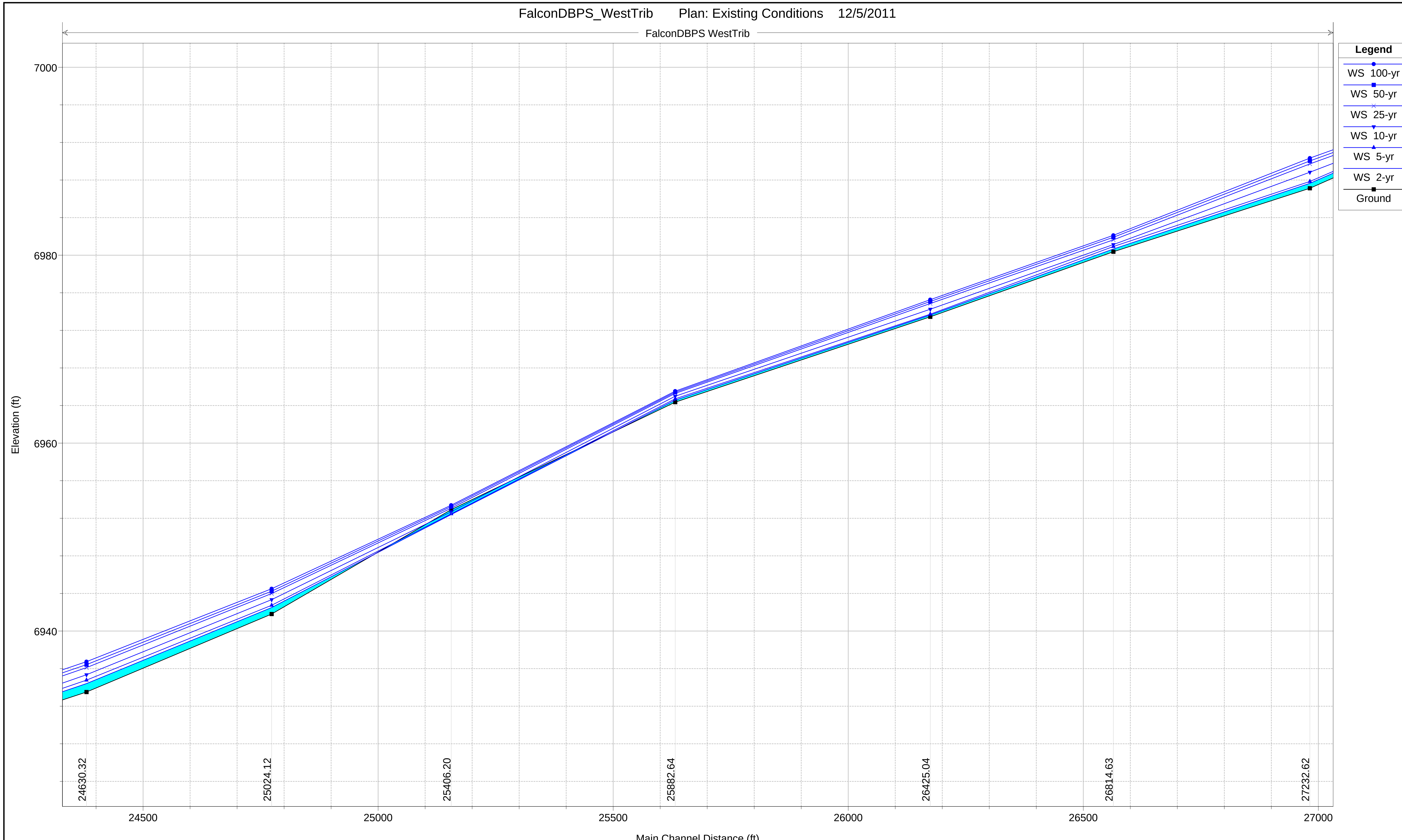
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



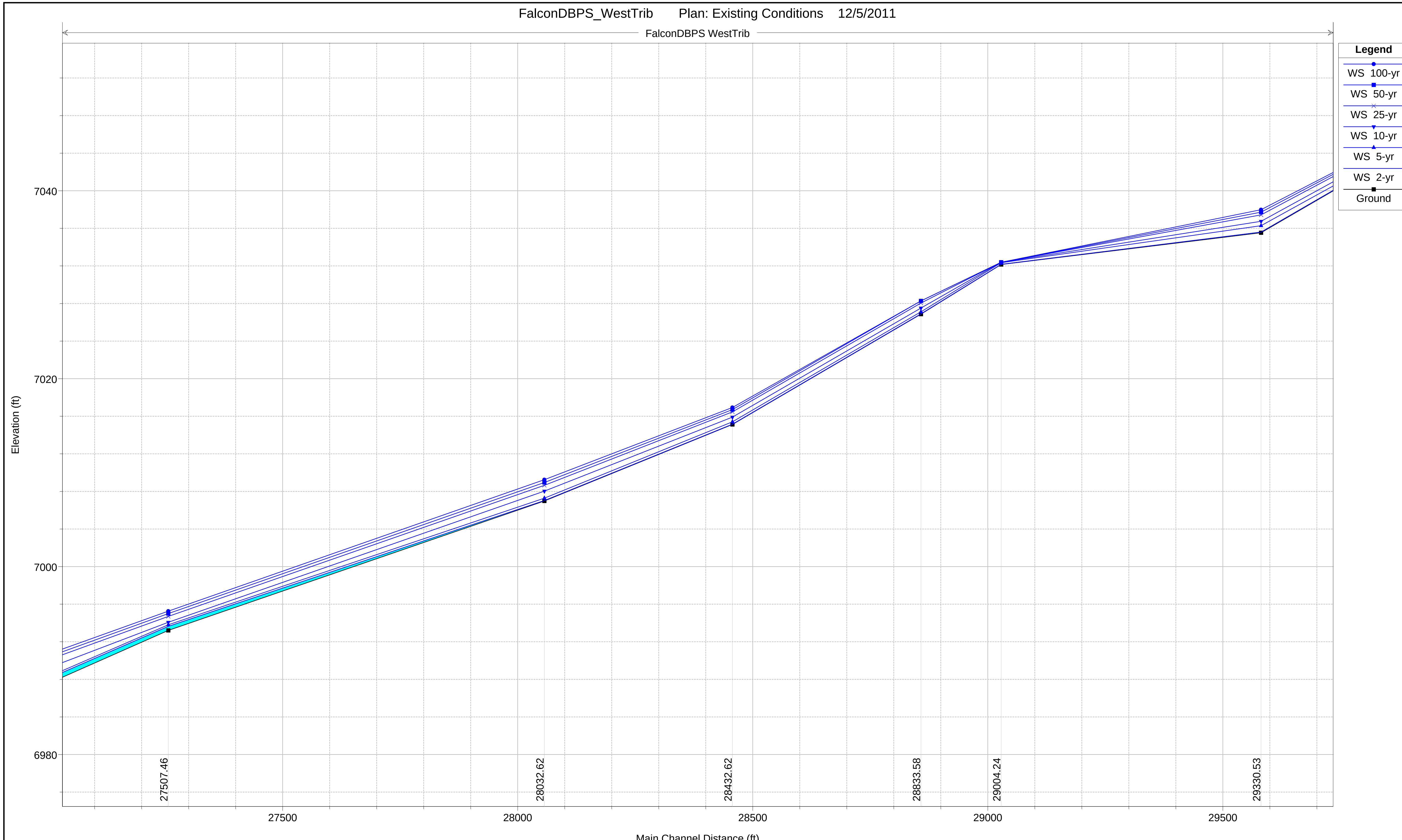
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



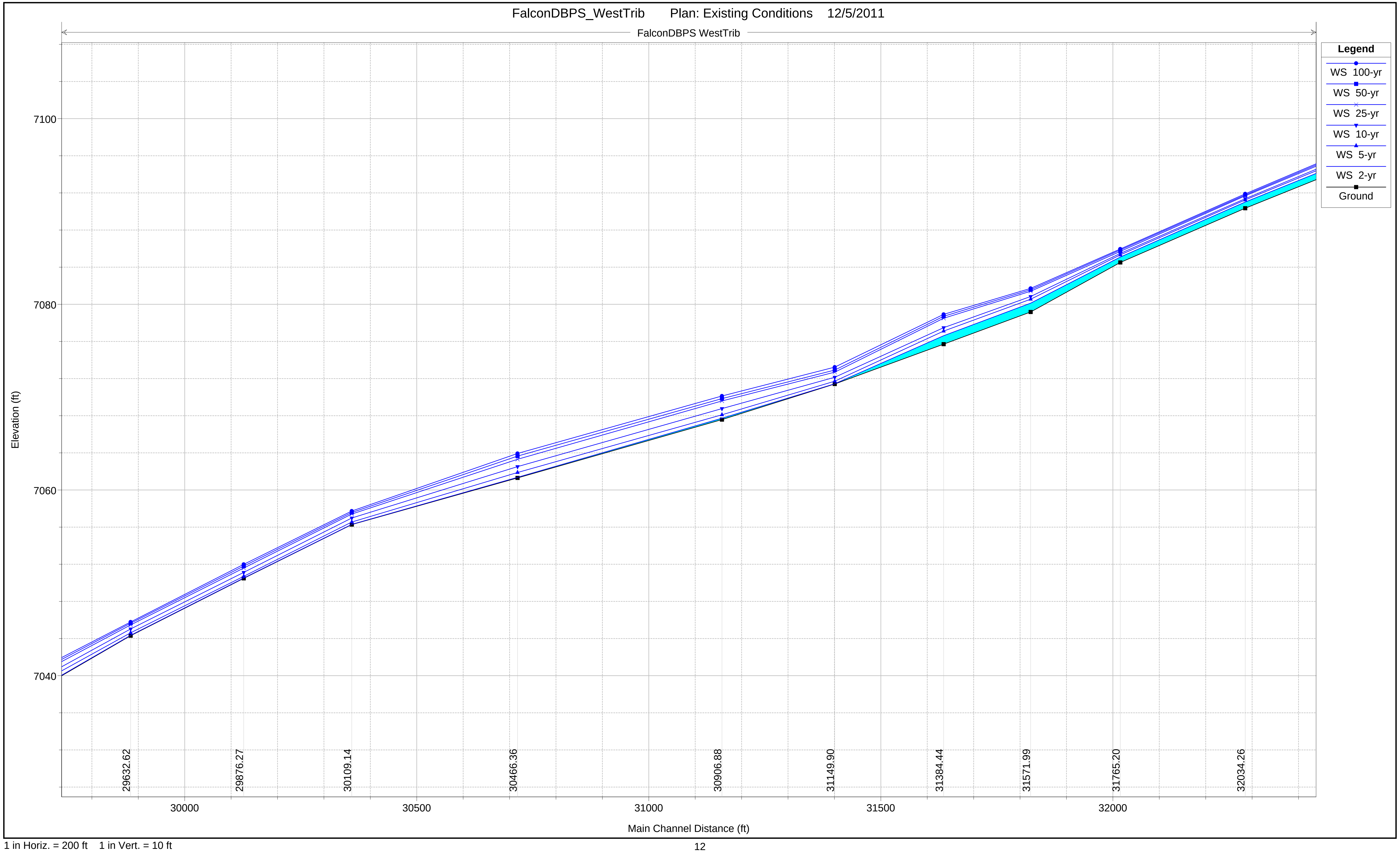
1 in Horiz. = 200 ft 1 in Vert. = 10 ft

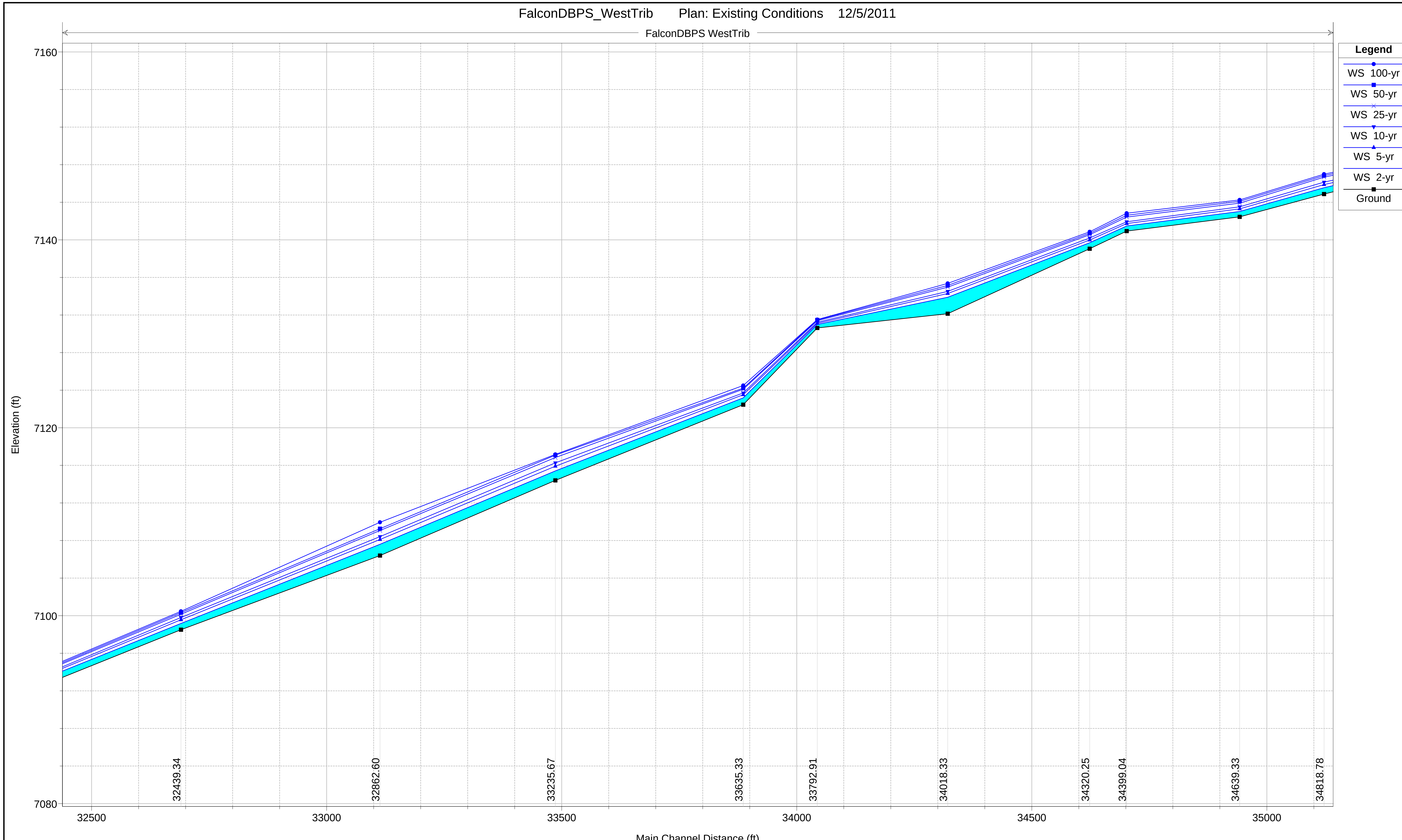


1 in Horiz. = 200 ft 1 in Vert. = 10 ft

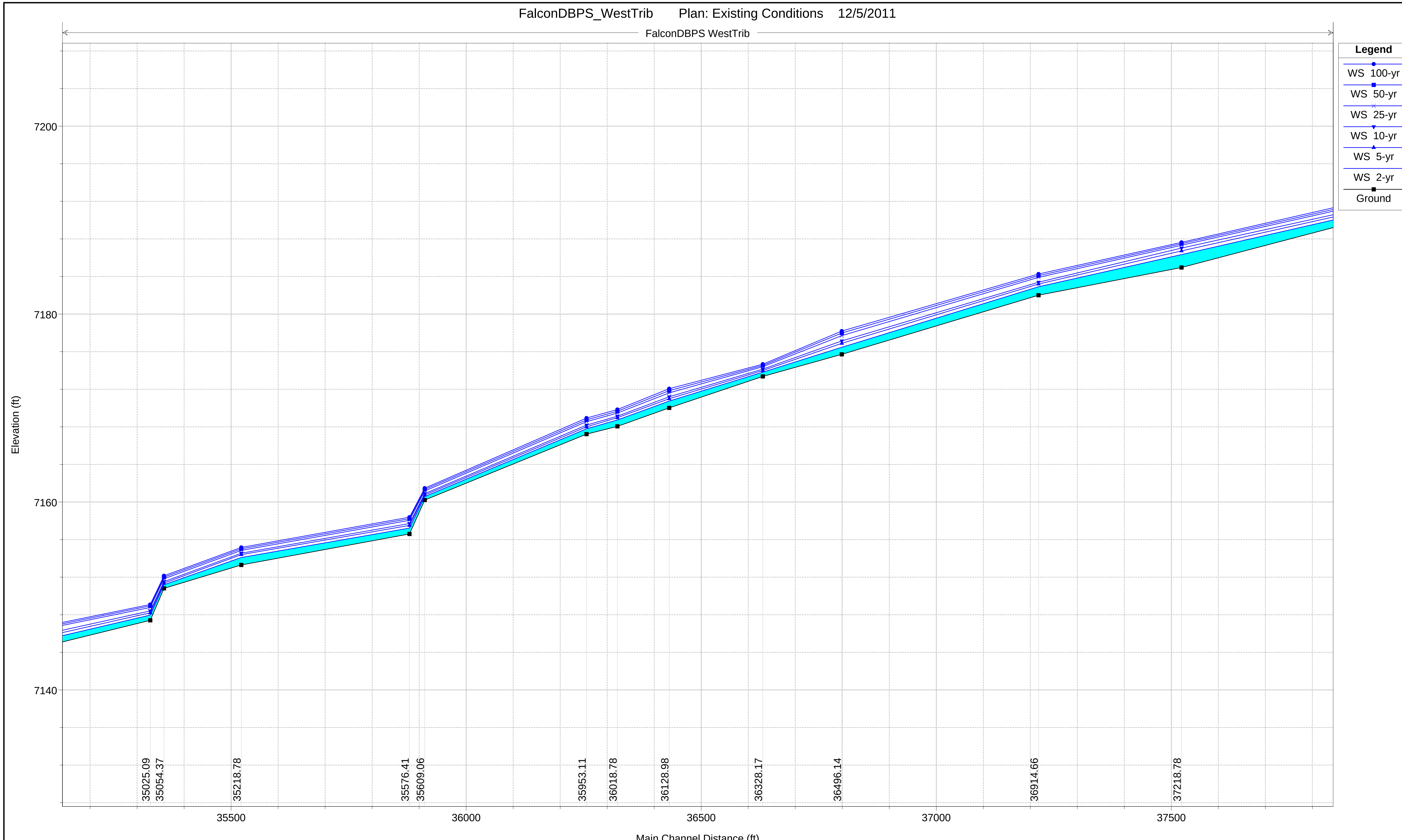


1 in Horiz. = 200 ft 1 in Vert. = 10 ft

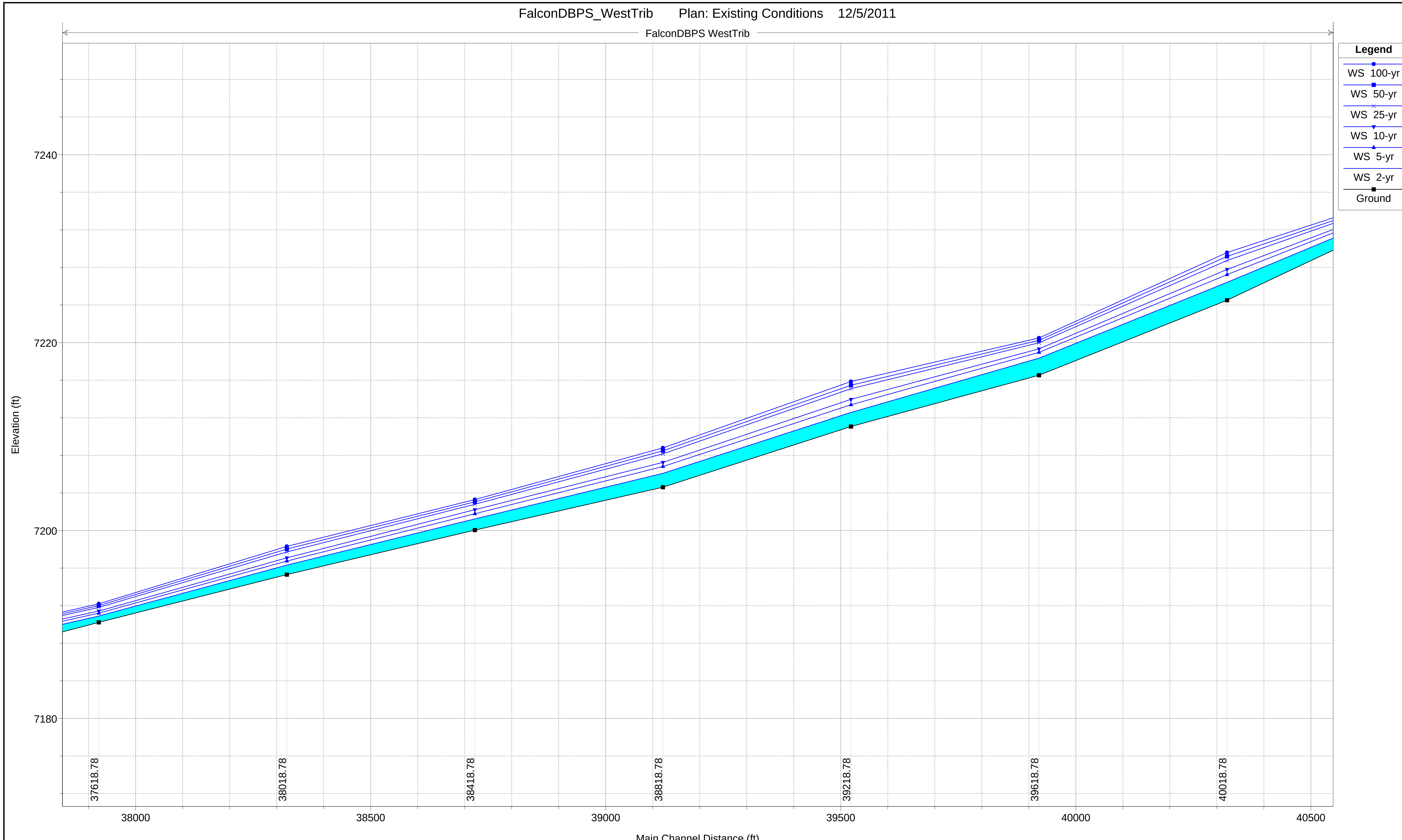

FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
FalconDBPS WestTrib
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Elevation (ft)
7100
7080
7060
7040
29632.62
29876.27
30109.14
30466.36
30906.88
31149.90
31384.44
31571.99
31765.20
32034.26
30000
30500
31000
31500
32000
Main Channel Distance (ft)
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



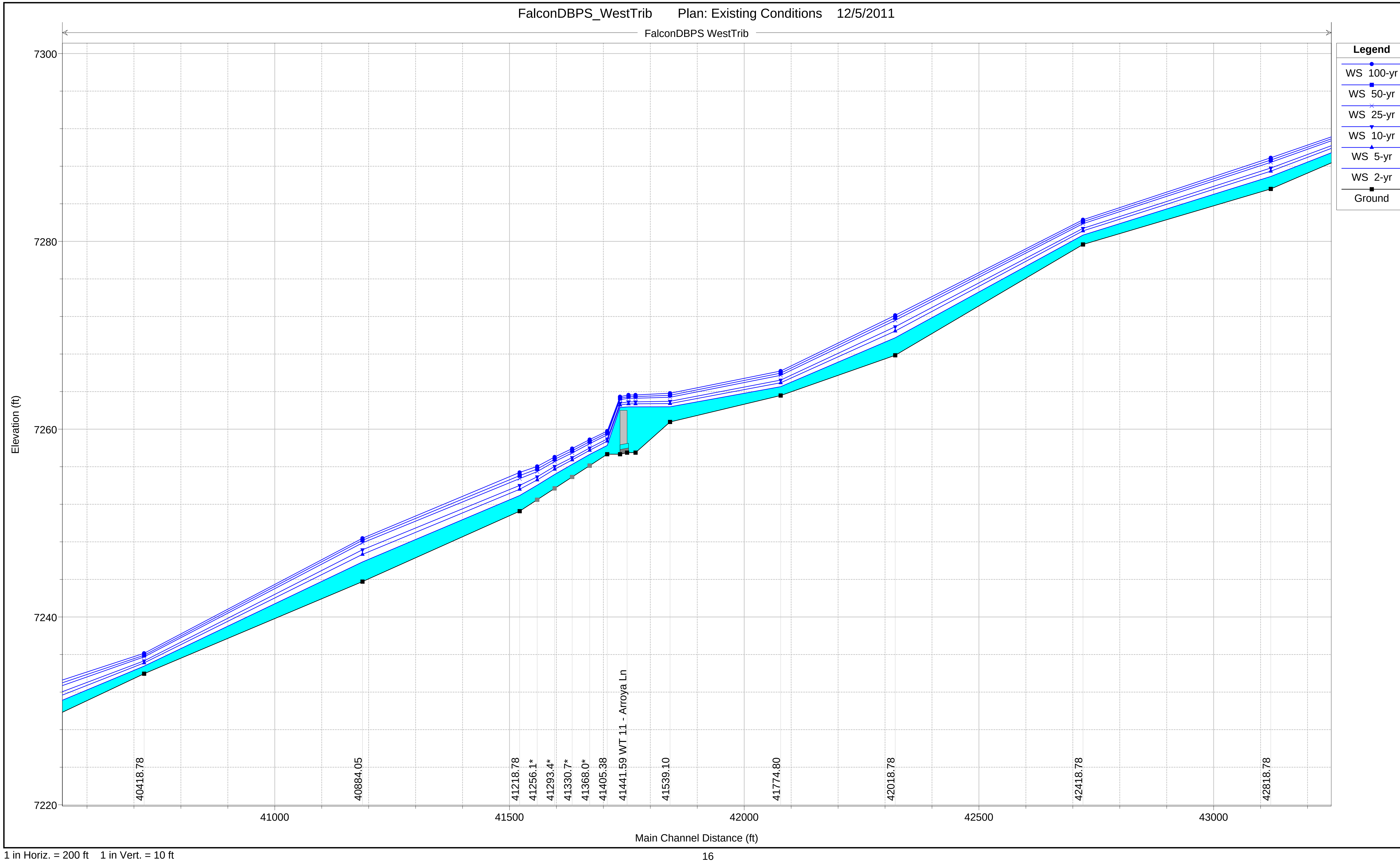
1 in Horiz. = 200 ft 1 in Vert. = 10 ft

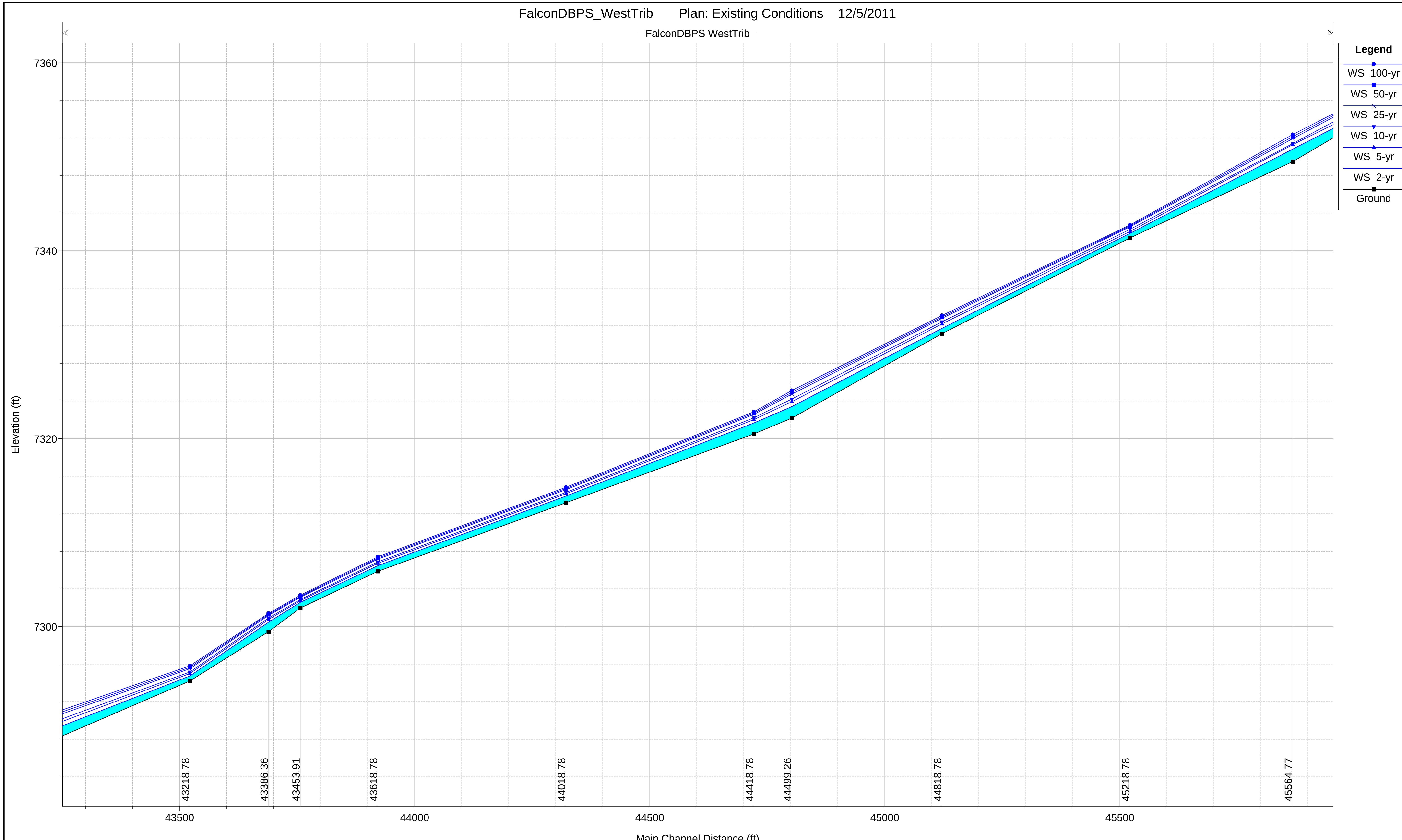


1 in Horiz. = 200 ft 1 in Vert. = 10 ft

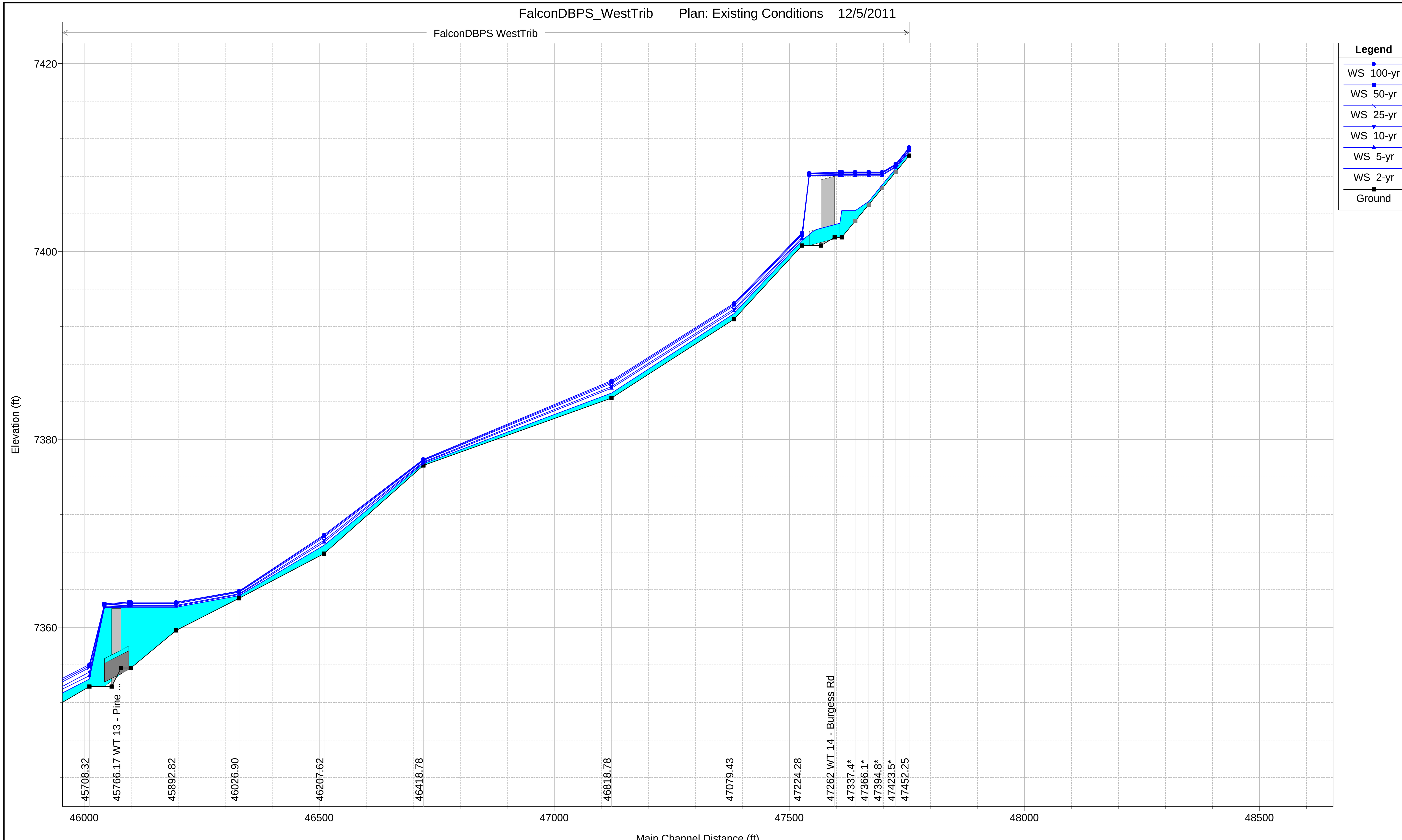


1 in Horiz. = 200 ft 1 in Vert. = 10 ft


FalconDBPS_WestTrib Plan: Existing Conditions 12/5/2011
FalconDBPS WestTrib
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Elevation (ft)
7300
7280
7260
7240
7220
40418.78
40884.05
41218.78
41256.1*
41293.4*
41330.7*
41368.0*
41405.38
41441.59 WT 11 - Arroya Ln
41539.10
41774.80
42018.78
42418.78
42818.78
41000
41500
42000
42500
43000
Main Channel Distance (ft)
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



1 in Horiz. = 200 ft 1 in Vert. = 10 ft



1 in Horiz. = 200 ft 1 in Vert. = 10 ft

West Tributary – Future Conditions

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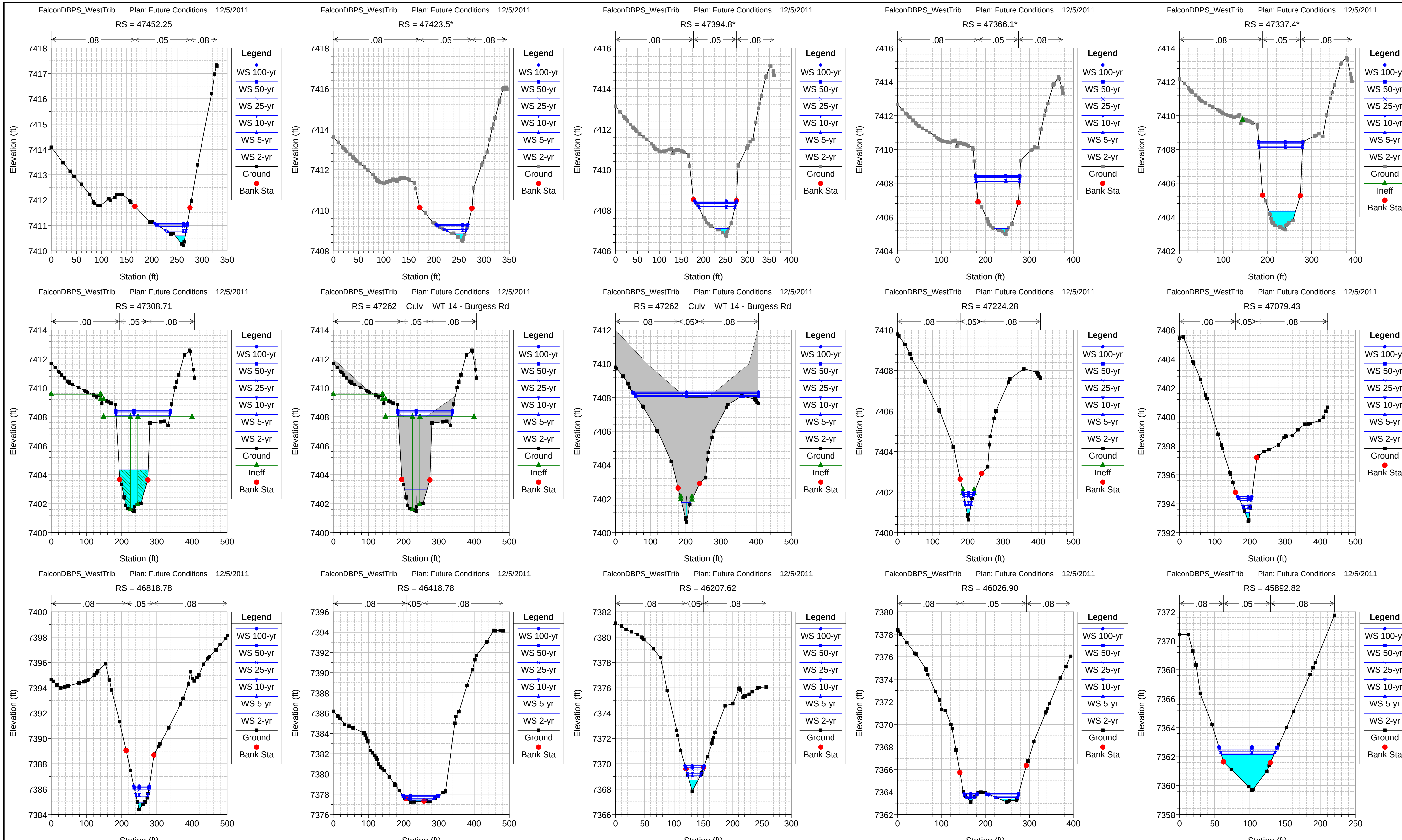
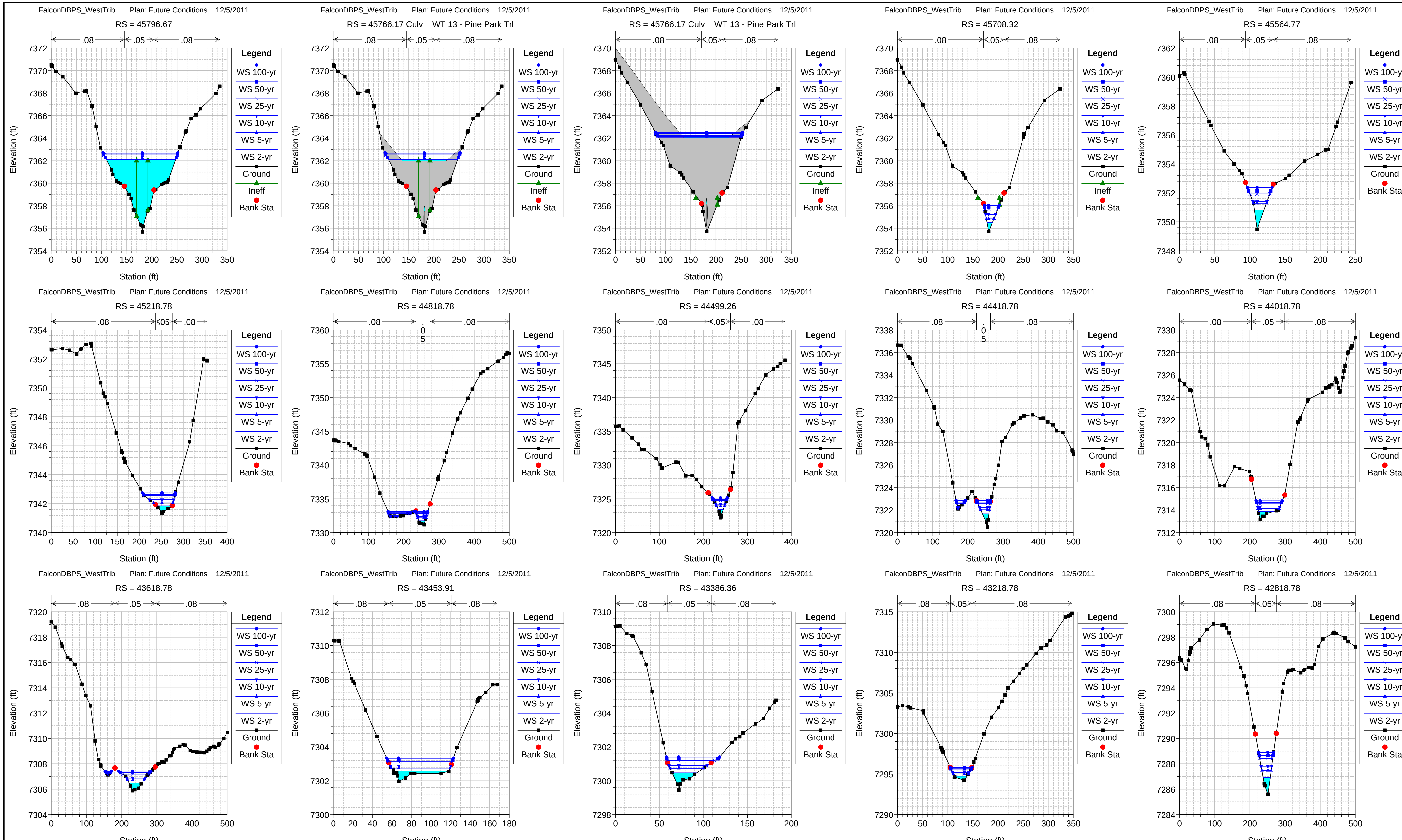
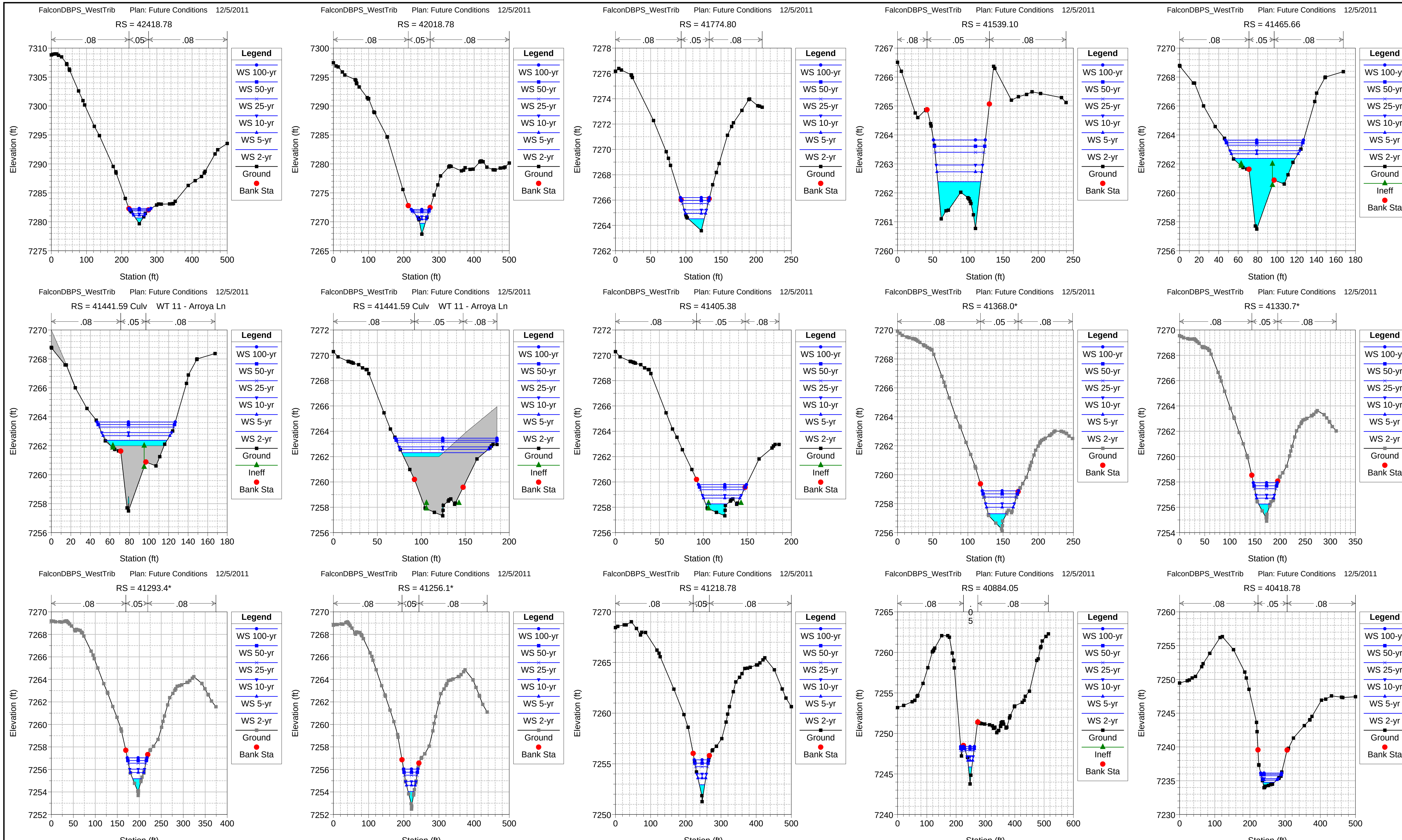
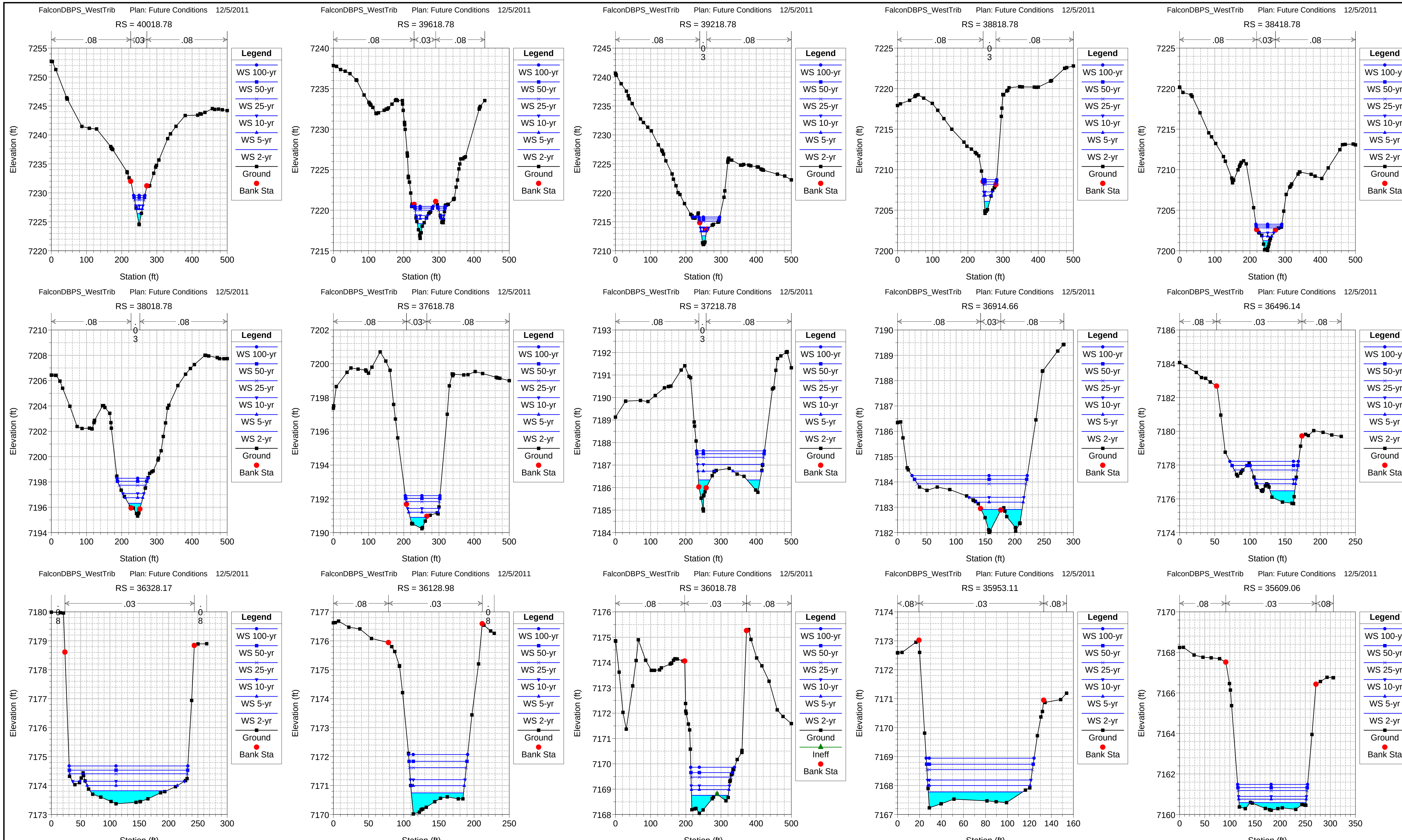
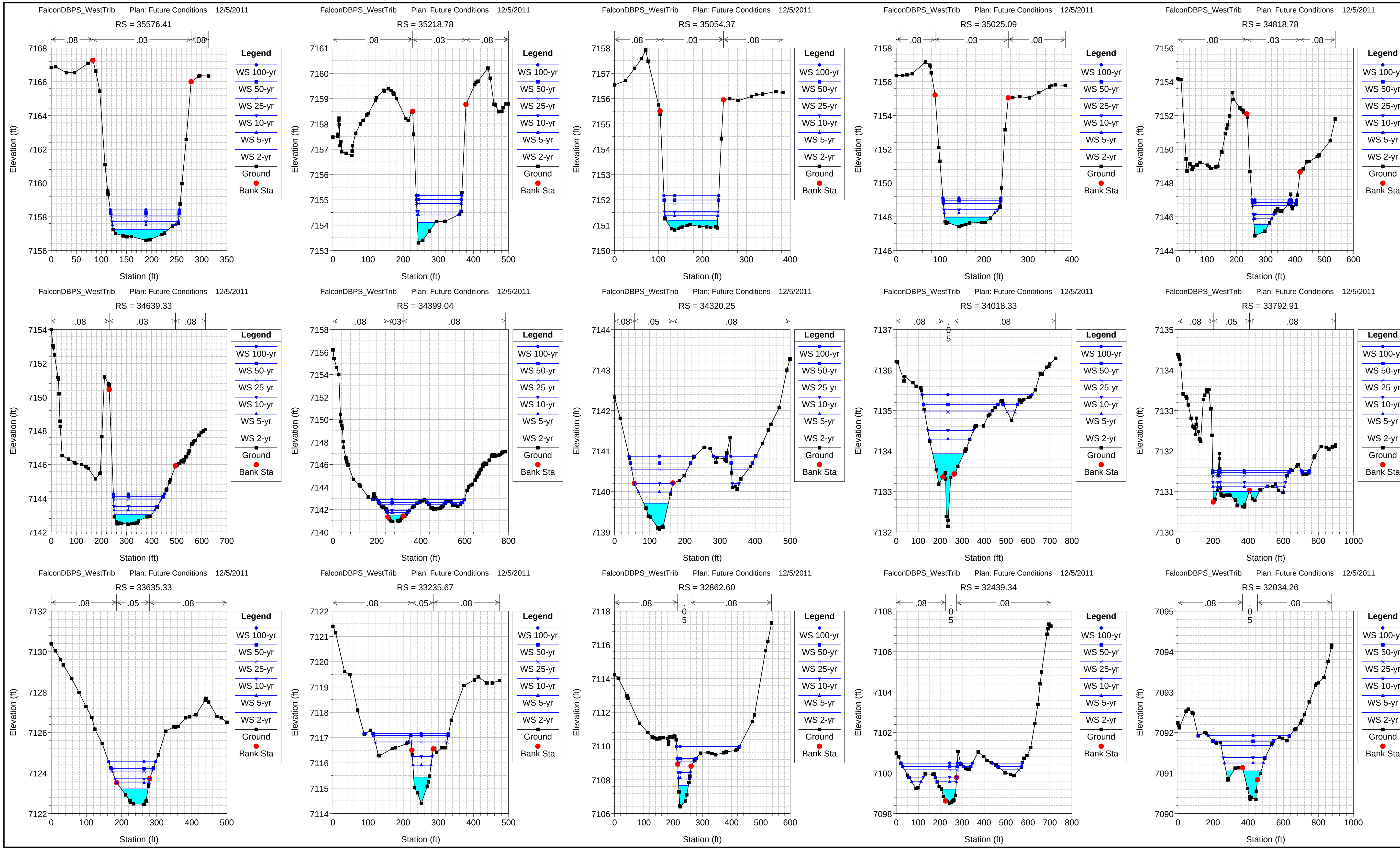

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47452.25
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47423.5*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47394.8*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47366.1*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47337.4*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47308.71
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47262 Culv WT 14 - Burgess Rd
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47262 Culv WT 14 - Burgess Rd
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47224.28
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 47079.43
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 46818.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 46418.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 46207.62
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 46026.90
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 45892.82
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

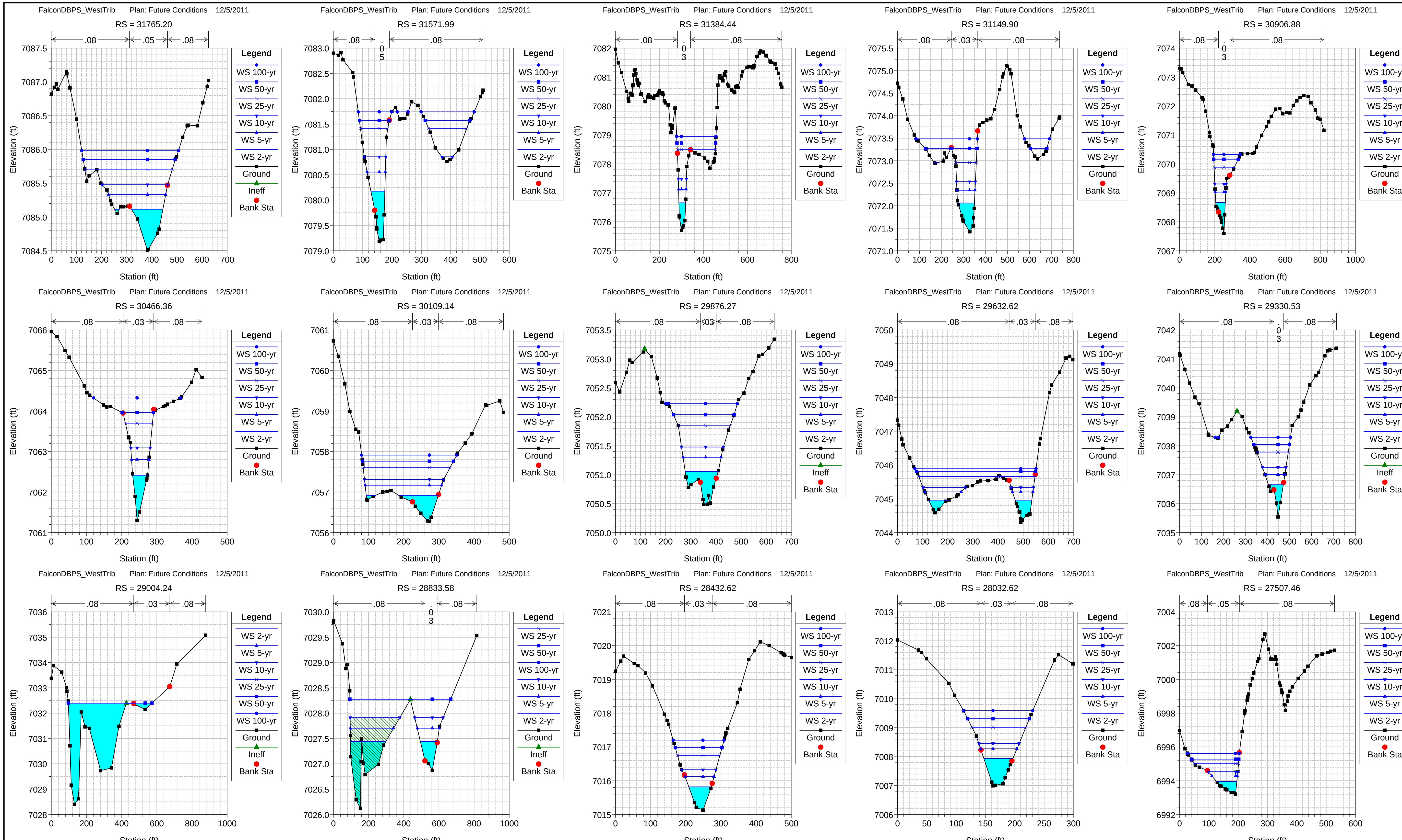

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 45796.67
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 45766.17 Culv WT 13 - Pine Park Trl
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 45766.17 Culv WT 13 - Pine Park Trl
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 45708.32
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 45564.77
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 45218.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 44818.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 44499.26
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 44418.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 44018.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 43618.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 43453.91
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 43386.36
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 43218.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 42818.78
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

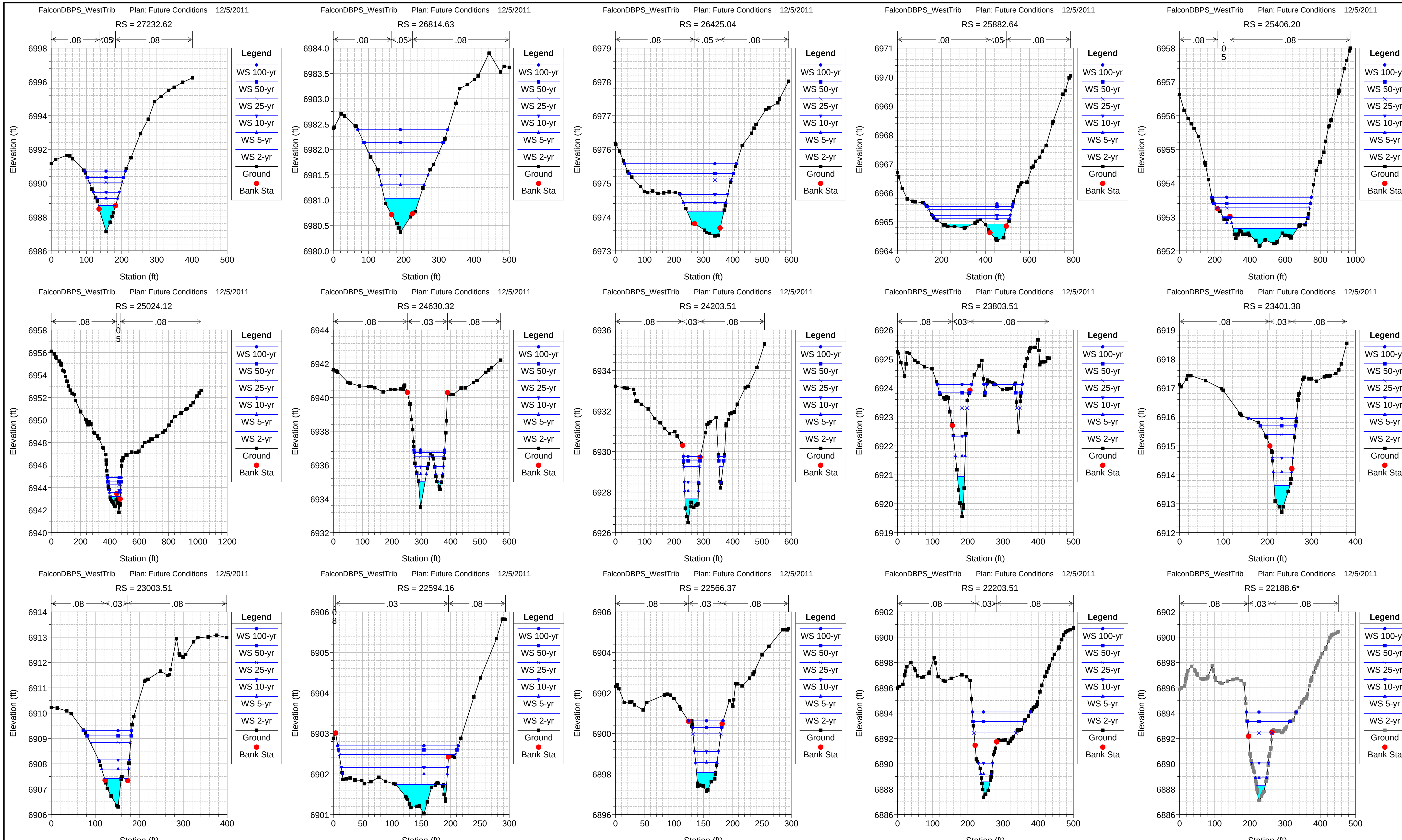


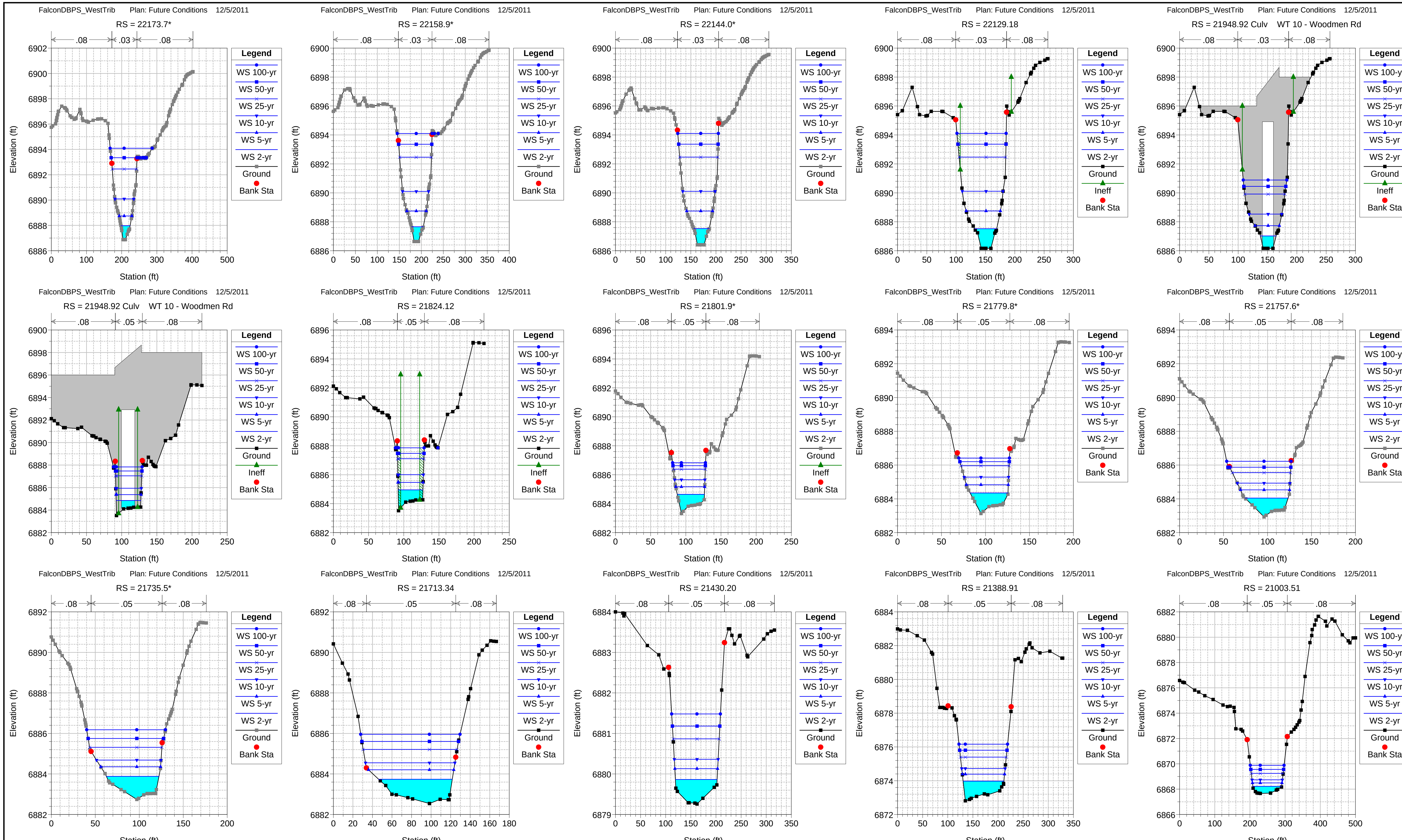
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 42418.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 42018.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41774.80
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41539.10
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41465.66
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41441.59 Culv WT 11 - Arroya Ln
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41441.59 Culv WT 11 - Arroya Ln
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41405.38
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41368.0*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41330.7*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41293.4*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41256.1*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 41218.78
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 40884.05
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 40418.78
.08
.05
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta

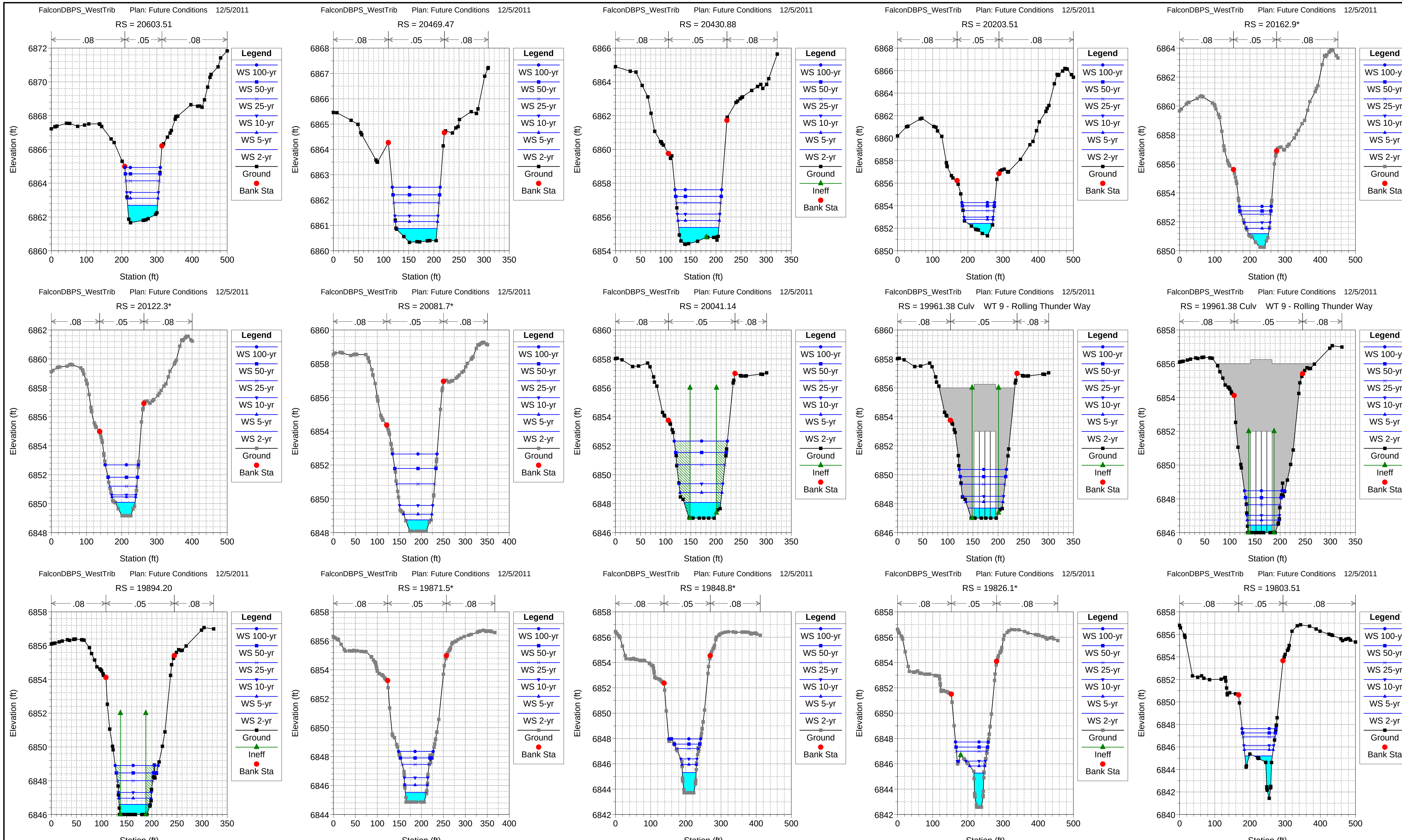

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 40018.78
RS = 39618.78
RS = 39218.78
RS = 38818.78
RS = 38418.78
RS = 38018.78
RS = 37618.78
RS = 37218.78
RS = 36914.66
RS = 36496.14
RS = 36328.17
RS = 36128.98
RS = 36018.78
RS = 35953.11
RS = 35609.06
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

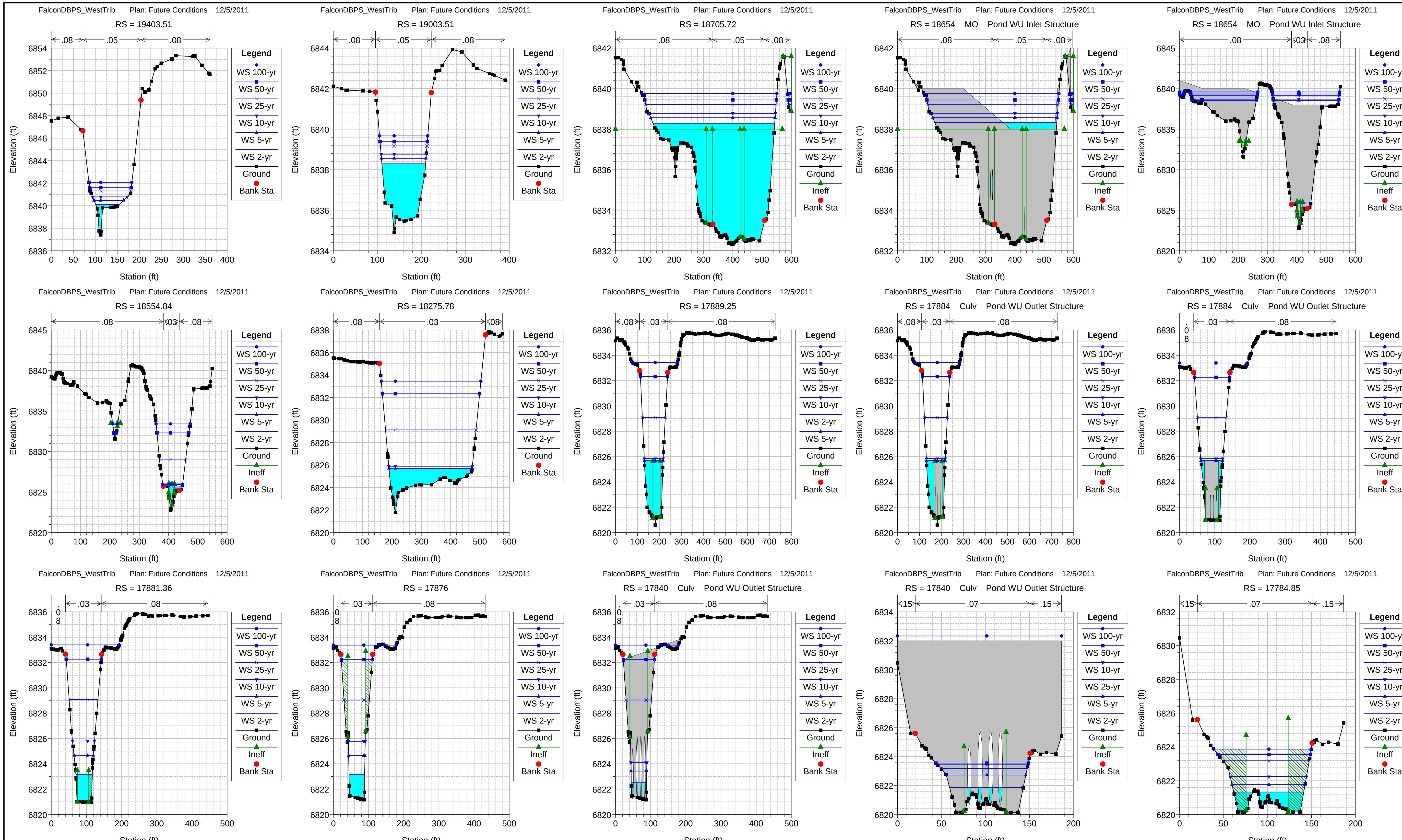

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 35576.41
.08 .03 .08
RS = 35218.78
.08 .03 .08
RS = 35054.37
.08 .03 .08
RS = 35025.09
.08 .03 .08
RS = 34818.78
.08 .03 .08
RS = 34639.33
.08 .03 .08
RS = 34399.04
.08 .03 .08
RS = 34320.25
.08 .05 .08
RS = 34018.33
.08 0 5 .08
RS = 33792.91
.08 .05 .08
RS = 33635.33
.08 .05 .08
RS = 33235.67
.08 .05 .08
RS = 32862.60
.08 0 5 .08
RS = 32439.34
.08 0 5 .08
RS = 32034.26
.08 0 5 .08
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)

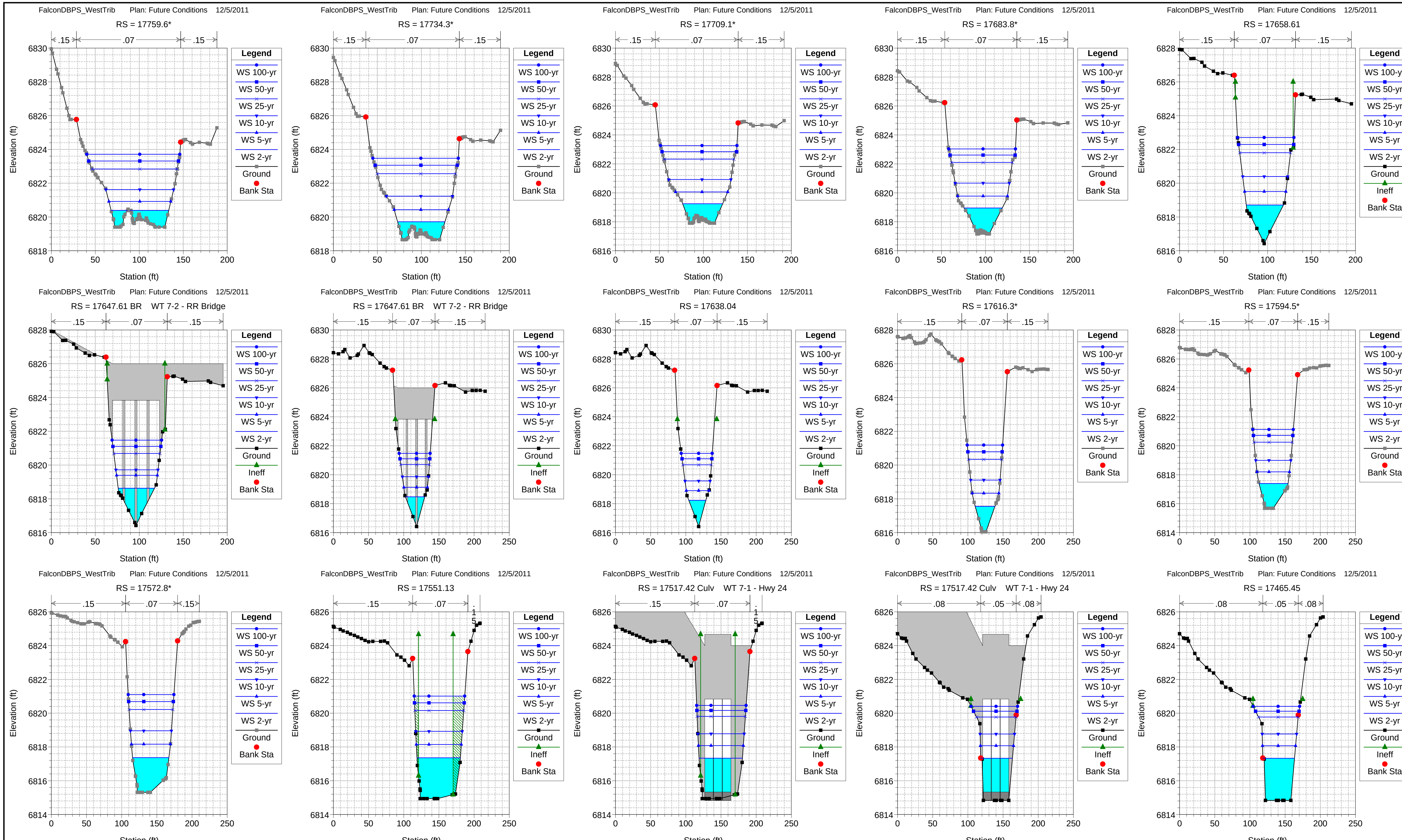

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 31765.20
RS = 31571.99
RS = 31384.44
RS = 31149.90
RS = 30906.88
RS = 30466.36
RS = 30109.14
RS = 29876.27
RS = 29632.62
RS = 29330.53
RS = 29004.24
RS = 28833.58
RS = 28432.62
RS = 28032.62
RS = 27507.46
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

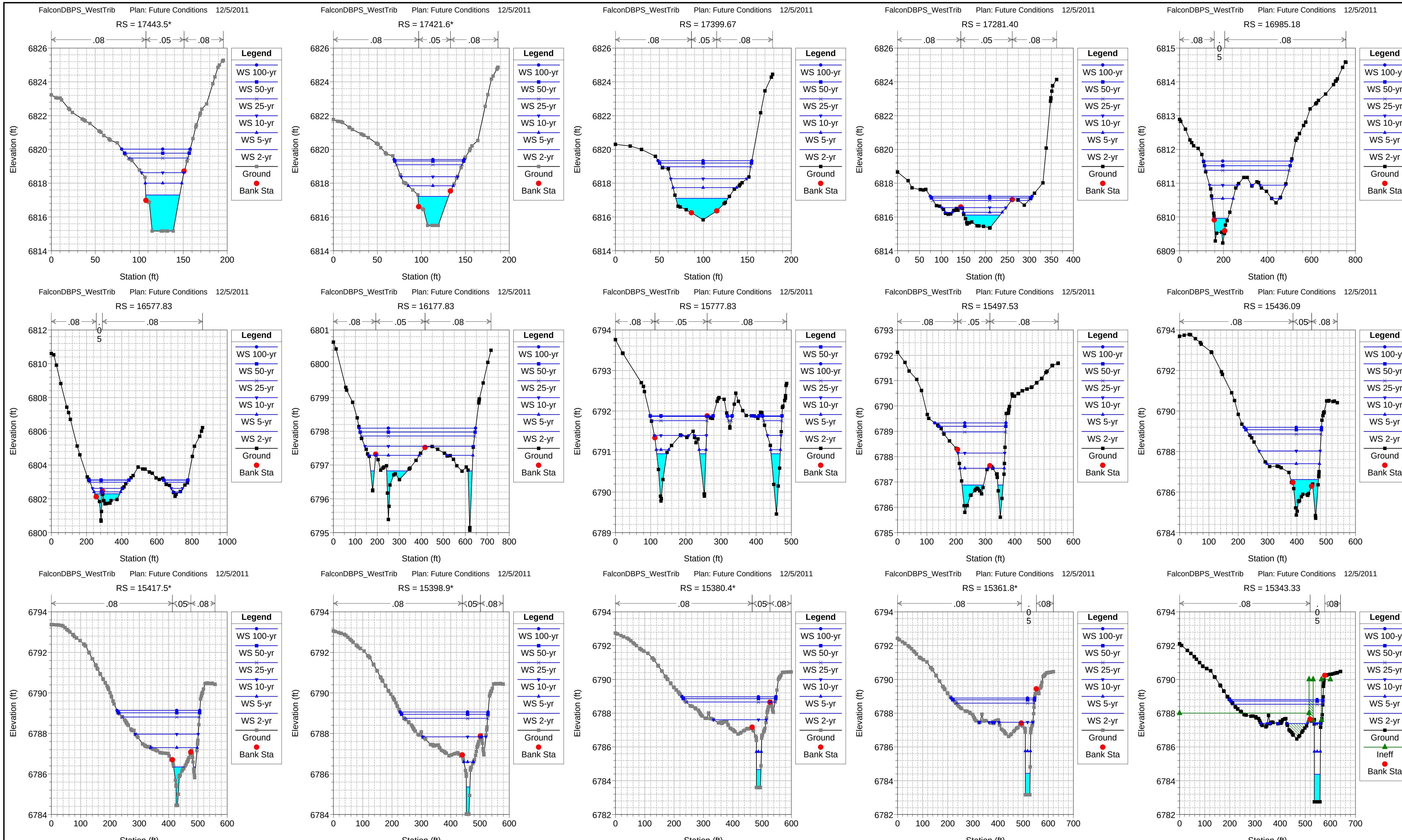

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 27232.62
RS = 26814.63
RS = 26425.04
RS = 25882.64
RS = 25406.20
RS = 25024.12
RS = 24630.32
RS = 24203.51
RS = 23803.51
RS = 23401.38
RS = 23003.51
RS = 22594.16
RS = 22566.37
RS = 22203.51
RS = 22188.6*
.08
.05
.03
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta

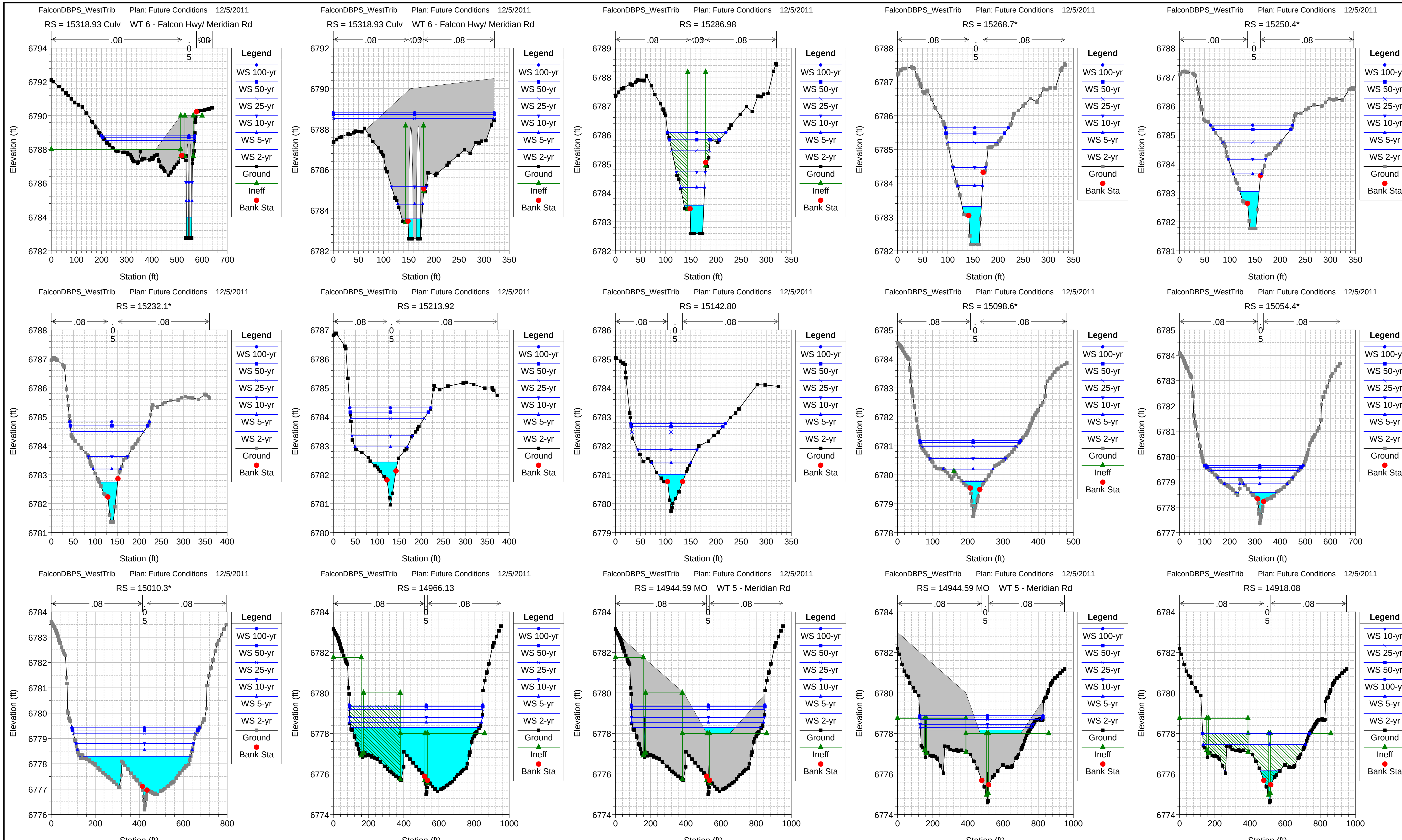

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 22173.7*
RS = 22158.9*
RS = 22144.0*
RS = 22129.18
RS = 21948.92 Culv WT 10 - Woodmen Rd
RS = 21948.92 Culv WT 10 - Woodmen Rd
RS = 21824.12
RS = 21801.9*
RS = 21779.8*
RS = 21757.6*
RS = 21735.5*
RS = 21713.34
RS = 21430.20
RS = 21388.91
RS = 21003.51
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
.08
.03
.05


FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 20603.51
RS = 20469.47
RS = 20430.88
RS = 20203.51
RS = 20162.9*
RS = 20122.3*
RS = 20081.7*
RS = 20041.14
RS = 19961.38 Culv WT 9 - Rolling Thunder Way
RS = 19894.20
RS = 19871.5*
RS = 19848.8*
RS = 19826.1*
RS = 19803.51
.08
.05
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

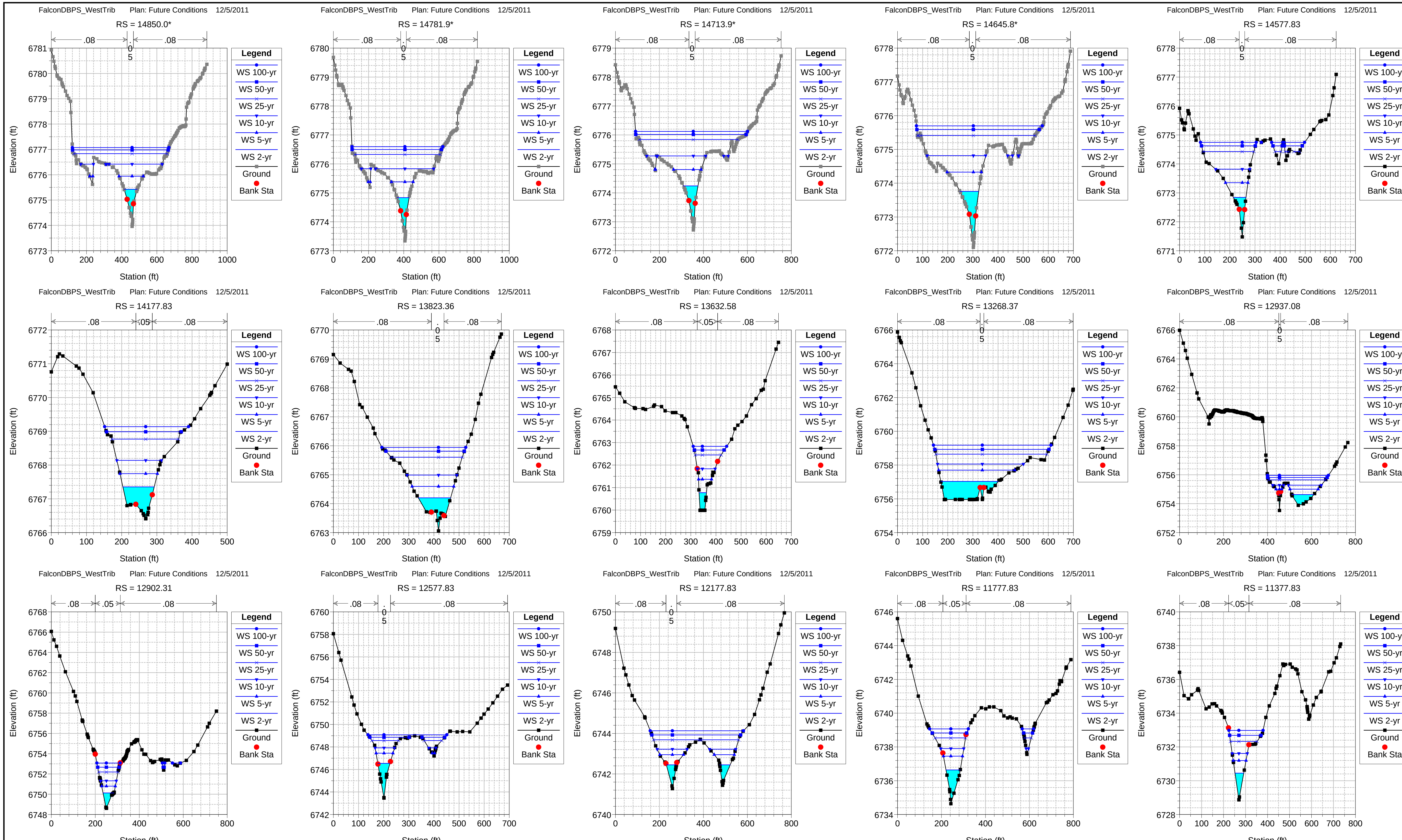

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 19403.51
RS = 19003.51
RS = 18705.72
RS = 18654 MO Pond WU Inlet Structure
RS = 18554.84
RS = 18275.78
RS = 17889.25
RS = 17884 Culv Pond WU Outlet Structure
RS = 17881.36
RS = 17876
RS = 17840 Culv Pond WU Outlet Structure
RS = 17784.85
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

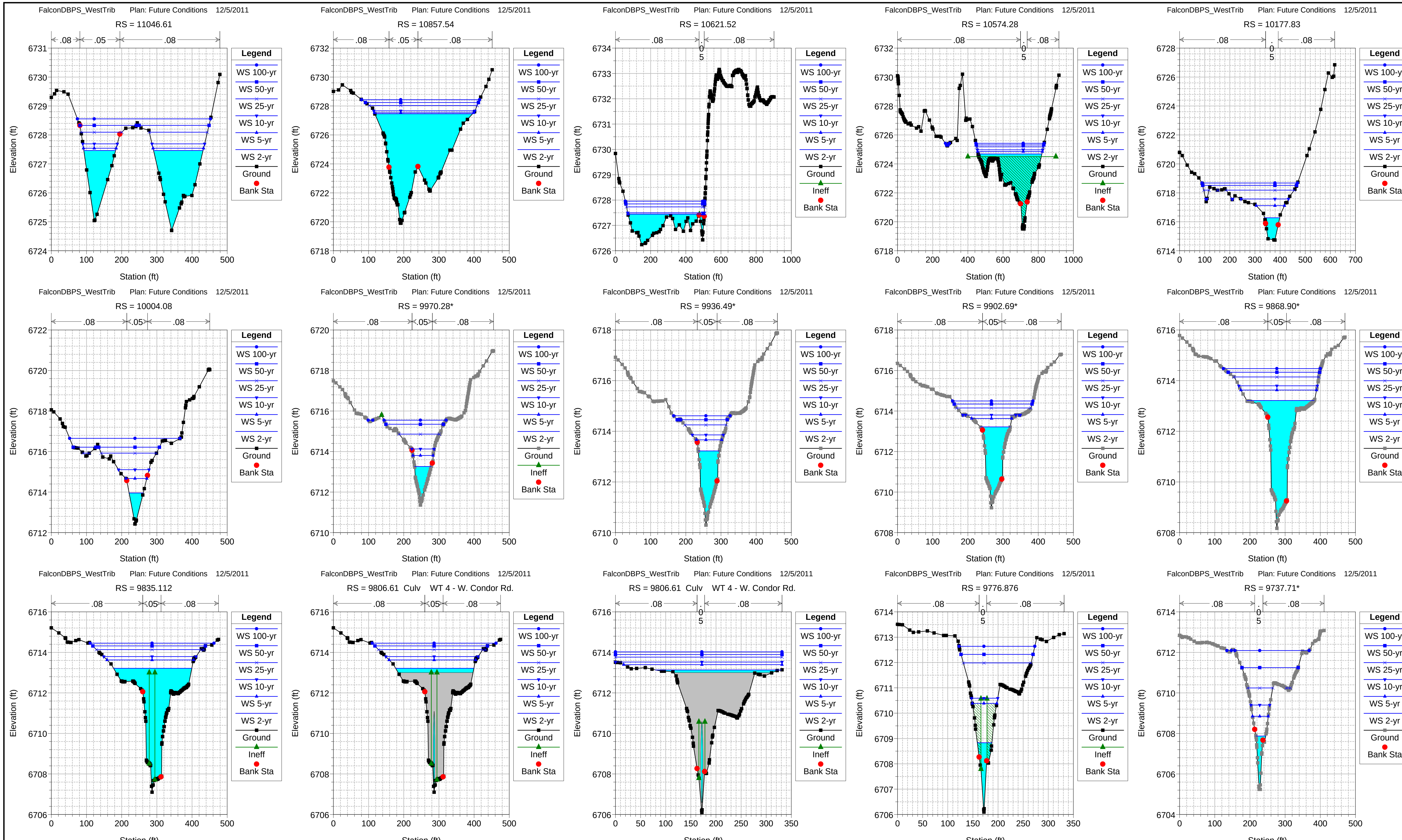

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17759.6*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17734.3*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17709.1*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17683.8*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17658.61
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17647.61 BR WT 7-2 - RR Bridge
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17647.61 BR WT 7-2 - RR Bridge
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17638.04
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17616.3*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17594.5*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17572.8*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17551.13
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17517.42 Culv WT 7-1 - Hwy 24
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17517.42 Culv WT 7-1 - Hwy 24
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17465.45
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 17443.5*
RS = 17421.6*
RS = 17399.67
RS = 17281.40
RS = 16985.18
RS = 16577.83
RS = 16177.83
RS = 15777.83
RS = 15497.53
RS = 15436.09
RS = 15417.5*
RS = 15398.9*
RS = 15380.4*
RS = 15361.8*
RS = 15343.33
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

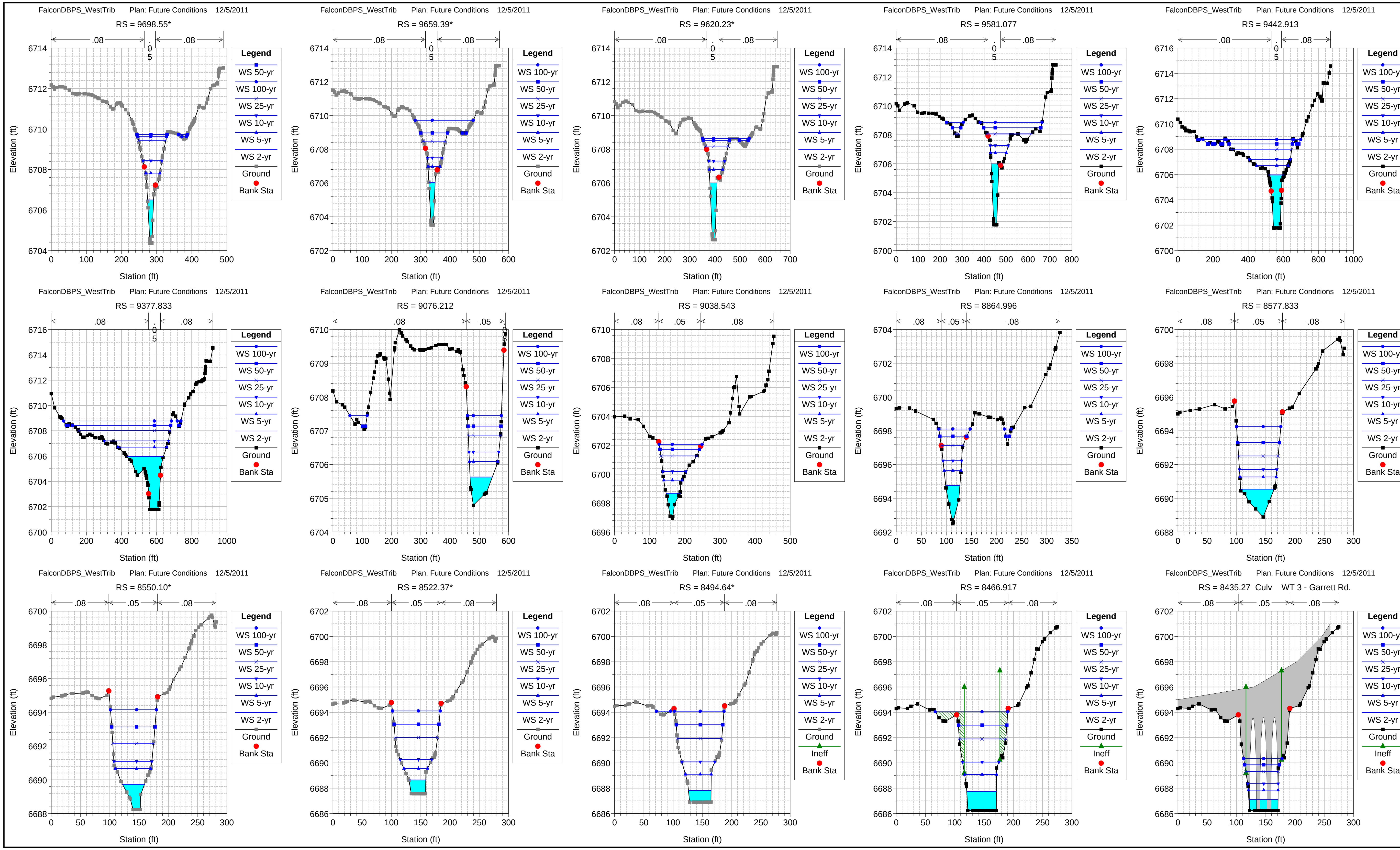


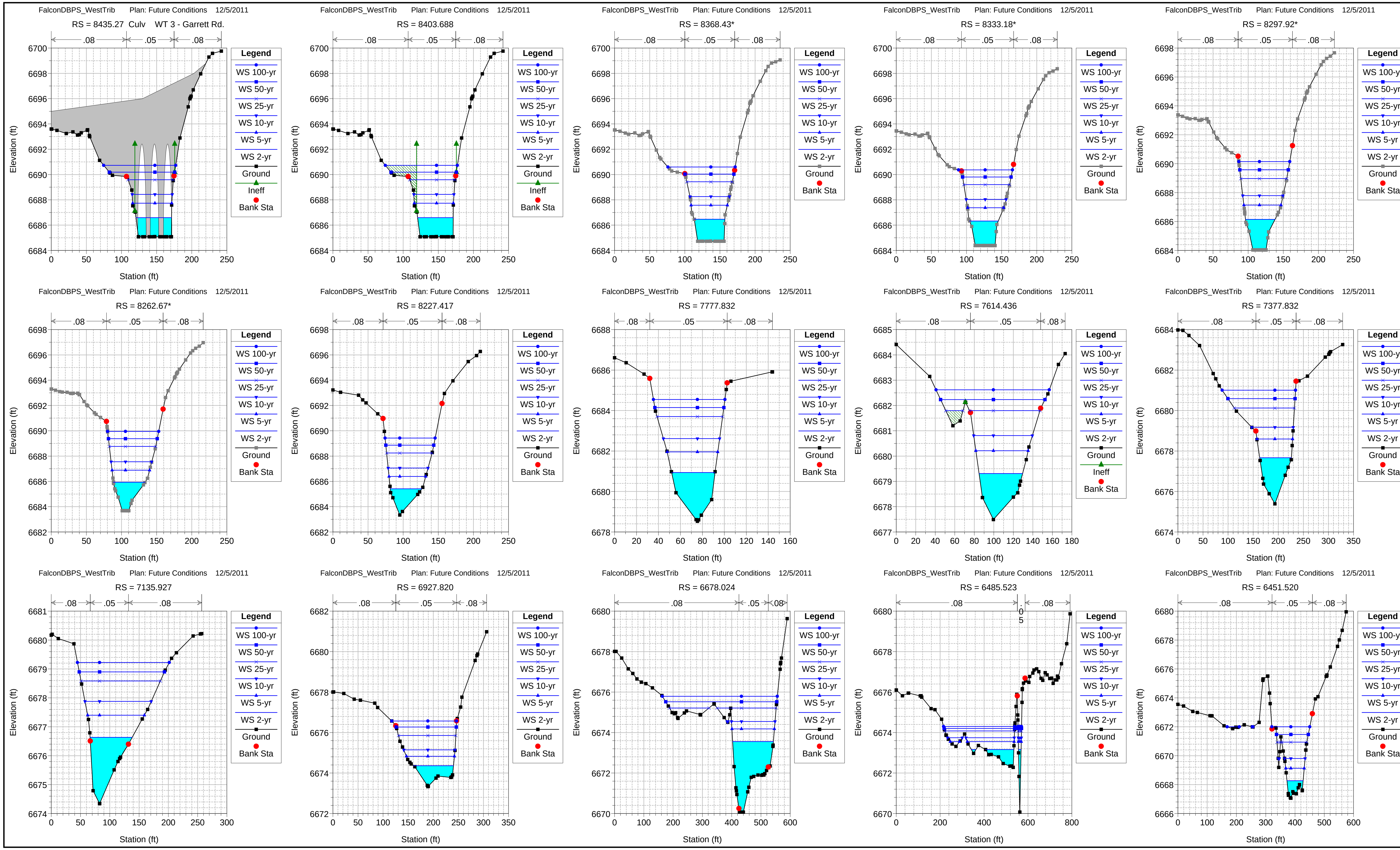
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15318.93 Culv WT 6 - Falcon Hwy/ Meridian Rd
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15318.93 Culv WT 6 - Falcon Hwy/ Meridian Rd
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15286.98
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15268.7*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15250.4*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15232.1*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15213.92
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15142.80
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15098.6*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15054.4*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 15010.3*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 14966.13
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 14944.59 MO WT 5 - Meridian Rd
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 14944.59 MO WT 5 - Meridian Rd
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 14918.08
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

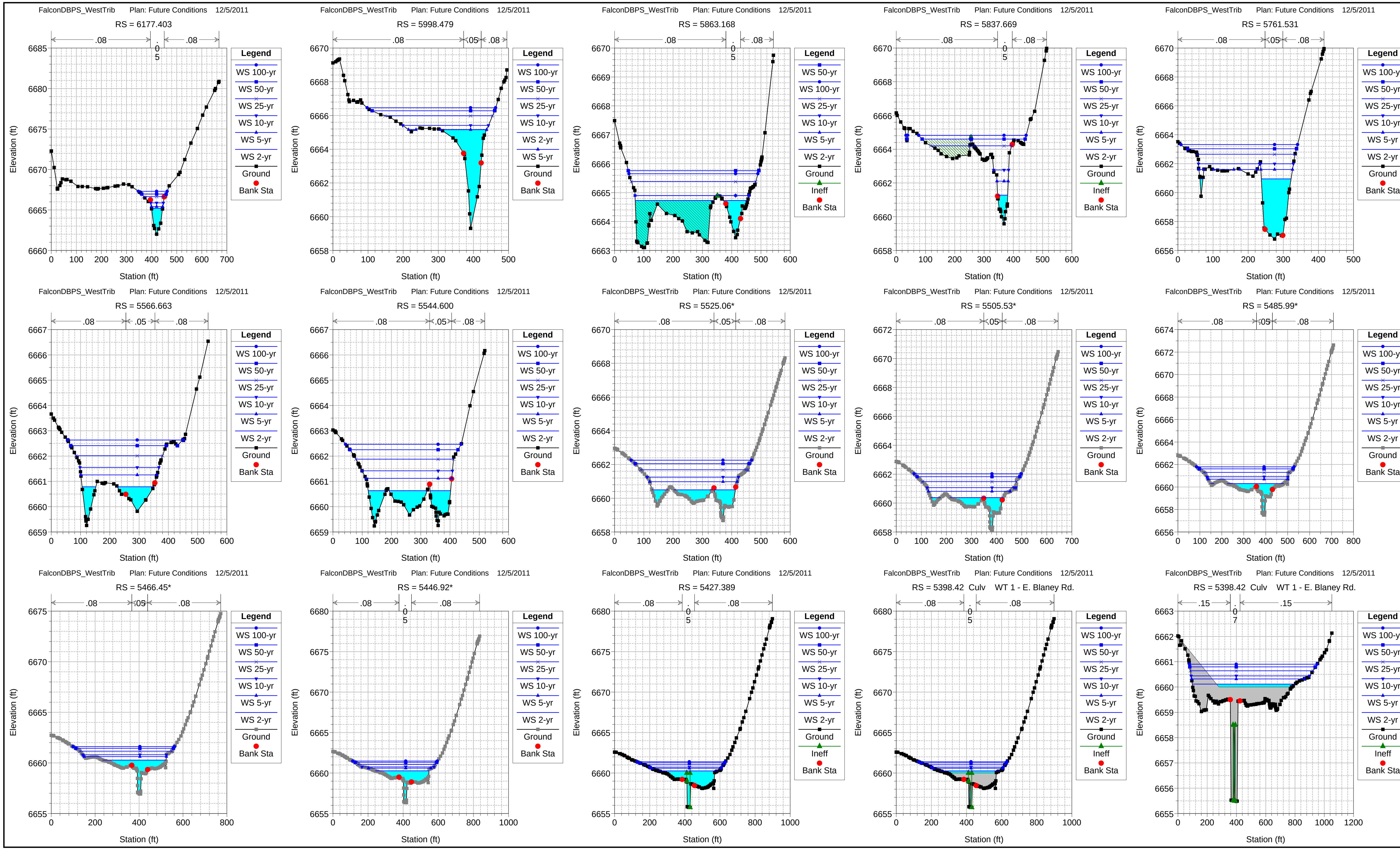

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 14850.0*
RS = 14781.9*
RS = 14713.9*
RS = 14645.8*
RS = 14577.83
RS = 14177.83
RS = 13823.36
RS = 13632.58
RS = 13268.37
RS = 12937.08
RS = 12902.31
RS = 12577.83
RS = 12177.83
RS = 11777.83
RS = 11377.83
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)



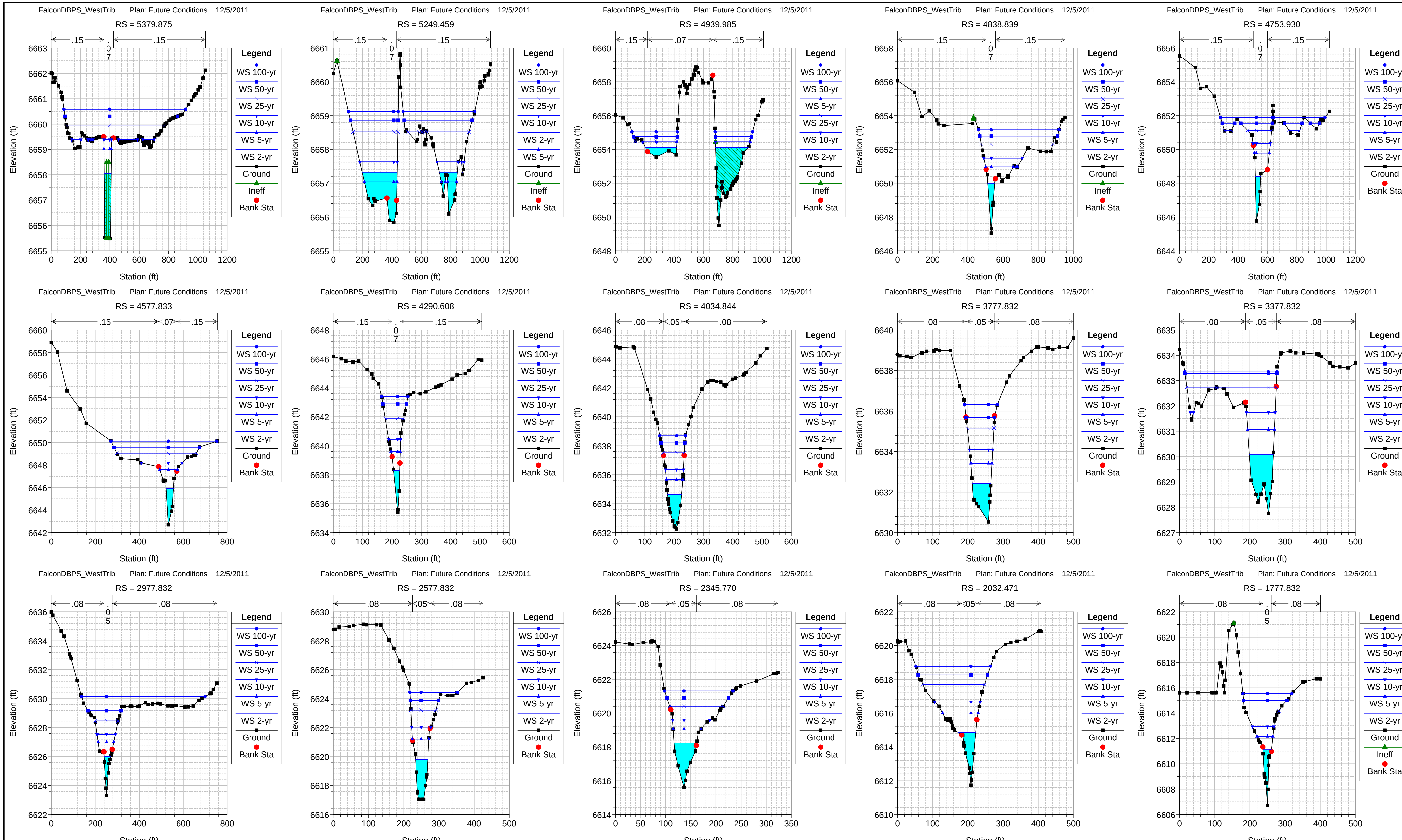
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 11046.61
RS = 10857.54
RS = 10621.52
RS = 10574.28
RS = 10177.83
RS = 10004.08
RS = 9970.28*
RS = 9936.49*
RS = 9902.69*
RS = 9868.90*
RS = 9835.112
RS = 9806.61 Culv WT 4 - W. Condor Rd.
RS = 9806.61 Culv WT 4 - W. Condor Rd.
RS = 9776.876
RS = 9737.71*
.08
.05
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

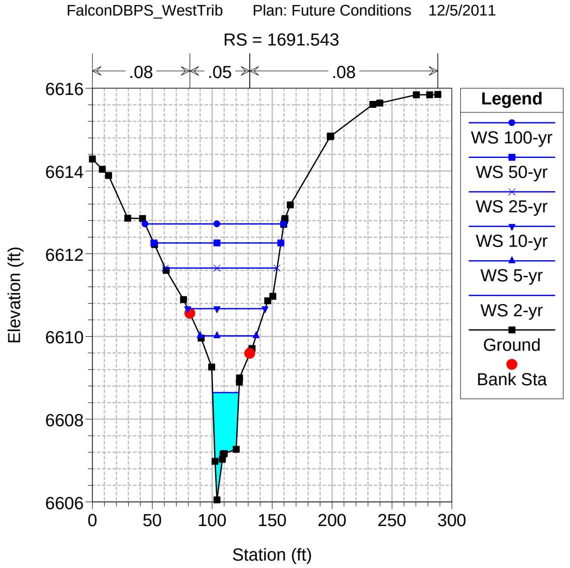

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 9698.55*
RS = 9659.39*
RS = 9620.23*
RS = 9581.077
RS = 9442.913
RS = 9377.833
RS = 9076.212
RS = 9038.543
RS = 8864.996
RS = 8577.833
RS = 8550.10*
RS = 8522.37*
RS = 8494.64*
RS = 8466.917
RS = 8435.27 Culv WT 3 - Garrett Rd.
.08
.05
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

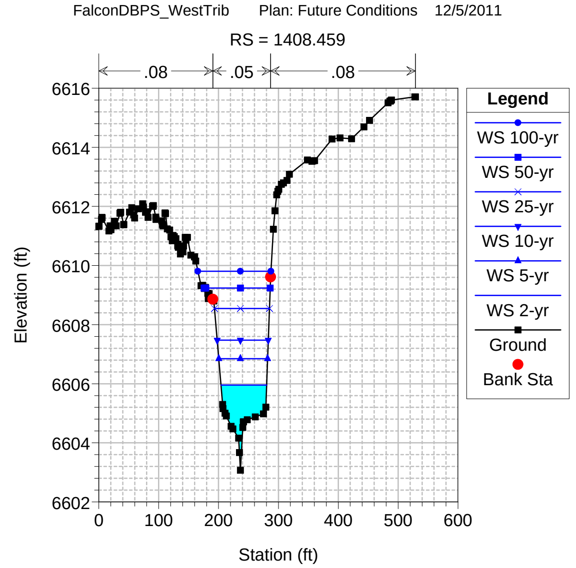

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 8435.27 Culv WT 3 - Garrett Rd.
RS = 8403.688
RS = 8368.43*
RS = 8333.18*
RS = 8297.92*
RS = 8262.67*
RS = 8227.417
RS = 7777.832
RS = 7614.436
RS = 7377.832
RS = 7135.927
RS = 6927.820
RS = 6678.024
RS = 6485.523
RS = 6451.520
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

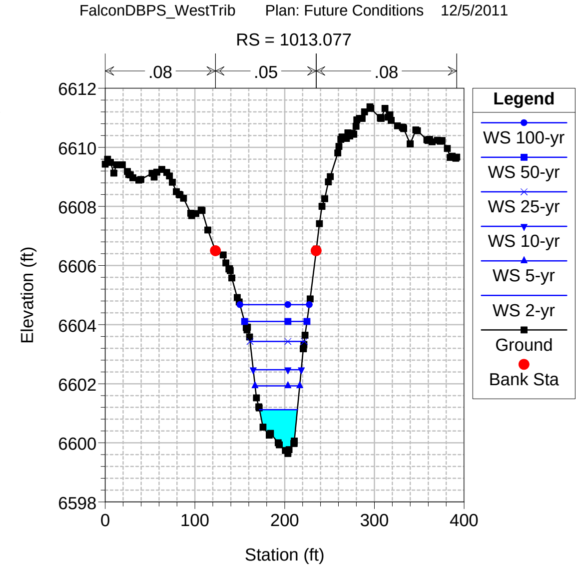


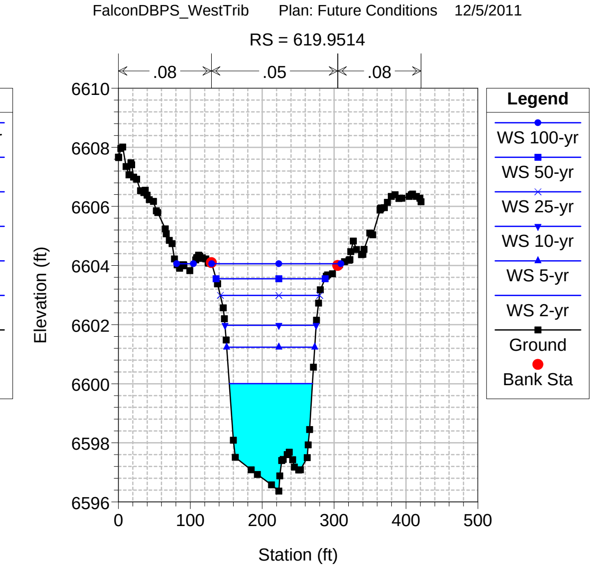
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 6177.403
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5998.479
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5863.168
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5837.669
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5761.531
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5566.663
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5544.600
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5525.06*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5505.53*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5485.99*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5466.45*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5446.92*
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5427.389
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5398.42 Culv WT 1 - E. Blaney Rd.
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5398.42 Culv WT 1 - E. Blaney Rd.
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

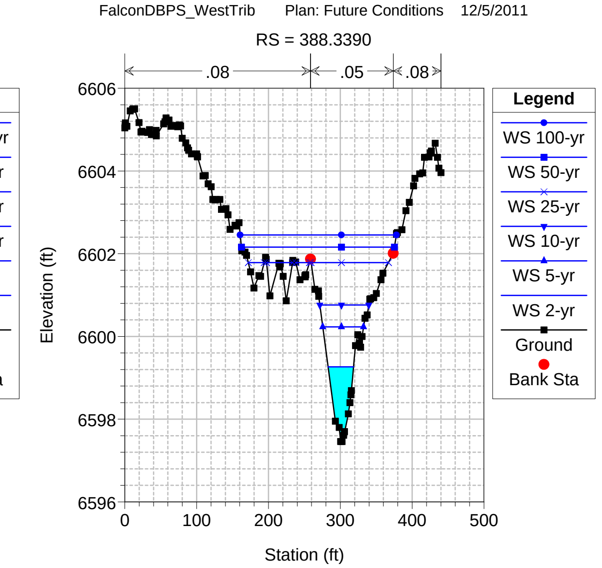

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5379.875
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 5249.459
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 2-yr
WS 5-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 4939.985
Legend
WS 100-yr
WS 50-yr
WS 5-yr
WS 25-yr
WS 10-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 4838.839
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 4753.930
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 4577.833
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 4290.608
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 4034.844
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 3777.832
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 3377.832
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 2977.832
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 2577.832
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 2345.770
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 2032.471
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta
Elevation (ft)
Station (ft)
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 1777.832
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

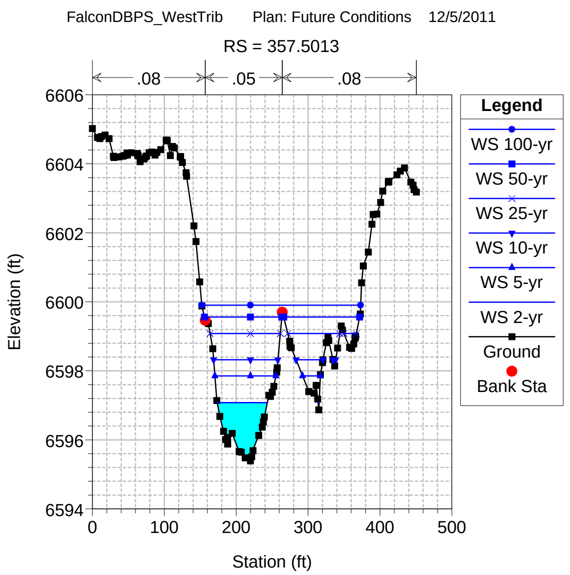

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 1691.543
.08 .05 .08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta

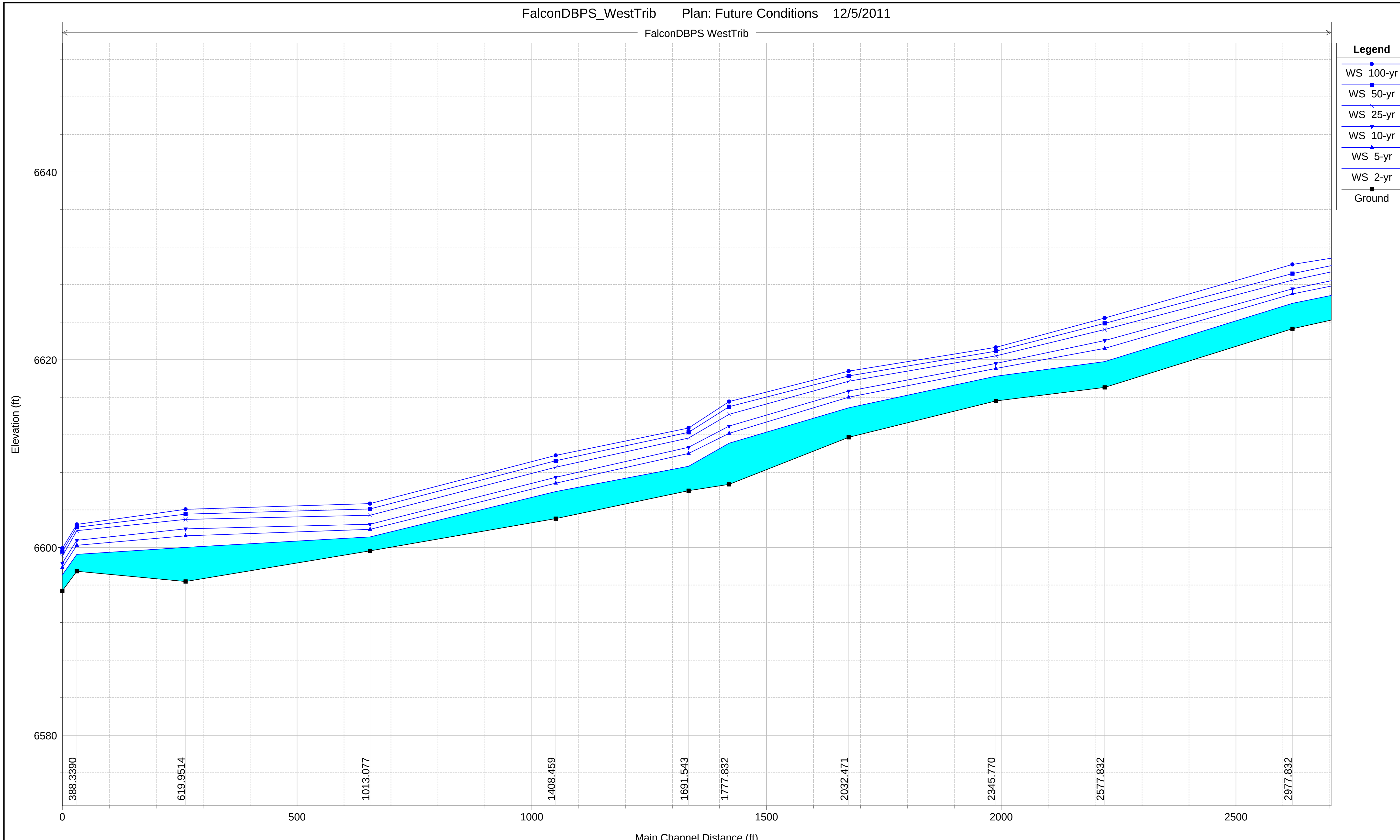

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 1408.459
.08 .05 .08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta


FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 1013.077
.08 .05 .08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta

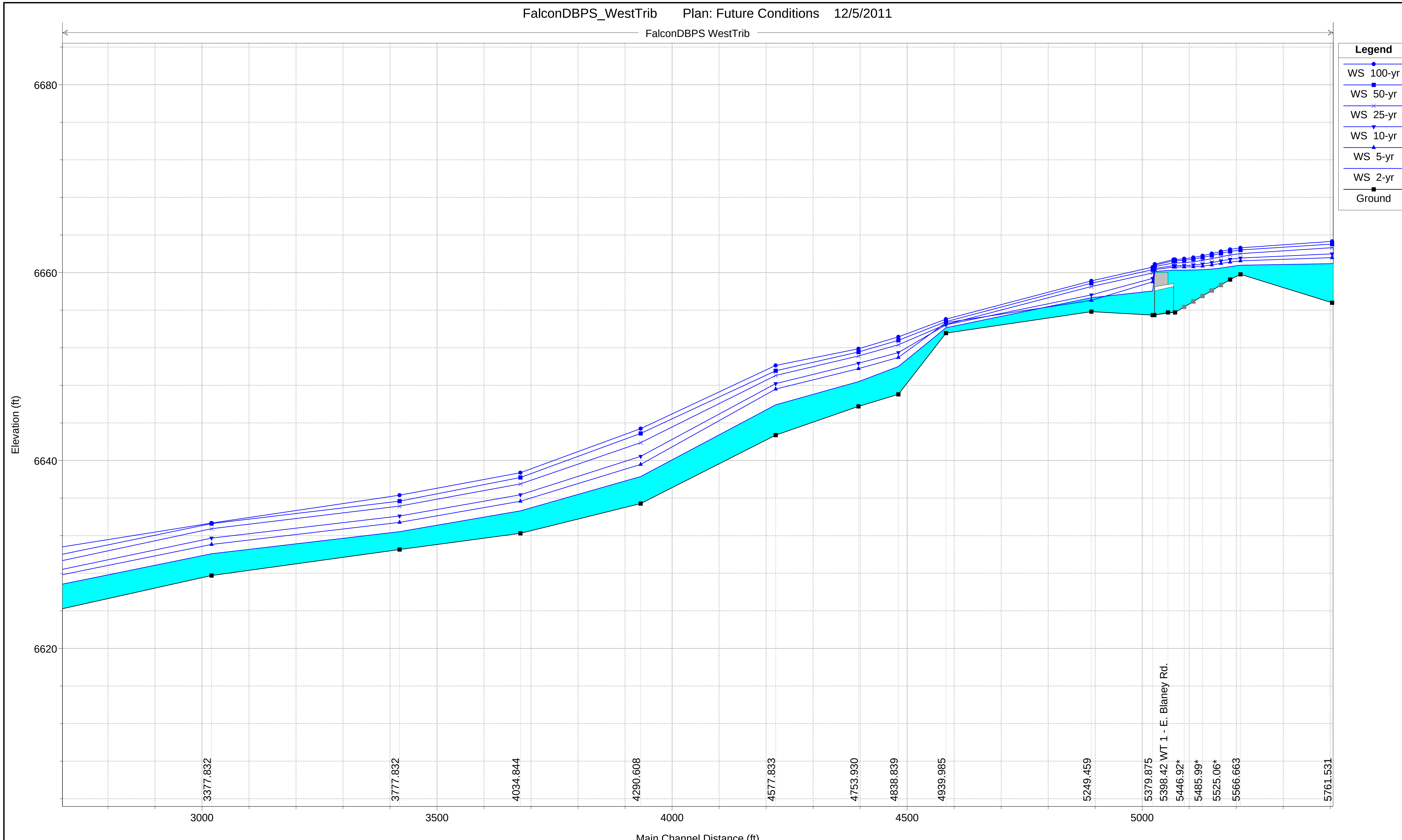

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 619.9514
.08 .05 .08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta


FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 388.3390
.08 .05 .08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta

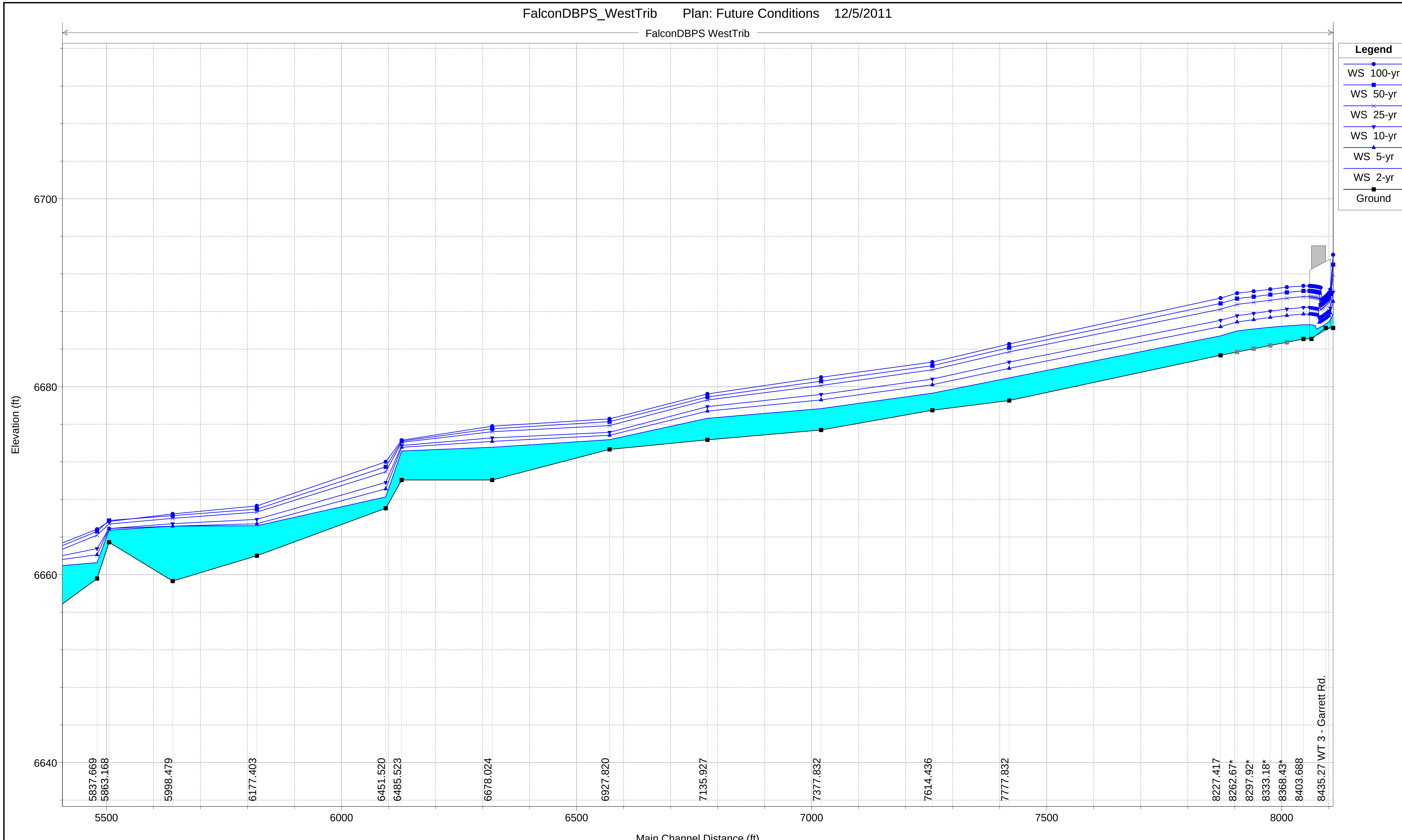

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
RS = 357.5013
.08 .05 .08
Elevation (ft)
Station (ft)
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Bank Sta



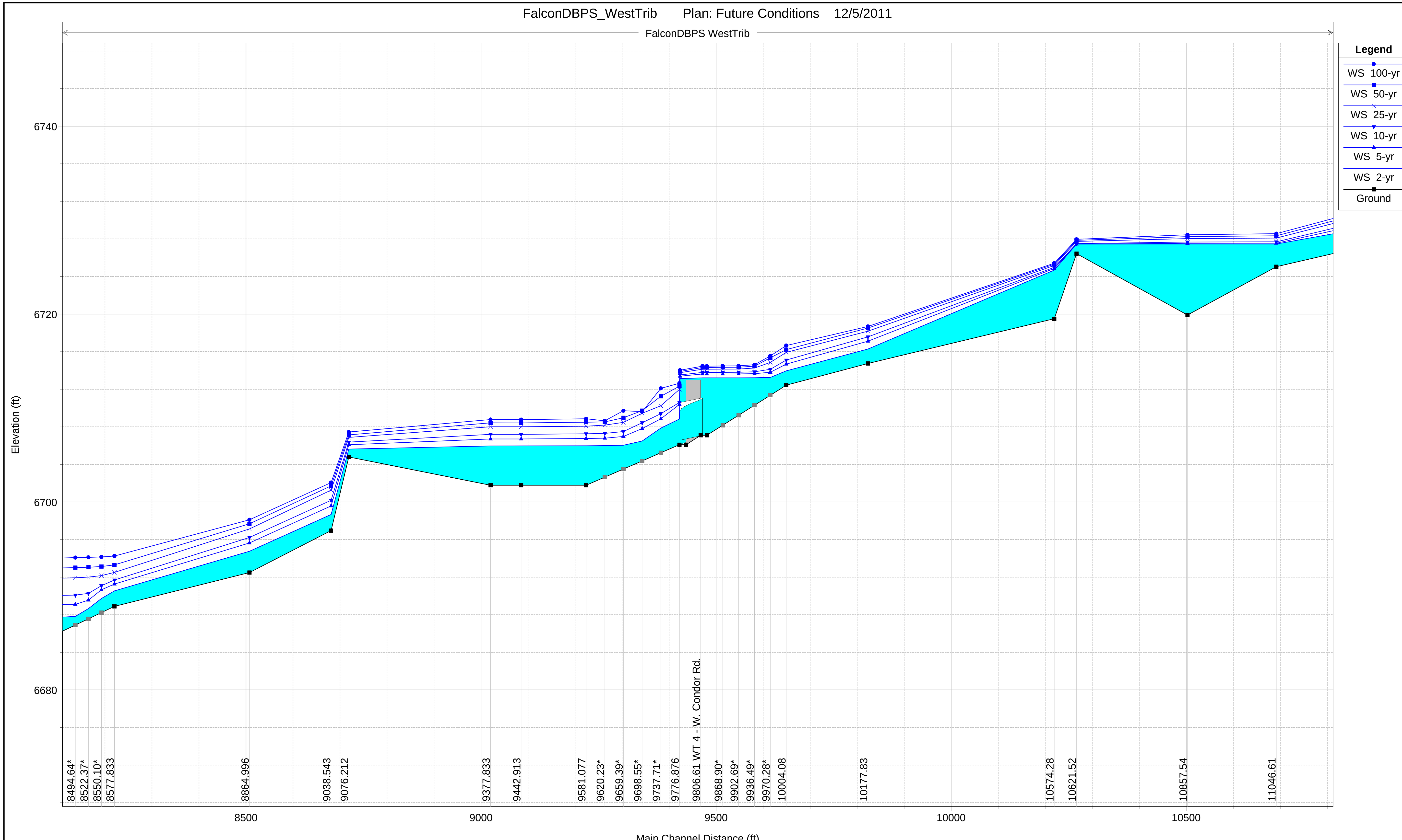
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



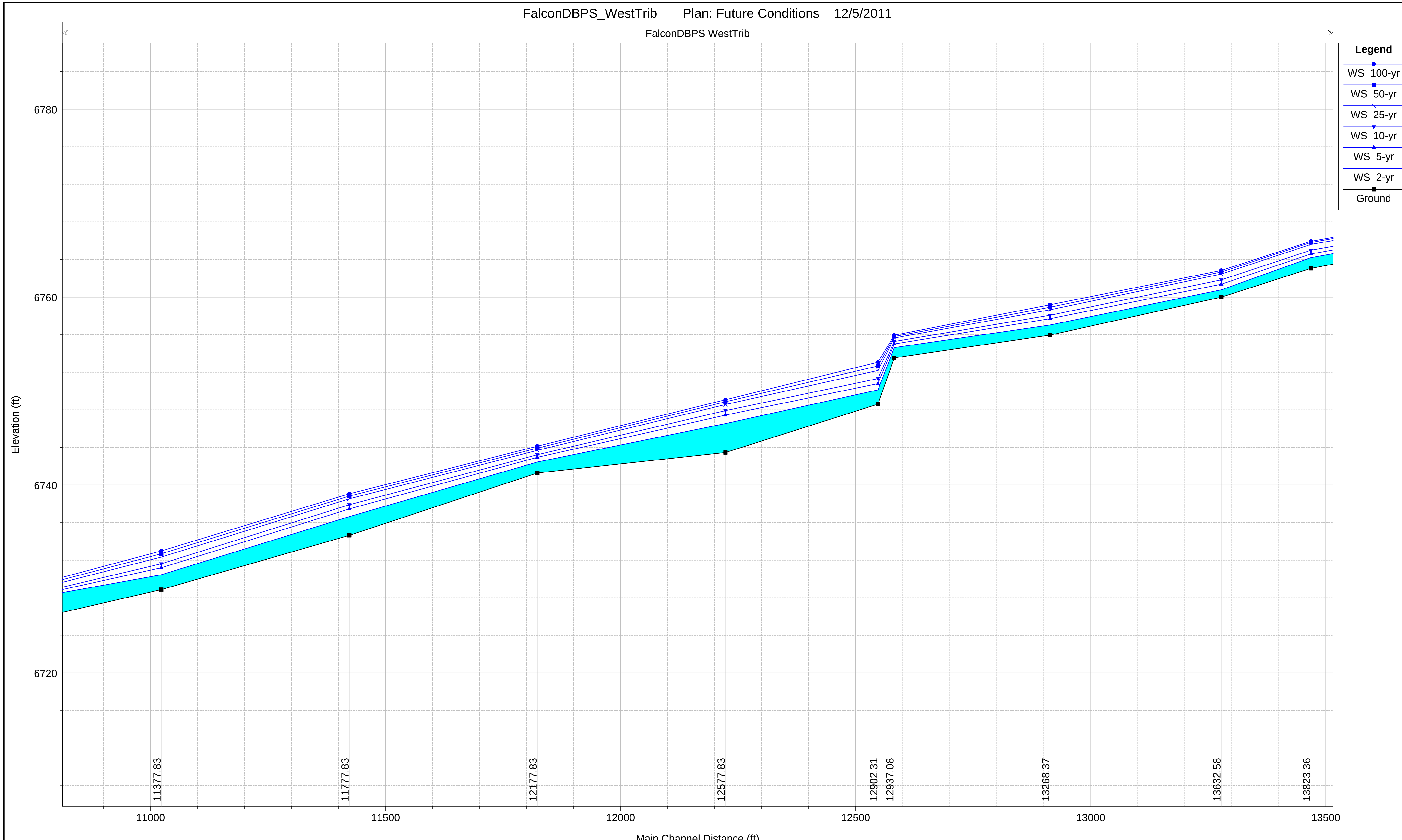
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



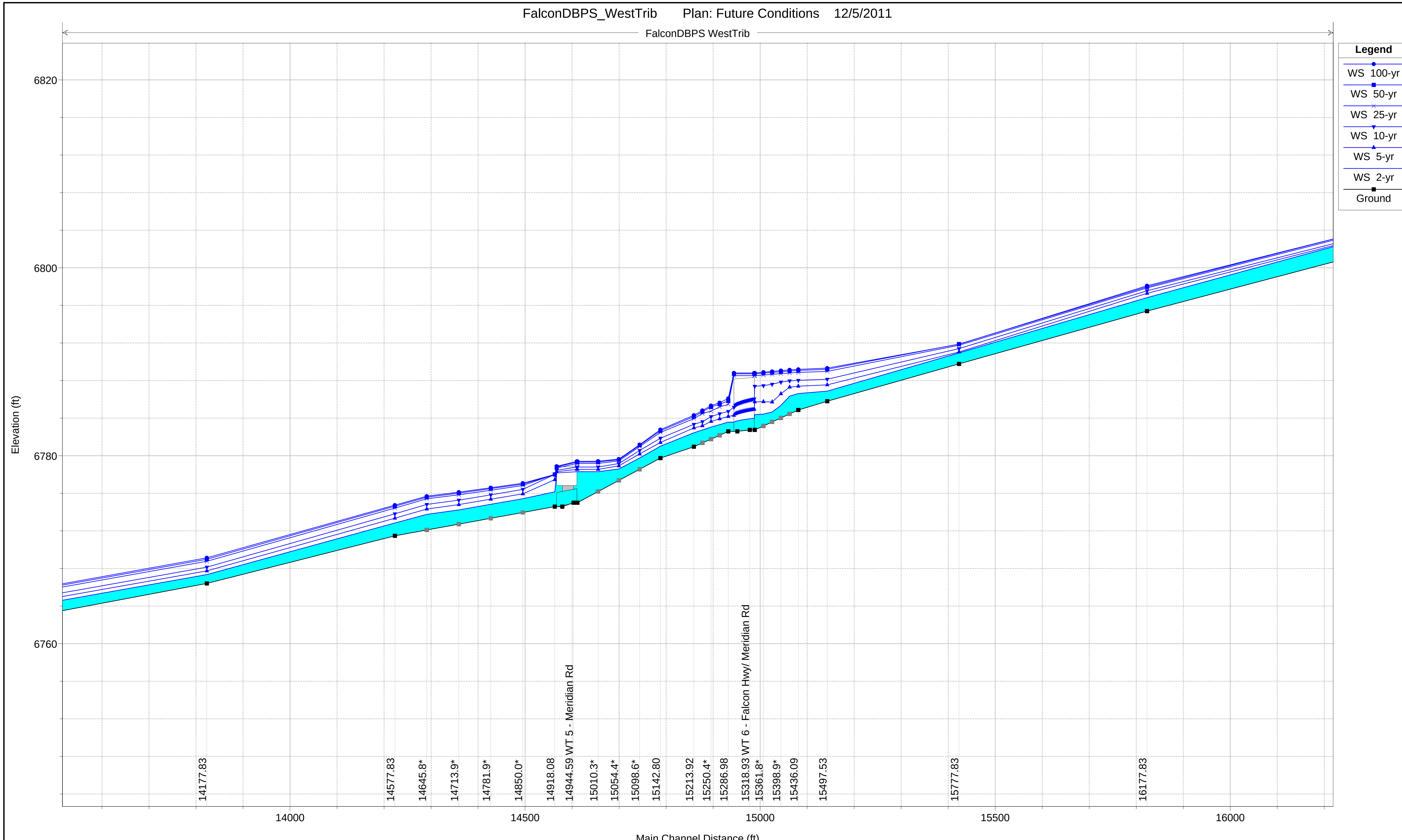
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



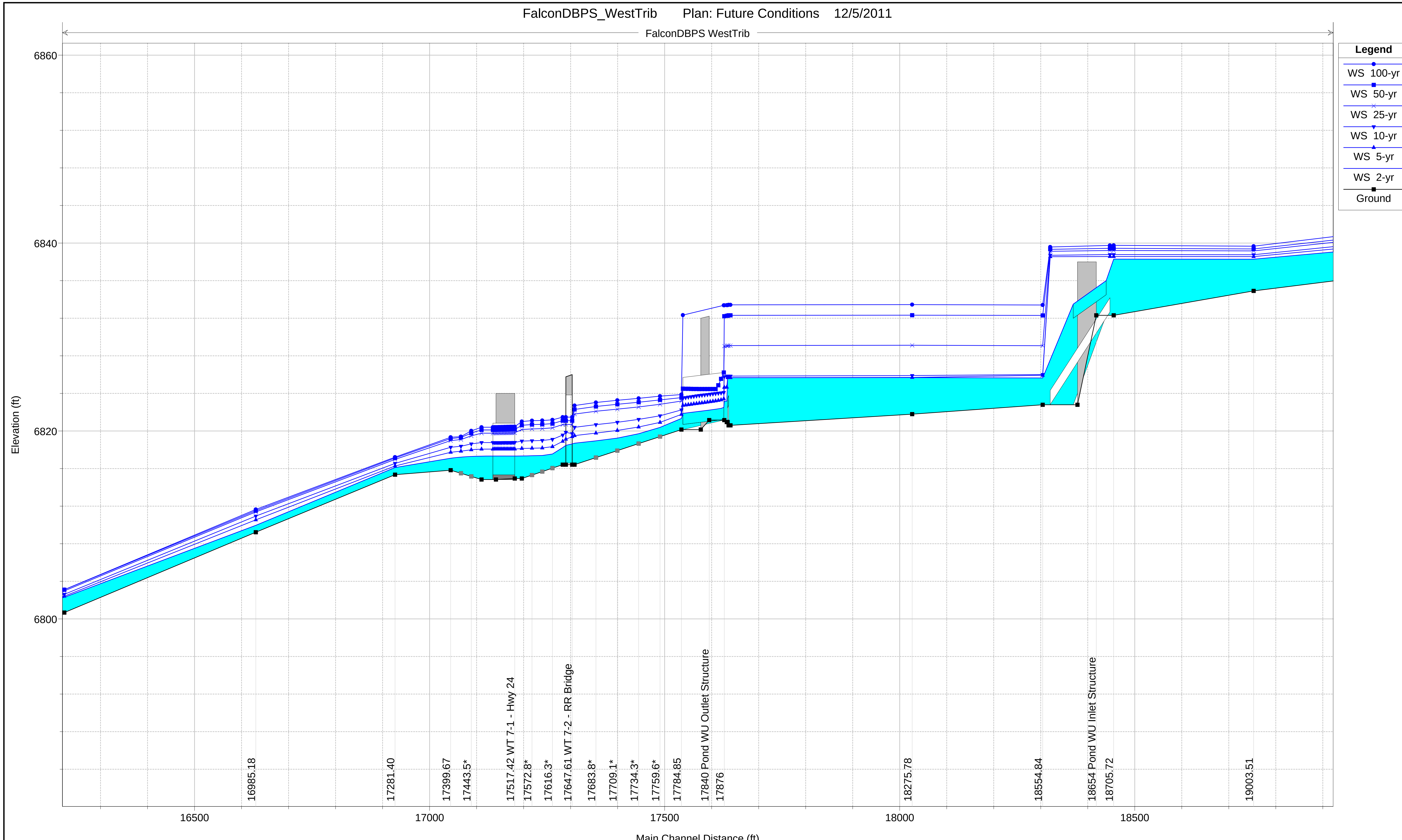
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



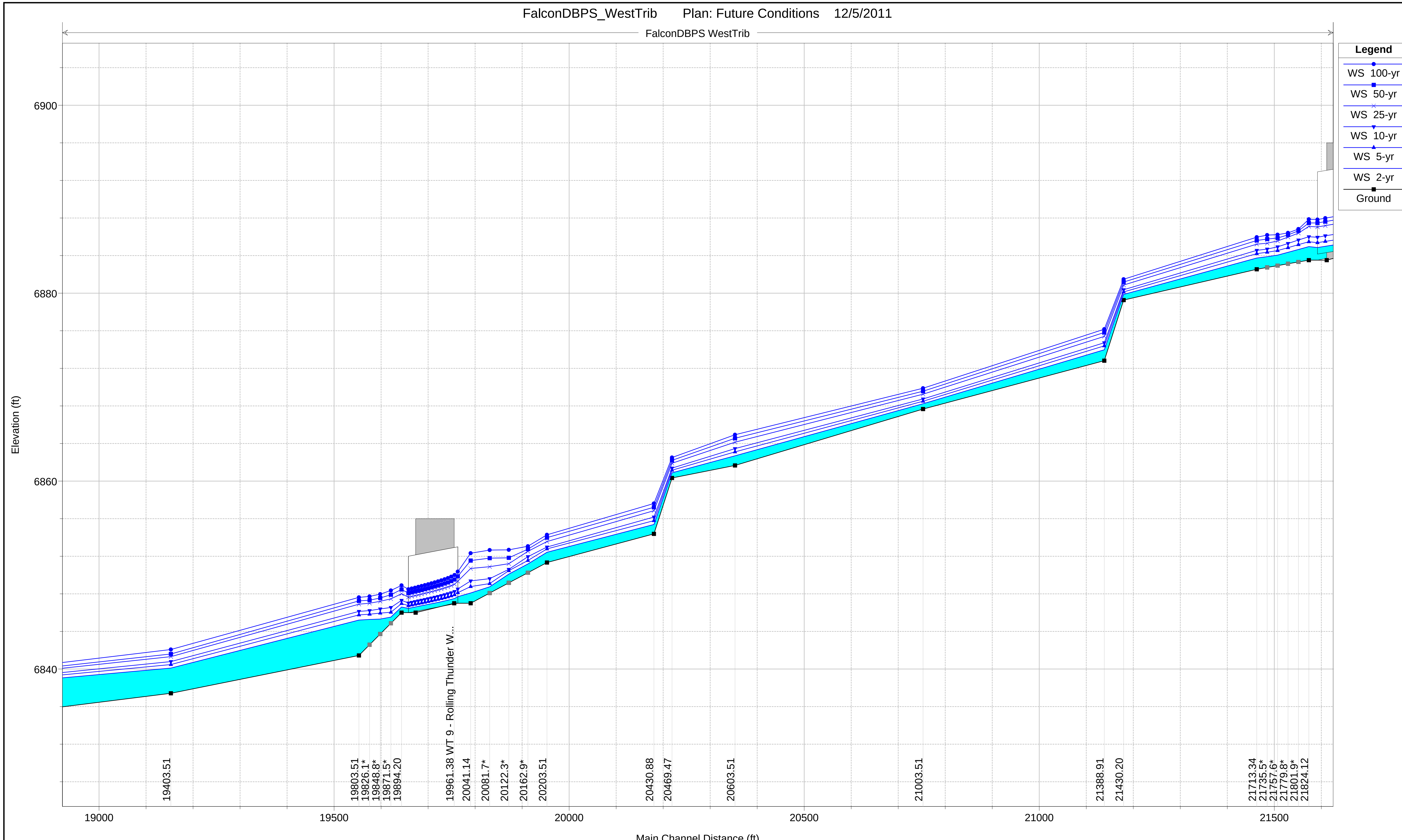
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



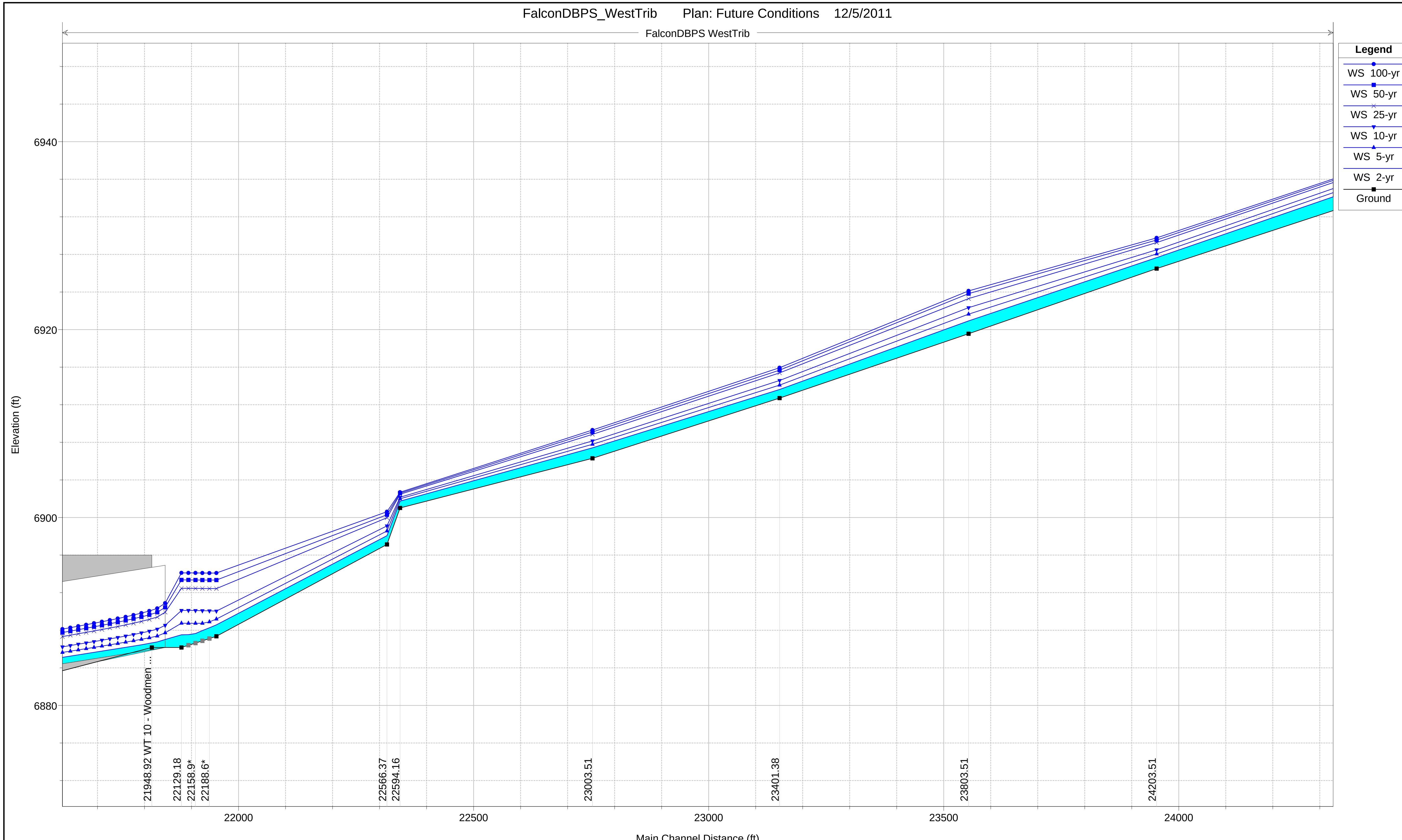
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



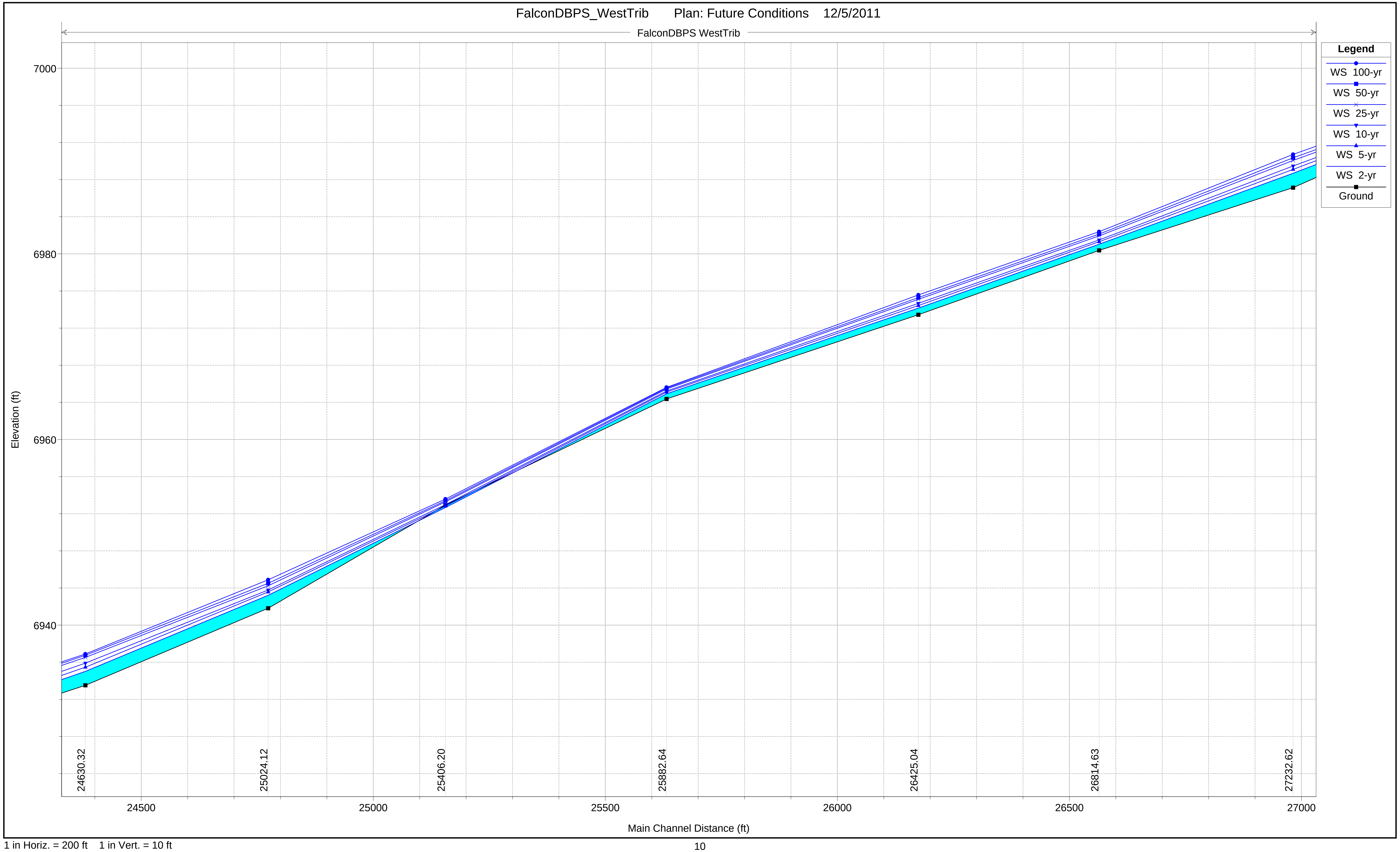
1 in Horiz. = 200 ft 1 in Vert. = 10 ft

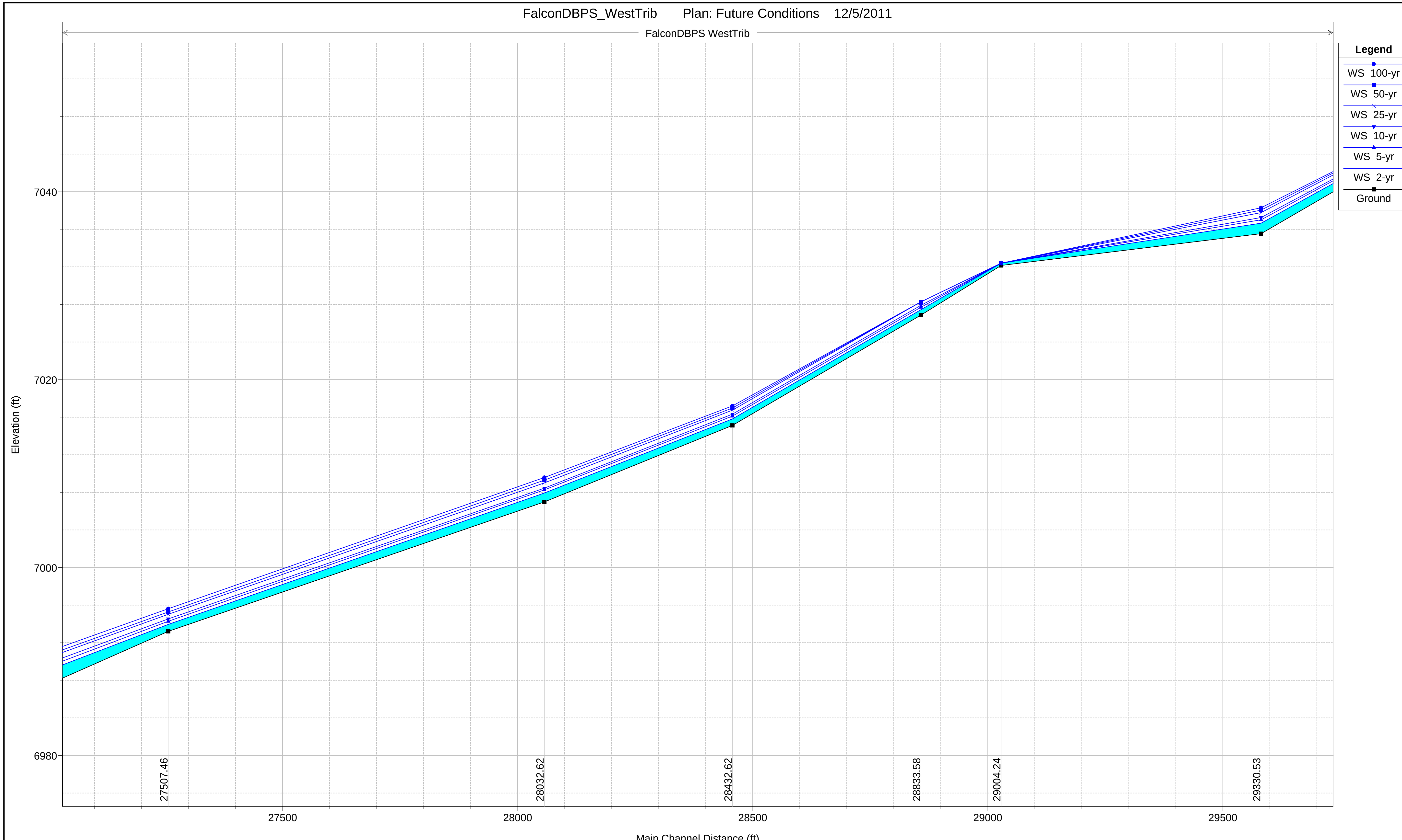


1 in Horiz. = 200 ft 1 in Vert. = 10 ft

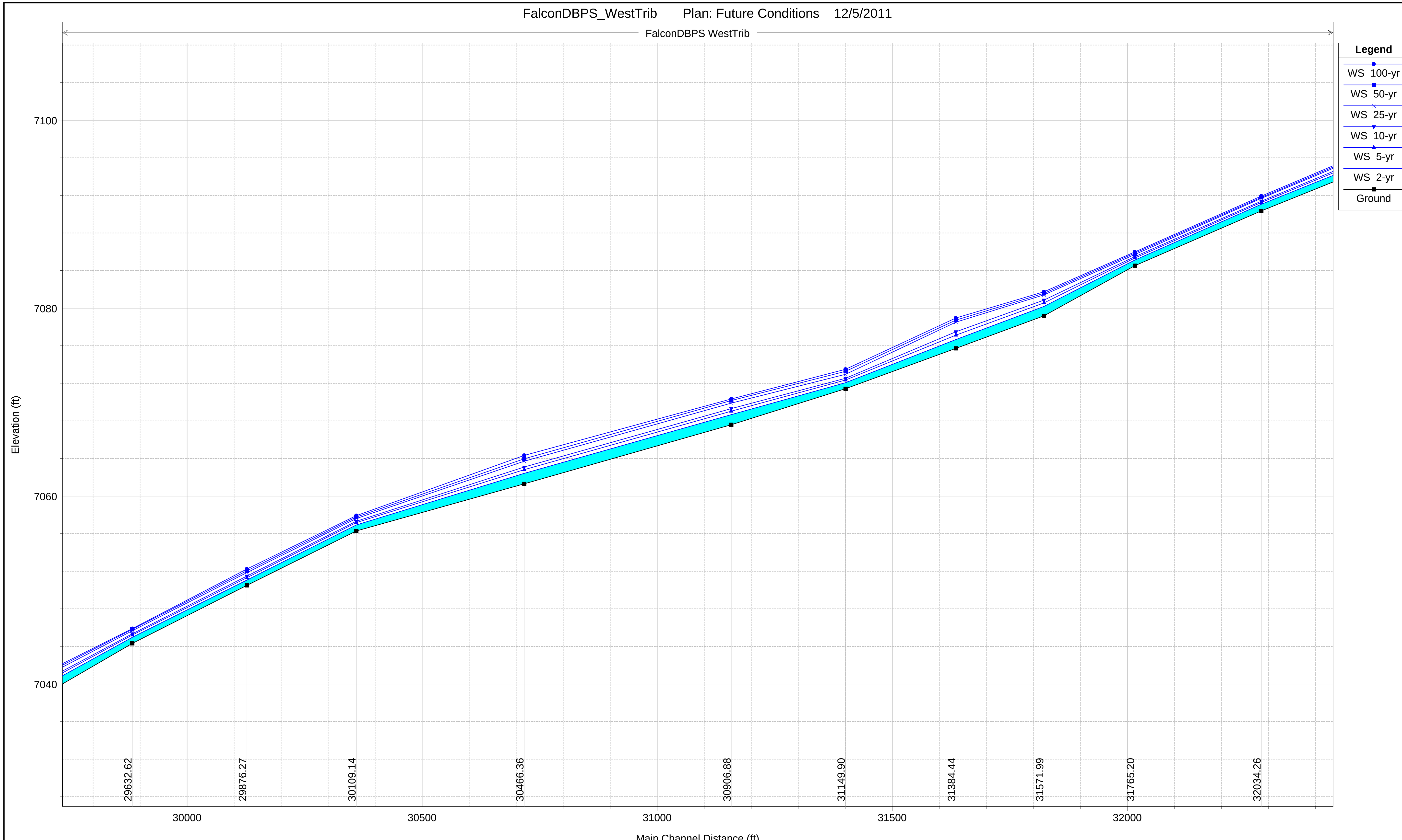


1 in Horiz. = 200 ft 1 in Vert. = 10 ft

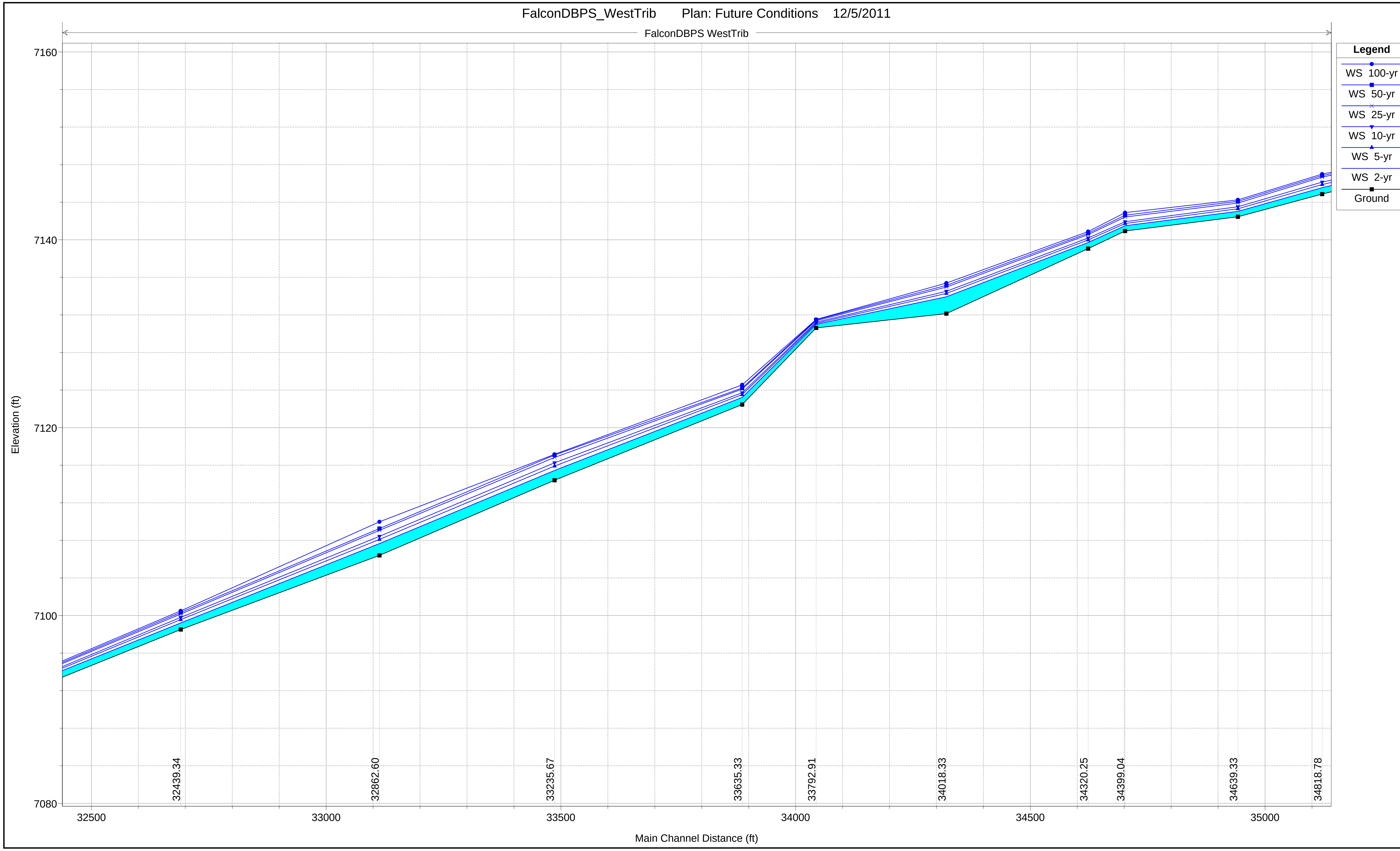

FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
FalconDBPS WestTrib
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Elevation (ft)
7000
6980
6960
6940
24630.32
25024.12
25406.20
25882.64
26425.04
26814.63
27232.62
24500
25000
25500
26000
26500
27000
Main Channel Distance (ft)
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



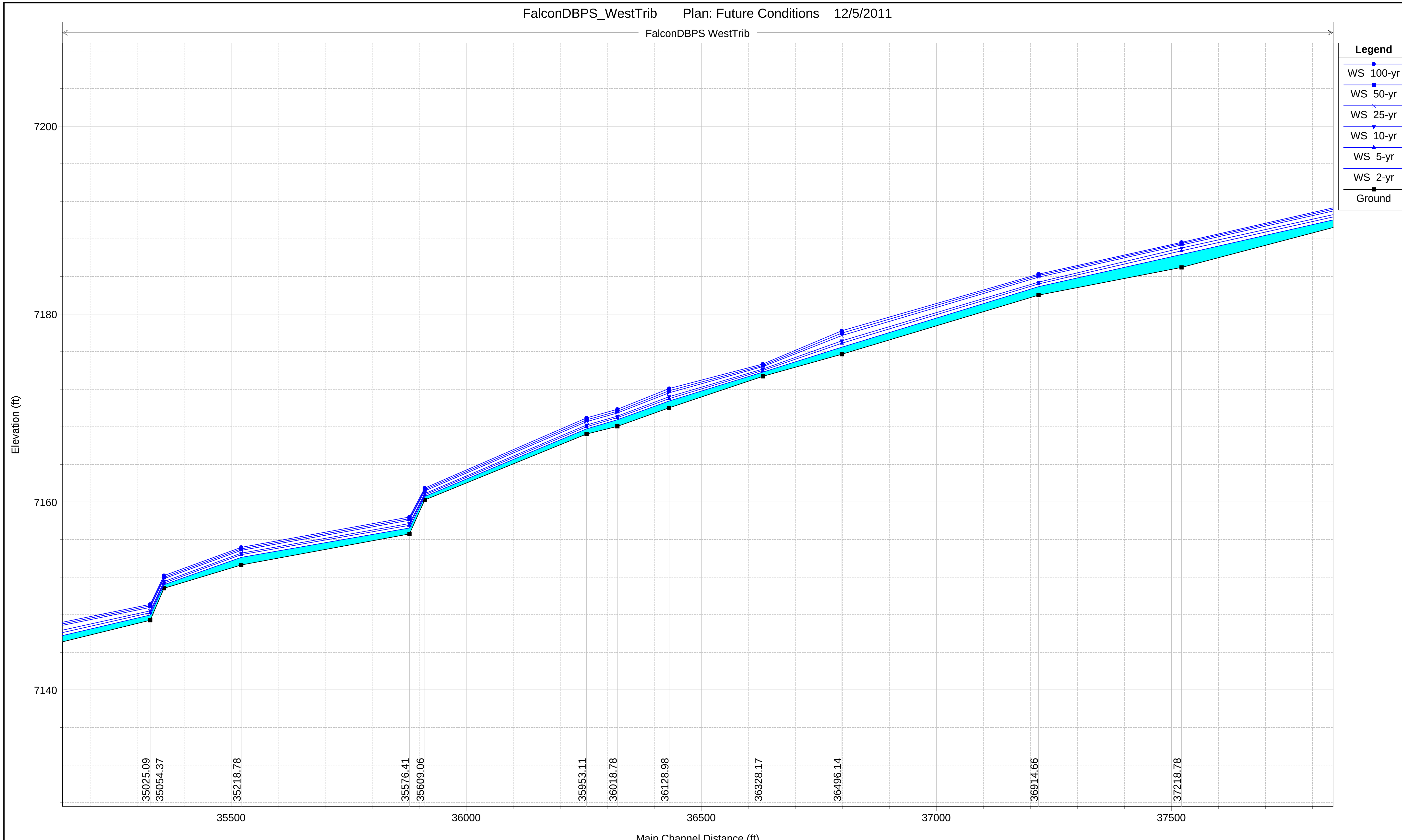
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



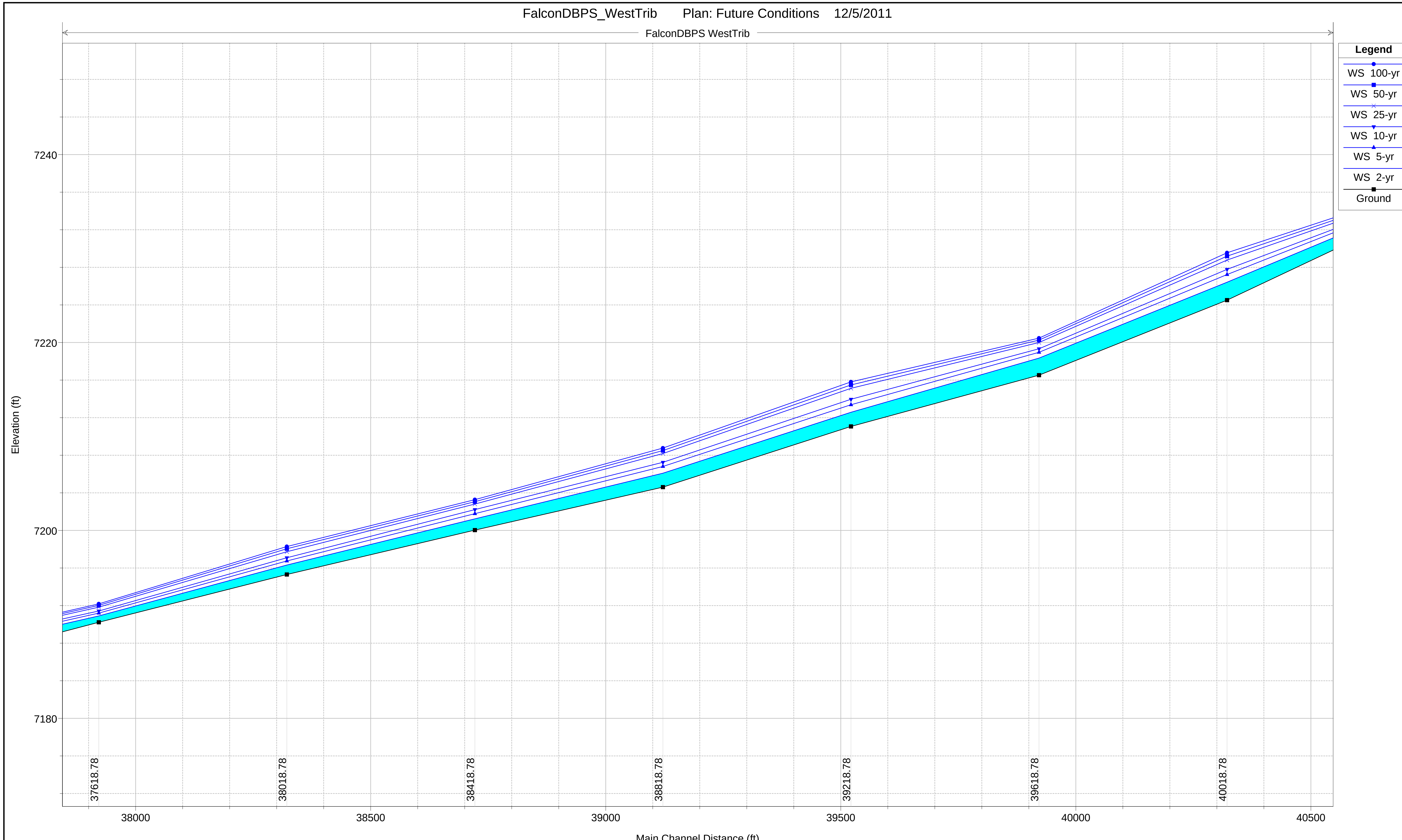
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



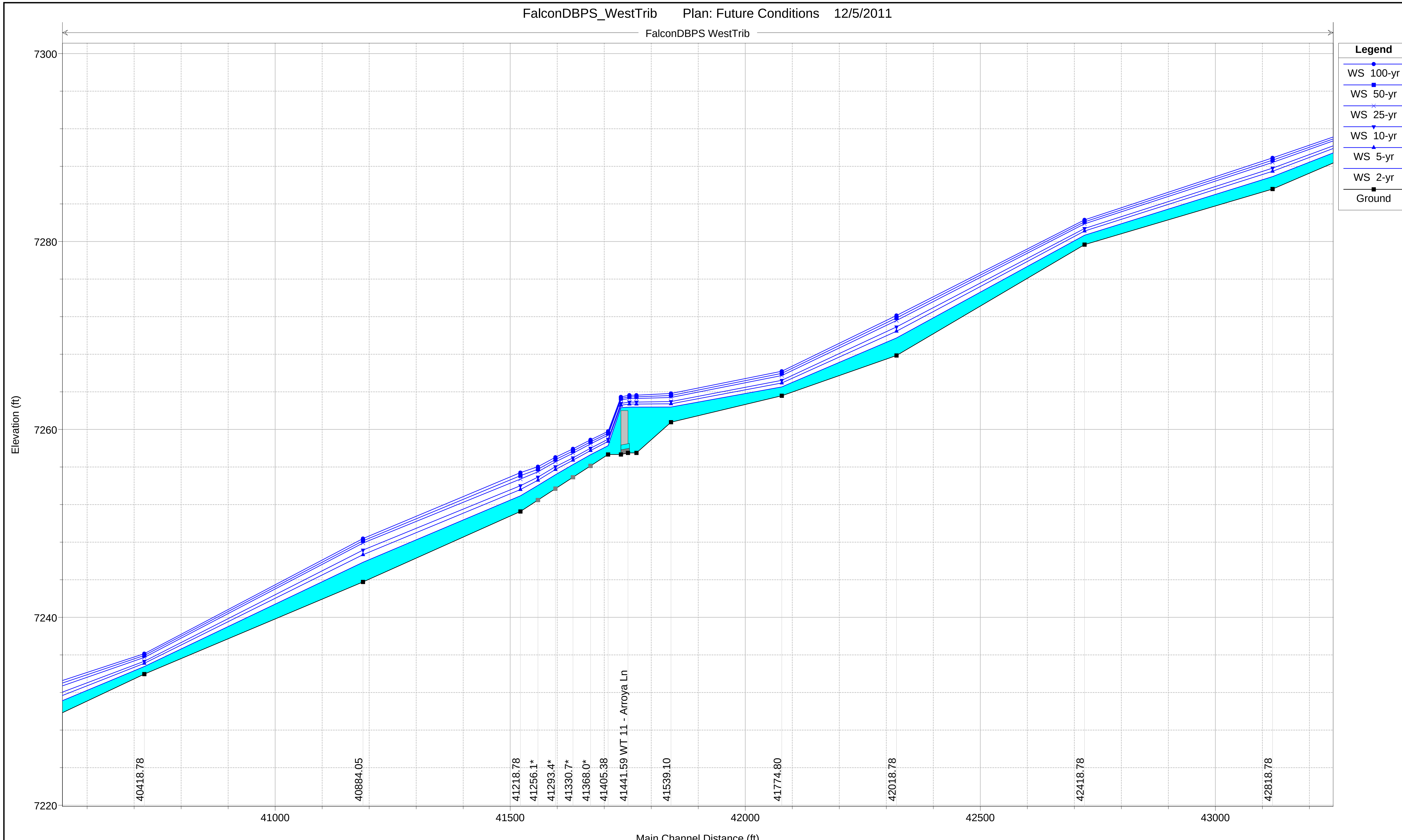
FalconDBPS_WestTrib Plan: Future Conditions 12/5/2011
FalconDBPS WestTrib
Legend
WS 100-yr
WS 50-yr
WS 25-yr
WS 10-yr
WS 5-yr
WS 2-yr
Ground
Elevation (ft)
7160
7140
7120
7100
7080
32439.34
32862.60
33235.67
33635.33
33792.91
34018.33
34320.25
34399.04
34639.33
34818.78
32500
33000
33500
34000
34500
35000
Main Channel Distance (ft)
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



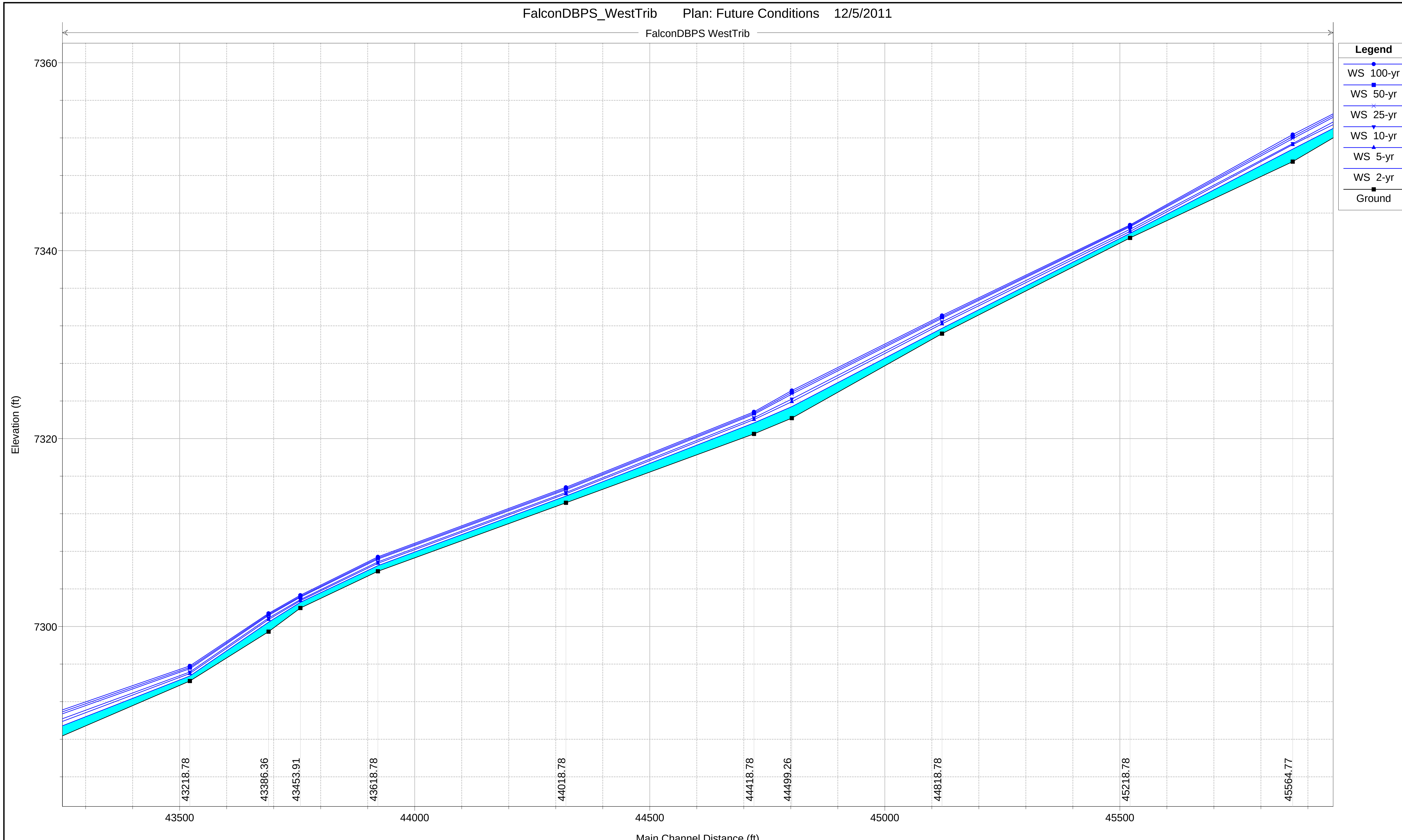
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



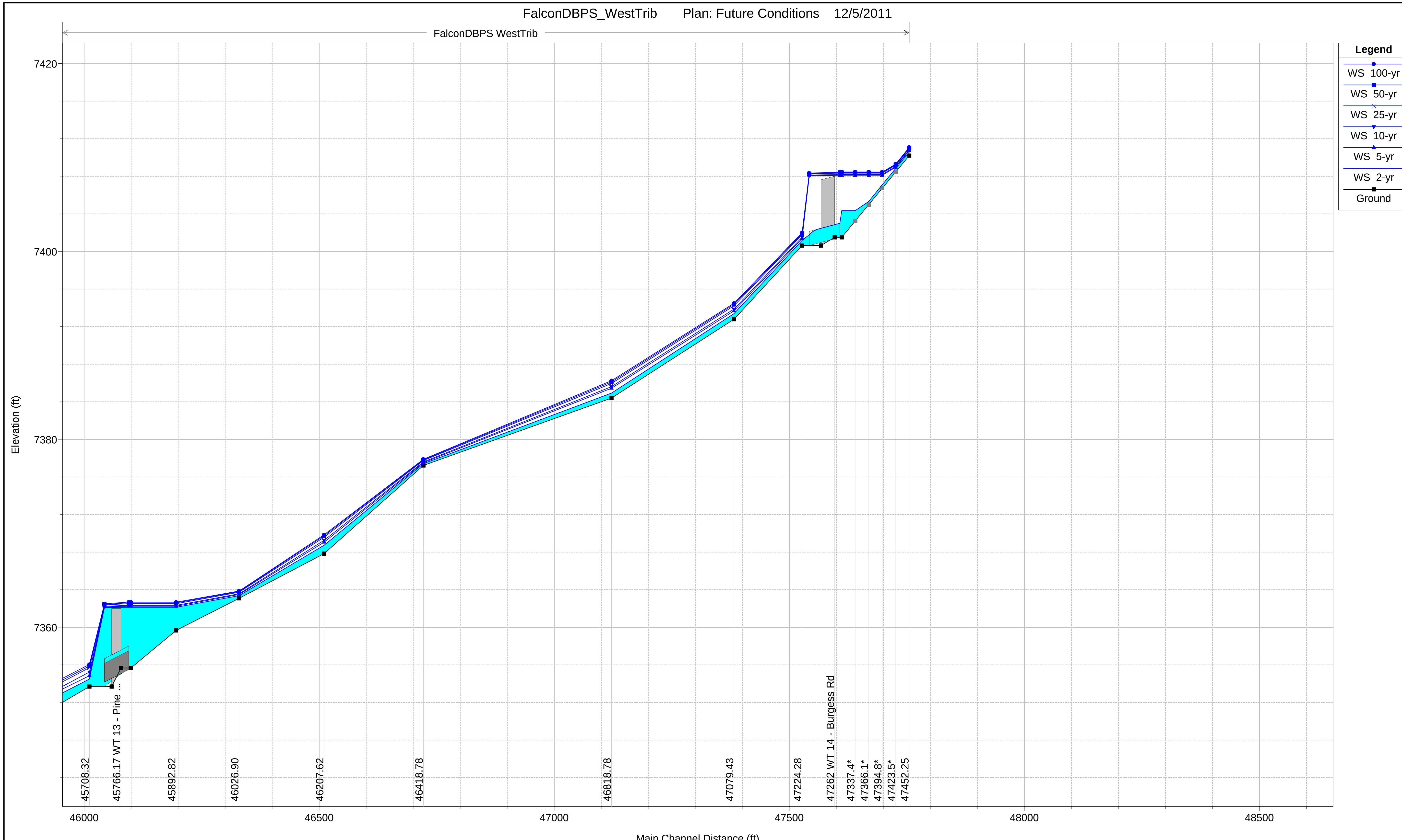
1 in Horiz. = 200 ft 1 in Vert. = 10 ft



1 in Horiz. = 200 ft 1 in Vert. = 10 ft



1 in Horiz. = 200 ft 1 in Vert. = 10 ft



1 in Horiz. = 200 ft 1 in Vert. = 10 ft

Falcon DBPS

Sub Regional Pond Drainage & Impervious Area

Pond	DA (ft2)	DA (Acres)	Impervious Area (ft2)	% Impervious
Sub Regional Pond SR1	30,622,649	703	831,542	3%
Paint Brush Hills Pond C	5,234,130	120	982,938	19%
Paint Brush Hills Pond A	2,811,615	65	832,760	30%
Paint Brush Hills Pond B1 & B2	10,050,309	231	3,095,805	31%
Sub Regional Pond SR2	17,141,776	394	1,300,551	8%
The Meadows Pond #1	1,601,777	37	127,495	8%
Sub Regional Pond SR3	11,154,554	256	805,816	7%
Regional Pond WU	20,333,432	467	5,914,148	29%
Woodmen Hills Pond H	15,479,390	355	4,492,233	29%
The Meadows Pond #2	8,081,678	186	902,796	11%
Sub Regional Pond SR4	8,717,356	200	1,238,224	14%
Regional pond MN	7,343,530	169	2,065,458	28%
Woodmen Hills Pond #5	1,212,993	28	773,858	64%
Regional Pond R1	23,851,242	548	3,448,795	14%
Paint Brush Hills Pond #4	4,045,968	93	1,167,110	29%
Sub Regional Pond SR6	5,943,070	136	1,971,083	33%
Woodmen Hills Pond #1 North & South	9,842,788	226	2,585,592	26%
Woodmen Hills Pond #2	3,267,140	75	623,185	19%
Woodmen Hills Pond #3	7,957,332	183	1,741,407	22%
Woodmen Hills Pond #4	15,092,968	346	5,150,148	34%
Sub Regional Pond SR5	29,299,647	673	2,287,324	8%
Regional Pond R2	52,661,473	1,209	1,520,507	3%

Notes

1) Areas calculated in ArcMap
2) These values are used for calculating the required EURV/WQCV only
3) Some values incude the drainage areas contributing to upstream ponds where that pond was not able to provide an EURV/WQCV

Falcon DBPS

Sub Regional Ponds (Including Existing Detention Ponds)

Pond Description					EURV/WQCV				
Modeling Order	Name	Pond Type[1]	Location	Inflow Hydrograph[2]	Drainage Area (Acres)[3]	% Impervious (Future)[4]	Stage (ft)[5]	Storage (AF)[6]	Release Rate (cfs)[7]
1	Sub Regional Pond SR1	Sub Regional	West Tributary	JWT080	703	3%	7218.0	1.57	2.60
1	Paint Brush Hills Pond C	On-site	West Tributary	WT100	120	19%	7197.2	2.18	2.93
1	Paint Brush Hills Pond A	On-site	West Tributary	WT130	65	30%	7146.3	0.99	1.65
1	Paint Brush Hills Pond B1	On-site	West Tributary	Paint Brush Hills Pond B1	N/A Place EURV in d/s Paint Brush Hills Pond B2				
1	Paint Brush Hills Pond B2	On-site	West Tributary	Paint Brush Hills Pond B2	231	31%	7146.1	7.46	17.37
2	Sub Regional Pond SR2	Sub Regional	West Tributary	JWT174	394	8%	7080.8	2.05	2.88
1	The Meadows Pond #1	On-site	West Tributary	WT190	37	8%	7011.0	0.19	0.12
3	Sub Regional Pond SR3	Sub Regional	West Tributary	JWT200	256	7%	6941.3	1.03	1.48
4	Regional Pond WU South	Regional	West Tributary	Regional Pond WU South	467	29%	6826.8	13.97	29.90
~~1~~	~~Woodmen Hills Pond H~~	~~Sub Regional~~	~~Middle Tributary~~	~~Woodmen Hills Pond H~~	~~355~~	~~29%~~	~~N/A~~	~~10.62~~	~~N/A~~
1	The Meadows Pond #2	On-site	Middle Tributary	MT010	186	11%	7006.5	1.62	1.83
2	Sub Regional Pond SR4	Sub Regional	Middle Tributary	JMT060	555	24%	6896.6	7.28	24.40
3	Regional Pond MN	Regional	Middle Tributary	Regional Pond MN	169	28%	6851.4	2.45	3.25
1	Woodmen Hills Pond #5	On-site	Middle Tributary	MT090	28	64%	6852.5	1.99	2.25
5	Regional Pond R1	Regional	West Tributary @ N	JWT296	548	14%	6760.3	6.72	12.31
~~1~~	~~Paint Brush Hills Pond #4~~	~~On-site~~	~~East Tributary~~	~~ET010~~	~~93~~	~~29%~~		~~2.78~~	
1	Sub Regional Pond SR6	Sub Regional	East Tributary	~~JET020~~	229	31%	7100.0	7.39	16.34
2	Woodmen Hills Pond #1 North	Sub Regional	East Tributary	Woodmen Hills Pond #1 North	N/A Place EURV in d/s Woodmen Hills Pond #1 South. Use Existing SSD curve up to 100-yr stage.				
3	Woodmen Hills Pond #1 South	Sub Regional	East Tributary	Woodmen Hills Pond #1 South	226	26%	6952.5	5.96	10.86
4	Woodmen Hills Pond #2	Sub Regional	East Tributary	Woodmen Hills Pond #2	75	19%	6926.8	1.36	0.67
5	Woodmen Hills Pond #3	Sub Regional	East Tributary	Woodmen Hills Pond #3	183	22%	6900.7	2.26	1.58
6	Woodmen Hills Pond #4	Sub Regional	East Tributary	Woodmen Hills Pond #4	346	34%	6858.7	12.39	16.88
~~7~~	~~Sub Regional Pond SR5~~	~~Sub Regional~~	~~East Tributary~~	~~JET152~~	~~673~~	~~8%~~			
8	Regional Pond R2	Regional	West Tributary d/s	JWT372	1,882	5%	6639.3	3.13	15.00

Notes

1 On-site = located off of the main tributary, Sub-reional = located on the main tributary with a small drainage area, Regional = located on the main tributary with a large drainage area

2 From the Falcon_DBPS HEC-HMS model

3 Only includes area draining directly to the pond. This does not include the area draining to an upstream detention pond if one exists. This column is for sizing the EURV/WQCV only.

4 Calculated in ArcMap using the existing impervious area coverage and average impervious area values for undeveloped land with known future land use

5 Corresponds to the stage within the existing pond grading given the required storage volume or the stage within the proposed pond with an assumed triangular pond grading

6 Calculated using UDFCD criteria. Watershed is primarily covered by HSG B soils in the developed condition.

7 Calculated using UDFCD EURV criteria for a 72-hr drain time or UDFCD WQCV criteria for a 40-hr drain time

8 Estimated based on the intersection of the 100-yr release rate with the desending portion of the Developed 100-yr hydrograph. For proposed ponds the maximum pond volume was set based on a maximum depth of 10ft within the approximated grading.

9 According to existing pond volume estimates calculated in this DBPS based on pond volume at the spillway elevation. See the Hydrology Section for assumptions on storage volume.

10 Developed flows account for existing and proposed upstream detention

11 Targeted the release of the historical 100-yr flow where possible given storage constraints. In some instances released flows are higher or lower depending on the available storage volume in existing detention ponds. This number was modified from the initial estiamte based on modeling results. All release rates reflect a 100-yr WSE that is at the spillway elevation (no spillway overtopping).

12 Corresponds to stage/storage at an elevation of 2ft above the 100-yr stage or where existing pond grading limits stage.

13 Set at the 100-yr release rate + the peak 100-yr inflow

Falcon DBPS

Sub Regional Ponds (Including Existing Detention Ponds)

Pond Description					100-yr						Spillway Overtopping		
Modeling Order	Name	Pond Type[1]	Location	Inflow Hydrograph[2]	Stage (ft)[5]	Required Storage (AF)[8]	Constructed Storage (AF)[9]	Developed Q_{100} (cfs)[10]	Historical Q_{100} (cfs)[2]	Release Rate (cfs)[11]	Stage (ft)[12]	Storage (AF)[12]	Release Rate (cfs)[13]
1	Sub Regional Pond SR1	Sub Regional	West Tributary	JWT080	7224.8	11.03	Proposed Pond	610.6	509	513	7226.8	15.18	1,124
1	Paint Brush Hills Pond C	On-site	West Tributary	WT100	7,200	6.77	6.77	303	200	144	7202	10.80	447
1	Paint Brush Hills Pond A	On-site	West Tributary	WT130	7,148	2.62	2.62	173	97	142	7150	4.89	315
1	Paint Brush Hills Pond B1	On-site	West Tributary	Paint Brush Hills Pond B1	Use existing SSD curve. Provide additional 100-yr control in Paint Brush Hills Pond B2.								
1	Paint Brush Hills Pond B2	On-site	West Tributary	Paint Brush Hills Pond B2	7,148	12.09	12.09	267	171	191	7150	17.28	458
2	Sub Regional Pond SR2	Sub Regional	West Tributary	JWT174	N/A	N/A	Proposed Pond	842	952	N/A	7083	4.21	844
1	The Meadows Pond #1	On-site	West Tributary	WT190	7,015	3.25	3.25	75	14	2.2	7016	4.56	77
3	Sub Regional Pond SR3	Sub Regional	West Tributary	JWT200	N/A	N/A	Proposed Pond	908	988	N/A	6943.3	1.97	909
4	Regional Pond WU South	Regional	West Tributary	Regional Pond WU South	6,832	39.54	39.54	1,069	1,057	932	6834	50.38	2,001
~~1~~	~~Woodmen Hills Pond H~~	~~Sub Regional~~	~~Middle Tributary~~	~~Woodmen Hills Pond H~~	~~N/A~~	~~18.65~~	~~2.66~~	~~748~~	~~288~~	~~288~~	~~N/A~~	~~N/A~~	~~1,036~~
1	The Meadows Pond #2	On-site	Middle Tributary	MT010	7,011	7.94	7.94	206	57	99	7012	9.88	305
2	Sub Regional Pond SR4	Sub Regional	Middle Tributary	JMT060	6,898	19.37	Proposed Pond	1,016	328	727	6900	43.33	1,743
3	Regional Pond MN	Regional	Middle Tributary	Regional Pond MN	6,854	7.53	7.53	854	355	825	6856	11.93	1,679
1	Woodmen Hills Pond #5	On-site	Middle Tributary	MT090	6,854	4.10	4.10	127	19	19	6856	7.42	146
5	Regional Pond R1	Regional	West Tributary @ N	JWT296	6,766	25.00	Proposed Pond	1,560	1,431	1,505	6768	32.00	3,065
~~1~~	~~Paint Brush Hills Pond #4~~	~~On-site~~	~~East Tributary~~	~~ET010~~		~~5.91~~	~~1.34~~	~~198~~	~~86~~	~~86~~			~~284~~
1	Sub Regional Pond SR6	Sub Regional	East Tributary	~~JET020~~	7,102	11.82	Proposed Pond	385	198	195	7104	16.44	580
2	Woodmen Hills Pond #1 North	Sub Regional	East Tributary	Woodmen Hills Pond #1 North	6,960	7.13	7.13	388	242	264	Use existing SSD after 100-yr stage.		
3	Woodmen Hills Pond #1 South	Sub Regional	East Tributary	Woodmen Hills Pond #1 South	6,954	8.78	8.78	264	242	261	6958	17.50	525
4	Woodmen Hills Pond #2	Sub Regional	East Tributary	Woodmen Hills Pond #2	6,930	9.18	9.18	270	246	250	6934	23.09	520
5	Woodmen Hills Pond #3	Sub Regional	East Tributary	Woodmen Hills Pond #3	6,902	8.35	8.35	530	255	360	6904	20.46	890
6	Woodmen Hills Pond #4	Sub Regional	East Tributary	Woodmen Hills Pond #4	6,862	40.45	44.20	789	251	259	6864	60.00	1,048
~~7~~	~~Sub Regional Pond SR5~~	~~Sub Regional~~	~~East Tributary~~	~~JET152~~									~~0~~
8	Regional Pond R2	Regional	West Tributary d/s	JWT372	6,644	7.90	Proposed Pond	2,235	1,674	2,233	6646	16.00	4,468

Notes

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2 From the Falcon_DBPS HEC-HMS model

3 Only includes area draining directly to the pond. This does not include the area draining to an upstream detention pond if one exists. This column is for sizing the EURV/WQCV only.

4 Calculated in ArcMap using the existing impervious area coverage and average impervious area values for undeveloped land with known future land use

5 Corresponds to the stage within the existing pond grading given the required storage volume or the stage within the proposed pond with an assumed triangular pond grading

6 Calculated using UDFCD criteria. Watershed is primarily covered by HSG B soils in the developed condition.

7 Calculated using UDFCD EURV criteria for a 72-hr drain time or UDFCD WQCV criteria for a 40-hr drain time

8 Estimated based on the intersection of the 100-yr release rate with the desending portion of the Developed 100-yr hydrograph. For proposed ponds the maximum pond volume was set based on a maximum depth of 10ft within the approximated grading.

9 According to existing pond volume estimates calculated in this DBPS based on pond volume at the spillway elevation. See the Hydrology Section for assumptions on storage volume.

10 Developed flows account for existing and proposed upstream detention

11 Targeted the release of the historical 100-yr flow where possible given storage constraints. In some instances released flows are higher or lower depending on the available storage volume in existing detention ponds. This number was modified from the initial estiamte based on modeling results. All release rates reflect a 100-yr WSE that is at the spillway elevation (no spillway overtopping).

12 Corresponds to stage/storage at an elevation of 2ft above the 100-yr stage or where existing pond grading limits stage.

13 Set at the 100-yr release rate + the peak 100-yr inflow

Falcon DBPS

Sub Regional Ponds (Including Existing Detention Ponds)

Pond Description					Pond Type	Design Notes
Modeling Order	**Name**	**Pond Type[1]**	**Location**	**Inflow Hydrograph[2]**		
1	Sub Regional Pond SR1	Sub Regional	West Tributary	JWT080	WQCV+100-yr	No EURV required per UDFCD criteria. Used WQCV instead to control low flows.
1	Paint Brush Hills Pond C	On-site	West Tributary	WT100	EURV+100-yr	Enough room for EURV, release less than historical Q100 to maximize pond volume
1	Paint Brush Hills Pond A	On-site	West Tributary	WT130	WQCV+100-yr	Used WQCV instead. Using an EURV resulted in very little depth between the EURV WSE and the 100-yr WSE which may result in an infeasible outlet structure configuration. Release more than historical Q100 due to pond volume limitations.
1	Paint Brush Hills Pond B1	On-site	West Tributary	Paint Brush Hills Pond B1	Existing configuration	Use existing SSD curve without modification. Provide additional 100-yr control and EURV in Pond B2 as the outlet structure in this pond will be easier to retrofit.
1	Paint Brush Hills Pond B2	On-site	West Tributary	Paint Brush Hills Pond B2	EURV+100-yr	Enough room for EURV, released more than historical Q100 due to pond volume limitations
2	Sub Regional Pond SR2	Sub Regional	West Tributary	JWT174	EURV only	Only using EURV. 100-yr flow is already less than historic upstream of this location.
1	The Meadows Pond #1	On-site	West Tributary	WT190	EURV+100-yr	Enough room for EURV, release less than historical Q100 to maximize pond volume
3	Sub Regional Pond SR3	Sub Regional	West Tributary	JWT200	EURV only	Only using EURV. 100-yr flow is already less than historic upstream of this location.
4	Regional Pond WU South	Regional	West Tributary	Regional Pond WU South	EURV+100-yr	Enough room for EURV, released less than historical to optimize pond volume
~~1~~	~~Woodmen Hills Pond H~~	~~Sub Regional~~	~~Middle Tributary~~	~~Woodmen Hills Pond H~~	~~Existing configuration~~	NO RETROFIT. Pond is grossly undersized. Can't do anything as there isn't enough pond volume to even control the 2-year. Recommend, but not design, on-site detention u/s of pond? Major problem - pond is off MT main stem and therefore overtopping deficiencies were not identified but this road crossing will likely overtop. Try and incorporate WQCV in proposed Sub Regional Pond SR4 downstream.
1	The Meadows Pond #2	On-site	Middle Tributary	MT010	EURV+100-yr	Enough room for EURV, released more than historical Q100 due to pond volume limitations
2	Sub Regional Pond SR4	Sub Regional	Middle Tributary	JMT060	WQCV+100-yr	Included Woodmen Hills Pond H DA. Used WQCV instead. Using an EURV resulted in very little depth between the EURV WSE and the 100-yr WSE which may result in an infeasible outlet structure configuration. Released more than historical Q100 due to pond volume limitations at the proposed pond site.
3	Regional Pond MN	Regional	Middle Tributary	Regional Pond MN	WQCV+100-yr	Used WQCV instead. Using an EURV resulted in very little depth between the EURV WSE and the 100-yr WSE which may result in an infeasible outlet structure configuration. Release more than historical Q100 due to pond volume limitations.
1	Woodmen Hills Pond #5	On-site	Middle Tributary	MT090	EURV+100-yr	Enough room for EURV, release less than historical Q100 to maximize pond volume
5	Regional Pond R1	Regional	West Tributary @ N	JWT296	EURV+100-yr	Enough room for EURV, released more than historical Q100 due to pond volume limitations
~~1~~	~~Paint Brush Hills Pond #4~~	~~On-site~~	~~East Tributary~~	~~ET010~~	~~Existing configuration~~	NO RETROFIT. Pond is grossly undersized. Can't do anything as there isn't enough pond volume to even control the 2-year. Recommend, but not design, on-site detention u/s of pond. Try and incorporate EURV in proposed Sub Regional Pond SR6 downstream.
1	Sub Regional Pond SR6	Sub Regional	East Tributary	~~JET020~~	EURV+100-yr	Included DA to Paint Brush Hills Pond #4 in EURV. Released at historical 100-yr.
2	Woodmen Hills Pond #1 North	Sub Regional	East Tributary	Woodmen Hills Pond #1 North	100-yr	Placing EURV in #1 south. Use #1 north as 100-yr attenuation. Reduce 100-yr as much as possible given storage constraints. Use existing SSD up to, and after, 100-yr stage.
3	Woodmen Hills Pond #1 South	Sub Regional	East Tributary	Woodmen Hills Pond #1 South	EURV only	Enough room for EURV. Pond only has enough volume to detain the EURV but not the 100-yr. This is acceptable since the 100-yr flow at this point is 264 cfs and the historical flow is 242 cfs.
4	Woodmen Hills Pond #2	Sub Regional	East Tributary	Woodmen Hills Pond #2	EURV+100-yr	Enough room for EURV. Pond also can be retrofit to release the ~ historical 100-yr flow. The depth of the EURV is 0.8ft. UDFCD criteria says 1ft is the minimum depth. Assume this is ok at this point.
5	Woodmen Hills Pond #3	Sub Regional	East Tributary	Woodmen Hills Pond #3	WQCV+100-yr	Used WQCV instead. Using an EURV resulted in very little depth between the EURV WSE and the 100-yr WSE which may result in an infeasible outlet structure configuration. Release more than historical Q100 due to pond volume limitations.
6	Woodmen Hills Pond #4	Sub Regional	East Tributary	Woodmen Hills Pond #4	EURV+100-yr	
~~7~~	~~Sub Regional Pond SR5~~	~~Sub Regional~~	~~East Tributary~~	~~JET152~~	~~Not using pond~~	Not an effective location. Only ~1.5AF of storage available and EURV required at this location is ~3.5AF.
8	Regional Pond R2	Regional	West Tributary d/s	JWT372	EURV only	Only using EURV. Included DA from Sub Regional Pond SR5 in EURV. Had to increase discharge to 15 cfs, which was above what was calculated using UDFCD criteria, because drain time was much greater than 72-hr. Not enough available storage volume for 100-yr control.

Notes

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2. From the Falcon_DBPS HEC-HMS model
3. Only includes area draining directly to the pond. This does not include the area draining to an upstream detention pond if one exists. This column is for sizing the EURV/WQCV only.
4. Calculated in ArcMap using the existing impervious area coverage and average impervious area values for undeveloped land with known future land use
5. Corresponds to the stage within the existing pond grading given the required storage volume or the stage within the proposed pond with an assumed triangular pond grading
6. Calculated using UDFCD criteria. Watershed is primarily covered by HSG B soils in the developed condition.
7. Calculated using UDFCD EURV criteria for a 72-hr drain time or UDFCD WQCV criteria for a 40-hr drain time
8. Estimated based on the intersection of the 100-yr release rate with the desending portion of the Developed 100-yr hydrograph. For proposed ponds the maximum pond volume was set based on a maximum depth of 10ft within the approximated grading.
9. According to existing pond volume estimates calculated in this DBPS based on pond volume at the spillway elevation. See the Hydrology Section for assumptions on storage volume.
10. Developed flows account for existing and proposed upstream detention
11. Targeted the release of the historical 100-yr flow where possible given storage constraints. In some instances released flows are higher or lower depending on the available storage volume in existing detention ponds. This number was modified from the initial estiamte based on modeling results. All release rates reflect a 100-yr WSE that is at the spillway elevation (no spillway overtopping).
12. Corresponds to stage/storage at an elevation of 2ft above the 100-yr stage or where existing pond grading limits stage.
13. Set at the 100-yr release rate + the peak 100-yr inflow

Falcon DBPS

Pond Effectiveness

Hydrologic Element	Pond Type	Area (sq mi)	Inflow (cfs)[1]		Outflow (cfs)[1]		% Reduction		Estimated 100-yr Drain Time (hr)[2]	Benefits		
			2-year	100-year	2-year	100-year	2-year	100-year		2-yr Peak Flow Reduction (cfs)	100-yr Peak Flow Reduction (cfs)	EURV/WQCV
Paint Brush Hills Pond #4	Existing configuration	0.15	38	198	29	151	22%	24%	10	x	x	
Paint Brush Hills Pond A	WQCV+100-yr	0.10	35	173	7	142	81%	18%	45	x	x	x
Paint Brush Hills Pond B1	Existing configuration	0.36	80	423	51	267	36%	37%	25	x	x	
Paint Brush Hills Pond B2	EURV+100-yr	0.36	51	267	10	182	81%	32%	46	x	x	x
Paint Brush Hills Pond C	EURV+100-yr	0.19	56	303	3	144	95%	53%	57	x	x	x
Regional Pond MN	WQCV+100-yr	1.42	65	854	32	824	51%	3%	72	x		x
Regional Pond R1	EURV+100-yr	5.88	113	1,561	77	1,506	32%	3%	72	x		x
Regional Pond R2	EURV only	10.36	143	2,233	140	2,232	2%	0%	>72			x
Regional Pond WU South	EURV+100-yr	3.55	47	1,072	22	932	54%	13%	72	x	x	x
Sub Regional Pond SR1	WQCV+100-yr	1.09	54	611	42	513	22%	16%	51	x	x	x
Sub Regional Pond SR2	EURV only	2.36	65	842	65	839	0%	0%	72			x
Sub Regional Pond SR3	EURV only	2.82	72	908	72	907	1%	0%	>72			x
Sub Regional Pond SR4	WQCV+100-yr	1.16	133	1,016	27	727	80%	28%	56	x	x	x
Sub Regional Pond SR6	EURV+100-yr	0.36	74	385	9	195	87%	49%	47	x	x	x
The Meadows Pond #1	EURV+100-yr	0.06	11	75	0	2	97%	97%	72	x	x	x
The Meadows Pond #2	EURV+100-yr	0.29	28	206	5	99	81%	52%	62	x	x	x
Woodmen Hills Pond #1 North	100-yr	0.71	65	388	61	264	6%	32%	26		x	
Woodmen Hills Pond #1 South	EURV only	0.71	61	264	10	261	84%	1%	65	x		x
Woodmen Hills Pond #2	EURV+100-yr	0.83	37	270	10	250	72%	7%	>72	x		x
Woodmen Hills Pond #3	WQCV+100-yr	1.11	105	530	13	361	88%	32%	>72	x	x	x
Woodmen Hills Pond #4	EURV+100-yr	1.66	114	789	15	259	87%	67%	72	x	x	x
Woodmen Hills Pond #5	EURV+100-yr	0.04	40	127	1	19	96%	85%	58	x	x	x
Woodmen Hills Pond H	Existing configuration	0.56	142	748	108	752	24%	0%	26	x		

Notes:

1 From Falcon_DBPS_SubRegional.hms file

2 Assumed a 72-hr drain time if the remaining storage volume was less than 5% of total pond volume after 72 hour simultaion.

Existing ponds and 100-yr ponds do not have a targeted drain time.

Per a phone conversation with Ken MacKenzie on 02/04/2013, the simplified equations for EURV target a drain time of 72-hours, however, actual drain times could vary between ~40-72 hours.

Ponds were sized using simplified UDFCD equations for EURV and WQCV design. Detailed design (optimizing drain time scenarios) is not part of this scope.

Assume WQCV ponds are functioning properly if they drain between ~40 and ~72 hours.

Assume EURV ponds are functioning properly if they drain between ~48 and ~72 hours.

In instances where EURV ponds release faster than 72 hours, reducing pond discharge to meet the 72-hr drain time would not change the downstream reach alternative.

Falcon DBPS

Sub Regional Detention Alternative[1]

Pond	Q_2 In (cfs)	Q_2 Out (cfs)	Q_{100} In (cfs)	Q_{100} Out (cfs)	Required Volume (AF)[2]	Land Requirement (ac)[3]	Construction Cost[4]	Land Cost[5]	Improvement Cost[6]	Total Cost
Paint Brush Hills Pond #4	38	29	200	150	1.34	0	$ -	$ -	$ -	$ -
Paint Brush Hills Pond A	35	7	170	140	2.62	0	$ -	$ -	$ 20,000	$ 20,000
Paint Brush Hills Pond B1	80	51	420	270	9.17	0	$ -	$ -	$ -	$ -
Paint Brush Hills Pond B2	51	10	270	180	12.09	0	$ -	$ -	$ 20,000	$ 20,000
Paint Brush Hills Pond C	56	3	300	140	6.77	0	$ -	$ -	$ 20,000	$ 20,000
Regional Pond MN	65	32	850	820	7.53	0	$ -	$ -	$ 20,000	$ 20,000
Regional Pond R1	110	77	1,600	1,500	25.00	18.8	$ 532,609	$ 940,420	$ -	$ 1,473,028
Regional Pond R2	140	140	2,200	2,200	3.13	5.1	$ 66,634	$ 255,974	$ -	$ 322,608
Regional Pond WU South	47	22	1,100	930	39.54	0		$ -	$ 20,000	$ 20,000
Sub Regional Pond SR1	54	42	610	510	11.03	3.4	$ 234,987	$ 170,782	$ -	$ 405,769
Sub Regional Pond SR2	65	65	840	840	2.05	5.2	$ 43,674	$ 257,529	$ -	$ 301,203
Sub Regional Pond SR3	72	72	910	910	1.03	0.6	$ 21,943	$ 27,609	$ -	$ 49,552
Sub Regional Pond SR4	130	27	1,000	730	19.37	20.5	$ 412,665	$ 1,022,834	$ -	$ 1,435,500
Sub Regional Pond SR6	74	9	390	200	11.82	6.69	$ 251,817	$ 334,260	$ -	$ 586,078
The Meadows Pond #1	11	0	70	0	3.25	0	$ -	$ -	$ 20,000	$ 20,000
The Meadows Pond #2	28	5	210	100	7.94	0	$ -	$ -	$ 20,000	$ 20,000
Woodmen Hills Pond #1 North	65	61	390	260	7.13	0	$ -	$ -	$ 20,000	$ 20,000
Woodmen Hills Pond #1 South	61	10	260	260	8.78	0	$ -	$ -	$ 20,000	$ 20,000
Woodmen Hills Pond #2	37	10	270	250	9.18	0	$ -	$ -	$ 20,000	$ 20,000
Woodmen Hills Pond #3	110	13	530	360	8.35	0	$ -	$ -	$ 20,000	$ 20,000
Woodmen Hills Pond #4	110	15	790	260	40.45	0	$ -	$ -	$ 240,000	$ 240,000
Woodmen Hills Pond #5	40	1	130	20	4.10	0	$ -	$ -	$ 20,000	$ 20,000
Woodmen Hills Pond H	140	110	750	750	2.66	0	$ -	$ -	$ -	$ -
									Subtotal	$ 5,053,738
									Engineering (15%)	$ 758,061
									Contingency (20%)	$ 1,010,748
									Total	$ 6,822,546

Notes

[1] Represents future hydrology with retrofit existing detention ponds and 7 new sub regional detention ponds

[2] Required volume to highest WSE, either EURV or 100-yr respectively, not including embankment

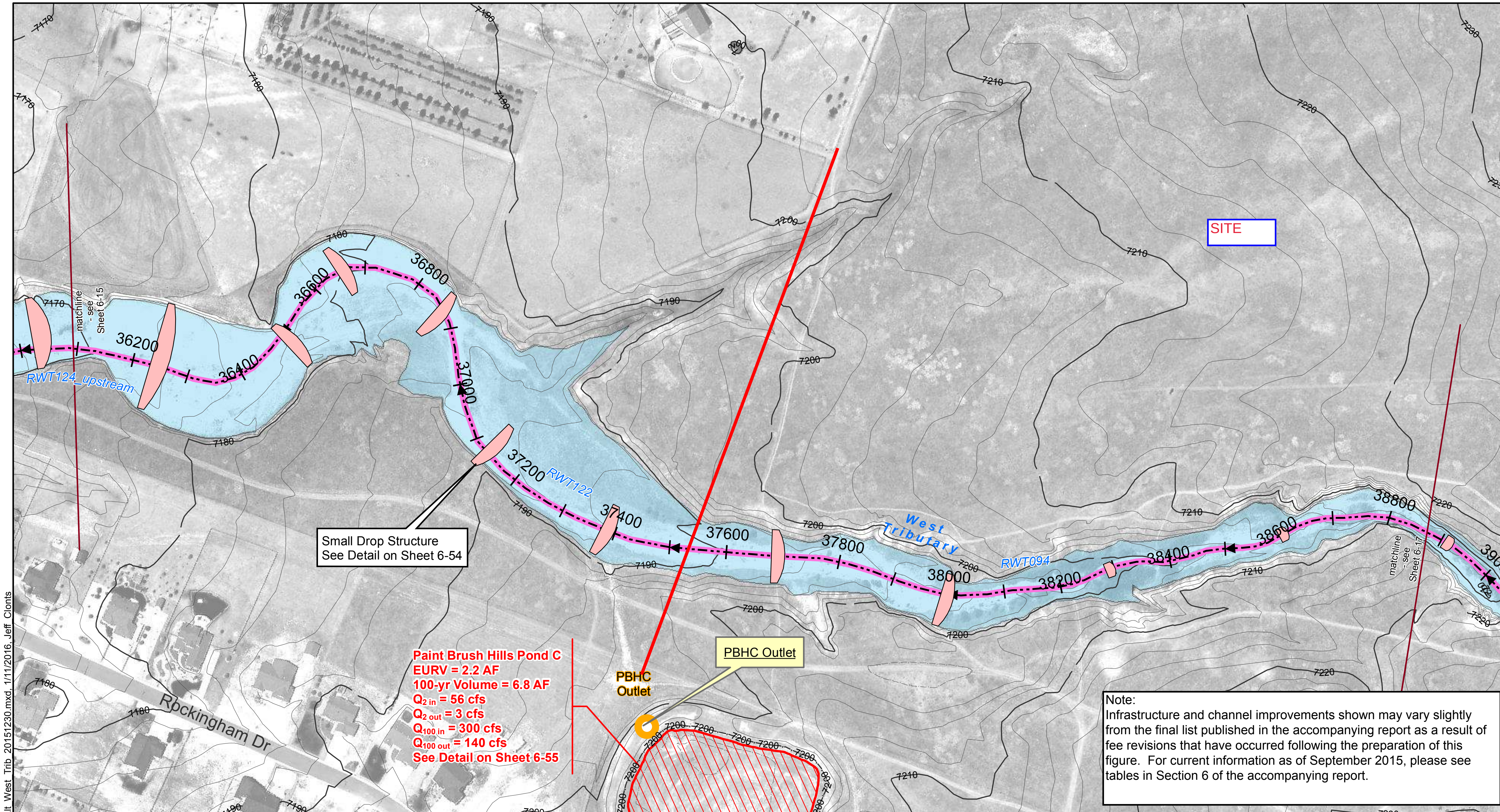
[3] Land requirement is based on approximate grading at spillway stage. Refer to Conceptual Plan GIS mapbook. Copied as value from GIS attribute.

[4] Based on $24,500/AF as documented in the Jimmy Camp Creek DBPS - FSD Costs Memo. The published value includes engineering costs - so dividing this cost by 1.15 to represent construction portion only.

[5] From Jeff Rice via comment letter on 5/24/13: Use $50,000/Ac. for land purchase costs, with a note that the actual current (2013) Parks fees are based on land value of $46,954/Ac.

[6] Includes costs to retrofit existing outlet structures for EURV/WQCV and 100-yr flood control. This costs assumes a plate can be placed over a low flow orifice and/or an opening be cut out of the existing drop structure OR 2 CDOT Type C inlets w/ 100LF of 48" RCP be used for the retrofit. Not all existing ponds are retrofit. Woodmen Hills Pond #4 improvement cost was taken directly from the March 2011 Wilson & Co. Pond 4 Assessment Report Preliminary Cost Estimates table for Alternative 2 on pg. 21.

Sheet 6-16
Falcon DBPS Conceptual Plan West Tributary El Paso County, CO



Note:
Infrastructure and channel improvements shown may vary slightly from the final list published in the accompanying report as a result of fee revisions that have occurred following the preparation of this figure. For current information as of September 2015, please see tables in Section 6 of the accompanying report.

Legend

- Drainageway Crossing
- Stream Centerline
- Existing Approximate 100-yr Floodplain*
- Floodplain Study Limit

Storm Sewer

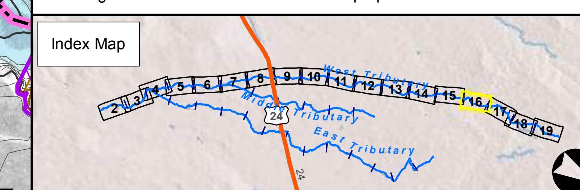
- Inlet
- Manhole
- Pipe

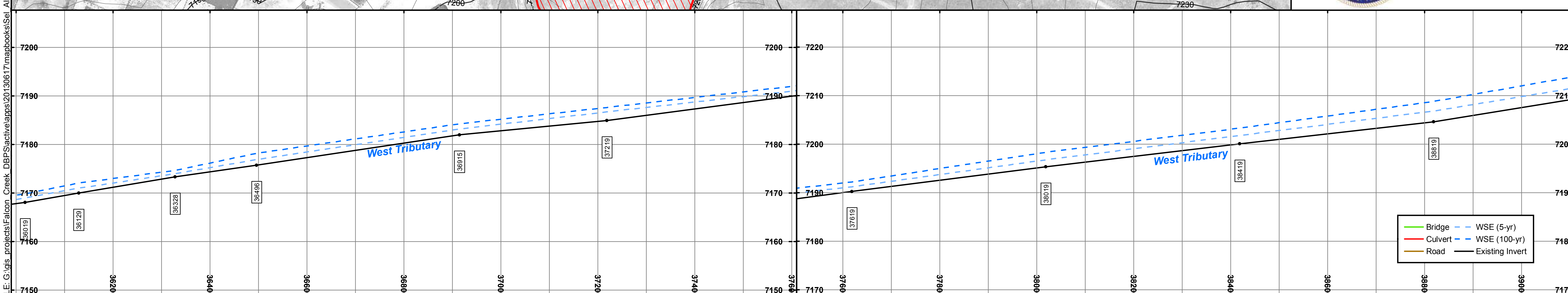
Reach Improvements

- Natural Channel Design
- Protect In Place
- Roadside Ditch Improvement
- Small Drop Structures w/ Toe Protection
- Existing Detention
- Proposed Detention
- Proposed Detention Grading
- Small Drop Structure
- Cross Vane
- Immediate Action Required to Preserve Existing Condition

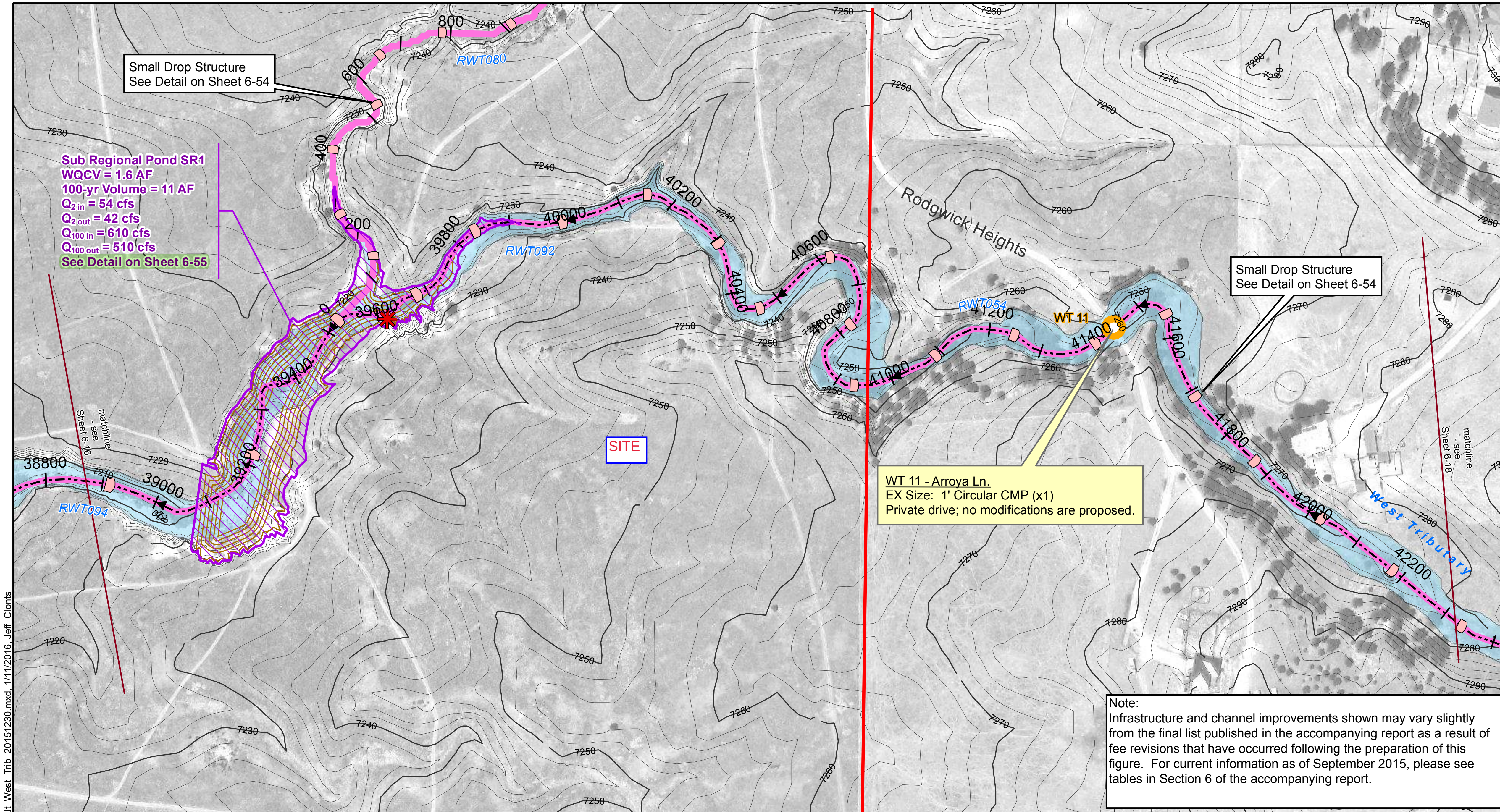
0 100 200 Feet

* These approximate 100-yr floodplain boundaries are for planning purposes only. This information is not intended to replace the information provided on the FEMA Flood Insurance Rate Maps for this area.
** These are conceptual design drawings and are subject to change. These drawings are not intended for construction purposes.





Sheet 6-17
Falcon DBPS
Conceptual Plan
West Tributary
El Paso County, CO



Legend

- Drainageway Crossing
- Stream Centerline
- Existing Approximate 100-yr Floodplain*
- Floodplain Study Limit

Storm Sewer

- Inlet
- Manhole
- Pipe

Reach Improvements

- Natural Channel Design
- Protect In Place
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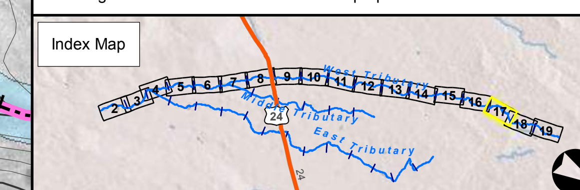
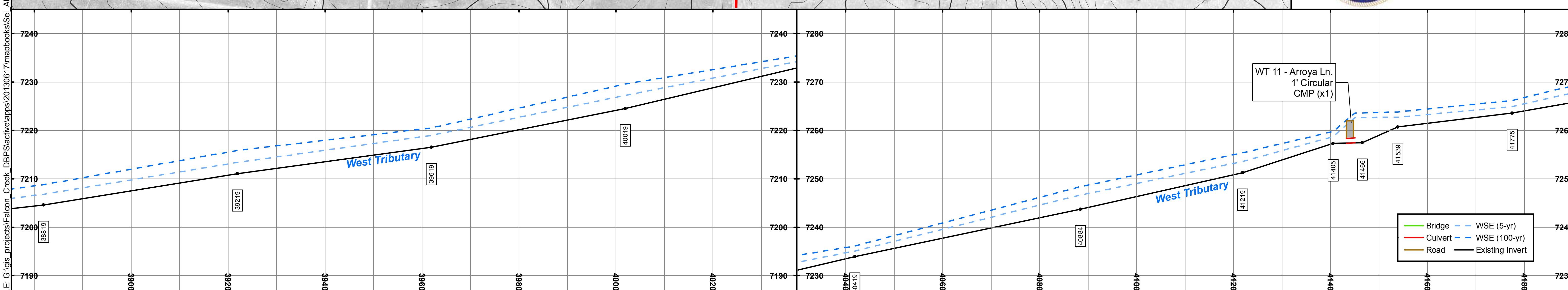
- Existing Detention
- Proposed Detention
- Proposed Detention Grading
- Small Drop Structure
- Cross Vane
- Immediate Action Required to Preserve Existing Condition

0 100 200 Feet

* These approximate 100-yr floodplain boundaries are for planning purposes only. This information is not intended to replace the information provided on the FEMA Flood Insurance Rate Maps for this area.
** These are conceptual design drawings and are subject to change. These drawings are not intended for construction purposes.



Note:
Infrastructure and channel improvements shown may vary slightly from the final list published in the accompanying report as a result of fee revisions that have occurred following the preparation of this figure. For current information as of September 2015, please see tables in Section 6 of the accompanying report.



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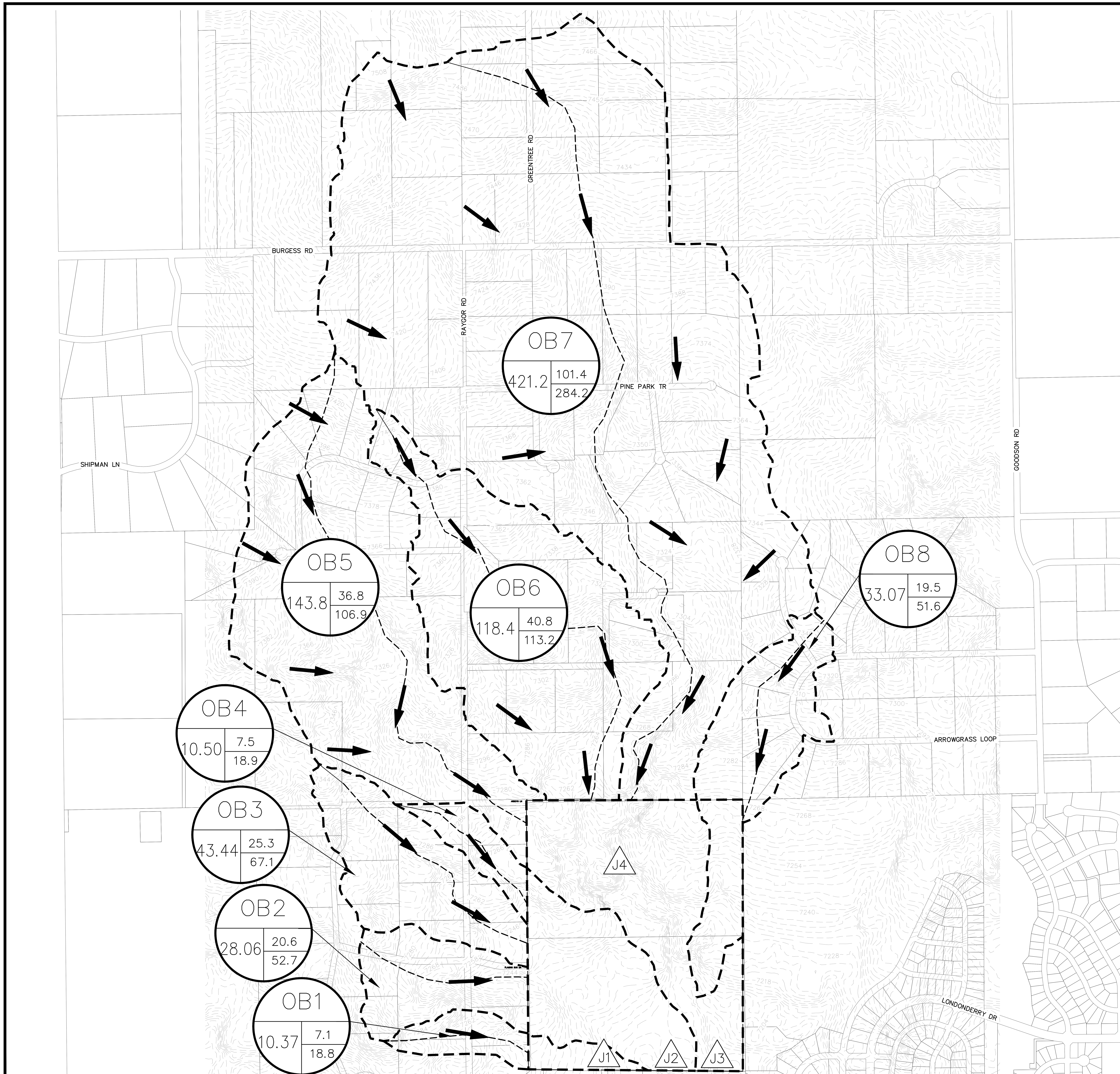
APPENDIX E: DRAINAGE MAPS



LEGEND

DRAINAGE BASIN AREAS

A – HEC-HMS BASINS
B – BASIN ACREAGE
C – 5-YR RUNOFF
D – 100-YR RUNOFF

E0 DESIGN POINT

EXISTING CONTOURS

PROPERTY BOUNDARY

FLOW ARROW

FLOW PATH

PARCEL LINE

HEC-HMS - EXISTING RUNOFF TABLE						
DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE DIRECT 5-YR RUNOFF (CFS)	CUMULATIVE DIRECT 100-YR RUNOFF (CFS)
	B1	5.55	3.0	8.5	-	-
J1	OB1	10.37	7.1	18.8	10.1	27.3
	B2	41.43	15.4	48.5	-	-
	OB2	28.06	20.6	52.7	-	-
	OB3	43.44	25.3	67.1	-	-
J2	OB4	10.50	7.5	18.9	67.5	183.8
	OB5	143.82	36.8	106.9	-	-
	OB6	118.40	40.8	113.2	-	-
J4	OB7	421.43	101.4	284.2	169.2	478.0
	B3	59.54	36.4	110.0	-	-
	B4	14.68	5.4	18.2	-	-
J3	OB8	33.07	19.5	51.6	183.1	515.5

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DRAWN BY: RS
CHECKED BY: KK
DATE: 12/06/2022

EAGLEVIEW
EL PASO COUNTY, COLORADO
PRE DEVELOPMENT DRAINAGE MAP

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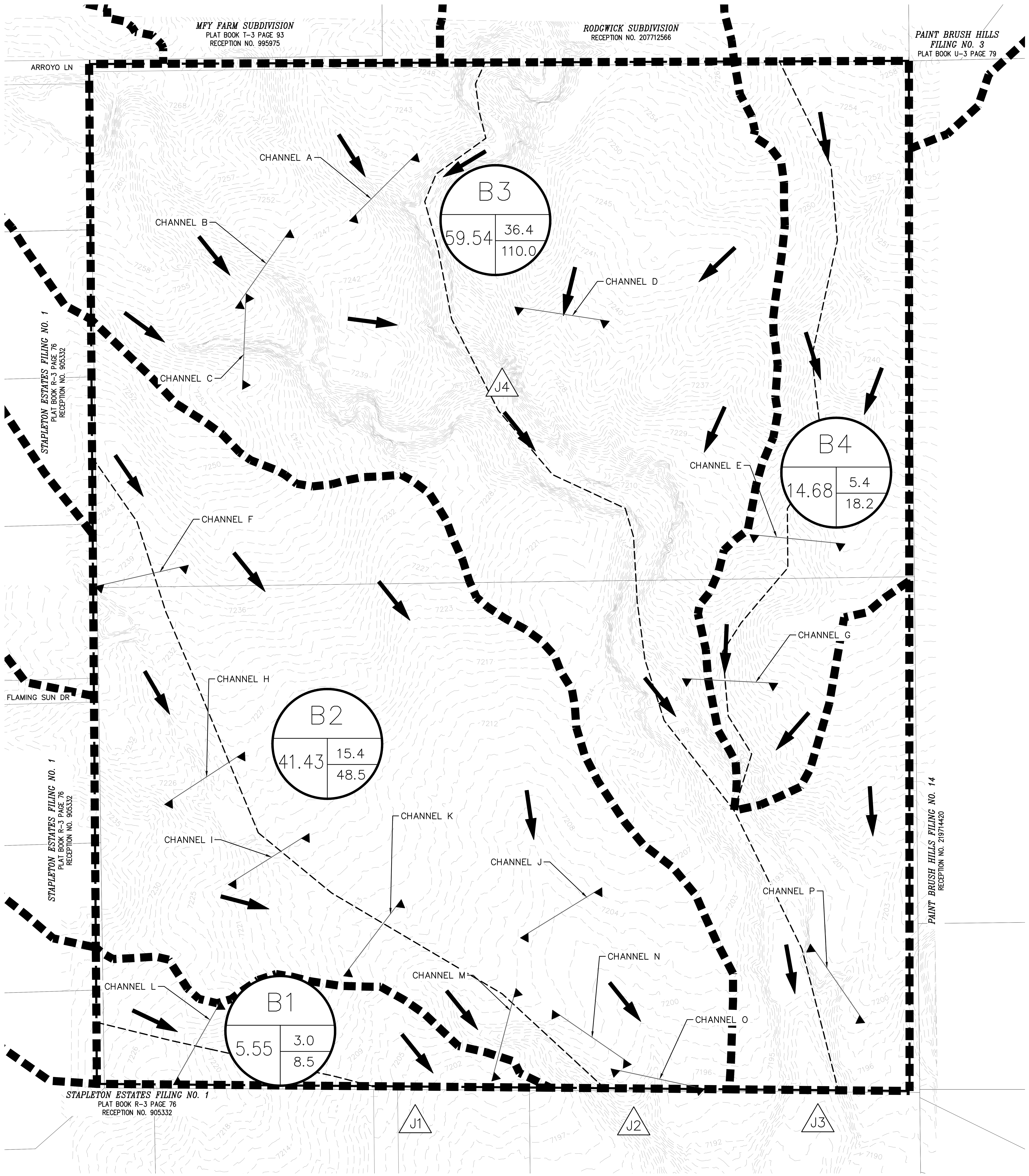
SHEET
1



LEGEND

HEC-HMS - EXISTING RUNOFF TABLE						
DESIGN POINT	BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)	CUMULATIVE DIRECT 5-YR RUNOFF (CFS)	CUMULATIVE DIRECT 100-YR RUNOFF (CFS)
	B1	5.55	3.0	8.5	-	-
J1	OB1	10.37	7.1	18.8	10.1	27.3
	B2	41.43	15.4	48.5	-	-
	OB2	28.06	20.6	52.7	-	-
	OB3	43.44	25.3	67.1	-	-
J2	OB4	10.50	7.5	18.9	67.5	183.8
	OB5	143.82	36.8	106.9	-	-
	OB6	118.40	40.8	113.2	-	-
J4	OB7	421.43	101.4	284.2	169.2	478.0
	B3	59.54	36.4	110.0	-	-
	B4	14.68	5.4	18.2	-	-
J3	OB8	33.07	19.5	51.6	183.1	515.5

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EAGLEVIEW
EL PASO COUNTY, COLORADO
PRE DEVELOPMENT DRAINAGE MAP

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SHEET
2

Provide maintenance access road and easements for the highlighted facilities & main stem channels.

Update the construction plans and plat document.

See ECM 3.3.3.K for Channel Easement and Access criteria.

Provide maintenance access and easements for the highlighted facilities & main stem channels.

Update the construction plans and plat document.

LEGEND

- DRAINAGE BASIN AREAS
- A – HEC-HMS BASINS
- B – BASIN ACREAGE
- C – 5-YR RUNOFF
- D – 100-YR RUNOFF
- DESIGN POINT (E0)
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY BOUNDARY
- FLOW ARROW
- FLOW PATH
- PROPOSED CHANNEL CROSS SECTIONS
- GROUTED BOULDER DROP STRUCTURE (4)
- RIFFLE DROP STRUCTURE (5)

HEC-HMS - DEVELOPED RUNOFF BASIN TABLE			
BASIN DESIGNATION	BASIN AREA (ACRES)	DIRECT 5-YR RUNOFF (CFS)	DIRECT 100-YR RUNOFF (CFS)
OB1	10.37	7.1	18.8
OB2	28.06	20.5	52.7
OB3	43.44	25.4	67.2
[illegible]	[illegible]	7.5	18.9
[illegible]	[illegible]	37.0	107.1
[illegible]	[illegible]	40.8	113.3
[illegible]	[illegible]	101.4	284.3
[illegible]	[illegible]	19.5	51.6
[illegible]	[illegible]	3.0	7.7
[illegible]	[illegible]	1.0	2.4
[illegible]	[illegible]	1.5	3.3
[illegible]	[illegible]	12.6	30.2
[illegible]	[illegible]	4.2	10.4
PB6	11.09	8.6	20.7
PB7	3.46	3.2	7.4
PB8	11.78	12.1	30.4
PB9	12.80	9.8	24.8
PB10	11.53	8.2	20.4
PB11	16.11	12.1	29.8
PB12	0.20	0.5	0.9
PB13	3.87	4.5	10.9
PB14	17.28	18.9	46.3
PB15	9.63	11.0	26.3

HEC-HMS - DEVELOPED RUNOFF DESIGN POINT TABLE				
DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (ACRES)	CUMULATIVE 5-YR FLOW (CFS)	CUMULATIVE 100-YR FLOW (CFS)
P1	OB1, PB1	14.62	10.1	26.4
P2	OB2, OB3, OB4, PB3, PB4, PB5, PB6, PB7, PB15	124.29	72.7	185.4
P3	OB5, OB6, OB7, OB8, PB8, PB9, PB10, PB11, PB12, PB13, PB14	790.08	158.4	405.1
P4	OB2, OB3, OB4, PB3, PB4, PB5, PB6, PB7	114.66	70.8	180.8
P5 (CULVERT 7)	OB3, OB4, PB5	60.12	36.9	96.1
P6	OB8, PB11, PB12	49.39	30.4	79.1
P7 (POND SR1)	OB5, OB6, OB7, PB8, PB9, PB10	719.55	130.7	387.8
P8	OB5, OB6, OB7, PB8, PB9, PB10	707.97	172.5	485.7
P9 (CULVERT 6)	OB8, PB11	49.18	30.4	79.1
P10 (CULVERT 2)	OB2, OB3, OB4, PB4, PB5	98.72	58.0	150.2
P11 (CULVERT 3)	PB6, PB7	14.55	11.7	28
P12 (CULVERT 8)	OB5, OB6, OB7, PB8, PB9, PB10, PB13	723.39	151.0	388.5

NOTES:
1. LOCATION OF DROP STRUCTURES IS APPROXIMATE AND WILL BE FINALIZED IN SUBSEQUENT SUBMITTALS OF THE FINAL DRAINAGE REPORT.

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EAGLEVIEW
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POST DEVELOPMENT - DRAINAGE MAP

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3

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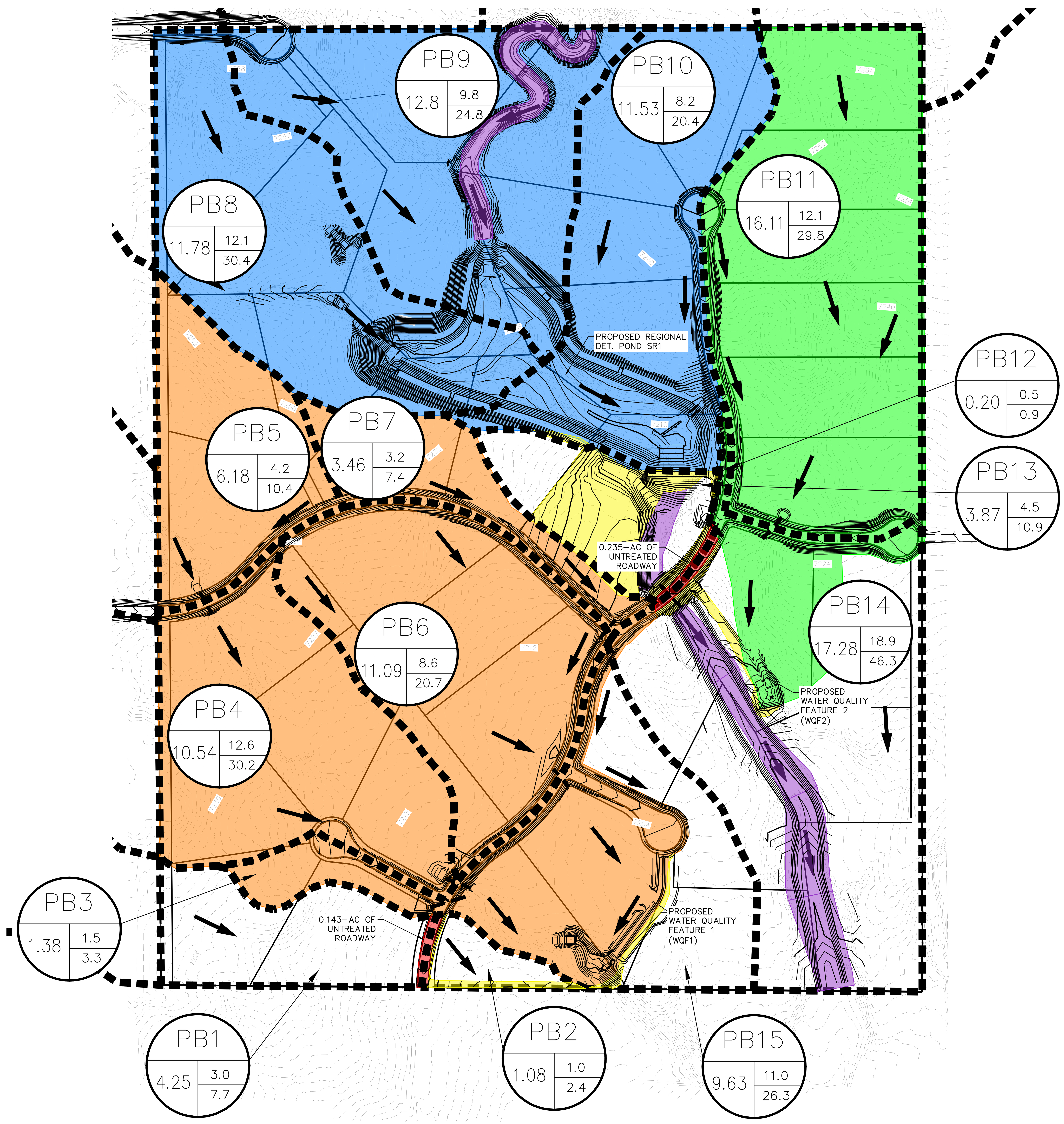

LEGEND

- DRAINAGE BASIN AREAS
- A / B / C / D: A – HEC-HMS BASINS; B – BASIN ACREAGE; C – 5-YR RUNOFF; D – 100-YR RUNOFF
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPERTY BOUNDARY
- FLOW ARROW
- FLOW PATH
- AREA TRIBUTARY TO SR1
- AREA TRIBUTARY TO WQF1
- AREA TRIBUTARY TO WQF2
- ROADWAY AREA NOT TREATED (SEE NOTE 2)
- GRADED AREA NOT TREATED (SEE NOTE 1)
- STREAM STABILIZATION SITES NOT TREATED (SEE NOTE 3)

NOTES:

1. NON-ROADWAY AREAS NOT TREATED BY A PBMP ARE EXCLUDED BASED ON ECM APP I.7.1.B.7 AND I.7.1.B.7 DUE TO GRADING WITHIN A DEDICATED DRAINAGE EASEMENT TO PROVIDE A PATHWAY FOR THE EMERGENCY OVERFLOW FROM THE SUB-REGIONAL POND AND A MAINTENANCE ROAD FROM TO THE WATER QUALITY FACILITIES #1 AND #2. THE PORTION OF THE AREA NOT WITHIN THE DRAINAGE EASEMENT WILL BE PART OF A "LARGE LOT" 2.5 ACRES OR GREATER WITH AND IMPERVIOUS PERCENTAGE LESS THAN 10%
2. ROADWAY AREA NOT TREATED BY A PBMP TOTALS 0.39 ACRES AND IS EXCLUDED BASED ON ECM APP I.7.1.C.1.
3. AREAS DISTURBED THROUGH THE CONSTRUCTION OF DROP STRUCTURES ARE EXCLUDED BASED ON ECM APP I.7.1.B.8.

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EAGLEVIEW
EL PASO COUNTY, COLORADO
OVERVIEW MAP - PBMP TRIBUTARY AREAS

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K:\COS_Civil\196288000_Eagleview\CADD\Exhibits\Drainage Analysis\196288000_TRIB_AREAS.dwg Morey, Doug 12/22/2022 5:45 PM