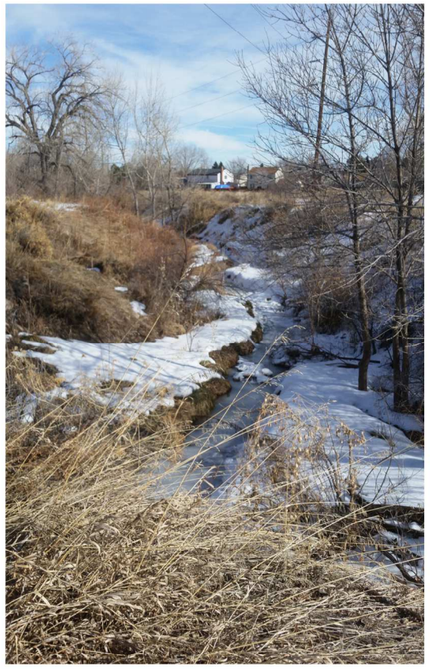
FLOOD HAZARD AREA DELINEATION

WEAVER CREEK

November 2021



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JEFFERSON COUNTY COLORADO

MHFD MILE HIGH FLOOD DISTRICT

Lakewood
Full of Possibilities.

November 15, 2021

Mrs. Brooke Seymour, PE, CFM
Engineering Service Manager
Mile High Flood District
2480 W. 26th Avenue, Suite 156B
Denver, CO 80211

Re: Weaver Creek Flood Hazard Area Delineation
Agreement No. 15-11.20
Olsson Project No. 016-0858

Dear Mrs. Seymour:

Olsson is pleased to submit the Weaver Creek Flood Hazard Area Delineation (FHAD). This report documents the baseline hydrology development process, hydraulic analysis, and floodplain mapping.

The FHAD report was prepared with the cooperation of MHFD, Jefferson County, and the City of Lakewood. The information from this study provides the project sponsors with guidance for future construction and development projects in the watershed.

We appreciate the opportunity to work with you on this project and look forward to working with you on future projects.

Sincerely,

Deb Ohlinger, PE, CFM
Project Manager

Amy M. Gabor, PE, CFM, LEED® AP
Project Engineer

Michelle Danaher, PE, CFM
Associate Engineer

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS INDEX

Ave – Avenue
Blvd – Boulevard
BMP – Best Management Practice
CDOT – Colorado Department of Transportation
CMP – corrugated metal pipe
CUHP– Colorado Urban Hydrograph Procedure
D/S – downstream
E – East
EGL – energy grade line
EPA – Environmental Protection Agency
EURV – excess urban runoff volume
EX – existing
FEMA – Federal Emergency Management Agency
FHAD – Flood Hazard Area Delineation
FIRM – Flood Insurance Rate Map
FTR – future
HSG – hydrologic soils group
I/Imp. – Imperviousness
Lakewood – City of Lakewood
LiDAR – light detection and ranging
MHFD – Mile High Flood District
MDP – Major Drainageway Plan
N – North
NLCD – National Land Cover Database
No. – Number
NOAA – National Oceanic and Atmospheric Administration
NRCS – Natural Resources Conservation Service
Olsson – Olsson Associates
O&M – operations and maintenance
Rd – Road
RCBC – reinforced concrete box culvert
RCP – reinforced concrete pipe
S – South
SEO – State Engineer's Office
SSP – smooth steel pipe
St – Street
SWMM – Storm Water Management Model
UDFCD – Urban Drainage and Flood Control District
U/S – upstream
USACE – United States Army Corps of Engineers
USDCM – Urban Storm Drainage Criteria Manual
W – West
WQCV – water quality capture volume
WSE – water surface elevation
% – percent
ac – acre
AF/ac-ft – acre-feet
cfs – cubic feet per second
ft or ' – foot/feet
in or " – inch/inches
mi – mile

1.0 INTRODUCTION

1.1 Authorization

Olsson was retained to complete a Major Drainageway Plan (MDP) and Flood Hazard Area Delineation (FHAD) for Weaver Creek, co-sponsored by Mile High Flood District (MHFD), Jefferson County, and City of Lakewood (Lakewood). The Agreement Regarding Major Drainageway Plan and Flood Hazard Area Delineation for Weaver Creek (Agreement No. 15-11.20) was executed on April 18, 2016.

1.2 Purpose and Scope

The purpose of this study was to update the hydrology as part of the MDP, and update the floodplain mapping along Weaver Creek. No modifications to the scope of this study were made by the project sponsors.

The following tasks were completed as part of the major drainageway plan:

- Collected existing information, including a previous FHAD and outfall systems plan (OSP), development drainage studies, and drainage improvement as-built plans
- Solicited input from project sponsors
- Obtained base mapping, structure surveys, and GIS information from MHFD, Jefferson County, and Lakewood.
- Obtained future land use mapping from Lakewood and Jefferson County
- Determined subwatershed boundaries and parameters in accordance with MHFD criteria
- Developed existing and future (fully developed) conditions baseline hydrology using the Colorado Urban Hydrograph Procedure (CUHP) 2005, version 1.5.2b and the Environmental Protection Agency Stormwater Management Model (EPA SWMM) 5.1, version 5.1.010
- Reconciled the hydrology with previous studies
- Evaluated existing structure and channel capacities
- Identified problem areas
- Mapped the 100-year floodplain, 500-year floodplain, and floodway
- Completed a report

1.3 Planning Process

The effective hydrology of the Weaver Creek watershed was completed for the *Flood Hazard Area Delineation: Weaver Creek,* prepared by Leonard Rice Consulting Water Engineers, Inc. in May 1981 (1981 FHAD). The *Bergen Reservoir Tributary to Weaver Creek: Outfall Systems Planning* report, by J.F. Sato and Associates, was completed in December 1995 (1995 OSP) and included updated hydrology, alternatives analysis, and conceptual design of the selected plan for a portion of the Weaver Creek watershed.

The baseline hydrology developed for this study represents an updated analysis using CUHP 2005, version 1.5.2b and EPA SWMM, version 5.1.010. Further information regarding the hydrologic modeling process is included in Section 3.0.

A kickoff meeting and five progress meetings were held to discuss the project goals, project status, hydrologic analysis, and hydraulic modeling with MHFD, Jefferson County, and Lakewood. The meetings were held on May 2, June 30, October 24, 2016, June 22, 2017, March 1, 2018, and November 5, 2020. Minutes from the meetings are included in Appendix A. A public meeting was held on May 16, 2017 to provide information on the master plan process and solicit input from watershed residents. The sign-in sheets are included in Appendix A.

MHFD, Jefferson County, and Lakewood reviewed the draft baseline hydrology and returned comments on August 9, 2016. The comments were incorporated into this final report. Only minor review comments were received for the draft baseline hydrology report, so a summary of the comments and responses was not prepared and was not included in the appendix. The hydrology was approved by MHFD on August 9, 2016 when direction was provided to move on to hydraulics. MHFD reviewed the draft FHAD models and figures and returned comments on 4/12/2017, 2/8/2018, 4/19/2018, 5/27/2019,8/14/2020, 4/26/2021, and 6/25/2021. The comments were incorporated into this report. A summary of review comments and responses are included in Appendix A.

1.4 Mapping and Surveys

MHFD provided 1-foot (ft) interval 2014 LiDAR mapping for the entire Weaver Creek watershed. The LiDAR mapping is referenced to the NAVD 88 vertical datum and the NAD 83 horizontal datum. The road crossing structures were surveyed by Accurate EngiSurv, LLC. The lowest adjacent grade was surveyed at 7 insurable structures by Wilson & Company, Inc. in September 2021. MHFD provided 2012 aerial photography. Jefferson County and Lakewood provided GIS files of parcels, street centerlines, trails, zoning, and some utilities in the watershed.

1.5 Data Collection

Drainage studies and as-built plans were collected from MHFD, Jefferson County, and Lakewood. The Jefferson County, Colorado and Incorporated Areas Flood Insurance Rate Maps (FIRMs) were obtained from the Federal Emergency Management Agency (FEMA). The main studies and plans that were reviewed in the preparation of this report are shown in Table 1. A list of all studies reviewed in the preparation of this report is shown in Section 7.

Table 1 – Data Collected

Title	Date	Author
Flood Hazard Area Delineation: Weaver Creek	May 1981	Leonard Rice Consulting Water Engineers, Inc.
Bergen Reservoir Tributary to Weaver Creek: Outfall Systems	December 1995	J.F. Sato and Associates
South Simms Street – U.S. 285 Interchange and Extension of South Simms Street – Quincy to U.S. 285	May 10, 2002	Washington Infrastructure Services, Inc.
West Belleview Avenue West Quincy Avenue to South Simms Street - Phase III Drainage Report	December 4, 2006	Muller Engineering Company, Inc.
Zoning Map	February 17, 2016	City of Lakewood
Zoning Maps (See Section 7.0)	August 18, 2010	Jefferson County Planning and Zoning

1.6 Acknowledgements

The FHAD was prepared with the cooperation of MHFD, Jefferson County, and Lakewood. The representatives who were involved with this study are listed in Table 2.

Table 2 – Project Participants

Name	Representing	Assignment
Brooke Seymour	MHFD	Engineering Services Manager
Hung-Teng Ho	MHFD	Hydraulic Modeler
Lauren Copenhagen	Jefferson County	Project Sponsor
Chris Proper	Lakewood	Project Sponsor
Deb Ohlinger	Olsson	Project Manager
David Krickbaum	Olsson	Technical Advisor, QA/QC
Amy Gabor	Olsson	Project Engineer
Michelle Danaher	Olsson	Associate Engineer

2.0 STUDY AREA DESCRIPTION

2.1 Project Area

Watershed and Drainageway Description

The approximate 7.2 square mile Weaver Creek watershed, Reuse number 5502, extends from west of Whale Rock Way to its confluence with Bear Creek, south of West Morrison Road and west of South Kipling Street. The watershed extends through Jefferson County and Lakewood, as shown on Figure 1. The watershed is approximately 7.0 miles long and 1.3 miles wide. Weaver Creek generally slopes down toward Bear Creek in a northeast direction, with slopes ranging from 0.4 to 11 percent (%). The lowest and highest watershed elevations are 5435 and 7952, respectively.

Reservoirs

Three large, off-stream reservoirs are located in the watershed: Bergen Reservoir No. 1, Bergen Reservoir No. 2, and Harriman Lake. None of these reservoirs were included in the baseline hydrology for this study.

According to the 1995 OSP, the Bergen Reservoirs are filled with water diverted from Weaver Creek and Turkey Creek. The reservoirs are used for the storage of irrigation water to be used for agricultural lands. The 1995 OSP states:

> *"During construction of Highway C-470 an agreement was signed between the Colorado Highway Department (now Colorado Department of Transportation) and the Bergen Reservoir and Ditch Company for some surcharge storage and spillway modifications on Reservoir No. 2 to limit the total 100-year flow across C-470 to 100 cfs…These modifications have not been implemented but the 100 cfs restriction is in place due to storage restriction by the State Engineer's Office. Modifications of the Bergen Reservoir No. 2 spillway to safely pass 75% of the Probable Maximum Flood peak have been requested by the State to be implemented by the end of year 1998. These modifications will not change the basic conclusions of the routing calculations performed in this study."*

The 1995 OSP included detention routing for Bergen Reservoirs No. 1 and 2, as well as inadvertent detention at both the southwest and the southeast corners of W. Belleview Avenue and C-470. The detention area in the southeast corner of W. Belleview Avenue and C-470 was later formalized and is described in more detail in the following "Existing Regional Detention Basins" section.

Harriman Lake is located on the east side of the Weaver Creek watershed. The lake stores municipal and irrigation water and is not used for flood control.

Existing Regional Detention Basins

One regional detention basin, which was included in the baseline hydrology, is located in the Weaver Creek watershed in unincorporated Jefferson County. The Southeast Belleview and C-470 Detention Basin is an off-line detention basin that was formalized in 2006 as part of the *West Belleview Avenue: West Quincy Avenue to South Simms Street* project, designed by Muller Engineering Company, Inc. More detailed hydrologic information is included in Section 3.4.

Irrigation Ditches

Three irrigation ditches cross the Weaver Creek watershed. Weaver Creek crosses under the Warrior Canal in an elliptical 60-inch corrugated metal pipe (CMP) upstream of U.S. 285. Harriman Canal crosses the creek approximately halfway between Simms Street and S. Youngfield Street. The canal appears to have been abandoned. Bergen Ditch joins Weaver Creek about 350 feet downstream of Crestbrook Dr and is carried within Weaver Creek through Structures 17 (Belleview Avenue) and 16 (Driveway). It then has two areas it draws water from: one directly downstream of Structure 17 and a second downstream of Structure 16, it then flows into the Bergen West Reservoir. The canals intercept some stormwater from adjacent developments.

Planned Construction

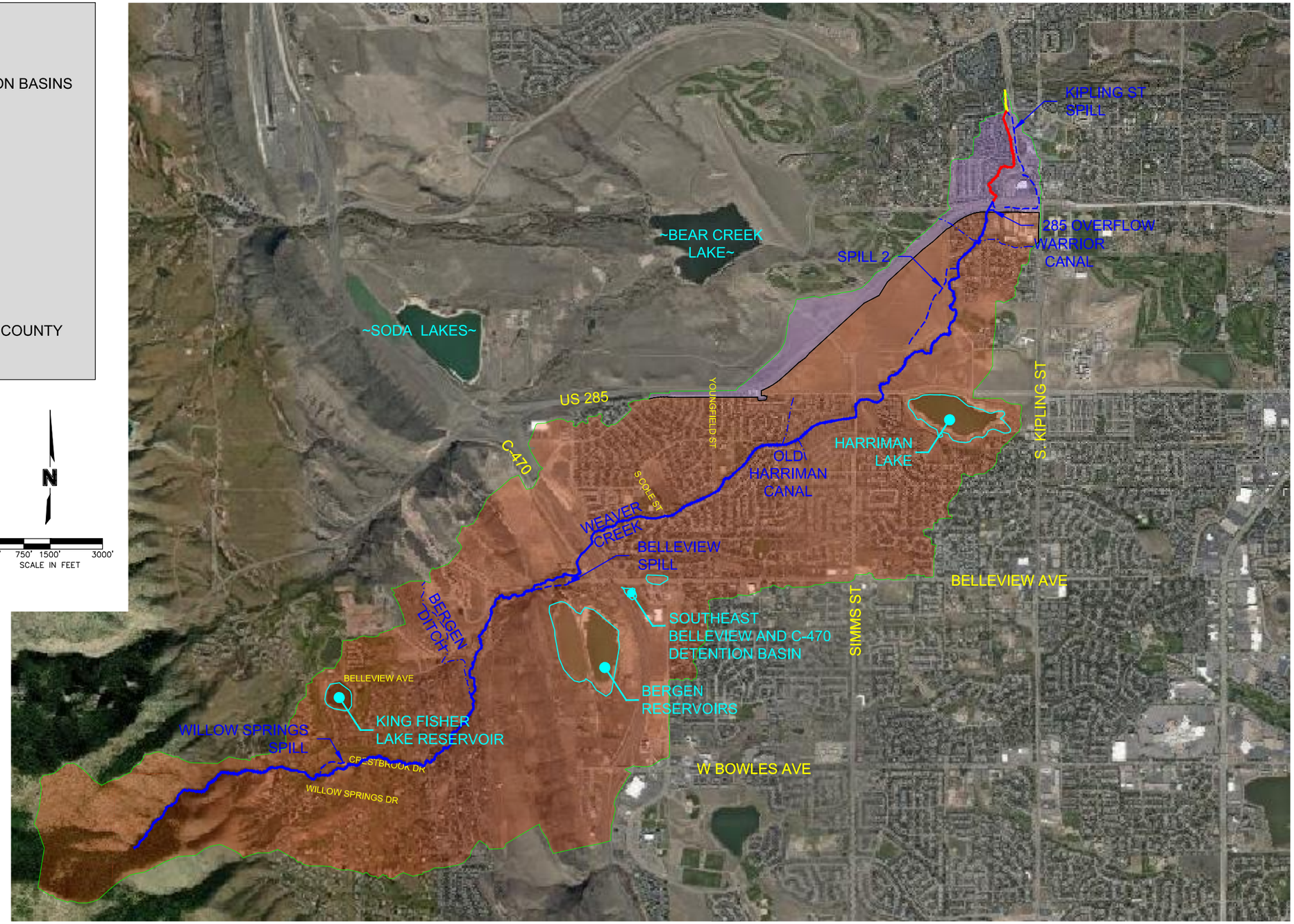
Several developments were under construction at the time of this study. Light industrial development was under construction at the southeast corner of W. Belleview Avenue and C-470, adjacent to the regional detention basin, and a low density single-family development was under construction west of Diamondback Road and W. Belleview Avenue. Both of these developments were included in the existing conditions hydrology.

Soils

Soil types were determined using the Natural Resources Conservation Service (NRCS) Web Soil Survey. The soils in the watershed consist primarily of hydrologic soils groups (HSG) C and D, which are generally characterized by low infiltration rates, as defined by the NRCS. Significant area of HSG B soils, generally characterized by moderate infiltration rates, are also present, primarily in the developed area west of C-470. Only a small area of HSG A soils, which are generally characterized by high infiltration rates, is present in the watershed. The soils map is included on Figure B-1 in Appendix B.

LEGEND

- WATERSHED BOUNDARY
- LAKES / RESERVOIRS/ DETENTION BASINS
- WEAVER CREEK REACH 0
- WEAVER CREEK REACH 1
- WEAVER CREEK REACH 2
- SPILL REACH
- CANAL
- JURISDICTIONAL BOUNDARY
- UNINCORPORATED JEFFERSON COUNTY
- CITY OF LAKEWOOD



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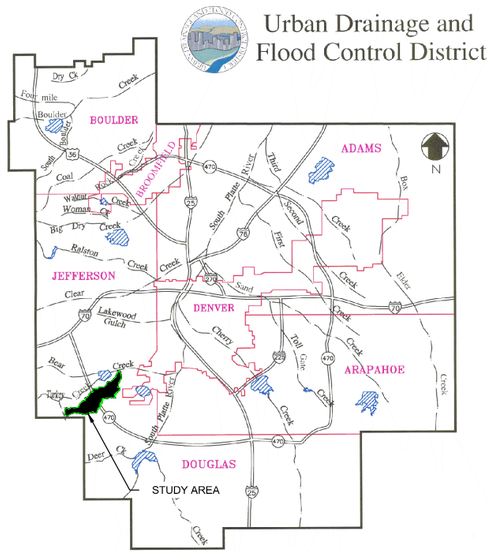

Urban Drainage and Flood Control District

February 2007

PROJECT:	016-0858
DRAWN BY:	MD/ND
DATE:	06/2021

MILE HIGH FLOOD DISTRICT, JEFFERSON COUNTY, AND CITY OF LAKEWOOD

WEAVER CREEK MDP & FHAD
STUDY AREA MAP

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FIGURE 1

2.2 Land Use

The watershed is partially developed, with areas of land that remain undeveloped, primarily west of C-470. Existing development consists mostly of single-family residential, with lower densities west of C-470 and higher densities east of C-470. Pockets of industrial, commercial, and open space/recreational areas are also present. Existing land use was verified using aerial imagery and site visit observations.

Outside of the existing developed area, future land use will consist mostly of light industrial and low density residential areas, with pockets of commercial areas. Future land use information was obtained from Jefferson County and Lakewood zoning maps, included in Appendix B, and GIS information. Additional discussion of land uses and corresponding percent impervious values is included in Section 3.3.

2.3 Reach Description

Weaver Creek was divided into three reaches, as shown on Figure 1. Table 3 summarizes the major crossing structure inventory for Weaver Creek. Photos of the major structure crossings are included in Appendix C. The existing channel conditions are described in more detail below.

Table 3 - Major Structure Crossing Inventory

Reach	Jurisdiction	Street Name	Structure Survey Number	Street Classification	Existing Structure	Width[1] (ft)	Condition
Weaver Creek - 1	Lakewood	Dartmouth Avenue	40	Local (25 mph)	(2) 22.5-ft by 9.2-ft RCBC (Modified Drop Inlet) (14-ft by 9.2-ft RCBC at Throat)	149.3	Good - Clear
Weaver Creek - 2	Lakewood	Pedestrian Walkway*	39	Trail	(3) 24-inch RCP (with Trash Rack)	18	Good - Clear
	CDOT	Hampden Avenue/Highway 285	38	Parkway	(1) 15.5-ft by 6-ft RCBC (Modified Drop Inlet) (7-ft by 6-ft RCBC at Throat)	386.7	Good - Clear
	Jeffco	Pedestrian Bridge	37	---	90-ft Bridge (no piers)	26.7	Good - Clear
	Jeffco	Warrior Canal	36	---	96-inch by 60-inch Elliptical CMP	61.2	Good - Debris
	Jeffco	Private Drive*	35	Driveway	(2) 15-inch, (1) 18-inch Round Pipe (Material Unknown)	---	Fair - Debris
	Jeffco	Private Drive*	34	Driveway	(1) 15-inch CMP	20	Fair - Debris
	Jeffco	Private Drive*	33	Driveway	(1) 15-inch CMP	20	Fair - Debris
	Jeffco	West Quincy Avenue	32	Minor Arterial (40 mph)	(2) 16-ft by 5-ft RCBC	160	Good
	Jeffco	Simms Street	31	Minor Arterial (40 mph)	(1) 12-ft by 10-ft RCBC	91.7	Good - Clear
					(1) 12-ft by 9-ft RCBC		Good - Clear
	Jeffco	Pedestrian Bridge	30	---	60-ft Bridge (no piers)	6.8	Good - Clear
	Jeffco	Pedestrian Walkway	29	---	(1) 36-inch RCP	15.5	Fair - Debris
Weaver Creek - 2	Jeffco	South Youngfield Street	28	Collector (25mph)	(2) 10-ft by 8-ft RCBC	104.9	Good - Clear
	Jeffco	Cole Street	27	Collector (20mph)	(1) 68-inch CMP	82.5	Poor - Debris
					(1) 68-inch CMP	80.6	Poor - Debris
	Jeffco	Eldridge Street	26	Collector (25 mph)	(2) 10-ft by 6-ft RCBC	76	Fair - Debris
	Jeffco/CDOT	C-470	25	Freeway	(1) 35-ft by 6-ft RCBC (Modified Drop Inlet) (16-ft by 6-ft RCBC at Throat)	284.7	Fair- Vegetation
	Jeffco	Quincy Avenue/ Frontage Road	24	Minor Arterial (35 mph)	(1) 20-ft by 8-ft RCBC	117.8	Fair - Vegetation
	Jeffco	Private Driveway	23	Driveway	(1) 72-inch CMP	48.7	Good - Clear
	Jeffco	Private Drive*	22	Driveway	(1) 22-inch by 15-inch Elliptical CMP	19.2	Poor - Debris
	Jeffco	Belleview Avenue	21	Minor Arterial	(1) 78-inch CMP	65.7	Fair - Debris
	Jeffco	Belleview Avenue	19	Minor Arterial	(1) 74-inch CMP	120	Fair - Bank Erosion
	Jeffco	Private Driveway	18	Driveway	(1) 72-inch CMP	30.1	Good - Clear
	Jeffco	Belleview Avenue	17	Minor Arterial	(1) 72-inch CMP	86.8	Fair - Debris
	Jeffco	Private Driveway	16	Driveway	(1) 6-ft by 3.7-ft Elliptical CMP	29.4	Good - Clear
	Jeffco	Crestbrook Drive	15	Local (30mph)	(1) 72-inch CMP	62.3	Good - Clear
	Jeffco	Willowbrook Drive	14	Local (30mph)	(1) 36-inch RCP	60.9	Good - Clear
	Jeffco	Meadowbrook Drive	13	Local (30mph)	(1) 36-inch RCP	65.2	Good -Clear
	Jeffco	Colorow Drive	12	Local (30 mph)	(1) 36-inch RCP	66.4	Fair - Debris
	Jeffco	Pedestrian Bridge	11	---	29.5-ft Bridge (1 pier)	1.7	Good - Clear
	Jeffco	Pedestrian Bridge	10	---	13-ft Bridge (no piers)	5.1	Good - Clear
	Jeffco	Private Driveway	9	Driveway	(1) 32-inch by 28-inch Elliptical CMP	33.3	Fair - Debris
	Jeffco	Private Driveway	8	Driveway	(1) 36-inch RCP	32.7	Good - Clear
	Jeffco	Pedestrian Bridge	7	---	19.5-ft Bridge (1 pier)	5	Fair - Debris
	Jeffco	W Roton Arena	6	Driveway	(1) 36-inch RCP	30.9	Fair - Debris
	Jeffco	Willow Springs Drive	5	Local (30 mph)	(1) 48-inch RCP (Modified Drop Inlet)	73.3	Good - Clear
					(1) 48-inch RCP (Modified Drop Inlet)	74.3	Fair - Debris
	Jeffco	Golf Cart Path	4	Trail	(1) 24-inch ABS	20.2	Good - Clear
					(1) 36-inch Steel Pipe	21.3	Good - Clear
	Jeffco	Golf Cart Path	3	Trail	(1) 36-inch Steel Pipe	18	Poor - Debris
					(1) 36-inch Steel Pipe		Poor - Debris
	Jeffco	Whale Rock Way*	2	Local	(1) 15-inch CMP	114.6	Fair - Debris
					(1) 18-inch RCP	115.6	Good - Clear
					(1) 29-inch RCP	115.3	Good - Clear
					(1) 29-inch RCP	115.3	Good - Clear
	Jeffco	Golf Cart Path*	1	Trail	(3) 18-inch RCP	15.2	Fair -Debris

[1]Length for culverts, and widths for bridges
*Crossings not included in HEC-RAS Model

Weaver Creek Reaches 0 and 1: Bear Creek Confluence to Lakewood/Jefferson County Border at US-285 (City of Lakewood)

Existing Channel Conditions
Weaver Creek consists of both vegetated and concrete open channels with drop structures within these reaches, which correspond to MDP Reach WC-1. The approximate 0.8-mile reach lies within the City of Lakewood, primarily in residential neighborhoods, and has an approximate longitudinal slope of 1.1%. A large concrete baffle drop structure is located upstream of West Dartmouth Avenue. The downstream channel consists of a trapezoidal channel with a concrete low flow that flows parallel to South Kipling Parkway. Upstream of the concrete baffle drop structure, the channel is a broad, more natural, channel that meanders along residential apartment complexes. The channel geometry consists of side slopes ranging from approximately 3 horizontal feet to 1 vertical foot (3:1) to 6:1, and bottom widths between 2 and 160 feet. The channel and overbanks consist primarily of native and nonnative grasses with several areas of more condensed vegetation bankside in the form of shrubs and the occasional tree. The channel appears to be in good condition.

Photo 1: MDP Reach WC-1

Weaver Creek Reach 2: Lakewood/Jefferson County Border at US-285 to Upstream Study Limit (Jefferson County)

Existing Channel Conditions
Weaver Creek consists of a vegetated, open channel with drop structures within this reach, which corresponds to MDP Reach WC-2. The approximate 0.6-mile reach lies within Jefferson County, primarily in residential neighborhoods, and has an approximate longitudinal slope of 0.9%. Most of the channel in this reach has a defined, vegetated, low flow channel and a broader floodplain. The channel geometry consists of side slopes ranging from 3:1 to 10:1, and bottom widths between 2 and 45 feet. The channel and overbanks consist primarily of native and nonnative grasses, several dense areas of bushes, shrubs and trees, especially downstream of the Warrior Canal. The channel appears to be in good condition.

Photo 2: MDP Reach WC-2

Weaver Creek Reach 2: South of S Nelson Court to West Quincy Avenue (Jefferson County)

Existing Channel Conditions
Weaver Creek consists of a vegetated, open channel with drop structures within this reach, which corresponds to MDP Reach WC-3. The approximate 0.9-mile reach lies within Jefferson County open space and has an overall longitudinal slope of 0.8%. The channel generally has a well-defined, vegetated low flow channel that is incised in some areas, and a broader floodplain. The channel geometry consists of side slopes ranging from 1:1 in the low flow channel to 50:1 outside of the low flow channel. The channel bottom widths vary between 2 and 20 feet. The channel and overbanks consist primarily of native and nonnative grasses with several areas of bushes, shrubs and areas of dense wetland vegetation. The channel appears to be in fair condition.

Photo 3: MDP Reach WC-3 –
Existing Crossing Underneath Quincy Avenue

Weaver Creek Reach 2: West Quincy Avenue to C-470 (Jefferson County)

Existing Channel Conditions
Weaver Creek consists of a vegetated, open channel with drop structures within this reach, which corresponds to MDP Reach WC-4. The approximate 2-mile reach lies within Jefferson County, primarily in residential neighborhoods, and has an overall longitudinal slope of 1.1%. Approximately 2,000 feet of this segment borders Weaver Hollow Park. The channel geometry generally consists of a vegetated trapezoidal section with side slopes ranging from 2:1

Photo 4: MDP Reach WC-4

to 20:1 and bottom widths between 3 and 30 feet. The channel and overbanks consist of primarily native and nonnative grasses with several areas of bushes, shrubs and a few trees. The channel appears to be in good condition.

Weaver Creek Reach 2: C-470 to Upstream Study Limit (Jefferson County)

Existing Channel Conditions
Weaver Creek consists of a vegetated, more natural, open channel with drop structures within this reach, which corresponds to MDP Reach WC-5. The approximate 3.0-mile reach lies in Jefferson County, primarily in large-lot residential neighborhoods and open land and has an overall longitudinal slope of 3.3%. The channel geometry generally consists of a vegetated trapezoidal section with side slopes ranging from 1:1 to 10:1, and bottom widths between 1 and 30 feet. Channel and overbanks consist of primarily native and nonnative grasses with some dense areas of bushes, shrubs and trees. The channel appears to be in good condition.

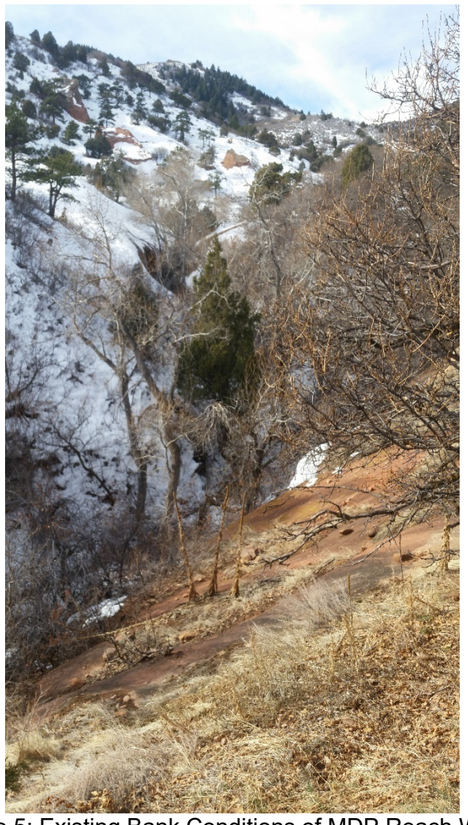

Photo 5: Existing Bank Conditions of MDP Reach WC-5

2.4 Flood History

The FIRMs show a FEMA-designated Zone AE floodplain on Weaver Creek from the upstream limit, west of Whale Rock Way, to just downstream of U.S. 285. A Zone A floodplain is shown downstream of U.S. 285 to the confluence with Bear Creek. The spills from Weaver Creek, located at W. Belleview Avenue, W. Saratoga Place, and W. Quincy Avenue are mapped as Zone AO floodplains. The FEMA FIRM panels are included in Appendix C. Several Letters of Map Revisions (LOMR) have been completed along Weaver Creek.

Areas of concern and observed problem areas were discussed at the kickoff meeting. Flood-related problems include:

- The culvert at Cole Street is undersized. Jefferson County receives reports of flooding annually.
- Ponding occurs in the pedestrian cell of the Simms Street culvert. Jefferson County noted that concrete aprons were installed upstream and downstream of the culvert to improve maintenance access. A floodwall was installed to prevent flooding of the pedestrian cell during frequent storms.

2.5 Environmental Assessment

Wetland and riparian zones within the Weaver Creek watershed primarily occur in riverine areas, freshwater ponds, or lakes. Areas where there is increased urbanization or a concrete channel will be less likely to have wetland qualities. Areas directly alongside the banks of Weaver Creek or any of its tributaries are likely to qualify as a wetland. This information was acquired through the U.S. Fish & Wildlife Service's National Wetlands Inventory. See Appendix D for the delineation of wetland areas for Weaver Creek.

3.0 HYDROLOGIC ANALYSIS

3.1 Overview

Hydrology was developed for the baseline condition using existing infrastructure, for both existing and future (fully developed) land uses. Peak discharges for the 2-, 5-, 10-, 25-, 50-, 100-, and 500-year return period storms were analyzed using CUHP 2005, version 1.5.2b, to generate hydrographs for each subwatershed. Hydrographs for the subwatersheds were routed using EPA SWMM, version 5.1.010, to determine peak discharge rates at select design points. The updated EPA SWMM results were compared to the 1981 FHAD. The hydrology comparison is detailed in Section 3.6 and shown in Table 8. Future land use 100-year peak flows are less than 130% of existing land-use peak flows. Therefore, future land-use hydrology was used for the FHAD.

3.2 Design Rainfall

One-hour rainfall depths from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 were input into CUHP 2005 to model the watershed hydrology for each storm event and are shown in Table 4. Area adjustments were used for the 2-, 5-, and 10-year storm events with tributary drainage basins greater than 5 square miles. Area correction values are included in Table 5. No area adjustment factors were necessary for the 25-, 50-, 100-, and 500-year storm events. Tables of the adjusted and unadjusted rainfall distributions for each storm event are included as Tables B-1, in Appendix B.

Table 4 - One-Hour Point Rainfall (inches)

Duration	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
1-Hour	0.769	1.04	1.28	1.63	1.91	2.21	2.94
6-Hour	1.23	1.62	1.96	2.47	2.89	3.33	4.45

Table 5 - Depth Reduction Factors for Design Rainfall Distributions 2-, 5-, and 10-yr Design Rainfall

Time (minutes)	Correction Factor by Watershed Area in Square Miles	
	2	5
5	1	1
10	1	1
15	1	0.97
20	1	0.86
25	1	0.86
30	1	0.86
35	1	0.97
40	1	0.97
45-120	1	1

3.3 Subwatershed Characteristics

A summary of the CUHP 2005 model parameters can be found in Appendix B. LiDAR mapping, structure survey information, as-built drawings, and drainage studies were used to determine input parameters.

Subwatershed Delineation

The overall watershed boundary was delineated using LiDAR mapping and by referencing adjacent watershed boundaries, where applicable. The adjacent watershed boundaries were delineated using less detailed topography; therefore, the overall watershed boundary was delineated solely based on the LiDAR mapping and then checked for general agreement with the surrounding watersheds.

The Weaver Creek watershed was divided into 60 subwatersheds that were delineated based on the LiDAR mapping MHFD provided (Section 1.4), various drainage studies, and site observations. Subwatershed boundaries reflect the major storm event conditions. The subwatersheds range in size from 7.7 acres to 130.3 acres, with an average subwatershed size of 77.2 acres.

Subbasins 13 and 14 are tributary to Harriman Lake and will not reach Weaver Creek unless either the lake overtops, or the dam is breached. If the lake overtops, water will flow both to the west, toward Weaver Creek, and to the east, toward Marston Lake North Drainageway. The Harriman Lake tributary area was not included in the Marston Lake North Drainageway watershed area. Pursuant to MHFD policy, Warrior Canal, Harriman Ditch, and Bergen Ditch were assumed to be at full capacity for the baseline hydrology, so stormwater runoff would flow over the canals. The subwatersheds are shown on Figure B-1 in Appendix B.

Length, Distance to Centroid, Slope

The LiDAR data and structure survey information were used to determine subwatershed flow path lengths, distance to centroid values, and slopes. Flow paths were based on major drainage overland paths and, therefore, storm drain systems were not modeled. Private detention facilities and irrigation reservoirs were not included in the model. Where private detention basins and irrigation reservoirs were present, flow paths were determined based on the overflow path from the ponds, assuming the outlets would be clogged.

Subwatersheds were generally delineated to avoid shapes with elongated tails and very narrow and long shapes. To check these two scenarios, the following equations were used:

r = Length to Centroid / Total Length (if $0.1 \leq r < 0.3$, the subwatershed may have an elongated tail)
r = Length^2 / Area (if $r > 4$, the subwatershed may be very narrow and long)

If the r value of a subwatershed indicated that it may have an elongated tail, or be very narrow and long, it was checked. Many of the subwatersheds in question did not have an elongated tail and were not long and narrow in shape. The questionable r values were generally a result of the nature of the urbanized portion of the watershed. Flow paths were generally delineated following streets, which resulted in longer paths than a more direct, undeveloped path. The majority of subwatersheds with questionable r values had reasonable unit discharges, as compared to similar subwatersheds.

The Weaver Creek watershed generally slopes down toward the northeast. Subbasin flow path slopes ranged from 0.1 to 32 percent (%). The lowest and highest watershed elevations are 5435 and 7952, respectively. Slopes were estimated using the weighted slope equation from the CUHP manual.

$((L_1 s_1^{0.24} + \ldots + L_n s_n^{0.24}) / (L_1 + \ldots + L_n))^{4.17}$

For subbasins with slopes greater than 4 percent, a slope correction was applied based on Figure 6-4: Slope Correction for Streams and Vegetated Channels, in the MHFD *Urban Storm Drainage Criteria Manual Volume 1*. These subbasins were generally in the upper watershed.

Watershed Imperviousness

The existing and future land uses are discussed in Section 2.2. To determine the existing conditions percent imperviousness, the National Land Cover Database (NLCD) was used. Several changes to the NLCD information were made to determine the existing percent imperviousness:

- The NLCD 0% imperviousness value used for water was changed to 100%
- All 0% NLCD values that were not water were changed to 2%
- The database was developed in 2011. Aerial imagery from 2011 was compared to 2016 aerial imagery to determine areas in the watershed that developed after the database was compiled. These areas of post-2011 development were added into the existing conditions percent imperviousness calculations.
- Several developments were under construction at the time of this study. Light industrial development was under construction at the southeast corner of W. Belleview Avenue and C-470, adjacent to the Southeast Belleview and C-470 regional detention basin, and a low density single-family development was under construction west of Diamondback Road and W. Belleview Avenue. These areas of development were added into the existing conditions percent imperviousness calculations.

After the aforementioned changes were made to the NLCD percent imperviousness values, the percent impervious values were spot checked for accuracy and were determined to be acceptable. The overall existing percent imperviousness of the watershed is 21.1%. The existing percent impervious values for each subbasin are shown on Figure B-1, in Appendix B.

Future land use designations were discussed with the project sponsors. Many of the residential land uses include ranges of densities and would allow denser development to occur than what the existing development showed. It was decided that future land use designations and percent imperviousness values would only be used in undeveloped areas, or areas that showed different zoning categories than existing. The future land use areas are shown on Figure B-1, in Appendix B.

To determine appropriate future land use percent imperviousness values in the undeveloped portions of the watershed, the zoning descriptions and MHFD's Urban Storm Drainage Criteria Manual (USDCM) Table 6-3 were used. The future land use designations and corresponding percent imperviousness values are shown in Table 6. The overall future percent imperviousness of the watershed was estimated to be 27.5%, which compares well to the 1981 FHAD estimated 28.8%. The future percent impervious values for each subbasin are shown on Figure B-1, in Appendix B.

Table 6 – Land Uses and Corresponding Impervious Values

Land Use Plan	Land Use Designation from Corresponding Plan	Figure Designation	% IMP
Jefferson County	Bergen Reservoir Subarea (Average density < 1 du/10 acre)	Very Low Density Residential	5
Jefferson County	Residential (1 du/10 acre)		
Lakewood	R-1-12 (Large Lot Residential)	Low Density Residential	10
Jefferson County	Belleview Subarea (<1 du/5acre)		
Jefferson County	Residential < 4 du/acre	Medium Low Density Residential	45
Jefferson County	NC (Neighborhood Commercial)	Limited Commercial	75
Jefferson County	LC (Limited Commercial)		
Jefferson County	Limited Commercial, Residential, Mixed Use		
Jefferson County	OLI (Office, Light Industrial)	Light Industrial	80
Jefferson County	OLI/MU (Office, Light Industrial, Mixed Use)		
Jefferson County	OLI/MF (Office, Light Industrial, Multi-Family)		
Jefferson County	LSC (Large Scale Commercial)	Commercial	95

Depression Losses

Depression losses were determined using Table 6-6 in the USDCM. A weighted average was used for the depression losses in each subbasin, based on land use designation. A pervious depression loss of 0.35 inches, which represents lawns and grass, was used for the developed portions of the watershed, and a value of 0.4, which represents open fields, was used for the undeveloped portions of the watershed. An average of an impervious depression loss of 0.05, which represents sloped roofs, and 0.1, which represents large paved areas, was used for residential areas. A value of 0.1, which represents flat roofs and large paved areas, was used for commercial, office, and industrial areas.

Infiltration

Initial and final infiltration rates and Horton's decay rate were determined using Table 6-7 in the USDCM and are shown in Table 7. A weighted average of soil type was used to determine subwatershed rates. The hydrologic soil groups are shown on Figure B-1, in Appendix B.

Table 7 - Horton's Equation Parameters

NRCS Hydrologic Soil Group	Infiltration (inches per hour)		Decay Coefficient
	Initial	Final	
A	5.0	1.0	0.0007
B	4.5	0.6	0.0018
C	3.0	0.5	0.0018
D	3.0	0.5	0.0018

3.4 Detention

Pursuant to MHFD's policy to recognize only regional and publicly-owned facilities, private detention basins, irrigation reservoirs, and inadvertent detention areas were not modeled. One regional detention basin, southeast of C-470 and W. Belleview Avenue, was included in the baseline hydrology. The Southeast Belleview and C-470 Detention Basin, owned by Jefferson County and maintained by MHFD, is an off-line regional detention basin that was formalized in 2006 as part of the *West Belleview Avenue: West Quincy Avenue to South Simms Street* project, designed by Muller Engineering Company, Inc.

The Phase III Drainage Report for the project included detention basin stage-storage-discharge information. It appears that the 1995 OSP hydrology was used as a basis for the detention basin analysis and was updated to reflect the proposed storm drain and detention basin design. The 1995 OSP included detention routing through Bergen Reservoirs No. 1 and No. 2, and an inadvertent detention area southwest of W. Belleview Avenue and C-470, resulting in lower 100-year peak flows reaching the Southeast Belleview and C-470 Detention Basin than what is shown in this study. The pond stage-storage-discharge information from the Phase III Drainage Report needed to be extended to higher elevations for this study to avoid stacking storage in the EPA SWMM model. The area, storage, and outlet structure discharge were extrapolated using the design information. LiDAR data was used to develop a rating curve for the roadway overtopping discharge and was added to the extrapolated outlet discharge to determine a total discharge rating curve for the higher elevations.

The detention basin tributary area shown in the Phase III Drainage Report generally matches the tributary area delineated for this study. However, the drainage report also included three additional tributary areas, Subbasins 18, 19, and 20 (shown on an excerpt in Appendix B), that will reach the detention basin via storm drain. This study delineated the major system flow overland paths and, therefore, these areas were not modeled as tributary to the pond in this study. In addition, runoff could bypass the storm drain system and the detention basin if the inlets or pipe became clogged.

The detention basin stage-storage-discharge information can be found in Table B-2 in Appendix B. Excerpts from the drainage study are also included in Appendix B.

3.5 Hydrograph Routing

The parameters for the EPA SWMM model conveyance elements were determined using the LiDAR data, structure survey information, as-built drawings, and drainage reports. Many conveyance elements in the SWMM model contain multiple drop structures, steep culverts, and short, steep sections. The slope used for the conveyance element in the model reflects the actual slope of the ground between drop structures and not the calculated slope between two design points. To adjust the slope in the SWMM model, the drops were modeled in EPA SWMM as one large drop at the downstream end of the conveyance element.

Channel geometry was determined using the LiDAR mapping. For flows that are conveyed via streets, the street sections were modeled as trapezoidal sections with a 5-foot depth, 1-foot bottom width, and 20-foot horizontal to 1-foot vertical (20:1) side slopes, consistent with the EPA SWMM manual. Overflow elements were added where they were needed to convey the full future 100-year storm event to ensure no inadvertent detention was being modeled at these locations. The underground storm drain system was not modeled, with the exception of Subbasin 11, near the interchange of US-285 and Simms Street. This subbasin drains to a significant low point, where it enters a storm drain system that outfalls into Weaver Creek.

The Manning's n values for engineered conveyance elements, including engineered channels, pipe, and street, were increased 25 percent in accordance with the USDCM. Channel section Manning's n values ranged from 0.035 to 0.05625 in the model. Street section Manning's n values were set at 0.016, or 0.02 in the model. Concrete pipe Manning's n values were set at 0.015, or 0.01875 in the model.

The EPA SWMM 5.1 input parameters and 100-year future conditions output are included in Appendix B. EPA SWMM 5.1 model elements, including subwatersheds, design points and conveyance elements are shown on Figure B-1 and a schematic of the model is shown on Figures B-2 in Appendix B. No flow diversions were included in the analysis.

3.6 Previous Studies

Two previous studies of the Weaver Creek watershed have been completed: the 1981 FHAD, and the 1995 OSP, which studied only a small portion of the watershed.

A comparison of peak flows between this study and the 1995 OSP was not completed. The 1995 OSP only studied a small portion of the watershed, in the Bergen Reservoirs area. In addition, the OSP modeled detention at the Bergen Reservoirs and inadvertent detention southwest of W. Belleview Avenue and C-470, in addition to the southeast Belleview and C-470 detention basin.

A comparison of 100-year peak flows from the 1981 FHAD and this study is shown in Table 8. A summary of peak discharges is shown in Table 9. Differences and similarities between the 1981 FHAD and this study are noted below.

- Peak flows for the upper 2 subbasins in the 1981 FHAD were analyzed using SYNHYD. The rest of the subbasins were analyzed using CUHP.
- A 3-hour rainfall distribution was used for the 1981 FHAD.
- The 1981 FHAD was based on future conditions. The overall 1981 FHAD future percent imperviousness was 28.8%, which is similar to this study's future percent imperviousness of 27.5%.
- The 1981 FHAD overall watershed area was 6.52 square miles, compared to 7.2 square miles in this study.
- The 1981 FHAD did not include any detention. This study included one regional detention basin.
- The uppermost 1981 FHAD Subbasins 1 and 2 had 10% and 15% imperviousness values, respectively. Comparing roughly the same area, Subbasins 55-60 in this study are all much closer to 2%.

The "EX Q100" and "FTR Q100" peak flows shown in Table 8 represent the baseline hydrology from this study and include the Southeast Belleview and C-470 Detention Basin. For comparison purposes, the detention basin was removed from the model and conveyance elements were adjusted to avoid flooded nodes in the model. The results are presented as "FTR Q100 No Det" in Table 8.

To better compare the upper portion of the watershed, the percent impervious values in Subbasins 55-60 were increased to match the 1981 FHAD Subbasin 1 and 2 percent impervious values of 10% and 15%, respectively. The results are presented as "FTR Q100 No Det, % Imp" in Table 8.

Table 8 – Previous Studies Hydrology Reconciliation

1981 FHAD					2017 MDP and FHAD						
Design Point	Reference Location	Peak Discharges (cfs)			Design Point	Peak Discharges (cfs)				% Diff (FTR No Det to FHAD)	% Diff (FTR No Det %, Imp to FHAD)
		QI0	Q50	QI00		EX Q100	FTR Q100	FTR Q100 No Det	FTR Q100 No Det, % Imp		
A	U/S Limit	112	170	182	158	98	99	99	168	-46%	-8%
B		220	332	353	156T	140	141	141	273	-60%	-23%
C	U/S Crestbrook Drive	370	538	603	151	296	301	301	476	-50%	-21%
D	West Belleview Hogback Ridge	733	1020	1153	139	619	666	666	861	-42%	-25%
E	Old Harriman Canal	1329	1812	2080	120T	1178	1276	1935	2096	-7%	1%
F	U.S. 285	1819	2472	2809	103	1902	2277	2979	3006	6%	7%
G	Confluence with Bear Creek	1875	2547	2895	101	1991	2382	3079	3103	6%	7%

Removing the detention basin from the baseline model resulted in similar peak flows in the lower portion of the watershed (Design Points E through G). Differences in the upper-most design points (A through C) appear to be due to higher percent impervious values being used in the 1981 FHAD model. Adjusting the percent imperviousness in the upper portions of the watershed to better match the FHAD resulted in closer peak flows. Design Point D shows larger differences between the 1981 FHAD and this study. The 1981 FHAD routed the Bergen Reservoirs area to this location, whereas the Bergen Reservoir area is routed farther downstream in this study. The larger differences are due to a much larger tributary area to Design Point D in the 1981 FHAD model as compared to this model. The peak flows in the lower watershed compare well to the 1981 FHAD peak flows, when the detention basin was removed and the upper watershed percent impervious values were adjusted; therefore, calibration was not warranted.

3.7 Results of Analysis

The baseline peak discharges compared fairly well to the 1981 FHAD, as described in Section 3.6. In general, the peak flows are lower than the 1981 FHAD, since the 1981 FHAD did not include any detention in the hydrologic models. The Southeast Belleview and C-470 Detention Basin was formalized in 2006 and was included in this study. The baseline peak discharges and volumes for the 2-, 5-, 10-, 25-, 50-, 100-year, and 500-year storm events for all of the EPA SWMM 5.1 design points can be found in Table B-3 and B-4, respectively, in Appendix B. A summary of key peak flows and runoff volumes are listed in Tables B-5 and B-6, respectively, in Appendix B. The peak discharges versus channel station are shown in Figure B-3 and select SWMM generated hydrographs are included in as Figure B-4, in Appendix B.

Table 9 – Baseline Peak Flows Along Drainageway Centerline

Design Point	Location	Length (feet)	Future Peak Flows (cfs)						
			Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	Q_{500}
101	Confluence with Bear Creek	0	262	421	594	1,382	1,801	2,382	3,620
102		1,991	255	409	576	1,347	1,753	2,316	3,520
103	U.S. 285 / West Hampden Avenue	4,301	251	403	566	1,329	1,727	2,277	3,459
106T		6,158	241	386	541	1,273	1,649	2,177	3,329
108T		8,515	227	361	504	1,199	1,550	2,060	3,251
110T		11,767	224	355	494	1,173	1,509	1,987	3,171
112	West Quincy Avenue	12,203	207	327	455	1,082	1,391	1,865	3,074
115T		13,202	174	272	376	895	1,159	1,595	2,788
116	South Simms Street	13,541	156	243	336	807	1,071	1,488	2,682
120T		15,236	130	200	272	661	908	1,276	2,432
123T		16,665	126	188	273	533	751	1,059	2,146
125	South Youngfield Street	18,467	84	122	183	450	636	897	1,963
126T		19,487	82	118	177	439	621	880	1,935
127T	South Cole Street	20,084	73	107	165	421	595	865	1,891
139	Quincy Avenue / C-470	22,863	30	46	89	310	457	666	1,092
140		23,901	12	26	71	270	400	589	966
141	West Belleview Avenue	25,110	11	25	69	261	387	570	934
142T		26,400	11	25	69	260	385	567	929
145T		27,797	10	22	64	236	348	510	833
148	West Belleview Avenue	28,607	4	9	40	169	252	373	616
149		29,967	3	9	37	159	236	350	576
151	Crestbrook Drive	30,175	3	7	33	138	204	301	494
152T		31,660	2	6	28	119	176	259	425
154	Meadowbrook Drive	32,758	1	4	21	92	136	201	329
155		35,349	1	3	19	80	118	174	285
156T		36,389	1	2	16	66	96	141	228
157		37,994	1	2	14	57	83	121	196
158		40,933	1	2	12	47	68	99	159
159T		43,343	0	1	8	29	42	62	99

4.0 HYDRAULIC ANALYSIS

4.1 Evaluation of Existing Facilities

Jefferson County, City of Lakewood, and CDOT criteria were used to determine the crossing structure capacities. A summary of the criteria used to evaluate existing crossing structure capacities is included in Table 10. Weaver Creek was assumed to have low to moderate debris for future land use conditions when evaluating bridge freeboard capacities based on CDOT criteria. The floodplain analysis and mapping assumed no clogging at the crossing structures.

The HEC-RAS model that was developed for this study, as described in Section 4.2, was used to determine structure capacities based on the criteria listed in Table 10. Many of the crossings do not have capacity for the 100-year storm event. A detailed structure capacity summary table for the existing infrastructure and future land use flows is included in Table 11.

Table 10 – Crossing Structure Criteria

Jurisdiction	Max. Culvert Headwater:Depth	Bridge Freeboard	Street Overtopping
CDOT	Rise/Diameter: <36" – 2 36"-60" – 1.7 >60"-<84" – 1.5 84"-120" – 1.2 ≥120" – 1.0	4' (high debris), $0.1Q^{0.3} + 0.008V^2$ (low-moderate debris)	No overtopping
Jefferson County	≤1.5	Minimum clearance between the low chord or culvert crown and the energy grade line is 6 inches for basins less than 2 square miles, 1 foot for basins up to 10 square miles and 2 feet for basins greater than 10 square miles.	No overtopping
City of Lakewood	≤1.5	See CDOT	No overtopping

Table 11 – Crossing Structure Capacities (Existing Infrastructure, Future Land Use Hydrology)

MDP Reach	Station	Jurisdiction	Street Name	Structure Survey Number	Existing Structure	Q_{10} (cfs)	Q_{10} Overtop Depth (ft)	Q_{100} (cfs)	Q_{100} Overtop Depth (ft)	Bridge Freeboard Height (ft)	Bridge Freeboard Elevation	HW/D Criteria	HW:D Criteria Elev	Overtop Elev[1]	Controlling Criteria	Controlling Elevation	Capacity (cfs)	Criteria Met?
WC-1	772	Lakewood	Dartmouth Avenue	40	(2) 22.5-ft W by 9.2-ft H RCBC (Modified Drop Inlet) (14-ft W by 9.2-ft H RCBC at Throat)	594	---	2,382	---	---	---	1.50	5,466.86	5,469.79	HW:D	5,466.86	3640	YES
WC-1	4116	Jeffco/ Lakewood/ CDOT	Hampden Avenue/Highway 285	38	(1) 15.5-ft W by 6-ft H RCBC (Modified Drop Inlet) (7-ft W by 6-ft H RCBC at Throat)	566	---	2,277	1.9	---	---	1.50	5,529.32	5,529.00	Overtopping	5,529.00	1250	NO
WC-2	4808	Jeffco	Pedestrian Bridge	37	90-ft Bridge (no piers)	541	---	2,177	---	1.40	5,535.10	---	---	5,540.00	Bridge FB	5,535.10	2360	YES
WC-2	5175	Jeffco	Warrior Canal	36	96-inch by 60-inch Elliptical CMP	541	0.5	2,177	1.7	---	---	1.50	5,542.34	5,542.51	HW:D	5,542.34	335	NO
WC-3	12144	Jeffco	West Quincy Avenue	32	(1) 16-ft W by 7-ft H RCBC, (1) 16-ft W by 7.5-ft H RCBC (with 2 and 2.5-ft of fill)	455	---	1,865	1.4	---	---	1.50	5,608.75	5,608.53	Overtopping	5,608.53	1090	NO
WC-4	13493	Jeffco	Simms Street	31	(1) 12-ft W by 10-ft H RCBC	336	---	1,488	---	---	---	1.50	5,623.74	5,621.02	Overtopping	5,621.02	2700	YES
					(1) 12-ft W by 9-ft H RCBC							1.50	5,623.01		Overtopping	5,621.02		
WC-4	15686	Jeffco	Pedestrian Bridge	30	60-ft Bridge (no piers)	273	---	1,059	---	1.25	5,652.48	---	---	5,652.83	Bridge FB	5,652.48	1090	YES
WC-4	16809	Jeffco	Pedestrian Walkway	29	(1) 36-inch RCP	183	1.6	897	3.4	---	---	1.50	5,665.32	5,664.05	Overtopping	5,664.05	35	NO
WC-4	18418.5	Jeffco	South Youngfield Street	28	(2) 10-ft by 8-ft RCBC	183	---	897	---	---	---	1.50	5,698.76	5,697.13	Overtopping	5,697.13	1995	YES
WC-4	20048.5	Jeffco	Cole Street	27	(1) 68-inch CMP	165	---	865	1.1	---	---	1.50	5,725.32	5,724.79	Overtopping	5,724.79	525	NO
					(1) 68-inch CMP							1.50	5,725.37		Overtopping	5,724.79		
WC-4	22368	Jeffco	Eldridge Street	26	(2) 10-ft W by 6-ft H RCBC	89	---	666	---	---	---	1.50	5,768.17	5,770.50	HW:D	5,768.17	1430	YES
WC-4	22725	Jeffco/CDOT	C-470	25	(1) 35-ft W by 6-ft H RCBC (Modified Drop Inlet) (16-ft W by 6-ft H RCBC at Throat)	89	---	666	---	---	---	1.50	5,780.00	5,779.50	Overtopping	5,779.50	2085	YES
WC-5	23092.5	Jeffco	Quincy Avenue/Frontage Road	24	(1) 20-ft W by 8-ft H RCBC	71	---	589	---	---	---	1.50	5,786.42	5,787.00	HW:D	5,786.42	2090	YES
WC-5	23876.5	Jeffco	Private Driveway	23	(1) 72-inch CMP	71	---	589	1.8	---	---	1.50	5,795.00	5,793.01	Overtopping	5,793.01	235	NO
WC-5	25083	Jeffco	Belleview Avenue	21	(1) 78-inch CMP	69	---	570	2.4	---	---	1.50	5,819.83	5,821.50	HW:D	5,819.83	355	NO
WC-5	27217	Jeffco	Belleview Avenue	19	(1) 74-inch CMP	64	---	510	3.5	---	---	1.50	5,872.80	5,869.28	Overtopping	5,869.28	300	NO
WC-5	27889	Jeffco	Private Driveway	18	(1) 72-inch CMP	40	---	373	0.4	---	---	1.50	5,883.13	5,882.79	Overtopping	5,882.79	305	NO
WC-5	28475	Jeffco	Belleview Avenue	17	(1) 72-inch CMP	40	---	373	---	---	---	1.50	5,900.26	5,908.50	HW:D	5,900.26	290	NO
WC-5	29117	Jeffco	Private Driveway	16	(1) 6-ft by 3.7-ft Elliptical CMP	40	---	373	1.3	---	---	1.50	5,908.37	5,910.74	HW:D	5,908.37	140	NO
WC-5	30106	Jeffco	Crestbrook Drive	15	(1) 72-inch CMP	33	---	301	---	---	---	1.50	5,938.44	5,941.55	HW:D	5,938.44	290	NO
WC-5	31934	Jeffco	Willowbrook Drive	14	(1) 36-inch RCP	21	---	201	1	---	---	1.50	5,997.97	6,003.68	HW:D	5,997.97	50	NO
WC-5	32680	Jeffco	Meadowbrook Drive	13	(1) 36-inch RCP	21	---	201	0.8	---	---	1.50	6,021.36	6,028.80	HW:D	6,021.36	50	NO
WC-5	33285	Jeffco	Colorow Drive	12	(1) 36-inch RCP	21	---	201	0.6	---	---	1.50	6,043.27	6,048.51	HW:D	6,043.27	50	NO
WC-5	33586	Jeffco	Pedestrian Bridge	11	29.5-ft Bridge (1 pier)	21	---	201	0.1	0.60	6,056.96	---	---	6,056.48	Overtopping	6,056.48	180	NO
WC-5	33711	Jeffco	Pedestrian Bridge	10	13-ft Bridge (no piers)	21	---	201	---	0.77	6,062.11	---	---	6,062.48	Bridge FB	6,062.11	185	NO
WC-5	33847	Jeffco	Private Driveway	9	(1) 32-inch by 28-inch Elliptical CMP	21	---	201	0.8	---	---	1.50	6,068.25	6,070.00	HW:D	6,068.25	30	NO
WC-5	33925	Jeffco	Private Driveway	8	(1) 36-inch RCP	21	---	201	1.3	---	---	1.50	6,072.92	6,072.71	Overtopping	6,072.71	60	NO
WC-5	34200	Jeffco	Pedestrian Bridge	7	19.5-ft Bridge (1 pier)	21	---	201	0.3	0.67	6,082.10	---	---	6,083.37	Bridge FB	6,082.10	50	NO
WC-5	35411	Jeffco	W Roton Arena	6	(1) 36-inch RCP	19	---	174	1.6	---	---	1.50	6,138.30	6,139.77	HW:D	6,138.30	55	NO
WC-5	36308	Jeffco	Willow Springs Drive	5	(1) 48-inch RCP (Modified Drop Inlet)	16	---	141	---	---	---	1.50	6,191.46	6,189.00	Overtopping	6,189.00	240	YES
					(1) 48-inch RCP (Modified Drop Inlet)							1.50	6,191.35		Overtopping	6,189.00		
WC-5	36383	Jeffco	Golf Cart Path	4	(1) 24-inch ABS	16	---	141	2.2	---	---	1.50	6,195.34	6,194.97	Overtopping	6,194.97	50	NO
					(1) 36-inch Steel Pipe							1.50	6,197.08		Overtopping	6,194.97		
WC-5	36651	Jeffco	Golf Cart Path	3	(1) 36-inch Steel Pipe	14	---	121	---	---	---	1.50	6,199.39	6,200.58	HW:D	6,199.39	110	NO
					(1) 36-inch Steel Pipe							1.50	6,200.16		HW:D	6,200.16		

1. Overtopping elevation based on lowest road elevation from the survey where water could overtop.

4.2 Flood Hazards

Hydraulic Modeling General Approach

The FHAD study limits of Weaver Creek encompass 7.4 miles of stream length, which generally slopes to the northeast with slopes ranging from 0.4 to 11 percent.

The U.S. Army Corps of Engineers' HEC-RAS River Analysis System, version 5.0.7 was used to evaluate both the floodplain and the infrastructure crossing structure capacities. Cross sections for HEC-RAS were developed electronically using 1-foot interval LiDAR data. Land survey data was collected at all major bridges, culverts, and drop structures. Cross section locations were set upstream and downstream of all crossings and drop structures, spaced no farther than 400 feet apart throughout long reaches, and were based on the LiDAR and survey data, described in Section 1.4. Bank stations were typically set at the low flow channel. To better represent existing conditions, survey data at crossing structures and drop structures was input into the model. The HEC-RAS cross sections are included in Appendix C.

Manning's "n" values were determined based on observations made during site visits and supplemented with aerial photography. The channel and bank roughness values ranged from 0.04 to 0.1. Areas that appeared to have short grasses were set to 0.04. Areas with longer grass and scattered trees were set to 0.045 to 0.05. Areas with thick trees and brush ranged from 0.06 to 0.08. Developed areas with privacy fence were set to 0.1. Photos illustrating the Manning's "n" values for sample reaches are shown below. A table of Manning's "n" values for all cross sections is included in Table C-1, in Appendix C.

Channel Manning's "n" = 0.05
Overbank Manning's "n" = 0.05-0.1

Channel Manning's "n" = 0.05
Overbank Manning's "n" = 0.04-0.045

Channel Manning's "n" = 0.07
Overbank Manning's "n" = 0.05

Structure Modeling Approach

Considerable attention was given to each location in determining appropriate modeling techniques. Photos of the major crossing structures that were surveyed are included in Appendix C. The general modeling techniques used at the structures are summarized below.

- The floodplain analysis and mapping assumed no clogging at the crossing structures.
- Cross section orientation – At the road crossing structures, cross sections were oriented perpendicular to the channel. Survey data was used to input the crossing structures so that bridge openings were not exaggerated at skewed crossings.
- Ineffective flow area contraction and expansion ratio ranges – In general, a 1:1 contraction ratio and a 3:1 expansion ratio were used to determine ineffective areas upstream and downstream of crossings, respectively. The skewed crossings required special consideration to determine reasonable ineffective areas.
- Contraction and Expansion coefficients – The contraction coefficient was changed from the default value of 0.1 to 0.3 and the expansion coefficient was changed from the default value of 0.3 to 0.5 at the upstream and downstream bounding cross section of all major crossing structures, in accordance with the HEC-RAS manual. The increased expansion and contraction coefficients better represent losses from the change in effective flow area as the channel transitions to and from the crossing.
- Ineffective flow areas – Ineffective flow area elevations upstream of crossing structures were typically set 0.1 foot below the top of roadway. Ineffective flow area elevations downstream of crossing structures were set between the pipe crown/bridge low chord elevation and the top of roadway elevation to more accurately model roads that overtop. Some ineffective areas were modified to increase model stability or better represent the crossing.
- HEC-RAS "Bridge Modeling Approach" – HEC-RAS contains numerous options to model each crossing within the "Bridge Modeling Approach" form. If piers existed on bridges, the pier information and coefficients were input into the momentum and Yarnell equations and the highest energy answer was selected. This approach applies only to low flow methods. Pressure and/or weir flow was selected for high flows.

Modified Inlet Culverts and Set Internal Water Surface Elevations

Weaver Creek contains four culverts with modified drop inlets:

- Cross Section 36354 – The Willow Springs Drive culverts are 48-inch broken back culverts initially dropping at a 45-degree angle and then flattening to a 0.3 percent slope.
- Cross Section 22881 – The C-470 culvert has a face opening that is 34.8-feet by wide by 6-feet high and constricts and drops in elevation to a 16-foot wide by 6-foot high concrete culvert at the throat.
- Cross Section 4339 – The Hampden Avenue/Highway 285 culvert has a face opening that is 15.5-feet by wide by 6-feet high and constricts and drops in elevation to a 7-foot wide by 6-foot high concrete culvert at the throat.
- Cross Section 873 – The Dartmouth Avenue culverts have face openings that are 22.5-feet by wide by 9.2-feet high and constricts and drops in elevation to be 14-foot wide by 6-foot high concrete culverts at the throat.

A separate hydraulic analysis of each of these structures was completed to model the water surface elevations more accurately. Set water surface elevations, based on the outside analysis, were then input into the HEC-RAS model at the cross sections noted above. Calculations for the modified inlets are included in Appendix C. FHWA nomographs (FHWA, 2012) were used to check for face control conditions or throat control conditions for the slope tapered inlets. The resultant headwater depths of

the controlling condition were compared to critical depth at the upstream cross section of the culverts in HEC-RAS.

Each culvert was input in HEC-RAS with the culvert invert set to the inlet elevation. The Highway 285 culvert was not modeled in HEC-RAS, rather a rating curve for the overtopping flow was developed using outside calculations and input as a set water surface elevation. The culverts use Chart 59 in HEC-RAS, which contains a slope tapered inlet option and refers to Federal Highway Administration (FHWA) charts from *Hydraulic Design of Highway Culverts, Hydraulic Design Series Number 5* (FHWA, 2012). It was assumed that the culvert face was not beveled.

Spill Modeling Approach

During the major storm event, Weaver Creek will spill in four locations and will also spill into streets that were not modeled in HEC-RAS in four additional locations. The four main spills were modeled as separate reaches in HEC-RAS. The 285 Overflow reach contains two additional spills. The spills were quantified using different methods, as described in this section. The spill flows are summarized in Table 12. The full flow was used for main channel calculations downstream of the spill locations.

Willow Spill

Weaver Creek will overtop Willow Springs Drive during the major storm event. The water in the left overbank of cross section 36360, upstream of the crossing, was assumed to be the amount of water spilling.

Belleview Spill

Weaver Creek will spill at the downstream most Belleview crossing. The cross section contains the extent of the floodplain. The flow in the right overbank of cross section 25121 was assumed to be the amount of water spilling. Water will flow along the south side of Belleview Avenue, eventually overtopping Belleview Avenue and joining Weaver Creek downstream of the Private Driveway crossing. A small swale on the south side of Belleview will convey some water out of the system, as described in the Additional Street Spills section. The right bank was moved to elevation 5823.64 in the model to estimate the spill flow, in a separate model run. The results are summarized in Table 12 and included in Appendix C.

Spill 2

A spill will also occur in Fehringer Ranch Park. The flow in the left overbank of cross section 10166 was assumed to be the amount of water spilling. The left bank was moved to elevation 5590.79 in the model to estimate the spill flow, in a separate model run. The results are summarized in Table 12 and included in Appendix C.

285 Overflow

The overtopping flow at Highway 285 was modeled with the 285 Overflow reach. The reach models the overland flow path. Water will initially flow to the low area between Highway 285 and W Hampden Avenue. Flow will then split, with most of the flow continuing north and rejoining Weaver Creek, downstream of the crossing. The flow split to the east was quantified using a lateral structure. The weir flow was then input into the Kipling St Spill reach.

The Kipling St Spill reach follows the spill flow path east along the Highway 285 off ramp and then turns north along Kipling Street. At the intersection of W Girton Avenue and Kipling Street, flow splits again. Sump inlets convey water to a channel that returns to Weaver Creek. For this analysis, the inlets were considered clogged, and only flows that overtopped the high ground were routed to the swale, which returns to Weaver Creek. The spill flow is 10 cfs and 19 cfs for the 100-year and 500-year events, respectively. Normal depth was calculated for the swale, included in Appendix C, and the average depth is less than 1 foot. The swale was mapped as shallow flooding. The flow was not removed for the downstream analysis. At the north end of the Kendall Reservoir, flows begin to return to Weaver Creek, sheet flowing down the bank. The flows returning to Weaver were quantified using a lateral structure, and a flow change was added at cross section 80162. At the intersection of W Dartmouth Avenue and Kipling Street, a flow split occurs, as described in the Additional Street Spills section.

Additional Spills

Weaver Creek spills into the road at South Miller Court (from upstream of the Warrior Canal), into the parking lot at the Pheasant Creek Townhomes, along Belleview form the Belleview Spill reach, and north along Kipling Street from the Kipling St Spill reach. Weaver Creek also spills into a north drainage channel upstream of the pedestrian crossing near Swarthmore Avenue. At S Van Gordon Way and W Radcliff Ave, Weaver Creek does not spill, but the high ground between the creek and the roads acts as a non-levee embankment. The calculations are included in Appendix C.

- At South Miller Court the amount spilling was based on right overbank flow of cross section 5270. The right overbank flow at cross section 5270 was measured as the flow above elevation 5443, which is the elevation at which the spill would occur. The bank was moved in a separate model run to estimate this flow. The floodplain was mapped based on the depth of water calculated using the street capacity section of UD-Inlet v. 4.05. Normal depth was calculated using FlowMaster to verify the shallow flooding area and was less than 1 foot. The area was mapped as shallow flooding.

- Just upstream of the large baffle drop, at cross section 1734, Weaver Creek spills into the parking lot at the Pheasant Creek Townhomes in the 100- and 500-year events. The spills were estimated by calculating the discharge in FlowMaster based on the water surface elevations calculation in HEC-RAS at cross section 1734. Normal depth was calculated at four locations through the parking lot, and the floodplain was mapped based on the results. The depths at the four locations analyzed is less than 1 foot. The area was mapped as shallow flooding.

- A small swale on the south side of Belleview along the Belleview Spill reach will convey some water out of the system. The flow leaving was estimated based on a normal depth calculation based on the swale capacity, calculated using FlowMaster. Approximately 2.5 cfs flows out of the system, along Belleview Avenue in the 100- and 500-year events. The minor flows are conveyed by the local drainage system and further analysis was not warranted. The flow was not removed for calculations downstream.

- At the intersection of W Dartmouth Avenue and Kipling Street, a flow split occurs with most flow returning to Weaver Creek and some flow continuing along Kipling Street, leaving the system. The flow in Kipling street will continue north, ultimately reaching Bear Creek. Kipling Street has capacity for the remaining flow and the spill was not mapped. The capacity calculations, completed in UD-Inlet v. 4.05, are included in Appendix C.

- At the pedestrian crossing near Swarthmore Avenue, Structure 30, Weaver Creek spills into the drainage channel that is located north of the creek upstream of the bridge and then re-enters Weaver Creek through a culvert downstream of the bridge. The spill was quantified by looking at the flow in the left overbank of cross section 15758 when the bank is set at the top of the Weaver Creek channel, Station 403.80, Elevation 5653.99. A total of 0.2 cfs will spill in the 100-year storm event. The 500-year floodplain encompasses this area and was not quantified at this location. The spill flow was not subtracted from the overall Weaver Creek flow.

- At S Van Gordon Way (cross sections 15937 through 16323) and W Radcliff Ave (cross sections 13709 through 14475), the high ground between Weaver Creek and the streets acts as a non-levee embankment. While the creek does not spill in the 100-year at these locations, the street capacities were analyzed. The streets have capacity for the potential overbank flow at a flow depth of 12-inches at the flowline. The overbank flow was estimated by changing the left bank at cross sections 15937 and 13970 to station 292.63 and 250.28, respectively. Since the flow depth is less than 1-foot, the streets were mapped within the 500-year but excluded from the 100-year mapping.

Table 12. Spill Flow Summary

Spill Location	Spill Flow Source (Program)	RAS Node/XS	Q (cfs)				
			10-YR	25-YR	50-YR	100-YR	500-YR
Spill Reaches							
Willow Springs Drive	HEC-RAS[1]	36360	7	50	76	117	197
Belleview	HEC-RAS[1]	25121	--	--	--	33	148
Spill 2 (Fehringer Ranch Park)	HEC-RAS[1]	10166	--	3	38	192	775
285 Overflow	Rating Curve (nomographs & HY-8)	--	--	362	736	1259	2401
Kipling Street Spill	HEC-RAS[1]	70220	--	122	227	317	489
Spills into Streets							
South Miller Court	HEC-RAS[1]	5270	--	2	5	13	36
Parking Lot	FlowMaster	1734	--	--	--	69	450
Out of System Spills							
Belleview Swale	FlowMaster	--	--	--	--	3	3
Kipling Street	HEC-RAS[1]	80162	--	26	61	88	122

[1]Results from the HEC-RAS plan titled *2 - Weaver Creek Spill Quantification*

Shallow Flooding

An additional area of shallow flooding (depth 2-foot) was mapped along Crestbrook Drive, between W Roton Arena driveway and the pedestrian bridge (crossing 7). The shallow flooding area was mapped downstream of cross section 34340 since that is the last cross section in which the channel BFE is higher than the overbank. The shallow flooding depth was based on the depth of the ineffective flow in the right overbank of cross sections 34340 and 34374.

Detention Pond Mapping

Hydraulically connected ponds were mapped as floodplains without base flood elevations, encompassing the entire footprint of the pond.

Boundary Conditions

The Bear Creek 10-year water surface elevation at the Weaver Creek confluence was not available; therefore, the normal depth boundary condition with a 0.005 ft/ft slope, which represents the Bear Creek slope, was used for Weaver Creek.

Floodway Modeling Approach

A 0.5-foot floodway analysis was completed for Weaver Creek. The existing conditions HEC-RAS model of 100-year future flow was used as the basis for the 100-year floodway model. The floodway was modeled using Method 1, and encroachments were set at or between the bank stations and the 100-year floodplain water surface elevation stations. Encroachments were typically set in a way that would allow for smooth floodway transitions when mapping.

At cross-sections where floodplain was equal to floodway negative surcharges in the HGL and EGL were typical. Per discussions with MHFD, negative surcharges up to -0.04 were left in the model where they resulted from setting encroachments at the floodplain limits. Encroachment stations were kept in the model where defining encroachments at the floodplain limits did not result in negative surcharges.

When mapping the floodway, the general shape followed Weaver Creek centerline geometry while avoiding necking and providing a smooth transition from embankment to embankment between cross-sections.

Drainage Problems

Problem areas as determined by the hydraulic model are shown in Figure 2, included at the end of this section. The following flood hazards are described as they relate to the future peak flows (future land use, existing infrastructure). Only major road crossings are listed below.

Hampden Avenue/Highway 285 is overtopped during the 25-year storm event.

Warrior Canal is overtopped during the 5-year storm event, which could potentially lead to flooding along the canal.

Quincy Avenue is overtopped during the 50-year storm event. The crossing only has slightly more capacity than the 25-year storm event.

Cole Street is overtopped in the 50-year storm events. Jefferson County has received complaints of flooding at the Cole Street crossing for many years. This is most likely due to the large amount of sediment that has filled in the culverts. The capacities were evaluated assuming a clean condition. The pedestrian trail crossing at Weaver Hollow Park (crossing 29) is overtopped in the 2-year storm event.

Water spills onto Belleview Avenue at two locations, crossings 19 and 21. Approximately 33 cfs in a 100-year storm event spills out of the channel at crossing 21. The golf cart path (crossing 4), and several private driveways (crossings 8, 9, and 23) are overtopped in the 25-year storm event. Belleview Avenue (crossing 19), W Roton Arena driveway, Colorow Drive, Meadowbrook Drive, Willowbrook

Drive, and a private driveway (crossing 16) are overtopped in the 50-year storm event. Belleview Avenue (crossing 21) and pedestrian crossings 7 and 18 are overtopped in the 100-year storm event. Crestbrook Drive, Belleview Avenue (crossing 17), pedestrian crossing 10, and golf cart crossing 3 are not overtopped in the 100-year storm event, but do not meet local criteria.

A total of 14 insurable structures are in the FHAD 100-year floodplain, as shown on the floodplain map in Appendix E.

Erosion Analysis

Maximum allowable shear stresses for various types of channel materials were taken from the USDA Agricultural Handbook No. 667 and are shown in Table 13.

Table 13 - Maximum Permissible Shear Stress (USDA's AG HBK 667)

Channel Material Class	Veg. Height	Max. Permissible Shear (lbs/ft^2)	
		Short Duration	Long Duration
A	>24"	7.5	7.5
B	12"-24"	5.73	5.73
C	6"-12"	4.2	4.2
D	2"-6"	3.33	3.33
E	<2"	2.16	2.16
Riprap	---	(4xD50)	(4xD50)
Concrete	---	100	100

The short and long duration values are the same. The HEC-RAS data was used to determine the shear stresses at each cross section for the future land use 100-year storm event. High shear stresses are present at several locations. Typically, the highest shear stresses are located at drop structures and at road crossings, where the water backs up as a result of the road embankment. Steeper reaches will also have higher shear stresses. The shear stresses for the major storm are high in many areas, due to the steep longitudinal slope of the channel. The channel is more stable in the minor storm events, with the high shear stresses located at drop structures.

Water Quality Analysis

No regional water quality facilities are located in the watershed.

4.3 Previous Analysis

The effective floodplain is based on the 1981 FHAD which utilized HEC-2 for the hydraulic analysis. A Letter of Map Revision (LOMR) has been completed near C-470, along Weaver Creek. The LOMR utilized HEC-RAS for the hydraulic analysis. The FIRMs show a FEMA-designated Zone AE floodplain on Weaver Creek from the upstream limit, west of Whale Rock Way, to just downstream of U.S. 285. A Zone A floodplain is shown downstream of U.S. 285 to the confluence with Bear Creek. The spills from Weaver Creek, located at W. Belleview Avenue, W. Saratoga Place, and W. Quincy Avenue are mapped as Zone AO floodplains. The FEMA FIRM panels are included in Appendix C. The effective floodplains and existing infrastructure floodplains developed for this study for both the existing land use (existing) and future land use (FHAD) conditions are shown on Figure C-1, in Appendix C. A total of 14 insurable structures are in the FHAD 100-year floodplain, as compared to a total of 92 in the effective Zone AE 100-year floodplain and 20 in the effective Zone AO 100-year floodplain.

Legend

- Reaches
- Reaches
- Existing Structures
- Weaver Creek Centerline
- Floodway
- Shallow Flooding
- 100yr Floodplain
- 500yr Floodplain
- Streets
- Watershed Boundary
- Jurisdictional Boundary

Table – Crossing Structure Capacities

Street Name	Structure Survey Number	Existing Structure	Future Q100 (cfs)	Capacity (cfs)	Future 100-YR Capacity OK?
Dartmouth Avenue	40	(2) 22.5-ft W by 9.2-ft H RCBC (Modified Drop Inlet) (14-ft W by 9.2-ft H RCBC at Throat)	2382	3640	YES
Hampden Avenue/Highway 285	38	(1) 15.5-ft W by 6-ft H RCBC (Modified Drop Inlet) (7-ft W by 6-ft H RCBC at Throat)	2277	1250	NO
Pedestrian Bridge	37	90-ft Bridge (no piers)	2177	2360	YES
Warrior Canal	36	96-inch by 60-inch Elliptical CMP	2177	335	NO
West Quincy Avenue	32	(1) 16-ft W by 7-ft H RCBC, (1) 16-ft W by 7.5-ft H RCBC (with 2 and 2.5-ft of fill)	1865	1090	NO
Simms Street	31	(1) 12-ft W by 10-ft H RCBC (1) 12-ft W by 9-ft H RCBC	1488	2700	YES
Pedestrian Bridge	30	60-ft Bridge (no piers)	1059	1090	YES
Pedestrian Walkway	29	(1) 36-inch RCP	897	35	NO
South Youngfield Street	28	(2) 10-ft by 8-ft RCBC	897	1995	YES
Cole Street	27	(1) 68-inch CMP (1) 68-inch CMP	865	525	NO
Eldridge Street	26	(2) 10-ft W by 6-ft H RCBC	666	1430	YES
C-470	25	(1) 35-ft W by 6-ft H RCBC (Modified Drop Inlet)	666	2085	YES
Quincy Avenue/Frontage Road	24	(1) 20-ft W by 8-ft H RCBC	589	2090	YES
Private Driveway	23	(1) 72-inch CMP	589	235	NO
Belleview Avenue	21	(1) 78-inch CMP	570	355	NO
Belleview Avenue	19	(1) 74-inch CMP	510	300	NO
Private Driveway	18	(1) 72-inch CMP	373	305	NO
Belleview Avenue	17	(1) 72-inch CMP	373	290	NO
Private Driveway	16	(1) 6-ft by 3.7-ft Elliptical CMP	373	140	NO
Crestbrook Drive	15	(1) 72-inch CMP	301	290	NO
Willowbrook Drive	14	(1) 36-inch RCP	201	50	NO
Meadowbrook Drive	13	(1) 36-inch RCP	201	50	NO
Colorow Drive	12	(1) 36-inch RCP	201	50	NO
Pedestrian Bridge	11	29.5-ft Bridge (1 pier)	201	180	NO
Pedestrian Bridge	10	13-ft Bridge (no piers)	201	185	NO
Private Driveway	9	(1) 32-inch by 28-inch Elliptical CMP	201	30	NO
Private Driveway	8	(1) 36-inch RCP	201	60	NO
Pedestrian Bridge	7	19.5-ft Bridge (1 pier)	201	50	NO
W Roton Arena	6	(1) 36-inch RCP	174	55	NO
Willow Springs Drive	5	(1) 48-inch RCP (Modified Drop Inlet) (1) 48-inch RCP (Modified Drop Inlet)	141	240	YES
Golf Cart Path	4	(1) 24-inch ABS (1) 36-inch Steel Pipe	141	50	NO
Golf Cart Path	3	(1) 36-inch Steel Pipe (1) 36-inch Steel Pipe	121	110	NO

KIPLING SPILL OUT OF SYSTEM, Q100=88 CFS

1 STRUCTURE IN 100-YEAR FLOODPLAIN

Kipling St. Spill

KIPLING STREET SPILL, Q100=317 CFS

3 HOMES NEAR 100-YR FLOODPLAIN

2 HOMES IN 100-YR FLOODPLAIN

6 STRUCTURES IN 100-YEAR FLOODPLAIN

SPILL 2 (FEHRINGER RANCH PARK), Q100= 192 CFS

1 HOME NEAR 100-YR FLOODPLAIN

1 STRUCTURE IN 100-YEAR FLOODPLAIN

SPILL ONTO BELLEVIEW AVENUE

Belleview Spill

BELLEVIEW SPILL, Q100 = 33 CFS

1 HOME IN 100-YEAR FLOODPLAIN

SPILL DOWNSTREAM OF WILLOW SPRINGS DRIVE, Q100= 117 CFS

1 HOME IN 100-YR FLOODPLAIN

1 HOME IN 100-YEAR FLOODPLAIN

1 HOME NEAR 100-YR FLOODPLAIN

Willow Spill

1 STRUCTURE IN 100-YEAR FLOODPLAIN

BEAR CREEK, OAK, NEWCOMBE, FOX HOLLOW, HAMPDEN, CORNELL, DARTMOUTH, EUREKA, HOYT, GARLAND, GIRTON, 285 Overflow, KEENE, MOORE, LAMBUTH, LEHIGH, LEE, MILAN, INDEPENDENCE, KIPLING, NASSAU, QUINCY, RADCLIFFE, LAKEWOOD, JEFFERSON COUNTY, US HWY 285, PURDUE, BEECH, ROANOKE, YANK, QUINN, TUFTS, ELDRIDGE, DEVINNEY, BRAUN, COLE, COORS, STANFORD, ZANG, YOUNGFIELD, SWARTHMORE, LAYTON, TEMPLE, ARBUTUS, XENOPHON, WRIGHT, WARD, UNION, URBAN, TAFT, SWADLEY, LABOR, ROUTT, ROBB, QUEEN, QUAIL, MARLOWE, TULANE, TANEY, ORCHARD, PIERSON, PARFET, BADGER, SURREY, ADOBE, WHITE, LAKEHURST, STETSON, FOUNTAIN, JOHNSON, JELLISON, RICE, IRIS, LEWIS, KLINE, SARATOGA, BARTON, BELLEWOOD, MILLER, CHENANGO, BELLEVIEW, SIMMS, BELMONT, VAN GORDON, HIAL EAH, PROGRESS, ALKIRE, ZINNIA, C-470 WESTBOUND, GRAND, LLWOOD, VIVIAN, DE-LINE, AQUEDUCT, ARLINGTON, PRENTICE, OWENS, BERRY, BRADY, POWERS, CROSS, XENIA, DORADO, BOWLES AVE - DEFRAME, CRESTBROOK, MEADOWBROOK, WILLOWBROOK, COLOROW, RIDGE TEE, GOLF COURSE, CEDARBROOK, WHALE ROCK, LITTLE CANYON, STONEBRIDGE, WILD PLUM, STATE HWY 8, LOST HORSE, WILLOW SPRINGS, FOXMOOR, RED WOLF, WOODRIDGE, SILVER BEND, SINGLETREE, FLATROCK, RED CLIFF, DESERT FOX, FOOTHILL, OAK HOLLOW, RAVENRAVEN, DEERMAN, WEAVER GULCH, ELF OWL, BURROWING OWL, RED DEER, FOX HILLS, DOUBLE EAGLE, WILLOW WOOD, SPARROW POINT, CHIMNEY ROCK, DIAMONDBACK, DINOSAUR RIDGE, HOGBACK RIDGE, MOUNT GLENNON, LYONS RIDGE, CREAROCK, QUINCY AVE, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 36, 37, 38, 40, N

PROJECT: 016-0858 DRAWN BY: MD DATE: 11/2021	**MILE HIGH FLOOD DISTRICT, JEFFERSON COUNTY, AND CITY OF LAKEWOOD**	**WEAVER CREEK FHAD DRAINAGE AREA PROBLEMS**	olsson 1525 Raleigh Street Suite 400 Denver, CO 80204 TEL: 303.237.2072 FAX: 303.237.2659 www.olssonassociates.com	FIGURE 2 Page 18

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US Department of Commerce, National Oceanic and Atmospheric Administration. July 8, 2016. Point Precipitation Frequency Estimates.

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APPENDIX A

PROJECT CORRESPONDENCE

WEAVER CREEK

FLOOD HAZARD AREA DELINEATION

MEETING MINUTES

KICKOFF MEETING MINUTES

Weaver Creek MDP and FHAD
Monday, May 02, 2016
1:30 pm at Urban Drainage and Flood Control District

Attendees:

Name	Company	E-mail
Shea Thomas	Urban Drainage and Flood Control District (UDFCD)	sthomas@udfcd.org
Terri Fead	UDFCD	tfead@udfcd.org
John Conn	Jefferson County	jconn@co.jefferson.co.us
Terry Rogers	City of Lakewood (Lakewood)	terrog@lakewood.org
Deb Ohlinger	Olsson Associates (Olsson)	dohlinger@olssonassociates.com
Amy Gabor	Olsson Associates	agabor@olssonassociates.com
Jason Messamer	Olsson Associates	jmessamer@olssonassociates.com
Michelle Danaher	Olsson Associates	mdanaher@olssonassociates.com

Discussion Items:

The meeting was held to discuss the start of the project, determine known issues and problem areas, and identify other stakeholders that should be involved in the project. While this summary is not intended to represent a comprehensive account of the meeting, it is intended to reflect the key points raised and issues for further consideration and to identify the action items resulting from the discussions.

1) Introduction
    a) Other stakeholders will be contacted during the alternatives analysis phase of the project.

2) Project goals
    a) Main areas of concern and observed problems were discussed.
        i. The culvert at Cole Street is undersized. Jefferson County receives reports of flooding annually.
        ii. Jefferson County is concerned about CMP crossings.
        iii. Erosion is occurring on the east bank near the concrete baffle drop at Dartmouth Avenue.
        iv. John Conn foresees the widening of Belleview Avenue, west of C-470 sometime in the future.
        v. North of Quincy Avenue, is a Foothills Park and Recreation area. No plans for the park are in place yet, but something might be implemented in the future.
        vi. Ponding occurs in the pedestrian cell of the Simms Street culvert. Concrete aprons will be installed upstream and downstream of the culvert to improve maintenance access.
        vii. It is unclear if the effective floodplain mapping downstream of US 285 reflects the development that has happened, especially where the floodplain is shown over Kipling.
        viii. The MDP should include recommendations to replace the gabion drop structures.
3) Needed information
    a) Complete mapping and structure surveys have been provided by UDFCD.
    b) The abutting watershed boundaries will be provided be UDFCD.
    c) Lakewood and Jefferson County will send the GIS files that are available for streets, utilities, parcels, and land uses (existing and future).
    d) Jefferson County will provide a culvert inventory for culverts over 48-inches in diameter.
    e) The drainage report for the upstream West Quincy Avenue will be provided by Jefferson County.
    f) There are no as-constructed documents for maintenance projects.
    g) The Bergen Reservoirs are irrigation reservoirs for Foothills Parks.
    h) Lakewood and Jefferson County will send current logos.

4) New hydrology to be developed
    a) Olsson will use EPA SWMM 5.1.010 and CUHP 1.4.4. UDFCD will send the C_p and C_t spreadsheet to be used with CUHP 1.4.4. The hydrology will be calibrated to hydrology developed for watersheds between 2 and 3 square miles in size.
    b) The use of National Land Use Database is acceptable for existing percent imperviousness values, but should be verified. The values for water and undeveloped land will to be changed to 100 percent and 2 percent, respectively.
    c) Regional detention ponds to be included in the baseline hydrology were discussed.
        i. John will send information on the Bergen Reservoirs. They probably do not detain and will not be counted in baseline hydrology.
        ii. A regional detention pond is located at the southeast corner of C-470 and Belleview Avenue. John will send information about the pond.
        iii. Inadvertent detention upstream of C-470 will not be counted in the baseline hydrology.

5) Floodplain
    a) The upstream mapping limit will extend to the same limit as the 1981 FHAD.
    b) UDFCD has no preference between HEC-RAS version 4.1.0 and version 5.0 to evaluate the floodplain, as long as the version used is noted with the submittal.
    c) In general, culvert crossings smaller than 36-inches in diameter do not need to be modeled. A cross section can be placed on top of the private driveway crossing or the crossing can be ignored if cross sections are placed in a logical locations.
    d) Where there are multiple drop structures close together and the channel is not near homes, three cross sections per drop structure can be used instead of four.
    e) Modified inlets will require a custom rating curve for inlet control, outlet control, and weir flow scenarios. A decision will be made whether or not to set a water surface elevation in the model after comparing model results to the rating curves.
    f) There do not appear to be any concrete channels. A concrete low flow channel is downstream of the baffle drop.
    g) There is no preference for cross section orientation at culverts on skewed crossings.

6) Submittals for FHAD reviews
    a) The FHAD review will have 5 submittals. The detailed submittal process UDFCD presented at the May 3, 2016 FHAD meeting will be followed.

7) Schedule to follow agreement
    a) Draft hydrology due July 5, 2016.

b) It is acceptable for Olsson to start the HEC-RAS model before hydrology is complete; however, Olsson assumes the risk of the model needing to change if the hydrology changes before it has been finalized.

8) Upcoming meetings
   a) A meeting will be scheduled soon to discuss the development of new hydrology. Feedback from local sponsors could affect the land use and percent impervious values used in the model.
   b) The next meeting will be scheduled after the hydrology submittal has been reviewed.

9) Other
   a) West of C-470 is private property. Lakewood may have drainage easements.

Action Items:

- UDFCD
  - Send Olsson watershed boundaries of surrounding studies
  - Provide Olsson with complete mapping – *Completed*
  - Provide structure surveys – *Completed*
  - Contact the Foothills Park and Recreation Department
- Jefferson County
  - Send Olsson information on the regional detention at Belleview and C-470
  - Send Olsson information on the Bergen reservoirs
  - Send Olsson the drainage report for the upstream Quincy Avenue
  - Send Olsson any relevant GIS files, including streets, utilities, parcels, and existing and future land use
  - Send Olsson culvert inventory
  - Send Olsson any other relevant drainage studies in the watershed
  - Send Olsson updated logo
- Lakewood
  - Send Olsson any relevant GIS files, including streets, utilities, parcels, and existing and future land use
  - Send Olsson any other relevant drainage studies in the watershed
  - Check into drainage easements
  - Send Olsson updated logo – *Completed*
- Olsson
  - Schedule next progress meeting
  - Send an email requesting GIS data from Lakewood and Jefferson County

Please contact Olsson at 303-237-2072 if there are any changes or questions with these meeting minutes. These minutes will be considered final unless comments are received within seven days of distribution. Although comments will be incorporated, as appropriate, only major revisions will be redistributed.

Minutes prepared by: Michelle Danaher
cc: Attendees, File

PROGRESS MEETING MINUTES

Weaver Creek MDP and FHAD
Thursday, June 30, 2016
1:30 pm at Urban Drainage and Flood Control District

Attendees:

Name	Company	E-mail
Shea Thomas	Urban Drainage and Flood Control District (UDFCD)	sthomas@udfcd.org
Omer Karaketir	UDFCD	okaraketir@udfcd.org
John Conn	Jefferson County	jconn@co.jefferson.co.us
Terry Rogers	City of Lakewood (Lakewood)	terrog@lakewood.org
Deb Ohlinger	Olsson Associates (Olsson)	dohlinger@olssonassociates.com
Amy Gabor	Olsson Associates	agabor@olssonassociates.com
Michelle Danaher	Olsson Associates	mdanaher@olssonassociates.com

Discussion Items:

The meeting was held to discuss the assumptions used in developing the hydrology. While this summary is not intended to represent a comprehensive account of the meeting, it is intended to reflect the key points raised and issues for further consideration and to identify the action items resulting from the discussions.

1) Needed information
   a) Olsson has received all requested information.

2) Hydrology Parameters
   a) Percent imperviousness assumptions were discussed.
      i. In existing developed areas, the existing impervious values will be used except where the zoning designation could change.
      ii. Active development, including the development at the southeast corner of C-470 and Belleview and the development near Belleview west of C-470, will be included in existing percent impervious calculations.
      iii. The areas in Lakewood indicated as parks but zoned as residential, will be assumed to remain parks.
      iv. Shea will send example report figures for existing land use maps using the national land cover data set and a composite percent impervious per subbasin. She prefers that the latter be used.
   b) Detention
      i. The only detention included in the model is the pond southeast of Belleview and C-470.
      ii. FEMA requires as-built plans or survey for detention ponds.
   c) Harriman Reservoir
      i. The Harriman Reservoir overtops to the east and west. Water does not drain toward Weaver Creek. The question of whether the subbasins draining toward the reservoir should be included in hydrology was discussed. The basins will be included in the hydrology, unless UDFCD decides otherwise.

3) Draft Model Flows
   a) The model will be updated with percent impervious updates and NOAA Atlas 14 rainfall data. The CUHP version with updated Cp and Ct values provided by UDFCD is being used for the hydrology analysis.

4) Calibration
   a) A summary table comparing the model flows to FHAD flows will be emailed before the hydrology report is completed. Calibration is not anticipated.

5) Hydrology Report
   a) Reach descriptions will not be included in the hydrology report.

6) Floodplain
   a) HEC-RAS version 5.0.1 will be used for the Hydraulic analysis.
   b) Olsson has started laying out cross sections. Some cross sections will be coincident with FHAD cross sections.

7) Website
   a) The website will be live by July 8, 2016. The study area map will be included the following week.

8) Schedule
   a) Draft hydrology is due July 5, 2016 according to the agreement. Olsson received some information in the last two weeks and will submit July 15, 2016.

9) Upcoming Meetings
   a) The next meeting will take place after the hydrology review. It will be scheduled when the draft hydrology is submitted.

10) Other

Action Items:

- UDFCD
  - Send Olsson example report figures for existing land use maps.
- Jefferson County
  - Inform Olsson of any edits to the future land use percent impervious values.
- Lakewood
  - Inform Olsson of any edits to the future land use percent impervious values.
- Olsson
  - Send a summary of model results by email to project sponsors.

Please contact Olsson at 303-237-2072 if there are any changes or questions with these meeting minutes. These minutes will be considered final unless comments are received within seven days of distribution. Although comments will be incorporated, as appropriate, only major revisions will be redistributed.

Minutes prepared by: Michelle Danaher
cc: Attendees, File

PROGRESS MEETING MINUTES

Weaver Creek MDP and FHAD
Monday, October 24, 2016
2:00 pm at Urban Drainage and Flood Control District

Attendees:

Name	Company	E-mail
Shea Thomas	Urban Drainage and Flood Control District (UDFCD)	sthomas@udfcd.org
Omer Karaketir	UDFCD	okaraketir@udfcd.org
Terri Fead	UDFCD	tfead@udfcd.org
John Conn	Jefferson County	jconn@co.jefferson.co.us
Terry Rogers	City of Lakewood (Lakewood)	terrog@lakewood.org
Deb Ohlinger	Olsson Associates (Olsson)	dohlinger@olssonassociates.com
Amy Gabor	Olsson Associates	agabor@olssonassociates.com
Michelle Danaher	Olsson Associates	mdanaher@olssonassociates.com

Discussion Items:

The meeting was held to discuss the preliminary results of the floodplain model and the alternatives analysis. While this summary is not intended to represent a comprehensive account of the meeting, it is intended to reflect the key points raised and issues for further consideration and to identify the action items resulting from the discussions.

1) Logos – Terry stated that the "Lakewood" text in the logo did not need to be included. The report cover will be updated so that the logos and names are equally sized.

2) HEC-RAS model remaining items
   a) Modified inlet calculations (limited survey data available) – Jefferson County and Lakewood will send any design reports or plans they have to aid in developing the models for modified inlets.
      i) 5 - Willow Springs Drive (2 – 48" RCP)
      ii) 25 - C-470 (1 – 35' x 6' RCBC)
      iii) 38 - Hampden Avenue/Highway 285 (1 – 15.5' x 6' RCBC)
      iv) 40 - Dartmouth Avenue (2 – 22.5' x 6.8' RCBC)
   b) 36 - Irrigation Ditch siphon (limited survey data available) – UDFCD agreed with Olsson's assumption that this structure is not a siphon, but likely has varied slopes.
   c) Refine bridges (7, 10, 11, 30, 37)
   d) Refine Manning's n values – Olsson will include a shape file of Manning's n values used in the model as a project deliverable.
   e) Crossing profiles – Terri noted that the crossing profiles do not need to be resolved with the first submittal, but that Olsson should note that they will be addressed with the next submittal.
   f) Unbound cross sections
   g) Spills at roads (Belleview in 2 areas) – Olsson will send information to Terri to review model options.

3) Initial model results
   a) Roads overtopping (Table 1)
   b) Rough floodplain limits
      i) In general, the floodplain is slightly narrower than the effective floodplain, largely due to the detention pond that was constructed after the effective study was completed.
      ii) Terri stated that the rough, auto-generated floodplain limits are acceptable for the first review.
      iii) The effective floodplain adjacent to Kipling is shown overtopping the road. The initial model results show the floodplain contained in the channel.

4) Alternatives
   a) Crossing structures
      i) Many undersized crossings
         (1) Crossings will be evaluated based on both headwater to depth criteria and overtopping. Two alternatives for crossings not meeting the headwater to depth ratio, but not overtopping, will be evaluated: a full removal and replacement, and calculation of uplift forces if the existing structure were to remain.
         (2) Private driveway culverts will not be included in the alternatives analysis, unless the improvement could alleviate upstream flooding of a structure.
         (3) Cole St has had reported flooding, which was verified with the initial model results
         (4) The pedestrian cell of the Simms Street culvert frequently floods. Jefferson County recently completed a project to install concrete aprons and extend the upstream floodwall to make the situation more manageable during frequent storm events. Record drawings might be available from the UDFCD.
         (5) Undersized pedestrian bridges will be noted, but no new structures will be evaluated.
         (6) The east Quincy Avenue culvert was constructed and then filled in approximately 4 feet deep for the interim condition prior to downstream channel improvements. Jefferson County will send plans of the culvert to Olsson. Olsson will develop channel improvements to allow full use of the culvert.
      ii) All CMPs, even the ones that meet criteria, will include a replacement alternative.
   b) Channel improvements
      i) Erosion on east bank near baffle drop at Dartmouth
      ii) Replace gabion drop structures, if any
      iii) Olsson will review shear stresses and velocities to evaluate bank stabilization and grade control alternatives
      iv) The channel is steeper lower in the watershed. Braiding and degradation is occurring in the park area.
   c) Detention – The majority of the watershed is built. The large undeveloped parcels are mostly low density development. The alternatives will likely not include any detention alternatives.
   d) Water quality – The majority of the watershed is built and is conveyed overland to the creek. If outfalls are present, end treatments will be included in the alternatives. The land north of Quincy Avenue will also be considered for water quality.
   e) Olsson will use the SWIFT tool to develop the alternatives figure and cost estimate. Shea will send Olsson the SWIFT tool.

5) Schedule
   a) Draft alternatives and the first FHAD submittal will be submitted by November 24, 2016.

6) Upcoming meetings
   a) After alternatives analysis review

Table 1 – Crossing Structure Capacities

Street Name	Structure Survey Number	Existing Structure	Overtop?
Dartmouth Avenue	40	(2) 22.5-ft by 6.8-ft RCBC	No
Hampden Avenue/Highway 285	38	(1) 15.5-ft by 6-ft RCBC (Modified Drop Inlet)	Yes
Pedestrian Bridge	37	90-ft Bridge (no piers)	No
Siphon Under Irrigation Ditch on Maintenance Road	36	96-inch by 60-inch Elliptical CMP	Yes
West Quincy Avenue	32	(2) 16-ft by 5-ft RCBC	Yes
Simms Street	31	(1) 12-ft by 10-ft RCBC (1) 12-ft by 9-ft RCBC	No
Pedestrian Bridge	30	60-ft Bridge (no piers)	Yes
Pedestrian Walkway	29	(1) 36-inch RCP	Yes
South Youngfield Street	28	(2) 10-ft by 8-ft RCBC	No
Cole Street	27	(1) 68-inch CMP (1) 68-inch CMP	Yes
Eldridge Street	26	(2) 10-ft by 6-ft RCBC	No
C-470	25	(1) 35-ft by 6-ft RCBC (Modified Drop Inlet)	No
Quincy Avenue/Frontage Road	24	(1) 20-ft by 8-ft RCBC	No
Private Driveway	23	(1) 72-inch CMP	Yes
Belleview Avenue	21	(1) 78-inch CMP	Yes
Private Drive	20	(1) 3.5-ft by 2.5-ft Elliptical CMP	Yes
Belleview Avenue	19	(1) 74-inch CMP	Yes
Private Driveway	18	(1) 72-inch CMP	Yes
Belleview Avenue	17	(1) 72-inch CMP	No
Private Driveway	16	(1) 6-ft by 3.7-ft Elliptical CMP	Yes
Crestbrook Drive	15	(1) 72-inch CMP	No
Willowbrook Drive	14	(1) 34-inch RCP	Yes
Meadowbrook Drive	13	(1) 34-inch RCP	Yes
Colorow Drive	12	(1) 34-inch RCP	Yes
Pedestrian Bridge	11	30-ft Bridge (1 pier)	No
Pedestrian Bridge	10	16-ft Bridge (no piers)	No
Private Driveway	9	(1) 32-inch by 28-inch Elliptical CMP	Yes
Private Driveway	8	(1) 36-inch RCP	Yes
Pedestrian Bridge	7	23-ft Bridge (1 pier)	Yes
W Roton Arena	6	(1) 36-inch RCP	Yes
Willow Springs Drive	5	(1) 48-inch RCP (Modified Drop Inlet) (1) 48-inch RCP (Modified Drop Inlet)	Yes
Golf Cart Path	4	(1) 24-inch ABS (1) 36-inch Steel	Yes Yes
Golf Cart Path	3	(1) 36-inch Steel (1) 36-inch Steel	Yes

Red text indicates road overtopping
Yellow, orange, and green highlighted text indicates structures that need refined in the model

Action Items:

- UDFCD
  - Send Olsson SWIFT tool

- Jefferson County and Lakewood
  - Send Olsson any design information for:
    - 5 – Willow Springs Drive (2 – 48" RCP)
    - 25 – C-470 (1 – 35' x 6' RCBC)
    - 38 – Hampden Avenue/Highway 285 (1 – 15.5' x 6' RCBC)
    - 40 – Dartmouth Avenue (2 – 22.5' x 6.8' RCBC)
    - 36 – Irrigation crossing
    - 32 – West Quincy Avenue (east crossing – 2 – 16' x 5' RCBC)
- Olsson
  - Send Terri screenshots of both Belleview Avenue spills

Please contact Olsson at 303-237-2072 if there are any changes or questions with these meeting minutes. These minutes will be considered final unless comments are received within seven days of distribution. Although comments will be incorporated, as appropriate, only major revisions will be redistributed.

Minutes prepared by: Amy Gabor
cc: Attendees, File

OLSSON ASSOCIATES

PUBLIC MEETING MINUTES

Weaver Creek Major Drainageway Plan
Public Open House
Tuesday, May 16, 2017
6:00 to 7:30 pm at the Rocky Mountain Deaf School

Attendees:

See sign-in sheets.

Meeting Notification:

Urban Drainage & Flood Control District sent postcards to the property owners within a distance adjacent to the drainageway.

Meeting Purpose:

The meeting was held to discuss the draft Alternatives Analysis as posted on the project website for review by the public. Public input was solicited regarding known problems.

Discussion Items:

While this summary is not intended to represent a comprehensive account of the meeting, it is intended to reflect the key points raised and issues for further consideration and to identify the action items resulting from the discussions.

1) Shea Thomas opened the meeting and provided a background of the Urban Drainage & Flood Control District and the purpose of major drainageway master plans.

2) The final Alternatives Analysis Report will be submitted in PDF format after the public meeting and will also be posted to the project website.

3) The Selected Plan will be determined by the project sponsors. The public is encouraged to provide comments to the project sponsors.

4) Several general questions were raised at the public meeting. Shea explained how construction of the master planned improvements is funded and the process by which local governments prioritize improvements and they become projects.

5) Meeting attendees were encouraged to look at the maps provided, discuss issues, and ask questions one-on-one with the project sponsors and Olsson Associates team members.

Please contact Olsson at 303-237-2072 if there are any changes or questions with these meeting minutes. These minutes will be considered final unless comments are received within seven days of distribution. Although comments will be incorporated, as appropriate, only major revisions will be redistributed.

Minutes prepared by: Deb Ohlinger

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Jack Slade	5867 Colorow Dr	3-697-9611	jeanneslade@comcast.net
Stan Holtan	13241 W. Layton Ave.	3-697-1754	stanholtan@aol.com
Sue & John Gould	10351 W Girton Dr #1	3-988-8354	johnsuegould@comcast.net
Jeanne Slade	5867 Colorow Dr	3-697-9611	jeanneslade@comcast.net
Colin Insley	6612 S. Ward St.	3.409-2304	insley@hotmail.com
John Conn	Jefferson County	3 27/8496	

Name	Address	Phone	Email
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Lee Dieue Zieroth	15184 Willowbrook Ln	3036919001	
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BERND BACHMEHAK	5575 MEADOWBROOK DR	3036976530	—
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VINCE CASTEEL	CITY OF LAKEWOOD	303-987-7941	VINCAS@LAKEWOOD.ORG
Judy Dindo	4525 S. TAFT WAY	303-973-8717	JudyDindo@Q.com

PROGRESS MEETING MINUTES

Weaver Creek MDP and DFHAD
Thursday, June 22, 2017
4:00 pm at Urban Drainage and Flood Control District

Attendees:

Name	Company	E-mail
Shea Thomas	Urban Drainage and Flood Control District (UDFCD)	sthomas@udfcd.org
Terri Fead	UDFCD	tfead@udfcd.org
Brooke Seymour	UDFCD	bseymour@udfcd.org
Deb Ohlinger	Olsson Associates (Olsson)	dohlinger@olssonassociates.com
Amy Gabor	Olsson Associates	agabor@olssonassociates.com
Michelle Danaher	Olsson Associates	mdanaher@olssonassociates.com

Discussion Items:

The meeting was held to discuss the preliminary results of the floodplain model and the alternatives analysis. While this summary is not intended to represent a comprehensive account of the meeting, it is intended to reflect the key points raised and issues for further consideration and to identify the action items resulting from the discussions.

1) Update hydrology? – Steep slopes (>4% in 19 subbasins) were not adjusted and depth reduction factor adjustments for 2-, 5-, and 10-year were not applied
   a) Olsson will update hydrology.

2) FHAD Comments
   a) Propose using Bear Creek slope of 0.5% for normal depth. There is no 10-year FHAD data. Used normal depth, per discussion with Shea.
      i) Olsson will ensure the decision is documented in the report.
   b) Culvert cross sections were located at the end of the wingwalls, which resulted in longer distances from the culvert in some areas.
      i) Olsson will move cross section closer to the culvert opening and cut through wingwalls where necessary.
   c) Belleview Spill along road comment: “Most overtopping flow will remain on west side of Belleview Ave. Model does not currently represent flow on west side of road. Please use revised cutline to determine floodplain extents and discharge to the NW. Recommend weir equation at low point on Belleview north of crossing for spill back at XS 26731.”
      i) The floodplain will be mapped on the west side of Belleview Avenue, but a formal spill analysis will not be performed.
   d) Alignment downstream of Belleview: “Channel alignment appears to jump from canal to natural channel between XS 26901 & XS 26787. The channel alignment is not obvious in this location.”
      i) Olsson will update the alignment in this area.

   e) Willow Springs Drive modelling technique
      i) At Willow Springs Drive the overtopping flow will be modelled in a split north of Weaver Creek. The full flow will be modelled in Weaver Creek.

3) FHAD draft #2 submittal
   a) Delineate 100-YR floodplain and BFEs for main reach
   b) Rough cut floodplain on spills
   c) Partial agreement table

4) Schedule

5) Other

Action Items:

- Olsson
  - Finalize alternatives

Please contact Olsson at 303-237-2072 if there are any changes or questions with these meeting minutes. These minutes will be considered final unless comments are received within seven days of distribution. Although comments will be incorporated, as appropriate, only major revisions will be redistributed.

Minutes prepared by: Michelle Danaher
cc: Attendees, File

PROGRESS MEETING MINUTES

Weaver Creek MDP and DFHAD
Thursday, March 1, 2018
10:00 am at Urban Drainage and Flood Control District

Attendees:

Name	Company	E-mail
Brooke Seymour	Urban Drainage and Flood Control District (UDFCD)	bseymour@udfcd.org
Deb Ohlinger	Olsson Associates (Olsson)	dohlinger@olssonassociates.com
Amy Gabor	Olsson Associates	agabor@olssonassociates.com
Michelle Danaher	Olsson Associates	mdanaher@olssonassociates.com

Discussion Items:

The meeting was held to discuss comments the Weaver Creek FHAD review comments. While this summary is not intended to represent a comprehensive account of the meeting, it is intended to reflect the key points raised and issues for further consideration and to identify the action items resulting from the discussions.

1) FHAD Comments
   a) Comment 1 "Per FEMA guidance, we recommend labeling 100-yr water surface elevations at cross section lines with supplemental BFE lines as needed at inflection points or in areas of backwater, ponding, complex flow areas, etc. BFEs will be checked in detail once this change is made"
      i) The water surface elevation will be labelled to a tenth of a foot at each cross section on the map. Brooke will determine whether the water surface elevation should also be included on the profile.
      ii) Only select areas may require additional BFEs, including hydraulically connected detention ponds and areas of overtopping.

   b) At locations where cross sections are not perpendicular to the channel center line, a jog will be added to the cross section to make it perpendicular to the alignment.

   c) Cross section 37093 (Whale Rock Way)– banks stations, alignment
      i) A cross section will be added upstream of the road to determine the controlling cross section. If it is the controlling section instead of the road cross section, a note will be added to the cross section to explain why the road is not modeled.
      ii) If the road cross section controls, edits to the channel alignment will be made.

   d) Comment 8: "Channel invert elevations decrease moving upstream at the following cross sections: 402, 11890, 13628, 13694, 14922, 14940, 15068, 16198, 18747, 19604, 19890, 23002 and 36588. This may be a result of LiDAR inaccuracy – please verify and revise if necessary."
      i) The areas of adverse slope will be looked at in more detail. Where it appears that the LiDAR is inaccurate a low flow invert based on the survey points will be carried through the reach.

   e) Comment 21/comment 24 – IEFA at stilling basins
      i) Ineffective areas will be added at the stilling basins to smooth the profile.

   f) Comment 27: "XS 27139-27149 – Please extend LOB to contain 50-yr, 100-yr and 500-yr events."
      i) The cross sections will be extended.

   g) In the steep upper reach of Weaver Creek, the profile and sections will be checked to see if they are consistent between cross sections. Cross sections will only be added where they are not consistent, rather than looking at keeping the change in water surface elevation between cross sections less than 10-feet.

2) FHAD draft #3 submittal
   a) The updated model and response letter will be submitted to UDFCD for an expedited review to ensure a consensus on the modeling approach before proceeding with the submittal checklist.

3) Schedule
   a) 3 weeks

Action Items:

- UDFCD
  - Determine whether water surface elevations should be added to the profile drawing in addition to the map
- Olsson
  - Address comments and submit model and response letter for an expedited review.

Please contact Olsson at 303-237-2072 if there are any changes or questions with these meeting minutes. These minutes will be considered final unless comments are received within seven days of distribution. Although comments will be incorporated, as appropriate, only major revisions will be redistributed.

Minutes prepared by: Michelle Danaher
cc: Attendees, File

PROGRESS MEETING MINUTES

Weaver Creek FHAD
Thursday, November 5, 2020
9:00 am via Teams

Attendees:

Name	Company	E-mail
Brooke Seymour	Mile High Flood District (MHFD)	bseymour@udfcd.org
Hung-Teng Ho	MHFD	hho@udfcd.org
Amy Gabor	Olsson	agabor@olsson.com
Deb Ohlinger	Olsson	dohlinger@olsson.com
Michelle Danaher	Olsson	mdanaher@olsson.com

Discussion Items:

The meeting was held to discuss comments the Weaver Creek FHAD review comments. While this summary is not intended to represent a comprehensive account of the meeting, it is intended to reflect the key points raised and issues for further consideration and to identify the action items resulting from the discussions. Non-bolded items comprise the meeting agenda, while bold items comprise information from the meeting.

1) Kipling St Spill

   a) Kipling Spill 2

      i) **Since the flow is in an existing swale, having a separate profile and BFEs does not provide much benefit.**

      ii) **Brooke confirmed that FEMA documentation states you need to have a profile for every split reach in the model and will confirm with Terri Fead. We need to evaluate the flows we think are getting there to determine if we want to eliminate it.**

      iii) **The floodplain is potentially shallow flooding (a shaded Zone X if average depth < 1-ft, or potentially shallow flooding with average depths <2-ft) and justify with an outside calculation.**

      iv) **If the spill flow is small, the potential spill could be identified with a note on the map.**

   b) IEFA at 80914 – 81327

      i) **The current model approach will be kept. The permanent IEFA elevations will be lowered to keep water in the median, while allowing a reasonable amount of water to flow to the ponds to the east.**

2) Modify Inlet Culvert/Set WSE Approach

   a) **It can be confusing to have both a structure and a rating curve based on outside calculations in the model. For this model, both the rating curves and structures will be included in the model. Notes will be added in the model to clearly denote that culverts where analyzed outside of HEC-RAS.**

3) Floodway Analysis

   a) Negative surcharges when encroachments defined for FW = FP

      i) **FEMA's preference is to have encroachments defined where floodway (FW) equals floodplain (FP). Recently, some studies have successfully gone through FEMA without defining encroachments where FW = FP where it causes problems with negative surcharges when the station is defined.**

      ii) **The floodway cannot be greater than the floodplain. Encroachments may need to be defined when FP = FW at the transition from a defined FW.**

   b) FW transitions/necking down

      i) **Floodway mapping will be updated so that the top width does not neck down between cross sections.**

   c) Smooth floodway

      i) **More consistency through cross sections**

4) Maps

   a) Gutterline locations

      i) **The location of the gutter line at the Willow Springs Spill is abnormal based on how the overbank spill was modeled. Brooke and Hung-Teng will discuss with Terri and follow up.**

5) Profiles

   a) Vertical scale (1" = 20'), per FHAD guidelines minimum vertical scale 1' = 10'

      i) **MHFD is inclined to keep the scale as it is, since the channel is so steep. Upper reach slightly hard to see. FEMA uses the model for profiles. Local governments use the FHAD profiles. Brooke will solicit input from Lauren, at Jefferson County, about how they use the profiles and whether the current scale serves their needs.**

6) Weaver Creek at Swarthmore

7) Schedule

   a) **The Weaver FHAD will be a part of the 2021 PMR if the Weaver at Swarthmore as-builts can be verified in time. The goal is to have everything else complete for the 2021 PMR.**

   b) **The model can be submitted for review without the floodway analysis complete if that works best to keep the Weaver at Swarthmore and FHAD moving forward. Olsson will follow-up with MHFD regarding schedule.**

8) Other

Action Items:

- **MHFD**
  - **Reach out to Jefferson County for input on the vertical scale for the profiles**

- **Discuss with Terri whether a profile is required for a modeled reach**
- **Discuss with Terri the gutter line location at the Willow Springs Spill**

- **Olsson**
  - **Follow up on schedule for re-submitting**
  - **Follow up with specific areas where the floodway transition to FW = FP cause problems, if any**

Please contact Olsson at 303-237-2072 if there are any changes or questions with these meeting minutes. These minutes will be considered final unless comments are received within seven days of distribution. Although comments will be incorporated, as appropriate, only major revisions will be redistributed.

Minutes prepared by: Michelle Danaher
cc: Attendees, File

COMMENTS AND RESPONSES

MEMO

TO: Brooke Seymour and Terri Fead, UDFCD
FROM: Amy Gabor, PE and Michelle Danaher, EI
RE: Weaver Creek FHAD – Response to Submittal 2 Comments
DATE: April 4, 2018

Olsson Associates provided the information listed below to the Urban Drainage and Flood Control District on September 29, 2017 for review. This submittal packet represents the second official FHAD submittal for this project. Review of this submittal focused on comments presented on the first review, as well as the 100-yr GIS floodplain and the partially complete Floodplain and Floodway Data Table.

Submitted items for review include:

- FHAD HEC-RAS model
- Supporting HEC-RAS model at Hwy. 285
- GIS data: 100-year floodplain and shallow flooding, BFEs, cross sections, lateral structure, spill arrows and text, and channel centerline.
- Hydraulic analysis narrative from the MDP Report
- Street capacity calculations
- Partial floodplain and floodway data table

The following are comments that have resulted from the review of the project materials:

1. Per FEMA guidance, we recommend labeling 100-yr water surface elevations at cross section lines with supplemental BFE lines as needed at inflection points or in areas of backwater, ponding, complex flow areas, etc. BFEs will be checked in detail once this change is made.
   RESPONSE: TO BE ADDRESSED WITH NEXT SUBMITTAL

2. Many BFEs are not perpendicular to the centerline - for example Mainstem BFEs 5666, 5725, 5780, 5798, 5837, 5863, 5882, 5939, 6141, 6382, and Willow Spill BFEs 6173-6177.
   RESPONSE: THE BFE APPROACH FROM COMMENT 1 WILL BE IMPLEMENTED WITH THE NEXT SUBMITTAL.

3. To expedite the review process, please make the floodplain a polygon in GIS and Cross Section Station attribute numeric double format instead of text.
   RESPONSE: THE FLOODPLAIN SHAPEFILE WILL BE UPDATED WITH THE NEXT SUBMITTAL. UPDATED CROSS SECTION AND CENTERLINE SHAPEFILES HAVE BEEN INCLUDED WITH THIS SUBMITTAL.

4. The following cross sections are not perpendicular to the channel centerline: 26871, 26911, 30068, 33325, 37093, 400596 and 400507.
   RESPONSE: CROSS SECTION ALIGNMENTS HAVE BEEN UPDATED. AS DISCUSSED IN THE 03-01-18 MEETING, CROSS SECTION 37093 WAS REMOVED FROM THE MODEL.

5. Banks stations are outside of 100-yr floodplain at a number of locations throughout the model. Please lower bank stations below the 100-yr event at the following cross sections: 9734, 30163, 36368, 37093, 37175, 37449, 50151 and 50721.
   RESPONSE: BANK STATIONS HAVE BEEN UPDATED. AS DISCUSSED IN THE 03-01-18 MEETING, CROSS SECTION 37093 HAS BEEN REMOVED FROM THE MODEL.

6. Channel slope is generally steep along Weaver Creek. Channel cross section and slope is fairly consistent between sections, however we recommend additional cross sections as needed to result in no more than a 10-ft change in HGL between sections. This applies in the reach downstream of the following cross sections: 30057, 30985, 32612, 35378, 35842, 36091, 37783, 38062, 38270, 38381, 38507 and 38640.
   RESPONSE: CROSS SECTIONS WERE ADDED. AS DISCUSSED IN THE 03-01-18 MEETING, CHANGES IN WSE GREATER THAN 10 FEET STILL OCCUR, BUT THE PROFILE AND SECTIONS SEEM FAIRLY CONSISTENT BETWEEN THESE SECTIONS. THE FOLLOWING CROSS SECTIONS WERE ADDED: 38580, 38473, 38429, 38168, 37682, AND 35200.

7. Channel, LOB and ROB reach lengths are identical at several cross sections where it does not appear to be realistic. Please verify LOB and ROB reach lengths at the following cross sections: 18581, 18729, 18747, 20101, 37462, 50369, 50921, 51128, 51224, 60880, 61049, 61323, 61637, 61902, 62100, 62287, 400507 and 400596.
   RESPONSE: REACH LENGTHS WERE UPDATED. THE BELLEVIEW SPILL ALIGNMENT AND CROSS SECTION STATIONS HAVE BEEN UPDATED.

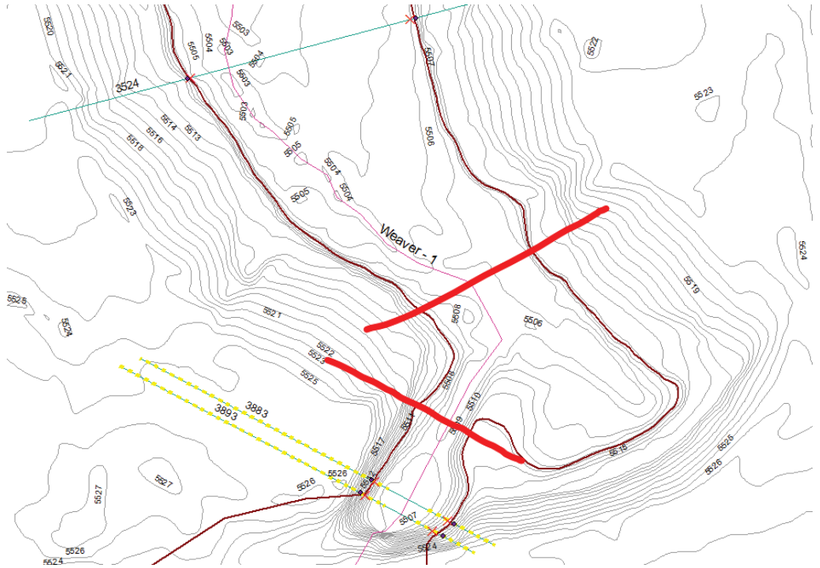
8. Channel invert elevations decrease moving upstream at the following cross sections: 402, 11890, 13628, 13694, 14922, 14940, 15068, 16198, 18747, 19604, 19890, 23002 and 36588. This may be a result of LiDAR inaccuracy – please verify and revise if necessary.
   RESPONSE: SEE TABLE BELOW.

XS	Addressed?	Comments
402	X	Crest invert adjusted.
11890	X	IEFA added at cross section 12012 per stilling basin/scour discussion from 3/01/18 meeting.
13628		Looks like a scour hole just after the check structures. Leave adverse slopes. Comment: "Adverse slope due to scour hole beneath check structure"
13694		Looks like a scour hole just after the check structures. Leave adverse slopes. Comment: "Adverse slope due to scour hole beneath check structure"
14922		Looks like a scour hole just after the check structures. Leave adverse slopes. Comment: "Adverse slope due to scour hole beneath check structure"
14940		xs 14927 based on survey shot, xs 14940 based on LiDAR
15068		Looks like a scour hole just after the check structures. Leave adverse slopes. Comment: "Adverse slope due to scour hole beneath check structure"
16198	X	Downstream xs low flow adjusted.
18747	X	Adjusted
19604		Adverse slope/scour based on LiDAR. Note added to cross section.
19890	X	Crossing 27. Culvert cross section kept at the surveyed invert. Next downstream cross section at the LiDAR elevation based on survey picture, so we do not overestimate channel capacity. See photo below.
23002	X	

36588	X	Crossing 3. Culvert cross section kept at the surveyed invert. Next downstream cross section at the LiDAR elevation based on survey picture, so we do not overestimate channel capacity. See photo below.

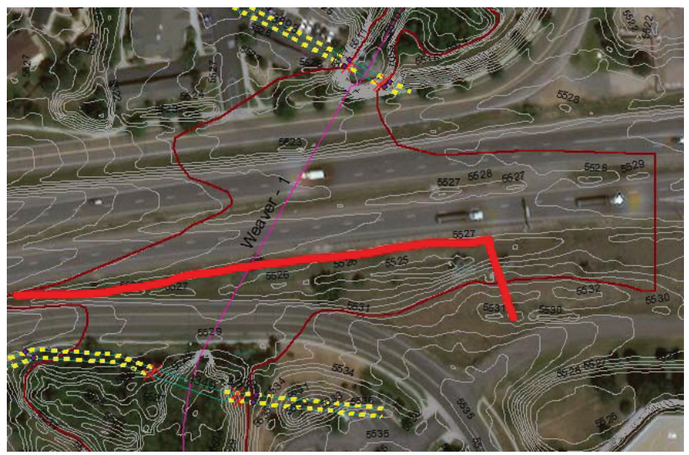
9. Channel centerline is not located between bank stations at cross sections 38735 and 50369.
RESPONSE: BANK STATIONS WERE UPDATED.

10. Please add cross sections to better model the transition between XS 3883 and XS 3524 (see recommended locations in the image below).



RESPONSE: CROSS SECTIONS 3700 AND 3834 WERE ADDED.

11. XS 4369 in supporting Hwy. 285 model – We recommend realigning the cross section similar to the alignment shown in the following image to help estimate the potential spill discharge into the roadside ditch.



RESPONSE: AN ADDITIONAL CROSS SECTION WITH THE SUGGESTED ALIGNMENT WAS ADDED TO THE SUPPORTING 285 MODEL.

12. Please add cross section at location of fully expanded flow d/s Crossing 36 (d/s XS 5106).
RESPONSE: CROSS SECTION 5000 WAS ADDED. THE ADVERSE SLOPE IS DUE TO THE CHANNEL MODIFICATIONS FOR THE CULVERT INVERT.

13. Shallow flooding area from W. Keene Ave to S. Miller Ct. (located in vicinity of XS 5223) – Please provide estimate of potential spill discharge and document in the report.
RESPONSE: THE REPORT WILL BE UPDATE WITH SPILL DISCHARGES WITH NEXT SUBMITTAL

14. XS 13575-13709 – Is pond in ROB hydraulically connected? If so, please show as floodplain. (Note that top width in agreement table won't include this area since there is no surface connection.)
RESPONSE: THE POND APPEARS TO BE HYDRAULICALLY CONNECTED. THE FLOODPLAIN LIMITS WILL BE UPDATED WITH THE NEXT SUBMITTAL.

15. Please add cross section at location of fully expanded flow d/s Crossing 29 (d/s XS 16776).
RESPONSE: CROSS SECTION 16720 WAS ADDED.

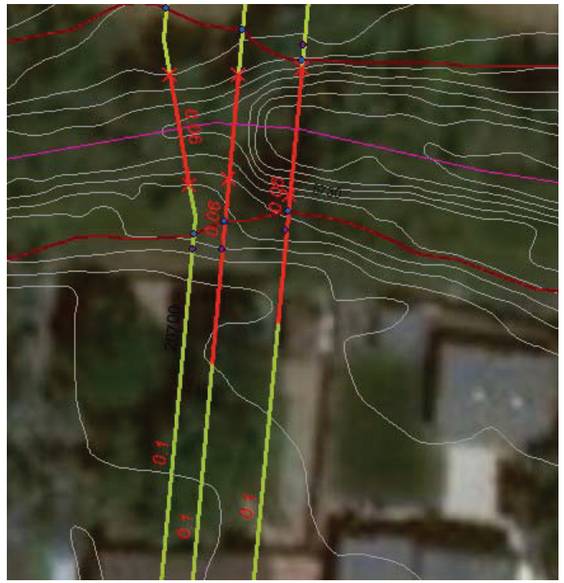
16. XS 20239 – We recommend realigning LOB of cross section to be perpendicular to contours.
RESPONSE: THE CROSS SECTION WAS REALIGNED.

17. XS 20360, 20381 – Please review and revise extents of n=0.06 representing channel vegetation in LOB (see image below)

RESPONSE: THE CROSS SECTIONS WERE TRIMMED, AND MANNING'S N STATIONS WERE ADJUSTED.

18. XS 20391 – Cross section is uncontained in 500-yr event. We recommend bending LOB of cross section perpendicular to contours.
RESPONSE: CROSS SECTION WAS TRIMMED.

19. XS 20700-20685 – Please adjust extents of n=0.1 in ROB to match limits of residential area (see image below).



RESPONSE: MANNING'S N STATIONS WERE ADJUSTED.

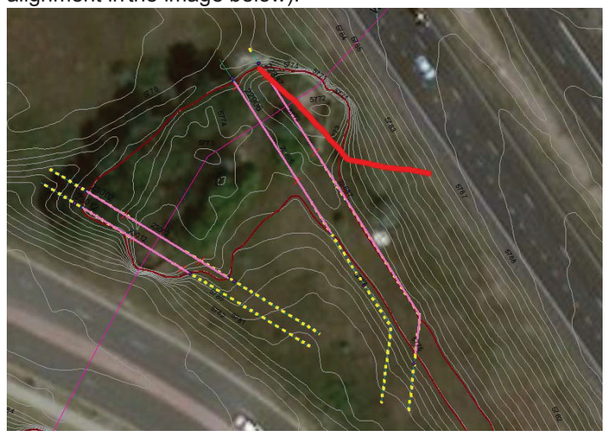
20. XS 21012 – n=0.10 in LOB seems too high and is not consistent with u/s and d/s cross sections – please review and revise. (Refer to image below.)

RESPONSE: LOB MANNING'S N VALUE CHANGED TO 0.04.

21. XS 22272 – Please add IEFA at apparent scour hole (stilling basin?).
RESPONSE: IEFA WAS ADDED TO THE CROSS SECTION. A NOTE WAS ADDED TO THE CROSS SECTION.

22. XS 22887 – Please realign cross section to avoid low area in ROB (see suggested

alignment in the image below).

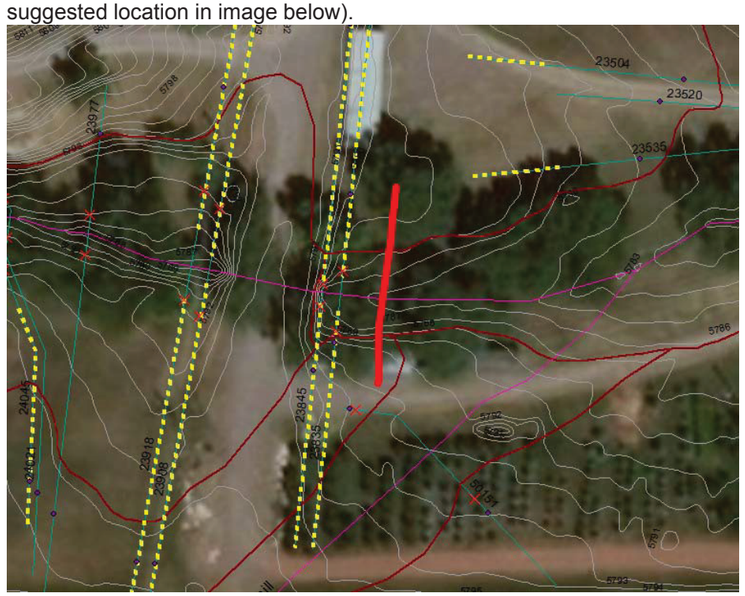


RESPONSE: CROSS SECTION WAS REALIGNED AND RENAMED. IT IS NOW CROSS SECTION 22881.

23. XS 22429, 22419 – Please check placement of IEFA due to downstream crossing.
RESPONSE: IEFA STATIONS WERE UPDATED.

24. XS 22562 – Please add IEFA at apparent scour hole.
RESPONSE: IEFA WAS ADDED TO THE CROSS SECTION. A NOTE WAS ADDED TO THE CROSS SECTION.

25. Please add XS at location at or near fully expanded flow d/s Crossing 23 (see suggested location in image below).



RESPONSE: CROSS SECTION 23810 WAS ADDED.

26. XS 25121 – Bank station height is not consistent with adjacent cross sections.
RESPONSE: BANK STATIONS WERE UPDATED.

27. XS 27139-27149 – Please extend LOB to contain 50-yr, 100-yr and 500-yr events.
RESPONSE: CROSS SECTIONS WERE EXTENDED.

28. Please add cross section at location of fully expanded flow d/s Crossing 18 (d/s XS 27853).
RESPONSE: CROSS SECTION 27810 WAS ADDED.

29. XS 28600 – Please review and revise IEFA for culvert based on a contraction ratio consistent with other crossings.
RESPONSE: IEFA STATIONS WERE UPDATED.

30. Please add XS at location of fully expanded flow d/s Crossing 14 (d/s XS 31883).
RESPONSE: CROSS SECTION 31838 WAS ADDED.

31. XS 32815 – It appears that ROB IEFA should be permanent to el. 6027 - please verify and revise as needed. Additionally, please add IEFA in LOB for consistent expansion from downstream cross section.
RESPONSE: ROB IEFA WAS MADE PERMANENT. IEFA WAS ADDED TO LOB.

32. XS 36354-36262 – Please revise 100-yr floodplain limits to follow contours in ROB over Willow Springs Dr.
RESPONSE: TO BE ADDRESSED WITH NEXT SUBMITTAL

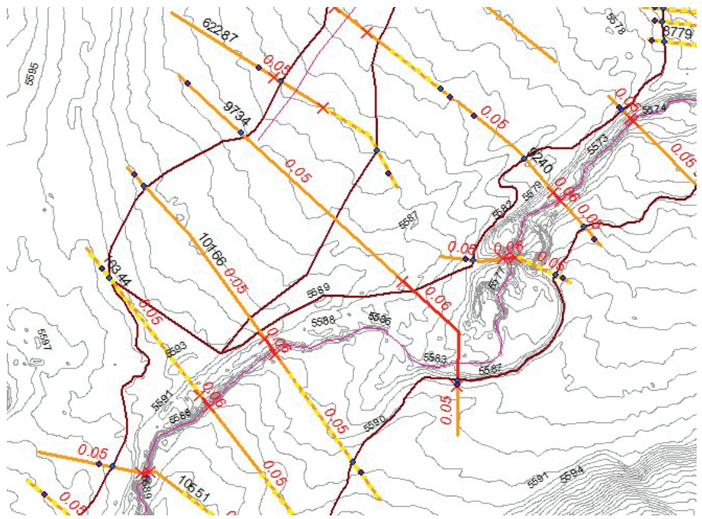
33. XS 36404 – This is the immediate upstream cross section for Crossing 4, however note indicates that it is the “next u/s XS Crossing 4” – please revise note.
RESPONSE: THE NOTE WAS REVISED.

34. XS 37093 – Cross section is not perpendicular to centerline and 100-yr top width in HEC does not contain the centerline. We recommend relocating the cross section upstream as shown in the image below.

RESPONSE: CROSS SECTION **37093** WAS REMOVED FROM THE MODEL. WHALE ROCK IS NOW MODELED WITH TWO CROSS SECTIONS: **37122** AND **37072.**

Spill 2:

35. The spill flow appears to be determined based on LOB flow at XS 9734. However, the actual spill flow appears to be higher based on XS 10166. We recommend that XS 9734 be divided between the mainstem and split reaches. Please document how the split flow was calculated in the report (see image below).



RESPONSE: CROSS SECTION **9734** WAS DIVIDED INTO THE MAIN AND SPLIT REACHES.

36. Please connect centerline to mainstem on upstream and downstream ends.
RESPONSE: CENTERLINE WAS UPDATED.

Belleview Spill:

37. Flow in ROB of XS 25151 assumed to be spill flow. Please update the report to reflect the correct XS (report states XS 25110).
RESPONSE: THE REPORT HAS BEEN UPDATED.

38. XS 50500 – It appears IEFA in LOB should be changed to permanent (consistent with XS 50369).
RESPONSE: IEFA HAS BEEN CHANGED TO PERMANENT.

39. Please connect centerline to mainstem at upstream end.
RESPONSE: CENTERLINE WAS UPDATED.

Willow Spill:

40. Spill flow appears to be based on LOB at XS 36360. Please document this in the report.
RESPONSE: THE REPORT WILL BE UPDATED WITH THE NEXT SUBMITTAL.

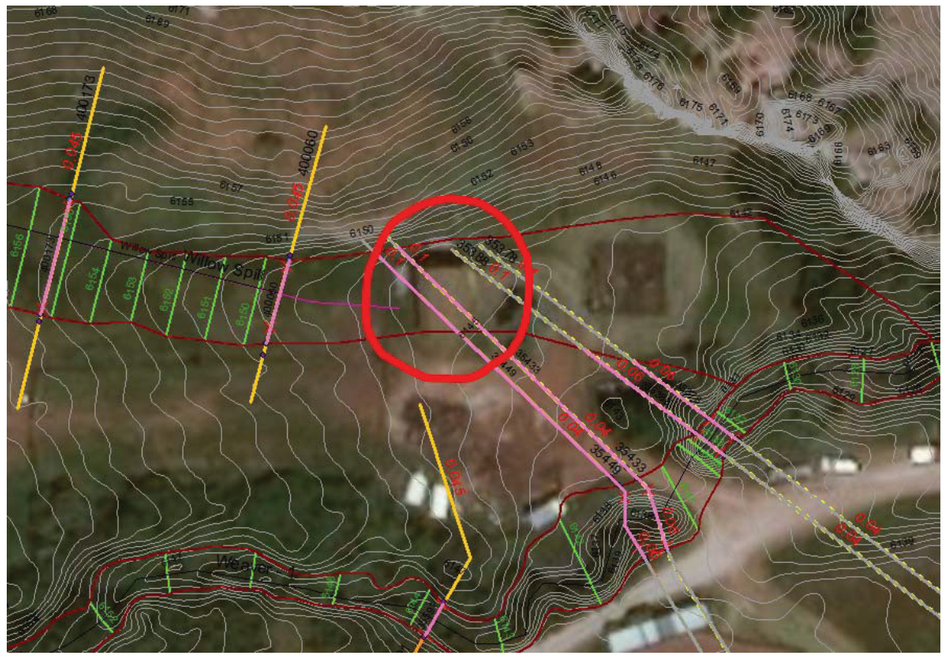
41. We recommend bending back contours in the overbanks to be perpendicular to contours.
RESPONSE: CROSS SECTIONS WERE REALIGNED.

42. Please connect centerline to mainstem on upstream and downstream sides.
RESPONSE: CENTERLINE WAS UPDATED.

43. Please trim mainstem cross sections 35449-35378 so that they do not overlap the spill reach.
RESPONSE: CROSS SECTIONS HAVE BEEN TRIMMED.

44. Please add a cross section at the barn located in the spill path d/s of XS 400060.

Please adjust centerline alignment to avoid going through barn. (Refer to following image.)



RESPONSE: CENTERLINE WAS UPDATED AND CROSS SECTION 400179 WAS ADDED.

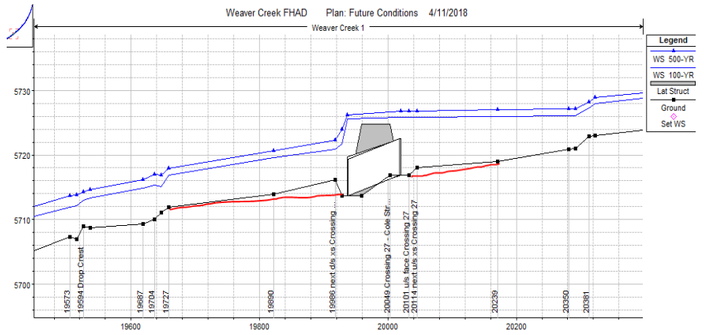
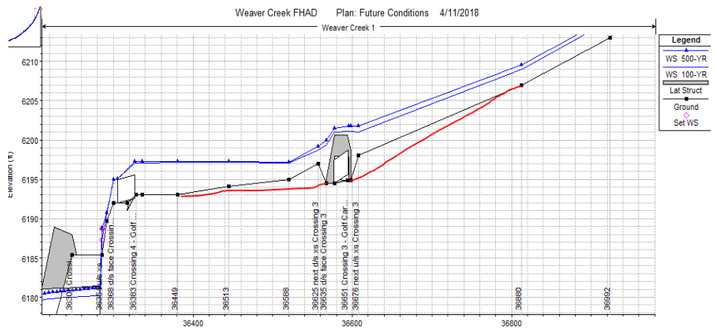
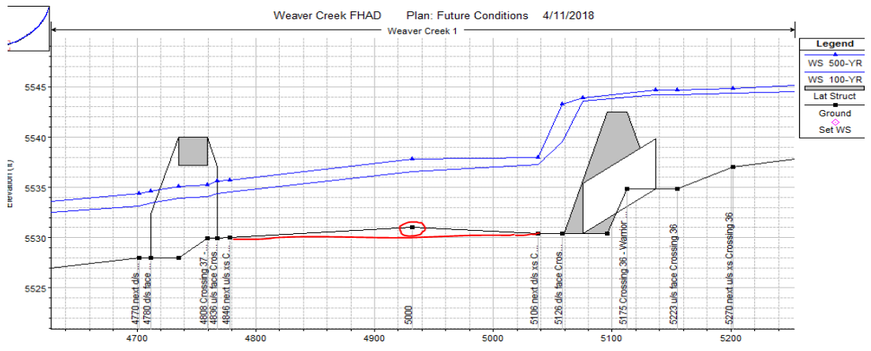
Tables:

45. BEF Note 1 is not necessary. BFE Note 2 may not be necessary when BFEs are labeled at cross sections.
    RESPONSE: TO BE ADDRESSED WITH NEXT SUBMITTAL

46. In general, please be more specific in notes when floodplain top width is wider than model width due to physical flow path (e.g. “floodplain mapped wider than model due to flow in LOB from upstream cross section”).
    RESPONSE: TO BE ADDRESSED WITH NEXT SUBMITTAL

47. Please refer to enclosed spreadsheet for additional comments on table.
    RESPONSE: TO BE ADDRESSED WITH NEXT SUBMITTAL

48. Please provide Partial Agreement Table per the standard template with the next submittal. Based on the new FHAD submittal procedure, the Floodplain and Floodway Data Table is not required until Step 4 – Full Review.
    RESPONSE: TO BE ADDRESSED WITH NEXT SUBMITTAL

Comment		Response
The following are comments that have resulted from the review of the project materials:		
1	We discovered that a number of small drop structures were not picked up in the survey. We will work with you to determine if any of these structures have potential to affect the floodplain; if needed, we will collect additional survey to be incorporated into the model.	5 drop structures were surveyed. Additional survey was incorporated into the model
2	The drop structure at approximately Station 4+00 was not included in the survey. In an effort to eliminate an adverse slope based on LiDAR topography, the crest elevation was lowered; instead, please raise the invert of the upstream cross section or leave the adverse slope if realistic. Note that this location may be identified for additional survey, in which case the survey will determine the crest elevation in the model.	Drop structure adjusted based on survey. The invert was lowered at cross section 350 to avoid adverse slope.
3	The baffle drop at approximately Station 17+00 does not reflect the survey elevations well, and it appears that the survey data may be insufficient. We will work with the surveyor to get additional information to be incorporated into the model.	Drop structure adjusted based on survey
4	XS 13628, 13694, 14922, 15068 – We agree with leaving adverse slopes at these locations where scour holes have been identified beneath the check structures. Please add this information to the cross section description in the HEC-RAS model.	Added to description.
5	Crossing 3 and Crossing 27 – Site photos indicate that these culverts are partially clogged with sediment and debris. Please assume that the culverts and channel reaches upstream and downstream are clear to reasonable tie-in points that avoid adverse slopes. Please see profile suggestions below.  	Lowered invert elevations at cross sections: 19890,19986,20114,36588,36625,36676
6	XS 5000 – Please adjust channel invert based on upstream and downstream survey points (see profile below). 	Cross Section 5000 invert lowered to 5530.225
7	Please verify overbank reach lengths throughout the model and revise as necessary. Potential discrepancies were identified at a number of cross sections, including XS 900, 4550-4836, 22429, 22552, 23173, 24021, 24123, 24289, 25034-25121, 26278, 26415, 26340, 27915, 27925, 28600.	Overbank reach lengths have been updated.
8	Hwy. 285 spill – Please provide an estimate of the flow rate spilling to the east in Highway 285 and the adjacent ditch. This may be done with a normal depth calculation based on the water surface elevation from the Hwy. 285 model. Please provide us with the estimated spill amount before mapping the spill extents.	We would like to discuss the modeling of the 285 spill.
9	XS 3834 – Please check for IEFA in ROB and revise as necessary.	IEFA added to ROB to account for wingwall.
10	XS 23810 – Please check for IEFA in LOB and revise as necessary.	IEFA added to LOB
11	11. XS 23977-24045 – Please add IEFA in ROB for consistency with adjacent cross sections.	IEFA has been extended from downstream cross section.
12	XS 23977-24123– The GIS stream centerline alignment has changed in this location since previous submittals and no longer follows the thalweg. The reach lengths for cross sections 24021-24171 do not match the GIS centerline alignment. Please review and revise.	Updated GIS shapefiles are included in this submittal.

Comment		Response
The following are comments that have resulted from the review of the project materials:		
13	XS 35200 – Please add this section to the GIS cross section shapefile.	Updated GIS shapefiles are included in this submittal.
14	XS 36354-36360 – Please lower bank stations to be at or below the 100-yr event.	Bank stations adjusted
15	XS 36368 – Please add permanent IEFA in LOB.	Added permanent IEFA in LOB
16	XS 36449, 36513 – Please add IEFA in overbanks to be consistent with cross section 36404.	Added IEFA
17	XS 37072 at Whale Rock Way – The cross section alignment appears to overestimate conveyance area; please consider the alternative alignment shown in the image below. Please also add permanent IEFA to elevation 6225 in the low area shown in the image below. 	Cross Section has been realigned.
18	XS 38580 – Please lower bank stations to be consistent with adjacent cross sections.	Lowered bank stations
Spill 2:		
19	We recommend using a flow distribution on cross section 10166, so that the spill flow rate is not over estimated.	The flow used for the spill was the flow in the low area in the left overbank of cross section 10166.
Belleview Spill:		
20	Please update the Belleview Spill flow data based on latest model results.	The spill flow data for Belleview has been updated.
Willow Spill:		
21	XS 400251 - Please add an obstruction to represent the barn in the flow path.	Added obstruction.

MEMORANDUM

TO: Michelle Danaher, Olsson

FROM: Brooke Seymour and Dana Morris, UDFCD

SUBJECT: Weaver Creek FHAD: 7/26/2018 Submittal Review Comments

DATE: May 27, 2019

The bolded text represents Olsson's response to comments received May 27, 2019.

Olsson provided the information listed below to the Urban Drainage and Flood Control District on July 26, 2018 for model review. This review focused on the 100-year floodplain delineation.

Submitted items include:

- FHAD HEC-RAS model
- Supporting spreadsheets: DFHAD Tables
- GIS shapefiles including cross sections, centerlines, 100-yr extents
- Comment response letter

The following comments have resulted from review of the project materials:

1. Additional drop structure survey:
    a. XS 1712 – Please verify drop crest elevations and revise as necessary. Survey shots along the crest range from 5481.22 to 5481.37, while the crest elevation in the model is 5481.05.
    Response: The cross section has been updated to match survey shots.
    b. XS 18747 – Please adjust invert elevation based on survey at cross section upstream to avoid adverse slope.
    Response: The cross section has been updated to match upstream survey shot.
2. Hwy. 285 spill:
    a. It appears that spill will be leaving the system to the east. Let's discuss the best approach to estimate the spill flowrate and map the spill path.
    Response: Reaches were added to the model for the 285 overflow path and the Kipling Street spill. Flow splits along the Kipling St Spill were quantified and modeled. Flow does leave the system at the intersection of Kipling St and Dartmouth Avenue.
    b. The upstream and downstream water surface elevations in the supporting Hwy. 285 model do not match the FHAD model - please review and revise.
    Response: The 285 Overflow model has now been incorporated into the main model, as its own reach.

    c. Please smooth the delineation along the west side.
    Response: The delineation was updated to match the updated cross sections. If additional smoothing is needed, the DLOMC table will also be updated to note why the model does not match the plan.
3. Please update narrative in the report to document the revised spill calculations. The spill results seem reasonable, but we were not able to exactly replicate the numbers.
Response: Report has been updated and a table has been added for clarity.
4. Any areas of shallow flooding need to be on a separate layer contained within the 100-yr floodplain extents.
Response: The 100-year floodplain encompasses the shallow flooding areas.
5. Please provide BFE labels at cross sections rounded to one decimal.
Response: BFE labels have been added to the floodplain map
6. Please trim the spill centerlines on the upstream ends to avoid crossing cutlines for the mainstem. (We recognize that this was done to address a previous comment, but we now realize the problem with doing so.)
Response: Trimmed spill centerlines
7. Please delineate the entire footprint of adjacent ponds to be within the 100-yr floodplain (rather than delineating based on adjacent BFE). These adjacent ponds will be mapped as Zone A without BFEs.
Response: Ponds mapped
8. XS 1734-XS 1658 – Please review floodplain delineation along the left side; it appears to be mapped too narrow.
Response: A spill occurs upstream of cross section 1734. The spill was estimated based on left overbank flow and the shallow flooding area was mapped based on normal depth calculations in the parking lot.
9. XS 6801-XS 7010 – Please trim LOB to avoid crossing into 500-yr floodplain for Spill 2.
Response: Trimmed cross sections
10. XS 15654-15717 - 500-yr flow is uncontained in the LOB.
Response: Extended cross sections
11. XS 15702 – Please make IEFA permanent to provide consistent conveyance area with adjacent cross sections for the 500-yr event.
Response: Made IEFA permanent. Adjusted stations downstream for 500-year expansion
12. XS 21408 – Should the adjacent pond in LOB be mapped as floodplain?
Response: Mapped pond in LOB in floodplain
13. XS 23810 - Please check placement of IEFA in LOB considering expansion from IEFA at upstream cross sections.
Response: Updated IEFA station
14. XS 23835-XS 23845 – Please trim ROB to avoid intersecting 100-yr and 500-yr spill floodplains.
Response: Trimmed cross sections
15. XS 23908-XS 24098 – Please verify/smooth floodplain extents in ROB.
Response: ROB mapping updated
16. XS 23977-XS 24123 – Please add permanent IEFA in ROB due to expansion from downstream cross sections.
Response: Added IEFA, ineffective elevation based on downstream crossing is below ground
17. XS 24034 – Mapped floodplain top width measurement needs to extend the full width of the floodplain, even though the floodplain is wider than the cross section (due to flow from

upstream). Unless the cross section is extended to the mapped floodplain limits, the alignment for the top width measurement needs to be documented in the report.
Response: Extended cross section

18. Please verify overbank reach lengths for cross sections 25034, 25044, 26278 and revise as necessary.
Response: Updated overbank lengths
19. XS 33393-33555 – The berm at XS 33393 is shown within the floodplain delineation, but HEC-RAS indicates that it isn't overtopping – please review and revise as necessary. Please also add a cross section near station 334+80, where the channel grade changes to provide better model detail in this area (particularly given the adjacent home to the north).
Response: Added cross section and updated mapping
20. XS 34420 – The ROB is low in this area. We recommend field verification to confirm that the berm along the right side of the channel based on the LiDAR data exists and is continuous. Aerial imagery indicates very dense vegetation, which can impact the accuracy of LiDAR data.
Response: The high ground exists but tapers down as the creek moves east from the tennis courts towards the house, visually verified by a site visit. Additional cross sections were added to the model to better capture this area. The 100-year water surface overtops the high ground near the house. The house is now mapped in the 100-year floodplain, in an area of shallow flooding. The unofficial/not-surveyed crossings in the vicinity of the house (as seen on the aerial) were not included in the model.

21. XS 35378-35388 – Please trim LOB to avoid intersecting the 100-yr and 500-yr spill floodplains.
Response: Trimmed cross sections
22. Culvert 36308 – Please correct the upstream invert elevation for the pipe.
Response: Culvert invert updated
23. XS 50378 - Is there a spill east down Belleview Ave? If the spill flowrate is relatively insignificant, then note potential shallow street flooding with arrow and estimated flow leaving.
Response: A spill was noted to the east based on the capacity of the roadside swale. Full flow was kept in the reach for modeling and mapping purposes.
24. XS 60027 - Please check cross section stationing along Spill 2. XS 60027 appears to be located 150-ft upstream of the confluence with the mainstem centerline (rather than 27-ft).
Response: Updated stations
25. XS 61049-XS62287- Left floodplain extents are located outside of terrain surface provided for review. Floodplain extents look reasonable compared to LiDAR contours.
Response: Added data to model terrain
26. XS 62100 – 500-yr flow is uncontained in the ROB.
Response: Extended cross section

DFHAD Tables

27. Note that the purpose of the agreement table is to support QA/QC by comparing values from differing sources (map versus model). The agreement tables do not appear to have been populated in this manner. Also, profile values were provided, even though profiles are not part of this submittal package.
    Response: The agreement tables were populated based on model output and geo-spatial output from the digital mapping.
28. Map top width measurement should include areas of high ground and exclude adjacent ponds without a surface connection.
    Response: Mapped top widths and notes have been updated.
29. Please revise the statement, “floodplain mapped wider than model top width due to physical flow path,” with a more specific statement similar to “flooding in LOB/ROB/overbanks from upstream cross section” in the DFHAD tables.
    Response: Statement has been updated to be more specific
30. Please refer to the yellow highlighted comments in the enclosed DFHAD Tables spreadsheet.
    Response: DFHAD tables have been updated per highlighted comments

Weaver Creek FHAD
Olsson and Associates
Submittal Received 08/14/2020
Review 11/2/2020

Products Received:
Electronic submittal: Draft FHAD Report (PDF); HEC-RAS files; GIS Shapefiles; DFHAD Tables Weaver Creek (Excel).

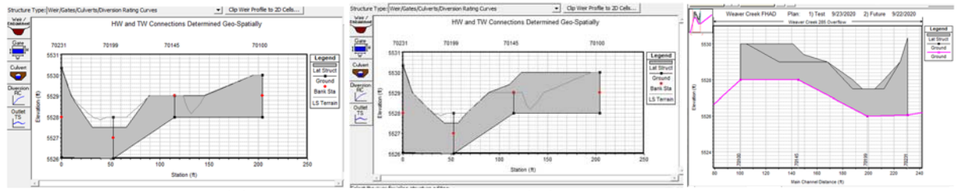
Products Returned:
Electronic review comments:

- Weaver Creek Draft FHAD Report_Noted (PDF);
- DFHAD Tables Weaver Creek_Noted (Excel)

General Comments:

1. Highway 285 Spill, in general, the hydraulic model approaches are reasonable. There are some issues that need clarification and/or refinement for model consistency and better results.
    a. Please have the known water surface elevations used at the entrance of the Hwy 285 culverts match the water surface elevations in the supporting calculation (very slightly off).
    Response: Updated known WSE
    b. XS 70231 does not contain all events at ROB.
    Response: Extended ROB
    c. The lateral structure 70220 spans between cross section 70100, 70145, 70199 and 70231 may overestimate the split flows because:
        - The spill between cross section 70100 and 70145 will be contained in the north of the east bound roadway embankment and return to Weaver Creek eventually.
        - The low area of the lateral structure is too wide compared to the LiDAR contours at the proximity of the XS 70199.

    The figures below show the issues and recommended adjustment. Let's discuss.



Current Model *Recommended* *Comparison*

Response: Revised lateral structure

    d. Floodway analysis at Hwy. 285 to be based on more detailed overflow model. Please also include the Hwy. 285 overflow model into the main model (different plans).
    Response: Revised floodway analysis is based on the 285 Overflow reach

2. Kipling St Spill, in general, the hydraulic model approaches are reasonable. There are some issues that may need clarification and/or refinement for model consistency and better results.
    a. The river centerline of Kipling Spill 2 cuts across high ground.
    Response: Kipling Spill 2 removed from the model.
    b. Once the high ground is accounted for, the Kipling Spill 2 is likely too minor to keep in the model. Let's discuss.
    Response: The spill flow was quantified based on the cross section through the high ground. The spill flow is 10 cfs and 19 cfs for the 100-year and 500-year events, respectively. Based on normal depth calculations, the average depth is less than one foot, and the swale was mapped as shallow flooding. The Kipling Spill 2 reach was removed from the model.
    c. The IEFA at the cross section 81918 may block too much of the effective flow area.
    Response: Revised ineffective flow stations
    d. Please consider the need of an additional cross section at the high ground downstream of the XS 81918.
    Response: Added cross section through the high ground.
    e. Please provide justification for the IEFA elevations at cross section 81327, 81194 and 80914. The elevations may be too high that artificially forced flow spill. Let's discuss.
    Response: Lowered elevation of permanent IEFA to target swale flow from upstream cross section.

3. Floodway Analysis:
    a. Please start the encroachment analysis at a width yielding the maximum allowable surcharge since the study reach begins at the mouth of the stream.
    Response: Encroachments were set to target a 0.5-ft surcharge in WSE. The surcharge is less than 0.5-feet at Cross Section 68 but is 0.49-feet at Cross Section 100.

    b. Please eliminate negative surcharges on both EGL and HGL (0.00-ft).
    Response: Negative surcharges removed by removing encroachments at some locations where FP=FW. At Cross Sections 19715 and 19716, the EGL has a negative surcharge of -0.03 and -0.01, respectively. Encroachments are set such that FW = FP at these cross sections. The sections model a vertical drop and encroachments were defined at the model floodplain limits because the mapped floodplain is mapped wider than the model at Cross Section 19715.

    c. The set water surface elevations at cross section 873, 4339, 22881 and 36354 are missing in the floodway analysis model.
    Response: Included in model.

    d. The floodway encroachment stations should not be outside of the 100-year floodplain boundary, or on the islands/high grounds located inside the floodplain. The floodway encroachment stations should be at the stations where the active flow intersects the ground.
    Response: Encroachments are within the 100-year floodplain boundary.

    e. The bank stations define the main flow conveyance area in a channel cross section. Please avoid floodway encroachment in the main channel, or please provide the reason why it is appropriate.
    Response: Encroachments moved outside of the main channel, bank stations modified when appropriate.

g. Floodways are unobstructed waterways to convey floodwaters. Therefore, floodways should not contain IEFAs, or please provide the reason why it is appropriate (okay where decision has been made for floodway = floodplain).
Response: IEFAs are generally outside of the floodway encroachment limits, some of the floodway encroachments are within structure IEFAs, but are above the top of the IEFA elevation; and therefore are within an area of active flow.

h. Floodway delineation is finished based on the encroachment stations at the bounding cross sections then interpolate the floodway top widths between. Please provide smooth transition of interpolated floodway top widths by avoiding any necking or expanding of the top widths and excessively maneuvering following the river centerline.
Response: Floodway mapping has been revised.

i. Floodway delineations need to encompass the river centerline.
Response: Floodway mapping has been revised.

4. Please see detailed review comments in the redlined draft FHAD Report, FHAD maps (Appendix G) and FHAD Profiles (Appendix H) (PDF) and DFHAD Tables Weaver Creek (Excel).
Response: See PDFs for comment responses.

08/09/2021 - Olsson response to comments are in blue.

Weaver Creek FHAD Submittal 8

Olsson and Associates
Submittal Received 06/07/2021
Review 06/25/2021

Products Received:
Electronic submittal:

- Olsson Response - W_Weaver_FHAD Maps.pdf
- DFHAD Tables Weaver Creek.xlsx
- FHAD GIS.zip
- HEC-RAS v 5.0.7.zip
- Olsson Response - Weaver Creek FHAD_2021-02-12 Submittal 7 Review Comments.pdf
- Weaver Creek - FHAD Report - 06042021.pdf

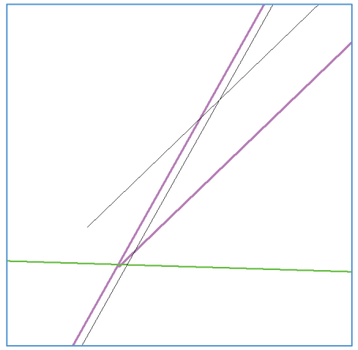
Products Returned:
Electronic review comments:

- DFHAD Tables Weaver Creek - MHFD Noted.xlsx
- Floodway_Delineation_Check_GIS.zip
- Weaver Creek - FHAD Report - 06042021 - MHFD Noted.pdf

General Comments:

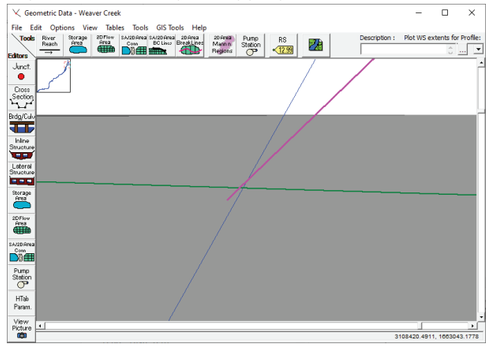
In general, most of the review comments for the 2021-02-12 Submittal 7 have been addressed. Our detailed review revealed a few issues that need further revisions. Please see our comments in the products returned.

1. The GIS data should be geo-referenced seamlessly into the HEC-RAS hydraulic model, or vice versa.
   Our detailed review revealed that there are very minor discrepancies between the GIS data and HEC-RAS hydraulic model. The figure below shows that the river centerlines in GIS shapefile (purple) do not match the river centerline (black) in the hydraulic model. The offset is very small (0.04 inches). Please investigate the cause of the differences and revise as appropriate, or provide an explanation for why it is appropriate.



Response: GIS data has been updated

2. The figure below shows that the river centerline of 285 Overflow (pink) in the HEC-RAS hydraulic model crosses Weaver Creek river centerline (blue) at XS 70470 (green) at upstream of Hwy 285. But, the river centerline in the GIS shapefile does not cross each other (see the purple lines on the figure above in Comment #1). Please verify and revise as appropriate, or provide an explanation for why it is appropriate.



Response: RAS centerline has been updated

3. The shallow flooding should be included in the 100-year floodplain delineation (i.e., the 100-year floodplain will overlap shallow flooding). The corresponding delineation must be distinguishable from the 100-year floodplain.
   Response: The 1000-year floodplain limits have been updated to include the shallow flooding area. The 1000-year floodplain shapefile includes shallow flooding area.

4. The floodway delineation should be equal to or less than the extents of the 100-year floodplain delineation. Please see the problem areas in the GIS shapefile of Floodway Delineation Check and revise the floodway or floodplain delineation as appropriate.
   Response: Floodway has been revised.

Report:

5. Please see comments in the FHAD Report.
   Response: Report has been revised.

Topographic Work Map:

6. Please see comments on the PDF work map in the FHAD Report.
   Response: Maps have been revised.

DFHAD Tables:

7. Please see comments in the DFHAD Tables Weaver Creek_MHFD_Noted.xlsx.
   Response: Tables have been revised.

APPENDIX B

HYDROLOGIC ANALYSIS

Legend

- Basin ID
- Design Point
- Storage Unit
- Conveyance Element

Land Use Designation

- Very Low Density Residential - 5%
- Low Density Residential - 10%
- Medium Low Density Residential - 45%
- Limited Commercial - 75%
- Light Industrial - 80%
- Commercial - 95%
- Watershed Boundary

- Jurisdictional Boundary
- Subbasins
- Weaver Creek CL
- Streets
- 5-Foot Contours
- Water Body

Soil Type

- A
- B
- C
- D
- Lakes

Imperviousness (%)

- 2 - 5
- 6 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- 61 - 70
- 71 - 80

NOTE: SUBBASIN COMPOSITE PERCENT IMPERVIOUS DOES NOT EXCEED 80 PERCENT.

NOTE: DUMMY LINKS AND NODES ARE NOT SHOWN FOR CLARITY. SEE FIGURES B-2A AND B-2B FOR MORE DETAILED INFORMATION.

0 750 1,500 3,000 Feet

Lakewood

City of Lakewood

Denver

Jefferson County

Harriman Lake

Bergen Reservoirs

Southeast Belleview and C-470 Detention Basin

INTERACTIVE FIGURES

STUDY AREA
SUBBASIN BOUNDARIES
SOILS
EXISTING PERCENT IMPERVIOUS
FUTURE PERCENT IMPERVIOUS
AREAS STILL TO DEVELOP
EPA SWMM ROUTING
DETENTION BASINS

CLICK TO TURN STREETS ON OR OFF

CLICK TO TURN AERIAL ON OR OFF

CLICK TO TURN TOPOGRAPHY ON OR OFF

N

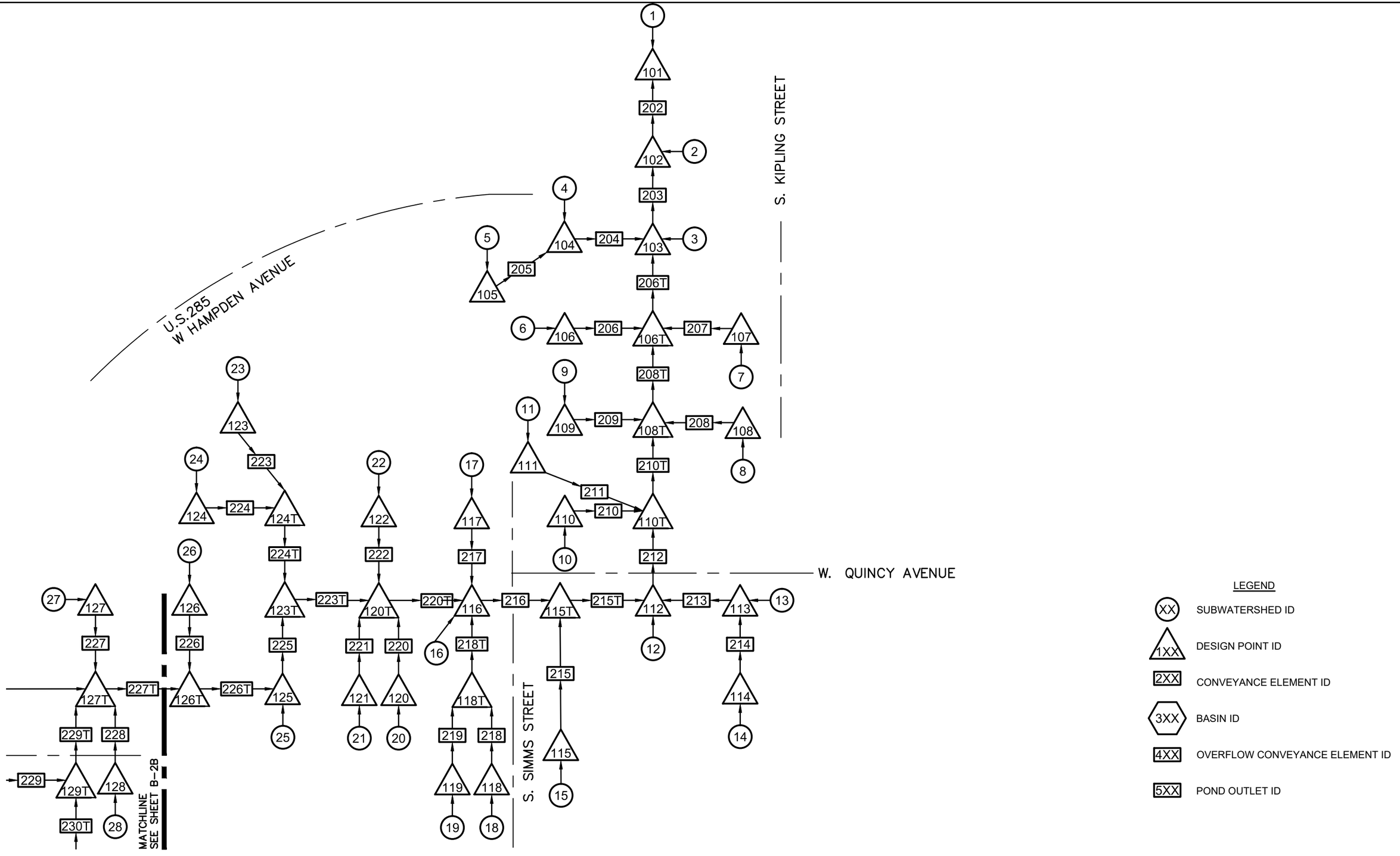
PROJECT: 016-0858
DRAWN BY: MD
DATE: 08/2016

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT
JEFFERSON COUNTY AND CITY OF LAKEWOOD

WEAVER CREEK MDP AND FHAD
HYDROLOGY MAP

OLSSON ASSOCIATES
1525 Raleigh Street
Suite 400
Denver, CO 80204
TEL: 303.237.2072
FAX: 303.237.2659
www.olssonassociates.com

EXHIBIT
B-1



PROJECT:	016-0858
DRAWN BY:	MD/ND
DATE:	08/2016

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT
JEFFERSON COUNTY AND CITY OF LAKEWOOD

WEAVER CREEK MDP & FHAD
EPA SWMM SCHEMATIC

OLSSON ASSOCIATES
4690 Table Mountain Dr
Suite 200
Golden, CO 80403
TEL 303.237.2072
FAX 303.237.2659

FIGURE
B-2A

LEGEND

- XX — SUBWATERSHED ID
- 1XX — DESIGN POINT ID
- 2XX — CONVEYANCE ELEMENT ID
- 3XX — BASIN ID
- 4XX — OVERFLOW CONVEYANCE ELEMENT ID
- 5XX — POND OUTLET ID

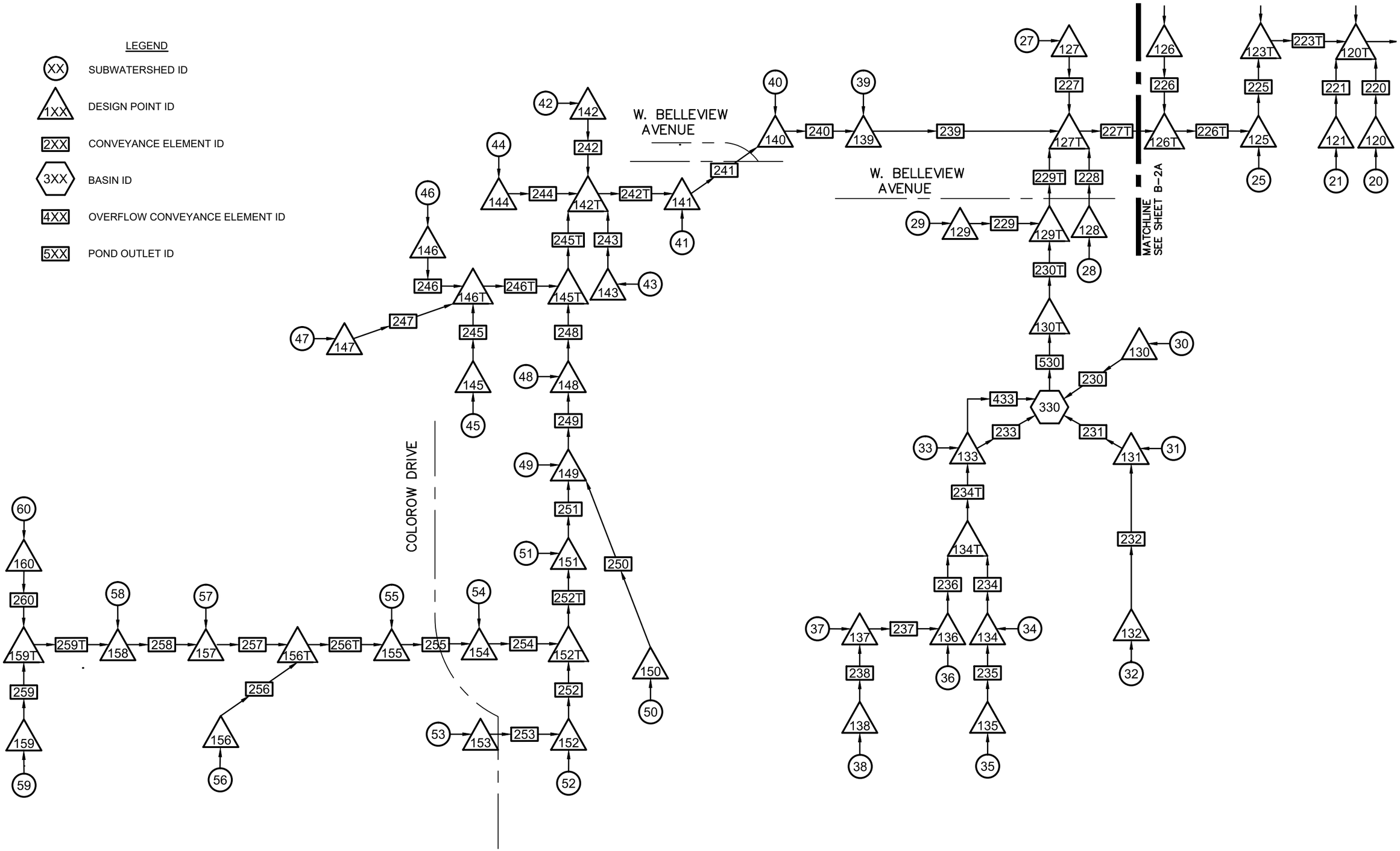


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FIGURE
B-2B

LAND USE MAPS

City of Lakewood
Zoning

- R-1-43
- R-1-18
- R-1-12
- R-1-9
- R-1-6
- R-2
- R-MH
- R-MF
- M-R-S
- M-N-S
- M-E-S
- M-G-S
- M-R-U
- M-N-U
- M-E-U
- M-G-U
- M-C-U
- M-R-T
- M-N-T
- M-E-T
- M-G-T
- M-C-T
- C-R
- LI
- LI-RD
- PD with Base Zone District
- Park
- City Boundary

0 0.5 1 Miles

Publication Date: 2/17/2016

17200 W
16400 W
MCINTYRE 15600 W
INDIANA 14800 W
ELDRIDGE 14000 W
ALKIRE 13200 W
WARD 12400 W
SIMMS 11600 W
OAK 10800 W
KIPLING 10000 W
GARRISON 9200 W
CARR 8400 W
WADSWORTH 7600 W
PIERCE 6800 W
HARLAN 6000 W
SHERIDAN 5200 W

26TH
20TH
COLFAX
10TH
6TH
1ST
ALAMEDA 300 S
EXPOSITION 700 S
MISSISSIPPI 1100 S
FLORIDA 1500 S
JEWELL 1900 S
ILIFF 2300 S
YALE 2700 S
DARTMOUTH 3100 S
HAMPDEN 3500 S
MANSFIELD 3900 S
QUINCY 4300 S
UNION 4700 S
BELLEVIEW 5100 S
BERRY 5500 S
BOWLES 5900 S

South Plains Area Plan Land Use Recommendations

Central Mountains Community Plan

Indian Hills Community Plan

MORRISON

Tiny Town

LAKEWOOD

CITY&COUNTY OF DENVER

DENVER COUNTY

BOW MAR

ARAPAHOE COUNTY

DOUGLAS COUNTY

LITTLETON

Bear Creek Subarea

Jefferson/Carr Subarea

FEHRINGER RANCH ACTIVITY CENTER

Highway 8 Subarea

BELLEVIEW ACTIVITY CENTER

Belleview Subarea

Bergen Reservoir Subarea

Willows Subarea

Belleview / Kipling Neighborhood Center

Montgomery Acres Subarea

C-470/BOWLES ACTIVITY CENTER

Bowles / Kipling Neighborhood Center

SOUTHWEST PLAZA ACTIVITY CENTER

Bowles/Eaton Subarea

Coal Mine / Pierce Neighborhood Center

KEN CARYL-MEADOWS ACTIVITY CENTER

Ken-Caryl Subarea

Wadsworth / Chatfield Neighborhood Center

Deer Creek Subarea

Activity Centers
(See specific Activity Center Maps for Recommendations)

Neighborhood Centers

Subareas

1. Schools

Community Uses:
2. Cemetery
* Open Space and Other Preserved Lands
(* not labeled)

Residential:
3. Residential <4 du/acre
4. Residential >4-7 du/acre
5. Residential >7-15 du/acre
6. Residential >15 du/acre
7. Residential up to 10 du/acre, (<1,000 units)

Commercial:
8. Limited Commercial
9. Limited Commercial / Recreation
10. Light Industrial
11. Industrial
12. Neighborhood Commercial
13. Office
14. Office / Light Industrial
15. Large Scale Commercial
16. Potential Activity Center

Mixed Use:
17. Limited Commercial / Residential Above Commercial
18. Limited Commercial and/or Residential
19. Limited Commercial and/or Residential <=15 du/acre
20. Office and/or Residential
21. Office and/or Residential <=7 du/acre
22. Neighborhood/Limited Commercial and Residential

Stateplane Coordinate System
Colorado Central Zone
Datum: NAD83
Updated Aug 18, 2011

Jefferson County Planning & Zoning
100 Jefferson County Parkway, Suite 3550
Golden, CO 80419 - 303.271.8700

Legend:

Roads
- Freeway
- Arterial
- Collector
- Local
- Cities
- Adjacent Counties

0 0.5 1 2 Miles

N

South Jefferson County Community Plan Update

New Belleview Activity Center

Soda Lake

LAKEWOOD

NC

LSC

285

LC

S ELDRIDGE ST

W MARLOWE AVE

470

OLI/MU

OLI/MU/MF/SF

W QUINCY AVE

W BELLEVIEW AVE

LLEVIEW AVE

Bergen Reservoirs

Bergen Reservoirs

Recommended Land Uses

- Limited Commercial (LC)
- Neighborhood Commercial (NC)
- Large Scale Commercial (LSC)
- Office, Light Industrial (OLI)
- Office, Light Industrial, Multi-Family, Single Family (OLI/MF/SF)
- Mixed Use (MU)

N

Updated: August 18, 2011
2010 Orthophoto

0 500 1,000 2,000 Feet

C-470 / Bowles Activity Center

W BELLEVIEW AVE
W BELLEVIEW AVE
S VIVIAN CT
S ALKIRE CIR
Planning Commission change
OLI/MF
Bergen Reservoirs
Bergen Reservoirs
OLI
470
S ALKIRE ST
W CRESTLINE AVE
W ARLINGTON AVE
S YOUNGFIELD ST
W CROSS AVE
OLI
NC
CU/SR
CU/SR/OLI
NC/MU
NC
W BOWLES AVE
LC
10 du
CU/SR
LSC
OLI
ROW
OLI
OLI/CU
Hine Lake
20 du

Recommended Land Uses

- Residential (Recommended density labeled)
- Limited Commercial (LC)
- Neighborhood Commercial (NC)
- Large Scale Commercial (LSC)
- Community Use, Senior Residential (CU/SR)
- Comm. Use, Sr. Resid., Office, Light Ind. (CU/SR/OLI)
- Office, Light Industrial (OLI)
- Office, Light Industrial, Multi-Family (OLI/MF)
- Office, Light Industrial, Community Use (OLI/CU)
- Mixed Use (MU)

N

Updated: August 18, 2011
2010 Orthophoto

0 0.25 0.5 1 Miles

Fehringer Ranch Activity Center

Recommended Land Uses

- Residential (Recommended density labeled)
- Community Use, Open Space, Recreation (CU/OS/REC)
- Office, Light Industrial (OLI)
- Open Space (OS)
- Public Facility, Open Space, Recreation, Community Use (PF/OS/REC/CU)
- Mixed Use (MU)

LAKEWOOD

US HWY 285

285

US HWY 285 RAMP

S NELSON CIR

25 du

S LEWIS CT

OLI

S OAK ST

OS

S NEWCOMBE WAY

S NELSON WAY

S MOORE ST

S MILLER CT

W KEENE AVE

W KENYON DR

W KEENE PL

W LAMBUTH PL

S LEE CT

W KENYON AVE

S KIPLING CT

W LEHIGH AVE

W LAMBUTH AVE

S NELSON CT

W MILAN PL

S LEE ST

S KIPLING PKWY

OLI

OLI/MU

CU/OS/REC

PF/OS/REC/CU

W NASSAU AVE

S SIMMS ST

S NELSON ST

391

W QUINCY AVE

W QUINCY PL

Updated: August 18, 2011
2010 Orthophoto

0 0.25 0.5 1 Miles

N

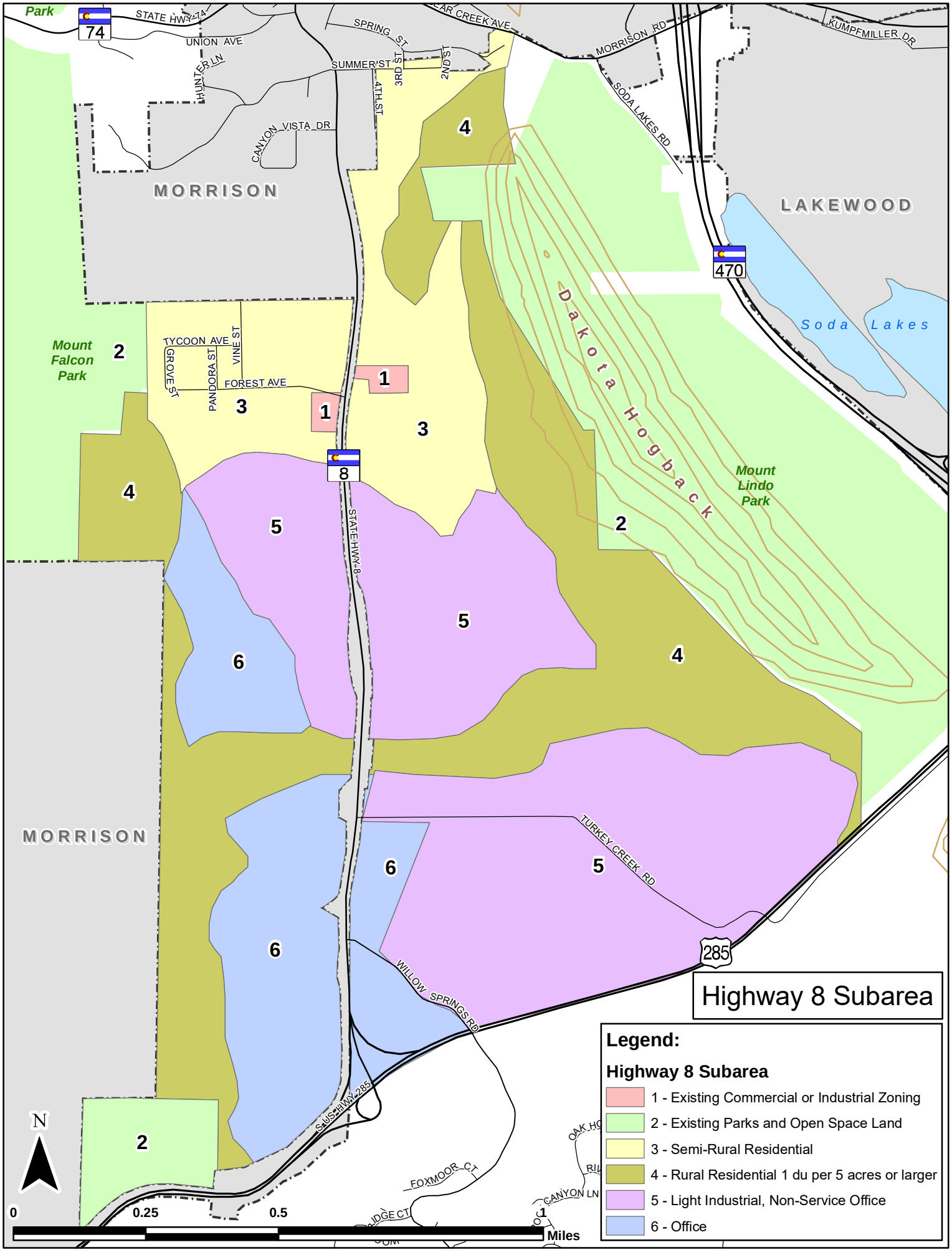

Park
74
STATE HWY 74
UNION AVE
HUNTER LN
SPRING ST
SUMMER ST
4TH ST
3RD ST
2ND ST
BEAR CREEK AVE
MORRISON RD
KUMPFMILLER DR
SODA LAKES RD
CANYON VISTA DR
MORRISON
LAKEWOOD
470
Soda Lakes
Dakota Hogback
Mount Falcon Park
TYCOON AVE
GROVE ST
PANDORA ST
VINE ST
FOREST AVE
8
STATE HWY 8
Mount Lindo Park
MORRISON
TURKEY CREEK RD
285
WILLOW SPRINGS RD
STATE HWY 285
FOXMOOR CT
CANYON LN
N
0
0.25
0.5
1
Miles
Highway 8 Subarea
Legend:
Highway 8 Subarea
1 - Existing Commercial or Industrial Zoning
2 - Existing Parks and Open Space Land
3 - Semi-Rural Residential
4 - Rural Residential 1 du per 5 acres or larger
5 - Light Industrial, Non-Service Office
6 - Office

Table B-1 - Unadjusted Rainfall Distributions

1Hr Depth	0.769	
Return Period	2	Years
Time	Depth	CurveValue
0:05	0.0154	0.0200
0:10	0.0308	0.0400
0:15	0.0646	0.0840
0:20	0.1230	0.1600
0:25	0.1923	0.2500
0:30	0.1077	0.1400
0:35	0.0484	0.0630
0:40	0.0385	0.0500
0:45	0.0231	0.0300
0:50	0.0231	0.0300
0:55	0.0231	0.0300
1:00	0.0231	0.0300
1:05	0.0231	0.0300
1:10	0.0154	0.0200
1:15	0.0154	0.0200
1:20	0.0154	0.0200
1:25	0.0154	0.0200
1:30	0.0154	0.0200
1:35	0.0154	0.0200
1:40	0.0154	0.0200
1:45	0.0154	0.0200
1:50	0.0154	0.0200
1:55	0.0077	0.0100
2:00	0.0077	0.0100

1Hr Depth	1.04	
Return Period	5	Years
Time	Depth	CurveValue
0:05	0.0208	0.0200
0:10	0.0385	0.0370
0:15	0.0905	0.0870
0:20	0.1591	0.1530
0:25	0.2600	0.2500
0:30	0.1352	0.1300
0:35	0.0603	0.0580
0:40	0.0458	0.0440
0:45	0.0374	0.0360
0:50	0.0374	0.0360
0:55	0.0312	0.0300
1:00	0.0312	0.0300
1:05	0.0312	0.0300
1:10	0.0312	0.0300
1:15	0.0260	0.0250
1:20	0.0229	0.0220
1:25	0.0229	0.0220
1:30	0.0229	0.0220
1:35	0.0229	0.0220
1:40	0.0156	0.0150
1:45	0.0156	0.0150
1:50	0.0156	0.0150
1:55	0.0156	0.0150
2:00	0.0135	0.0130

1Hr Depth	1.28	
Return Period	10	Years
Time	Depth	CurveValue
0:05	0.0256	0.0200
0:10	0.0474	0.0370
0:15	0.1050	0.0820
0:20	0.1920	0.1500
0:25	0.3200	0.2500
0:30	0.1536	0.1200
0:35	0.0717	0.0560
0:40	0.0550	0.0430
0:45	0.0486	0.0380
0:50	0.0410	0.0320
0:55	0.0410	0.0320
1:00	0.0410	0.0320
1:05	0.0410	0.0320
1:10	0.0410	0.0320
1:15	0.0410	0.0320
1:20	0.0320	0.0250
1:25	0.0243	0.0190
1:30	0.0243	0.0190
1:35	0.0243	0.0190
1:40	0.0243	0.0190
1:45	0.0243	0.0190
1:50	0.0243	0.0190
1:55	0.0218	0.0170
2:00	0.0166	0.0130

1Hr Depth	1.63	
Return Period	25	Years
Time	Depth	CurveValue
0:05	0.0212	0.0130
0:10	0.0571	0.0350
0:15	0.0815	0.0500
0:20	0.1304	0.0800
0:25	0.2445	0.1500
0:30	0.4075	0.2500
0:35	0.1956	0.1200
0:40	0.1304	0.0800
0:45	0.0815	0.0500
0:50	0.0815	0.0500
0:55	0.0522	0.0320
1:00	0.0522	0.0320
1:05	0.0522	0.0320
1:10	0.0391	0.0240
1:15	0.0391	0.0240
1:20	0.0293	0.0180
1:25	0.0293	0.0180
1:30	0.0228	0.0140
1:35	0.0228	0.0140
1:40	0.0228	0.0140
1:45	0.0228	0.0140
1:50	0.0228	0.0140
1:55	0.0228	0.0140
2:00	0.0228	0.0140

1Hr Depth	1.91	
Return Period	50	Years
Time	Depth	CurveValue
0:05	0.0248	0.0130
0:10	0.0669	0.0350
0:15	0.0955	0.0500
0:20	0.1528	0.0800
0:25	0.2865	0.1500
0:30	0.4775	0.2500
0:35	0.2292	0.1200
0:40	0.1528	0.0800
0:45	0.0955	0.0500
0:50	0.0955	0.0500
0:55	0.0611	0.0320
1:00	0.0611	0.0320
1:05	0.0611	0.0320
1:10	0.0458	0.0240
1:15	0.0458	0.0240
1:20	0.0344	0.0180
1:25	0.0344	0.0180
1:30	0.0267	0.0140
1:35	0.0267	0.0140
1:40	0.0267	0.0140
1:45	0.0267	0.0140
1:50	0.0267	0.0140
1:55	0.0267	0.0140
2:00	0.0267	0.0140

1Hr Depth	2.21	
Return Period	100	Years
Time	Depth	CurveValue
0:05	0.0221	0.0100
0:10	0.0663	0.0300
0:15	0.1017	0.0460
0:20	0.1768	0.0800
0:25	0.3094	0.1400
0:30	0.5525	0.2500
0:35	0.3094	0.1400
0:40	0.1768	0.0800
0:45	0.1370	0.0620
0:50	0.1105	0.0500
0:55	0.0884	0.0400
1:00	0.0884	0.0400
1:05	0.0884	0.0400
1:10	0.0442	0.0200
1:15	0.0442	0.0200
1:20	0.0265	0.0120
1:25	0.0265	0.0120
1:30	0.0265	0.0120
1:35	0.0265	0.0120
1:40	0.0265	0.0120
1:45	0.0265	0.0120
1:50	0.0265	0.0120
1:55	0.0265	0.0120
2:00	0.0265	0.0120

1Hr Depth	2.94	
Return Period	500	Years
Time	Depth	CurveValue
0:05	0.0294	0.0100
0:10	0.0882	0.0300
0:15	0.1352	0.0460
0:20	0.2352	0.0800
0:25	0.4116	0.1400
0:30	0.7350	0.2500
0:35	0.4116	0.1400
0:40	0.2352	0.0800
0:45	0.1823	0.0620
0:50	0.1470	0.0500
0:55	0.1176	0.0400
1:00	0.1176	0.0400
1:05	0.1176	0.0400
1:10	0.0588	0.0200
1:15	0.0588	0.0200
1:20	0.0353	0.0120
1:25	0.0353	0.0120
1:30	0.0353	0.0120
1:35	0.0353	0.0120
1:40	0.0353	0.0120
1:45	0.0353	0.0120
1:50	0.0353	0.0120
1:55	0.0353	0.0120
2:00	0.0353	0.0120

Table B-2 - Detention Basin Stage-Storage-Discharge Information

Design Point 303 - Detention at Southeast corner of C-470 and West Belleview

Elevation	Depth (ft)	Area (SF)	Storage (AF)	Outlet Structure Discharge (cfs)	Roadway Overtopping Discharge (cfs)	Total Discharge (cfs)
5761	0	155	0	0.00	0	0.00
5762	1	13,491	0.20	7.00	0	7.00
5762.5	1.5	33,915	0.40	9.00	0	9.00
5763	2	54,340	0.90	18.81	0	18.81
5764	3	72,371	2.40	26.10	0	26.10
5765	4	87,228	4.20	31.77	0	31.77
5766	5	109,793	6.50	36.56	0	36.56
5767	6	129,511	9.20	40.80	0	40.80
5768	7	146,671	12.40	44.63	0	44.63
5769	8	169,616	16.00	48.16	0	48.16
5770	9	191,589	20.20	51.45	0	51.45
5771	10	215,529	24.80	54.54	0	54.54
5772	11	241,521	30.10	57.47	0	57.47
5772.72	11.72	259,546	34.20	59.48	0	59.48
5773	12	266,555	35.90	60.25	0	60.25
5773.5	12.5	278,764	39.10	61.59	0	61.59
5773.75	12.75	284,868	40.70	62.26	0	62.26
5774	13	290,973	42.30	62.91	0	62.91
5775	14	311,293.8	49.20	65.46	0	65.46
5775.5	14.5	321,454	52.7	66.7	59.40	126.13
5776	15	331,615	56.1	68.0	246.00	314.01
5776.5	15.5	341,775	59.6	69.3	595.23	664.51
5777	16	351,935	63.0	70.6	1137.03	1207.59

[1]Stage-Discharge from Muller Engnineering Company, Inc. *West Belleview Avenue: West Quincy Avenue to South Simms Street: Phase III Drainage Report,* December 4, 2006

[2]Pink values indicate extrapolated data

[3]Green values were calculated based on a trapezoidal weir configuration determined using LiDAR topography

SOUTHEAST BELLEVIEW AND C-470
REGIONAL DETENTION BASIN INFORMATION

Belleview - W. Quincy to S. Simms
Muller Engineering Company, Inc. Project # 02014.02

Stage Storage of Pond at Southeast Corner of C470 & W. Belleview
(with 1' contour survey from Lund)

Contour	Vertical Distance	Area within Contour	Average Area	Volume	Cumulative Volume		
	ft	sf	sf	cf	cf	ac-ft	
5761		0					
5761	0.00	155	78	0	0	0.0	
5762	1.00	13,491	6,823	6,823	6,823	0.2	
5762.5	0.50	33,915	23,703	11,852	18,675	0.4	*
5763	0.50	54,340	44,128	22,064	40,739	0.9	
5764	1.00	72,371	63,355	63,355	104,094	2.4	
5765	1.00	87,228	79,799	79,799	183,893	4.2	
5766	1.00	109,793	98,511	98,511	282,404	6.5	
5767	1.00	129,511	119,652	119,652	402,056	9.2	
5768	1.00	146,671	138,091	138,091	540,147	12.4	
5769	1.00	169,616	158,143	158,143	698,290	16.0	
5770	1.00	191,589	180,603	180,603	878,893	20.2	
5771	1.00	215,529	203,559	203,559	1,082,452	24.8	
5772	1.00	241,521	228,525	228,525	1,310,977	30.1	
5772.72	0.72	259,546	250,533	180,384	1,491,361	34.2	
5773	1.00	266,555	254,038	254,038	1,565,015	35.9	
5773.5	0.50	278,764	272,660	136,330	1,701,345	39.1	*
5773.75	0.25	284,868	281,816	70,454	1,771,799	40.7	*
5774	0.25	290,973	287,920	71,980	1,843,779	42.3	
5775	1.00	311293.8	301,133	301,133	2,144,912	49.2	

Orifice Calculation

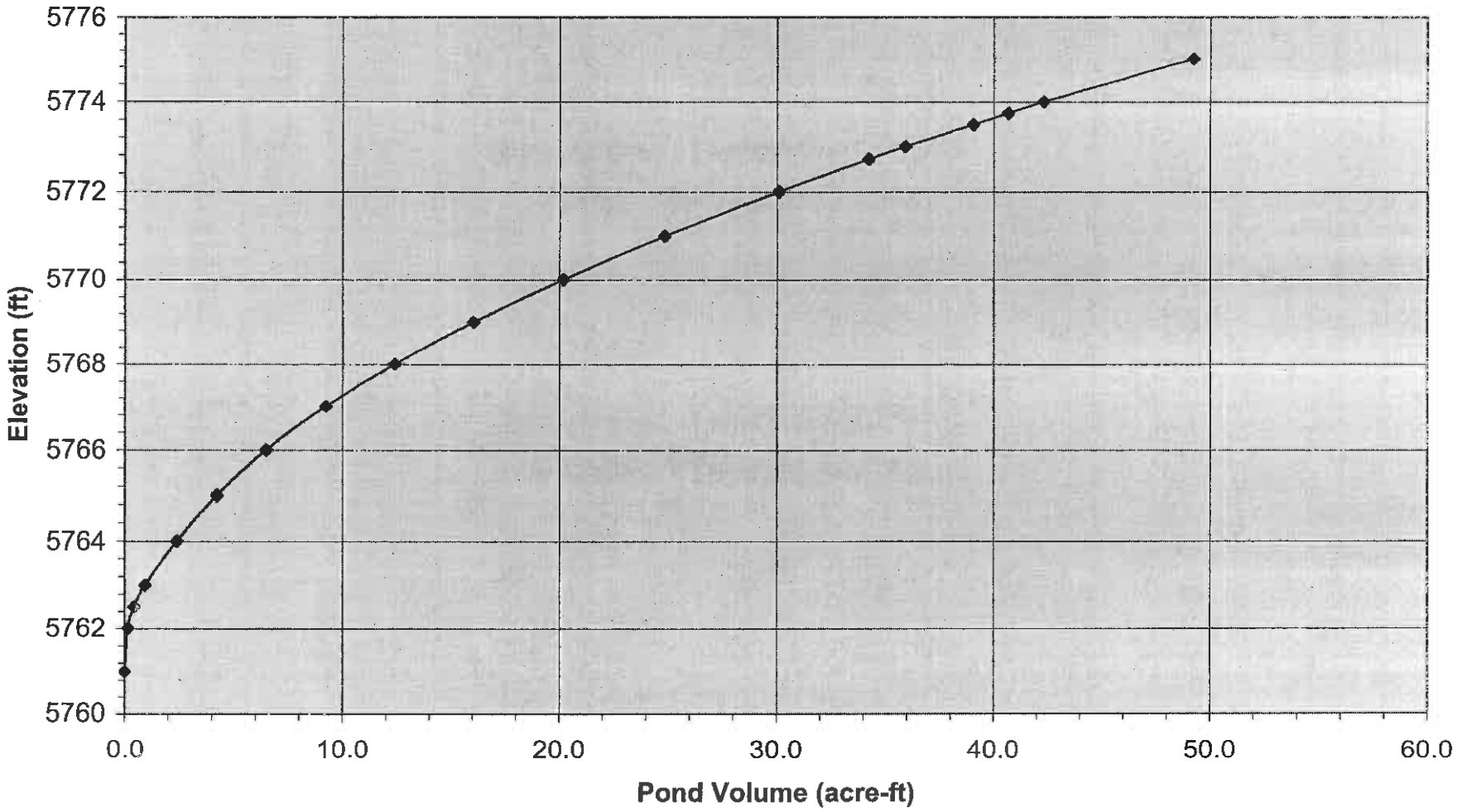
Outlet Diameter	Orifice Head	Release Rate	Open Area w/ Restrictor	Orifice Head w/ Restrictor	Release Rate	Weir Head	HW/D ratio	Release Rate by Nomograph	Final Release
in	ft	cfs			cfs	ft	ft/ft	cfs	cfs
27	-1.13				0.00	0	0.00	0.00	**0.00**
27	-0.13		3.47	0.08	5.12	1	0.44	7.00	**7.00**
27	0.375	12.70	3.47	0.58	13.78	1.5	0.67	9.00	**9.00**
27	0.875	19.40	3.47	1.08	18.81	2	0.89		**18.81**
27	1.875	28.40	3.47	2.08	26.10	3	1.33		**26.10**
27	2.875	35.17	3.47	3.08	31.77	4	1.78		**31.77**
27	3.875	40.83	3.47	4.08	36.56	5	2.22		**36.56**
27	4.875	45.79	3.47	5.08	40.80	6	2.67		**40.80**
27	5.875	50.27	3.47	6.08	44.63	7	3.11		**44.63**
27	6.875	54.38	3.47	7.08	48.16	8	3.56		**48.16**
27	7.875	58.20	3.47	8.08	51.45	9	4.00		**51.45**
27	8.875	61.79	3.47	9.08	54.54	10	4.44		**54.54**
27	9.875	65.17	3.47	10.08	57.47	11	4.89		**57.47**
27	10.6	67.51	3.47	10.8	59.48	11.72	5.21		**59.48**
27	10.88	68.40	3.47	11.08	60.25	12	5.33		**60.25**
27	11.38	69.95	3.47	11.58	61.59	12.5	5.56		**61.59**
27	11.63	70.71	3.47	11.83	62.26	12.75	5.67		**62.26**
27	11.88	71.47	3.47	12.08	62.91	13	5.78		**62.91**
27	12.88	74.42	3.47	13.08	65.46	14	6.22		**65.46**

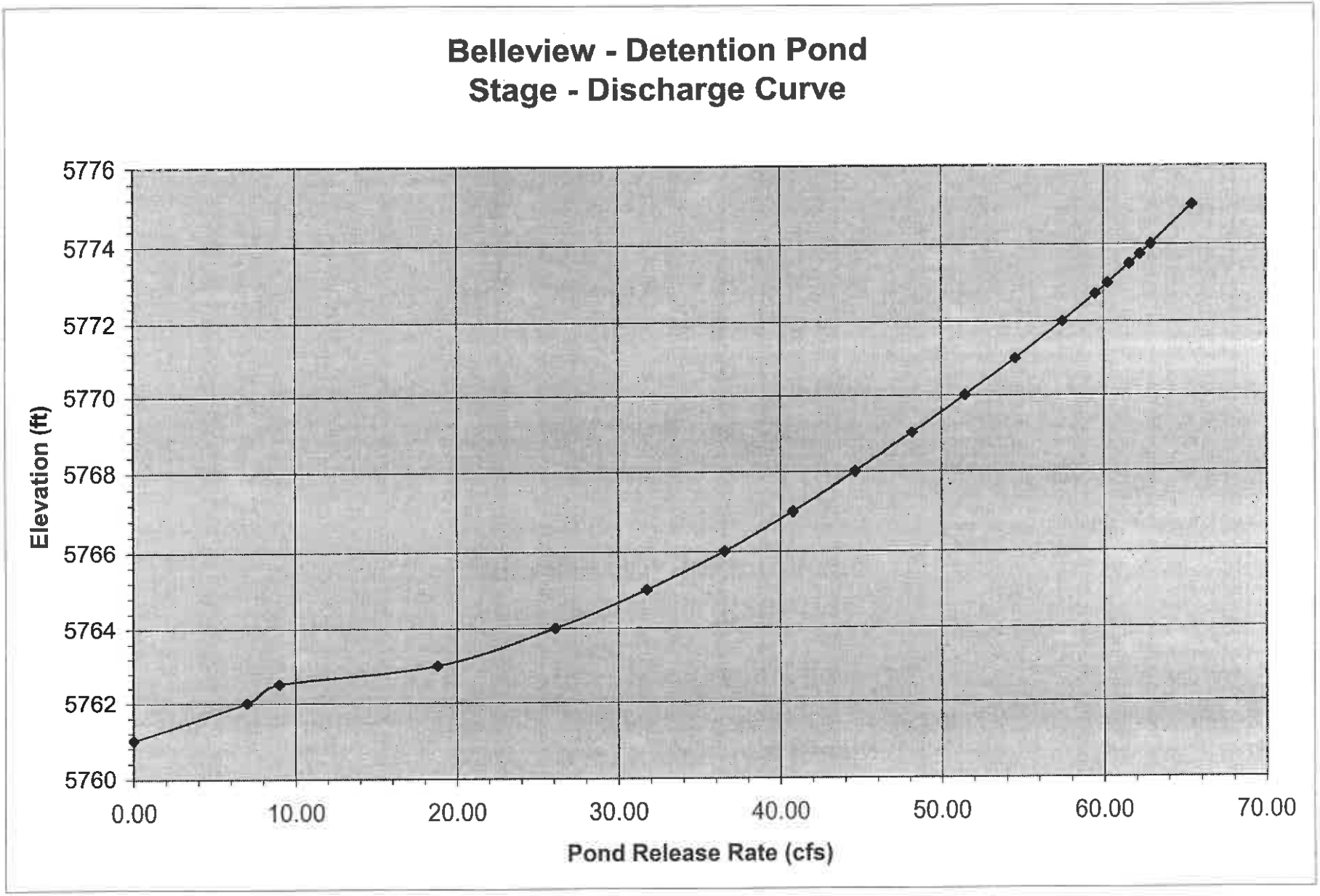
Notes: Area of orifice and centroid location were computed by AutoCAD. Also, the weir release was obtained through the FHWA circular concrete pipe nomograph.
* Contour Area is averaged using 5773 and 5774

27" RCP w/ restrictor plate covering all but 23" 5/16"= 3.65
24" RCP = 53.73
2-18" RCP = 61.14
27" RCP = 67.6

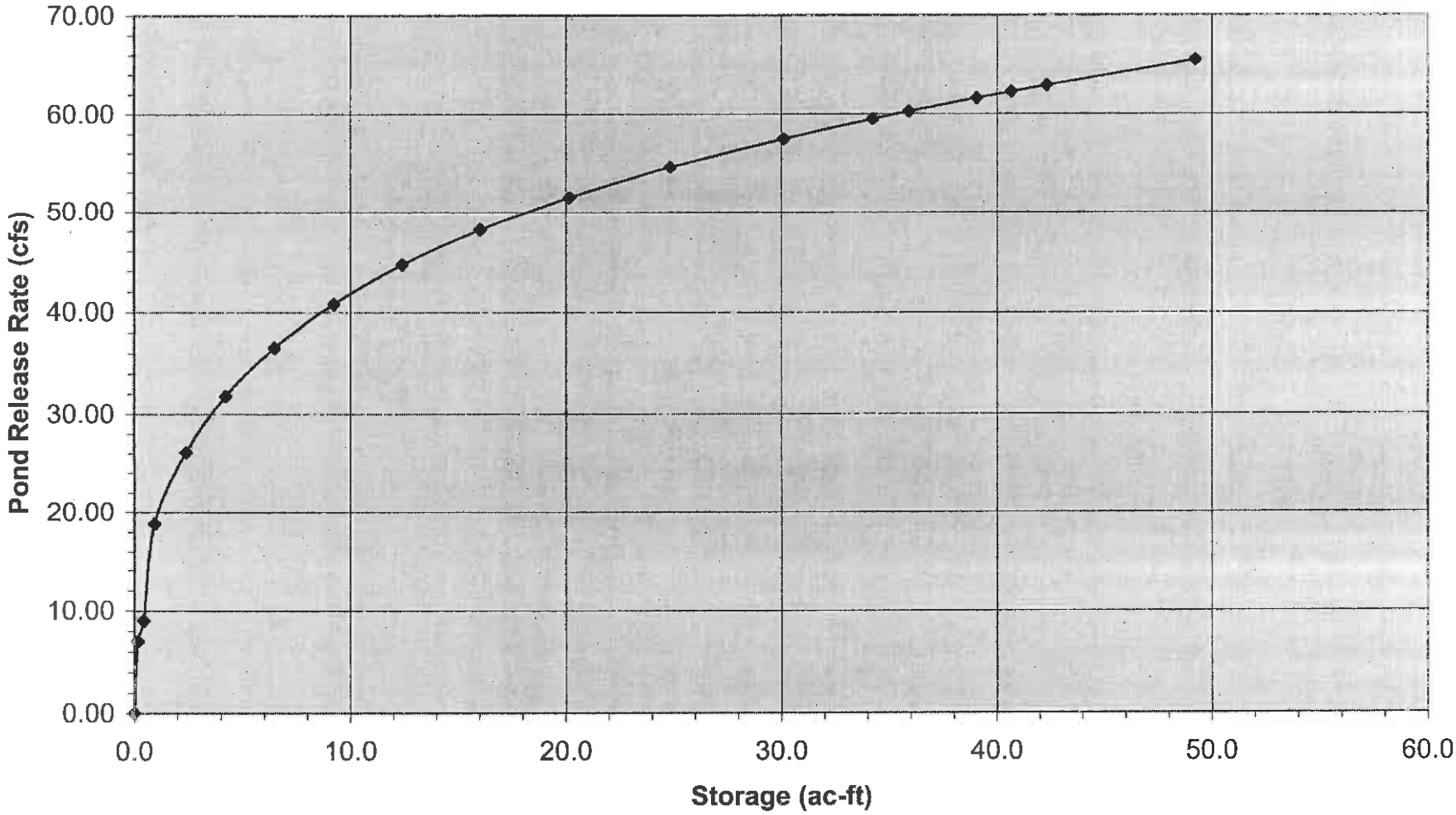
73.05 max elevation is 12" below roadway flowline at sump
74.05 max elevation is1' freeboard below 12" max allowable ponding depth at sump
73.53 max elevation is 1' freeboard below nearby manhole rim
75.05 is max ponding elevation at sump
74.53 is rim elevation at nearby manhole

Belleview - Detention Pond
Stage - Storage Curve



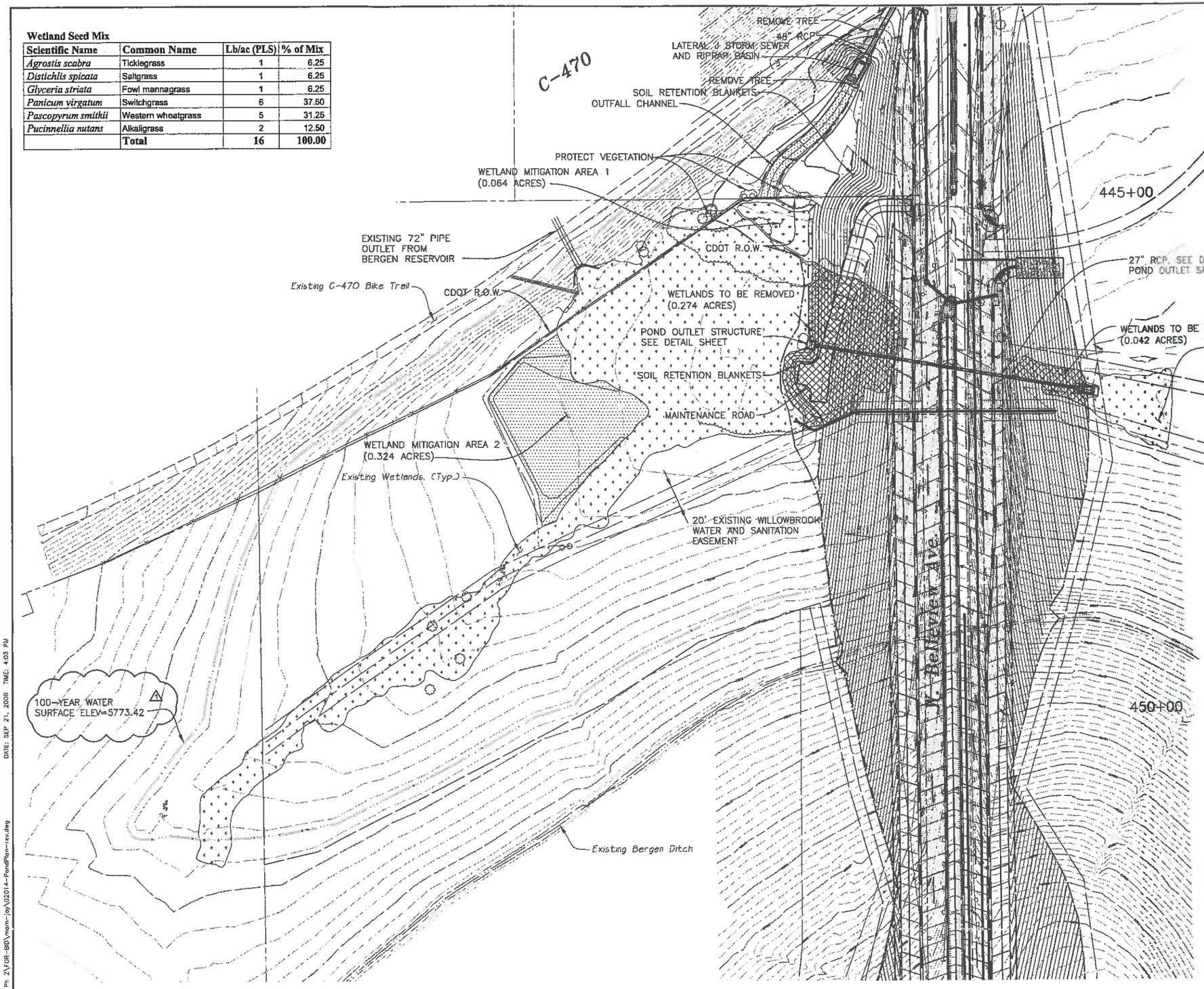

Belleview - Detention Pond
Stage - Discharge Curve
Elevation (ft)
5776
5774
5772
5770
5768
5766
5764
5762
5760
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
Pond Release Rate (cfs)

Belleview - Detention Pond
Storage - Discharge Curve



Wetland Seed Mix

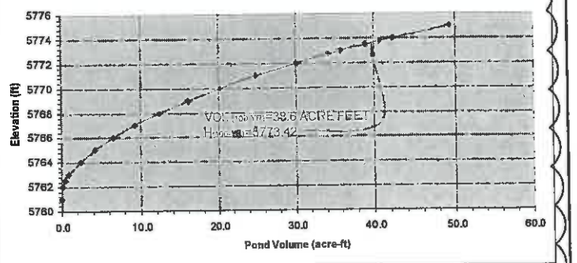
Scientific Name	Common Name	Lb/ac (PLS)	% of Mix
Agrostis scabra	Ticklegrass	1	6.25
Distichlis spicata	Saltgrass	1	6.25
Glyceria striata	Fowl mannagrass	1	6.25
Panicum virgatum	Switchgrass	6	37.50
Pascopyrum smithii	Western wheatgrass	5	31.25
Pucinnellia nutans	Alkaligrass	2	12.50
	Total	**16**	**100.00**



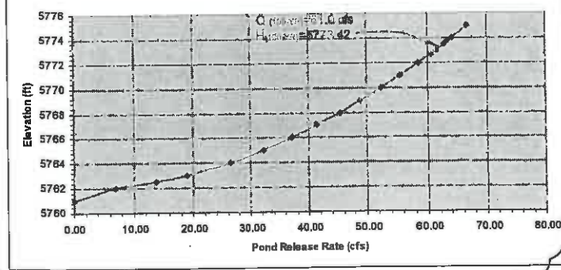
Pond Summary

Tributary Area = 727.3 Acres
$Q_{(100\text{-}yr)}$ Inflow = 643 cfs
$Q_{(100\text{-}yr)}$ Outflow = 61 cfs
$Q_{(100\text{-}yr)}$ Water Surface Elev = 5773.42
Outlet Device = 27" RCP with Top 5° Blocked

Belleview - Detention Pond
Stage - Storage Curve



Belleview - Detention Pond
Stage - Discharge Curve



NO.	DATE	REVISIONS	APPR.
1	9/21/06	REVISED POND DESIGN	

MULLER ENGINEERING CO., INC.
CONSULTING ENGINEERS
IRONGATE 4, SUITE 100
777 S. WADSWORTH BLVD.
LAKEWOOD, COLORADO 80226
(303) 988-4939
MEC PROJECT NO. 02-014.01

SCALE:	1"=100'	APPROVED:	CLK
DATE:	4/24/06	DESIGNED:	JAW
DRAWN:	JAW	CHECKED:	

JEFFERSON COUNTY
DIVISION OF HIGHWAYS AND TRANSPORTATION

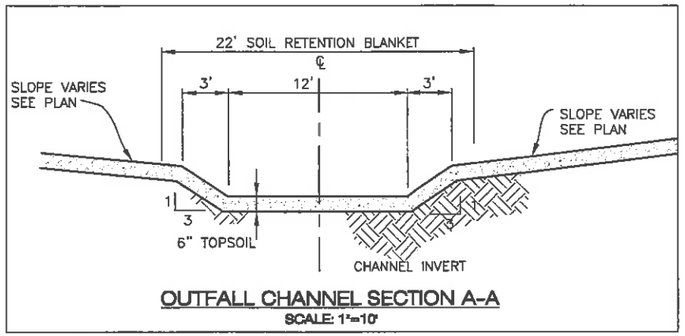
WEST BELLEVIEW AVENUE - WEST QUINCY AVENUE TO SOUTH SIMMS STREET

DETENTION POND PLAN

JEFFCO PROJECT NO. 5-69-17-3445

SHEET 58

NAME: P:\02-014 Belleview Pr 2\FDR-BID\mxm-jay\02014-PondPlan-rev.dwg DATE: SEP 21, 2006 TIME: 4:03 PM



OUTFALL CHANNEL SECTION A-A
SCALE: 1"=10'

C-470

REMOVE TREE
48" RCP
LATERAL J STORM SEWER AND RIPRAP BASIN
SOIL RETENTION BLANKET
100-YEAR WATER SURFACE ELEV=5773.42
REMOVE TREE
OUTFALL CHANNEL
N:191198.18 E:196139.31
PROTECT VEGETATION
N:191181.06 E:196130.28
N:191219.65 E:196137.78
CDOT R.O.W.
WETLAND MITIGATION AREA 1 (0.064 ACRES)
N:191146.76 E:196131.84
N:191136.47 E:196138.94
EXISTING 72" PIPE OUTLET FROM BERGEN RESERVOIR
CDOT R.O.W.
Existing C-470 Bike Trail
N:191147.05 E:196149.40
N:191154.35 E:196150.75
N:191184.94 E:196173.36
N:191216.53 E:196159.35
CONTRACTOR SHALL MINIMIZE DISTURBANCE WHEN GRADING WETLAND MITIGATION AREA 2
N:191217.12 E:196191.70
WETLANDS TO BE REMOVED (0.274 ACRES)
N:190969.48 E:196272.23
N:190964.97 E:196262.27
N:190978.33 E:196282.87
N:190983.68 E:196307.02
N:191005.75 E:196307.47
N:191019.30 E:196313.15
POND OUTLET STRUCTURE, SEE DETAIL SHEET
N:190930.45 E:196284.31
N:190894.22 E:196325.80
N:191043.72 E:196325.57
MAINTENANCE ROAD AGGREGATE BASE COARSE (CDOT CLASS 6) 12' WIDTH, 6" THICKNESS (SEE GEOMETRY PLAN FOR HORIZONTAL CONTROL)
LIMIT OF GRADING
WETLAND MITIGATION AREA 2 (0.364 ACRES)
N:191049.68 E:196344.01
LIMIT OF GRADING
Existing Wetlands, (Typ.)
20' EXISTING WILLOWBROOK WATER AND SANITATION EASEMENT
N:190962.69 E:196444.05
N:190948.79 E:196449.26
444+00
445+00
446+00
447+00
448+00
0' 30' 60'
27" RCP, SEE DETENTION POND OUTLET SHEET
WETLANDS TO BE REMOVED (0.042 ACRES)
Existing Wetlands, (Typ.)
Harlan St
Harlaw Ave

NOTES:
1. INSTALL SOIL RETENTION BLANKET ON THE OUTFALL CHANNEL AFTER SEEDING IS PERFORMED.

WETLAND MITIGATION AREA
WETLAND REMOVAL AREA
EXISTING WETLANDS

NO.	DATE	REVISIONS	APPR.
1	9/21/06	REVISED POND DESIGN	

MULLER ENGINEERING CO., INC.
CONSULTING ENGINEERS
IRONGATE 4, SUITE 100
777 S. WADSWORTH BLVD.
LAKEWOOD, COLORADO 80226
(303) 988-4939
MEC PROJECT NO. 02-014.01

SCALE:	1"=60'	APPROVED:	CLK
DATE:	4/24/06	DESIGNED:	JAW
DRAWN:	JAW	CHECKED:	

JEFFERSON COUNTY
DIVISION OF HIGHWAYS AND TRANSPORTATION

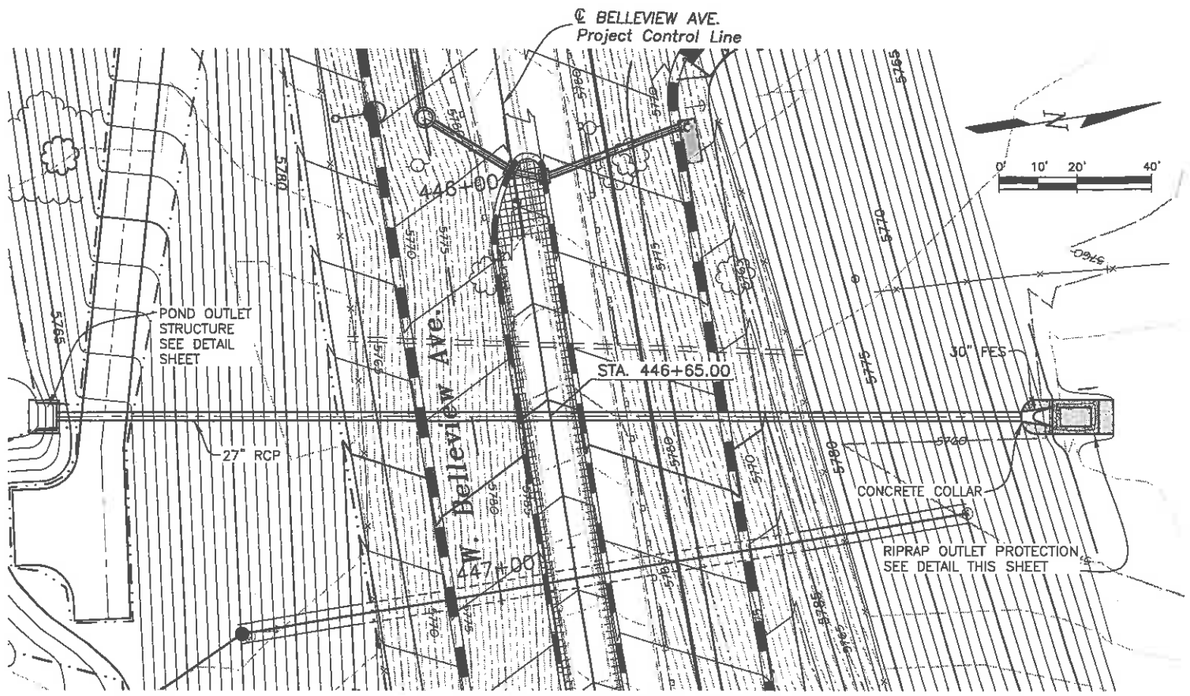
WEST BELLEVIEW AVENUE - WEST QUINCY AVENUE TO SOUTH SIMMS STREET

DETENTION POND GRADING PLAN

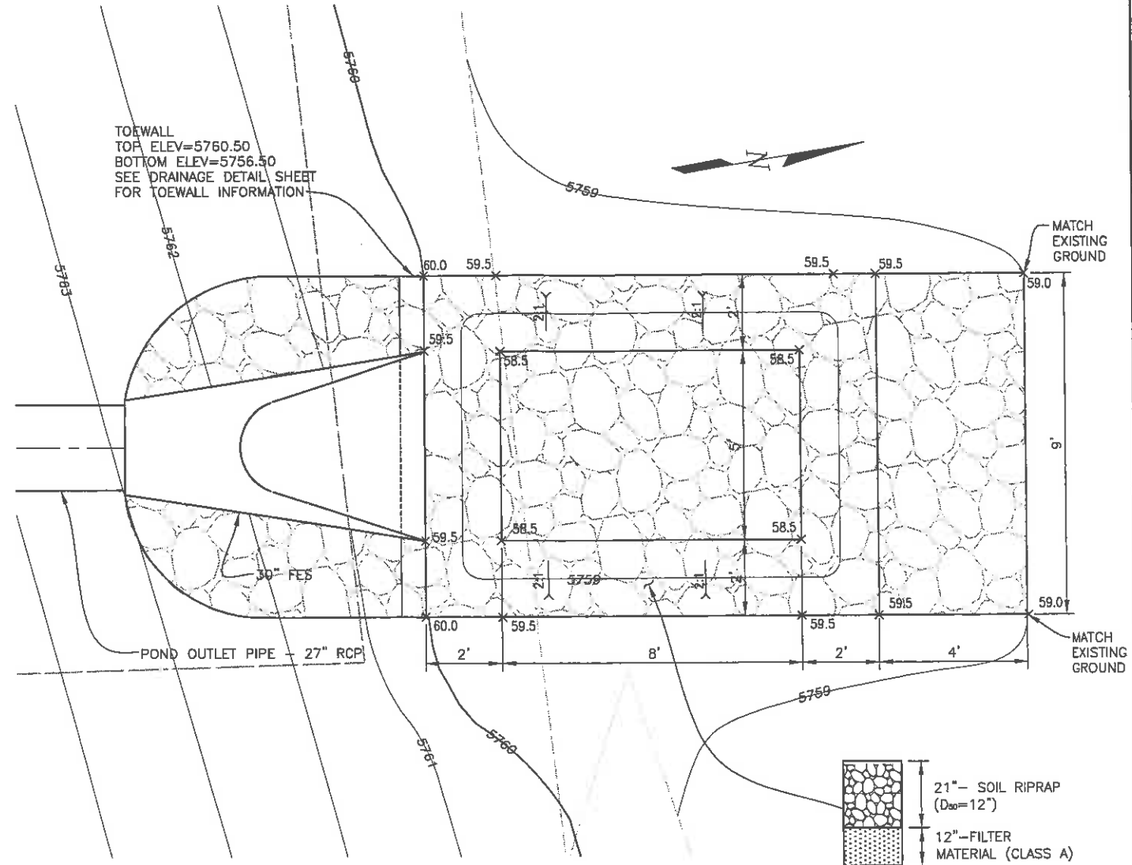
JEFFCO PROJECT NO. 5-69-17-3445

SHEET 59

NAME: P:\02-014 Belleview Ph 2\FOR-BID\mem-jay\02014-PondGRADErev.dwg DATE: SEP 21, 2006 TIME: 4:05 PM

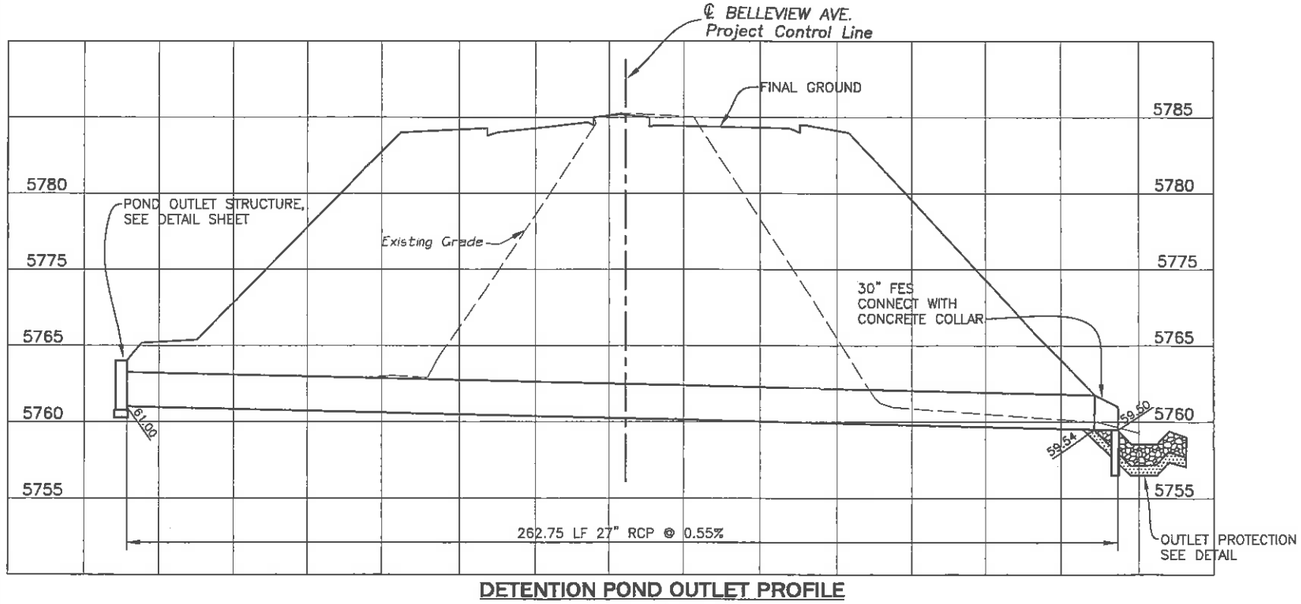


DETENTION POND OUTLET PLAN



DETENTION POND OUTLET/RIPRAP DETAIL

SCALE: 1"=4'



DETENTION POND OUTLET PROFILE

SCALE: 1"=40' HOR.
1"=10' VERT.

NOTES:

1. BURY RIPRAP SIDE SLOPES WITH 3" TOPSOIL, SEED AND COVER WITH SOIL RETENTION BLANKETS.
2. X 64.5 = FINISHED GROUND ELEVATIONS.
3. SEE DRAINAGE DETAILS SHEET FOR CONCRETE COLLAR DETAIL.

NO.	DATE	REVISIONS	APPR.
1	9/21/06	REVISED POND DESIGN	

MULLER ENGINEERING CO., INC.
CONSULTING ENGINEERS
IRONGATE 4, SUITE 100
777 S. WADSWORTH BLVD.
LAKEWOOD, COLORADO 80226
(303) 988-4939
MEC PROJECT NO. 02-014.01

SCALE: AS SHOWN	APPROVED:
DATE: 4/24/06	DESIGNED: JAW
DRAWN: MAM	CHECKED:

JEFFERSON COUNTY
DIVISION OF HIGHWAYS AND TRANSPORTATION

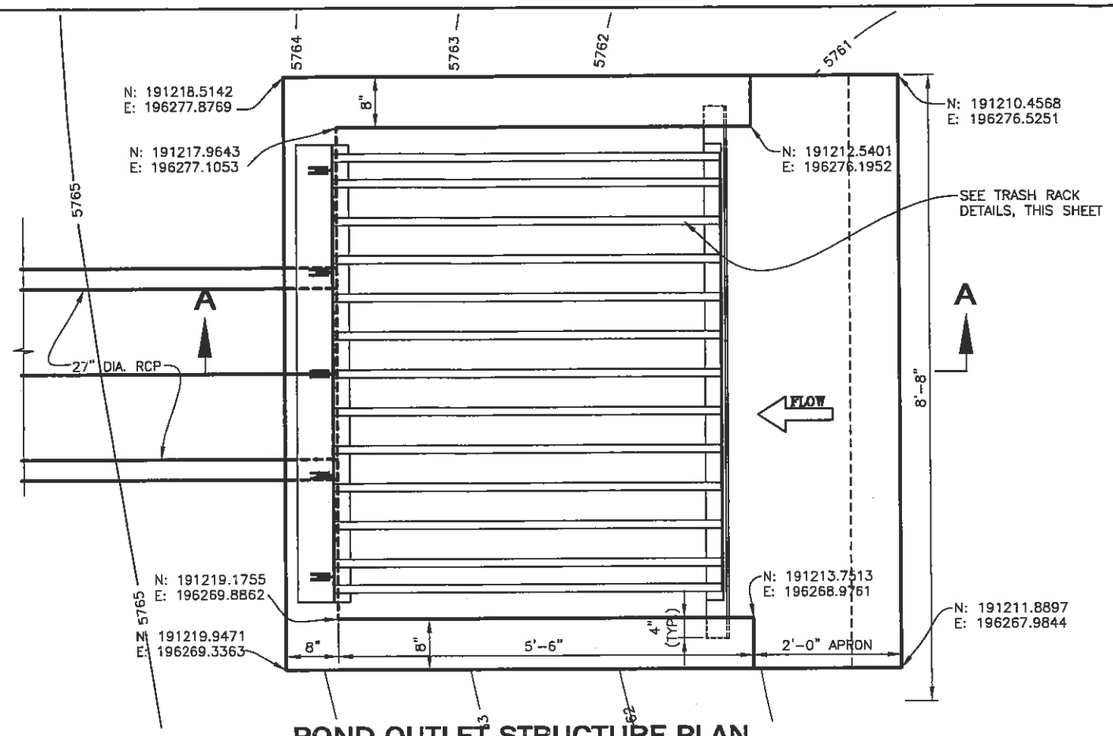
WEST BELLEVIEW AVENUE - WEST QUINCY AVENUE TO SOUTH SIMMS STREET

DETENTION POND OUTLET
STA 446+65.00

JEFFCO PROJECT NO. 5-69-17-3445

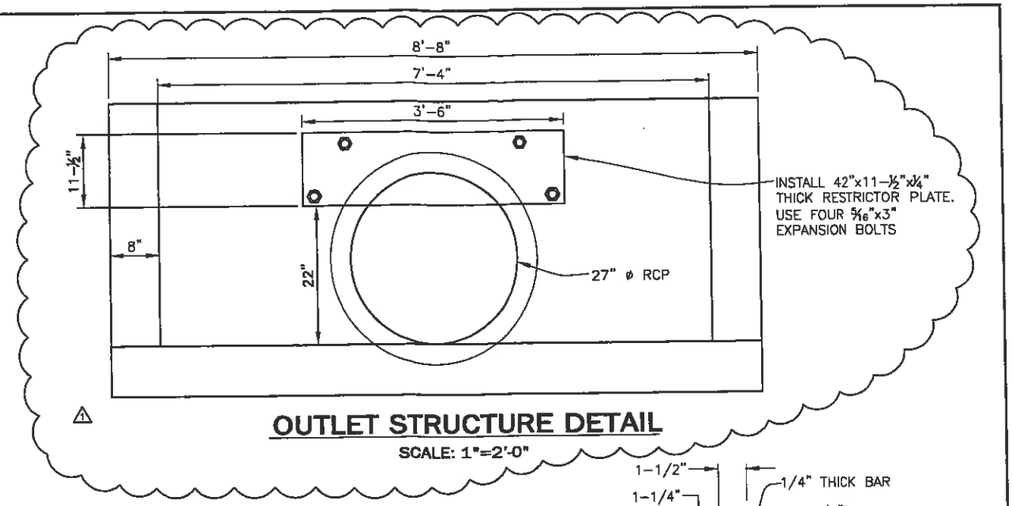
SHEET 60

NAME: P:\02-014 Belleview Ph 2\FOR-BID\mem-jay\02014-POND-OBJECT-new.dwg DATE: SEP 21, 2006 TIME: 3:29 PM



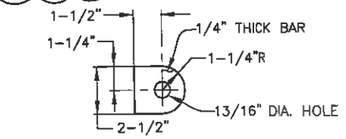
POND OUTLET STRUCTURE PLAN

SCALE: 1"=2'-0"



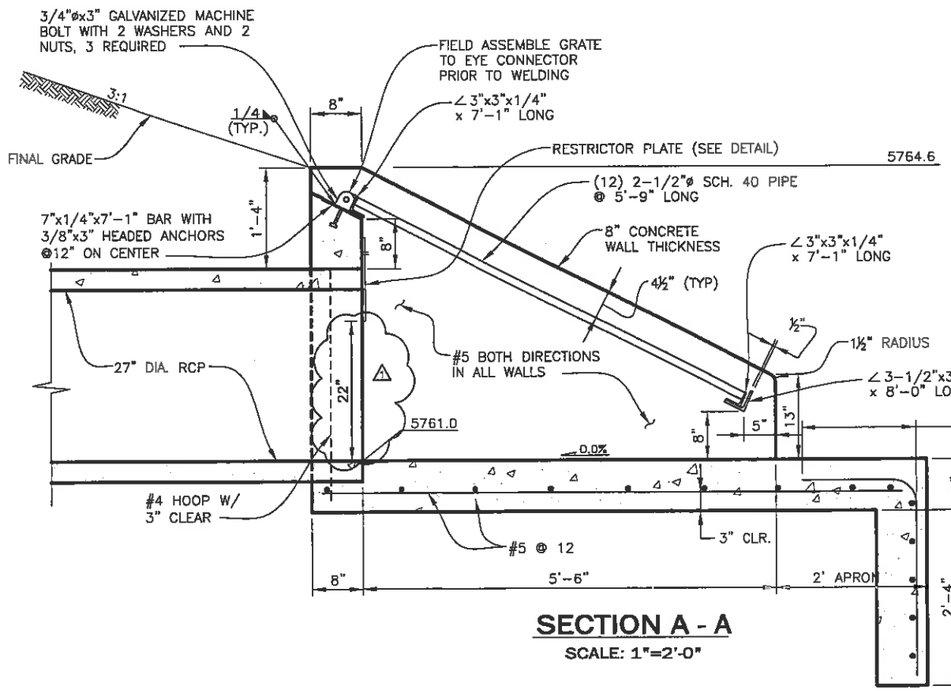
OUTLET STRUCTURE DETAIL

SCALE: 1"=2'-0"



EYE CONNECTOR DETAIL

SCALE: 1"=1'-0"



SECTION A - A

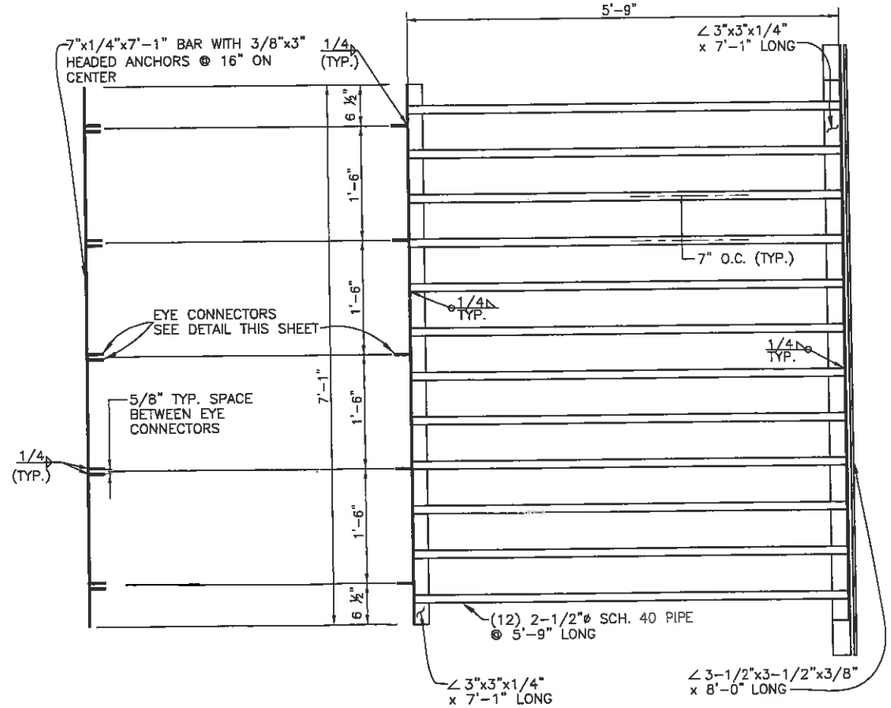
SCALE: 1"=2'-0"

NOTES:

1.) 3/4" CHAMFERS REQUIRED ON ALL EXPOSED EDGES OF CONCRETE

2.) TRASHRACK AND RELATED COMPONENTS, INCLUDING PLATES WITH EYE CONNECTORS AND ANGLES SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION

3.) POND OUTLET STRUCTURE SHALL BE MEASURED BY THE COMPLETE UNIT INCLUDING THE TRASH RACK, THE RESTRICTOR PLATE AND ALL OTHER MATERIALS AND LABOR REQUIRED TO FORM A COMPLETE FUNCTIONING UNIT.



TRASHRACK DETAIL

SCALE: 1"=2'-0"

NO.	DATE	REVISIONS	APPR.
1	9/21/06	REVISED POND DESIGN	

MULLER ENGINEERING CO., INC.
CONSULTING ENGINEERS
IRONGATE 4, SUITE 100
777 S. WADSWORTH BLVD.
LAKEWOOD, COLORADO 80226
(303) 988-4939
MEC PROJECT NO. 02-014.01

SCALE: AS SHOWN	APPROVED: CLK
DATE: 4/24/06	DESIGNED: CLK
DRAWN: JHK	CHECKED: MSD

JEFFERSON COUNTY
DIVISION OF HIGHWAYS AND TRANSPORTATION

WEST BELLEVIEW AVENUE - WEST QUINCY AVENUE TO SOUTH SIMMS STREET

POND OUTLET STRUCTURE DETAILS

JEFFCO PROJECT NO. 5-69-17-3445

SHEET 61

NAME: P:\02-014 Belleview Ph 2\FOR-BID\mun-jpy\02014PondDetails-rev.dwg DATE: SEP 21, 2006 TIME: 4:38 PM

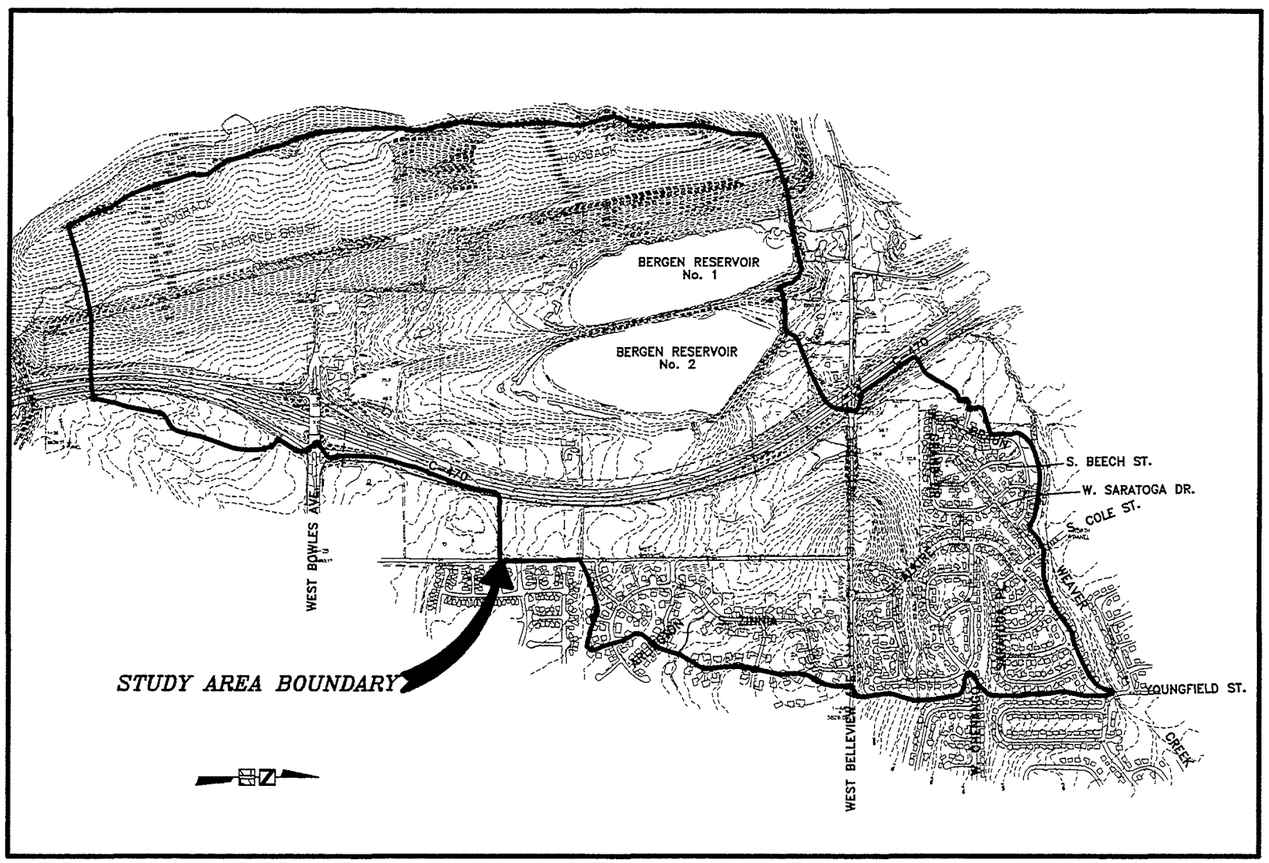
BERGEN RESERVOIR TRIBUTARY TO WEAVER CREEK OUTFALL SYSTEMS PLANNING

J.F. SATO AND ASSOCIATES

DECEMBER 1995

BERGEN RESERVOIR TRIBUTARY TO WEAVER CREEK

OUTFALL SYSTEMS PLANNING



JEFFERSON COUNTY, COLORADO

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

DECEMBER 1995

J.F. SATO AND ASSOCIATES
Consulting Engineers
Project Managers & Planners
5898 So. Rapp St. • Littleton, CO 80120 • (303) 797-1200

NOTES:

(1) STREET FLOW DIVERSION AT SARATOGA ST./BEECH ST. INTERSECTION

(2) STREET FLOW DIVERSION AT ALKIRE ST./COLE ST. INTERSECTION

BERGEN RESERVOIR No. 1

BERGEN RESERVOIR No. 2

HOGBACK

SCATTERED BRUSH

S. ELDRIDGE ST.

C-470

WEST BOWLES AVE.

WEST BELLEVIEW AVE.

ARLINGTON

S. ZINNIA

S. BRAUN

S. BEECH ST.

W. SARATOGA DR.

S. COLE ST.

WEAVER

SARATOGA PL.

W. CHENANGO

YOUNGFIELD ST.

CREEK

CORRECTED BASIN 6 BOUNDARY & AREA WAS INCLUDED IN THE 1995 OSP MODEL

LEGEND

- WATERSHED BOUNDARY
- WATERSHED DESIGNATION / WATERSHED AREA IN ACRES (1 / 61.3)
- DESIGN POINT DESIGNATION (301)
- CONVEYANCE ELEMENT NUMBER (1)
- ROUTING PATH & DRAINAGEWAY
- DETENTION FACILITY DESIGNATION (31)
- DIVERSION POINT DIVERSION (12)

0 400 800 1200

SCALE IN FEET

GROUND CONTROL SURVEY BY: REIDS AERIAL MAPPING
AERIAL PHOTOGRAPHY BY:
TOPOGRAPHIC MAPPING BY: REIDS AERIAL MAPPING
CONTOUR INTERVAL: 20 FEET DATE FLOWN: 9-27-94

J.F. SATO AND ASSOCIATES
Consulting Engineers
Project Managers & Planners
3540 So. 86th St. • Unit#1, CO 80120 • (303) 797-1200

DESIGNED ER/JG DATE 01-23-95
DRAWN PJK DATE 03-08-95
CHECKED ER DATE 03-27-95
REVISED DATE

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT
JEFFERSON COUNTY, COLORADO

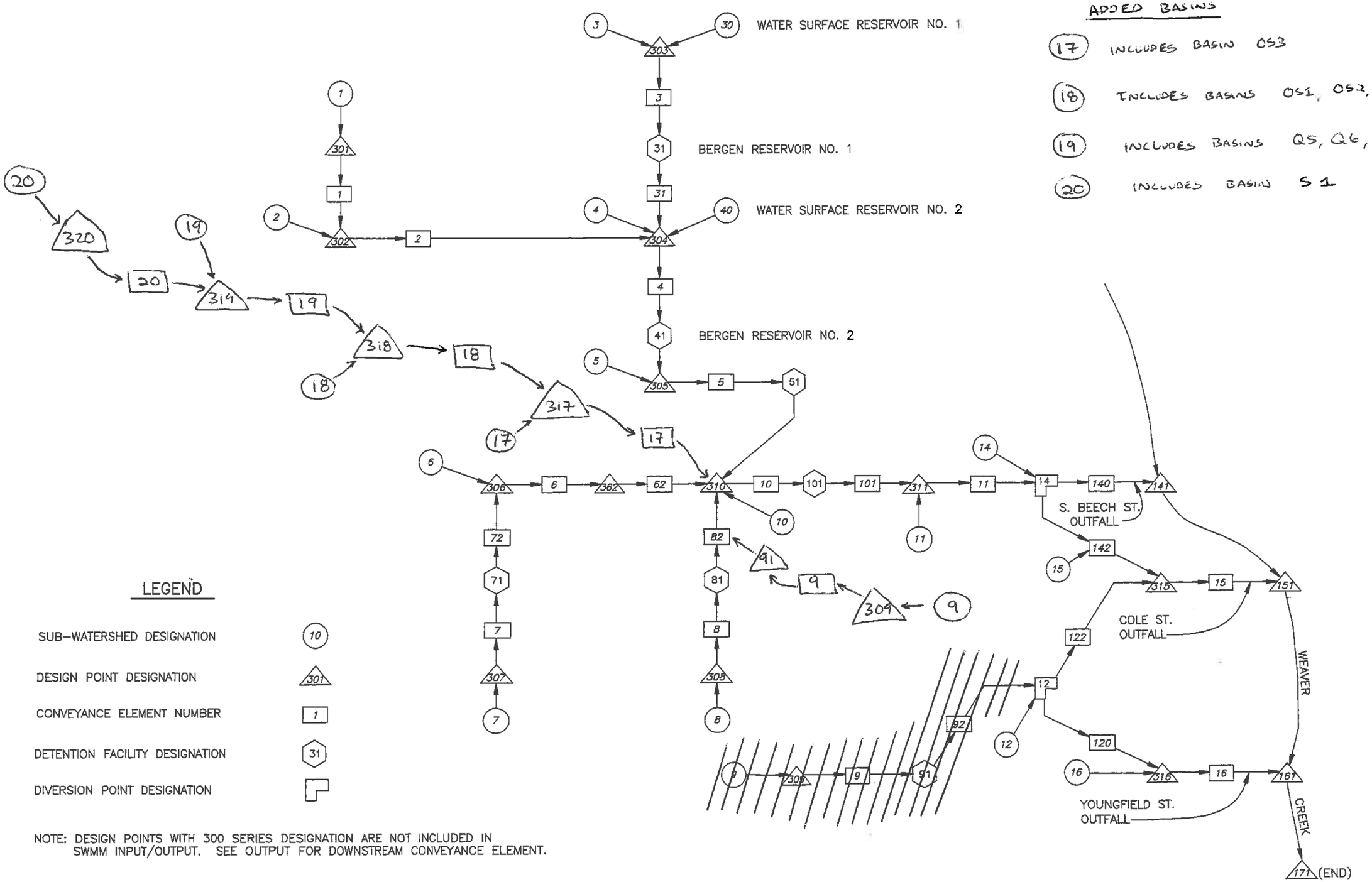
OUTFALL SYSTEMS PLANNING
BERGEN RESERVOIR TRIBUTARY TO WEAVER CREEK

SUB-WATERSHEDS

FIGURE 2

FILE: R:\1350\1350205-8.DWG
DATE: 10-16-95 DRAWN BY: PJK
Last updated by: PJK

PLOT SCALE: 1=1
JOB NO.: JF9502



ADDED BASINS

(17) INCLUDES BASIN OS3

(18) INCLUDES BASINS OS1, OS2, S2

(19) INCLUDES BASINS Q5, Q6, Q8

(20) INCLUDES BASIN S1

LEGEND

SUB-WATERSHED DESIGNATION (10)

DESIGN POINT DESIGNATION (301)

CONVEYANCE ELEMENT NUMBER [1]

DETENTION FACILITY DESIGNATION (31)

DIVERSION POINT DESIGNATION

NOTE: DESIGN POINTS WITH 300 SERIES DESIGNATION ARE NOT INCLUDED IN SWMM INPUT/OUTPUT. SEE OUTPUT FOR DOWNSTREAM CONVEYANCE ELEMENT.

REVISED 8/31/06 BY MULLER ENGINEERING COMPANY

FILE: R:\9502\9502SWMM.DWG
DATE: 03-03-95 PLOT SCALE: 1=1
Last updated by: PJK JOB NO.: JF9502
DRAWN BY: MJW

GROUND CONTROL SURVEY BY:
AERIAL PHOTOGRAPHY BY:
TOPOGRAPHIC MAPPING BY:
CONTOUR INTERVAL: DATE FLOWN:

J.F. SATO AND ASSOCIATES
Consulting Engineers
Project Managers & Planners
5898 So. Rapp St. • Littleton, CO 80120 • (303) 797-1200

DESIGNED ER/JKJ DATE 03-03-95
DRAWN MJW DATE 03-03-95
CHECKED ER DATE 04-25-95
REVISED ____ DATE ____

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT
JEFFERSON COUNTY, COLORADO

OUTFALL SYSTEMS PLANNING
BERGEN RESERVOIR TRIBUTARY TO WEAVER CREEK

SWMM SCHEMATIC

FIGURE 6

CUHP INPUT TABLE

CUHP INPUT

Subcatchment Name	EPA SWMM Target Node	Area (mi^2)	Length to Centroid (mi)	Length (mi)	Slope (ft/ft)	Existing Landuse % Imperviousness	Future Landuse % Imperviousness	Maximum Depression Storage (Watershed inches)		Horton's Infiltration Parameters		
								Pervious	Impervious	Initial Rate (in/hr)	Decay Coefficient (1/seconds)	Final Rate (in/hr)
1	101	0.16	1	1	0.00209	43.26	44.31	0.35	0.075	3.273	0.00180	0.5182
2	102	0.08	0	1	0.01025	61.80	61.80	0.35	0.1	3.343	0.00180	0.5229
3	103	0.18	0	1	0.01549	42.29	42.44	0.35	0.08	3.194	0.00180	0.513
4	104	0.01	0	0	0.02796	15.19	15.19	0.4	0.1	3	0.00180	0.5
5	105	0.02	0	0	0.02078	13.09	13.09	0.4	0.1	3	0.00180	0.5
6	106	0.19	0	1	0.01787	4.66	59.23	0.4	0.1	3.065	0.00180	0.5043
7	107	0.09	0	1	0.00936	16.92	16.92	0.37	0.1	3.23	0.00180	0.5153
8	108	0.11	0	1	0.00956	3.72	3.72	0.4	0.1	3.413	0.00180	0.5276
9	109	0.13	1	1	0.01036	3.49	35.26	0.4	0.1	3.038	0.00180	0.5026
10	110	0.13	0	1	0.02387	17.52	65.38	0.4	0.1	3	0.00180	0.5
11	111	0.11	0	1	0.01987	9.39	9.39	0.4	0.1	3	0.00180	0.5
12	112	0.16	0	1	0.01319	35.64	35.64	0.37	0.075	3.046	0.00180	0.503
13	113	0.20	0	1	0.00100	47.11	47.11	0.39	0.075	3	0.00180	0.5
14	114	0.08	0	1	0.03087	39.18	39.18	0.36	0.075	3	0.00180	0.5
15	115	0.17	0	1	0.01052	36.18	50.52	0.38	0.075	3	0.00180	0.5
16	116	0.17	0	1	0.00820	43.91	43.91	0.35	0.075	3	0.00180	0.5
17	117	0.08	0	1	0.01573	38.76	38.76	0.35	0.075	3	0.00180	0.5
18	118	0.07	0	1	0.01995	30.72	41.11	0.38	0.075	3	0.00180	0.5
19	119	0.09	0	1	0.02511	20.13	21.84	0.35	0.075	3	0.00180	0.5
20	120	0.12	0	1	0.01548	32.38	32.38	0.36	0.075	3	0.00180	0.5
21	121	0.19	1	1	0.01489	28.43	30.38	0.36	0.075	3	0.00180	0.5
22	122	0.20	1	1	0.00851	29.66	29.66	0.37	0.075	3.038	0.00180	0.5026
23	123	0.13	0	1	0.02423	39.01	39.01	0.35	0.075	3	0.00180	0.5
24	124	0.16	0	1	0.00984	44.11	56.29	0.37	0.09	3.047	0.00180	0.5031
25	125	0.05	0	0	0.00255	27.85	27.85	0.35	0.075	3.015	0.00180	0.501
26	126	0.07	0	0	0.01873	42.11	42.11	0.35	0.08	3.961	0.00180	0.5641
27	127	0.07	0	1	0.01118	31.15	31.15	0.4	0.1	3.644	0.00180	0.543
28	128	0.16	0	1	0.01036	42.69	42.69	0.37	0.075	3.693	0.00180	0.5462
29	129	0.05	0	1	0.03167	7.51	7.71	0.38	0.075	3.771	0.00180	0.5514
30	130	0.19	0	1	0.01034	37.25	43.14	0.38	0.09	3.011	0.00180	0.5007
31	131	0.08	0	1	0.01960	17.96	50.97	0.4	0.1	3.094	0.00180	0.5063
32	132	0.01	0	0	0.01698	31.19	31.19	0.4	0.1	3	0.00180	0.5
33	133	0.06	0	1	0.02600	13.66	53.14	0.4	0.1	3.039	0.00180	0.5026
34	134	0.03	0	0	0.02365	30.90	35.47	0.4	0.1	3	0.00180	0.5
35	135	0.15	0	1	0.06000	18.13	18.13	0.4	0.1	3.041	0.00180	0.5028
36	136	0.16	0	1	0.01346	46.17	74.78	0.4	0.05	3	0.00180	0.5
37	137	0.16	0	1	0.01338	35.70	37.06	0.4	0.05	3	0.00180	0.5
38	138	0.18	0	1	0.06000	2.37	3.69	0.4	0.05	3.164	0.00180	0.5109
39	139	0.18	0	1	0.04700	12.07	42.57	0.4	0.1	3.227	0.00180	0.5151
40	140	0.08	0	1	0.06000	2.81	8.52	0.4	0.05	3.164	0.00178	0.5506
41	141	0.02	0	0	0.04073	2.75	4.89	0.4	0.05	4.517	0.00154	0.6865
42	142	0.08	0	1	0.06000	7.05	7.05	0.4	0.05	4.262	0.00179	0.5872
43	143	0.07	0	1	0.01997	3.94	6.84	0.4	0.075	4.407	0.00163	0.6508
44	144	0.15	0	1	0.02409	9.89	9.89	0.4	0.05	4.109	0.00173	0.5959
45	145	0.09	0	1	0.04600	11.09	11.32	0.38	0.075	4.371	0.00180	0.5914
46	146	0.14	0	1	0.01854	14.69	14.81	0.38	0.08	4.077	0.00180	0.5718
47	147	0.16	0	1	0.00563	25.51	25.51	0.37	0.075	4.083	0.00180	0.5722
48	148	0.08	0	0	0.04700	2.67	8.15	0.4	0.075	4.084	0.00180	0.5722
49	149	0.13	0	1	0.06000	2.69	6.48	0.4	0.075	4.341	0.00180	0.5894
50	150	0.09	0	0	0.04500	2.00	6.78	0.4	0.075	4.311	0.00180	0.5874
51	151	0.20	0	1	0.02749	6.85	7.78	0.37	0.075	4.115	0.00180	0.5744
52	152	0.10	0	1	0.05000	5.68	5.70	0.37	0.075	3.489	0.00180	0.5326
53	153	0.19	0	1	0.06000	6.71	6.71	0.39	0.075	3.873	0.00180	0.5582
54	154	0.12	0	1	0.06000	5.51	5.51	0.39	0.075	4.309	0.00180	0.5873
55	155	0.17	0	1	0.06000	6.17	6.17	0.39	0.075	4.38	0.00180	0.592
56	156	0.11	0	1	0.06000	2.20	2.20	0.4	0.1	3.715	0.00180	0.5477
57	157	0.14	0	1	0.06000	2.00	2.00	0.4	0.1	3.296	0.00180	0.5197
58	158	0.17	0	1	0.06000	2.00	2.00	0.4	0.1	3	0.00180	0.5
59	159	0.12	0	1	0.06000	2.00	3.42	0.4	0.1	3.163	0.00180	0.5109
60	160	0.17	0	1	0.06000	2.00	2.20	0.4	0.1	3	0.00180	0.5

EPA SWMM 5.1
INPUT PARAMETERS

```
[TITLE]
;;Project Title/Notes

[OPTIONS]
;;Option             Value
FLOW_UNITS           CFS
INFILTRATION         HORTON
FLOW_ROUTING         KINWAVE
LINK_OFFSETS         DEPTH
MIN_SLOPE            0
ALLOW_PONDING        NO
SKIP_STEADY_STATE    NO

START_DATE           01/01/2005
START_TIME           00:00:00
REPORT_START_DATE    01/01/2005
REPORT_START_TIME    00:00:00
END_DATE             01/03/2005
END_TIME             00:00:00
SWEEP_START          01/01
SWEEP_END            12/31
DRY_DAYS             0
REPORT_STEP          00:05:00
WET_STEP             00:05:00
DRY_STEP             01:00:00
ROUTING_STEP         0:00:30

INERTIAL_DAMPING     PARTIAL
NORMAL_FLOW_LIMITED  BOTH
FORCE_MAIN_EQUATION  H-W
VARIABLE_STEP        0.75
LENGTHENING_STEP     0
MIN_SURFAREA         12.557
MAX_TRIALS           8
HEAD_TOLERANCE       0.005
SYS_FLOW_TOL         5
LAT_FLOW_TOL         5
MINIMUM_STEP         0.5
THREADS              1

[FILES]
;;Interfacing Files
USE INFLOWS "F:\2016\0501-1000\016-0858\40-Design\Calcs\1 HYDROLOGY\Baseline\CUHP
2005 - v. 1.5.2\Output Files\Existing\5A_Ex_5yr_5mi^2_.txt"

[EVAPORATION]
;;Data Source    Parameters
;;-------------- ----------------
```



```
CONSTANT         0.0
DRY_ONLY         NO

[JUNCTIONS]
;;Name           Elevation  MaxDepth   InitDepth  SurDepth   Aponded
;;-------------- ---------- ---------- ---------- ---------- ----------
102              5486       0          0          0          0
103              5520.32    0          0          0          0
104              5538       0          0          0          0
105              5599.5     0          0          0          0
106              5544       0          0          0          0
106T             5544       0          0          0          0
107              5544       0          0          0          0
108              5569       0          0          0          0
108T             5569       0          0          0          0
109              5569       0          0          0          0
110              5610       0          0          0          0
110T             5601       0          0          0          0
111              5637       0          0          0          0
112              5601.25    0          0          0          0
113              5624       0          0          0          0
114              5640       0          0          0          0
115              5659       0          0          0          0
115T             5608.57    0          0          0          0
116              5608.74    0          0          0          0
117              5622       0          0          0          0
118              5698       0          0          0          0
118T             5630       0          0          0          0
119              5711       0          0          0          0
120              5639       0          0          0          0
120T             5639       0          0          0          0
121              5639       0          0          0          0
122              5639       0          0          0          0
123              5688       0          0          0          0
123T             5659       0          0          0          0
124              5736       0          0          0          0
124T             5673.5     0          0          0          0
125              5686.76    0          0          0          0
126              5726       0          0          0          0
126T             5705       0          0          0          0
127              5716.59    0          0          0          0
127T             5716.59    0          0          0          0
128              5716.59    0          0          0          0
129              5777       0          0          0          0
129T             5746.5     0          0          0          0
130              5761       0          0          0          0
130T             5761       0          0          0          0
131              5842       0          0          0          0
```

```
132             5884.5     0          0          0          0
134             5842       0          0          0          0
134T            5786       0          0          0          0
135             5882       0          0          0          0
136             5798       0          0          0          0
137             5819       0          0          0          0
138             5825.5     0          0          0          0
139             5771       0          0          0          0
140             5786       0          0          0          0
141             5810.08    0          0          0          0
142             5848       0          0          0          0
142T            5848       0          0          0          0
143             5848       0          0          0          0
144             5848       0          0          0          0
145             5934.5     0          0          0          0
145T            5873       0          0          0          0
146             5934.5     0          0          0          0
146T            5934.5     0          0          0          0
147             6040       0          0          0          0
148             5891.26    0          0          0          0
149             5924       0          0          0          0
150             6063.5     0          0          0          0
151             5929.44    0          0          0          0
152             6036       0          0          0          0
152T            5979       0          0          0          0
153             6061.5     0          0          0          0
154             6016.72    0          0          0          0
155             6126       0          0          0          0
156             6317       0          0          0          0
156T            6185.35    0          0          0          0
157             6287       0          0          0          0
158             6630       0          0          0          0
159             6881       0          0          0          0
159T            6881       0          0          0          0
160             6881       0          0          0          0

[OUTFALLS]
;;Name           Elevation  Type       Stage Data       Gated    Route To
;;-------------- ---------- ---------- ---------------- -------- ----------------
101             5435.11    FREE                        NO

[DIVIDERS]
;;Name           Elevation  Diverted Link    Type       Parameters
;;-------------- ---------- ---------------- ---------- ----------
133             5772       433              OVERFLOW   0          0          0
     0

[STORAGE]
```



```
;;Name           Elev.    MaxDepth   InitDepth  Shape      Curve Name/Params
    N/A      Fevap    Psi      Ksat     IMD
;;-------------- -------- ---------- ----------- ----------
---------------------------- -------- --------          -------- --------
330             5761     16         0          TABULAR
SEBelleviewandC470_Storage   0        0

[CONDUITS]
;;Name           From Node        To Node          Length     Roughness  InOffset
OutOffset  InitFlow   MaxFlow
;;-------------- ---------------- ---------------- ---------- ---------- ----------
---------- ---------- ----------
202             102              101              1991.0267  0.05625    0
36.32      0          0
203             103              102              2309.8350  .05625     0
15.12      0          0
204             104              103              1065.011   .01875     0
2          0          0
205             105              104              1681.4712  0.04375    0
6          0          0
206             106              106T             1          0.01       0
0          0          0
206T            106T             103              1856.9015  .04375     0
5.5        0          0
207             107              106T             1          0.01       0
0          0          0
208             108              108T             1          0.01       0
0          0          0
208T            108T             106T             2357.5938  0.04375    0
3          0          0
209             109              108T             1          0.01       0
0          0          0
210             110              110T             981.0911   0.04375    0
0          0          0
210T            110T             108T             3251.968   0.04375    0
4.3        0          0
211             111              110T             2800.1213  0.01875    0
22.28      0          0
212             112              110T             436.0471   0.04375    0
0          0          0
213             113              112              863.4123   0.04375    0
6          0          0
214             114              113              1936.4089  0.04375    0
14         0          0
215             115              115T             2598.2248  .02        0
11.43      0          0
215T            115T             112              998.5049   0.04375    0
1.63       0          0
```

```
216             116             115T            338.8451   0.04375    0
0          0          0
217             117             116             150.4175   .04375     0
1          0          0
218             118             118T            2887.1975  .02        0
0          0          0
218T            118T            116             669.7937   .02        0
13.26      0          0
219             119             118T            4120.9748  .02        0
32         0          0
220             120             120T            1          0.01       0
0          0          0
220T            120T            116             1695.5769  0.04375    0
23.25      0          0
221             121             120T            1          0.01       0
0          0          0
222             122             120T            1          0.01       0
0          0          0
223             123             124T            694.2060   0.04375    0
2          0          0
223T            123T            120T            1428.6915  0.04375    0
4.73       0          0
224             124             124T            3365.9884  .02        0
16         0          0
224T            124T            123T            659.9281   0.04375    0
3          0          0
225             125             123T            1801.8175  0.04375    0
2.09       0          0
226             126             126T            1363.9461  0.04375    0
12         0          0
226T            126T            125             1020.3398  0.04375    0
5          0          0
227             127             127T            1          0.01       0
0          0          0
227T            127T            126T            597.2004   0.04375    0
0          0          0
228             128             127T            1          0.01       0
0          0          0
229             129             129T            1784.2046  .02        0
0          0          0
229T            129T            127T            1621.0962  .02        0
8.41       0          0
230             130             330             1          0.01       0
0          0          0
230T            130T            129T            1039.4677  0.04375    0
0          0          0
231             131             330             2617.27    .04375     0
14         0          0
```



```
232             132             131             2782.3179  .04375     0
0          0          0
233             133             330             483.0849   .01875     0
0          0          0
234             134             134T            2071.7840  .04375     0
5          0          0
234T            134T            133             531.9742   0.04375    0
5          0          0
235             135             134             2586.0685  .04375     0
0          0          0
236             136             134T            836.1693   0.04375    0
0          0          0
237             137             136             1195.8745  0.025      0
20         0          0
238             138             137             1956.7189  .025       0
6          0          0
239             139             127T            2778.5184  0.04375    0
13.87      0          0
240             140             139             1038.2982  0.04375    0
0          0          0
241             141             140             1208.7763  .05625     0
7.23       0          0
242             142             142T            1          0.01       0
0          0          0
242T            142T            141             1290.4846  .05625     0
18         0          0
243             143             142T            1          0.01       0
0          0          0
244             144             142T            1          0.01       0
0          0          0
245             145             146T            1          0.01       0
0          0          0
245T            145T            142T            1396.8045  .05625     0
9          0          0
246             146             146T            1          0.01       0
0          0          0
246T            146T            145T            1172.9547  0.04375    0
13         0          0
247             147             146T            2612.3736  .02        0
28.5       0          0
248             148             145T            809.3217   .05625     0
3.8        0          0
249             149             148             1360.4215  .05625     0
1.2        0          0
250             150             149             2907.2882  0.04375    0
14         0          0
251             151             149             208.0323   .05625     0
0          0          0
```

```
252             152             152T            1944.3212  0.04375    0
9          0          0
252T            152T            151             1484.6310  .05625     0
6.5        0          0
253             153             152             760.9139   0.04375    0
4          0          0
254             154             152T            1098.119   .05625     0
0          0          0
255             155             154             2591.2198  .05625     0
11.67      0          0
256             156             156T            1799.4742  .04375     0
9          0          0
256T            156T            155             1040.2158  .05625     0
8.65       0          0
257             157             156T            1605.2125  .05625     0
20.27      0          0
258             158             157             2938.1568  .05625     0
34         0          0
259             159             159T            1          0.01       0
0          0          0
259T            159T            158             2410.5445  .05625     0
0          0          0
260             160             159T            1          0.01       0
0          0          0
433             133             330             483.0849   .02        0
0          0          0

[OUTLETS]
;;Name           From Node       To Node         Offset     Type
QTable/Qcoeff    Qexpon     Gated
;;-------------- --------------- --------------- ---------- ---------------
---------------- ---------- --------
530             330             130T            0          TABULAR/DEPTH
SEBelleviewandC470_Discharge            NO

[XSECTIONS]
;;Link           Shape        Geom1            Geom2      Geom3      Geom4
Barrels    Culvert
;;-------------- ------------ ---------------- ---------- ---------- ----------
---------- ----------
202             TRAPEZOIDAL  10               30         4          4          1

203             TRAPEZOIDAL  15               80         4          4          1

204             HORIZ_ELLIPSE 2.417            3.750      6          0          1

205             TRAPEZOIDAL  3                4          3          5          1
```



```
206             DUMMY        0                0          0          0          1

206T            TRAPEZOIDAL  10               30         4          4          1

207             DUMMY        0                0          0          0          1

208             DUMMY        0                0          0          0          1

208T            TRAPEZOIDAL  9                5          6          6          1

209             DUMMY        0                0          0          0          1

210             TRAPEZOIDAL  1.5              20         30         100        1

210T            TRAPEZOIDAL  9                5          8          3          1

211             CIRCULAR     6                0          0          0          1

212             TRAPEZOIDAL  13               20         6          6          1

213             TRAPEZOIDAL  4                5          3          5          1

214             TRAPEZOIDAL  10               15         6          10         1

215             TRAPEZOIDAL  5                1          20         20         1

215T            TRAPEZOIDAL  11               6          3          3          1

216             TRAPEZOIDAL  13               40         2.5        3          1

217             TRAPEZOIDAL  2.5              5          7          10         1

218             TRAPEZOIDAL  5                1          20         20         1

218T            TRAPEZOIDAL  5                1          20         20         1

219             TRAPEZOIDAL  5                1          20         20         1

220             DUMMY        0                0          0          0          1

220T            TRAPEZOIDAL  9                5          7          5          1

221             DUMMY        0                0          0          0          1

222             DUMMY        0                0          0          0          1

223             TRAPEZOIDAL  3                20         20         20         1
```

223T	TRAPEZOIDAL	7	5	7	5	1
224	TRAPEZOIDAL	5	1	20	20	1
224T	TRAPEZOIDAL	4	5	3	3	1
225	TRAPEZOIDAL	6	5	7	7	1
226	TRAPEZOIDAL	6	8	4	4	1
226T	TRAPEZOIDAL	9	5	4	4	1
227	DUMMY	0	0	0	0	1
227T	TRAPEZOIDAL	7	5	4	4	1
228	DUMMY	0	0	0	0	1
229	TRAPEZOIDAL	5	1	20	20	1
229T	TRAPEZOIDAL	5	1	20	20	1
230	DUMMY	0	0	0	0	1
230T	TRAPEZOIDAL	10	35	4	6	1
231	TRAPEZOIDAL	6	6	4	4	1
232	TRAPEZOIDAL	3	6	6	6	1
233	CIRCULAR	6	0	0	0	1
234	TRAPEZOIDAL	3	5	5	6	1
234T	TRAPEZOIDAL	5	30	20	3	1
235	TRAPEZOIDAL	3	5	5	6	1
236	TRAPEZOIDAL	10	10	3	3	1
237	TRAPEZOIDAL	10	600	5	3	1
238	TRAPEZOIDAL	10	650	4	3	1
239	TRAPEZOIDAL	9	7	4	4	1
240	TRAPEZOIDAL	8	12	15	5	1

241	TRAPEZOIDAL	10	5	3	3	1
242	DUMMY	0	0	0	0	1
242T	TRAPEZOIDAL	10	5	2	2	1
243	DUMMY	0	0	0	0	1
244	DUMMY	0	0	0	0	1
245	DUMMY	0	0	0	0	1
245T	TRAPEZOIDAL	8	5	3	3	1
246	DUMMY	0	0	0	0	1
246T	TRAPEZOIDAL	11	10	4	4	1
247	TRAPEZOIDAL	5	1	20	20	1
248	TRAPEZOIDAL	8	5	3	3	1
249	TRAPEZOIDAL	8	5	3	3	1
250	TRAPEZOIDAL	8	7	3	3	1
251	TRAPEZOIDAL	8	5	3	3	1
252	TRAPEZOIDAL	8	8	6	6	1
252T	TRAPEZOIDAL	10	15	3	2	1
253	TRAPEZOIDAL	3	20	10	10	1
254	TRAPEZOIDAL	6	10	3	3	1
255	TRAPEZOIDAL	5	7	3	3	1
256	TRAPEZOIDAL	3	5	3	3	1
256T	TRAPEZOIDAL	7	7	3	3	1
257	TRAPEZOIDAL	10	5	3	3	1
258	TRAPEZOIDAL	15	5	2	2	1
259	DUMMY	0	0	0	0	1

```
259T             TRAPEZOIDAL  15               5          2          2          1
260              DUMMY        0                0          0          0          1
433              TRAPEZOIDAL  5                1          20         20         1


[CURVES]
;;Name           Type       X-Value    Y-Value
;;-------------- ---------- ---------- ----------
;Stage-Discharge from W Belleview to S Simms Phase III Drainage Report
SEBelleviewandC470_Discharge Rating     0          0
SEBelleviewandC470_Discharge            1          7
SEBelleviewandC470_Discharge            1.5        9
SEBelleviewandC470_Discharge            2          18.81
SEBelleviewandC470_Discharge            3          26.10
SEBelleviewandC470_Discharge            4          31.77
SEBelleviewandC470_Discharge            5          36.56
SEBelleviewandC470_Discharge            6          40.80
SEBelleviewandC470_Discharge            7          44.63
SEBelleviewandC470_Discharge            8          48.16
SEBelleviewandC470_Discharge            9          51.45
SEBelleviewandC470_Discharge            10         54.54
SEBelleviewandC470_Discharge            11         57.47
SEBelleviewandC470_Discharge            11.72      59.48
SEBelleviewandC470_Discharge            12         60.25
SEBelleviewandC470_Discharge            12.5       61.59
SEBelleviewandC470_Discharge            12.75      62.26
SEBelleviewandC470_Discharge            13         62.91
SEBelleviewandC470_Discharge            14         65.46
SEBelleviewandC470_Discharge            14.5       126.13
SEBelleviewandC470_Discharge            15         314.01
SEBelleviewandC470_Discharge            15.5       664.51
SEBelleviewandC470_Discharge            16         1207.59
;
;Stage-Area from W Belleview to S Simms Phase III Drainage Report
SEBelleviewandC470_Storage Storage    0          155
SEBelleviewandC470_Storage            1          13491
SEBelleviewandC470_Storage            1.5        33915
SEBelleviewandC470_Storage            2          54340
SEBelleviewandC470_Storage            3          72371
SEBelleviewandC470_Storage            4          87228
SEBelleviewandC470_Storage            5          109793
SEBelleviewandC470_Storage            6          129511
SEBelleviewandC470_Storage            7          146671
SEBelleviewandC470_Storage            8          169616
SEBelleviewandC470_Storage            9          191589
SEBelleviewandC470_Storage            10         215529
```



```
SEBelleviewandC470_Storage            11         241521
SEBelleviewandC470_Storage            11.72      259546
SEBelleviewandC470_Storage            12         266555
SEBelleviewandC470_Storage            12.5       278764
SEBelleviewandC470_Storage            12.75      284868
SEBelleviewandC470_Storage            13         290973
SEBelleviewandC470_Storage            14         311294
SEBelleviewandC470_Storage            14.5       321454
SEBelleviewandC470_Storage            15         331615
SEBelleviewandC470_Storage            15.5       341775
SEBelleviewandC470_Storage            16         351935

[REPORT]
;;Reporting Options
INPUT      NO
CONTROLS   NO
SUBCATCHMENTS ALL
NODES ALL
LINKS ALL

[TAGS]

[MAP]
DIMENSIONS -1470.588 0.000 11470.588 10000.000
Units      None

[COORDINATES]
;;Node           X-Coord            Y-Coord
;;-------------- ------------------ ------------------
102              10125.788          8696.601
103              9832.828           8064.868
104              9450.654           8057.635
105              8972.033           7633.265
106              9475.766           7485.916
106T             9513.345           7494.621
107              9536.112           7458.760
108              9445.592           6722.534
108T             9410.716           6785.965
109              9367.142           6761.759
110              8299.048           6225.032
110T             8638.158           6125.594
111              7924.243           6681.428
112              8653.456           5975.162
113              8941.572           5916.519
114              9329.126           5358.135
115              8339.843           4860.944
115T             8365.340           5862.975
116              8314.347           5763.537
```

117	8276.101	5809.432
118	8321.996	4407.099
118T	8327.095	5534.064
119	8005.833	4407.099
120	7737.789	5479.398
120T	7722.817	5528.965
121	7683.477	5482.415
122	7674.425	5524.657
123	6764.131	5470.322
123T	7215.427	5375.983
124	5912.532	5210.253
124T	6988.504	5388.732
125	6748.833	4911.938
126	6004.322	4996.078
126T	6396.975	4738.559
127	6138.609	4682.825
127T	6210.195	4656.850
128	6232.146	4583.253
129	5614.218	3904.808
129T	5966.076	4213.322
130	5814.892	3857.143
130T	5796.317	3868.315
131	6047.666	2872.181
132	5767.200	1839.554
134	5973.725	2742.147
134T	5805.445	3517.254
135	5675.411	1788.560
136	5652.463	3280.133
137	5236.863	3473.910
138	5308.254	2770.193
139	5326.102	4271.965
140	5159.954	4008.738
141	4757.520	3851.265
142	4301.061	3813.837
142T	4380.165	3746.727
143	4367.442	3687.109
144	4292.009	3717.282
145	3791.133	3008.212
145T	4145.593	3331.127
146	3736.822	3083.645
146T	3786.086	3063.408
147	2908.990	2759.995
148	4099.698	3043.011
149	4097.149	2607.013
150	4360.130	1573.706
151	4086.950	2530.522
152	3684.098	1378.059
152T	3811.583	2081.775

153	3477.572	1202.130
154	3541.315	1877.800
155	2702.465	1887.998
156	1897.395	1355.230
156T	2363.355	1770.712
157	1840.952	1863.219
158	881.417	1598.827
159	300.094	877.984
159T	290.249	954.186
160	227.678	989.625
101	10032.957	9435.631
133	5700.908	3693.184
330	5788.600	3847.027

[VERTICES]

;;Link	X-Coord	Y-Coord
202	10095.259	8857.481
202	10091.480	8910.391
202	10015.895	9103.132
202	10053.688	9184.386
202	10063.136	9227.848
202	10038.571	9288.315
203	9919.525	8209.341
203	9934.641	8258.471
203	9870.394	8313.270
203	9862.836	8364.290
203	9855.277	8388.855
203	9902.518	8407.751
203	9906.297	8439.875
203	9962.986	8502.232
203	9981.882	8549.473
203	10027.233	8579.707
203	10051.798	8583.486
203	10083.922	8564.590
203	10108.487	8564.590
203	10134.942	8589.155
203	10129.459	8691.640
204	9560.496	8058.171
204	9654.977	8054.392
204	9688.991	8046.833
204	9760.796	8048.723
204	9774.024	8044.944
204	9817.485	8031.716
205	9226.033	7861.650
205	9322.404	7954.242
205	9382.872	8020.379
205	9396.099	8046.833

205	9405.547	8061.950
206T	9517.035	7534.746
206T	9581.282	7591.434
206T	9658.757	7651.902
206T	9698.439	7710.480
206T	9713.556	7731.266
206T	9751.348	7731.266
206T	9747.569	7782.286
206T	9777.803	7810.630
206T	9804.258	7888.105
206T	9830.712	7969.359
206T	9826.933	8022.268
208T	9433.891	6829.916
208T	9477.353	6873.378
208T	9488.691	6922.508
208T	9479.242	6979.196
208T	9435.781	6984.865
208T	9418.774	7013.210
208T	9426.333	7030.216
208T	9454.677	7045.333
208T	9481.132	7103.912
208T	9466.015	7130.366
208T	9458.457	7137.925
208T	9460.346	7173.828
208T	9411.216	7232.406
208T	9413.106	7287.205
208T	9435.781	7313.660
208T	9471.684	7321.218
208T	9511.366	7343.894
210	8341.690	6219.568
210	8405.937	6159.100
210	8494.749	6140.204
210	8555.217	6119.418
210	8611.906	6092.963
210	8625.133	6094.853
210T	8666.705	6145.873
210T	8706.387	6145.873
210T	8734.731	6176.107
210T	8740.400	6230.906
210T	8780.082	6242.244
210T	8825.433	6259.250
210T	8870.784	6302.712
210T	8902.907	6340.504
210T	8923.693	6402.862
210T	8944.479	6438.764
210T	9008.726	6484.115
210T	9031.402	6504.901
210T	9103.207	6521.908

210T	9144.779	6493.563
210T	9176.903	6489.784
210T	9207.137	6495.453
210T	9227.923	6593.713
210T	9260.046	6625.837
210T	9294.059	6657.961
210T	9322.404	6684.415
210T	9352.638	6695.753
210T	9390.430	6701.422
210T	9407.437	6695.753
210T	9416.885	6707.091
211	7982.661	6637.175
211	8067.694	6712.760
211	8158.396	6599.382
211	8292.559	6442.544
211	8319.014	6402.862
211	8334.131	6346.173
211	8351.138	6225.237
211	8398.378	6189.334
212	8672.374	6000.372
212	8666.705	6038.164
212	8647.808	6070.288
212	8640.250	6098.632
213	8868.894	5924.787
213	8861.336	5932.345
213	8842.440	5968.248
214	9329.962	5425.927
214	9314.845	5482.615
214	9309.176	5580.876
214	9275.163	5694.253
214	9135.331	5868.098
215	8349.248	5195.393
215	8349.248	5628.116
215	8356.807	5851.092
215T	8368.144	5919.118
215T	8428.612	5970.138
215T	8504.197	5977.696
215T	8636.471	5947.462
216	8370.034	5781.176
218	8308.491	4514.209
218	8317.125	4591.912
218	8321.441	4665.299
219	8049.479	4522.843
219	8062.430	4764.587
219	8118.549	4829.340
219	8084.014	4932.944
219	7954.509	4919.994
219	7954.509	5006.331

219	8075.381	5027.915
219	8079.697	5109.935
219	8196.253	5114.252
219	8213.520	5248.075
219	8226.471	5291.243
219	8235.104	5494.136
219	8252.372	5520.037
220T	7797.478	5588.434
220T	7865.505	5647.012
220T	7924.083	5686.695
220T	7992.109	5713.149
220T	8084.701	5730.156
220T	8199.968	5749.052
220T	8281.222	5758.500
220T	8312.440	5763.097
223	6852.667	5384.355
223	6903.687	5350.342
223	6926.362	5361.679
223	6958.486	5386.245
223T	7308.066	5439.154
223T	7374.203	5463.719
223T	7430.891	5463.719
223T	7542.379	5467.498
223T	7616.074	5476.946
223T	7695.439	5509.070
224	5909.745	5199.172
224	6036.350	5148.152
224	6144.058	5131.145
224	6168.623	5129.256
224	6240.429	5182.165
224	6247.988	5174.607
224	6302.787	5078.236
224	6327.352	5068.788
224	6442.619	5117.918
224	6593.788	5206.730
224	6701.497	5350.342
224	6792.199	5356.011
224	6913.135	5306.880
224	6973.603	5356.011
224T	7022.733	5399.472
224T	7098.318	5405.141
224T	7141.779	5435.375
224T	7202.247	5384.355
225	6839.439	4966.748
225	6888.570	5053.671
225	6898.018	5083.905
225	6916.914	5091.463
225	6960.375	5091.463

225	7017.064	5150.042
225	7090.759	5227.516
225	7160.675	5274.757
226	6062.805	4938.404
226	6198.857	4734.325
226	6257.436	4719.208
226	6351.917	4743.773
226T	6499.307	4798.572
226T	6631.581	4838.254
227T	6234.760	4675.746
227T	6319.793	4670.077
229	5692.475	3944.384
229	5644.990	4043.672
229	5657.940	4160.227
229	5692.475	4190.445
229	5701.109	4224.980
229T	6076.676	4250.881
229T	6080.992	4328.584
229T	6068.042	4410.604
229T	6059.408	4466.724
229T	6115.527	4522.843
229T	6193.231	4574.645
229T	6206.181	4604.863
231	6029.190	3115.547
231	5994.655	3275.271
231	5951.487	3452.262
231	5852.199	3685.372
231	5834.932	3724.224
231	5813.347	3788.977
231	5809.030	3845.096
232	5856.516	2105.403
232	5882.417	2131.304
232	5912.635	2178.789
232	5990.338	2437.801
232	6016.240	2562.989
232	6042.141	2787.466
234	5981.705	2951.507
234	5955.804	3154.399
234	5908.318	3309.806
234	5891.051	3335.707
234	5873.783	3396.143
234T	5709.743	3633.570
235	5765.862	2014.749
235	5839.248	2204.690
235	5895.368	2385.998
235	5951.487	2541.405
235	5968.754	2679.545
236	5774.496	3309.806

236	5783.129	3396.143
236	5813.347	3434.995
236	5804.714	3478.163
237	5303.958	3478.163
237	5347.127	3452.262
238	5347.127	2822.001
238	5183.086	3387.509
238	5187.403	3422.044
239	5414.664	4365.848
239	5418.443	4396.082
239	5408.995	4435.764
239	5418.443	4450.881
239	5454.346	4498.122
239	5494.028	4505.680
239	5539.379	4496.232
239	5560.165	4530.245
239	5586.620	4539.694
239	5664.094	4556.700
239	5724.562	4607.720
239	5834.160	4624.727
239	5921.083	4662.519
239	5981.551	4664.409
239	6066.584	4643.623
239	6121.383	4641.733
239	6157.286	4647.402
240	5225.702	4003.041
240	5282.390	4025.716
240	5284.280	4054.060
240	5261.604	4106.970
240	5250.267	4150.431
240	5255.936	4174.996
240	5267.273	4186.334
240	5303.176	4239.244
241	4776.755	3890.741
241	4833.417	3903.008
241	4870.218	3917.612
241	4895.336	3921.701
241	4921.623	3953.244
241	4968.939	3949.740
241	4992.304	3947.987
241	5058.313	3999.976
241	5113.807	4018.669
241	5148.271	4010.491
242T	4392.378	3778.828
242T	4422.612	3776.939
242T	4428.281	3752.374
242T	4452.846	3759.932
242T	4503.866	3744.815

242T	4547.327	3786.387
242T	4602.126	3771.270
242T	4662.594	3790.166
242T	4673.932	3820.400
242T	4696.607	3833.627
242T	4746.963	3837.584
245T	4193.968	3366.891
245T	4226.091	3410.352
245T	4258.215	3484.047
245T	4273.332	3504.833
245T	4303.566	3587.976
245T	4299.786	3616.321
245T	4290.338	3637.107
245T	4314.903	3652.224
245T	4331.910	3661.672
245T	4343.248	3725.919
245T	4360.254	3741.036
246T	3836.829	3091.006
246T	3931.310	3134.467
246T	3980.440	3138.246
246T	4073.032	3228.948
247	2984.609	2832.127
247	3368.202	2843.465
247	3445.677	2913.381
247	3453.236	2954.953
247	3534.489	2977.628
247	3581.730	3004.083
247	3653.536	3013.531
247	3678.101	3047.544
247	3691.328	3055.103
247	3763.134	3043.765
248	4116.493	3115.571
248	4146.727	3153.363
248	4184.520	3198.714
248	4173.182	3287.526
249	4067.363	2662.061
249	4078.701	2679.068
249	4114.603	2718.750
249	4099.486	2854.803
249	4074.921	2860.472
249	4054.136	2875.589
249	4052.246	2943.615
249	4074.921	2960.622
249	4090.038	2975.739
249	4082.480	3036.207
250	4354.586	1605.762
250	4322.462	1645.444
250	4324.352	1732.367

250	4299.786	1802.283
250	4299.786	1951.563
250	4265.773	2027.148
250	4261.994	2070.609
250	4263.884	2138.636
250	4263.884	2218.000
250	4258.215	2278.468
250	4235.539	2295.474
250	4239.319	2310.591
250	4248.767	2335.157
250	4244.987	2397.514
250	4226.091	2457.982
250	4210.974	2501.443
250	4197.747	2529.788
250	4178.851	2550.574
250	4159.954	2558.132
250	4133.500	2578.918
252	3707.115	1467.653
252	3739.379	1539.097
252	3782.015	1610.540
252	3791.233	1633.586
252	3809.670	1683.135
252	3794.690	1760.340
252	3780.863	1796.062
252	3793.538	1852.525
252	3794.690	1897.465
252	3809.670	2013.848
252T	3856.915	2147.516
252T	3855.763	2229.330
252T	3869.590	2252.377
252T	3899.551	2252.377
252T	3905.312	2262.747
252T	3917.987	2278.880
252T	3966.385	2342.257
252T	4002.106	2351.475
252T	4013.629	2366.455
252T	4024.000	2421.766
252T	4089.682	2516.256
253	3566.533	1274.065
253	3657.565	1315.548
253	3674.850	1316.701
253	3695.592	1353.575
254	3560.771	1932.034
254	3582.665	1930.882
254	3619.539	1905.531
254	3632.215	1936.644
254	3658.718	1947.014
254	3666.784	1986.193

254	3686.373	2011.544
254	3718.638	2015.001
254	3754.359	2055.332
254	3763.578	2077.225
255	2751.850	1890.551
255	2784.114	1874.419
255	2804.856	1881.333
255	2852.101	1940.101
255	2903.955	1945.862
255	2929.305	1968.908
255	2982.312	1973.518
255	3015.729	1964.299
255	3016.881	1964.299
255	3037.623	1988.498
255	3089.477	1960.842
255	3121.741	1958.537
255	3171.291	1906.684
255	3204.708	1925.120
255	3235.820	1919.359
255	3260.018	1928.577
255	3285.369	1925.120
255	3309.568	1904.379
255	3347.594	1887.094
255	3391.382	1900.922
255	3439.779	1905.531
255	3481.262	1905.531
256	1979.802	1405.429
256	2009.762	1411.190
256	2122.688	1494.157
256	2202.198	1549.467
256	2258.661	1595.560
256	2304.753	1622.063
256	2393.481	1657.785
256	2393.481	1738.446
256T	2471.838	1767.254
256T	2483.361	1771.863
256T	2491.428	1785.691
256T	2519.083	1786.843
256T	2523.692	1796.062
256T	2524.845	1817.956
256T	2583.612	1845.611
256T	2604.354	1846.763
256T	2646.989	1830.631
257	1880.703	1844.459
257	1923.339	1861.743
257	1945.233	1864.048
257	1968.279	1858.287
257	2071.987	1821.413

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257             2118.079          1823.717
257             2167.628          1807.585
257             2211.416          1799.519
257             2265.575          1739.599
257             2305.906          1724.619
257             2319.733          1722.314
257             2334.713          1751.122
257             2342.780          1777.625
257             2356.607          1775.320
258             965.769           1593.255
258             1070.629          1588.646
258             1115.569          1622.063
258             1120.179          1664.698
258             1211.211          1729.228
258             1260.760          1796.062
258             1341.422          1799.519
258             1397.885          1787.996
258             1442.825          1781.082
258             1469.329          1782.234
258             1539.619          1821.413
258             1592.626          1823.717
258             1699.791          1801.823
258             1760.863          1802.976
258             1824.240          1857.134
259T            320.428           968.078
259T            344.242           979.986
259T            363.294           1029.996
259T            433.546           1093.104
259T            439.500           1126.444
259T            483.557           1169.310
259T            521.660           1235.991
259T            558.572           1268.140
259T            594.294           1294.336
259T            662.165           1416.980
259T            734.799           1443.176
259T            777.665           1493.186
259T            814.577           1563.439
259T            856.252           1607.496
433             5688.781          3720.331
433             5756.952          3833.396
```

EPA SWMM 5.1
100-YEAR FUTURE CONDITIONS OUTPUT

```
EPA STORM WATER MANAGEMENT MODEL - VERSION 5.1 (Build 5.1.010)
--------------------------------------------------------------

WARNING 04: minimum elevation drop used for Conduit 206
WARNING 04: minimum elevation drop used for Conduit 207
WARNING 04: minimum elevation drop used for Conduit 208
WARNING 04: minimum elevation drop used for Conduit 209
WARNING 04: minimum elevation drop used for Conduit 220
WARNING 04: minimum elevation drop used for Conduit 221
WARNING 04: minimum elevation drop used for Conduit 222
WARNING 04: minimum elevation drop used for Conduit 227
WARNING 04: minimum elevation drop used for Conduit 228
WARNING 04: minimum elevation drop used for Conduit 230
WARNING 04: minimum elevation drop used for Conduit 242
WARNING 04: minimum elevation drop used for Conduit 243
WARNING 04: minimum elevation drop used for Conduit 244
WARNING 04: minimum elevation drop used for Conduit 245
WARNING 04: minimum elevation drop used for Conduit 246
WARNING 04: minimum elevation drop used for Conduit 259
WARNING 04: minimum elevation drop used for Conduit 260

*****************************************************
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
*****************************************************

***************
Analysis Options
***************
Flow Units ............... CFS
Process Models:
  Rainfall/Runoff ........ NO
  RDII ................... NO
  Snowmelt ............... NO
  Groundwater ............ NO
  Flow Routing ........... YES
  Ponding Allowed ........ NO
  Water Quality .......... NO
Flow Routing Method ...... KINWAVE
Starting Date ............ JAN-01-2005 00:00:00
Ending Date .............. JAN-03-2005 00:00:00
Antecedent Dry Days ...... 0.0
Report Time Step ......... 00:05:00
Routing Time Step ........ 30.00 sec
```



```
*************************        Volume         Volume
Flow Routing Continuity        acre-feet      10^6 gal
*************************     ---------      ---------
Dry Weather Inflow .......         0.000          0.000
Wet Weather Inflow .......         0.000          0.000
Groundwater Inflow .......         0.000          0.000
RDII Inflow ..............         0.000          0.000
External Inflow ..........       556.517        181.350
External Outflow .........       562.568        183.321
Flooding Loss ............         0.000          0.000
Evaporation Loss .........         0.000          0.000
Exfiltration Loss ........         0.000          0.000
Initial Stored Volume ....         0.000          0.000
Final Stored Volume ......         0.105          0.034
Continuity Error (%) .....        -1.106


*******************************
Highest Flow Instability Indexes
*******************************
All links are stable.


************************
Routing Time Step Summary
************************
Minimum Time Step           :    30.00 sec
Average Time Step           :    30.00 sec
Maximum Time Step           :    30.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     1.01
Percent Not Converging      :     0.00


******************
Node Depth Summary
******************

-------------------------------------------------------------------------------------
                                  Average  Maximum  Maximum  Time of Max    Reported
                                    Depth    Depth      HGL   Occurrence   Max Depth
Node                 Type            Feet     Feet     Feet  days hr:min        Feet
-------------------------------------------------------------------------------------
102                  JUNCTION       15.58    19.31  5505.31     0  01:28       19.31
103                  JUNCTION        6.13    10.80  5531.12     0  01:25       10.80
104                  JUNCTION        6.03     6.36  5544.36     0  01:17        6.36
105                  JUNCTION        0.03     0.36  5599.86     0  01:10        0.36
106                  JUNCTION        0.00     0.00  5544.00     0  00:00        0.00
```

106T	JUNCTION	4.00	9.42	5553.42	0	01:28	9.42
107	JUNCTION	0.00	0.00	5544.00	0	00:00	0.00
108	JUNCTION	0.00	0.00	5569.00	0	00:00	0.00
108T	JUNCTION	5.32	10.95	5579.95	0	01:25	10.95
109	JUNCTION	0.00	0.00	5569.00	0	00:00	0.00
110	JUNCTION	0.03	1.00	5611.00	0	00:40	1.00
110T	JUNCTION	22.42	23.94	5624.94	0	01:13	23.94
111	JUNCTION	0.13	1.66	5638.66	0	01:05	1.66
112	JUNCTION	6.17	9.59	5610.84	0	01:26	9.59
113	JUNCTION	14.08	15.88	5639.88	0	01:09	15.88
114	JUNCTION	0.06	2.03	5642.03	0	00:40	2.02
115	JUNCTION	0.05	1.11	5660.11	0	00:45	1.11
115T	JUNCTION	11.48	12.54	5621.11	0	00:52	12.53
116	JUNCTION	24.32	29.49	5638.23	0	01:31	29.49
117	JUNCTION	0.04	0.81	5622.81	0	00:50	0.81
118	JUNCTION	0.03	0.64	5698.64	0	00:55	0.64
118T	JUNCTION	32.04	32.75	5662.75	0	01:09	32.75
119	JUNCTION	0.04	0.76	5711.76	0	00:50	0.76
120	JUNCTION	0.00	0.00	5639.00	0	00:00	0.00
120T	JUNCTION	5.57	9.52	5648.52	0	01:29	9.52
121	JUNCTION	0.00	0.00	5639.00	0	00:00	0.00
122	JUNCTION	0.00	0.00	5639.00	0	00:00	0.00
123	JUNCTION	0.03	0.95	5688.95	0	00:45	0.95
123T	JUNCTION	3.37	6.15	5665.15	0	00:50	6.15
124	JUNCTION	0.04	1.20	5737.20	0	00:40	1.20
124T	JUNCTION	16.04	17.18	5690.68	0	00:51	17.18
125	JUNCTION	5.86	9.87	5696.63	0	02:01	9.86
126	JUNCTION	0.05	1.70	5727.70	0	00:40	1.69
126T	JUNCTION	12.05	13.68	5718.68	0	00:48	13.67
127	JUNCTION	0.00	0.00	5716.59	0	00:00	0.00
127T	JUNCTION	14.37	17.89	5734.48	0	01:31	17.89
128	JUNCTION	0.00	0.00	5716.59	0	00:00	0.00
129	JUNCTION	0.05	0.35	5777.35	0	01:10	0.35
129T	JUNCTION	0.32	1.34	5747.84	0	02:06	1.34
130	JUNCTION	0.00	0.00	5761.00	0	00:00	0.00
130T	JUNCTION	0.22	1.32	5762.32	0	02:03	1.32
131	JUNCTION	0.06	1.45	5843.45	0	00:40	1.45
132	JUNCTION	0.02	0.38	5884.88	0	01:05	0.38
134	JUNCTION	0.07	1.66	5843.66	0	00:57	1.66
134T	JUNCTION	5.07	6.60	5792.60	0	01:03	6.60
135	JUNCTION	0.07	1.68	5883.68	0	00:50	1.68
136	JUNCTION	20.03	20.31	5818.31	0	01:07	20.31
137	JUNCTION	6.03	6.16	5825.16	0	02:38	6.16
138	JUNCTION	0.02	0.19	5825.69	0	01:10	0.19
139	JUNCTION	0.49	4.02	5775.02	0	01:26	4.02
140	JUNCTION	7.84	12.09	5798.09	0	01:29	12.09
141	JUNCTION	18.65	23.37	5833.45	0	01:27	23.37
142	JUNCTION	0.00	0.00	5848.00	0	00:00	0.00

142T	JUNCTION	9.59	13.83	5861.83	0	01:25	13.83
143	JUNCTION	0.00	0.00	5848.00	0	00:00	0.00
144	JUNCTION	0.00	0.00	5848.00	0	00:00	0.00
145	JUNCTION	0.00	0.00	5934.50	0	00:00	0.00
145T	JUNCTION	13.09	14.38	5887.38	0	01:09	14.38
146	JUNCTION	0.00	0.00	5934.50	0	00:00	0.00
146T	JUNCTION	28.55	29.22	5963.72	0	01:07	29.22
147	JUNCTION	0.05	0.72	6040.72	0	01:05	0.72
148	JUNCTION	1.65	4.72	5895.98	0	01:27	4.71
149	JUNCTION	14.05	14.62	5938.62	0	01:12	14.62
150	JUNCTION	0.04	0.62	6064.12	0	01:05	0.62
151	JUNCTION	6.74	8.58	5938.02	0	01:27	8.58
152	JUNCTION	4.05	4.49	6040.49	0	01:14	4.49
152T	JUNCTION	9.12	10.00	5989.00	0	01:19	10.00
153	JUNCTION	0.05	0.49	6061.99	0	01:10	0.49
154	JUNCTION	11.93	13.75	6030.47	0	01:25	13.75
155	JUNCTION	8.86	10.40	6136.40	0	01:21	10.40
156	JUNCTION	0.07	0.56	6317.56	0	01:10	0.56
156T	JUNCTION	20.49	22.07	6207.42	0	01:20	22.07
157	JUNCTION	34.16	35.45	6322.45	0	01:17	35.45
158	JUNCTION	0.16	1.45	6631.45	0	01:12	1.45
159	JUNCTION	0.00	0.00	6881.00	0	00:00	0.00
159T	JUNCTION	0.12	1.13	6882.13	0	01:10	1.13
160	JUNCTION	0.00	0.00	6881.00	0	00:00	0.00
101	OUTFALL	37.13	42.99	5478.10	0	01:32	42.99
133	DIVIDER	5.12	6.72	5778.72	0	01:00	6.72
330	STORAGE	3.58	14.80	5775.80	0	02:03	14.80

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Flow Inflow Volume 10^6 gal	Flow Balance Error Percent
102	JUNCTION	73.66	2316.01	0 01:27	2.58		

179	0.000							
103		JUNCTION	186.82	2276.58	0	01:22	5.12	
176	0.000							
104		JUNCTION	3.87	8.84	0	01:12	0.276	
0.717	0.000							
105		JUNCTION	5.10	5.10	0	01:10	0.439	
0.439	0.000							
106		JUNCTION	254.59	254.59	0	00:40	6.16	
6.16	0.000							
106T		JUNCTION	0.00	2176.98	0	01:23	0	
170	0.000							
107		JUNCTION	21.52	21.52	0	01:15	1.98	
1.98	0.000							
108		JUNCTION	14.63	14.63	0	01:15	2.2	
2.2	0.000							
108T		JUNCTION	0.00	2060.02	0	01:24	0	
162	0.000							
109		JUNCTION	71.08	71.08	0	01:00	3.41	
3.41	0.000							
110		JUNCTION	188.82	188.82	0	00:40	4.33	
4.33	0.000							
110T		JUNCTION	0.00	1987.48	0	01:20	0	
156	0.000							
111		JUNCTION	34.49	34.49	0	01:05	2.33	
2.33	0.000							
112		JUNCTION	114.93	1865.00	0	01:21	4.48	
149	0.000							
113		JUNCTION	148.10	214.47	0	01:00	6.04	
8.51	0.000							
114		JUNCTION	83.95	83.95	0	00:40	2.33	
2.33	0.000							
115		JUNCTION	162.38	162.38	0	00:45	5.16	
5.16	0.000							
115T		JUNCTION	0.00	1594.55	0	01:24	0	
136	0.000							
116		JUNCTION	129.70	1487.65	0	01:27	4.86	
131	0.000							
117		JUNCTION	60.15	60.15	0	00:50	2.38	
2.38	-0.000							
118		JUNCTION	48.33	48.33	0	00:55	2.07	
2.07	0.000							
118T		JUNCTION	0.00	98.67	0	01:07	0	
4.29	0.000							
119		JUNCTION	53.70	53.70	0	00:50	2.18	
2.18	0.000							
120		JUNCTION	81.70	81.70	0	00:50	3.14	
3.14	0.000							
120T		JUNCTION	0.00	1276.19	0	01:26	0	

120	0.000							
121		JUNCTION	97.24	97.24	0	01:00	4.93	
4.93	0.000							
122		JUNCTION	94.41	94.41	0	01:05	5.27	
5.27	0.000							
123		JUNCTION	124.85	124.85	0	00:45	3.6	
3.6	0.000							
123T		JUNCTION	0.00	1058.65	0	01:26	0	
106	0.000							
124		JUNCTION	189.16	189.16	0	00:40	5.02	
5.02	0.000							
124T		JUNCTION	0.00	304.42	0	00:49	0	
8.64	0.000							
125		JUNCTION	25.26	897.34	0	01:28	1.32	
97.7	0.000							
126		JUNCTION	75.91	75.91	0	00:40	1.98	
1.98	0.000							
126T		JUNCTION	0.00	880.19	0	02:00	0	
96.3	0.000							
127		JUNCTION	35.19	35.19	0	01:05	1.85	
1.85	0.000							
127T		JUNCTION	0.00	864.62	0	01:59	0	
94.4	0.000							
128		JUNCTION	153.78	153.78	0	00:45	4.63	
4.63	0.000							
129		JUNCTION	8.58	8.58	0	01:10	0.972	
0.972	0.000							
129T		JUNCTION	0.00	246.37	0	02:06	0	
30.2	0.000							
130		JUNCTION	176.31	176.31	0	00:45	5.43	
5.43	0.000							
130T		JUNCTION	0.00	239.29	0	02:03	0	
29.2	-0.000							
131		JUNCTION	89.82	90.33	0	00:40	2.39	
2.73	0.000							
132		JUNCTION	5.92	5.92	0	01:05	0.334	
0.334	0.000							
134		JUNCTION	17.38	116.47	0	00:57	0.718	
4.32	0.000							
134T		JUNCTION	0.00	431.01	0	00:59	0	
19.1	0.000							
135		JUNCTION	101.89	101.89	0	00:50	3.56	
3.56	0.000							
136		JUNCTION	217.34	317.43	0	00:55	5.82	
14.7	-0.000							
137		JUNCTION	170.55	170.55	0	00:40	4.42	
8.62	0.000							
138		JUNCTION	39.96	39.96	0	01:10	3.72	

```
3.72       0.000
  139                 JUNCTION    199.09   666.13     0  01:26        5.11
57.6       0.000
  140                 JUNCTION     20.46   588.79     0  01:29        1.75
52.5       0.000
  141                 JUNCTION      3.57   570.03     0  01:27       0.365
50.7       0.000
  142                 JUNCTION     16.90    16.90     0  01:10         1.6
1.6        0.000
  142T                JUNCTION      0.00   566.85     0  01:24           0
50.4       0.000
  143                 JUNCTION     10.62    10.62     0  01:10        1.21
1.21       0.000
  144                 JUNCTION     31.52    31.52     0  01:10        2.89
2.89       0.000
  145                 JUNCTION     25.86    25.86     0  01:05        1.85
1.85       0.000
  145T                JUNCTION      0.00   510.08     0  01:22           0
44.7       0.000
  146                 JUNCTION     47.94    47.94     0  01:05        3.12
3.12       0.000
  146T                JUNCTION      0.00   147.84     0  01:07           0
8.81       0.000
  147                 JUNCTION     74.12    74.12     0  01:05        3.84
3.84       0.000
  148                 JUNCTION     28.74   373.42     0  01:26        1.57
35.8       -0.000
  149                 JUNCTION     27.56   349.97     0  01:25        2.55
34.3       0.000
  150                 JUNCTION     24.65    24.65     0  01:05        1.64
1.64       0.000
  151                 JUNCTION     43.37   300.67     0  01:26        4.06
30.1       0.000
  152                 JUNCTION     20.37    58.32     0  01:12        2.07
5.96       -0.000
  152T                JUNCTION      0.00   259.14     0  01:24           0
 26        0.000
  153                 JUNCTION     38.12    38.12     0  01:10        3.89
3.89       0.000
  154                 JUNCTION     28.97   201.43     0  01:23        2.38
 20        0.000
  155                 JUNCTION     34.77   174.47     0  01:20        3.25
17.6       0.000
  156                 JUNCTION     19.43    19.43     0  01:10        2.17
2.17       0.000
  156T                JUNCTION      0.00   140.59     0  01:19           0
14.4       0.000
  157                 JUNCTION     23.07   121.37     0  01:16        2.85
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12.2       0.000
  158                 JUNCTION     37.25    98.52     0  01:12         3.4
9.35       0.000
  159                 JUNCTION     29.88    29.88     0  01:10         2.5
2.5        0.000
  159T                JUNCTION      0.00    61.63     0  01:10           0
5.94       0.000
  160                 JUNCTION     31.76    31.76     0  01:10        3.44
3.44       0.000
  101                 OUTFALL      83.93  2382.33     0  01:31         4.6
183        0.000
  133                 DIVIDER      72.62   488.02     0  00:59        1.85
20.9       0.000
  330                 STORAGE       0.00   756.49     0  00:58           0
29.3       0.056
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****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
102	JUNCTION	48.00	19.312	10.808
103	JUNCTION	48.00	10.802	4.698
104	JUNCTION	48.00	6.356	2.644
105	JUNCTION	48.00	0.357	2.643
106	JUNCTION	48.00	0.000	0.000
106T	JUNCTION	48.00	9.422	2.578
107	JUNCTION	48.00	0.000	0.000
108	JUNCTION	48.00	0.000	0.000
108T	JUNCTION	48.00	10.948	2.352
109	JUNCTION	48.00	0.000	0.000
110	JUNCTION	48.00	0.999	0.501
110T	JUNCTION	48.00	23.937	4.343
111	JUNCTION	48.00	1.663	4.337
112	JUNCTION	48.00	9.593	3.407
113	JUNCTION	48.00	15.885	8.115
114	JUNCTION	48.00	2.034	7.966
115	JUNCTION	48.00	1.115	3.885
115T	JUNCTION	48.00	12.537	3.893
116	JUNCTION	48.00	29.490	2.760
117	JUNCTION	48.00	0.813	1.687
118	JUNCTION	48.00	0.640	4.360

118T	JUNCTION	48.00	32.750	4.250
119	JUNCTION	48.00	0.762	4.238
120	JUNCTION	48.00	0.000	0.000
120T	JUNCTION	48.00	9.516	2.214
121	JUNCTION	48.00	0.000	0.000
122	JUNCTION	48.00	0.000	0.000
123	JUNCTION	48.00	0.949	2.051
123T	JUNCTION	48.00	6.147	1.943
124	JUNCTION	48.00	1.201	3.799
124T	JUNCTION	48.00	17.182	3.818
125	JUNCTION	48.00	9.867	4.133
126	JUNCTION	48.00	1.700	4.300
126T	JUNCTION	48.00	13.675	4.325
127	JUNCTION	48.00	0.000	0.000
127T	JUNCTION	48.00	17.887	4.983
128	JUNCTION	48.00	0.000	0.000
129	JUNCTION	48.00	0.345	4.655
129T	JUNCTION	48.00	1.339	8.661
130	JUNCTION	48.00	0.000	0.000
130T	JUNCTION	48.00	1.320	8.680
131	JUNCTION	48.00	1.452	4.548
132	JUNCTION	48.00	0.382	2.618
134	JUNCTION	48.00	1.665	1.335
134T	JUNCTION	48.00	6.605	3.395
135	JUNCTION	48.00	1.683	1.317
136	JUNCTION	48.00	20.306	9.694
137	JUNCTION	48.00	6.163	9.837
138	JUNCTION	48.00	0.193	9.807
139	JUNCTION	48.00	4.022	4.978
140	JUNCTION	48.00	12.088	5.142
141	JUNCTION	48.00	23.373	4.627
142	JUNCTION	48.00	0.000	0.000
142T	JUNCTION	48.00	13.831	3.169
143	JUNCTION	48.00	0.000	0.000
144	JUNCTION	48.00	0.000	0.000
145	JUNCTION	48.00	0.000	0.000
145T	JUNCTION	48.00	14.378	9.622
146	JUNCTION	48.00	0.000	0.000
146T	JUNCTION	48.00	29.224	4.276
147	JUNCTION	48.00	0.724	4.276
148	JUNCTION	48.00	4.716	4.484
149	JUNCTION	48.00	14.618	7.382
150	JUNCTION	48.00	0.622	7.378
151	JUNCTION	48.00	8.581	7.919
152	JUNCTION	48.00	4.488	3.512
152T	JUNCTION	48.00	9.996	7.004
153	JUNCTION	48.00	0.488	2.512
154	JUNCTION	48.00	13.751	2.919

155	JUNCTION	48.00	10.402	5.248
156	JUNCTION	48.00	0.565	2.435
156T	JUNCTION	48.00	22.066	8.204
157	JUNCTION	48.00	35.451	13.549
158	JUNCTION	48.00	1.452	13.548
159	JUNCTION	48.00	0.000	0.000
159T	JUNCTION	48.00	1.134	13.866
160	JUNCTION	48.00	0.000	0.000
133	DIVIDER	48.00	6.715	3.285
330	STORAGE	48.00	14.801	1.199

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	Evap Pcnt Loss	Exfil Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
330	431.369	15	0	0	2400.896	85	0 02:03	239.29

****
Outfall Loading Summary
****

Outfall Node	Flow Freq Pcnt	Avg Flow CFS	Max Flow CFS	Total Volume 10^6 gal

101	99.81	142.09	2382.33	183.308	
System	99.81	142.09	2382.33	183.308	

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days	hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
202	CONDUIT	2311.90	0	01:32	6.13	0.43	0.67
203	CONDUIT	2270.18	0	01:28	5.61	0.09	0.28
204	CONDUIT	8.83	0	01:15	5.64	0.15	0.29
205	CONDUIT	5.07	0	01:17	2.64	0.01	0.12
206	DUMMY	254.59	0	00:40			
206T	CONDUIT	2176.18	0	01:25	8.02	0.27	0.53
207	DUMMY	21.52	0	01:15			
208	DUMMY	14.63	0	01:15			
208T	CONDUIT	2058.94	0	01:28	7.38	0.42	0.71
209	DUMMY	71.08	0	01:00			
210	CONDUIT	182.66	0	00:46	2.26	0.36	0.65
210T	CONDUIT	1985.79	0	01:25	7.22	0.47	0.74
211	CONDUIT	34.25	0	01:13	5.43	0.17	0.28
212	CONDUIT	1864.47	0	01:23	2.52	0.48	0.74
213	CONDUIT	214.37	0	01:01	6.00	0.32	0.61
214	CONDUIT	71.75	0	01:09	1.43	0.02	0.19
215	CONDUIT	159.50	0	00:52	6.29	0.02	0.22
215T	CONDUIT	1594.29	0	01:26	6.70	0.46	0.72
216	CONDUIT	1487.46	0	01:28	2.58	0.48	0.69
217	CONDUIT	60.13	0	00:51	6.22	0.08	0.33
218	CONDUIT	47.83	0	01:00	5.51	0.00	0.13
218T	CONDUIT	98.65	0	01:08	5.07	0.01	0.19
219	CONDUIT	51.52	0	01:09	4.47	0.01	0.15
220	DUMMY	81.70	0	00:50			
220T	CONDUIT	1274.58	0	01:31	4.84	0.40	0.69
221	DUMMY	97.24	0	01:00			
222	DUMMY	94.41	0	01:05			
223	CONDUIT	124.52	0	00:47	3.39	0.08	0.32
223T	CONDUIT	1057.78	0	01:29	6.57	0.39	0.68
224	CONDUIT	181.36	0	00:51	6.38	0.02	0.24
224T	CONDUIT	304.22	0	00:50	6.70	0.58	0.79
225	CONDUIT	896.20	0	01:32	6.77	0.37	0.67
226	CONDUIT	73.69	0	00:48	3.04	0.06	0.28
226T	CONDUIT	879.82	0	02:01	7.40	0.22	0.54

227	DUMMY	35.19	0	01:05			
227T	CONDUIT	864.53	0	02:00	8.55	0.33	0.63
228	DUMMY	153.78	0	00:45			
229	CONDUIT	8.53	0	01:19	3.15	0.00	0.07
229T	CONDUIT	245.87	0	02:09	6.65	0.03	0.27
230	DUMMY	176.31	0	00:45			
230T	CONDUIT	238.93	0	02:06	4.37	0.02	0.13
231	CONDUIT	87.99	0	00:51	5.32	0.04	0.24
232	CONDUIT	5.62	0	01:21	1.90	0.01	0.12
233	CONDUIT	470.04	0	00:59	18.24	1.06	0.94
234	CONDUIT	115.65	0	01:03	5.25	0.24	0.53
234T	CONDUIT	430.86	0	01:00	5.05	0.11	0.34
235	CONDUIT	99.43	0	00:57	4.30	0.26	0.55
236	CONDUIT	317.29	0	00:57	6.16	0.06	0.28
237	CONDUIT	143.74	0	01:07	0.82	0.00	0.03
238	CONDUIT	30.02	0	02:38	0.30	0.00	0.02
239	CONDUIT	664.30	0	01:31	7.20	0.15	0.45
240	CONDUIT	588.55	0	01:31	5.57	0.07	0.34
241	CONDUIT	569.75	0	01:29	6.00	0.18	0.49
242	DUMMY	16.90	0	01:10			
242T	CONDUIT	566.62	0	01:27	6.70	0.24	0.54
243	DUMMY	10.62	0	01:10			
244	DUMMY	31.52	0	01:10			
245	DUMMY	25.86	0	01:05			
245T	CONDUIT	509.68	0	01:25	5.42	0.30	0.60
246	DUMMY	47.94	0	01:05			
246T	CONDUIT	147.76	0	01:09	6.92	0.01	0.13
247	CONDUIT	74.09	0	01:07	6.67	0.01	0.14
248	CONDUIT	373.36	0	01:27	5.91	0.18	0.48
249	CONDUIT	349.83	0	01:27	6.41	0.14	0.44
250	CONDUIT	24.40	0	01:12	4.50	0.01	0.08
251	CONDUIT	300.67	0	01:26	6.44	0.12	0.40
252	CONDUIT	58.15	0	01:19	4.19	0.01	0.12
252T	CONDUIT	259.01	0	01:27	6.17	0.04	0.21
253	CONDUIT	38.04	0	01:14	3.14	0.03	0.16
254	CONDUIT	201.36	0	01:25	6.21	0.11	0.34
255	CONDUIT	174.14	0	01:25	6.33	0.15	0.42
256	CONDUIT	19.37	0	01:16	5.15	0.04	0.19
256T	CONDUIT	140.55	0	01:21	6.55	0.05	0.25
257	CONDUIT	121.28	0	01:20	6.51	0.02	0.18
258	CONDUIT	98.34	0	01:17	8.60	0.01	0.10
259	DUMMY	29.88	0	01:10			
259T	CONDUIT	61.45	0	01:13	7.49	0.00	0.08
260	DUMMY	31.76	0	01:10			
433	CONDUIT	44.73	0	01:00	11.41	0.00	0.13
530	DUMMY	239.29	0	02:03			

****
Conduit Surcharge Summary
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Conduit	Hours Full: Both Ends	Hours Full: Upstream	Hours Full: Dnstream	Hours Above Full Normal Flow	Hours Capacity Limited
233	0.39	0.39	0.39	0.39	0.39

Analysis begun on: Mon Jun 26 15:15:43 2017
Analysis ended on: Mon Jun 26 15:15:43 2017
Total elapsed time: < 1 sec

Table B-3 - Baseline Peak Flows

Design Point	Drainage Area (acres)	Existing Percent Imperviousness	Future Percent Imperviousness	Existing Condtions Peak Flow (cfs)							Future Condtions Peak Flow (cfs)						
				Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	Q_{500}	Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	Q_{500}
101	4630	21	27	178	296	430	1,096	1,454	1,991	3,159	262	421	594	1,382	1,801	2,382	3,620
102	4529	21	27	171	284	413	1,061	1,406	1,933	3,073	255	409	576	1,347	1,753	2,316	3,520
103	4479	20	27	168	277	402	1,043	1,376	1,902	3,029	251	403	566	1,329	1,727	2,277	3,459
104	20	14	14	0	1	2	4	6	9	14	0	1	2	4	6	9	14
105	12	13	13	0	0	1	3	4	5	8	0	0	1	3	4	5	8
106T	4345	20	26	159	262	380	991	1,321	1,837	2,929	241	386	541	1,273	1,649	2,177	3,329
106	124	5	59	0	1	4	16	22	32	52	52	76	103	166	207	255	361
107	54	17	17	1	2	5	11	15	22	34	1	2	5	11	15	22	34
108T	4166	20	25	158	261	376	970	1,286	1,788	2,850	227	361	504	1,199	1,550	2,060	3,251
108	70	4	4	0	0	2	7	10	15	24	0	0	2	7	10	15	24
109	81	3	35	0	0	2	6	8	12	19	8	13	21	42	54	71	105
110T	4015	21	26	159	263	378	970	1,269	1,763	2,813	224	355	494	1,173	1,509	1,987	3,171
110	84	18	65	4	7	14	35	48	66	102	42	61	80	126	154	189	264
111	69	9	9	1	2	5	17	24	34	55	1	2	5	17	24	34	55
112	3862	21	25	156	256	367	921	1,208	1,680	2,679	207	327	455	1,082	1,391	1,865	3,074
113	183	45	45	31	48	71	131	167	214	314	31	48	71	131	167	214	314
114	53	39	39	12	19	29	52	67	84	122	12	19	29	52	67	84	122
115T	3575	19	24	124	202	289	742	1,033	1,448	2,320	174	272	376	895	1,159	1,595	2,788
115	108	36	51	16	24	39	75	96	123	181	29	43	61	104	130	162	232
116	3466	19	23	113	184	263	693	972	1,365	2,217	156	243	336	807	1,071	1,488	2,682
117	54	39	39	8	13	20	37	47	60	88	8	13	20	37	47	60	88
118T	102	25	31	7	12	22	48	64	86	129	10	17	28	57	75	99	147
118	47	31	41	4	6	11	22	28	38	56	7	11	16	30	38	48	70
119	56	20	22	3	7	13	28	38	50	76	4	8	14	31	41	54	81
120T	3204	17	22	90	145	204	590	835	1,178	2,019	130	200	272	661	908	1,276	2,432
120	75	32	32	9	15	25	49	63	82	120	9	15	25	49	63	82	120
121	119	28	30	9	15	26	53	69	92	137	10	17	28	57	74	97	145
122	129	30	30	9	16	26	54	71	94	141	9	16	26	54	71	94	141
123T	2882	16	21	82	127	195	485	689	975	1,780	126	188	273	533	751	1,059	2,146
124T	183	42	49	39	61	93	169	215	273	397	51	77	112	192	242	304	438
123	81	39	39	18	29	44	77	98	125	181	18	29	44	77	98	125	181
124	102	44	56	25	37	55	98	124	157	227	37	55	76	123	154	189	268
125	2699	14	19	58	89	153	413	586	832	1,644	84	122	183	450	636	897	1,963
126T	2667	14	19	56	86	148	403	572	812	1,620	82	118	177	439	621	880	1,935
126	45	42	42	12	17	26	47	60	76	110	12	17	26	47	60	76	110
127T	2621	14	18	52	79	141	387	549	780	1,589	73	107	165	421	595	865	1,891
127	47	31	31	4	6	9	20	26	35	53	4	6	9	20	26	35	53
128	105	43	43	24	35	52	95	121	154	223	24	35	52	95	121	154	223
129T	688	25	36	30	38	46	59	66	127	512	38	45	52	63	69	246	684
129	30	8	8	0	0	1	4	6	8	14	0	0	1	4	6	9	14
130T	657	26	37	30	37	45	57	62	121	500	38	45	51	60	65	239	672
330	657	26	37	57	94	156	333	443	591	896	111	163	233	437	564	756	1,086
130	121	37	43	21	32	50	94	121	155	228	27	40	61	109	139	176	255
131	59	20	48	2	4	9	22	30	42	65	16	24	34	57	73	90	131
132	8	31	31	1	1	2	3	4	6	9	1	1	2	3	4	6	9
133	478	24	35	40	65	108	231	307	410	623	71	104	152	289	374	488	727
134T	439	25	33	39	63	103	219	291	386	586	59	90	133	255	331	431	643
134	114	20	21	7	12	25	62	85	115	177	7	13	26	64	86	116	180

Table B-3 - Baseline Peak Flows

Design Point	Drainage Area (acres)	Existing Percent Imperviousness	Future Percent Imperviousness	Existing Condtions Peak Flow (cfs)							Future Condtions Peak Flow (cfs)						
				Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	Q_{500}	Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	Q_{500}
135	97	18	18	6	11	22	56	76	102	157	6	11	22	56	76	102	157
136	324	27	37	32	52	79	158	207	273	411	58	82	109	194	247	317	468
137	220	18	19	22	34	53	100	129	165	244	24	37	56	104	134	171	251
138	117	2	4	0	1	5	19	27	40	64	0	1	5	19	27	40	64
139	1782	7	10	12	25	73	284	421	619	1,014	30	46	89	310	457	666	1,092
140	1665	7	7	10	22	65	258	382	564	922	12	26	71	270	400	589	966
141	1611	7	7	10	22	64	252	373	551	901	11	25	69	261	387	570	934
142T	1597	7	7	10	22	64	251	372	548	895	11	25	69	260	385	567	929
142	53	7	7	0	1	2	7	11	17	28	0	1	2	7	11	17	28
143	43	4	7	0	0	0	4	6	9	15	0	0	1	4	7	11	18
144	94	10	10	1	2	3	14	21	32	52	1	2	3	14	21	32	52
145T	1406	7	7	9	20	60	228	336	492	802	10	22	64	236	348	510	833
146T	253	18	18	9	16	28	75	104	147	230	9	16	28	75	105	148	231
145	58	11	11	1	1	3	12	17	25	41	1	2	3	12	18	26	42
146	93	15	15	2	4	8	23	33	48	76	2	4	8	23	33	48	76
147	103	26	26	6	10	17	40	55	74	113	6	10	17	40	55	74	113
148	1153	4	5	3	7	36	161	241	358	589	4	9	40	169	252	373	616
149	1102	4	5	3	7	35	153	229	339	558	3	9	37	159	236	350	576
150	55	2	7	0	0	1	9	14	21	34	0	1	2	11	16	25	41
151	963	4	5	3	7	32	135	200	296	486	3	7	33	138	204	301	494
152T	834	4	4	2	5	28	119	175	259	424	2	6	28	119	176	259	425
152	188	6	6	1	2	7	27	40	59	96	1	2	7	27	40	58	96
153	124	7	7	1	1	4	17	26	38	63	1	1	4	17	26	38	63
154	646	3	3	1	3	21	92	136	201	329	1	4	21	92	136	201	329
155	566	3	3	1	3	19	80	118	174	284	1	3	19	80	118	174	285
156T	458	2	2	1	2	16	66	96	140	228	1	2	16	66	96	141	228
156	72	2	2	0	0	2	9	13	19	32	0	0	2	9	13	19	32
157	385	2	2	1	2	14	57	83	121	196	1	2	14	57	83	121	196
158	294	2	2	1	1	12	46	67	98	158	1	2	12	47	68	99	159
159T	187	2	3	0	1	7	29	42	61	99	0	1	8	29	42	62	99
159	79	2	3	0	0	3	14	20	30	48	0	1	4	14	21	30	48
160	108	2	2	0	0	4	15	22	32	51	0	0	4	15	22	32	51

Table B-4 - Baseline Runoff Volumes

Design Point	Drainage Area (acres)	Existing Percent Imperviousness	Future Percent Imperviousness	Existing Condtions Runoff Volume (acre-feet)							Future Condtions Runoff Volume (acre-feet)						
				V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}	V_{500}	V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}	V_{500}
101	4630	21	27	44	72	103	292	396	534	822	61	95	133	322	427	562	853
102	4529	21	27	42	68	99	284	384	519	801	58	92	128	313	414	549	832
103	4479	20	27	40	65	95	278	377	509	789	56	89	125	306	408	540	819
104	20	14	14	0	0	0	1	2	2	3	0	0	0	1	2	2	3
105	12	13	13	0	0	0	1	1	1	2	0	0	0	1	1	1	2
106T	4345	20	26	37	62	90	267	362	494	764	54	85	119	295	393	522	792
106	124	5	59	0	0	2	6	9	12	20	4	6	8	12	15	19	27
107	54	17	17	0	1	1	3	4	6	9	0	1	1	3	4	6	9
108T	4166	20	25	37	60	88	258	350	476	733	50	79	111	280	371	497	755
108	70	4	4	0	0	1	3	5	7	11	0	0	1	3	5	7	11
109	81	3	35	0	0	1	4	6	8	13	1	2	4	6	8	10	16
110T	4015	21	26	37	60	87	250	341	460	709	48	76	107	270	359	479	730
110	84	18	65	1	1	2	5	7	9	15	3	5	6	9	11	13	19
111	69	9	9	0	0	1	4	5	7	11	0	0	1	4	5	7	11
112	3862	21	25	36	59	85	242	328	442	681	45	72	101	257	344	457	700
113	183	45	45	5	7	10	16	21	26	38	5	7	10	16	21	26	38
114	53	39	39	1	2	3	4	6	7	10	1	2	3	4	6	7	10
115T	3575	19	24	30	49	72	217	296	402	623	39	62	88	233	313	417	641
115	108	36	51	2	3	5	9	11	14	21	3	5	7	10	13	16	23
116	3466	19	23	28	47	68	208	284	387	602	36	58	83	222	299	402	617
117	54	39	39	1	2	3	5	6	7	11	1	2	3	5	6	7	11
118T	102	25	31	1	2	4	7	10	13	19	2	3	4	8	10	13	20
118	47	31	41	1	1	2	3	5	6	9	1	2	2	4	5	6	9
119	56	20	22	1	1	2	4	5	7	10	1	1	2	4	5	7	10
120T	3204	17	22	23	39	58	187	257	353	552	31	50	72	201	271	368	565
120	75	32	32	1	2	3	6	7	10	14	1	2	3	6	7	10	14
121	119	28	30	2	3	5	9	11	15	22	2	3	5	9	12	15	23
122	129	30	30	2	3	5	9	12	16	24	2	3	5	9	12	16	24
123T	2882	16	21	23	37	68	163	226	313	491	31	49	81	176	240	325	503
124T	183	42	49	4	7	10	16	20	25	37	5	8	11	17	21	27	38
123	81	39	39	2	3	4	7	9	11	16	2	3	4	7	9	11	16
124	102	44	56	3	4	6	9	11	14	21	3	5	7	10	12	15	22
125	2699	14	19	18	30	58	147	206	287	451	26	41	70	160	219	300	466
126T	2667	14	19	18	30	56	145	203	283	448	26	41	69	157	215	296	460
126	45	42	42	1	2	2	4	5	6	9	1	2	2	4	5	6	9
127T	2621	14	18	17	28	54	141	198	277	439	24	39	67	153	211	290	451
127	47	31	31	1	1	2	3	4	6	9	1	1	2	3	4	6	9
128	105	43	43	3	4	5	9	11	14	21	3	4	5	9	11	14	21
129T	688	25	36	10	15	25	48	64	85	129	14	22	32	56	72	93	137
129	30	8	8	0	0	0	1	2	3	5	0	0	0	1	2	3	5
130T	657	26	37	9	15	24	47	62	82	124	14	22	32	54	70	90	132
330	657	26	37	9	15	24	47	62	82	124	14	22	32	54	70	90	132
130	121	37	43	2	4	6	10	12	16	24	3	4	6	10	13	17	24
131	59	20	48	1	1	2	4	5	7	10	2	2	3	5	7	8	12
132	8	31	31	0	0	0	1	1	1	2	0	0	0	1	1	1	2
133	478	24	35	7	10	17	34	45	59	90	10	15	22	39	50	64	95
134T	439	25	33	6	10	16	32	42	55	83	9	13	20	35	45	59	87
134	114	20	21	1	2	3	7	10	13	20	1	2	3	7	10	13	20

Table B-4 - Baseline Runoff Volumes

Design Point	Drainage Area (acres)	Existing Percent Imperviousness	Future Percent Imperviousness	Existing Condtions Runoff Volume (acre-feet)							Future Condtions Runoff Volume (acre-feet)						
				V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}	V_{500}	V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}	V_{500}
135	97	18	18	1	1	3	6	8	11	17	1	1	3	6	8	11	17
136	324	27	37	5	8	13	24	32	42	63	8	11	16	28	36	45	66
137	220	18	19	2	3	6	14	19	26	40	2	4	7	15	20	26	41
138	117	2	4	0	0	1	5	8	11	18	0	0	1	5	8	11	19
139	1782	7	10	4	8	22	81	118	172	279	7	12	27	86	123	177	284
140	1665	7	7	4	7	20	74	110	160	260	4	8	21	76	111	161	261
141	1611	7	7	3	7	19	72	106	155	251	4	8	21	73	107	156	253
142T	1597	7	7	3	7	19	72	105	153	249	4	8	20	73	106	155	251
142	53	7	7	0	0	1	2	3	5	8	0	0	1	2	3	5	8
143	43	4	7	0	0	0	1	2	4	6	0	0	0	2	2	4	6
144	94	10	10	0	1	1	4	6	9	14	0	1	1	4	6	9	14
145T	1406	7	7	3	6	18	64	94	136	221	3	7	19	65	95	137	222
146T	253	18	18	2	3	6	14	19	27	42	2	3	6	14	20	27	42
145	58	11	11	0	0	1	3	4	6	9	0	0	1	3	4	6	9
146	93	15	15	0	1	2	5	7	10	15	0	1	2	5	7	10	15
147	103	26	26	1	2	3	6	9	12	18	1	2	3	6	9	12	18
148	1153	4	5	1	3	12	50	74	109	178	2	4	13	51	75	110	180
149	1102	4	5	1	3	11	48	71	104	171	1	3	12	49	72	105	172
150	55	2	7	0	0	0	2	3	5	8	0	0	1	2	3	5	8
151	963	4	5	1	3	11	43	63	92	150	1	3	11	43	63	92	150
152T	834	4	4	1	2	9	37	55	80	130	1	2	9	37	55	80	130
152	188	6	6	0	1	2	9	13	18	30	0	1	2	9	13	18	30
153	124	7	7	0	1	1	6	8	12	19	0	1	1	6	8	12	19
154	646	3	3	1	1	7	28	42	61	100	1	1	7	28	42	61	101
155	566	3	3	0	1	6	25	37	54	88	0	1	6	25	37	54	88
156T	458	2	2	0	1	5	21	30	44	72	0	1	5	21	30	44	72
156	72	2	2	0	0	1	3	4	7	11	0	0	1	3	4	7	11
157	385	2	2	0	1	4	18	26	37	61	0	1	4	18	26	37	61
158	294	2	2	0	0	3	13	20	29	47	0	0	4	14	20	29	47
159T	187	2	3	0	0	2	9	12	18	30	0	0	2	9	13	18	30
159	79	2	3	0	0	1	4	5	8	12	0	0	1	4	5	8	13
160	108	2	2	0	0	1	5	7	11	17	0	0	1	5	7	11	17

Table B-5 - Baseline Peak Flows Along Drainageway Centerline

Design Point	Downstream Conveyance Element	Location	Total Drainage Area (acres)	Total Drainage Area (mi^2)	Length (feet)	Existing Peak Flows (cfs)							Future Peak Flows (cfs)						
						Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	Q_{500}	Q_2	Q_5	Q_{10}	Q_{25}	Q_{50}	Q_{100}	Q_{500}
101	---	Confluence with Bear Creek	4630	7.2	0	178	296	430	1,096	1,454	1,991	3,159	262	421	594	1,382	1,801	2,382	3,620
102	202		4529	7.1	1,991	171	284	413	1,061	1,406	1,933	3,073	255	409	576	1,347	1,753	2,316	3,520
103	203	U.S. 285 / West Hampden Avenue	4479	7.0	4,301	168	277	402	1,043	1,376	1,902	3,029	251	403	566	1,329	1,727	2,277	3,459
106T	206T		4345	6.8	6,158	159	262	380	991	1,321	1,837	2,929	241	386	541	1,273	1,649	2,177	3,329
108T	208T		4166	6.5	8,515	158	261	376	970	1,286	1,788	2,850	227	361	504	1,199	1,550	2,060	3,251
110T	210T		4015	6.3	11,767	159	263	378	970	1,269	1,763	2,813	224	355	494	1,173	1,509	1,987	3,171
112	212	West Quincy Avenue	3862	6.0	12,203	156	256	367	921	1,208	1,680	2,679	207	327	455	1,082	1,391	1,865	3,074
115T	215T		3575	5.6	13,202	124	202	289	742	1,033	1,448	2,320	174	272	376	895	1,159	1,595	2,788
116	216	South Simms Street	3466	5.4	13,541	113	184	263	693	972	1,365	2,217	156	243	336	807	1,071	1,488	2,682
120T	220T		3204	5.0	15,236	90	145	204	590	835	1,178	2,019	130	200	272	661	908	1,276	2,432
123T	223T		2882	4.5	16,665	82	127	195	485	689	975	1,780	126	188	273	533	751	1,059	2,146
125	225	South Youngfield Street	2699	4.2	18,467	58	89	153	413	586	832	1,644	84	122	183	450	636	897	1,963
126T	226T		2667	4.2	19,487	56	86	148	403	572	812	1,620	82	118	177	439	621	880	1,935
127T	227T	South Cole Street	2621	4.1	20,084	52	79	141	387	549	780	1,589	73	107	165	421	595	865	1,891
139	239	Quincy Avenue / C-470	1782	2.8	22,863	12	25	73	284	421	619	1,014	30	46	89	310	457	666	1,092
140	240		1665	2.6	23,901	10	22	65	258	382	564	922	12	26	71	270	400	589	966
141	241	West Belleview Avenue	1611	2.5	25,110	10	22	64	252	373	551	901	11	25	69	261	387	570	934
142T	242T		1597	2.5	26,400	10	22	64	251	372	548	895	11	25	69	260	385	567	929
145T	245T		1406	2.2	27,797	9	20	60	228	336	492	802	10	22	64	236	348	510	833
148	248	West Belleview Avenue	1153	1.8	28,607	3	7	36	161	241	358	589	4	9	40	169	252	373	616
149	249		1102	1.7	29,967	3	7	35	153	229	339	558	3	9	37	159	236	350	576
151	251	Crestbrook Drive	963	1.5	30,175	3	7	32	135	200	296	486	3	7	33	138	204	301	494
152T	252T		834	1.3	31,660	2	5	28	119	175	259	424	2	6	28	119	176	259	425
154	254	Meadowbrook Drive	646	1.0	32,758	1	3	21	92	136	201	329	1	4	21	92	136	201	329
155	255		566	0.9	35,349	1	3	19	80	118	174	284	1	3	19	80	118	174	285
156T	256T		458	0.7	36,389	1	2	16	66	96	140	228	1	2	16	66	96	141	228
157	257		385	0.6	37,994	1	2	14	57	83	121	196	1	2	14	57	83	121	196
158	258		294	0.5	40,933	1	1	12	46	67	98	158	1	2	12	47	68	99	159
159T	259T		187	0.3	43,343	0	1	7	29	42	61	99	0	1	8	29	42	62	99

Table B-6 - Baseline Runoff Volumes Along Drainageway Centerline

Design Point	Downstream Conveyance Element	Location	Total Drainage Area (acres)	Total Drainage Area (mi^2)	Length (feet)	Existing Runoff Volumes (acre-feet)							Future Runoff Volumes (acre-feet)						
						V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}	V_{500}	V_2	V_5	V_{10}	V_{25}	V_{50}	V_{100}	V_{500}
101	---	Confluence with Bear Creek	4630	7.2	0	44	72	103	292	396	534	822	61	95	133	322	427	562	853
102	202		4529	7.1	1,991	42	68	99	284	384	519	801	58	92	128	313	414	549	832
103	203		4479	7.0	4,301	40	65	95	278	377	509	789	56	89	125	306	408	540	819
106T	206T		4345	6.8	6,158	37	62	90	267	362	494	764	54	85	119	295	393	522	792
108T	208T		4166	6.5	8,515	37	60	88	258	350	476	733	50	79	111	280	371	497	755
110T	210T		4015	6.3	11,767	37	60	87	250	341	460	709	48	76	107	270	359	479	730
112	212		3862	6.0	12,203	36	59	85	242	328	442	681	45	72	101	257	344	457	700
115T	215T		3575	5.6	13,202	30	49	72	217	296	402	623	39	62	88	233	313	417	641
116	216		3466	5.4	13,541	28	47	68	208	284	387	602	36	58	83	222	299	402	617
120T	220T		3204	5.0	15,236	23	39	58	187	257	353	552	31	50	72	201	271	368	565
123T	223T		2882	4.5	16,665	23	37	68	163	226	313	491	31	49	81	176	240	325	503
125	225		2699	4.2	18,467	18	30	58	147	206	287	451	26	41	70	160	219	300	466
126T	226T		2667	4.2	19,487	18	30	56	145	203	283	448	26	41	69	157	215	296	460
127T	227T		2621	4.1	20,084	17	28	54	141	198	277	439	24	39	67	153	211	290	451
139	239		1782	2.8	22,863	4	8	22	81	118	172	279	7	12	27	86	123	177	284
140	240		1665	2.6	23,901	4	7	20	74	110	160	260	4	8	21	76	111	161	261
141	241		1611	2.5	25,110	3	7	19	72	106	155	251	4	8	21	73	107	156	253
142T	242T		1597	2.5	26,400	3	7	19	72	105	153	249	4	8	20	73	106	155	251
145T	245T		1406	2.2	27,797	3	6	18	64	94	136	221	3	7	19	65	95	137	222
148	248		1153	1.8	28,607	1	3	12	50	74	109	178	2	4	13	51	75	110	180
149	249		1102	1.7	29,967	1	3	11	48	71	104	171	1	3	12	49	72	105	172
151	251		963	1.5	30,175	1	3	11	43	63	92	150	1	3	11	43	63	92	150
152T	252T		834	1.3	31,660	1	2	9	37	55	80	130	1	2	9	37	55	80	130
154	254		646	1.0	32,758	1	1	7	28	42	61	100	1	1	7	28	42	61	101
155	255		566	0.9	35,349	0	1	6	25	37	54	88	0	1	6	25	37	54	88
156T	256T		458	0.7	36,389	0	1	5	21	30	44	72	0	1	5	21	30	44	72
157	257		385	0.6	37,994	0	1	4	18	26	37	61	0	1	4	18	26	37	61
158	258		294	0.5	40,933	0	0	3	13	20	29	47	0	0	4	14	20	29	47
159T	259T		187	0.3	43,343	0	0	2	9	12	18	30	0	0	2	9	13	18	30

Figure B-3
Weaver Creek
Baseline Peak Discharge vs. Drainageway Station

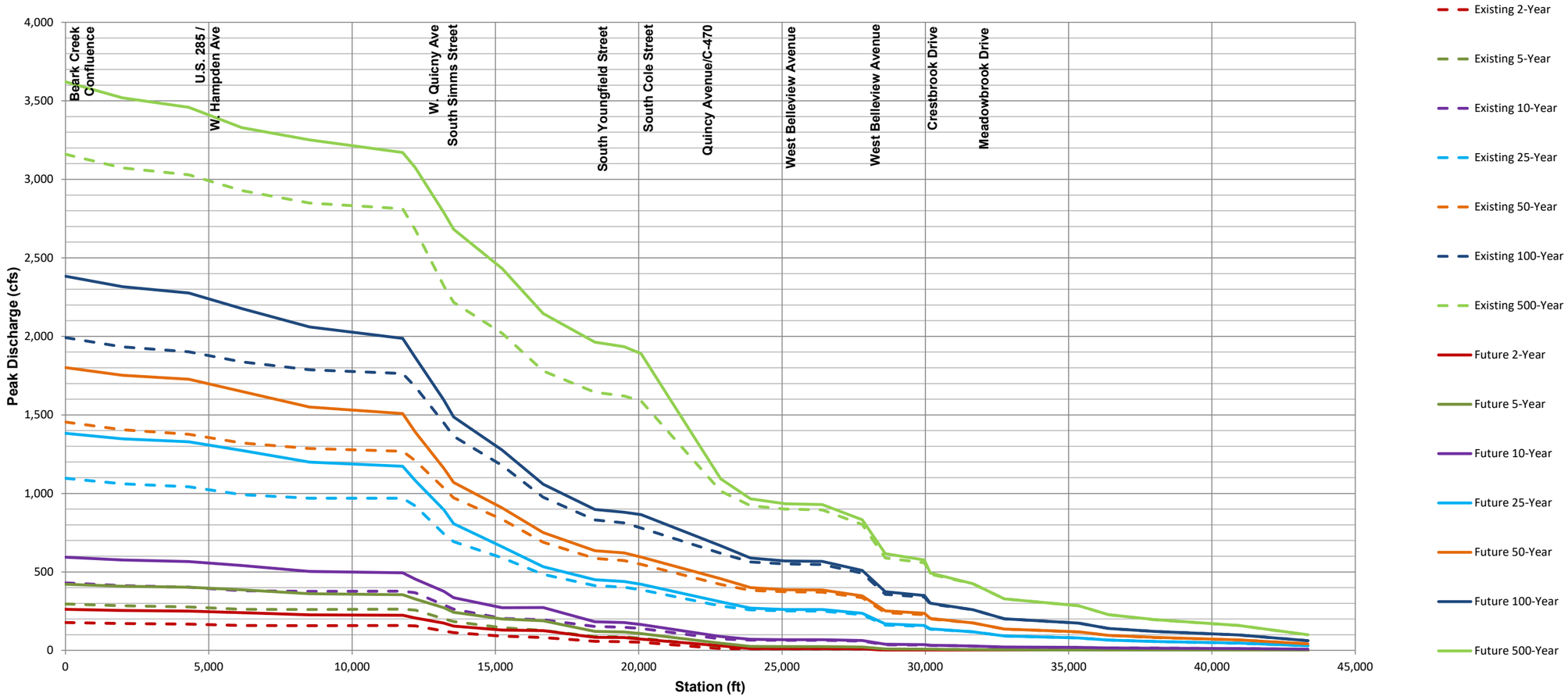
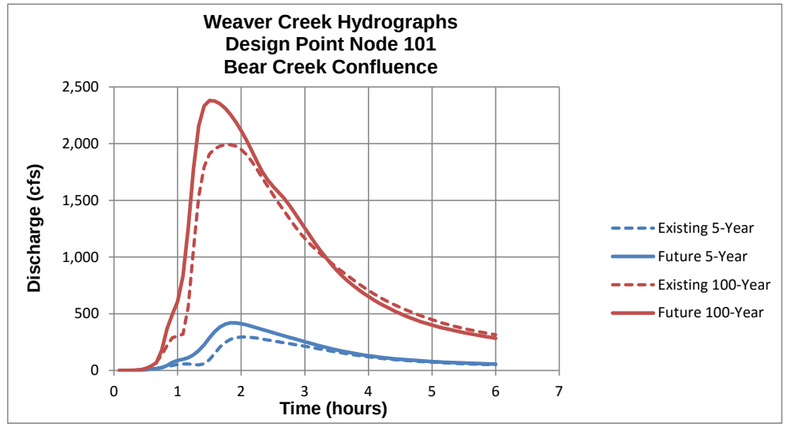
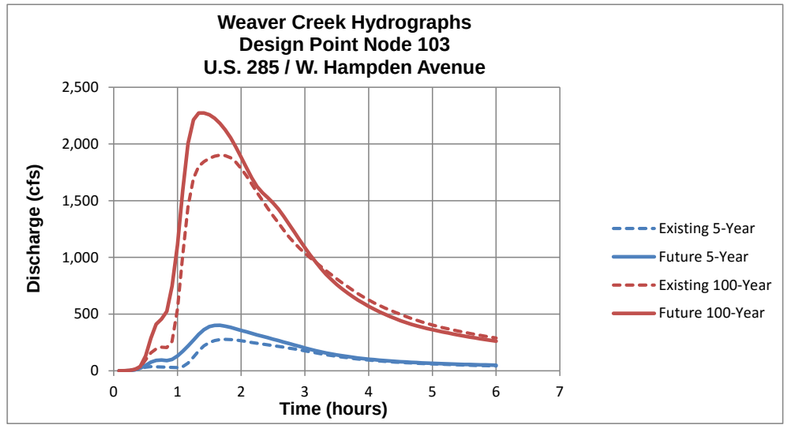
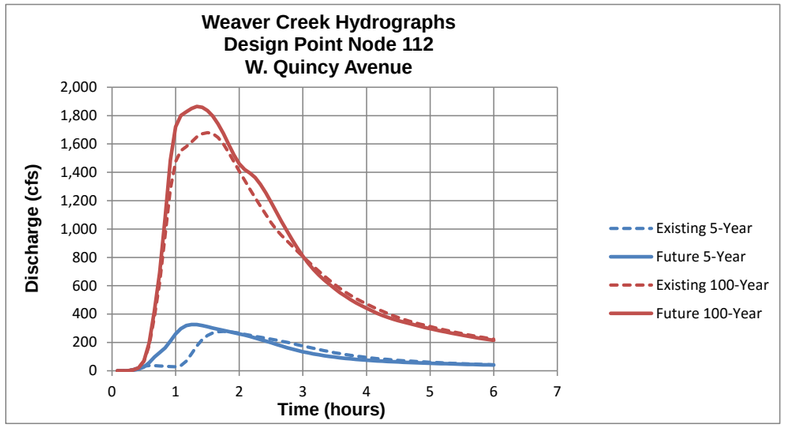
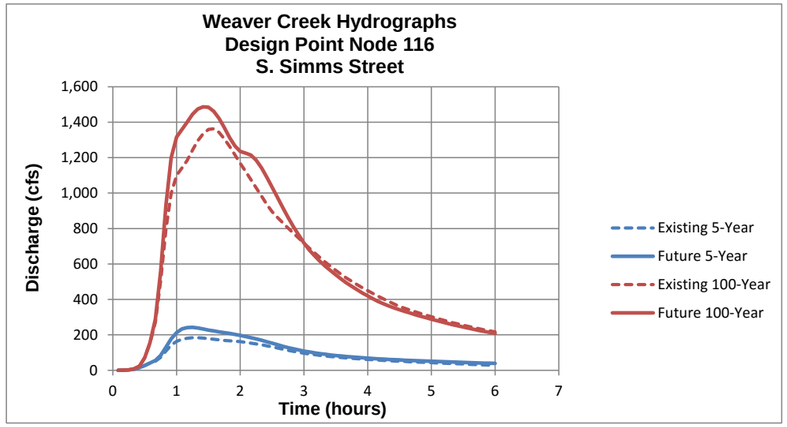


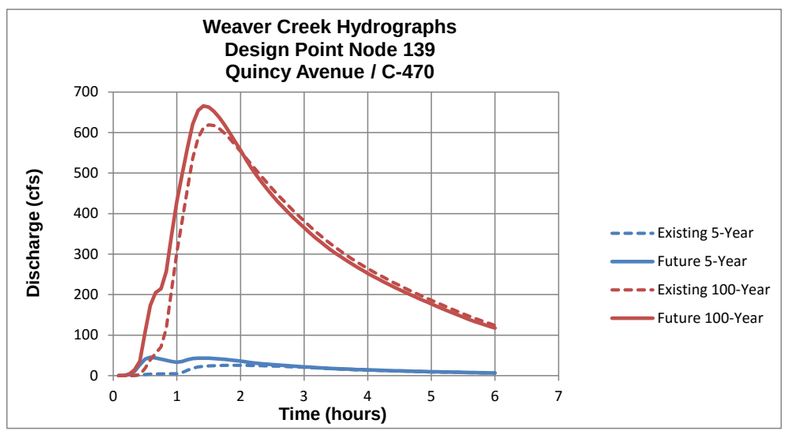
Figure B-4 - Baseline Hydrographs

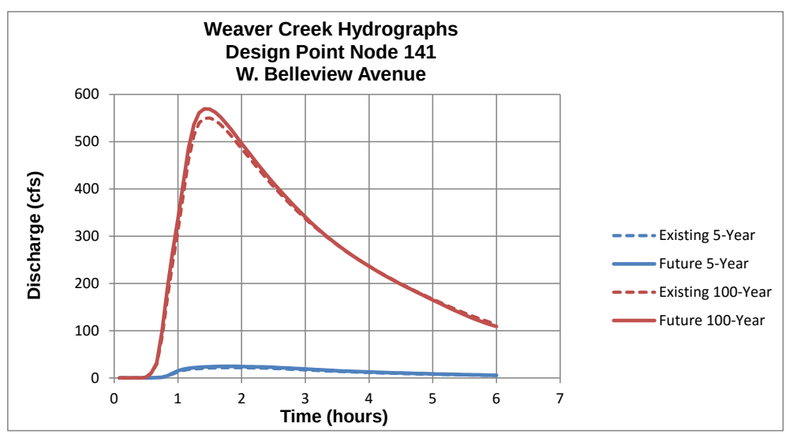












APPENDIX C

HYDRAULIC ANALYSIS

NOTES TO USERS

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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 Floodway Data table shown on this FIRM.

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NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

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.

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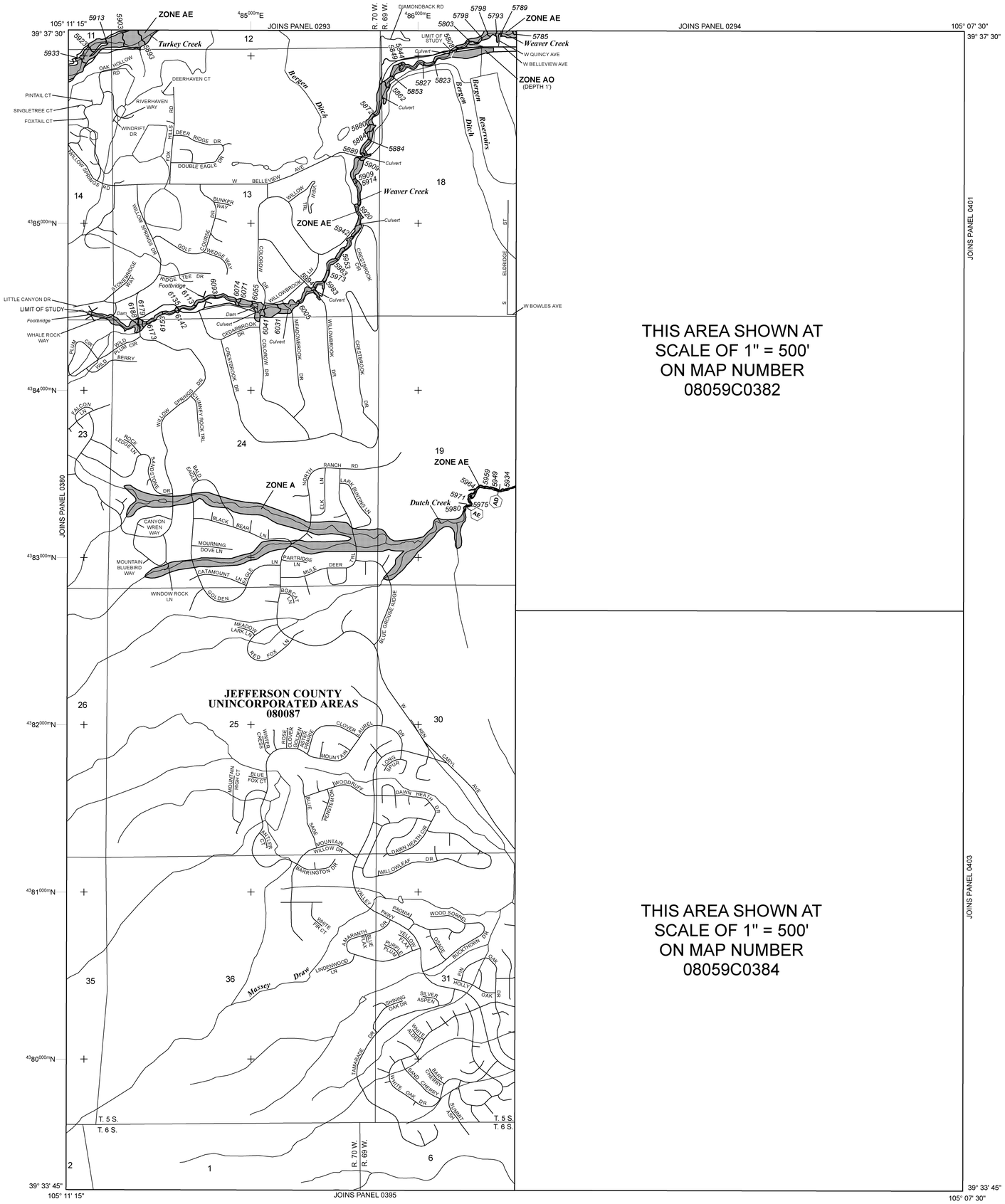

LEGEND

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 Areas 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.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance 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

- A — A — Cross section line
- 23 — 23 — Transect line
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4488000m N — 1000-meter Universal Transverse Mercator grid values, zone 13N
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
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EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
June 17, 2003

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
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MAP SCALE 1" = 1000'

500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0385F

FIRM

FLOOD INSURANCE RATE MAP

JEFFERSON COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 385 OF 675
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JEFFERSON COUNTY	080087	0385	F

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
08059C0385F
MAP REVISED
FEBRUARY 5, 2014

Federal Emergency Management Agency

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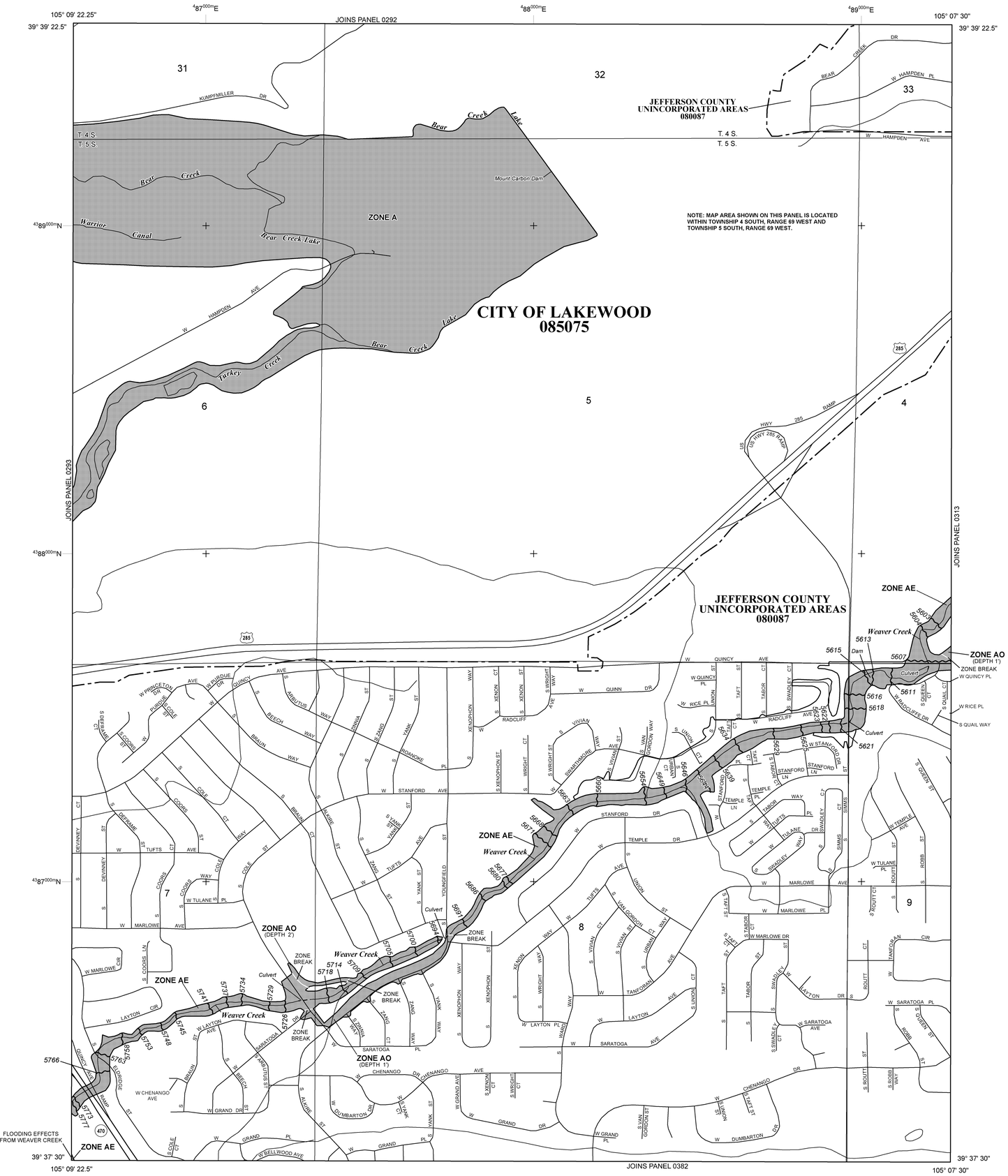

LEGEND

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.
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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

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COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

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	1% Annual Chance Floodplain Boundary
	0.2% Annual Chance 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

A — A	Cross section line
23 — 23	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
4488000mN	1000-meter Universal Transverse Mercator grid values, zone 13N
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
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June 17, 2003

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250 0 500 1000 FEET
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NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0294F

FIRM
FLOOD INSURANCE RATE MAP

JEFFERSON COUNTY, COLORADO
AND INCORPORATED AREAS

PANEL 294 OF 675
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JEFFERSON COUNTY	080087	0294	F
LAKEWOOD, CITY OF	085075	0294	F

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08059C0294F
MAP REVISED
FEBRUARY 5, 2014

Federal Emergency Management Agency

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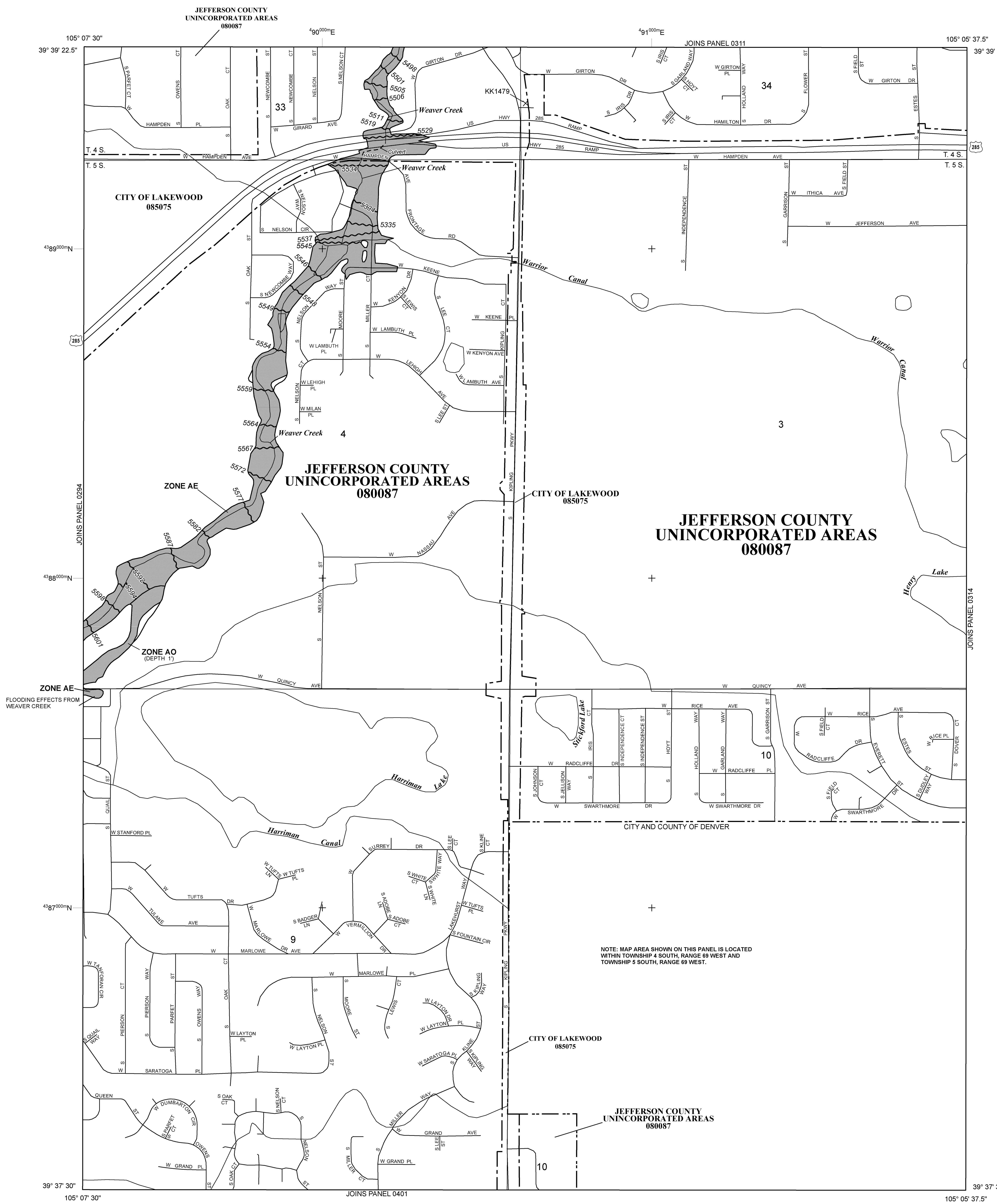

LEGEND

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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

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1% Annual Chance Floodplain Boundary

0.2% Annual Chance 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

(A)———(A)	Cross section line
(23) - - - - - (23)	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
$^{49}89^{000m}$ N	1000-meter Universal Transverse Mercator grid values, zone 13N
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
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June 17, 2003

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February 5, 2014: to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to update map format, to add roads and road names, to reflect updated topographic information, to incorporate previously issued letters of map revision.

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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" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0313F

FIRM

FLOOD INSURANCE RATE MAP

JEFFERSON COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 313 OF 675

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JEFFERSON COUNTY	080087	0313	F
LAKEWOOD, CITY OF	085075	0313	F

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 08059C0313F

MAP REVISED FEBRUARY 5, 2014

Federal Emergency Management Agency

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 shown on 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 Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

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 Floodway Data table shown on this FIRM.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 13. The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM 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. 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, Maryland 20910-3282
(301) 713-3242

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 derived from U.S. Geological Survey Digital Orthophoto Quadrangles produced at a scale of 1:12,000 from photography dated 1998 or later.

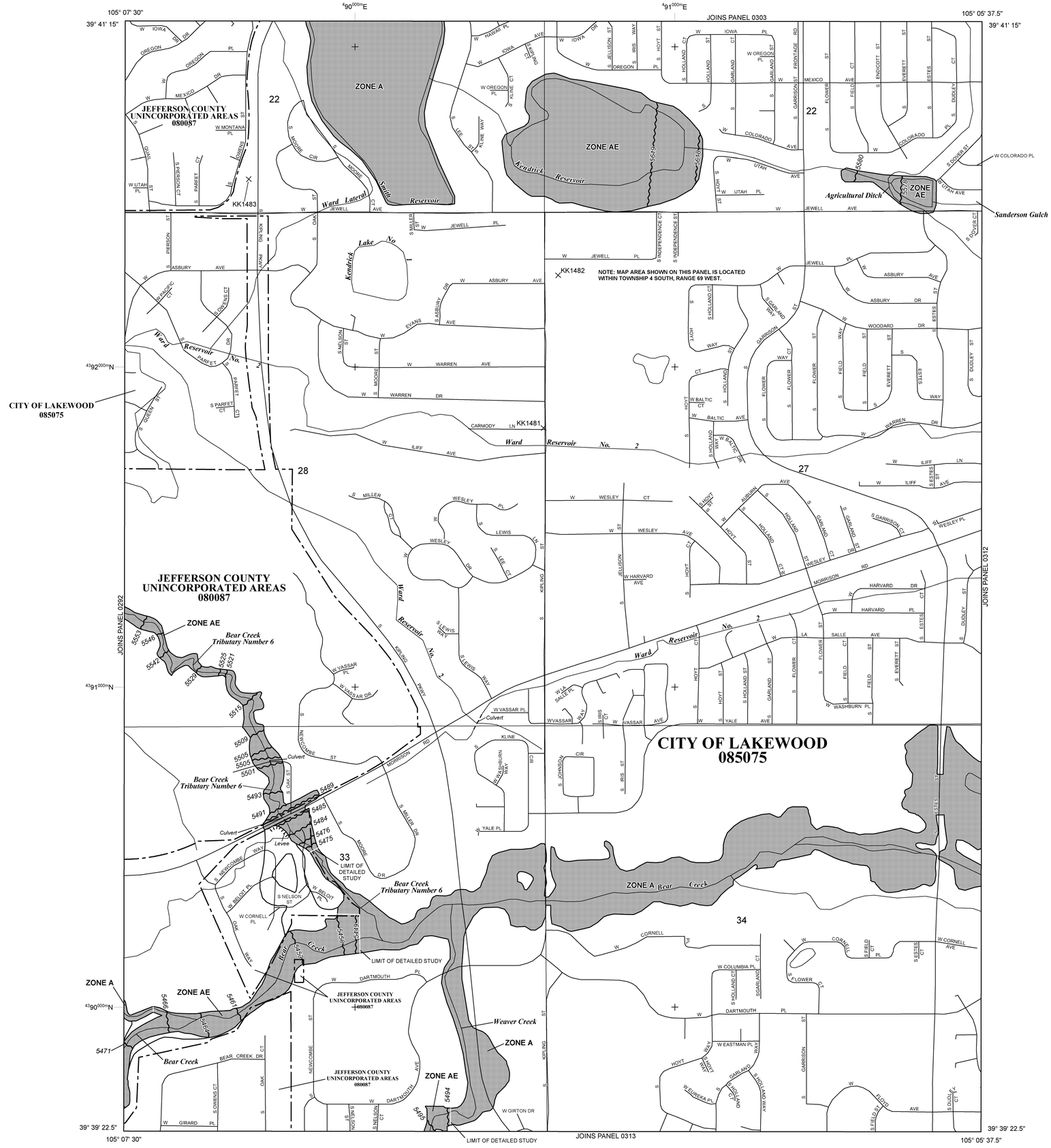
This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables to conform for multiple streams 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.

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.

For Information on available products associated with this FIRM, visit the **FEMA Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products, or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



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 Areas 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.

- 1% Annual Chance Floodplain Boundary
- 0.2% Annual Chance 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

- A — A — Cross section line
- 23 — 23 — Transect line
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4988000mN — 1000-meter Universal Transverse Mercator grid values, zone 13N
- 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
June 17, 2003

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 5, 2014: to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to update map format, to add roads and road names, to reflect updated topographic information, 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.

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MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0311F

FIRM

FLOOD INSURANCE RATE MAP

JEFFERSON COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 311 OF 675

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JEFFERSON COUNTY	080087	0311	F
LAKEWOOD, CITY OF	085075	0311	F

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
08059C0311F
MAP REVISED
FEBRUARY 5, 2014

Federal Emergency Management Agency

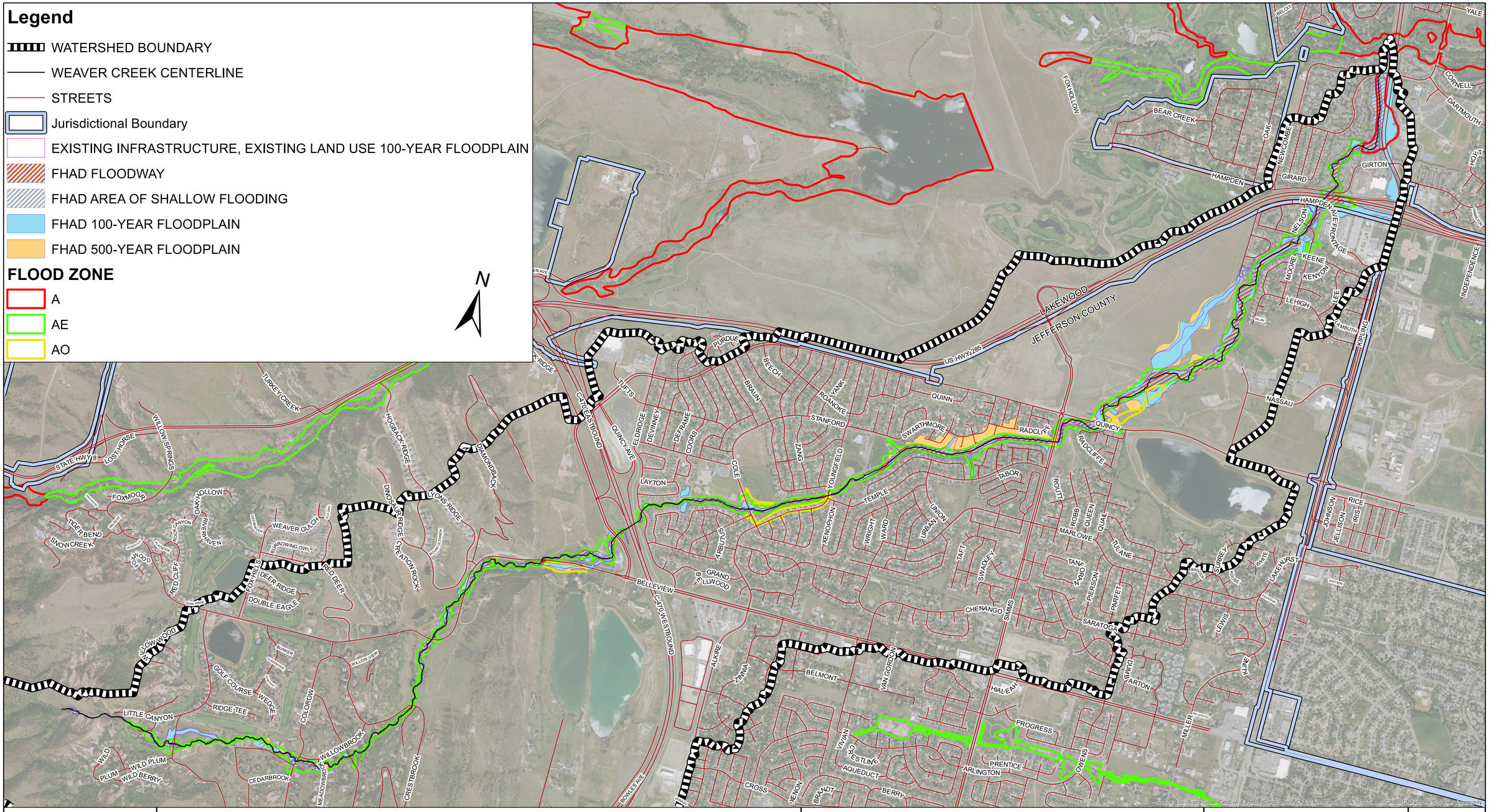
Legend

- WATERSHED BOUNDARY
- WEAVER CREEK CENTERLINE
- STREETS
- Jurisdictional Boundary
- EXISTING INFRASTRUCTURE, EXISTING LAND USE 100-YEAR FLOODPLAIN
- FHAD FLOODWAY
- FHAD AREA OF SHALLOW FLOODING
- FHAD 100-YEAR FLOODPLAIN
- FHAD 500-YEAR FLOODPLAIN

FLOOD ZONE

- A
- AE
- AO

N



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

PROJECT: 016-0858 DRAWN BY: MD DATE: 11/2021	**MILE HIGH FLOOD DISTRICT, JEFFERSON COUNTY, AND CITY OF LAKEWOOD**	**WEAVER CREEK FHAD FLOODPLAIN COMPARISON**	olsson 1525 Raleigh Street Suite 400 Denver, CO 80204 TEL: 303.237.2072 FAX: 303.237.2659 www.olssonassociates.com	EXHIBIT C-1

Table C-1: Summary of Manning's "n" Values

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	38813	n	0.05	0.06	0.05		
2	38735	n	0.05	0.06	0.05		
2	38640	n	0.05	0.06	0.05		
2	38580	n	0.05	0.06	0.05		
2	38507	n	0.05	0.06	0.05		
2	38473	n	0.05	0.06	0.05		
2	38429	n	0.05	0.06	0.05		
2	38381	n	0.05	0.06	0.05		
2	38270	n	0.05	0.06	0.05		
2	38168	n	0.05	0.06	0.05		
2	38062	n	0.05	0.06	0.05		
2	37888	n	0.05	0.06	0.05		
2	37783	n	0.05	0.06	0.05		
2	37682	n	0.05	0.06	0.05		
2	37609	n	0.05	0.06	0.05		
2	37462	n	0.05	0.06	0.05		
2	37449	n	0.05	0.06	0.05		
2	37306	n	0.05	0.06	0.05		
2	37175	n	0.05	0.06	0.05		
2	37122	n	0.05	0.06	0.05		
2	37072	n	0.05	0.06	0.05		
2	36992	n	0.05	0.06	0.05		
2	36880	n	0.05	0.06	0.05		
2	36676	n	0.05	0.06	0.04		
2	36666	n	0.05	0.06	0.04		
2	36651	Culvert					
2	36635	n	0.05	0.06	0.04		
2	36625	n	0.05	0.06	0.04		
2	36588	n	0.05	0.06	0.04		
2	36513	n	0.05	0.06	0.04		
2	36449	n	0.05	0.06	0.04		
2	36404	n	0.05	0.06	0.04		
2	36383	Culvert					
2	36368	n	0.05	0.05	0.04		
2	36360	n	0.05	0.05	0.04		
2	36354	n	0.05	0.05	0.04		
2	36308	Culvert					
2	36262	n	0.045	0.06	0.05		
2	36252	n	0.045	0.06	0.05		
2	36091	n	0.045	0.06	0.05		
2	35842	n	0.045	0.06	0.05		
2	35591	n	0.045	0.06	0.05		

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	35449	n	0.04	0.06	0.04		
2	35433	n	0.04	0.06	0.04		
2	35411	Culvert					
2	35388	n	0.06	0.04			
2	35378	n	0.06	0.04			
2	35200	n	0.06	0.04			
2	35022	n	0.05	0.06	0.04		
2	34797	n	0.05	0.06	0.04		
2	34591	n	0.05	0.06	0.04		
2	34420	n	0.05	0.06	0.05		
2	34374	n	0.05	0.06	0.05		
2	34340	n	0.05	0.06	0.05		
2	34234	n	0.04	0.06	0.1		
2	34213	n	0.04	0.06	0.1		
2	34200	Bridge					
2	34186	n	0.04	0.06	0.1		
2	34166	n	0.04	0.06	0.1		
2	34057	n	0.05	0.06	0.04		
2	33985	n	0.05	0.06	0.04		
2	33963	n	0.05	0.06	0.04		
2	33953	n	0.05	0.065	0.04		
2	33925	Culvert					
2	33897	n	0.04	0.065	0.05		
2	33887	n	0.04	0.06	0.05		
2	33878	n	0.04	0.06	0.05		
2	33868	n	0.04	0.06	0.05		
2	33847	Culvert					
2	33826	n	0.05	0.06	0.04		
2	33816	n	0.05	0.05	0.045		
2	33734	n	0.05	0.05	0.045		
2	33719	n	0.05	0.05	0.045		
2	33711	Bridge					
2	33702	n	0.05	0.05	0.045		
2	33692	n	0.05	0.05	0.045		
2	33607	n	0.06	0.06	0.04		
2	33597	n	0.06	0.06	0.04		
2	33586	Bridge					
2	33575	n	0.06	0.06	0.04		
2	33555	n	0.06	0.06	0.06		
2	33480	n	0.06	0.06	0.06		
2	33393	n	0.06	0.06	0.06		
2	33325	n	0.04	0.05	0.04		

Table C-1: Summary of Manning's "n" Values

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	33285	Culvert					
2	33244	n	0.04	0.06	0.05		
2	33234	n	0.04	0.06	0.05		
2	33146	n	0.04	0.06	0.05		
2	32996	n	0.05	0.06	0.05		
2	32877	n	0.05	0.06	0.05		
2	32815	n	0.05	0.06	0.05		
2	32729	n	0.05	0.06	0.05		
2	32716	n	0.05	0.06	0.05		
2	32680	Culvert					
2	32643	n	0.05	0.06	0.05		
2	32612	n	0.05	0.06	0.05		
2	32316	n	0.05	0.06	0.05		
2	31994	n	0.05	0.06	0.05		
2	31974	n	0.05	0.06	0.05		
2	31934	Culvert					
2	31893	n	0.05	0.06	0.05		
2	31883	n	0.05	0.06	0.05		
2	31838	n	0.05	0.06	0.05		
2	31594	n	0.05	0.06	0.05		
2	31487	n	0.05	0.06	0.05		
2	31466	n	0.05	0.06	0.05		
2	31353	n	0.05	0.06	0.05		
2	31254	n	0.05	0.06	0.05		
2	30985	n	0.05	0.06	0.05		
2	30597	n	0.05	0.06	0.05		
2	30412	n	0.05	0.06	0.05		
2	30246	n	0.05	0.06	0.05		
2	30163	n	0.05	0.06	0.05		
2	30143	n	0.05	0.06	0.05		
2	30106	Culvert					
2	30068	n	0.05	0.06	0.05		
2	30057	n	0.05	0.06	0.05		
2	29770	n	0.05	0.06	0.05		
2	29489	n	0.05	0.06	0.05		
2	29148	n	0.05	0.06	0.05		
2	29138	n	0.05	0.06	0.05		
2	29117	Culvert					
2	29095	n	0.05	0.06	0.05		
2	29085	n	0.05	0.06	0.05		
2	29000	n	0.05	0.06	0.05		
2	28925	n	0.05	0.06	0.05		

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	28862	n	0.05	0.06	0.05		
2	28749	n	0.05	0.06	0.05		
2	28707	n	0.05	0.06	0.05		
2	28600	n	0.05	0.06	0.05		
2	28575	n	0.05	0.06	0.05		
2	28525	Culvert					
2	28475	n	0.04	0.05	0.05		
2	28460	n	0.04	0.05	0.05		
2	28443	n	0.04	0.05	0.05		
2	28433	n	0.04	0.05	0.05		
2	28399	n	0.04	0.05	0.05		
2	28389	n	0.04	0.05	0.05		
2	28160	n	0.1	0.05	0.05		
2	27925	n	0.05	0.05	0.05		
2	27915	n	0.05	0.05	0.05		
2	27889	Culvert					
2	27863	n	0.05	0.06	0.05		
2	27853	n	0.05	0.06	0.05		
2	27810	n	0.05	0.06	0.05		
2	27748	n	0.05	0.06	0.05		
2	27630	n	0.05	0.08	0.05		
2	27558	n	0.05	0.08	0.05		
2	27295	n	0.05	0.08	0.05		
2	27285	n	0.05	0.08	0.05		
2	27217	Culvert					
2	27149	n	0.05	0.08	0.05		
2	27139	n	0.05	0.08	0.05		
2	26927	n	0.04	0.08	0.08		
2	26911	n	0.04	0.08			
2	26871	n	0.04	0.08			
2	26798	n	0.04	0.08	0.06		
2	26742	n	0.04	0.08	0.08		
2	26591	n	0.04	0.08	0.08		
2	26415	n	0.04	0.08	0.08		
2	26340	n	0.04	0.08	0.06		
2	26278	n	0.04	0.08	0.06		
2	25974	n	0.05	0.08	0.06		
2	25740	n	0.05	0.08	0.06		
2	25546	n	0.05	0.08	0.08		
2	25486	n	0.05	0.08	0.08		
2	25475	n	0.08	0.08	0.08		
2	25327	n	0.08	0.08	0.08		

Table C-1: Summary of Manning's "n" Values

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	25131	n	0.08	0.08	0.08		
2	25121	n	0.08	0.08	0.06		
2	25083	Culvert					
2	25044	n	0.05	0.08	0.05		
2	25034	n	0.05	0.08	0.05		
2	24807	n	0.04	0.08	0.05		
2	24567	n	0.04	0.06	0.04		
2	24373	n	0.04	0.05	0.045		
2	24289	n	0.045	0.04	0.04		
2	24171	n	0.04	0.04	0.04		
2	24123	n	0.04	0.05	0.04		
2	24120	n	0.04	0.05	0.04		
2	24098	n	0.05	0.06	0.04		
2	24034	n	0.05	0.06	0.04		
2	23977	n	0.05	0.06	0.04		
2	23918	n	0.04	0.05	0.04		
2	23908	n	0.04	0.06	0.04		
2	23877	Culvert					
2	23845	n	0.04	0.06	0.05		
2	23835	n	0.04	0.06	0.05		
2	23810	n	0.04	0.06	0.05		
2	23535	n	0.04	0.05	0.1		
2	23520	n	0.04	0.05	0.1		
2	23504	n	0.04	0.05	0.1		
2	23183	n	0.045	0.045	0.045		
2	23173	n	0.045	0.045	0.045		
2	23093	Culvert					
2	23012	n	0.05	0.05	0.05		
2	23002	n	0.05	0.05	0.05		
2	22906	n	0.05	0.05	0.05		
2	22881	n	0.05	0.05	0.05		
2	22725	Culvert					
2	22562	n	0.05	0.06	0.05		
2	22552	n	0.05	0.06	0.05		
2	22510	n	0.05	0.06	0.05		
2	22474	n	0.05	0.06	0.05		
2	22429	n	0.05	0.06	0.05		
2	22419	n	0.05	0.06	0.05		
2	22368	Culvert					
2	22272	n	0.05	0.06	0.05		
2	22247	n	0.05	0.06	0.05		
2	22050	n	0.1	0.06	0.1		

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	21668	n	0.1	0.06	0.1		
2	21408	n	0.1	0.06	0.05		
2	21110	n	0.04	0.06	0.1		
2	21033	n	0.04	0.06	0.1		
2	21012	n	0.04	0.06	0.1		
2	20994	n	0.04	0.06	0.1		
2	20868	n	0.04	0.06	0.1		
2	20834	n	0.04	0.06	0.1		
2	20818	n	0.04	0.06	0.1		
2	20808	n	0.04	0.06	0.1		
2	20700	n	0.04	0.06	0.1		
2	20685	n	0.04	0.06	0.1		
2	20668	n	0.04	0.06	0.1		
2	20391	n	0.04	0.06	0.1		
2	20381	n	0.04	0.06	0.1		
2	20360	n	0.04	0.06	0.1		
2	20350	n	0.04	0.06	0.1		
2	20239	n	0.04	0.06	0.1		
2	20114	n	0.04	0.06	0.1		
2	20101	n	0.04	0.06	0.1		
2	20049	Culvert					
2	19996	n	0.04	0.06	0.1		
2	19986	n	0.04	0.06	0.1		
2	19890	n	0.04	0.06	0.1		
2	19727	n	0.04	0.06	0.1		
2	19716	n	0.04	0.06	0.1		
2	19715	n	0.04	0.06	0.1		
2	19687	n	0.04	0.06	0.1		
2	19604	n	0.04	0.06	0.1		
2	19594	n	0.04	0.06	0.1		
2	19583	n	0.04	0.06	0.1		
2	19573	n	0.04	0.06	0.1		
2	19510	n	0.04	0.06	0.1		
2	19354	n	0.04	0.06	0.1		
2	19344	n	0.04	0.06	0.1		
2	19340	n	0.04	0.06	0.1		
2	19329	n	0.04	0.06	0.1		
2	19197	n	0.05	0.06	0.1		
2	19060	n	0.05	0.06	0.1		
2	19050	n	0.05	0.06	0.1		
2	19038	n	0.05	0.06	0.1		
2	19028	n	0.05	0.06	0.1		

Table C-1: Summary of Manning's "n" Values

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	18856	n	0.05	0.06	0.1		
2	18776	n	0.05	0.06	0.1		
2	18763	n	0.05	0.06	0.1		
2	18761	n	0.05	0.06	0.1		
2	18747	n	0.05	0.06	0.1		
2	18729	n	0.05	0.06	0.1		
2	18581	n	0.1	0.06	0.06		
2	18512	n	0.1	0.06			
2	18502	n	0.1	0.06			
2	18419	Culvert					
2	18335	n	0.04	0.05	0.05		
2	18325	n	0.04	0.05	0.05		
2	18142	n	0.04	0.05	0.05		
2	17935	n	0.04	0.05	0.05		
2	17596	n	0.04	0.05	0.05		
2	17207	n	0.04	0.05	0.1		
2	17051	n	0.04	0.05	0.1		
2	17006	n	0.04	0.05	0.1		
2	16991	n	0.04	0.05	0.1		
2	16970	n	0.04	0.05	0.1		
2	16842	n	0.04	0.06	0.05		
2	16832	n	0.04	0.06	0.05		
2	16809	Culvert					
2	16786	n	0.04	0.06	0.04		
2	16776	n	0.04	0.06	0.04		
2	16720	n	0.04	0.06	0.04		
2	16485	n	0.04	0.05	0.1		
2	16323	n	0.05	0.05	0.1		
2	16209	n	0.1	0.1	0.05	0.1	
2	16199	n	0.1	0.1	0.05	0.1	
2	16198	n	0.1	0.1	0.05	0.1	
2	16180	n	0.1	0.1	0.05	0.1	
2	16051	n	0.1	0.05	0.1		
2	15937	n	0.1	0.02	0.1	0.05	0.1
2	15864	n	0.1	0.05	0.1		
2	15782	n	0.1	0.05	0.1		
2	15773	n	0.1	0.05	0.1		
2	15768	n	0.1	0.05	0.1		
2	15760	n	0.1	0.05	0.1		
2	15758	n	0.1	0.05	0.1		
2	15748	n	0.1	0.05	0.1		
2	15719	n	0.1	0.05	0.1		

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	15710	n	0.1	0.05	0.1		
2	15706	n	0.1	0.05	0.1		
2	15697	n	0.1	0.05	0.1		
2	15696	n	0.1	0.05	0.1		
2	15686	Bridge					
2	15669	n	0.1	0.05	0.1		
2	15639	n	0.1	0.05	0.1		
2	15600	n	0.1	0.035	0.05	0.1	
2	15381	n	0.1	0.05	0.1		
2	15058	n	0.1	0.05	0.1		
2	14940	n	0.1	0.05	0.1		
2	14927	n	0.1	0.05	0.1		
2	14922	n	0.1	0.05	0.1		
2	14909	n	0.1	0.05	0.1		
2	14681	n	0.1	0.05	0.1		
2	14671	n	0.1	0.05	0.1		
2	14668	n	0.1	0.05	0.1		
2	14658	n	0.1	0.05	0.1		
2	14475	n	0.1	0.05	0.1		
2	14317	n	0.1	0.05	0.1		
2	13982	n	0.1	0.05	0.1		
2	13972	n	0.1	0.05	0.1		
2	13970	n	0.1	0.05	0.1		
2	13960	n	0.1	0.05	0.1		
2	13831	n	0.1	0.05	0.1		
2	13709	n	0.1	0.05	0.1		
2	13699	n	0.1	0.05	0.1		
2	13694	n	0.1	0.05	0.1		
2	13679	n	0.1	0.05	0.1		
2	13639	n	0.1	0.05	0.05		
2	13629	n	0.1	0.05	0.05		
2	13628	n	0.1	0.05	0.05		
2	13614	n	0.1	0.05	0.05		
2	13575	n	0.1	0.05	0.05		
2	13493	Culvert					
2	13411	n	0.05	0.07	0.05		
2	13384	n	0.05	0.07	0.05		
2	13214	n	0.05	0.07	0.05		
2	12969	n	0.05	0.07	0.05		
2	12677	n	0.05	0.07	0.05		
2	12279	n	0.05	0.07	0.05		
2	12237	n	0.05	0.07	0.05		

Table C-1: Summary of Manning's "n" Values

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	12144	Culvert					
2	12012	n	0.05	0.07	0.05		
2	11992	n	0.05	0.07	0.05		
2	11890	n	0.05	0.07	0.05		
2	11552	n	0.05	0.07	0.05		
2	11327	n	0.05	0.06	0.05		
2	11217	n	0.05	0.06	0.05		
2	11082	n	0.05	0.06	0.05		
2	10955	n	0.05	0.06	0.05		
2	10766	n	0.05	0.06	0.05		
2	10551	n	0.05	0.06	0.05		
2	10344	n	0.05	0.06	0.05		
2	10166	n	0.05	0.06	0.05		
2	9734	n	0.05	0.06	0.05		
2	9420	n	0.05	0.06	0.05		
2	9240	n	0.05	0.06	0.05		
2	9013	n	0.05	0.06	0.05		
2	8779	n	0.05	0.06	0.05		
2	8605	n	0.05	0.05	0.05		
2	8548	n	0.05	0.05	0.05		
2	8531	n	0.05	0.05	0.05		
2	8300	n	0.05	0.05	0.05		
2	8009	n	0.05	0.05	0.05		
2	7676	n	0.05	0.05	0.05		
2	7305	n	0.05	0.06	0.05		
2	7138	n	0.05	0.06	0.05		
2	7010	n	0.05	0.06	0.1		
2	6886	n	0.05	0.06	0.1		
2	6801	n	0.06	0.04			
2	6549	n	0.05	0.05	0.1		
2	6397	n	0.05	0.05	0.1		
2	6181	n	0.1	0.05	0.1		
2	5994	n	0.02	0.05	0.1		
2	5679	n	0.1	0.05	0.1		
2	5489	n	0.05	0.05	0.1		
2	5371	n	0.05	0.05	0.1		
2	5332	n	0.05	0.05	0.1		
2	5270	n	0.05	0.05	0.1		
2	5223	n	0.05	0.05	0.1		
2	5175	Culvert					
2	5126	n	0.1	0.08	0.045	0.1	
2	5106	n	0.1	0.08	0.045		

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
2	5000	n	0.1	0.07	0.045		
2	4846	n	0.1	0.06	0.045		
2	4836	n	0.1	0.06	0.045		
2	4808	Bridge					
2	4780	n	0.1	0.06	0.045		
2	4770	n	0.1	0.06	0.045		
2	4550	n	0.1	0.06	0.045		
2	4349	n	0.1	0.08	0.045		
2	4339	n	0.1	0.08	0.045		
1	3893	n	0.1	0.06	0.05		
1	3883	n	0.1	0.06	0.05		
1	3834	n	0.06	0.06	0.05		
1	3822	n	0.06	0.06	0.05		
1	3804	n	0.06	0.06	0.05		
1	3770	n	0.06	0.06	0.05	0.1	
1	3754	n	0.06	0.06	0.05	0.1	
1	3700	n	0.1	0.06	0.06	0.05	0.1
1	3524	n	0.1	0.06	0.1		
1	3297	n	0.1	0.06	0.1		
1	3280	n	0.1	0.06	0.1		
1	3155	n	0.1	0.06	0.1		
1	3128	n	0.1	0.06	0.1		
1	3100	n	0.1	0.06	0.1		
1	2836	n	0.1	0.06	0.1		
1	2543	n	0.1	0.06	0.1		
1	2323	n	0.1	0.08	0.1		
1	1939	n	0.1	0.06	0.035		
1	1734	n	0.1	0.06	0.04		
1	1712	n	0.1	0.06	0.04		
1	1706	n	0.1	0.06	0.04		
1	1682	n	0.1	0.06	0.04		
1	1658	n	0.1	0.06	0.04		
1	1644	n	0.1	0.04			
1	1300	n	0.1	0.04	0.04		
1	1037	n	0.1	0.04	0.04		
1	910	n	0.1	0.04	0.04		
1	900	n	0.1	0.04	0.04		
1	883	n	0.1	0.04	0.04		
1	873	n	0.1	0.04	0.04		
1	772	Culvert					
1	670	n	0.1	0.06	0.04		
1	647	n	0.1	0.06	0.05		

Table C-1: Summary of Manning's "n" Values

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
0	402	n	0.08	0.08	0.08		
0	392	n	0.08	0.08	0.08		
0	383	n	0.08	0.08	0.08		
0	378	n	0.08	0.08	0.08		
0	350	n	0.08	0.08	0.08		
0	200	n	0.08	0.08	0.08		
0	100	n	0.08	0.08	0.08		
0	68	n	0.08	0.08	0.08		
Willow Spill	400883	n	0.045	0.045	0.045		
Willow Spill	400787	n	0.045	0.045	0.045		
Willow Spill	400683	n	0.045	0.045	0.045		
Willow Spill	400569	n	0.045	0.045	0.045		
Willow Spill	400454	n	0.045	0.045	0.045		
Willow Spill	400340	n	0.045	0.045	0.045		
Willow Spill	400239	n	0.045	0.045	0.045		
Willow Spill	400179	n	0.045	0.045	0.045		
Kipling St Spill	83950	n	0.02	0.04	0.02	0.045	
Kipling St Spill	83643	n	0.02	0.04	0.02	0.04	0.02
Kipling St Spill	83361	n	0.04	0.02	0.04		
Kipling St Spill	83136	n	0.04	0.02	0.04	0.04	
Kipling St Spill	83035	n	0.04	0.02	0.02		
Kipling St Spill	82914	n	0.04	0.02	0.04		
Kipling St Spill	82667	n	0.045	0.04	0.02		
Kipling St Spill	82411	n	0.02	0.02	0.02		
Kipling St Spill	82168	n	0.04	0.02	0.02		
Kipling St Spill	81918	n	0.04	0.02	0.04		
Kipling St Spill	81839	n	0.04	0.02	0.02		
Kipling St Spill	81765	n	0.02	0.04	0.02	0.04	
Kipling St Spill	81632	n	0.02	0.04	0.02	0.04	
Kipling St Spill	81327	n	0.02	0.04	0.02	0.07	
Kipling St Spill	81295	Lat Struct					
Kipling St Spill	81194	n	0.04	0.02	0.07		

Reach	River Station	Frctn (n/K)	n #1	n #2	n #3	n #4	n #5
Kipling St Spill	80974	n	0.04	0.02	0.07		
Kipling St Spill	80785	n	0.02	0.04	0.02	0.05	
Kipling St Spill	80353	n	0.02	0.04	0.02	0.04	
Kipling St Spill	80162	n	0.04	0.02	0.04		
285 Overflow	70470	n	0.02	0.02	0.02		
285 Overflow	70231	n	0.04	0.04	0.04		
285 Overflow	70220	Lat Struct					
285 Overflow	70199	n	0.02	0.02	0.02		
285 Overflow	70145	n	0.02	0.02	0.02		
285 Overflow	70100	n	0.02	0.02	0.02		
285 Overflow	70023	n	0.02	0.02	0.02		
285 Overflow	70000	n	0.02	0.02	0.02		
Spill 2	62552	n	0.05	0.05	0.05		
Spill 2	62410	n	0.05	0.05	0.05		
Spill 2	62223	n	0.05	0.05	0.05		
Spill 2	62025	n	0.05	0.05	0.05		
Spill 2	61760	n	0.05	0.05	0.05		
Spill 2	61446	n	0.05	0.05	0.05		
Spill 2	61172	n	0.05	0.05	0.05		
Spill 2	61003	n	0.05	0.05	0.05		
Spill 2	60813	n	0.05	0.05	0.05		
Spill 2	60523	n	0.05	0.02	0.1		
Spill 2	60323	n	0.05	0.02	0.1		
Spill 2	60150	n	0.05	0.05	0.05		
Belleview Spill	51238	n	0.04	0.04	0.04		
Belleview Spill	51142	n	0.04	0.04	0.04		
Belleview Spill	50935	n	0.04	0.04	0.04		
Belleview Spill	50735	n	0.045	0.045	0.045		
Belleview Spill	50514	n	0.045	0.02	0.045	0.045	
Belleview Spill	50378	n	0.045	0.02	0.045		
Belleview Spill	50151	n	0.045	0.045	0.045		

MODIFIED CULVERT CALCULATIONS

Modified Inlet Rating Curves

Crossing 25 - C-470

Overall Culvert Rating Curve

Profile	Control	Culvert Flow (cfs)	Weir Flow (cfs)	Total Flow (cfs)	Headwater Elev
2-YR	Critical U/S	30	0	30	5771.28
5-YR	Critical U/S	46	0	46	5771.38
10-YR	Critical U/S	89	0	89	5771.61
25-YR	FACE	310	0	310	5773.16
50-YR	FACE	457	0	457	5773.76
100-YR	FACE	666	0	666	5774.54
500-YR	FACE	1092	0	1092	5775.92

Crossing 38 - Hampden Avenue/285

Overall Culvert Rating Curve

Profile	Control	Culvert Flow (cfs)	Weir Flow (cfs)	Total Flow (cfs)	Headwater Elev
2-YR	FACE	251	0	251	5523.50
5-YR	FACE	403	0	403	5524.64
10-YR	FACE	566	0	566	5525.84
25-YR	THROAT	967	362	1329	5530.04
50-YR	THROAT	991	736	1727	5530.45
100-YR	THROAT	1018	1259	2277	5530.91
500-YR	THROAT	1057	2401	3459	5531.60

Crossing 40 - Dartmouth Avenue

Overall Culvert Rating Curve

Profile	Control	Culvert Flow (cfs)	Weir Flow (cfs)	Total Flow (cfs)	Headwater Elev
2-YR	Critical U/S	262	0	262	5457.77
5-YR	Critical U/S	421	0	421	5458.22
10-YR	FACE	594	0	594	5459.512
25-YR	FACE	1382	0	1382	5461.72
50-YR	FACE	1801	0	1801	5462.548
100-YR	FACE	2382	0	2382	5463.652
500-YR	THROAT	3620	0	3620	5466.696

HY-8 Analysis Results

Crossing Summary Table

Culvert Crossing: Crossing 5 - Willow Springs Drive

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
6185.51	2-YR	1.00	1.00	0.00	1
6185.58	5-YR	2.00	2.00	0.00	1
6186.01	10-YR	16.00	16.00	0.00	1
6186.69	25-YR	66.00	66.00	0.00	1
6186.96	50-YR	96.00	96.00	0.00	1
6187.26	100-YR	141.00	141.00	0.00	1
6188.71	500-YR	228.00	228.00	0.00	1
6189.00	Overtopping	240.39	0.00	1.00	

HY-8 Analysis Results

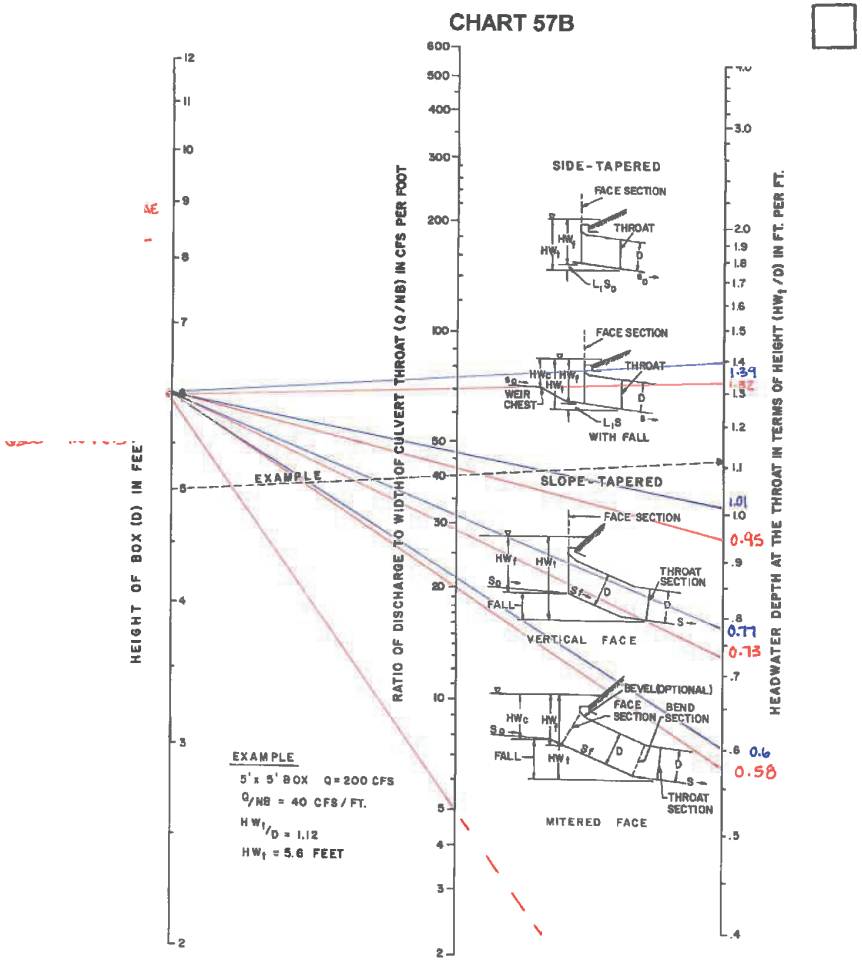
Crossing Summary Table

Culvert Crossing: Crossing 38 - Hampden Ave -Weir

Headwater Elevation (ft)	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
5529.52	100.00	0.05	99.68	25
5529.87	251.00	0.05	250.15	6
5530.10	403.00	0.05	401.99	5
5530.30	566.00	0.05	565.21	5
5530.97	1329.00	0.05	1327.68	4
5531.23	1727.00	0.04	1725.26	4
5531.54	2277.00	0.04	2276.06	4
5532.10	3459.00	0.04	3458.28	2
5529.00	0.05	0.05	0.00	Overtopping

CROSSING 25 – C-470

THROAT WIDTH = 16 FT

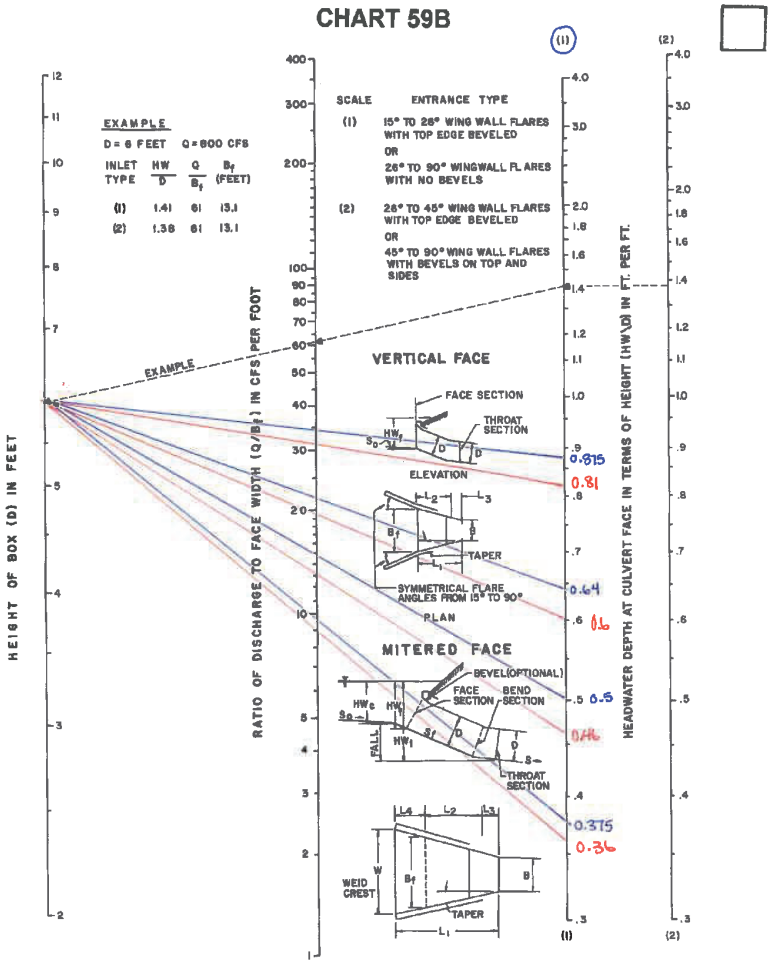


THROAT CONTROL FOR BOX CULVERTS WITH TAPERED INLETS

CROSSING 25 - C-470

FACE WIDTH = 34.8 FT

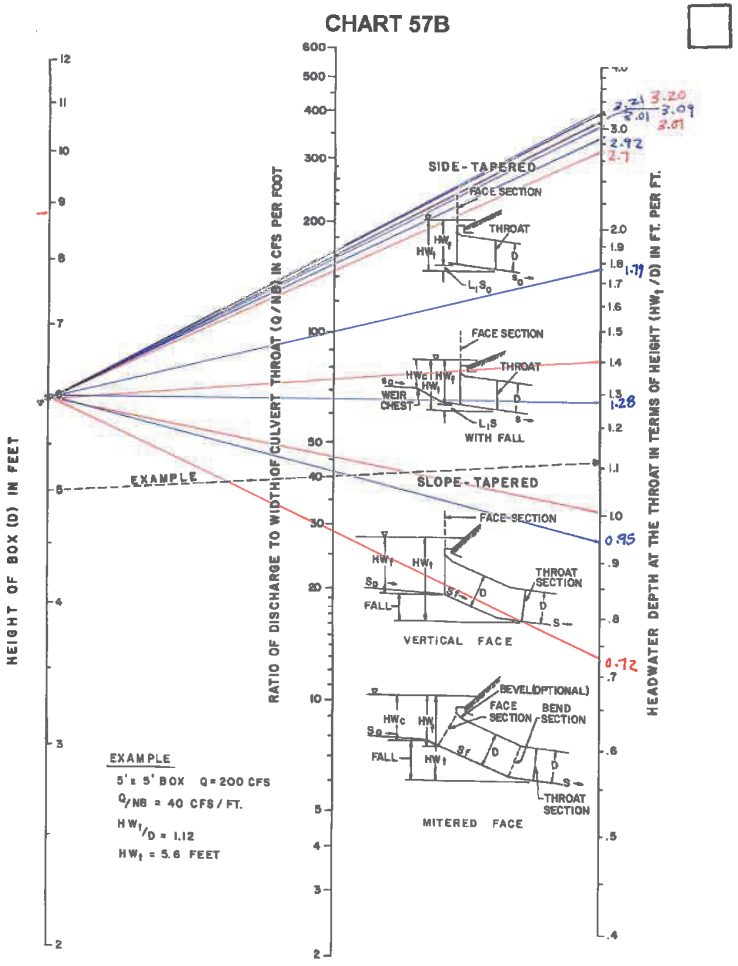
— = EX. LAND USE FLOWS



FACE CONTROL FOR BOX CULVERTS WITH SLOPE TAPERED INLETS

CROSSING 38 - HAMPDEN AVE./285

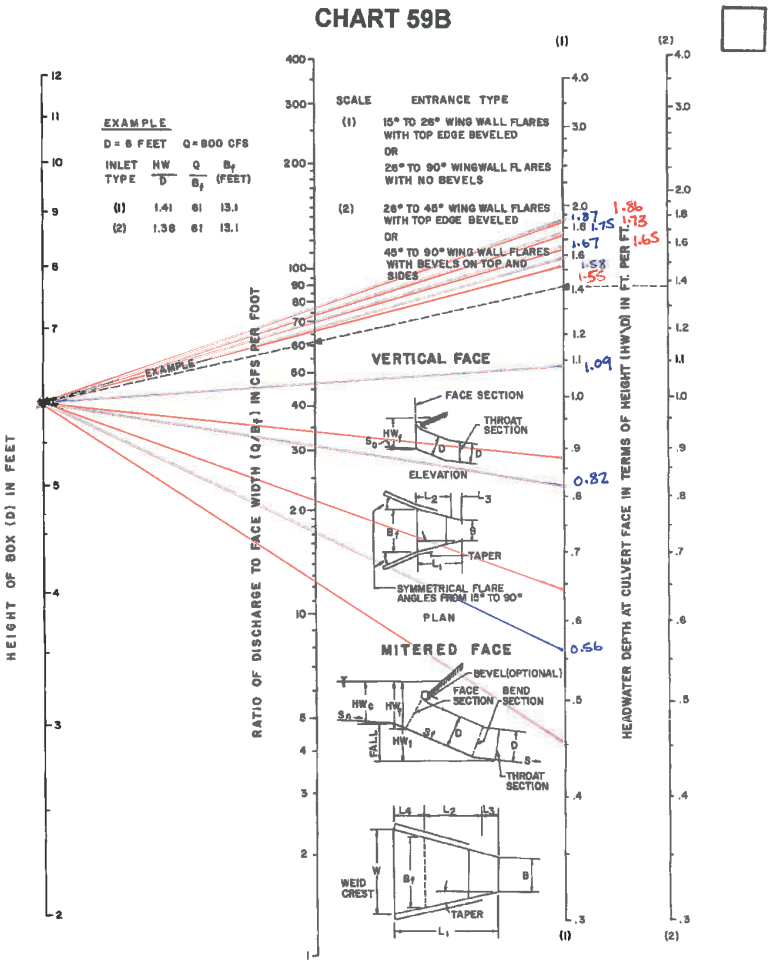
THROAT WIDTH = 7 FT



THROAT CONTROL FOR BOX CULVERTS WITH TAPERED INLETS

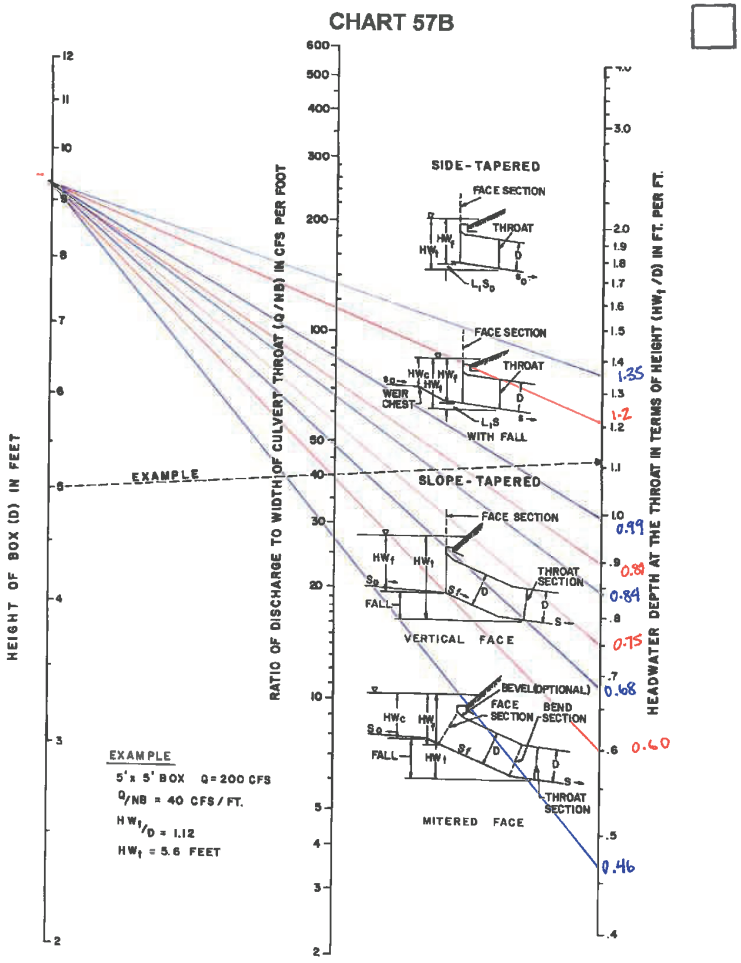
CROSSING 38 - HAMPDEN AVE.

FACE WIDTH = 15.5 FT



FACE CONTROL FOR BOX CULVERTS WITH SLOPE TAPERED INLETS

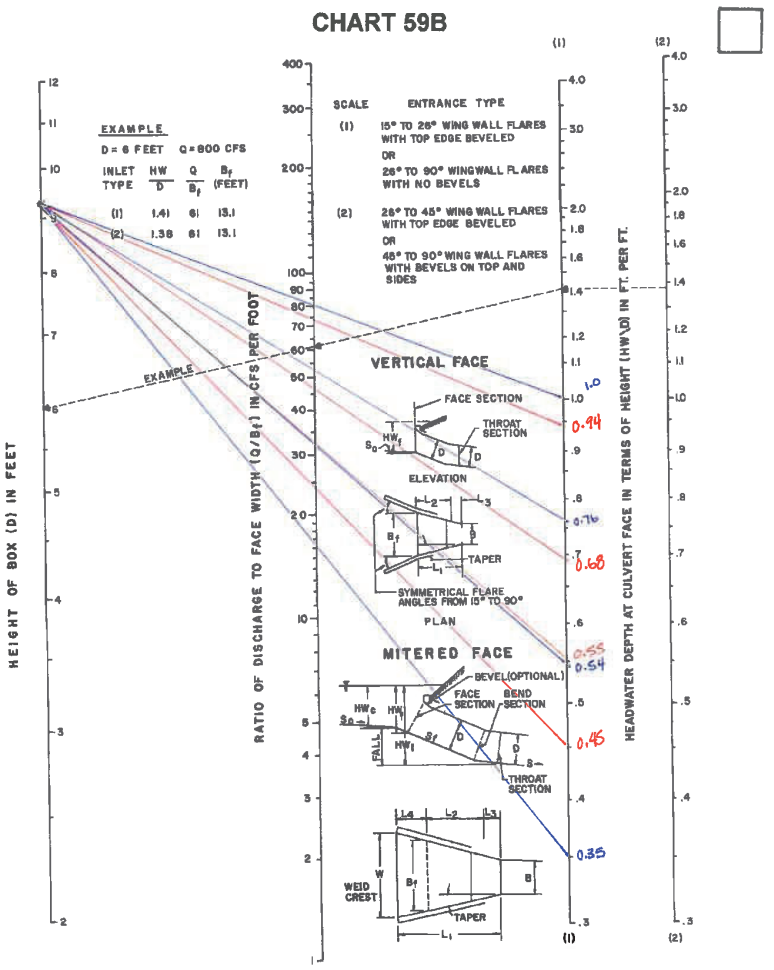
CROSSING 40 - DARTMOUTH AVE.
THROAT WIDTH = 14 FT



THROAT CONTROL FOR BOX CULVERTS WITH TAPERED INLETS

CROSSING 40 - DARTMOUTH AVE.
FACE WIDTH = 22.5 FT

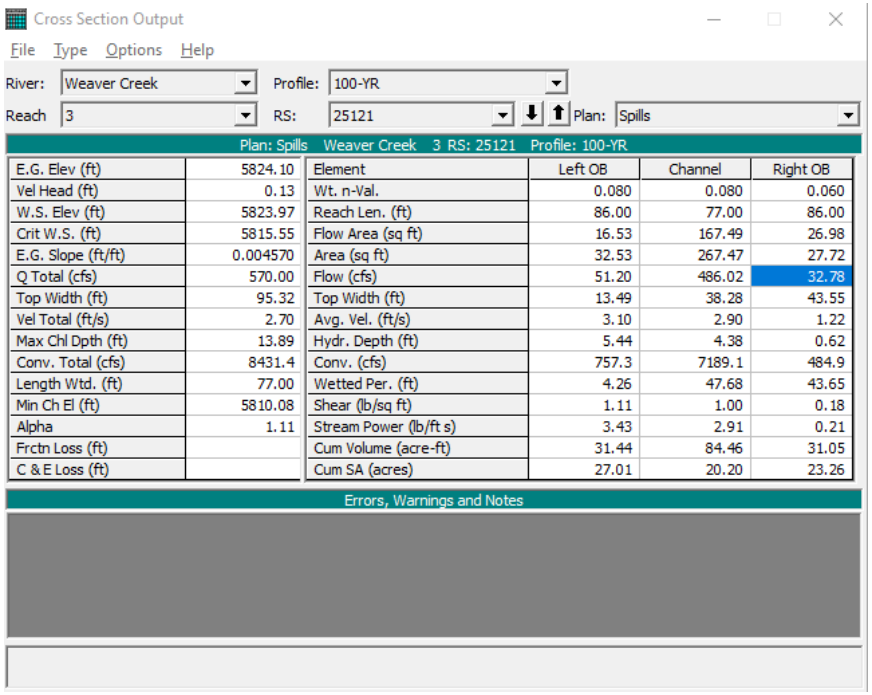
— - EX LAND USE FLOWS

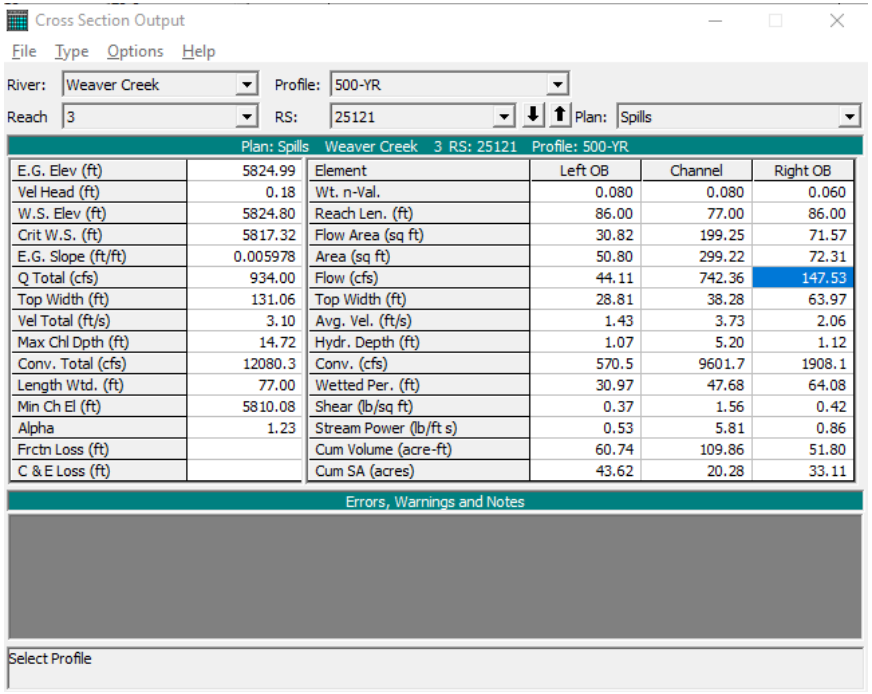


FACE CONTROL FOR BOX CULVERTS WITH SLOPE TAPERED INLETS

SPILL FLOW AND STREET CAPACITY CALCULATIONS

Belleview Spill – Spill Flow Approximation

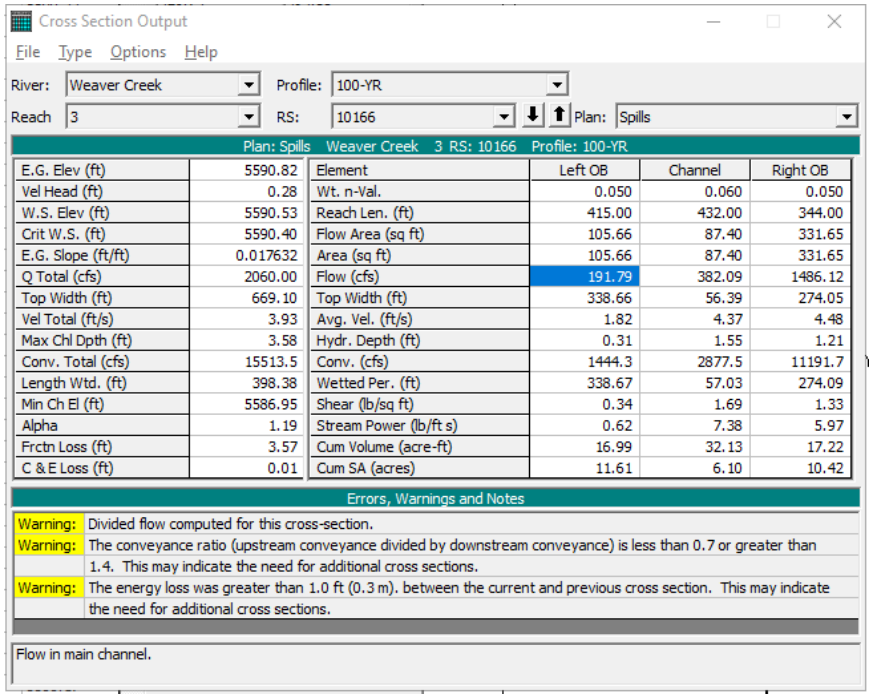




Note:

1. Right bank set at elevation 5823.64

Spill 2 – Spill Flow Approximation



Cross Section Output

File Type Options Help

River: Weaver Creek Profile: 100-YR

Reach 3 RS: 10166 Plan: Spills

Plan: Spills Weaver Creek 3 RS: 10166 Profile: 100-YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	5590.82	Wt. n-Val.	0.050	0.060	0.050
Vel Head (ft)	0.28	Reach Len. (ft)	415.00	432.00	344.00
W.S. Elev (ft)	5590.53	Flow Area (sq ft)	105.66	87.40	331.65
Crit W.S. (ft)	5590.40	Area (sq ft)	105.66	87.40	331.65
E.G. Slope (ft/ft)	0.017632	Flow (cfs)	191.79	382.09	1486.12
Q Total (cfs)	2060.00	Top Width (ft)	338.66	56.39	274.05
Top Width (ft)	669.10	Avg. Vel. (ft/s)	1.82	4.37	4.48
Vel Total (ft/s)	3.93	Hydr. Depth (ft)	0.31	1.55	1.21
Max Chl Dpth (ft)	3.58	Conv. (cfs)	1444.3	2877.5	11191.7
Conv. Total (cfs)	15513.5	Wetted Per. (ft)	338.67	57.03	274.09
Length Wtd. (ft)	398.38	Shear (lb/sq ft)	0.34	1.69	1.33
Min Ch El (ft)	5586.95	Stream Power (lb/ft s)	0.62	7.38	5.97
Alpha	1.19	Cum Volume (acre-ft)	16.99	32.13	17.22
Frctn Loss (ft)	3.57	Cum SA (acres)	11.61	6.10	10.42
C & E Loss (ft)	0.01				

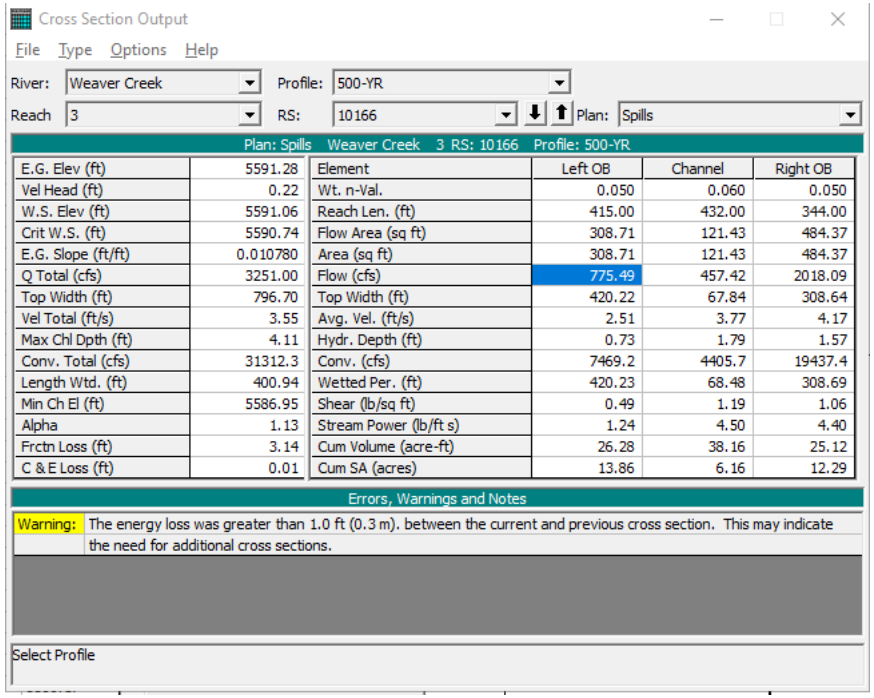
Errors, Warnings and Notes

Warning: Divided flow computed for this cross-section.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Flow in main channel.



Cross Section Output

File Type Options Help

River: Weaver Creek Profile: 500-YR

Reach 3 RS: 10166 Plan: Spills

Plan: Spills Weaver Creek 3 RS: 10166 Profile: 500-YR

		Element	Left OB	Channel	Right OB
E.G. Elev (ft)	5591.28	Wt. n-Val.	0.050	0.060	0.050
Vel Head (ft)	0.22	Reach Len. (ft)	415.00	432.00	344.00
W.S. Elev (ft)	5591.06	Flow Area (sq ft)	308.71	121.43	484.37
Crit W.S. (ft)	5590.74	Area (sq ft)	308.71	121.43	484.37
E.G. Slope (ft/ft)	0.010780	Flow (cfs)	775.49	457.42	2018.09
Q Total (cfs)	3251.00	Top Width (ft)	420.22	67.84	308.64
Top Width (ft)	796.70	Avg. Vel. (ft/s)	2.51	3.77	4.17
Vel Total (ft/s)	3.55	Hydr. Depth (ft)	0.73	1.79	1.57
Max Chl Dpth (ft)	4.11	Conv. (cfs)	7469.2	4405.7	19437.4
Conv. Total (cfs)	31312.3	Wetted Per. (ft)	420.23	68.48	308.69
Length Wtd. (ft)	400.94	Shear (lb/sq ft)	0.49	1.19	1.06
Min Ch El (ft)	5586.95	Stream Power (lb/ft s)	1.24	4.50	4.40
Alpha	1.13	Cum Volume (acre-ft)	26.28	38.16	25.12
Frctn Loss (ft)	3.14	Cum SA (acres)	13.86	6.16	12.29
C & E Loss (ft)	0.01				

Errors, Warnings and Notes

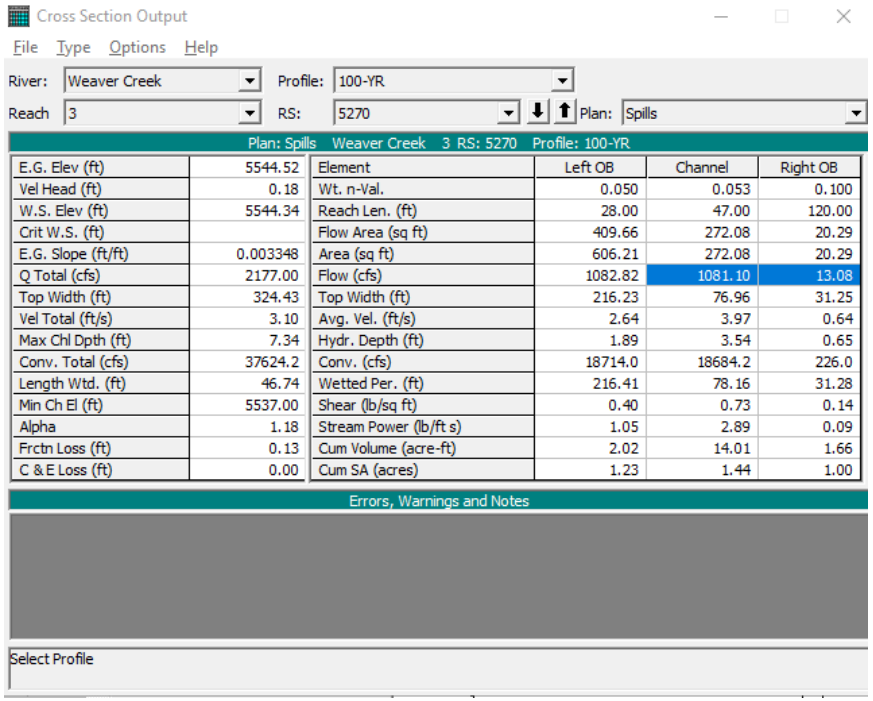
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

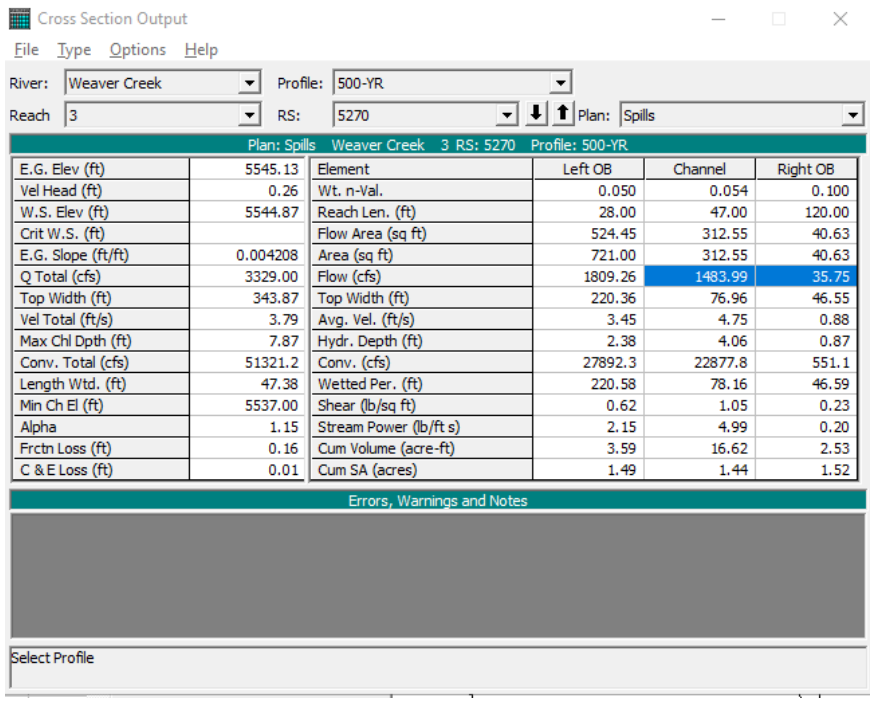
Select Profile

Note:

1. Left bank set at elevation 5590.79

South Miller Court – Street Flow Approximation





Note:

1. Right bank set at elevation 5443
2. Flow used in street capacity calcs is ½ of the ROB flow, since the spreadsheet factors ½ the street geometry.
3. Flow was targeted for the 500-year to determine 500-year depth in the street.

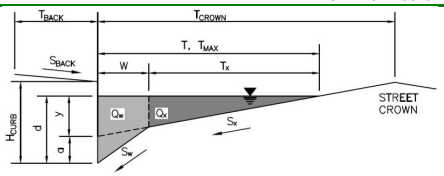
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Weaver Creek

Inlet ID: S Miller Court



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	20.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.250	ft/ft
Warning 01 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.035	
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.073	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	17.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	7.5	inches
Allow Flow Depth at Street Crown (leave blank for no)		☑	☑	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**7.3**	**17.7**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

WARNING: MAJOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'

Warning 01: Manning's n-value does not meet the USDCM recommended design range.

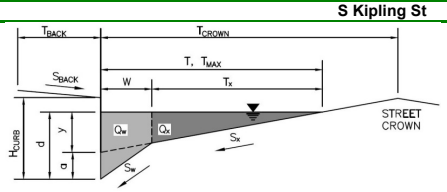
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Weaver Creek

Inlet ID: S Kipling St



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	0.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =		ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.020	
Height of Curb at Gutter Flow Line	H_{CURB} =	6.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	62.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.020	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	62.0	62.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	6.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☑	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**15.6**	**117.0**	**cfs**

WARNING: MINOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'

WARNING: MAJOR STORM max. allowable capacity is less than the design flow given on sheet 'Inlet Management'

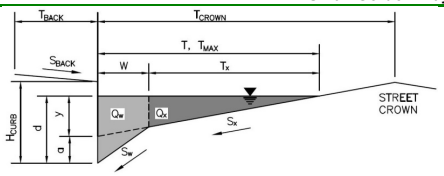
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Weaver Creek

Inlet ID: S Van Gordon Way



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.020	ft/ft
Warning 01 Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.035	
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	20.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.020	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.010	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	20.0	20.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☑	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**2.7**	**89.6**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Warning 01: Manning's n-value does not meet the USDCM recommended design range.

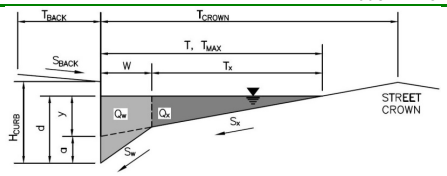
Version 4.05 Released March 2017

ALLOWABLE CAPACITY FOR ONE-HALF OF STREET (Minor & Major Storm)

(Based on Regulated Criteria for Maximum Allowable Flow Depth and Spread)

Project: Weaver Creek

Inlet ID: W Radcliff Ave



Gutter Geometry (Enter data in the blue cells)

Maximum Allowable Width for Spread Behind Curb	T_{BACK} =	5.0	ft
Side Slope Behind Curb (leave blank for no conveyance credit behind curb)	S_{BACK} =	0.015	ft/ft
Manning's Roughness Behind Curb (typically between 0.012 and 0.020)	n_{BACK} =	0.012	
Height of Curb at Gutter Flow Line	H_{CURB} =	4.00	inches
Distance from Curb Face to Street Crown	T_{CROWN} =	17.0	ft
Gutter Width	W =	2.00	ft
Street Transverse Slope	S_X =	0.026	ft/ft
Gutter Cross Slope (typically 2 inches over 24 inches or 0.083 ft/ft)	S_W =	0.083	ft/ft
Street Longitudinal Slope - Enter 0 for sump condition	S_O =	0.017	ft/ft
Manning's Roughness for Street Section (typically between 0.012 and 0.020)	n_{STREET} =	0.020	

		Minor Storm	Major Storm	
Max. Allowable Spread for Minor & Major Storm	T_{MAX} =	14.0	17.0	ft
Max. Allowable Depth at Gutter Flowline for Minor & Major Storm	d_{MAX} =	4.0	12.0	inches
Allow Flow Depth at Street Crown (leave blank for no)		☐	☑	check = yes

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Depth Criterion				
MAJOR STORM Allowable Capacity is based on Depth Criterion	**Q_{allow} =**	**3.1**	**119.0**	**cfs**

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Worksheet for Belleview Swale

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data		
Roughness Coefficient	0.030	
Channel Slope	0.017	ft/ft
Normal Depth	6.0	in
Left Side Slope	4.000	H:V
Right Side Slope	4.000	H:V

Results		
Discharge	2.49	cfs
Flow Area	1.0	ft²
Wetted Perimeter	4.1	ft
Hydraulic Radius	2.9	in
Top Width	4.00	ft
Critical Depth	5.7	in
Critical Slope	0.022	ft/ft
Velocity	2.49	ft/s
Velocity Head	0.10	ft
Specific Energy	0.60	ft
Froude Number	0.878	
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	6.0	in
Critical Depth	5.7	in
Channel Slope	0.017	ft/ft
Critical Slope	0.022	ft/ft

Worksheet for 100-YR LOB of XS 1734, Assume vertical to contain Flow

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Channel Slope	0.036 ft/ft
Normal Depth	6.5 in

Section Definitions

Station (ft)	Elevation (ft)
1+33	5,488.62
1+45	5,487.97
1+49	5,487.66
1+58	5,487.11
1+61	5,487.11
1+64	5,487.15
1+71	5,487.18
1+79	5,487.17
1+82	5,487.13
1+88	5,487.00
1+91	5,486.99
1+94	5,486.99
1+99	5,487.00
1+99	5,487.00
2+06	5,487.10
2+08	5,487.11
2+15	5,487.02
2+16	5,488.62

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+33, 5,488.62)	(2+16, 5,488.62)	0.060

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Discharge	69.44 cfs
Roughness Coefficient	0.060

Worksheet for 100-YR LOB of XS 1734, Assume vertical to contain Flow

Results	
Elevation Range	5,487.0 to 5,488.6 ft
Flow Area	26.8 ft²
Wetted Perimeter	64.8 ft
Hydraulic Radius	5.0 in
Top Width	64.37 ft
Normal Depth	6.5 in
Critical Depth	5.4 in
Critical Slope	0.076 ft/ft
Velocity	2.59 ft/s
Velocity Head	0.10 ft
Specific Energy	0.64 ft
Froude Number	0.709
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	6.5 in
Critical Depth	5.4 in
Channel Slope	0.036 ft/ft
Critical Slope	0.076 ft/ft

Worksheet for 500-YR LOB of XS 1734, Assume vertical to contain Flow

Project Description	
Friction Method	Manning Formula
Solve For	Discharge

Input Data	
Channel Slope	0.036 ft/ft
Normal Depth	17.0 in

Section Definitions

Station (ft)	Elevation (ft)
1+33	5,488.62
1+45	5,487.97
1+49	5,487.66
1+58	5,487.11
1+61	5,487.11
1+64	5,487.15
1+71	5,487.18
1+79	5,487.17
1+82	5,487.13
1+88	5,487.00
1+91	5,486.99
1+94	5,486.99
1+99	5,487.00
1+99	5,487.00
2+06	5,487.10
2+08	5,487.11
2+15	5,487.02
2+16	5,488.62

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(1+33, 5,488.62)	(2+16, 5,488.62)	0.060

Options	
Current Roughness Weighted Method	Pavlovskii's Method
Open Channel Weighting Method	Pavlovskii's Method
Closed Channel Weighting Method	Pavlovskii's Method

Results	
Discharge	450.10 cfs
Roughness Coefficient	0.060

Worksheet for 500-YR LOB of XS 1734, Assume vertical to contain Flow

Results	
Elevation Range	5,487.0 to 5,488.6 ft
Flow Area	89.3 ft²
Wetted Perimeter	80.0 ft
Hydraulic Radius	13.4 in
Top Width	78.67 ft
Normal Depth	17.0 in
Critical Depth	15.3 in
Critical Slope	0.053 ft/ft
Velocity	5.04 ft/s
Velocity Head	0.39 ft
Specific Energy	1.81 ft
Froude Number	0.834
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	17.0 in
Critical Depth	15.3 in
Channel Slope	0.036 ft/ft
Critical Slope	0.053 ft/ft

Worksheet for Parking Lot XS 1 - 100YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.036 ft/ft
Discharge	69.44 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	5,483.53
0+05	5,483.22
0+09	5,483.15
0+09	5,482.65
0+15	5,482.65
0+16	5,482.64
0+51	5,482.04
0+54	5,482.02
0+55	5,482.52
0+55	5,482.52

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 5,483.53)	(0+55, 5,482.52)	0.020

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	0.020
Elevation	5,482.59 ft
Elevation Range	5,482.0 to 5,483.5 ft
Flow Area	11.1 ft²
Wetted Perimeter	37.4 ft
Hydraulic Radius	3.6 in
Top Width	37.04 ft
Normal Depth	6.9 in
Critical Depth	9.1 in
Critical Slope	0.008 ft/ft

Worksheet for Parking Lot XS 1 - 100YR

Results

Velocity	6.25 ft/s
Velocity Head	0.61 ft
Specific Energy	1.18 ft
Froude Number	2.010
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	6.9 in
Critical Depth	9.1 in
Channel Slope	0.036 ft/ft
Critical Slope	0.008 ft/ft

Worksheet for Parking Lot XS 2 - 100YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.010 ft/ft
Discharge	69.44 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+10	5,477.49
0+11	5,477.49
0+11	5,476.99
0+28	5,476.70
0+53	5,476.26
0+54	5,476.24
0+55	5,476.23
0+88	5,476.00
0+88	5,476.50
0+89	5,476.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+10, 5,477.49)	(0+89, 5,476.50)	0.020

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	0.020
Elevation	5,476.58 ft
Elevation Range	5,476.0 to 5,477.5 ft
Flow Area	18.9 ft²
Wetted Perimeter	54.5 ft
Hydraulic Radius	4.2 in
Top Width	54.00 ft
Normal Depth	7.0 in
Critical Depth	7.2 in
Critical Slope	0.008 ft/ft

Worksheet for Parking Lot XS 2 - 100YR

Results

Velocity	3.67 ft/s
Velocity Head	0.21 ft
Specific Energy	0.79 ft
Froude Number	1.093
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	7.0 in
Critical Depth	7.2 in
Channel Slope	0.010 ft/ft
Critical Slope	0.008 ft/ft

Worksheet for Parking Lot XS 3 - 100YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.010 ft/ft
Discharge	69.44 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	5,474.82
0+03	5,474.68
0+03	5,474.18
0+19	5,474.00
0+59	5,473.01
0+60	5,473.00
0+63	5,472.91
0+63	5,473.41
0+68	5,473.41

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 5,474.82)	(0+68, 5,473.41)	0.020

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	10.5 in
Roughness Coefficient	0.020
Elevation	5,473.78 ft
Elevation Range	5,472.9 to 5,474.8 ft
Flow Area	16.9 ft²
Wetted Perimeter	41.3 ft
Hydraulic Radius	4.9 in
Top Width	40.52 ft
Normal Depth	10.5 in
Critical Depth	10.9 in
Critical Slope	0.008 ft/ft
Velocity	4.10 ft/s

Worksheet for Parking Lot XS 3 - 100YR

Results

Velocity Head	0.26 ft
Specific Energy	1.13 ft
Froude Number	1.118
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	10.5 in
Critical Depth	10.9 in
Channel Slope	0.010 ft/ft
Critical Slope	0.008 ft/ft

Worksheet for Parking Lot XS 4 - 100YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.013 ft/ft
Discharge	69.44 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	5,473.27
0+06	5,473.15
0+07	5,473.15
0+07	5,472.65
0+12	5,472.42
0+19	5,472.02
0+38	5,472.00
0+38	5,472.50
0+38	5,472.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 5,473.27)	(0+38, 5,472.50)	0.020

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	7.2 in
Roughness Coefficient	0.020
Elevation	5,472.60 ft
Elevation Range	5,472.0 to 5,473.3 ft
Flow Area	14.1 ft²
Wetted Perimeter	30.9 ft
Hydraulic Radius	5.5 in
Top Width	30.39 ft
Normal Depth	7.2 in
Critical Depth	8.2 in
Critical Slope	0.007 ft/ft
Velocity	4.92 ft/s

Worksheet for Parking Lot XS 4 - 100YR

Results

Velocity Head	0.38 ft
Specific Energy	0.98 ft
Froude Number	1.274
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	7.2 in
Critical Depth	8.2 in
Channel Slope	0.013 ft/ft
Critical Slope	0.007 ft/ft

Worksheet for Parking Lot XS 1 - 500YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.036 ft/ft
Discharge	450.10 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	5,483.53
0+05	5,483.22
0+09	5,483.15
0+09	5,482.65
0+15	5,482.65
0+16	5,482.64
0+51	5,482.04
0+54	5,482.02
0+55	5,482.52
0+55	5,482.52

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 5,483.53)	(0+55, 5,482.52)	0.020

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	14.1 in
Roughness Coefficient	0.020
Elevation	5,483.19 ft
Elevation Range	5,482.0 to 5,483.5 ft
Flow Area	38.2 ft²
Wetted Perimeter	49.7 ft
Hydraulic Radius	9.2 in
Top Width	48.28 ft
Normal Depth	14.1 in
Critical Depth	21.3 in
Critical Slope	0.006 ft/ft

Worksheet for Parking Lot XS 1 - 500YR

Results

Velocity	11.78 ft/s
Velocity Head	2.16 ft
Specific Energy	3.33 ft
Froude Number	2.335
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	14.1 in
Critical Depth	21.3 in
Channel Slope	0.036 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for Parking Lot XS 2 - 500YR

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.010 ft/ft
Discharge	450.10 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+10	5,477.49
0+11	5,477.49
0+11	5,476.99
0+28	5,476.70
0+53	5,476.26
0+54	5,476.24
0+55	5,476.23
0+88	5,476.00
0+88	5,476.50
0+89	5,476.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+10, 5,477.49)	(0+89, 5,476.50)	0.020

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	15.2 in
Roughness Coefficient	0.020
Elevation	5,477.27 ft
Elevation Range	5,476.0 to 5,477.5 ft
Flow Area	67.4 ft²
Wetted Perimeter	79.2 ft
Hydraulic Radius	10.2 in
Top Width	77.74 ft
Normal Depth	15.2 in
Critical Depth	17.0 in
Critical Slope	0.006 ft/ft

Worksheet for Parking Lot XS 2 - 500YR

Results	
Velocity	6.68 ft/s
Velocity Head	0.69 ft
Specific Energy	1.96 ft
Froude Number	1.264
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	15.2 in
Critical Depth	17.0 in
Channel Slope	0.010 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for Parking Lot XS 3 - 500YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.010 ft/ft
Discharge	450.10 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	5,474.82
0+03	5,474.68
0+03	5,474.18
0+19	5,474.00
0+59	5,473.01
0+60	5,473.00
0+63	5,472.91
0+63	5,473.41
0+68	5,473.41

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 5,474.82)	(0+68, 5,473.41)	0.020

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	20.0 in
Roughness Coefficient	0.020
Elevation	5,474.58 ft
Elevation Range	5,472.9 to 5,474.8 ft
Flow Area	63.1 ft²
Wetted Perimeter	67.0 ft
Hydraulic Radius	11.3 in
Top Width	65.07 ft
Normal Depth	20.0 in
Critical Depth	22.2 in
Critical Slope	0.006 ft/ft
Velocity	7.14 ft/s

Worksheet for Parking Lot XS 3 - 500YR

Results

Velocity Head	0.79 ft
Specific Energy	2.46 ft
Froude Number	1.278
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	20.0 in
Critical Depth	22.2 in
Channel Slope	0.010 ft/ft
Critical Slope	0.006 ft/ft

Worksheet for Parking Lot XS 4 - 500YR

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

Input Data

Channel Slope	0.013 ft/ft
Discharge	450.10 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	5,474.00
0+06	5,473.15
0+07	5,473.15
0+07	5,472.65
0+12	5,472.42
0+19	5,472.02
0+38	5,472.00
0+38	5,472.50
0+38	5,472.50

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 5,474.00)	(0+38, 5,472.50)	0.020

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	0.020
Elevation	5,473.60 ft
Elevation Range	5,472.0 to 5,474.0 ft
Flow Area	46.7 ft²
Wetted Perimeter	37.4 ft
Hydraulic Radius	15.0 in
Top Width	35.44 ft
Normal Depth	19.3 in
Critical Depth	24.3 in
Critical Slope	0.005 ft/ft
Velocity	9.63 ft/s

Worksheet for Parking Lot XS 4 - 500YR

Results

Velocity Head	1.44 ft
Specific Energy	3.05 ft
Froude Number	1.479
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	19.3 in
Critical Depth	24.3 in
Channel Slope	0.013 ft/ft
Critical Slope	0.005 ft/ft

Worksheet for S Miller Ct

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.007 ft/ft
Discharge	13.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
-0+25	5.19
-0+17	5.03
-0+17	4.53
-0+15	4.70
0+00	5.00
0+15	4.70
0+17	4.53
0+17	5.03
0+25	5.19

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(-0+25, 5.19)	(0+25, 5.19)	0.020

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	5.7 in
Roughness Coefficient	0.020
Elevation	5.01 ft
Elevation Range	4.5 to 5.2 ft
Flow Area	6.4 ft²
Wetted Perimeter	35.0 ft
Hydraulic Radius	2.2 in
Top Width	34.19 ft
Normal Depth	5.7 in
Critical Depth	5.4 in
Critical Slope	0.011 ft/ft
Velocity	2.04 ft/s
Velocity Head	0.06 ft

Worksheet for S Miller Ct

Results	
Specific Energy	0.54 ft
Froude Number	0.832
Flow Type	Subcritical

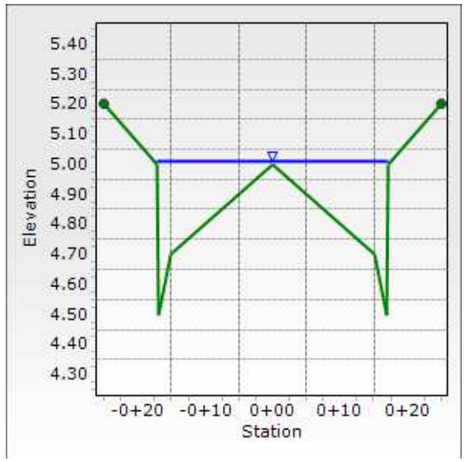
GVF Input Data	
Downstream Depth	0.0 in
Length	0.0 ft
Number Of Steps	0

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	5.7 in
Critical Depth	5.4 in
Channel Slope	0.007 ft/ft
Critical Slope	0.011 ft/ft

Cross Section for S Miller Ct

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.007 ft/ft
Normal Depth	5.7 in
Discharge	13.00 cfs



Worksheet for Kipling St Swale

Project Description	
Friction Method	Manning Formula
Solve For	Normal Depth

Input Data	
Channel Slope	0.015 ft/ft
Discharge	19.00 cfs

Section Definitions

Station (ft)	Elevation (ft)
0+00	5,506.02
0+03	5,506.00
0+08	5,505.00
0+12	5,504.00
0+17	5,502.41
0+21	5,501.66
0+24	5,501.43
0+28	5,501.99
0+31	5,503.00
0+39	5,505.74
0+40	5,506.00
0+50	5,506.02

Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 5,506.02)	(0+50, 5,506.02)	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	10.9 in
Roughness Coefficient	0.040
Elevation	5,502.34 ft
Elevation Range	5,501.4 to 5,506.0 ft
Flow Area	6.3 ft²
Wetted Perimeter	11.8 ft
Hydraulic Radius	6.4 in
Top Width	11.66 ft
Normal Depth	10.9 in

Worksheet for Kipling St Swale

Results	
Critical Depth	9.4 in
Critical Slope	0.031 ft/ft
Velocity	3.00 ft/s
Velocity Head	0.14 ft
Specific Energy	1.05 ft
Froude Number	0.718
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	10.9 in
Critical Depth	9.4 in
Channel Slope	0.015 ft/ft
Critical Slope	0.031 ft/ft

PHOTOS OF MAJOR HYDRAULIC CROSSINGS

WEAVER CREEK

FLOOD HAZARD AREA DELINEATION

Reach WC-5: Structure 3 – Golf Cart Path
(2) 36-inch Steel Pipe

Reach WC-5: Structure 4 – Golf Cart Path
(1) 24-inch ABS, (1) 36-inch Steel Pipe

Reach WC-5: Structure 5 – Willow Springs Drive
(2) 48-inch RCP (Modified Drop Inlet)

Reach WC-5: Structure 6 – W. Roton Arena
(1) 36-inch RCP

Reach WC-5: Structure 7 – Pedestrian Bridge
19.5-ft Bridge (1 pier)

Reach WC-5: Structure 8 – Private Driveway
(1) 36-inch RCP

Reach WC-5: Structure 9 – Private Driveway
(1) 32-inch by 28-inch Elliptical CMP

Reach WC-5: Structure 10 – Pedestrian Bridge
13-ft Bridge (no piers)

Reach WC-5: Structure 11 – Pedestrian Bridge
29.5-ft Bridge (1 pier)

Reach WC-5: Structure 12 – Colorow Drive
(1) 36-inch RCP

Reach WC-5: Structure 13 – Meadowbrook Drive
(1) 36-inch RCP

Reach WC-5: Structure 14 – Willowbrook Drive
(1) 36-inch RCP

WEAVER CREEK

FLOOD HAZARD AREA DELINEATION

Reach WC-5: Structure 15 – Crestbrook Drive
(1) 72-inch CMP

Reach WC-5: Structure 16 – Private Driveway
(1) 6-ft by 3.7-ft Elliptical CMP

Reach WC-5: Structure 17 – Belleview Avenue
(1) 72-inch CMP

Reach WC-5: Structure 18 – Private Driveway
(1) 72-inch CMP

Reach WC-5: Structure 19 – Belleview Avenue
(1) 74-inch CMP

Reach WC-5: Structure 21 – Belleview Avenue
(1) 78-inch CMP

Reach WC-5: Structure 23 – Private Driveway
(1) 72-inch CMP

Reach WC-5: Structure 24 – Quincy Avenue/Frontage Road
(1) 20-ft by 8-ft RCBC

Reach WC-4: Structure 25 – C-470
(1) 35-ft by 6-ft RCBC (Modified Drop Inlet)
(16-ft by 6-ft RCBC at Throat)

Reach WC-4: Structure 26 – Eldridge Street
(2) 10-ft by 6-ft RCBC

Reach WC-4: Structure 27 – Cole Street
(2) 68-inch CMP

Reach WC-4: Structure 28 – South Youngfield Street
(2) 10-ft by 8-ft RCBC

WEAVER CREEK

FLOOD HAZARD AREA DELINEATION

Reach WC-4: Structure 29 – Pedestrian Walkway
(1) 36-inch RCP

Reach WC-3: Structure 30 – Pedestrian Bridge
60-ft Bridge (no piers)

Reach WC-4: Structure 31 – Simms Street
(1) 12-ft by 10-ft RCBC
(1)12-ft by 9-ft RCBC

Reach WC-3: Structure 32 – West Quincy Avenue
(1) 16-ft by 7-ft RCBC with 2 feet filled in
(1) 16-ft by 7.5-ft RCBC with 2.5 feet filled in

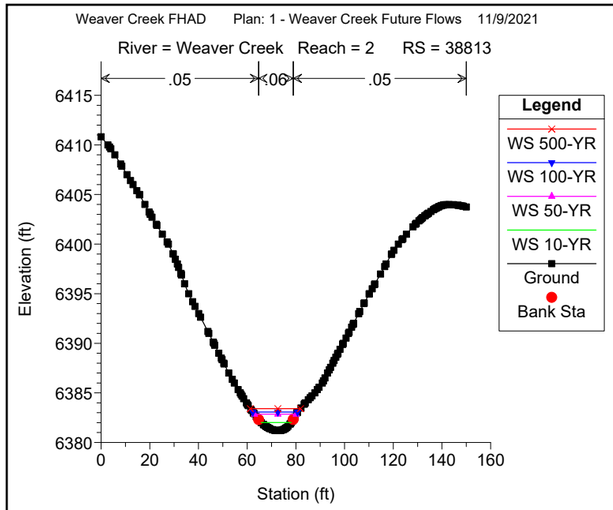
Reach WC-2: Structure 36 – Warrior Canal and Maintenance Road
(1) 96-inch by 60-inch Elliptical CMP

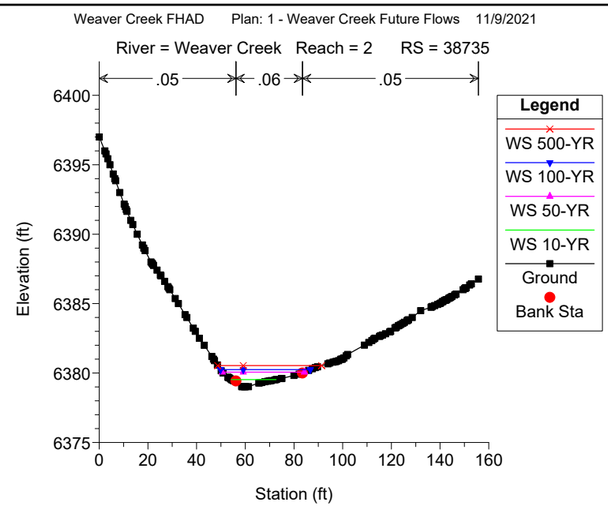
Reach WC-2: Structure 37 – Pedestrian Bridge
90-ft Bridge (no piers)

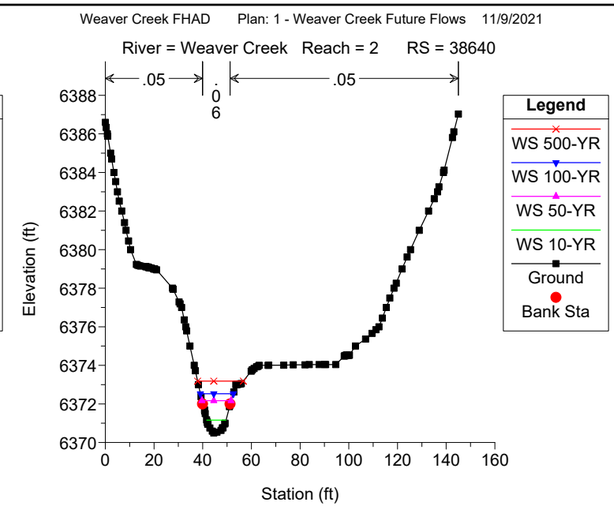
Reach WC-1: Structure 38 – Hampden Avenue/Highway 285
(1) 15.5-ft by 6-ft RCBC (Modified Drop Inlet)
(7-ft by 6-ft RCBC at Throat)

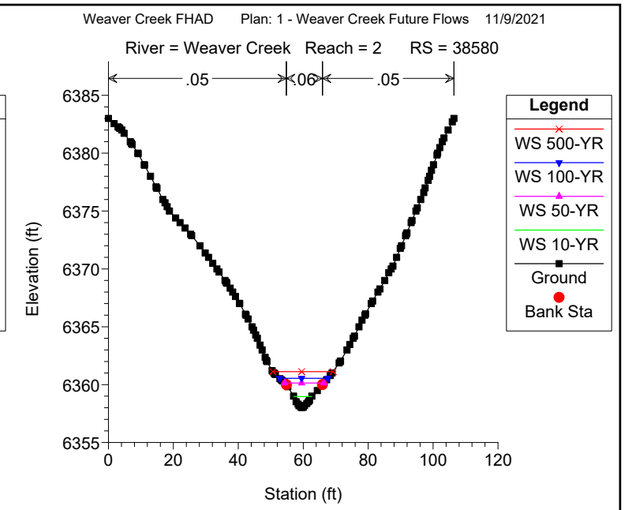
Reach WC-1: Structure 40 – Dartmouth Avenue
(2) 22.5-ft by 9.2-ft RCBC (Modified Drop Inlet)
(14-ft by 9.2-ft RCBC at Throat)

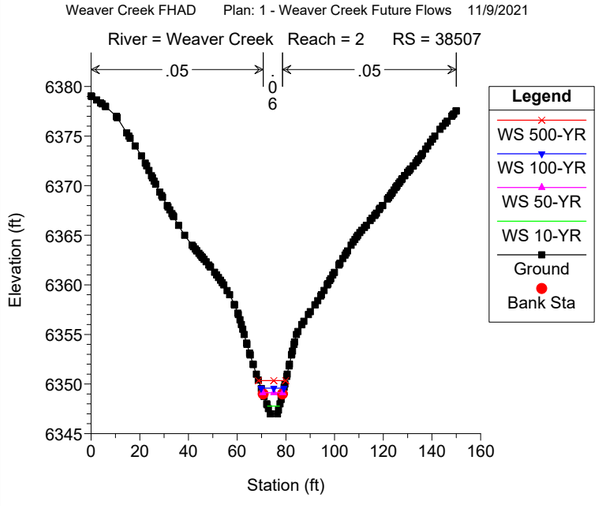
HEC-RAS CROSS SECTIONS

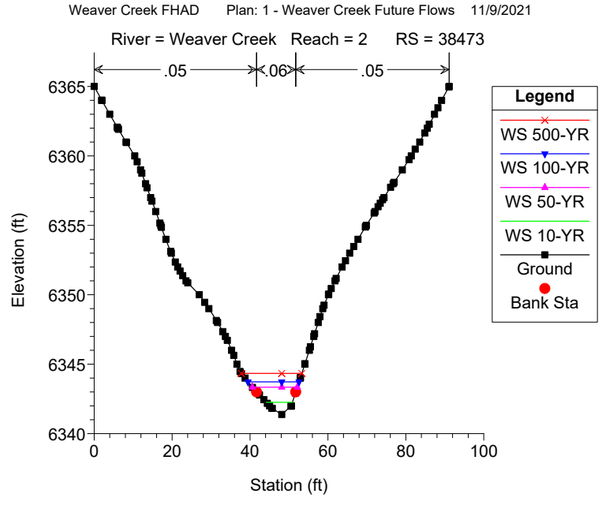

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38813
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

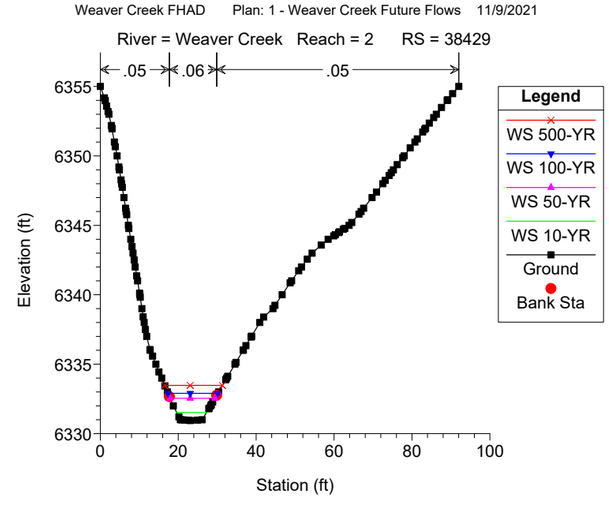

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38735
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

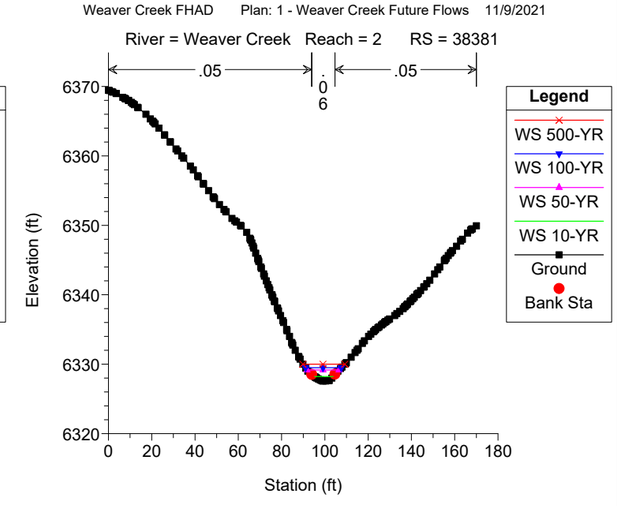

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38640
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

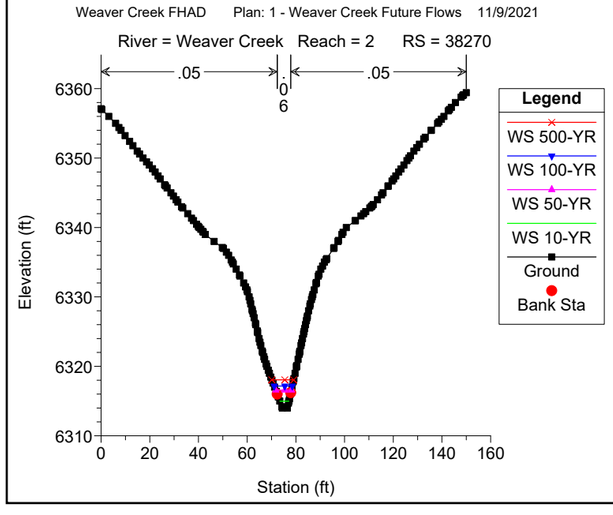

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38580
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

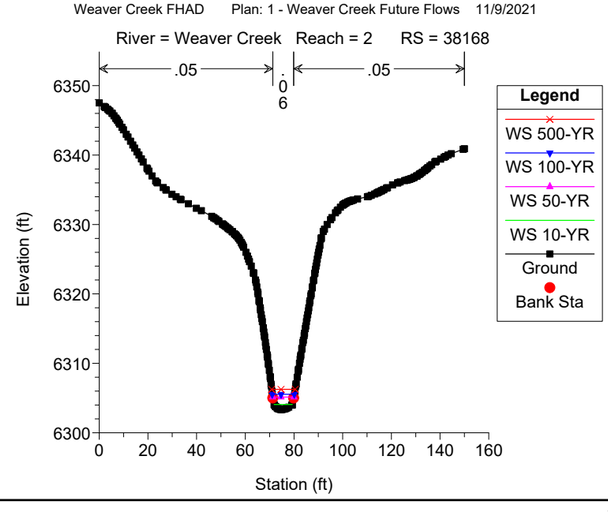

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38507
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

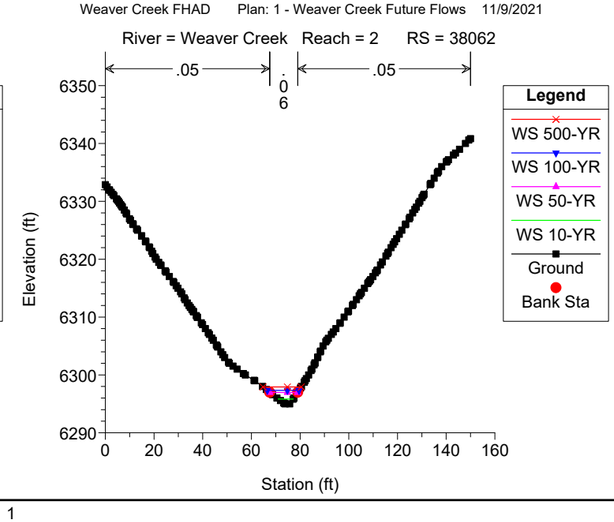

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38473
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

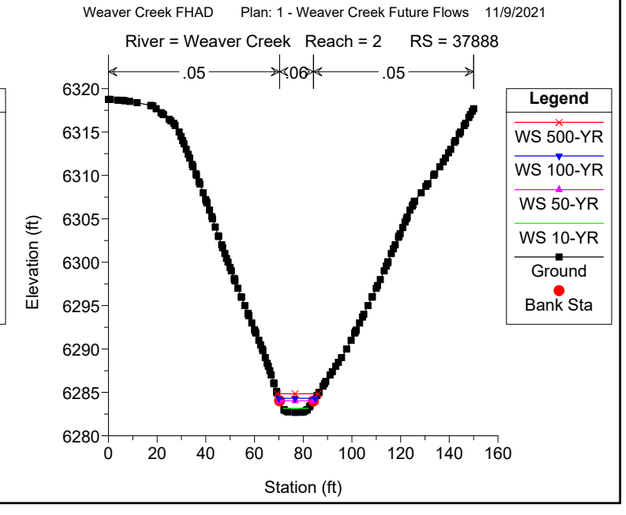

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38429
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38381
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38270
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

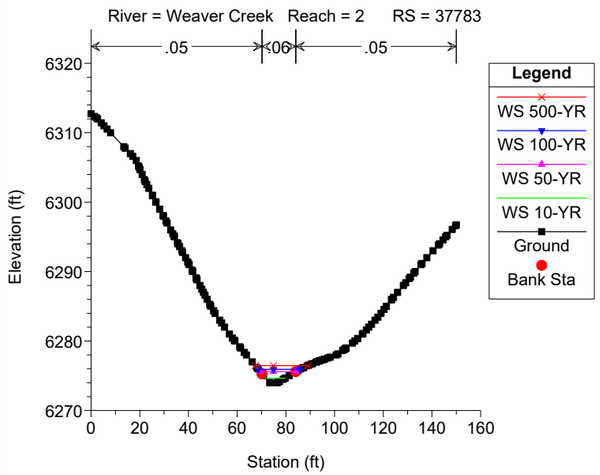

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38168
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 38062
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 37888
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

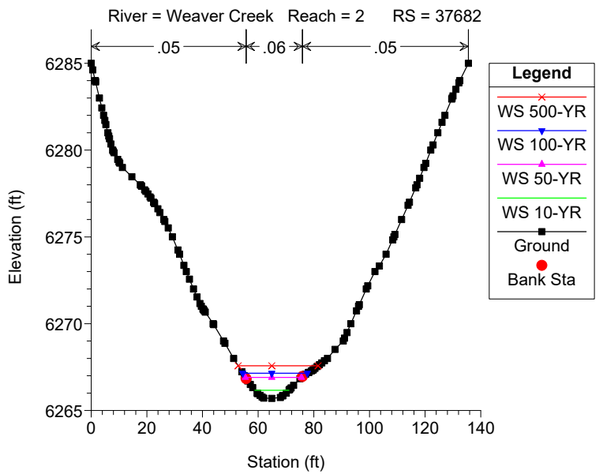
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 37783



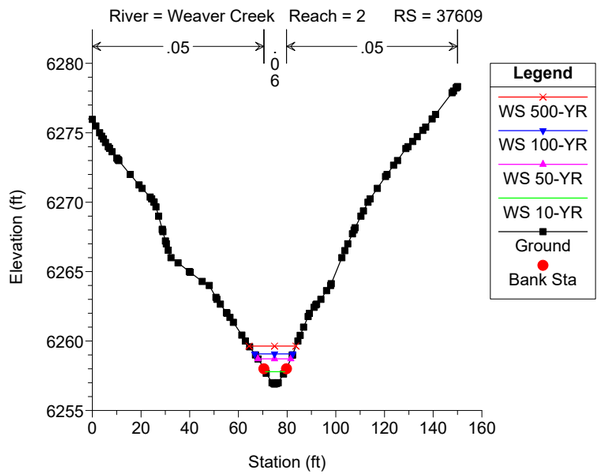
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 37682



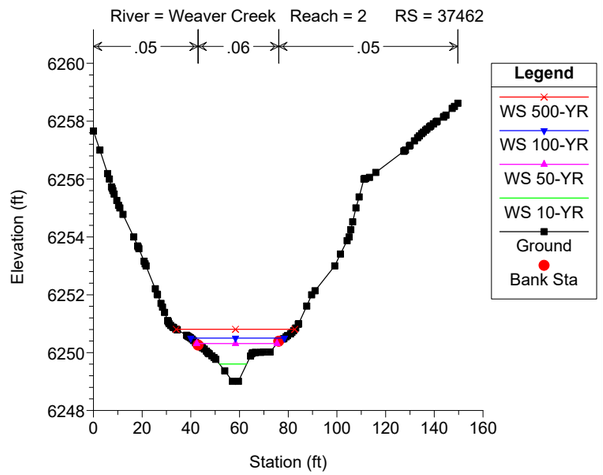
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 37609



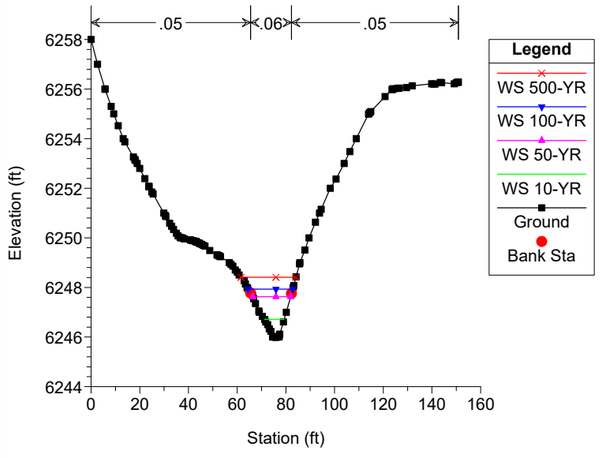
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 37462



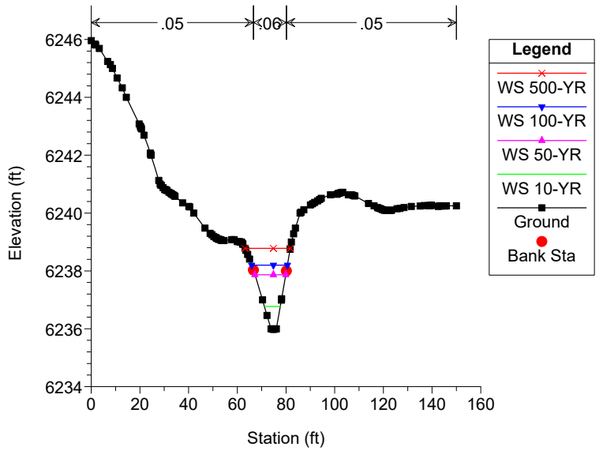
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 37449



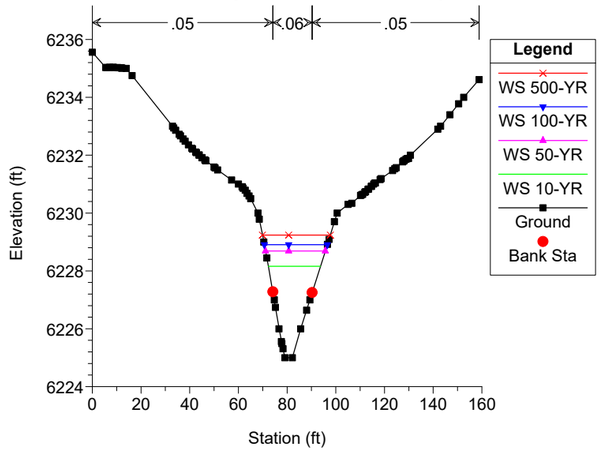
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 37306



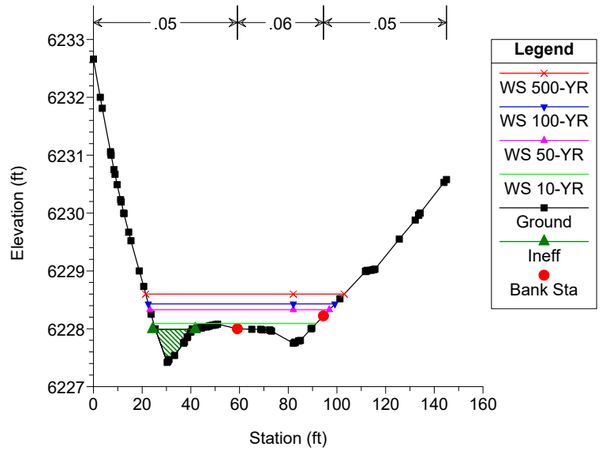
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 37175



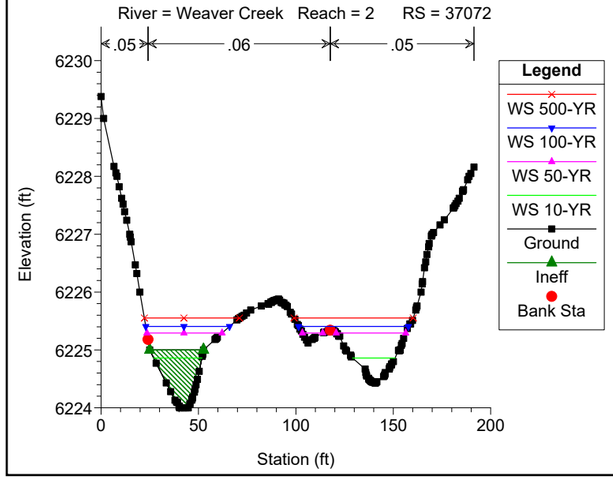
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 37122



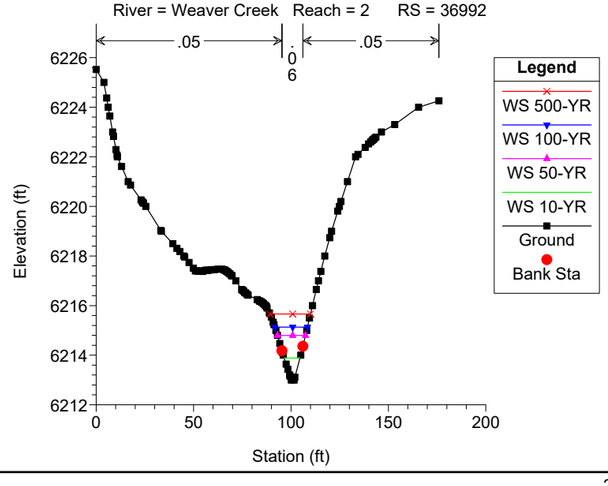
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 37072



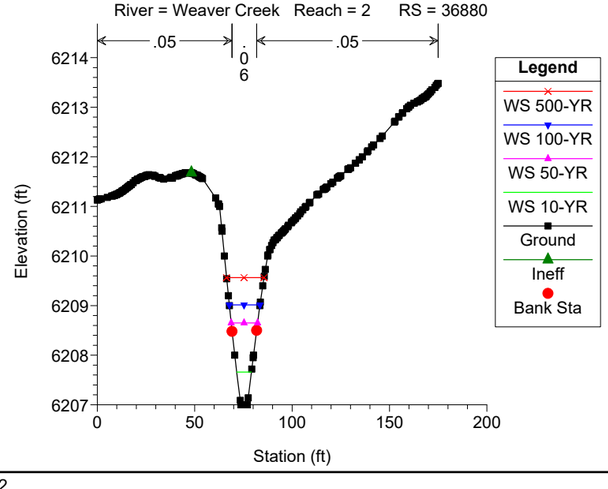
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 36992



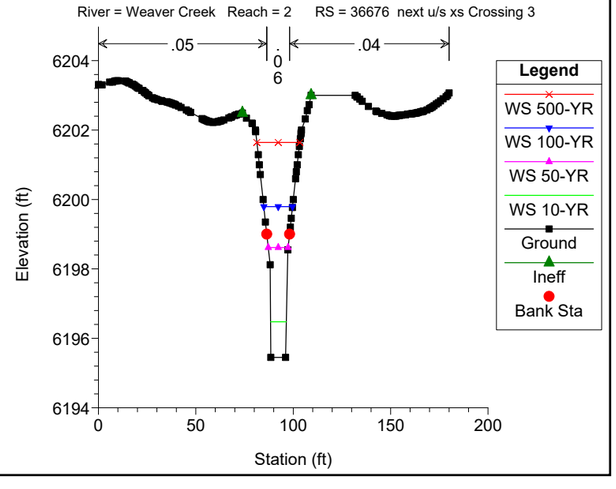
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

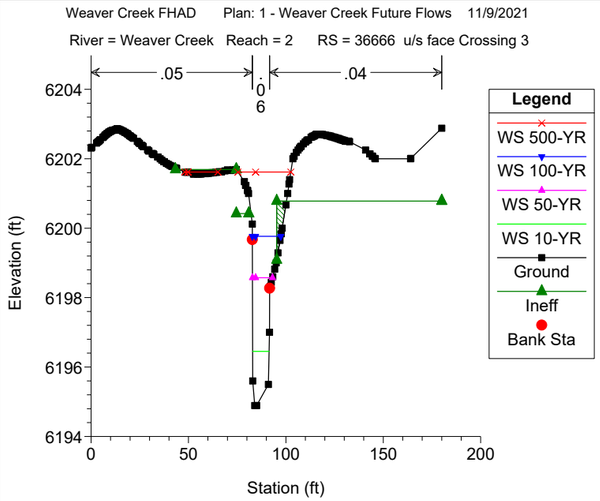
River = Weaver Creek Reach = 2 RS = 36880

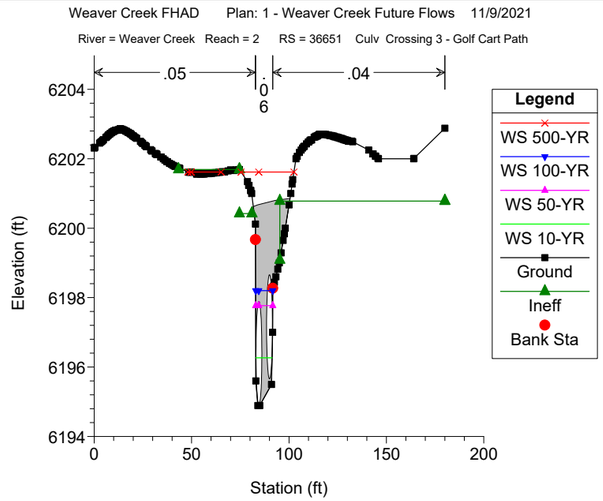


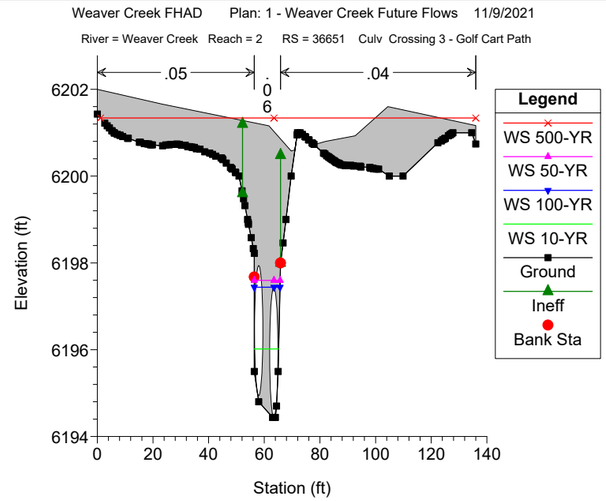
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

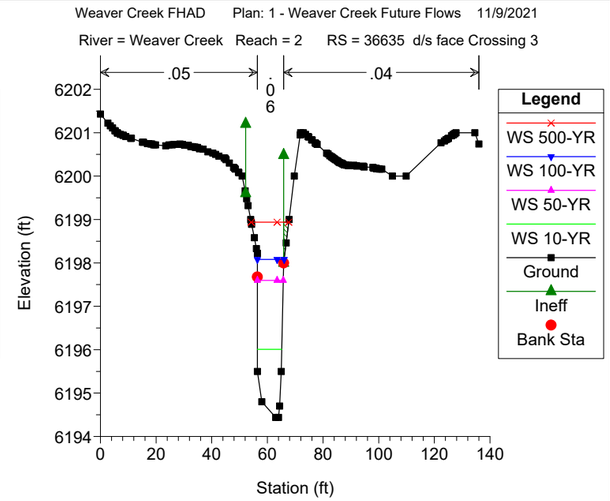
River = Weaver Creek Reach = 2 RS = 36676 next u/s xs Crossing 3

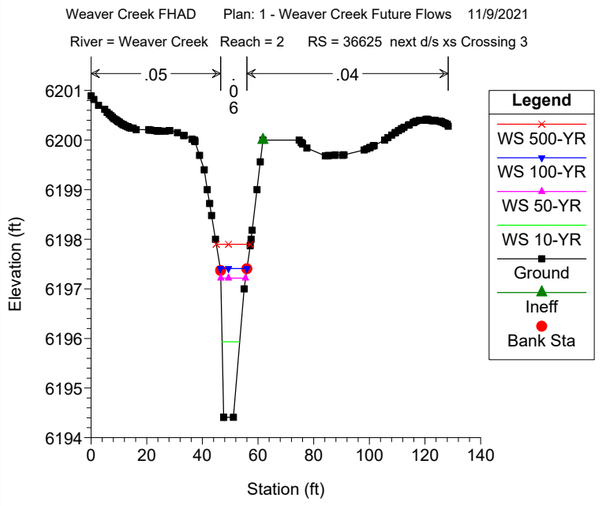


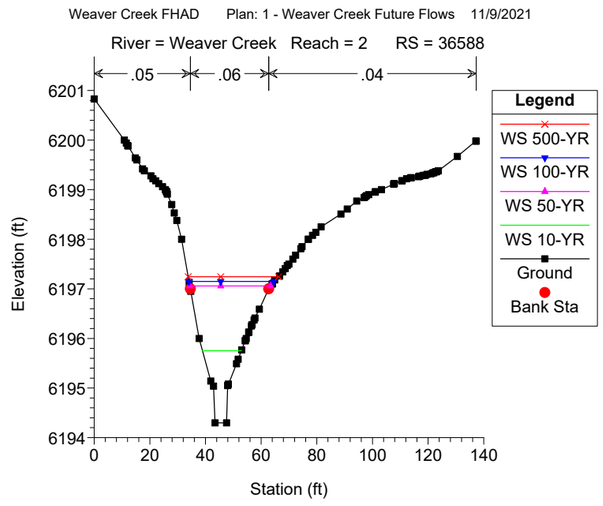

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36666 u/s face Crossing 3
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

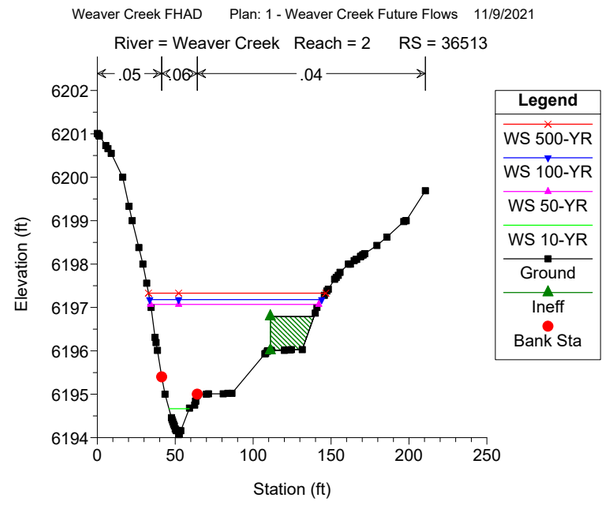

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36651 Culv Crossing 3 - Golf Cart Path
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

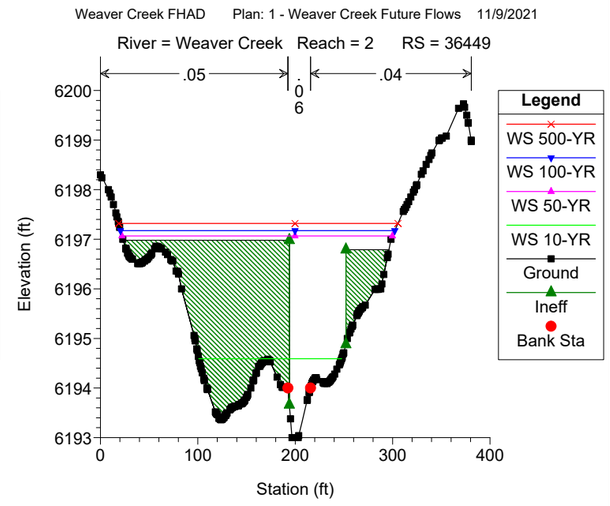

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36651 Culv Crossing 3 - Golf Cart Path
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 50-YR
WS 100-YR
WS 10-YR
Ground
Ineff
Bank Sta

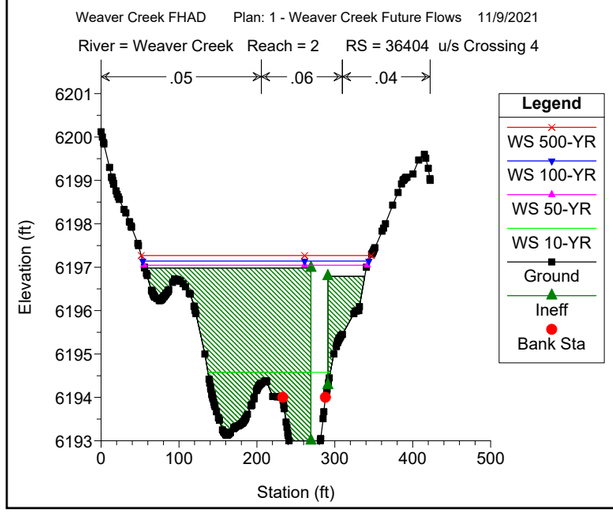

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36635 d/s face Crossing 3
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

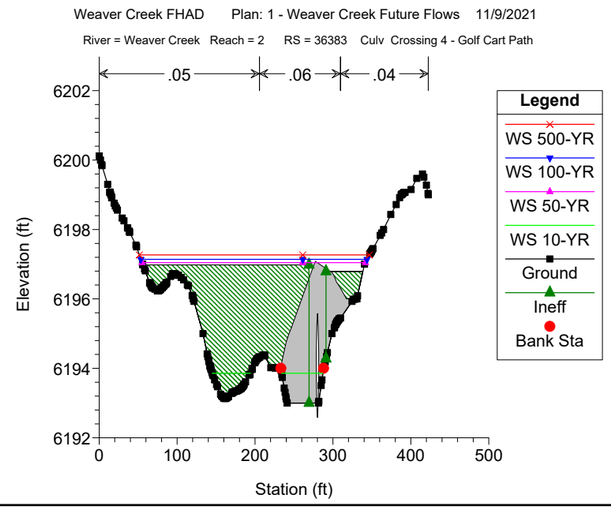

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36625 next d/s xs Crossing 3
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

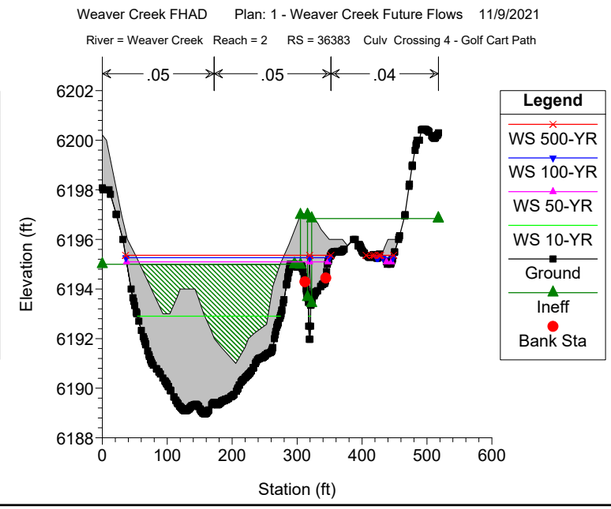

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36588
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

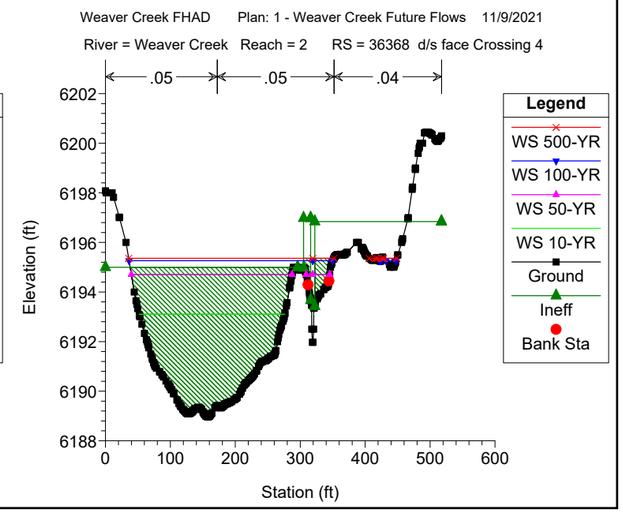

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36513
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36449
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36404 u/s Crossing 4
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

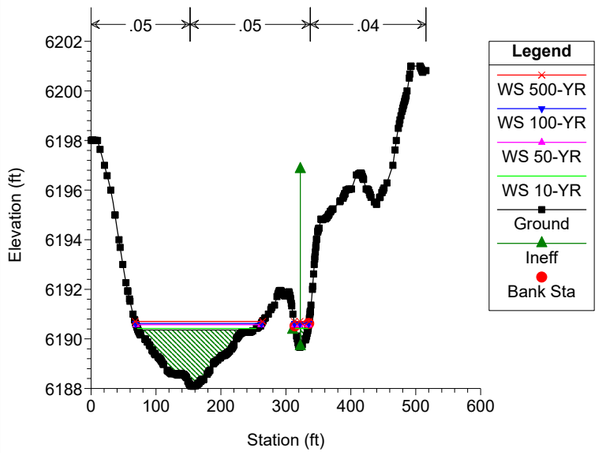

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36383 Culv Crossing 4 - Golf Cart Path
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36383 Culv Crossing 4 - Golf Cart Path
.05 .05 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 36368 d/s face Crossing 4
.05 .05 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

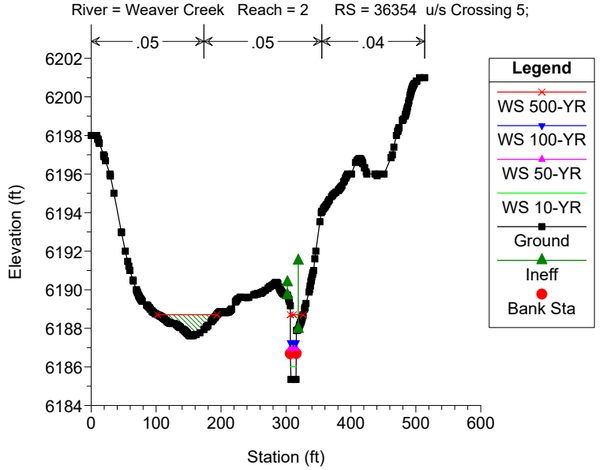
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 36360 next d/s xs Crossing 4, next u/s xs Crossing 5



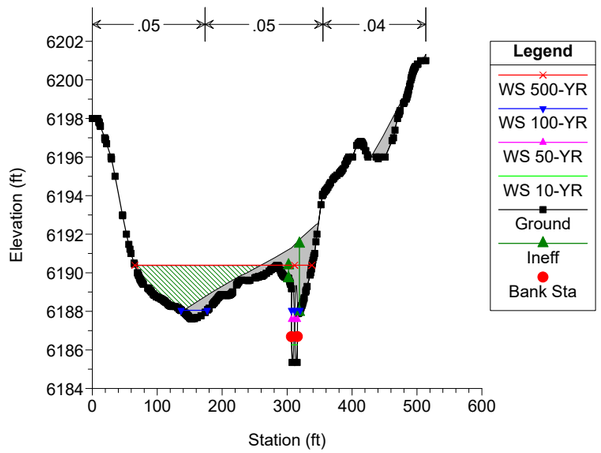
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 36354 u/s Crossing 5;



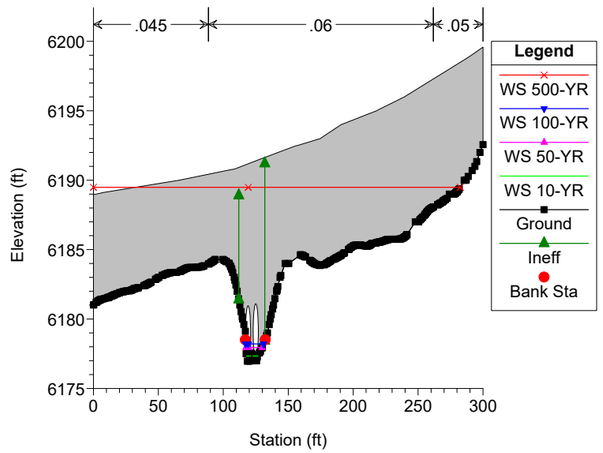
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 36308 Culv Crossing 5 - Willow Springs Drive;



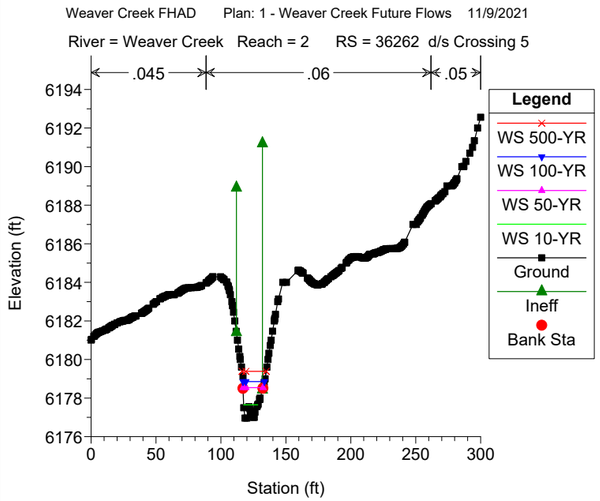
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 36308 Culv Crossing 5 - Willow Springs Drive;



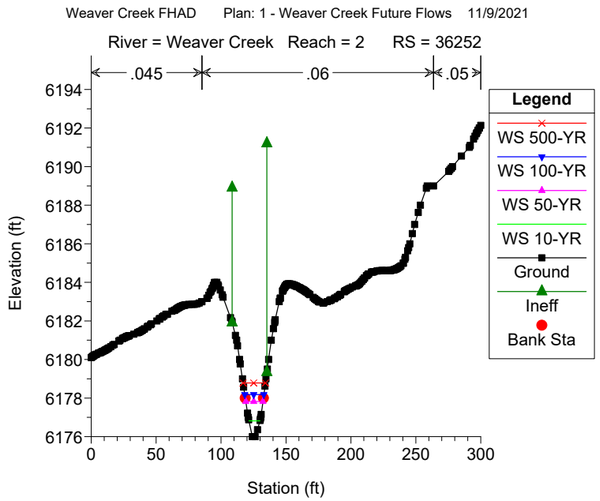
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 36262 d/s Crossing 5



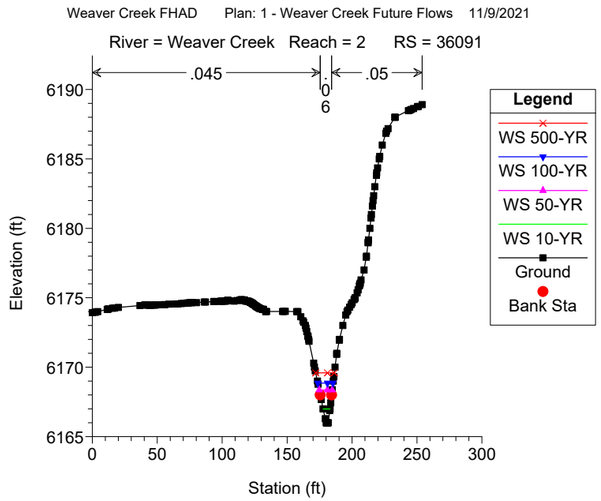
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 36252



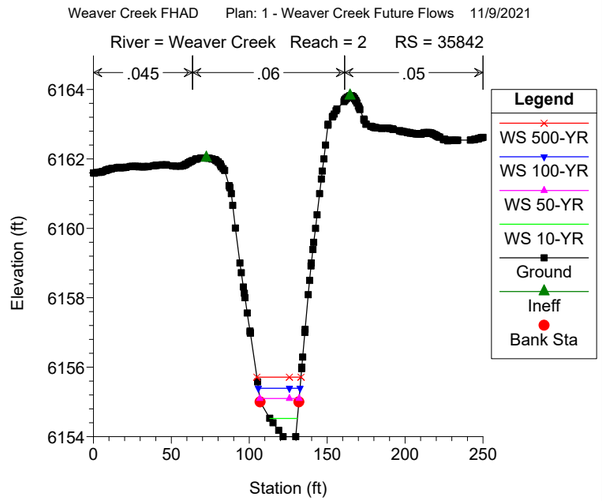
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 36091



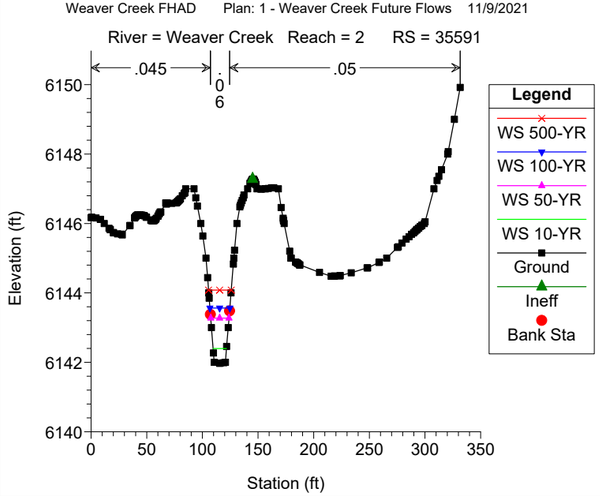
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 35842



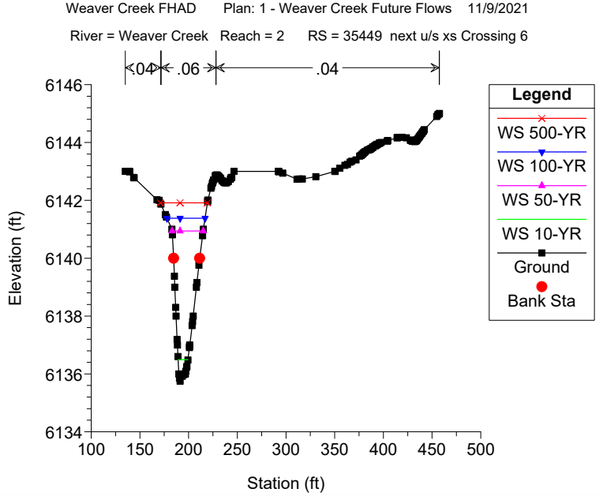
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 35591



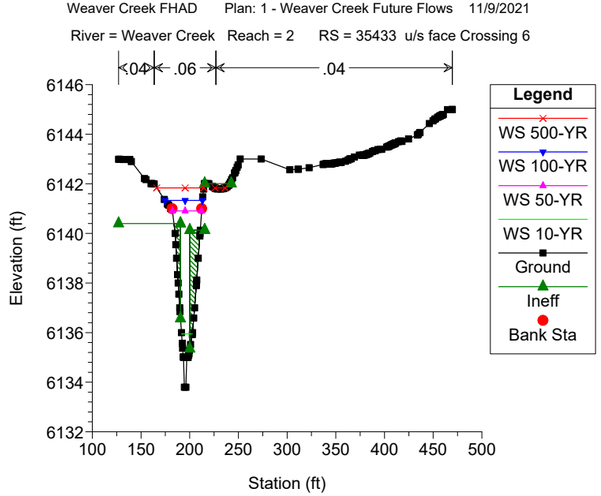
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 35449 next u/s xs Crossing 6



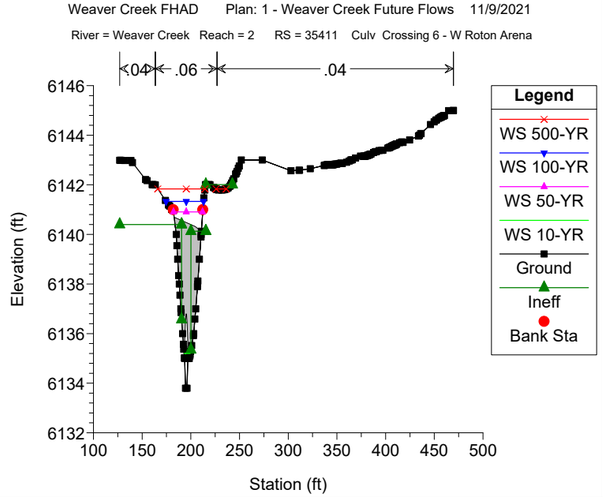
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

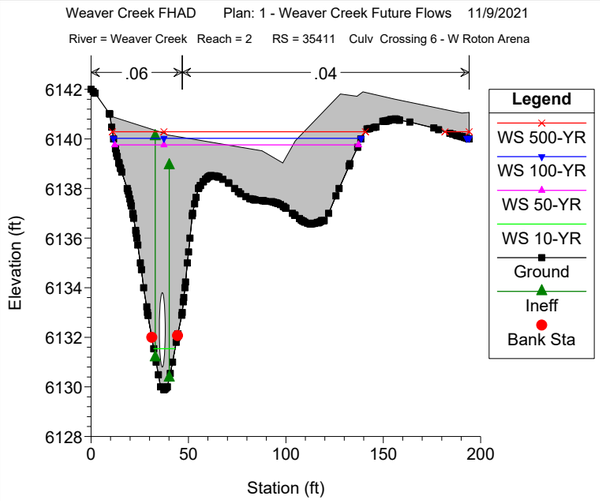
River = Weaver Creek Reach = 2 RS = 35433 u/s face Crossing 6

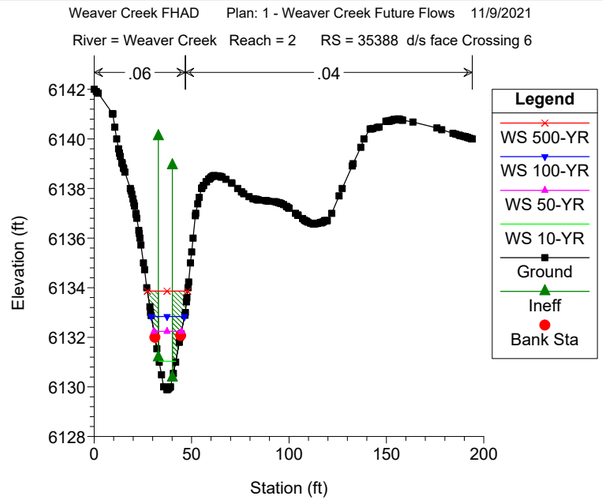


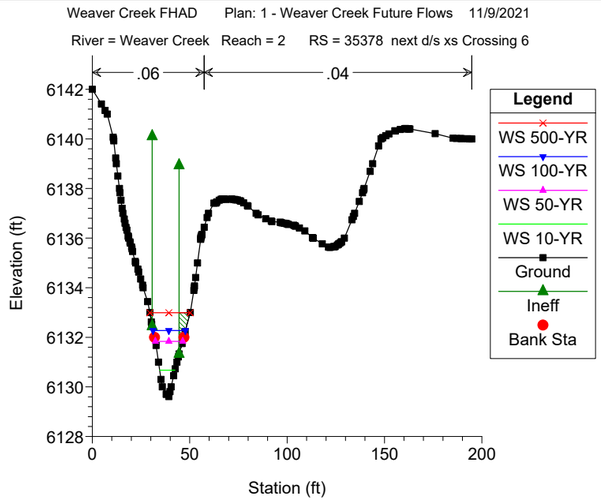
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

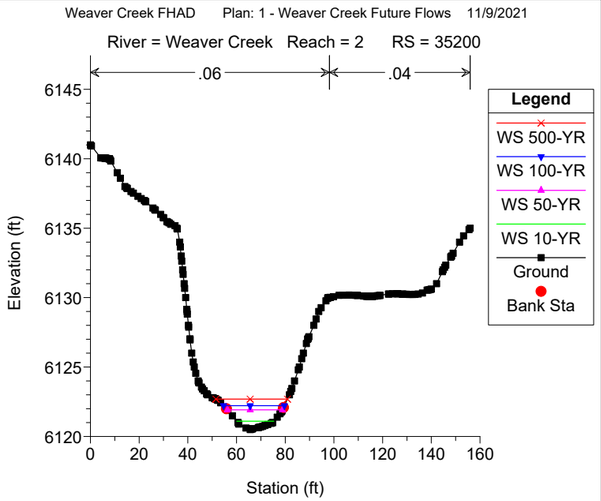
River = Weaver Creek Reach = 2 RS = 35411 Culv Crossing 6 - W Roton Arena

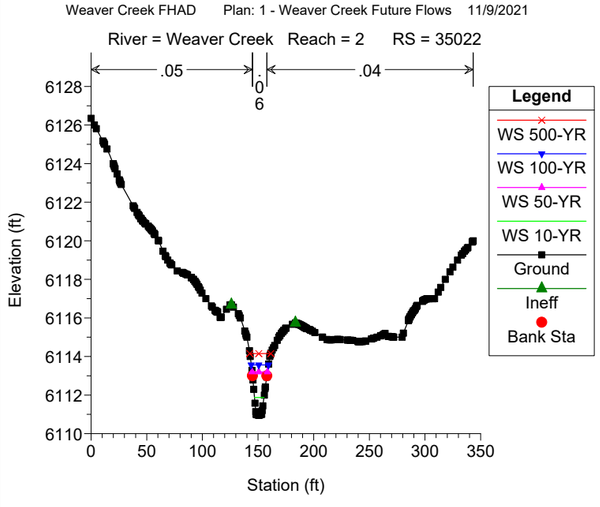


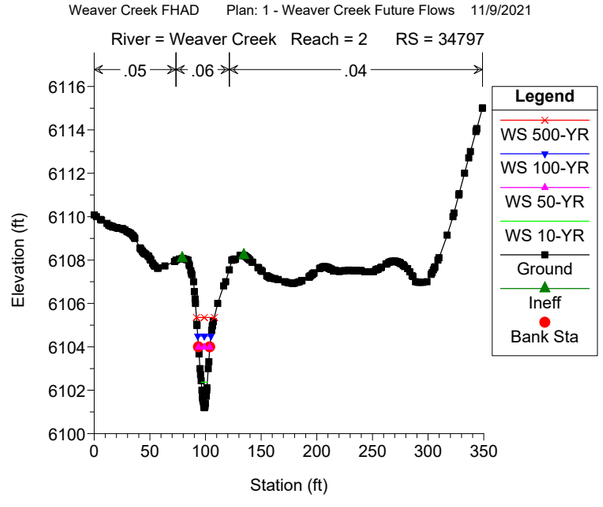

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 35411 Culv Crossing 6 - W Roton Arena
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

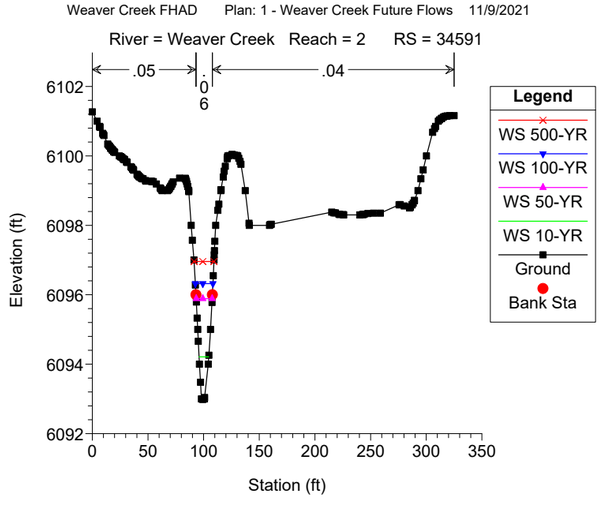

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 35388 d/s face Crossing 6
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

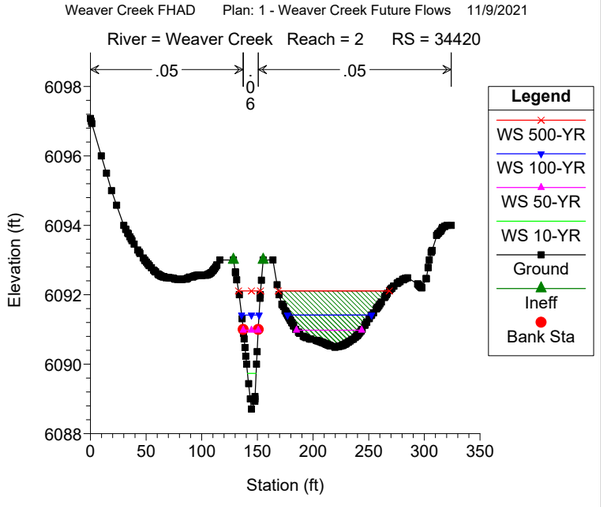

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 35378 next d/s xs Crossing 6
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

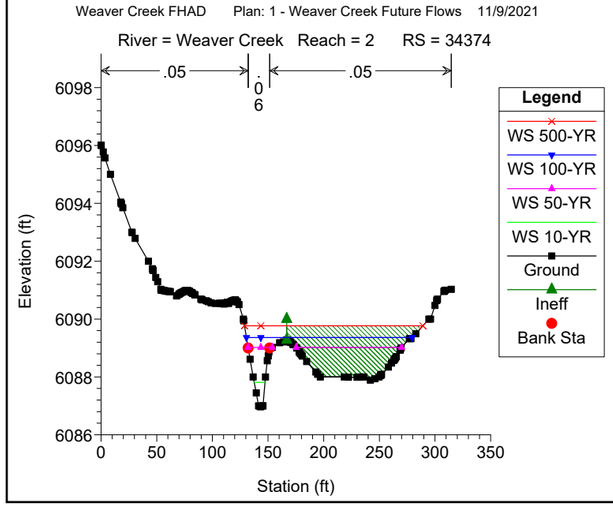

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 35200
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

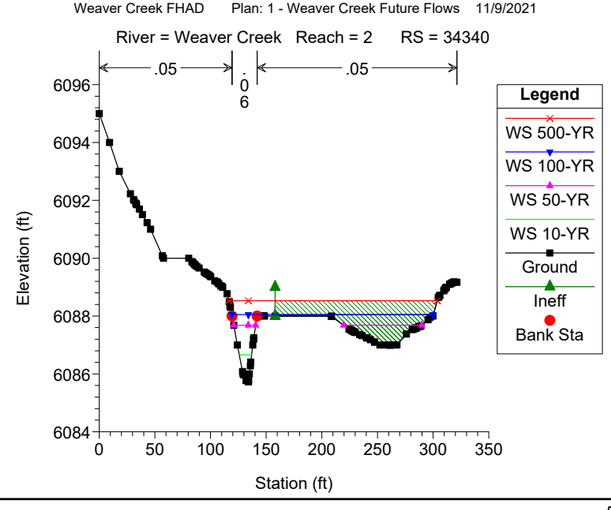

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 35022
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

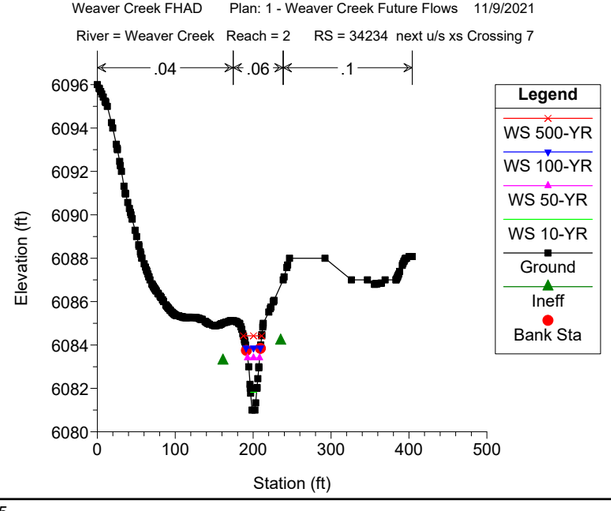

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34797
.05
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

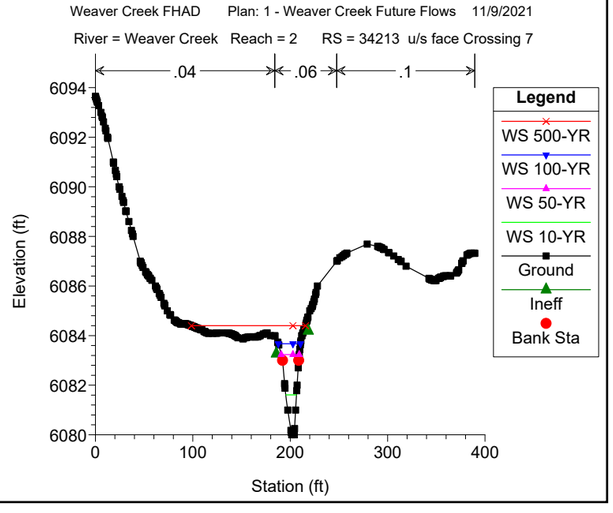

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34591
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

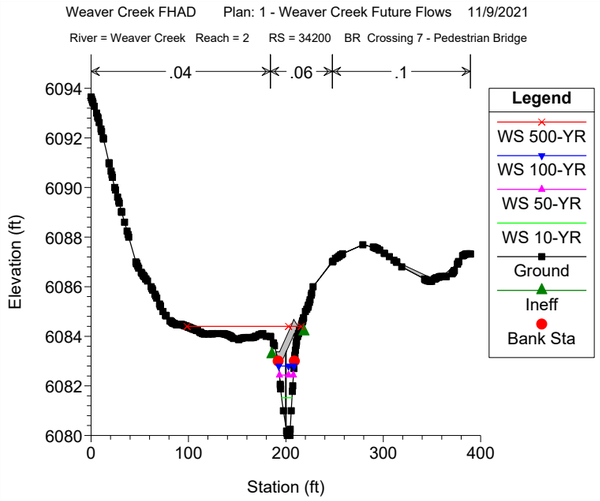

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34420
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

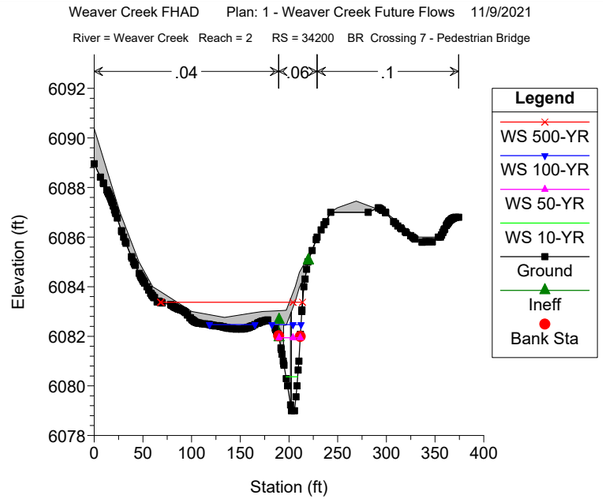

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34374
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

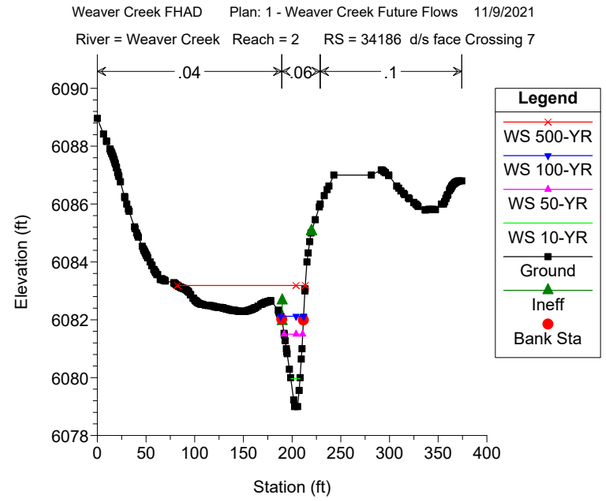

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34340
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

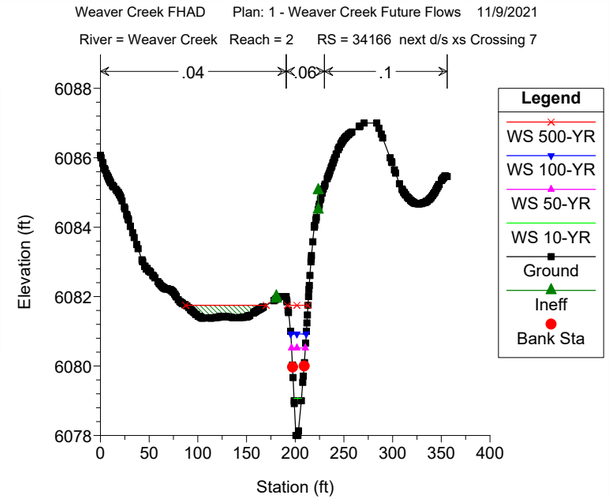

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34234 next u/s xs Crossing 7
.04
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

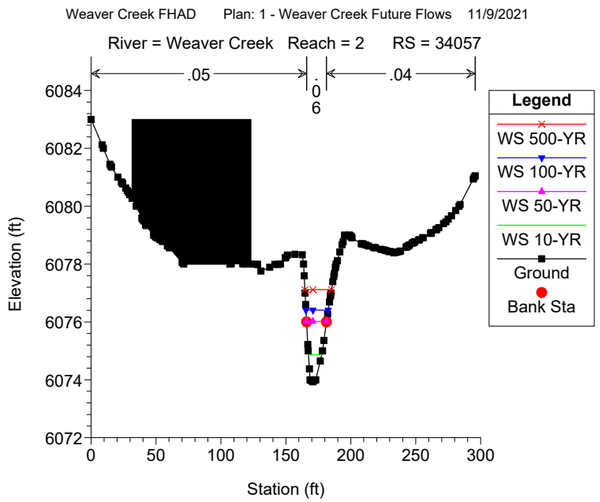

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34213 u/s face Crossing 7
.04
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

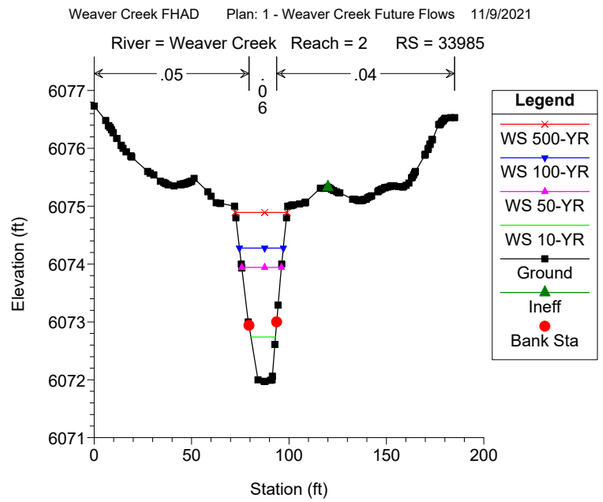

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34200 BR Crossing 7 - Pedestrian Bridge
.04
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

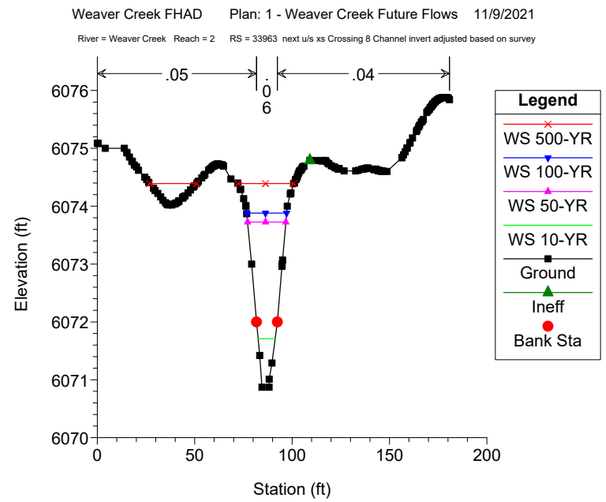

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34200 BR Crossing 7 - Pedestrian Bridge
.04
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

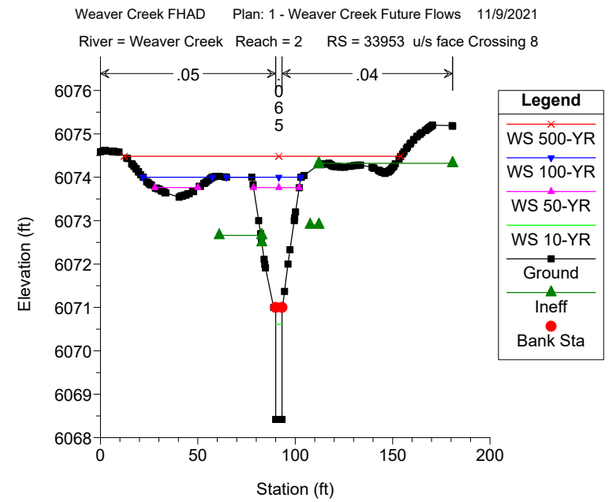

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34186 d/s face Crossing 7
.04
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

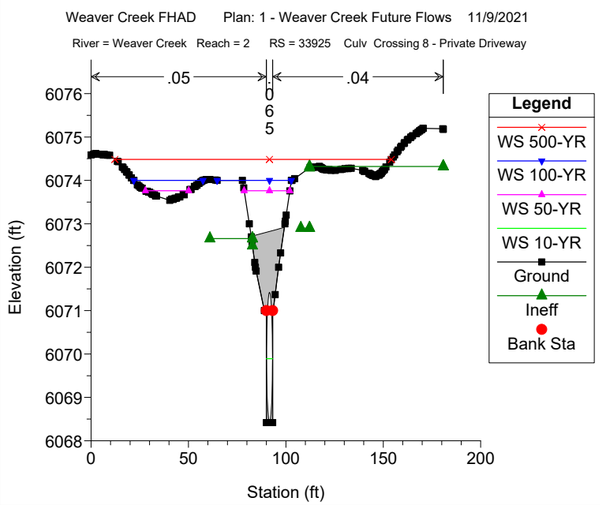

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34166 next d/s xs Crossing 7
.04
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

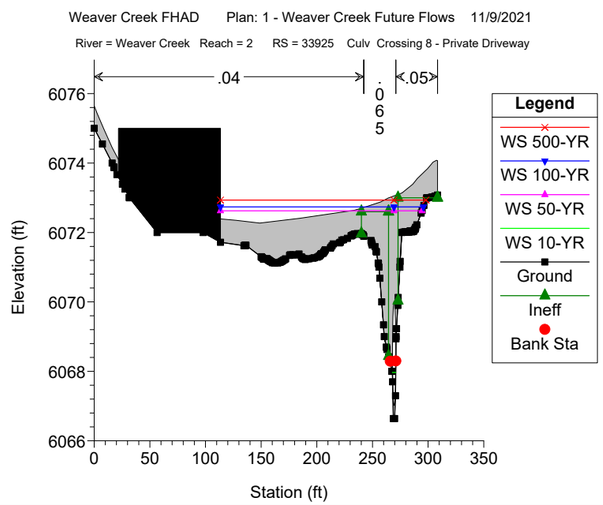

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 34057
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

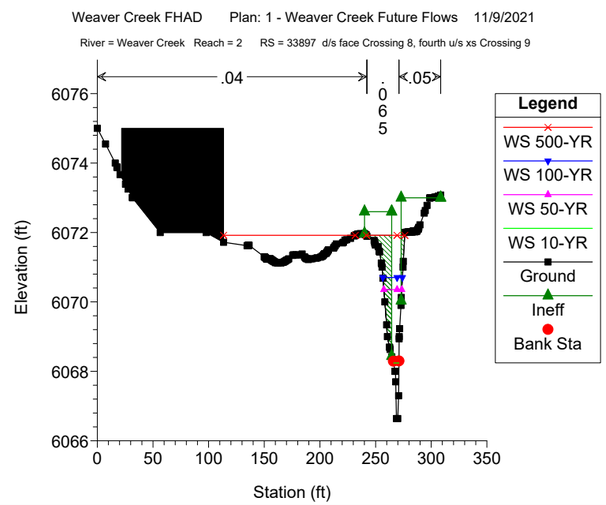

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33985
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

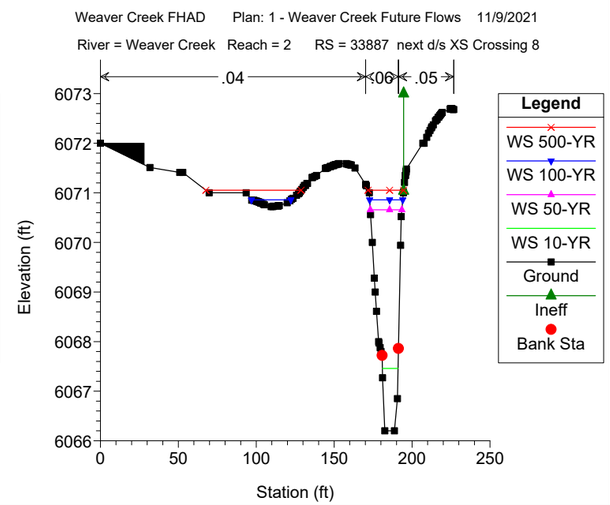

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33963 next u/s xs Crossing 8 Channel invert adjusted based on survey
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

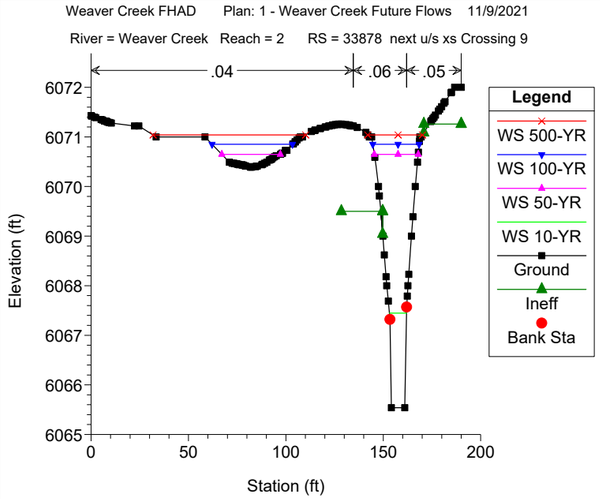

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33953 u/s face Crossing 8
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

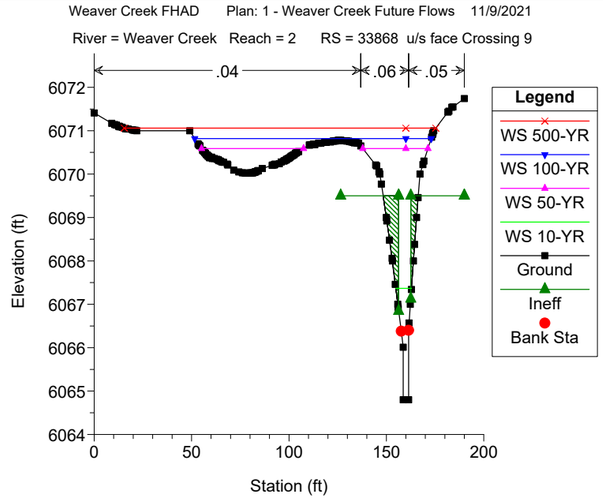

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33925 Culv Crossing 8 - Private Driveway
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

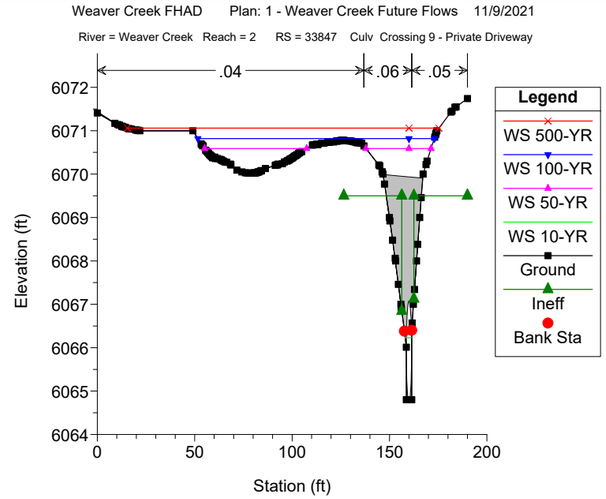

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33925 Culv Crossing 8 - Private Driveway
.04
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

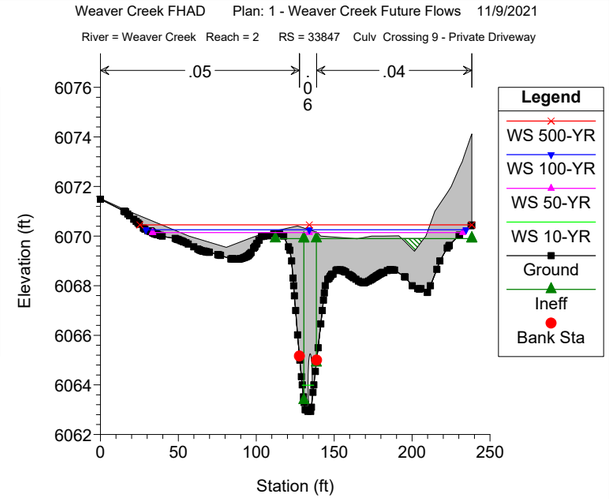

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33897 d/s face Crossing 8, fourth u/s xs Crossing 9
.04
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

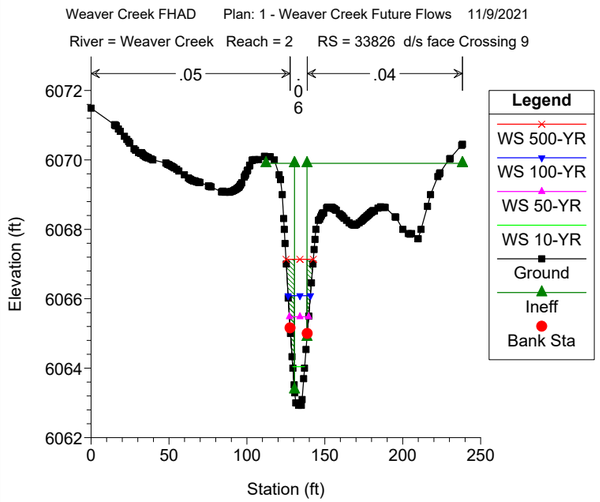

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33887 next d/s XS Crossing 8
.04
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

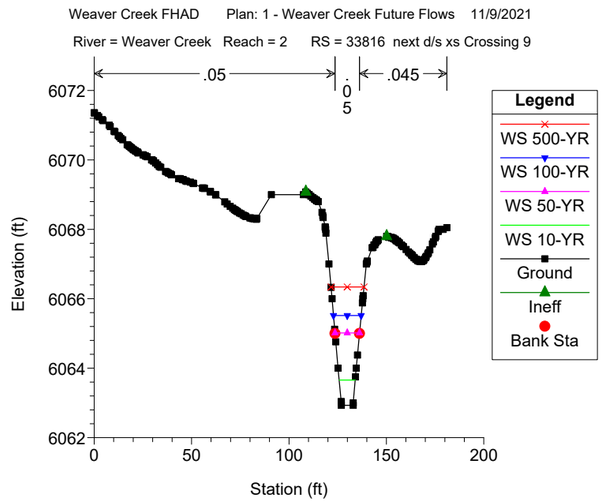

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33878 next u/s xs Crossing 9
.04
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

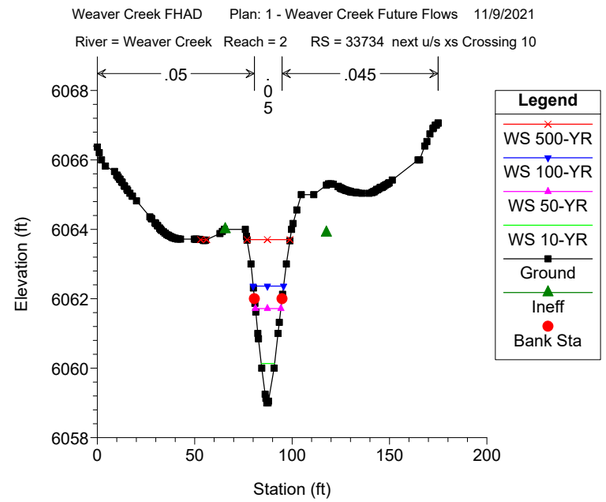

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33868 u/s face Crossing 9
.04
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

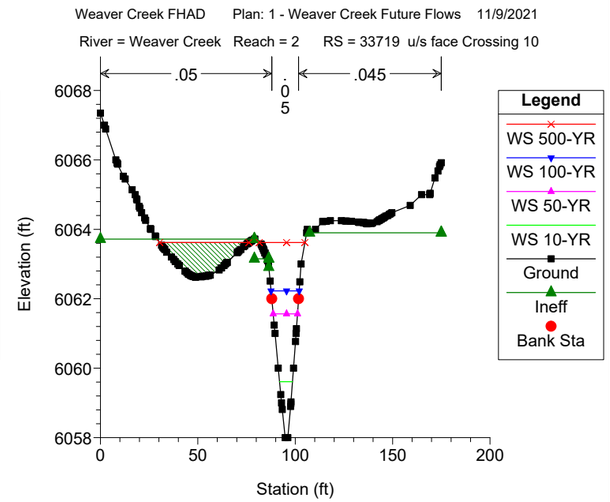

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33847 Culv Crossing 9 - Private Driveway
.04
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

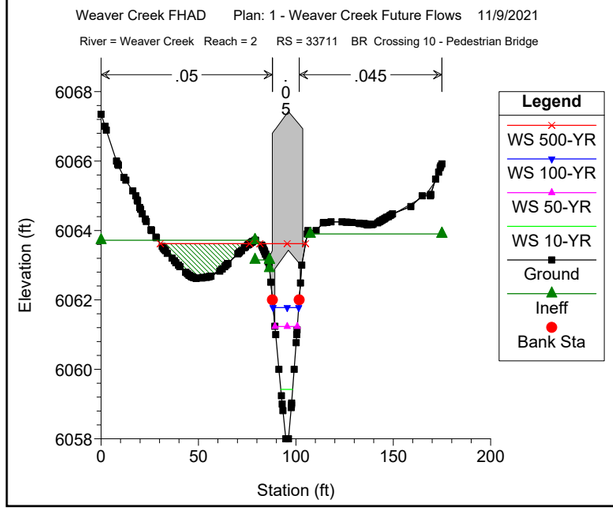

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33847 Culv Crossing 9 - Private Driveway
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

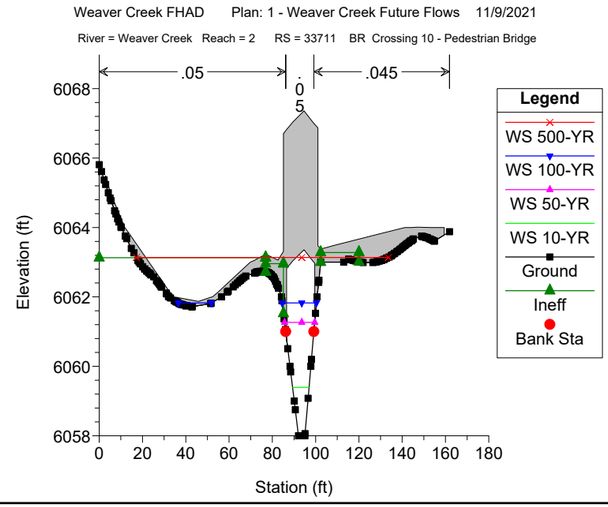

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33826 d/s face Crossing 9
.05
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

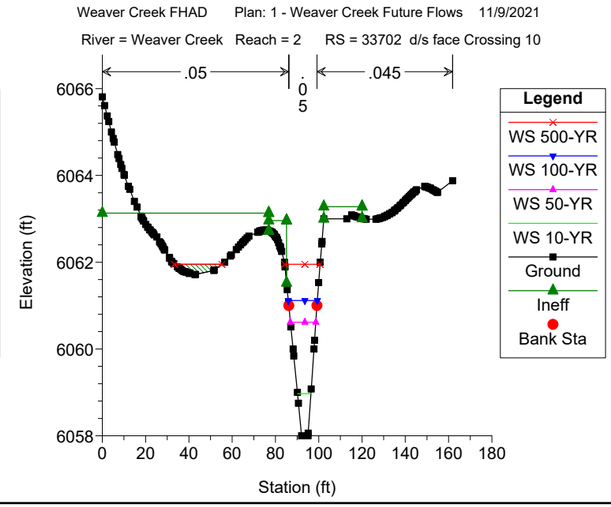

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33816 next d/s xs Crossing 9
.05
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

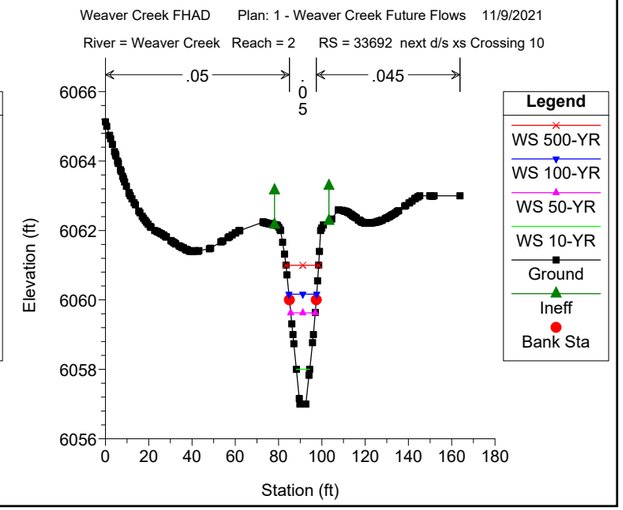

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33734 next u/s xs Crossing 10
.05
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

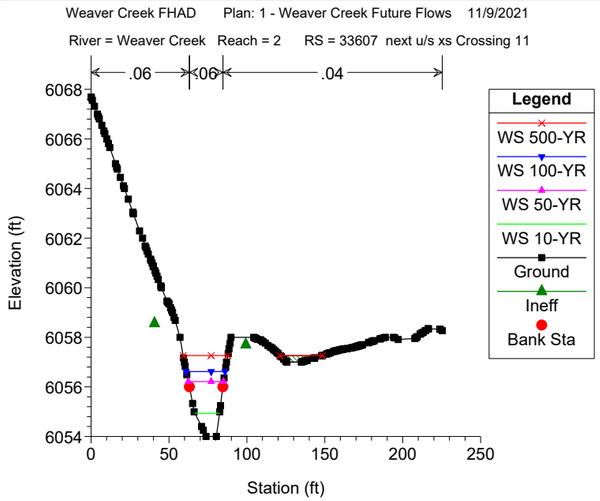

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33719 u/s face Crossing 10
.05
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

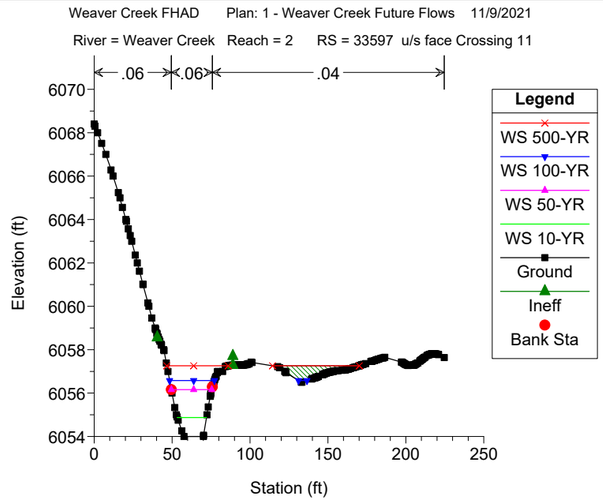

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33711 BR Crossing 10 - Pedestrian Bridge
.05
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

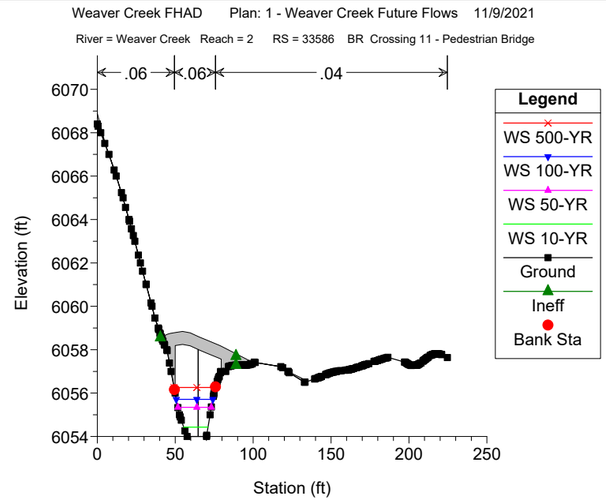

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33711 BR Crossing 10 - Pedestrian Bridge
.05
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

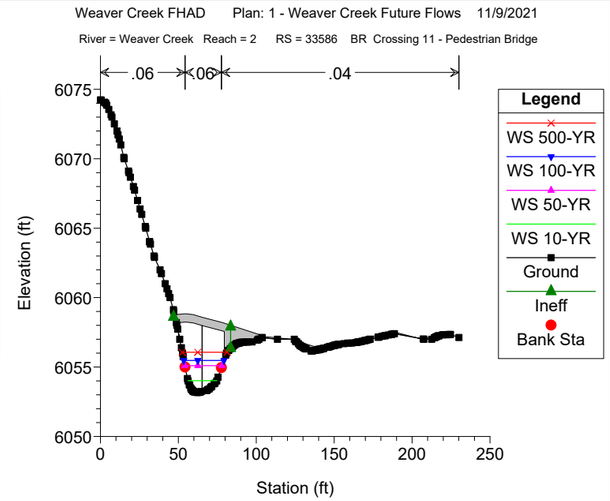

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33702 d/s face Crossing 10
.05
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

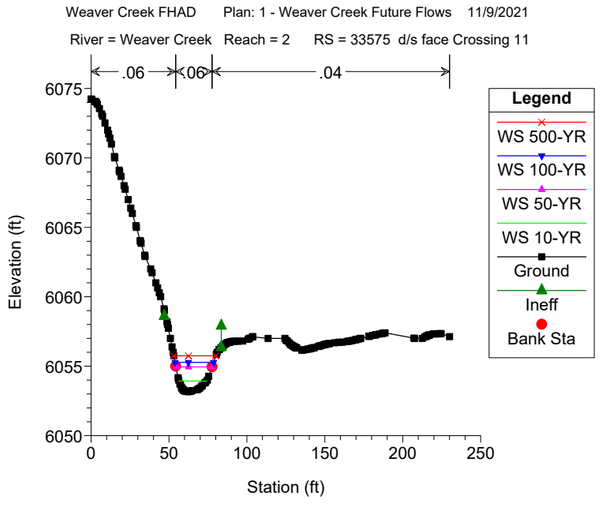

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33692 next d/s xs Crossing 10
.05
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

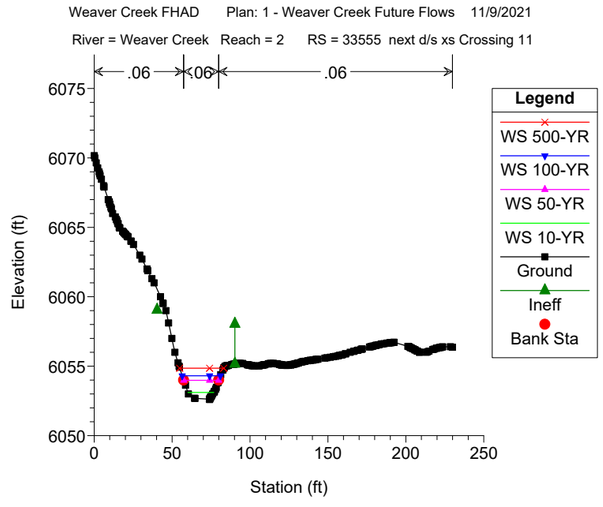

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33607 next u/s xs Crossing 11
.06 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

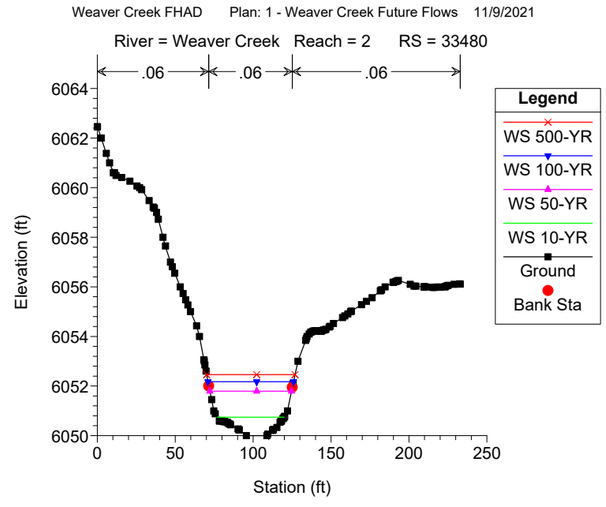

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33597 u/s face Crossing 11
.06 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

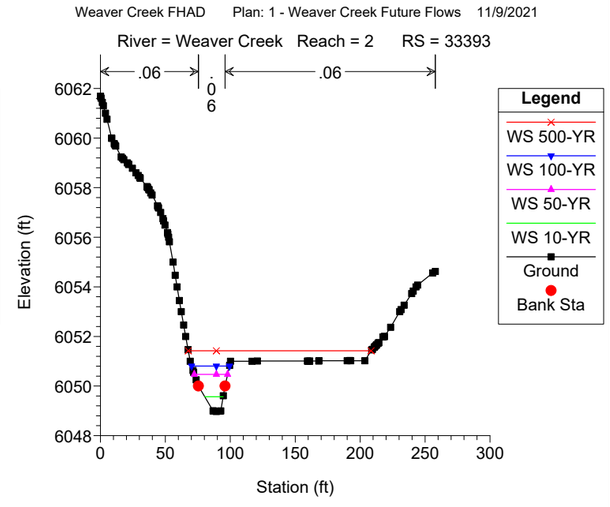

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33586 BR Crossing 11 - Pedestrian Bridge
.06 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

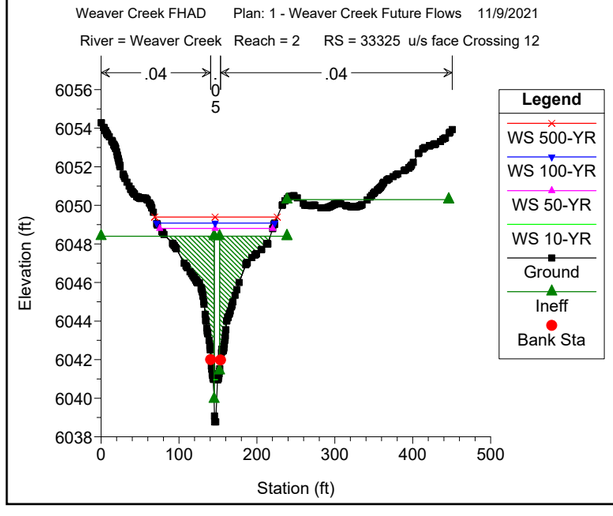

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33586 BR Crossing 11 - Pedestrian Bridge
.06 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

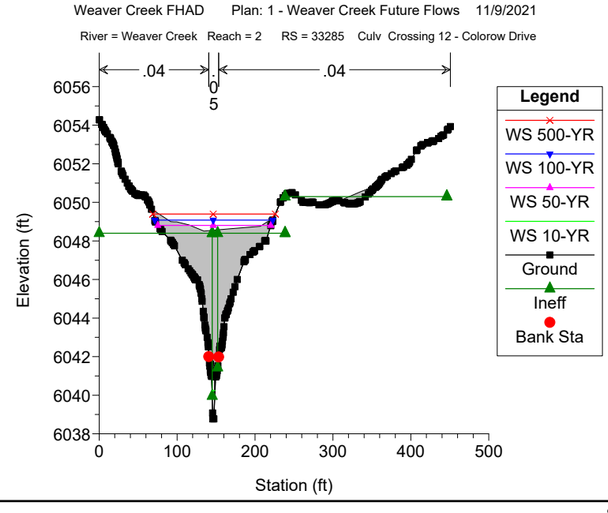

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33575 d/s face Crossing 11
.06 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

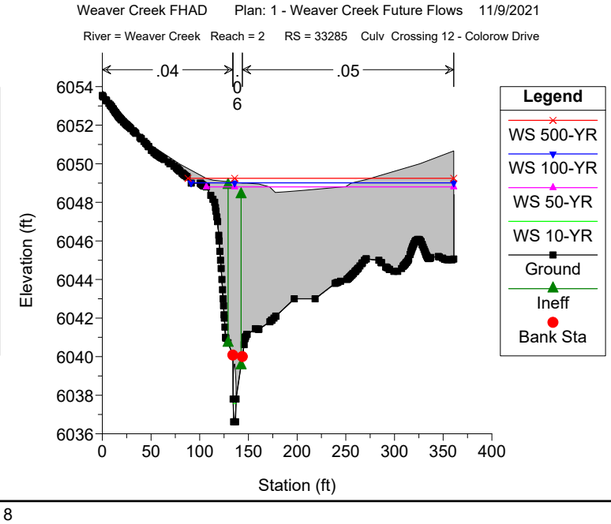

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33555 next d/s xs Crossing 11
.06 .06 .06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

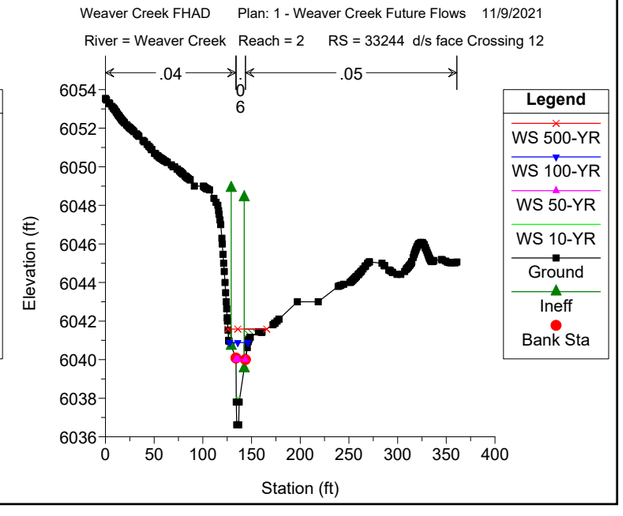

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33480
.06 .06 .06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

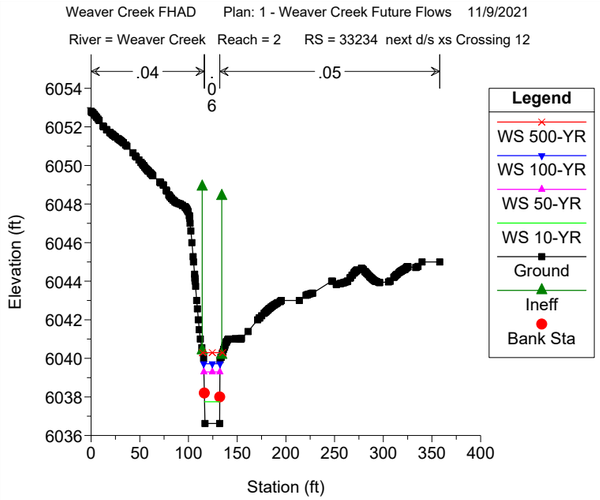

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33393
.06 .06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

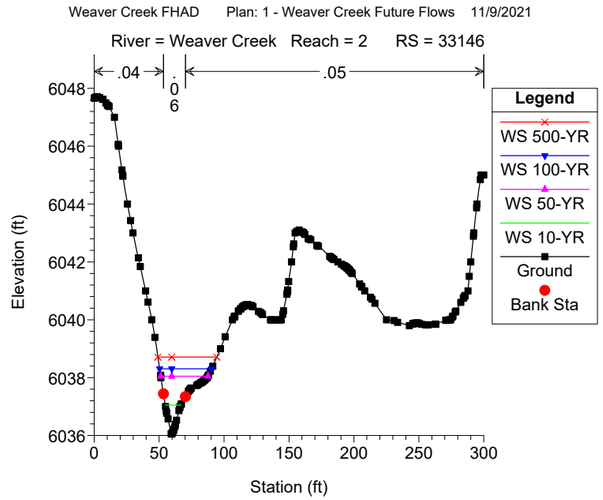

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33325 u/s face Crossing 12
.04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

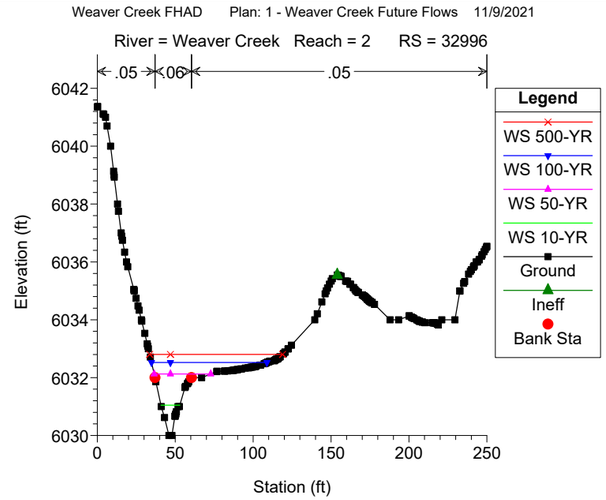

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33285 Culv Crossing 12 - Colorow Drive
.04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

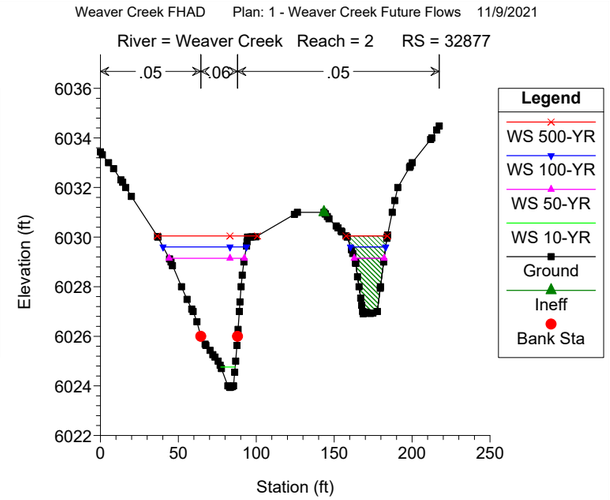

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33285 Culv Crossing 12 - Colorow Drive
.04 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

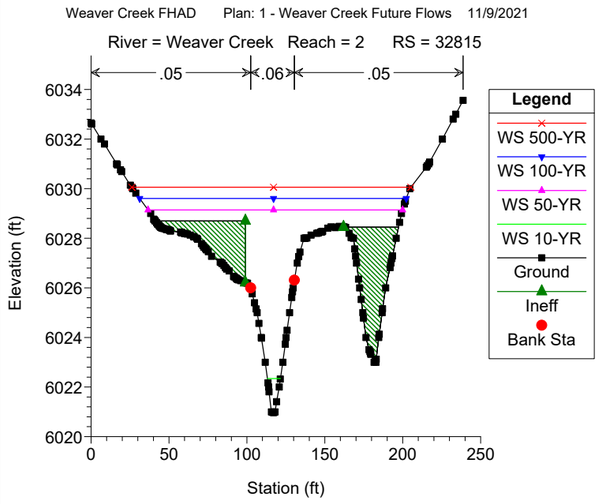

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33244 d/s face Crossing 12
.04 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

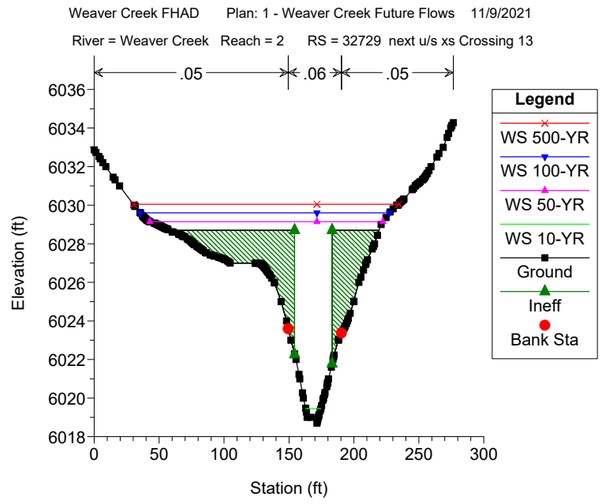

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33234 next d/s xs Crossing 12
.04
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

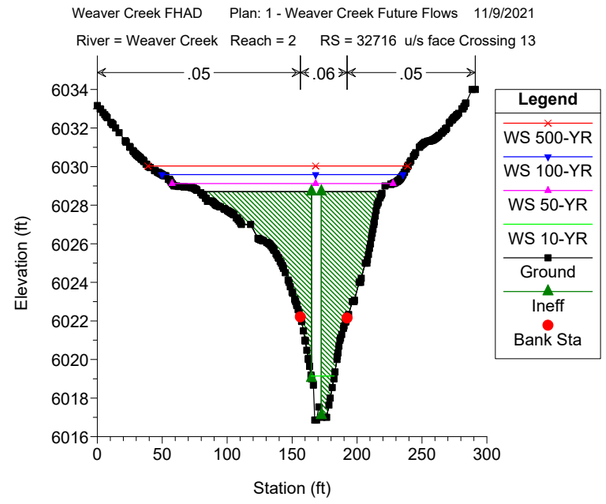

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 33146
.04
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

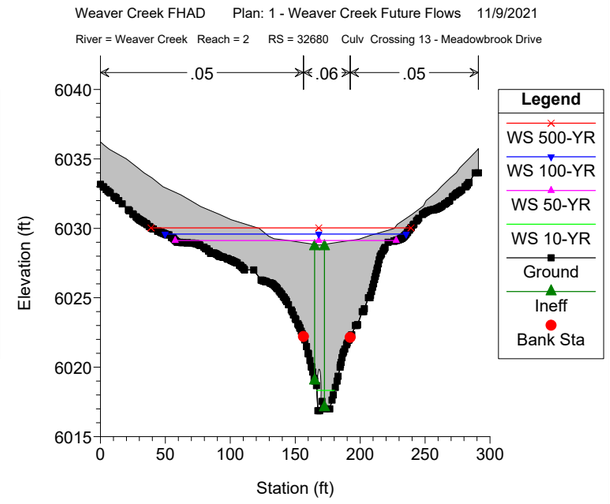

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32996
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

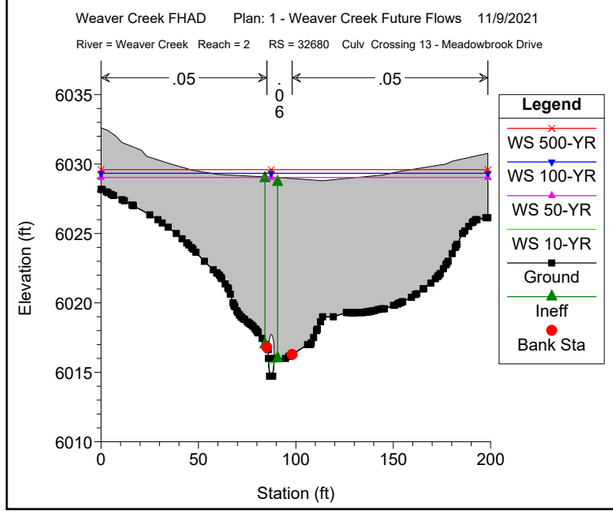

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32877
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

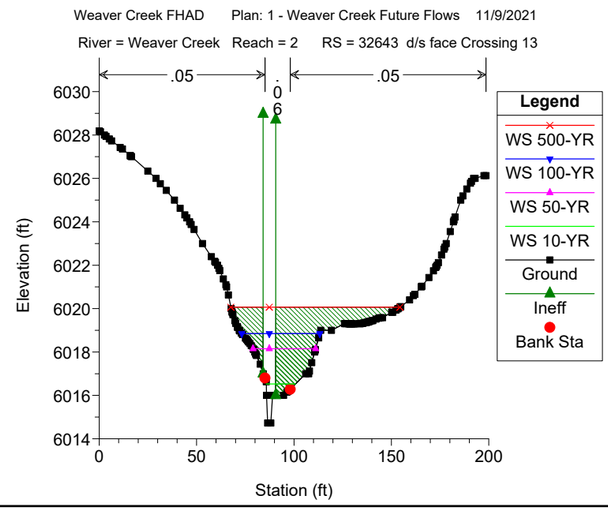

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32815
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

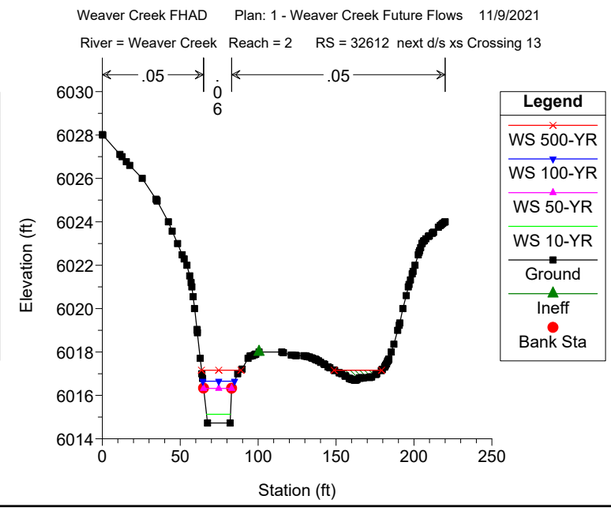

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32729 next u/s xs Crossing 13
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

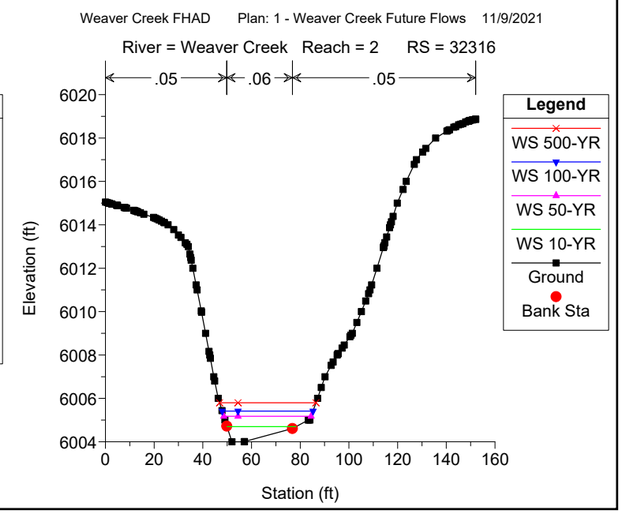

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32716 u/s face Crossing 13
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

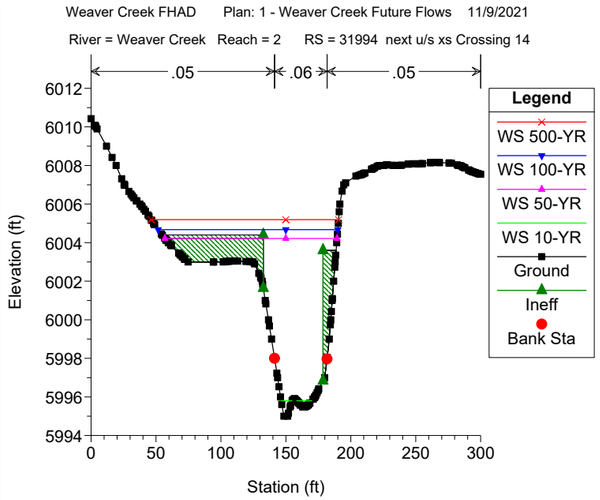

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32680 Culv Crossing 13 - Meadowbrook Drive
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

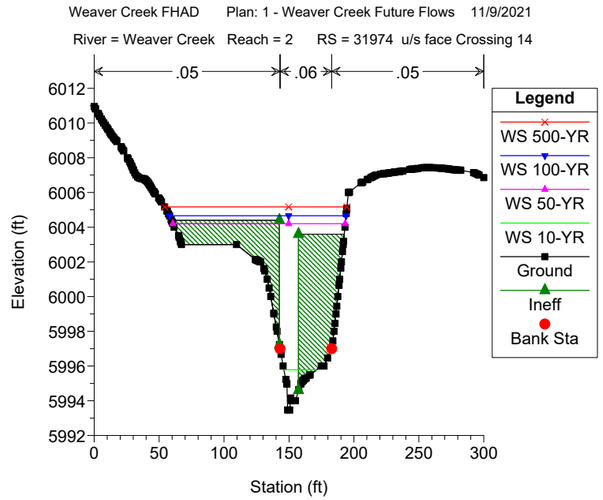

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32680 Culv Crossing 13 - Meadowbrook Drive
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

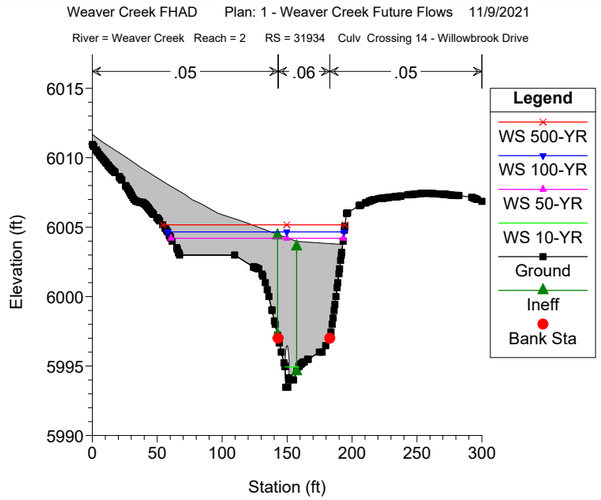

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32643 d/s face Crossing 13
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

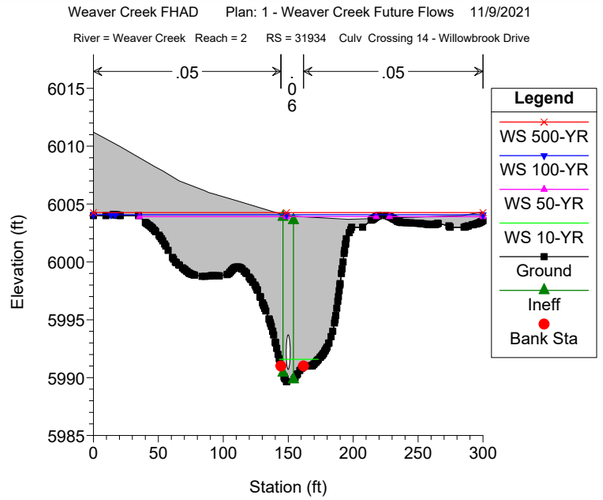

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32612 next d/s xs Crossing 13
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

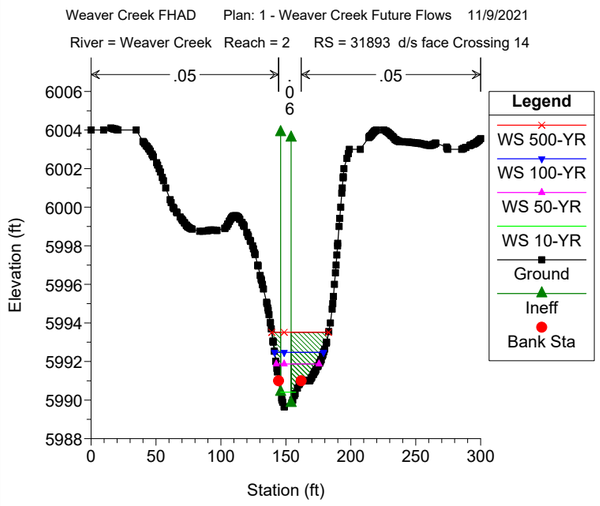

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 32316
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

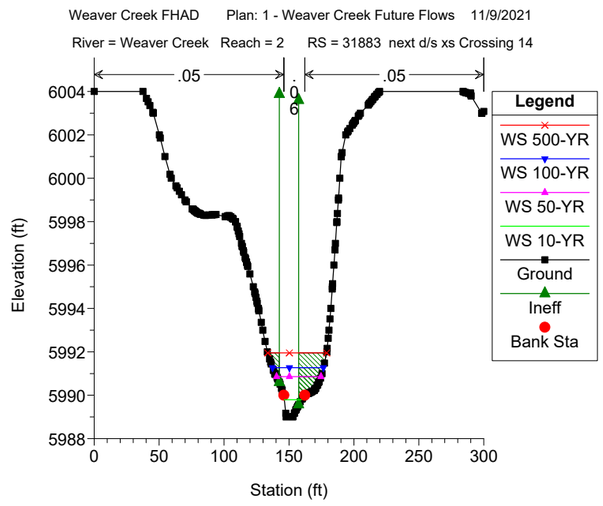

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31994 next u/s xs Crossing 14
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

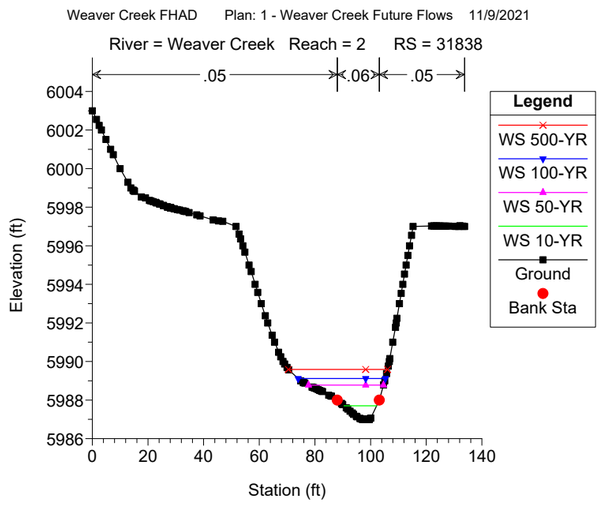

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31974 u/s face Crossing 14
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

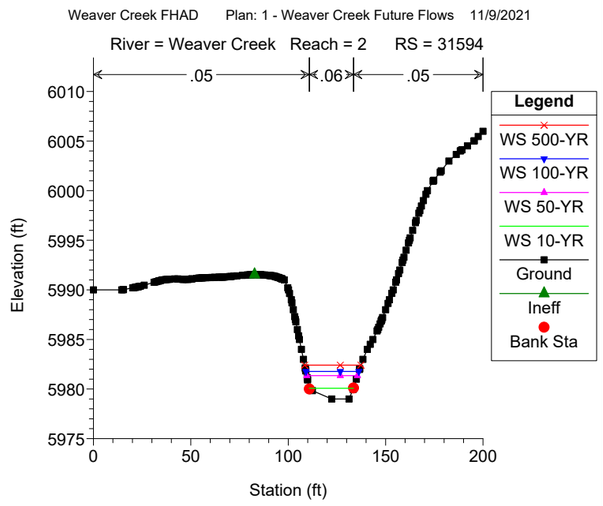

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31934 Culv Crossing 14 - Willowbrook Drive
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

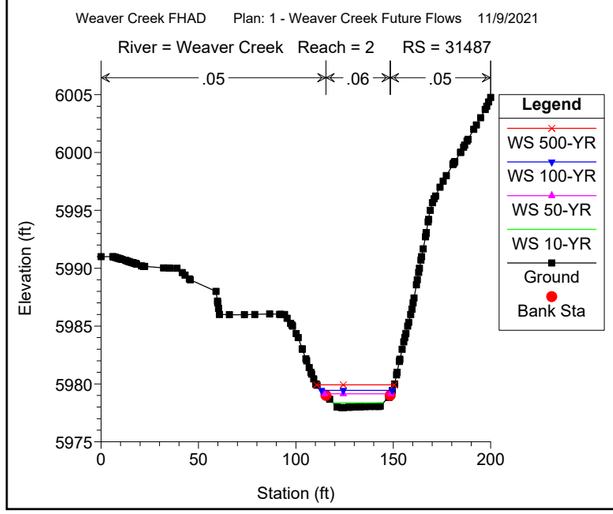

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31934 Culv Crossing 14 - Willowbrook Drive
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

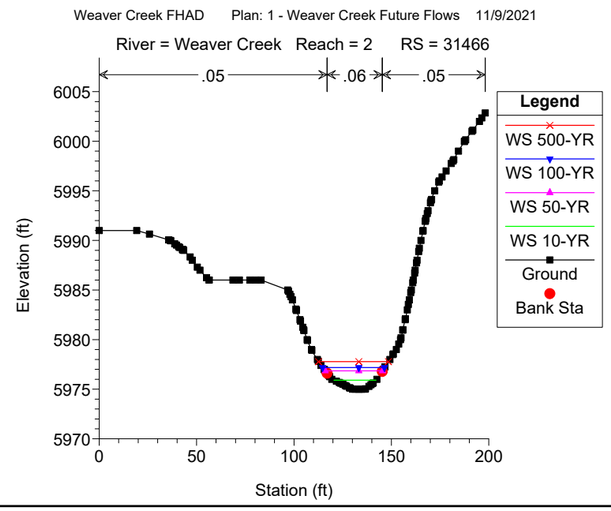

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31893 d/s face Crossing 14
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

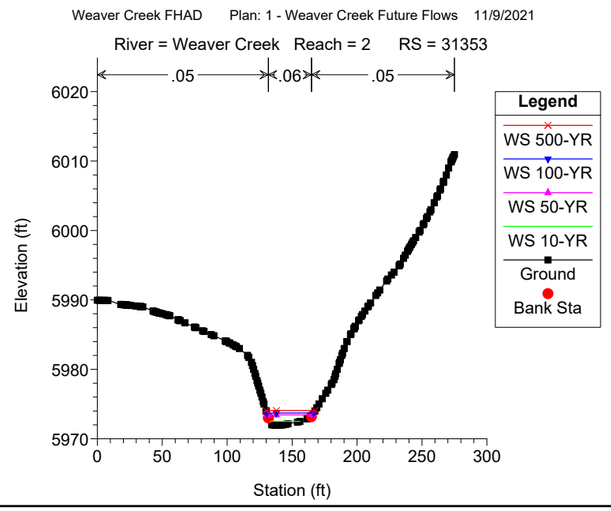

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31883 next d/s xs Crossing 14
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

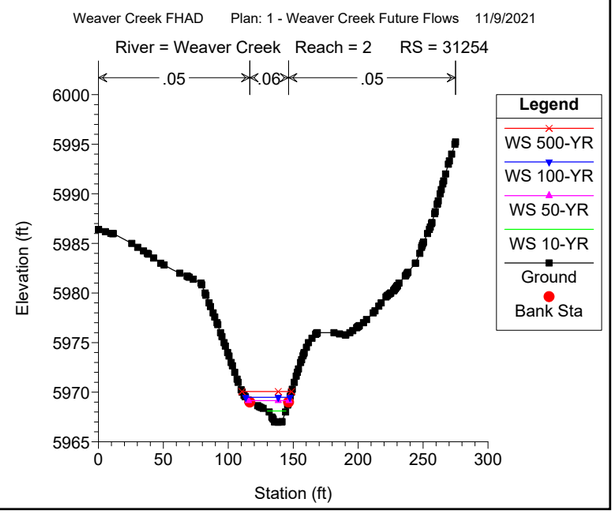

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31838
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

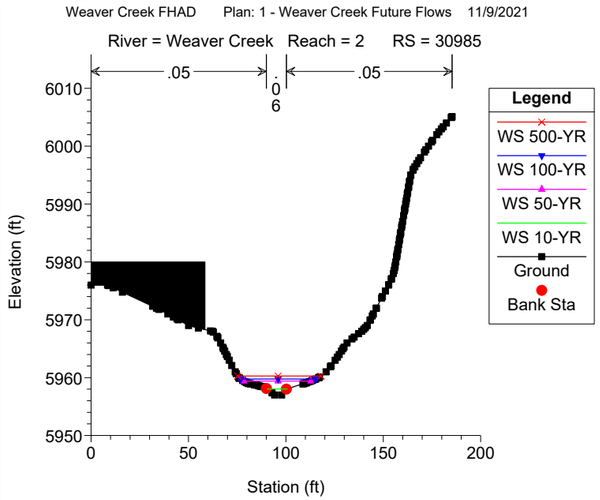

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31594
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

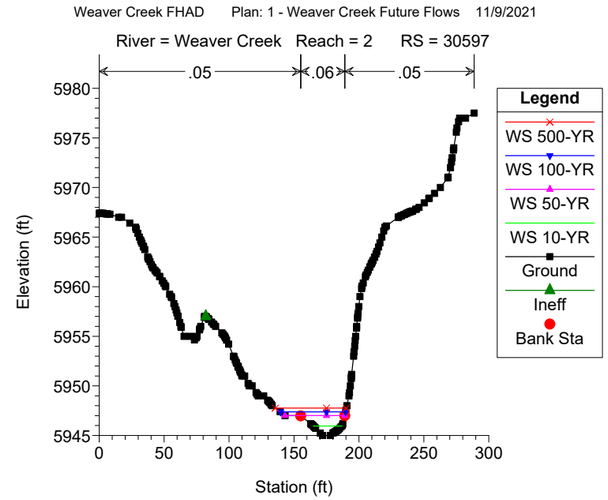

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31487
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

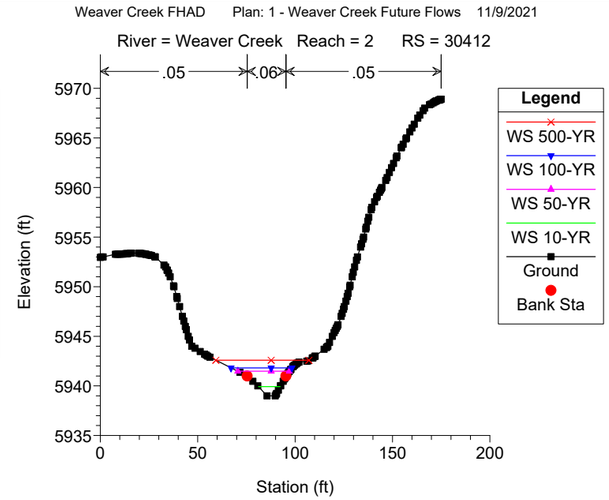

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31466
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

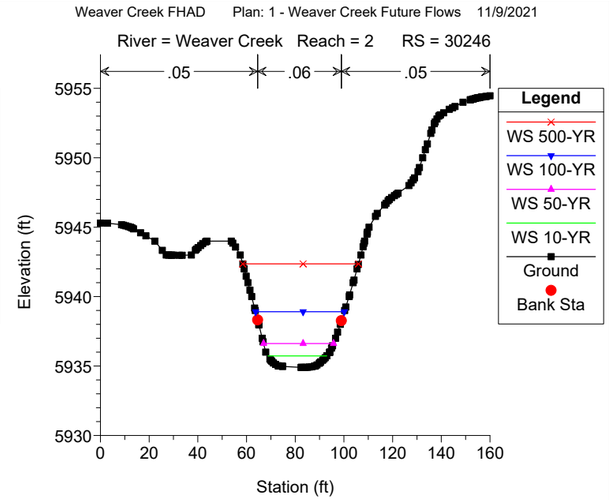

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31353
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

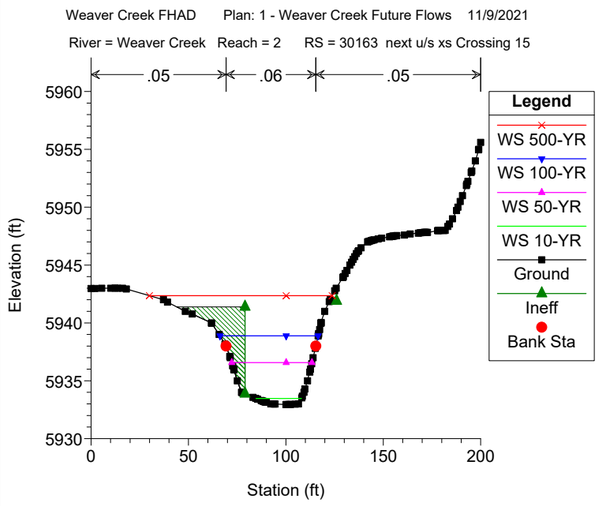

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 31254
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

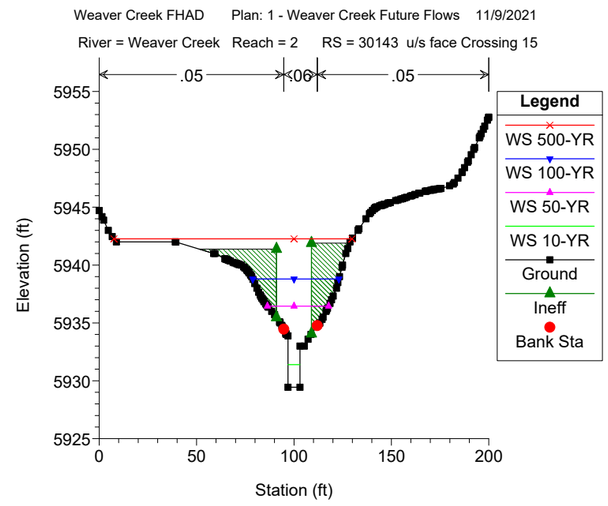

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30985
.05 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)

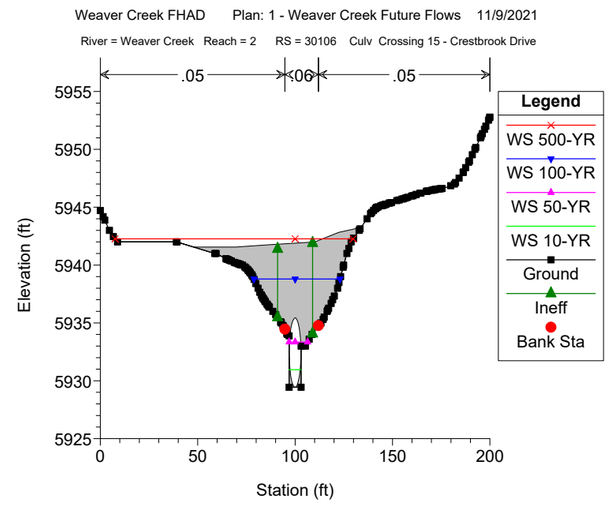

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30597
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

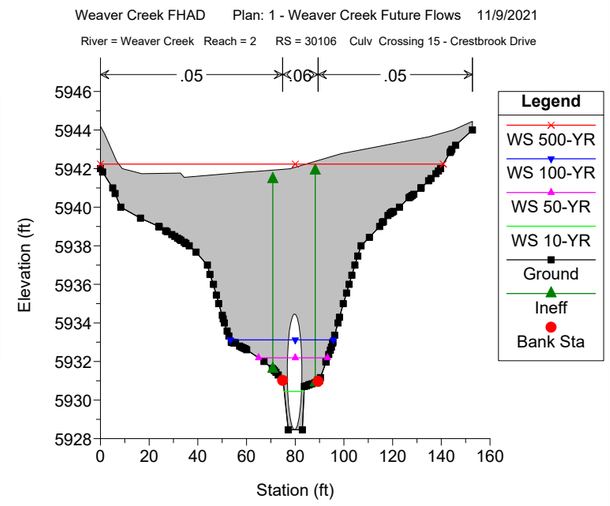

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30412
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)

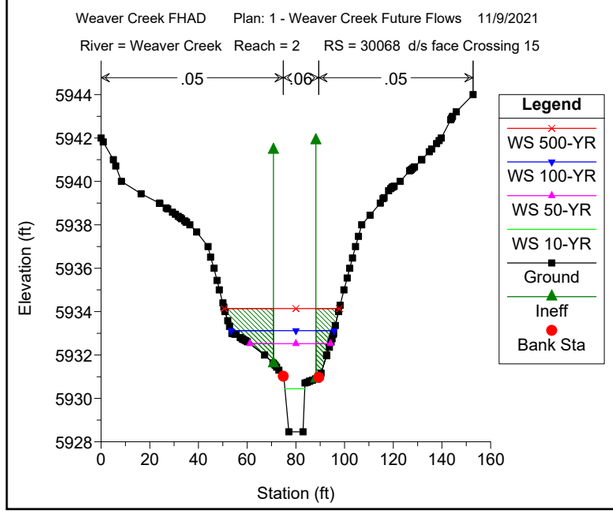

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30246
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)

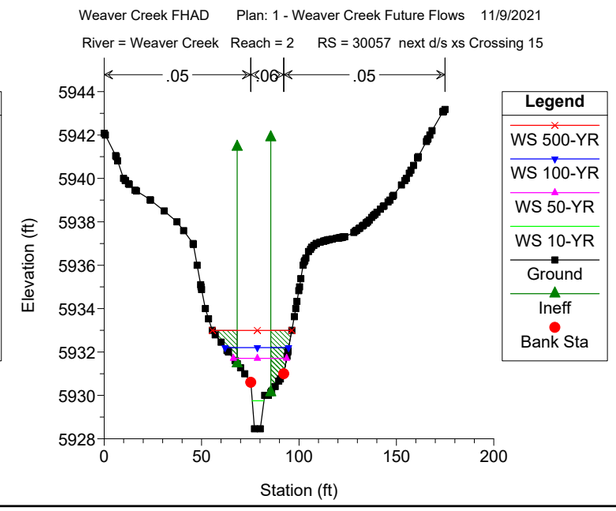

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30163 next u/s xs Crossing 15
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

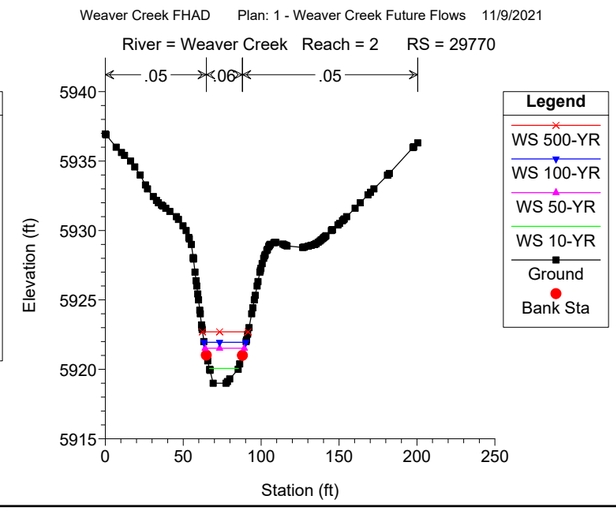

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30143 u/s face Crossing 15
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

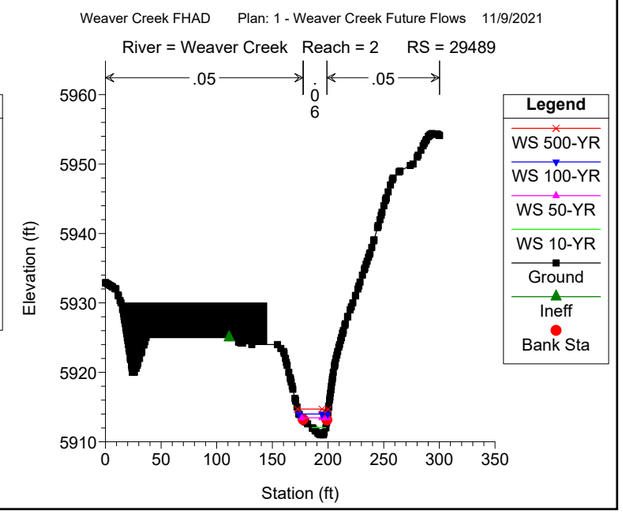

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30106 Culv Crossing 15 - Crestbrook Drive
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30106 Culv Crossing 15 - Crestbrook Drive
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30068 d/s face Crossing 15
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

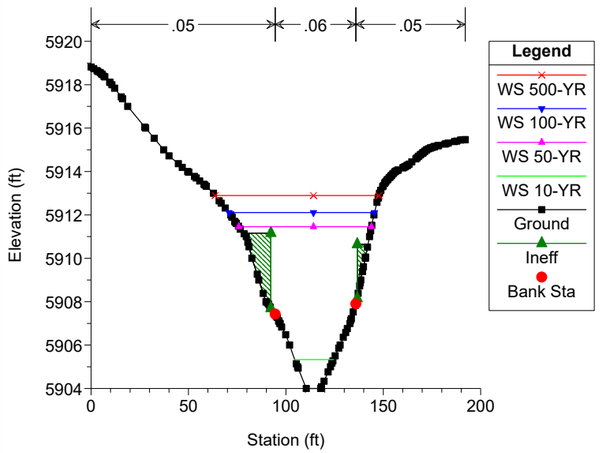

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 30057 next d/s xs Crossing 15
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 29770
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 29489
.05 .06 .05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

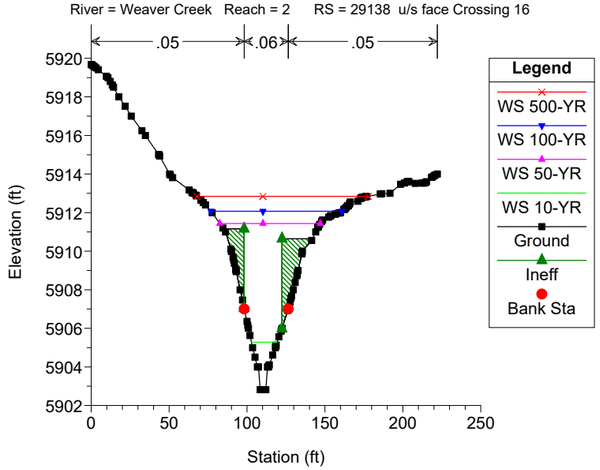
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 29148 next u/s xs Carossing 16



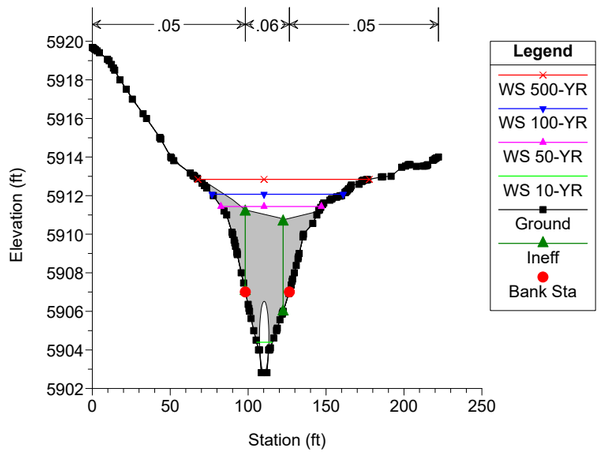
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 29138 u/s face Crossing 16



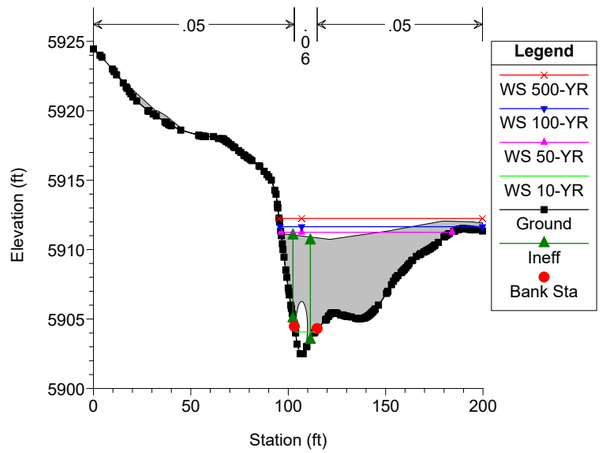
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 29117 Culv Crossing 16 - Private Driveway



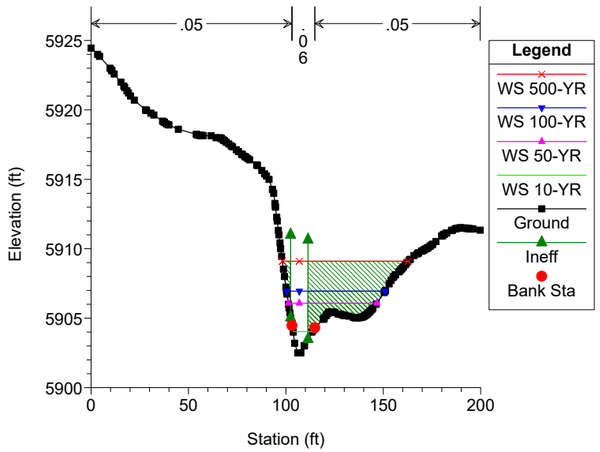
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 29117 Culv Crossing 16 - Private Driveway



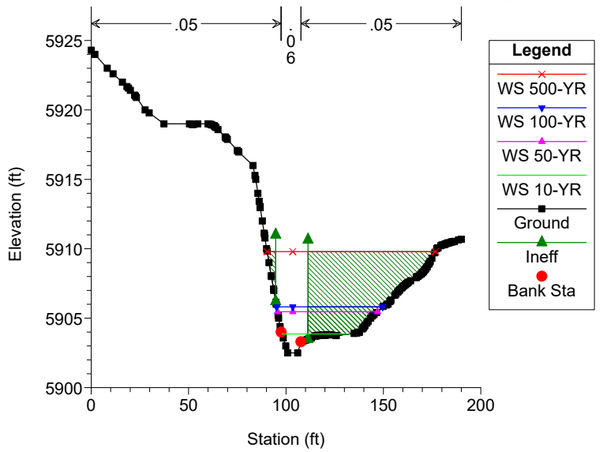
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 29095 d/s face Crossing 16



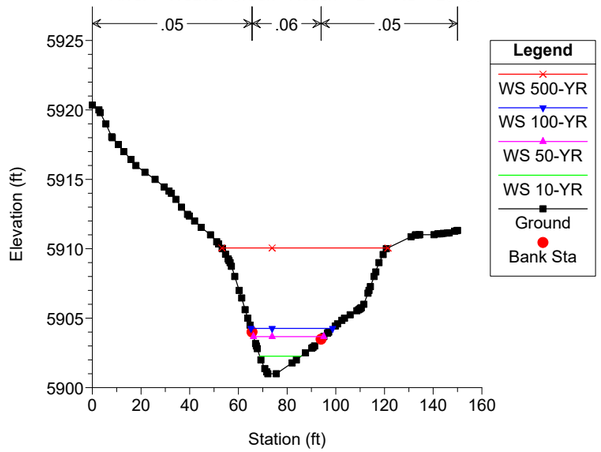
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 29085 next d/s xs Crossing 16



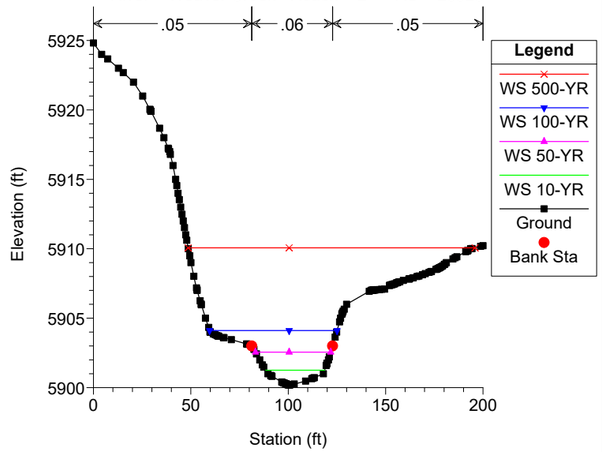
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 29000



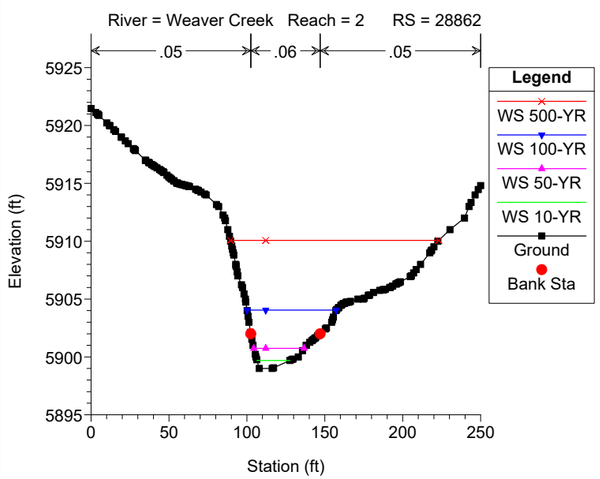
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 28925



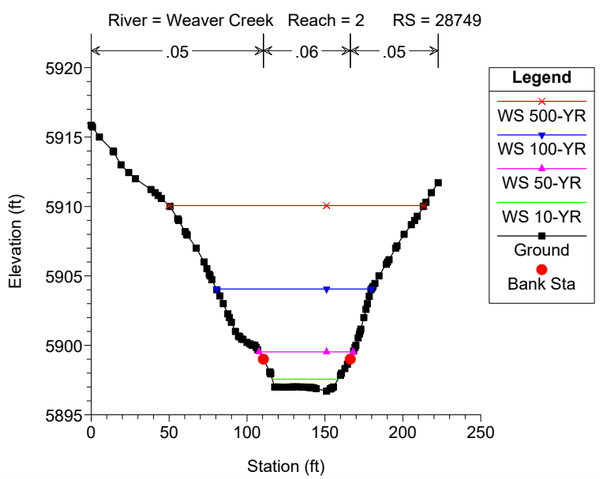
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 28862



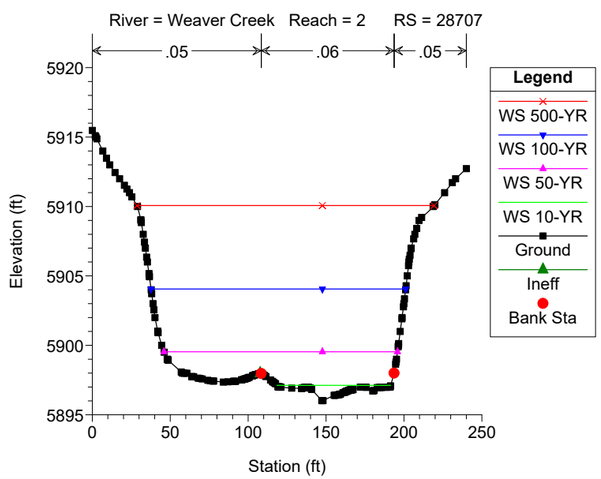
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 28749



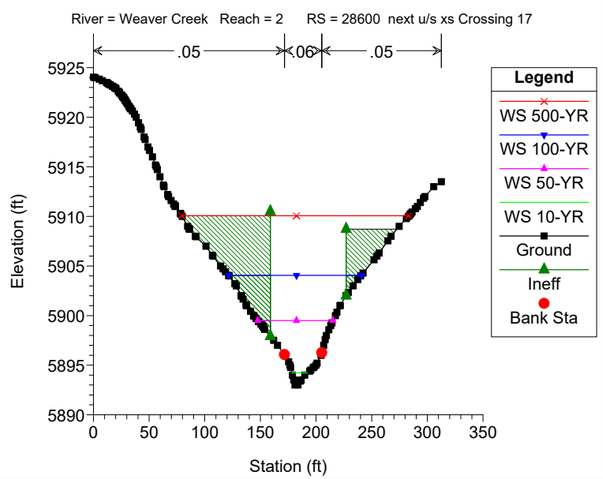
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

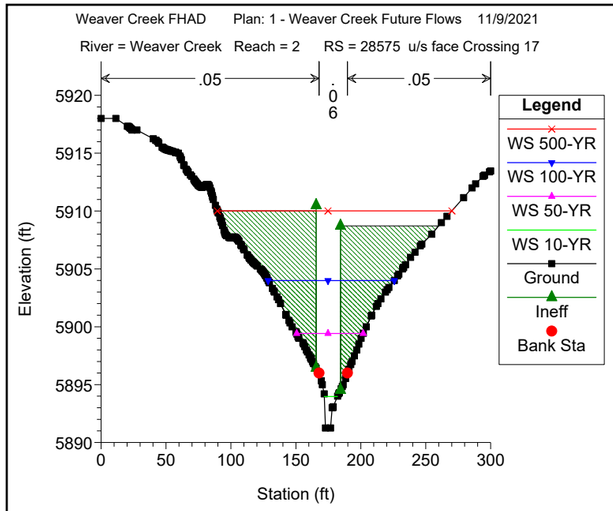
River = Weaver Creek Reach = 2 RS = 28707

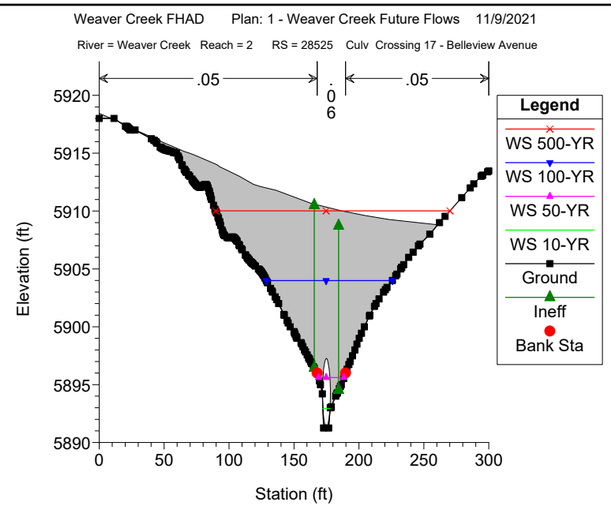


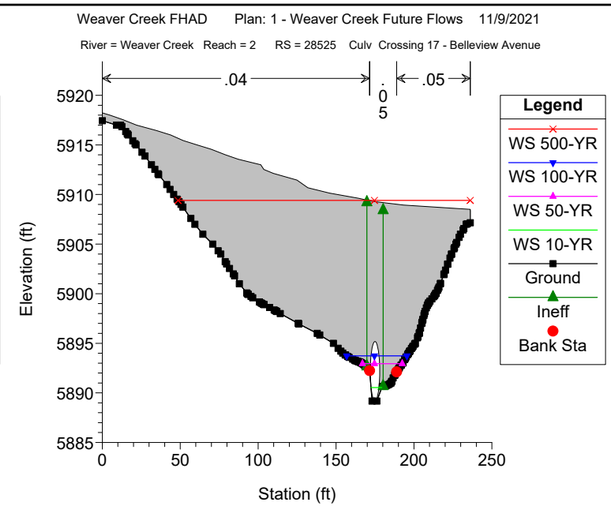
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

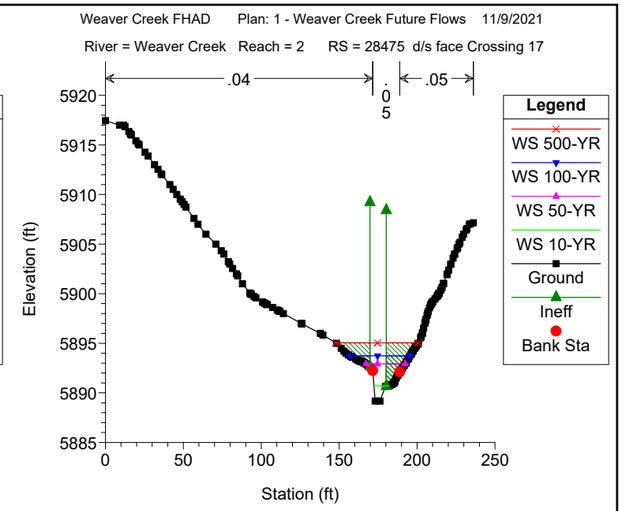
River = Weaver Creek Reach = 2 RS = 28600 next u/s xs Crossing 17

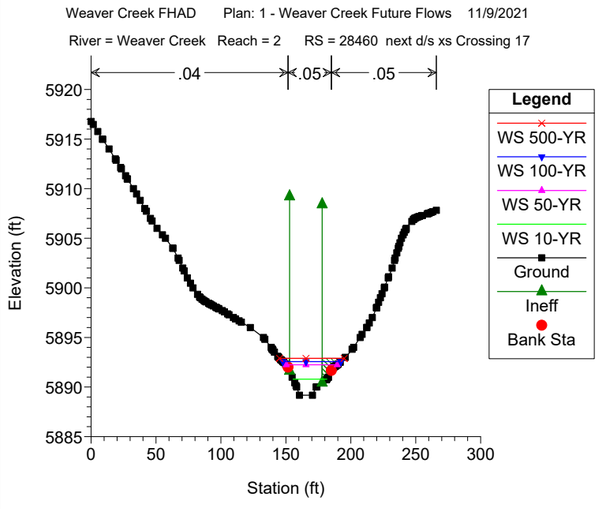


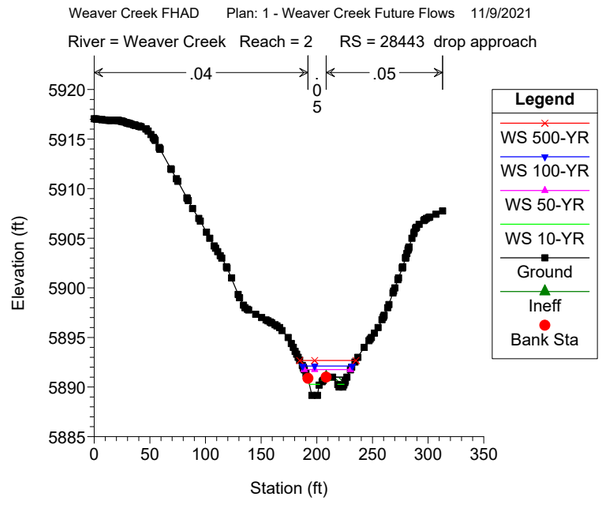

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28575 u/s face Crossing 17
.05
.06
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

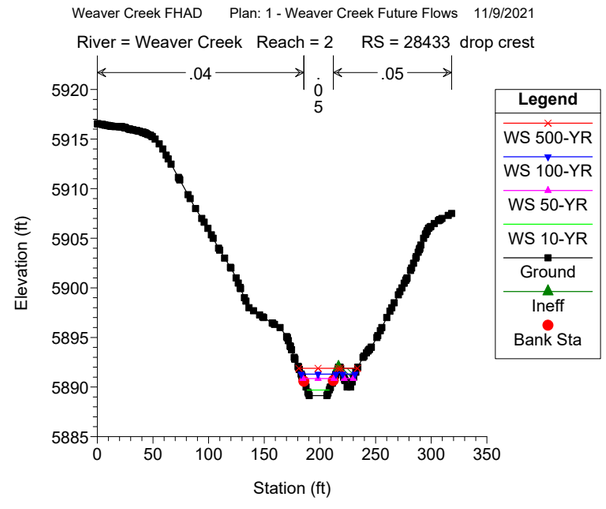

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28525 Culv Crossing 17 - Belleview Avenue
.05
.06
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

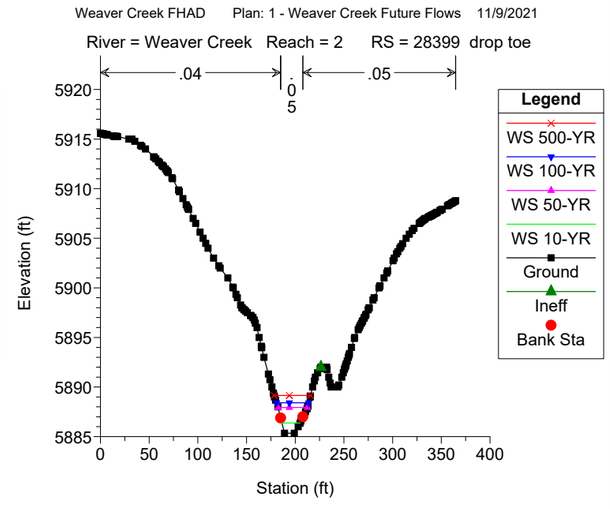

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28525 Culv Crossing 17 - Belleview Avenue
.04
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

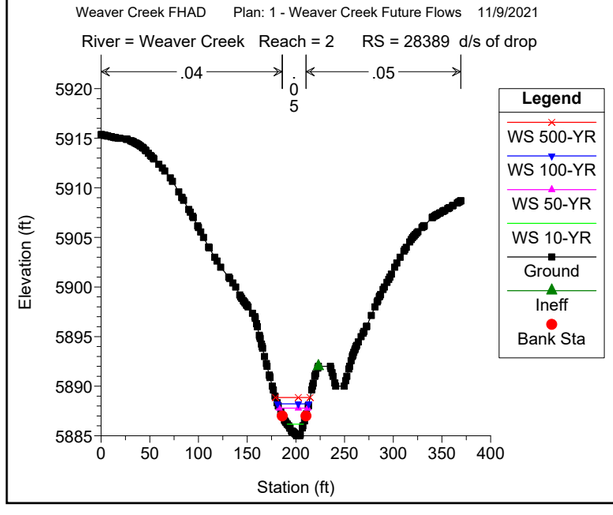

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28475 d/s face Crossing 17
.04
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

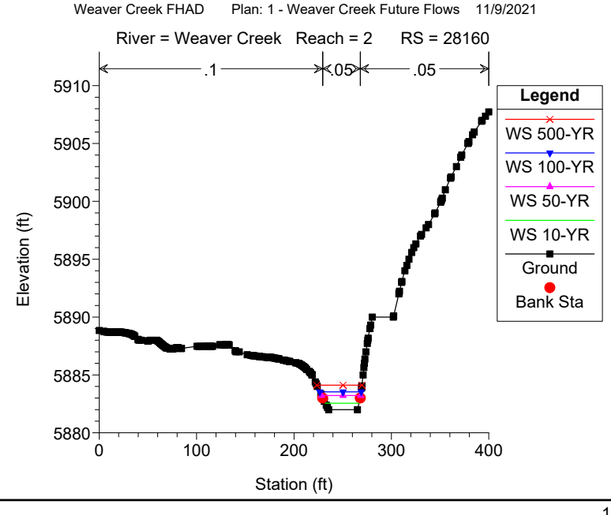

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28460 next d/s xs Crossing 17
.04
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

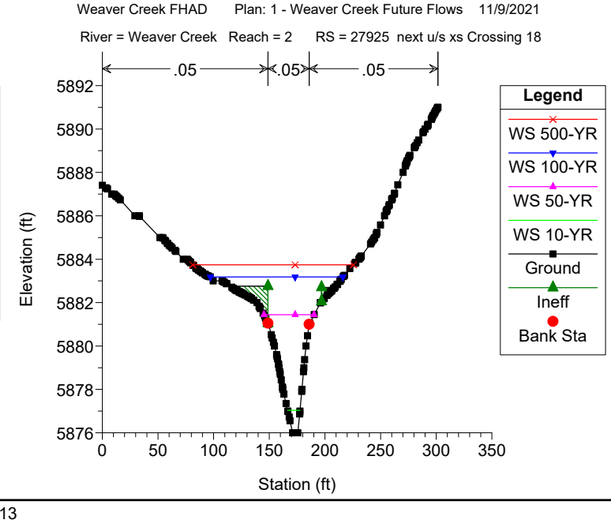

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28443 drop approach
.04
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

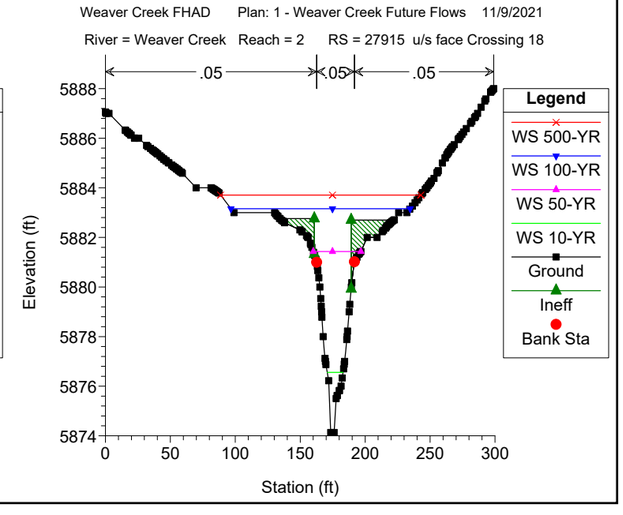

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28433 drop crest
.04
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28399 drop toe
.04
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28389 d/s of drop
.04
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

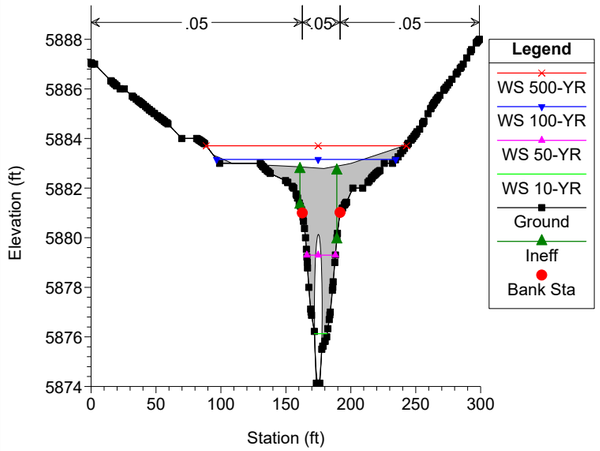

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 28160
.1
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 27925 next u/s xs Crossing 18
.05
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 27915 u/s face Crossing 18
.05
.05
.05
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

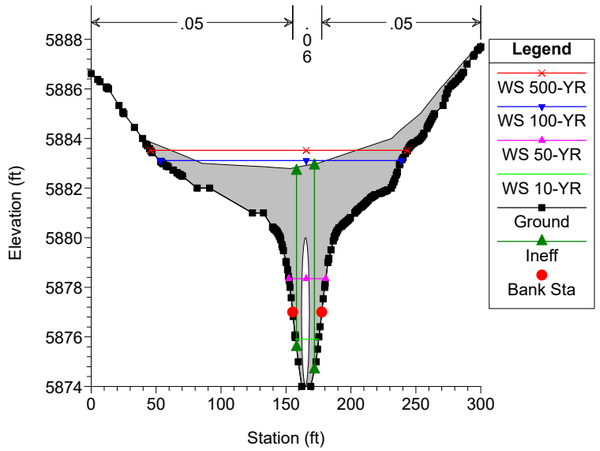
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27889 Culv Crossing 18 - Private Driveway



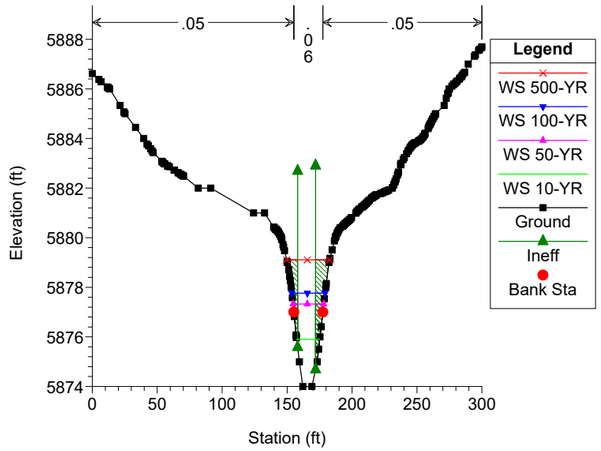
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27889 Culv Crossing 18 - Private Driveway



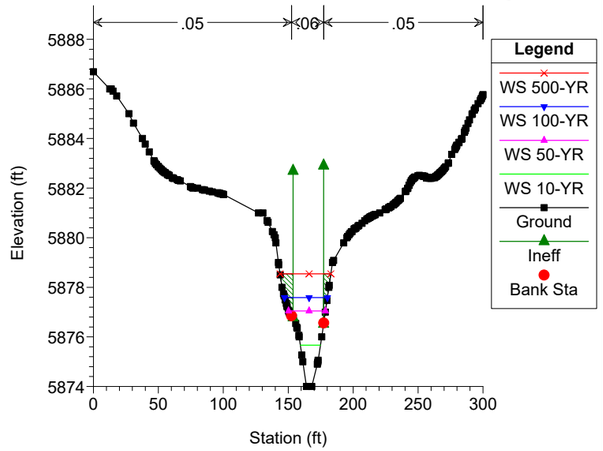
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27863 d/s face Crossing 18



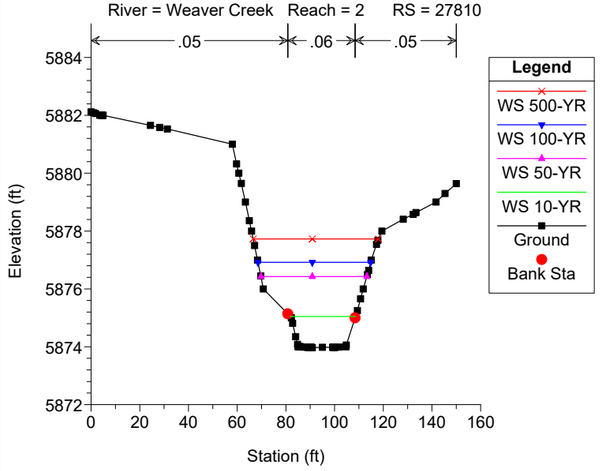
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27853 next d/s xs Crossing 18



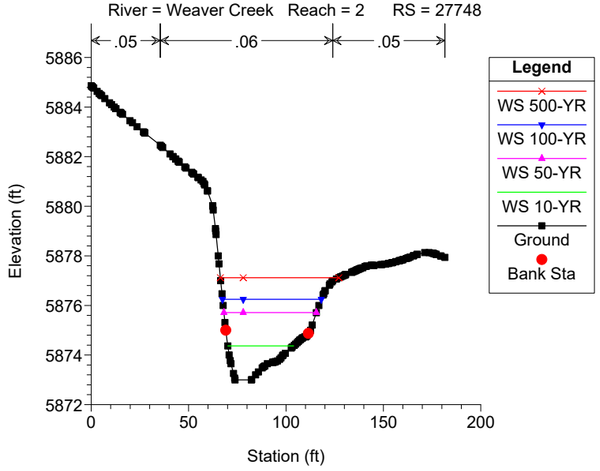
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27810



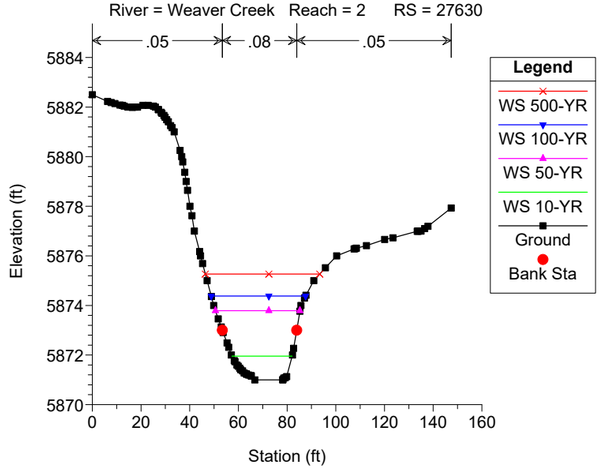
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27748



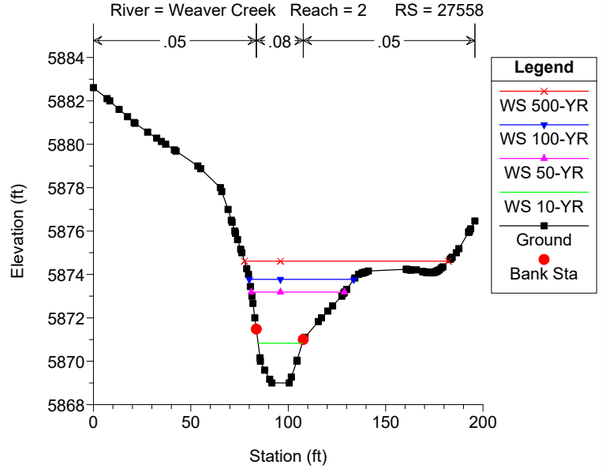
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27630



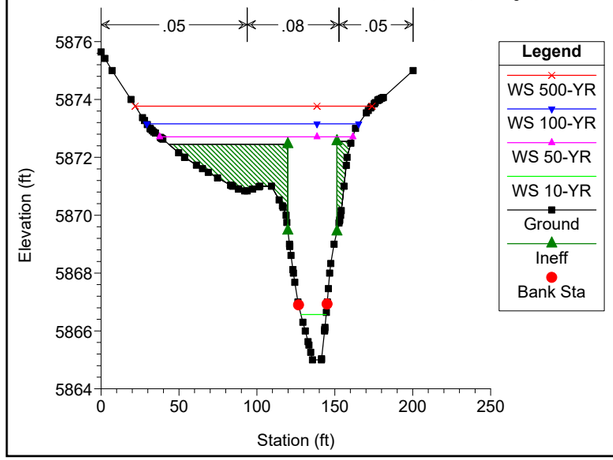
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27558



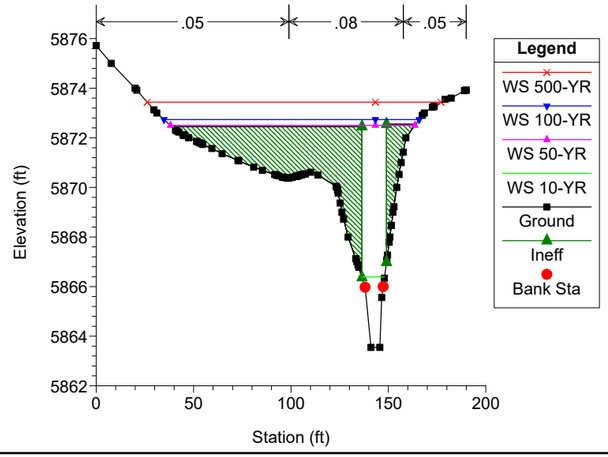
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27295 next u/s xs Crossing 19



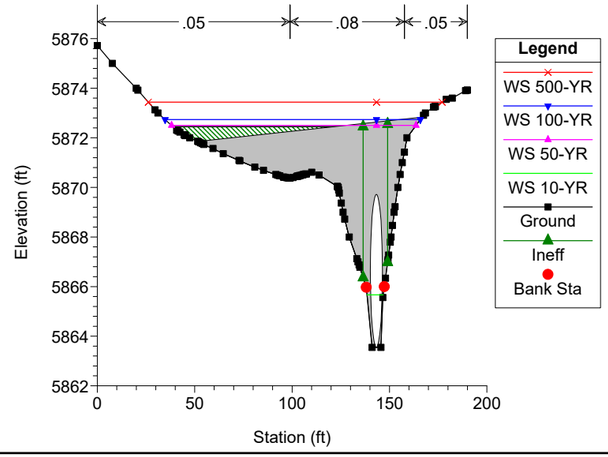
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 27285 u/s face Crossing 19



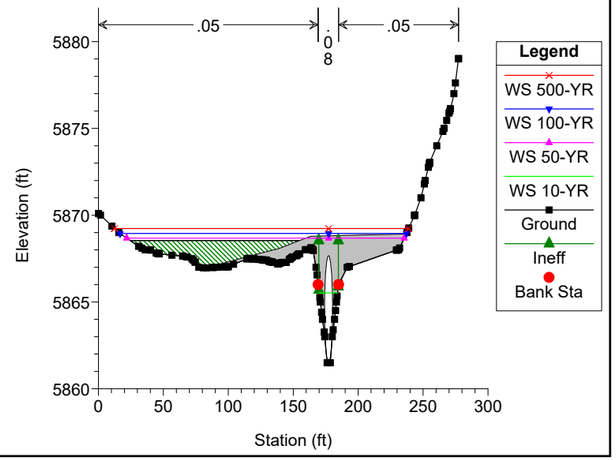
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

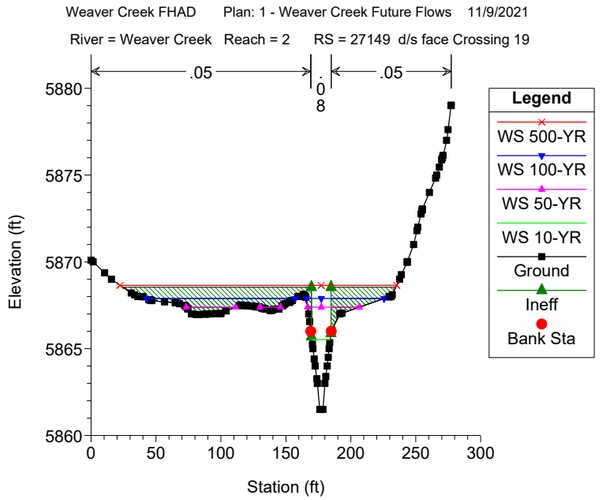
River = Weaver Creek Reach = 2 RS = 27217 Culv Crossing 19 - Belleview Avenue

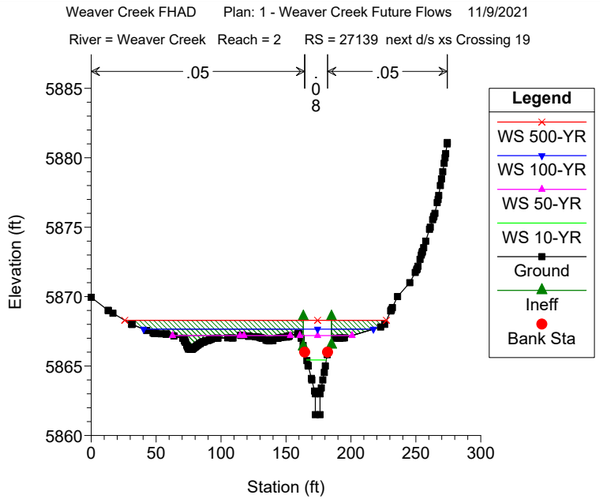


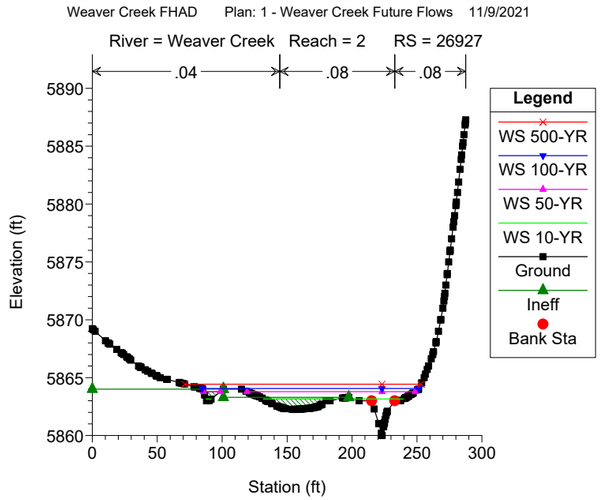
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

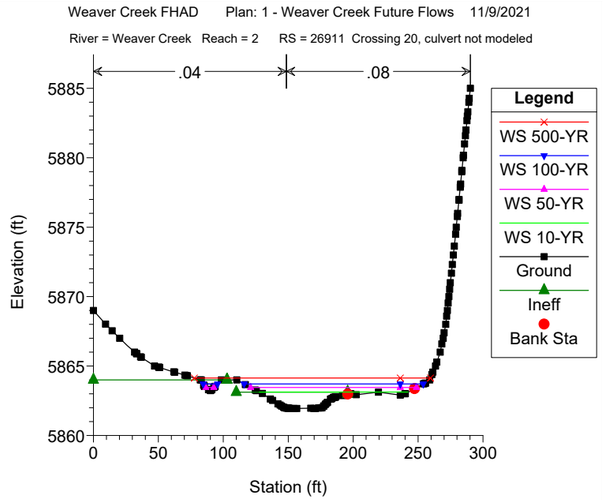
River = Weaver Creek Reach = 2 RS = 27217 Culv Crossing 19 - Belleview Avenue

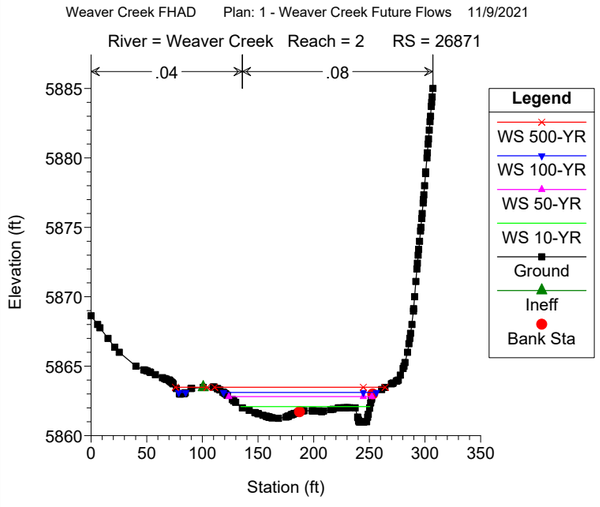


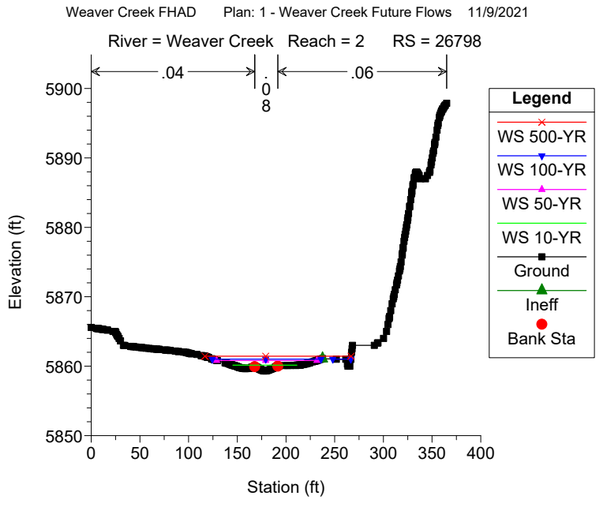

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 27149 d/s face Crossing 19
.05
.05
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

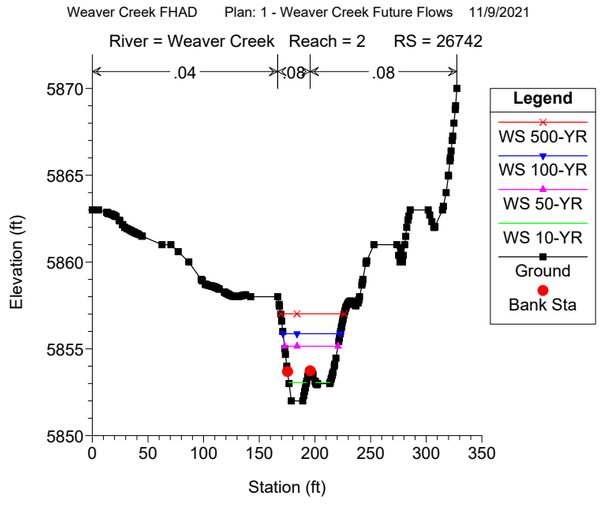

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 27139 next d/s xs Crossing 19
.05
.05
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

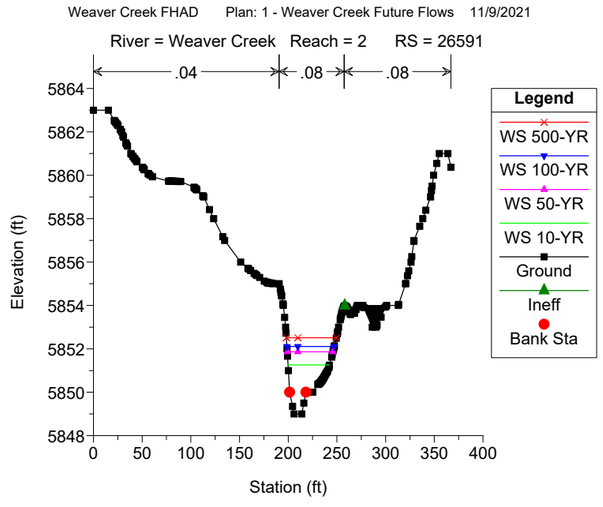

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 26927
.04
.08
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

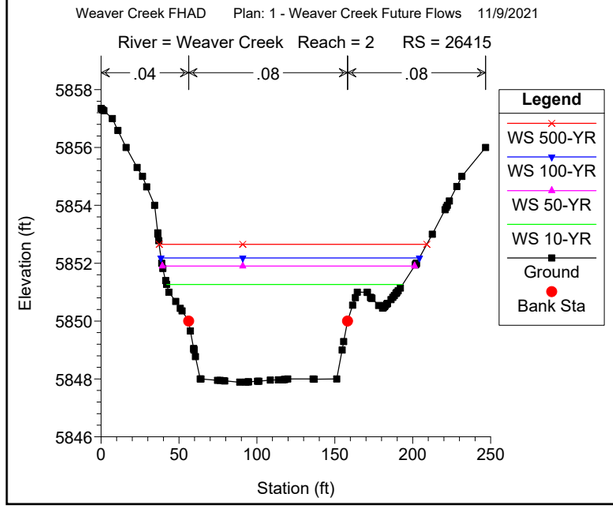

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 26911 Crossing 20, culvert not modeled
.04
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

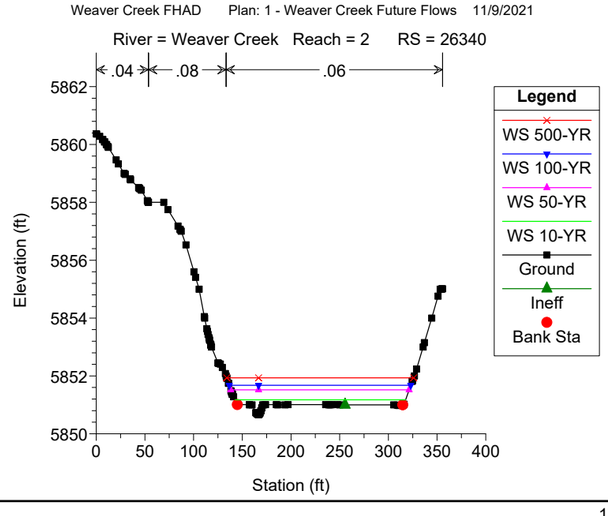

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 26871
.04
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

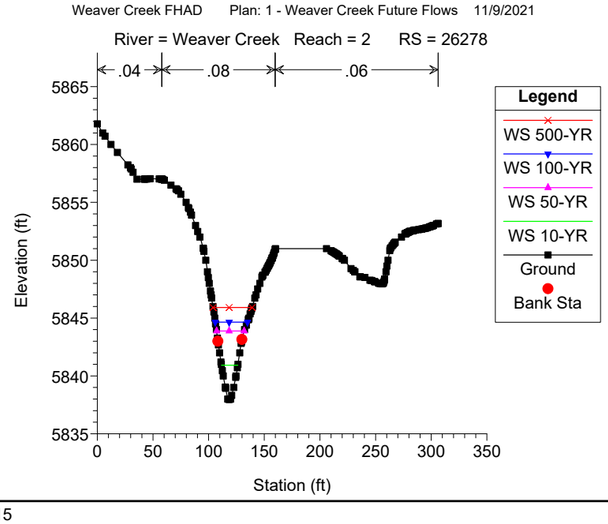

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 26798
.04
.06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

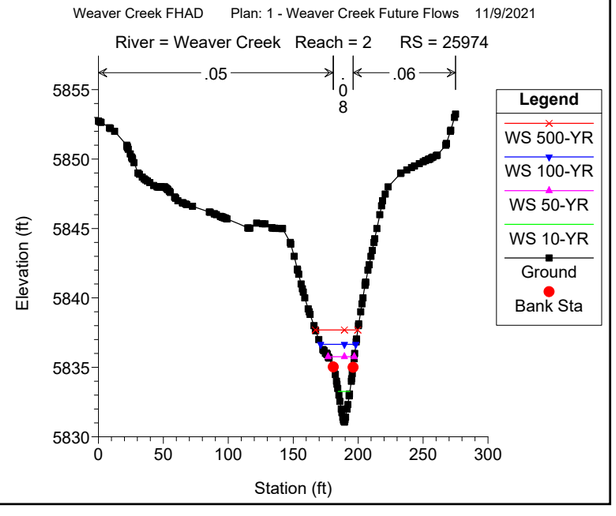

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 26742
.04
.08
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

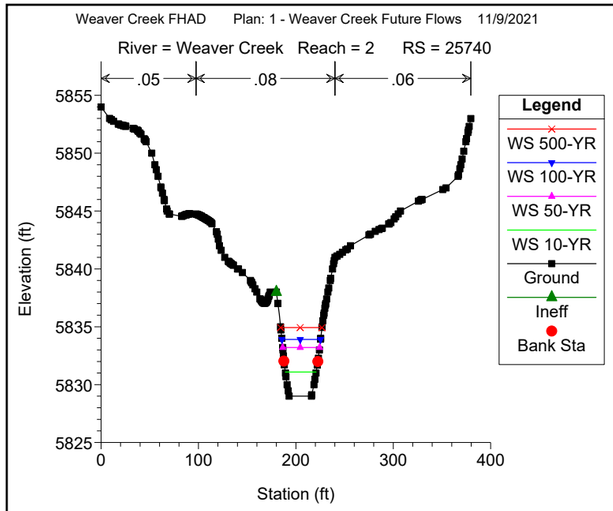

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 26591
.04
.08
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

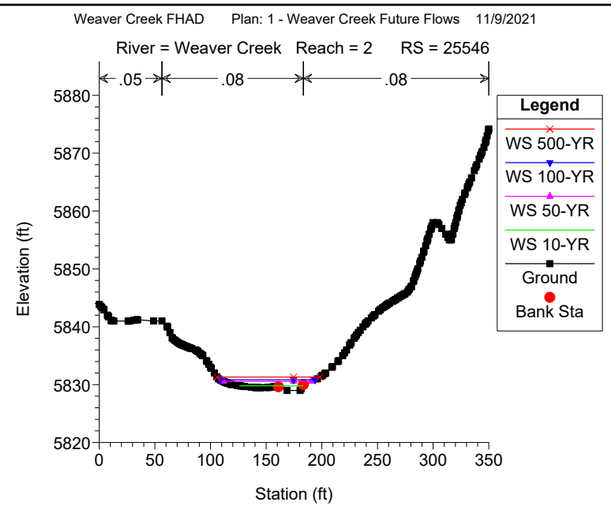

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 26415
.04
.08
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

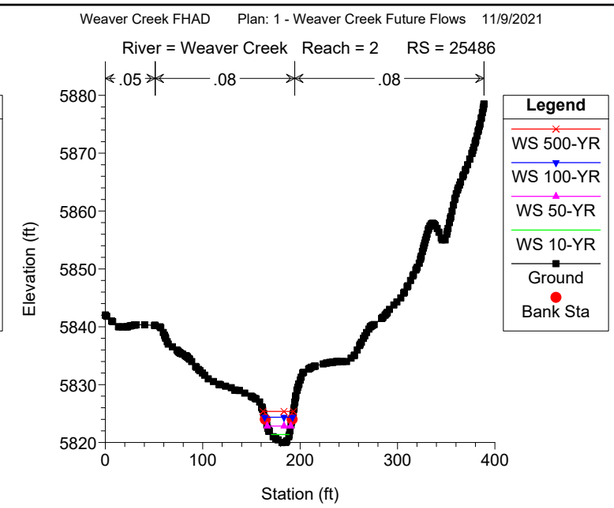

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 26340
.04
.08
.06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

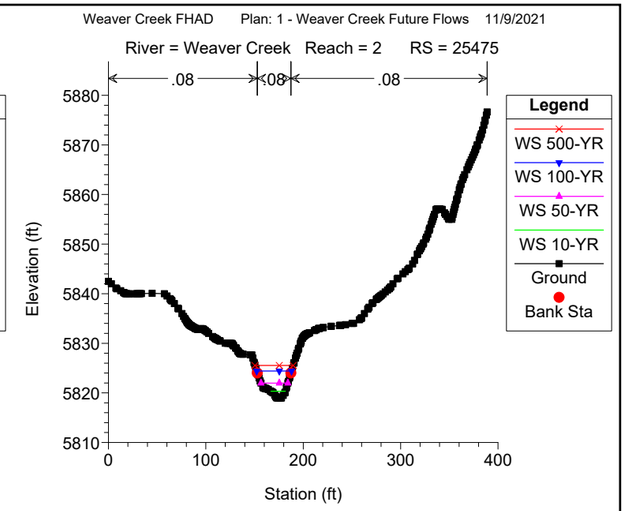

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 26278
.04
.08
.06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

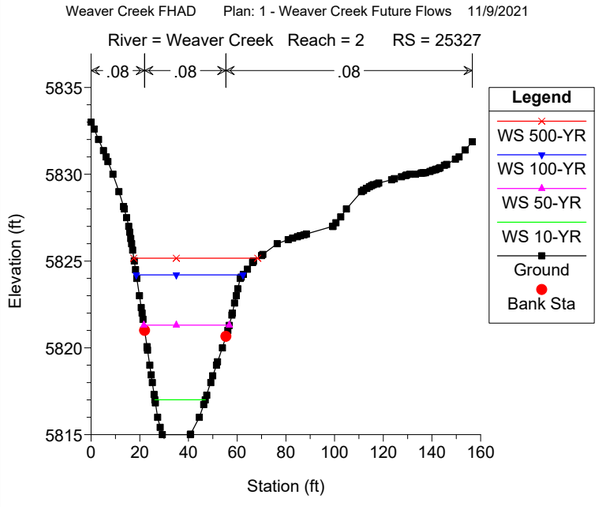

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25974
.05
.06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

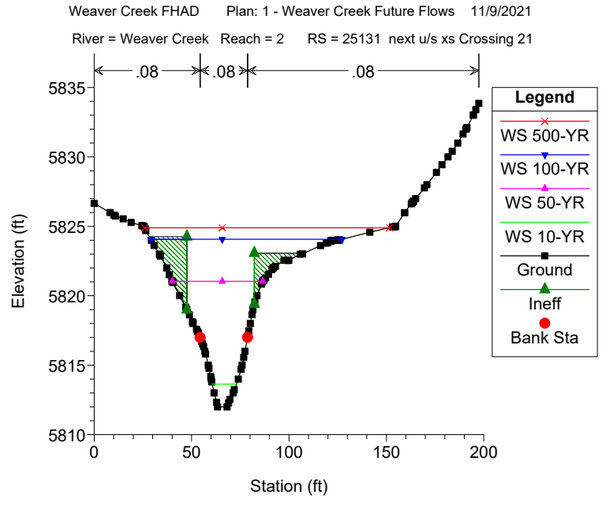

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25740
.05
.08
.06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

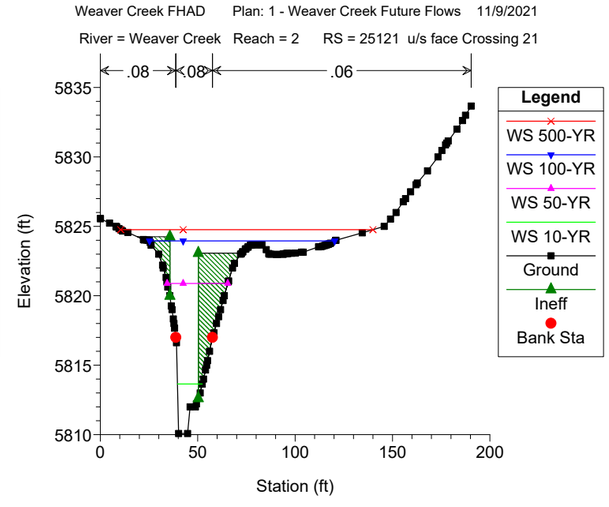

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25546
.05
.08
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

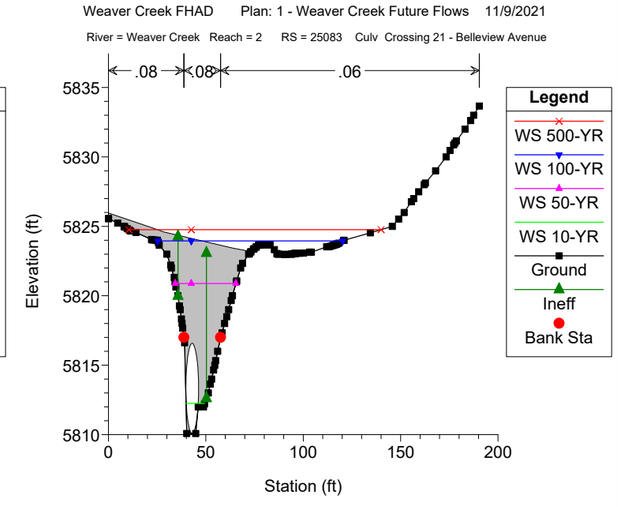

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25486
.05
.08
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

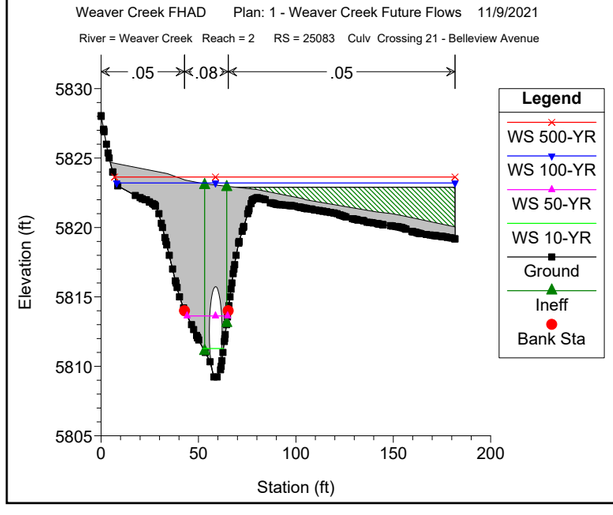

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25475
.08
.08
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

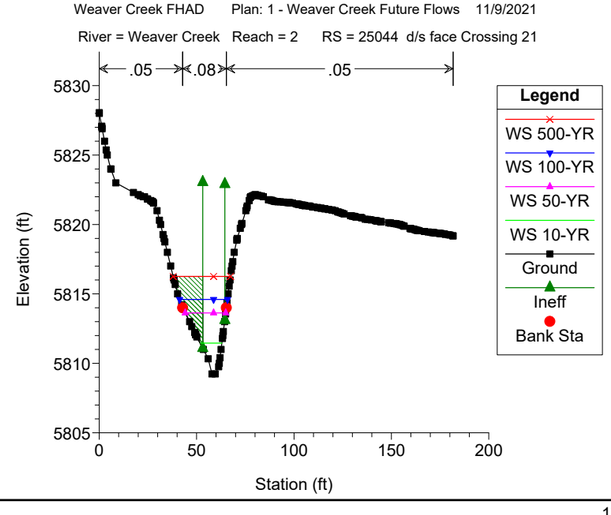

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25327
.08
.08
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

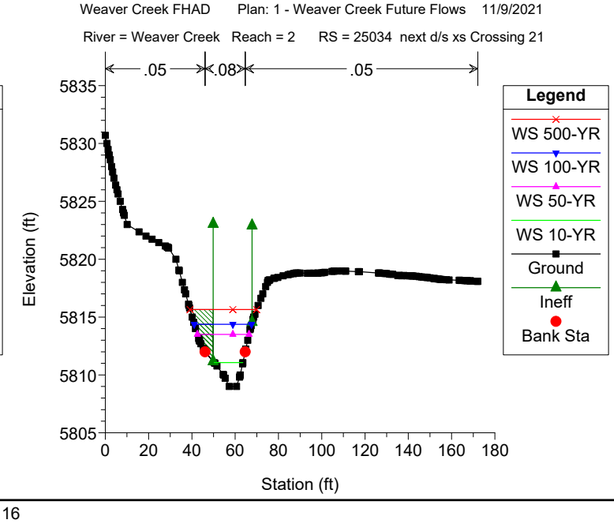

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25131 next u/s xs Crossing 21
.08
.08
.08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

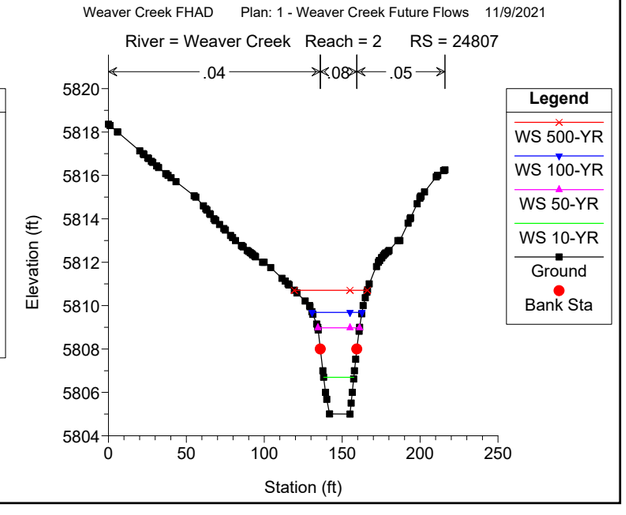

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25121 u/s face Crossing 21
.08
.08
.06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

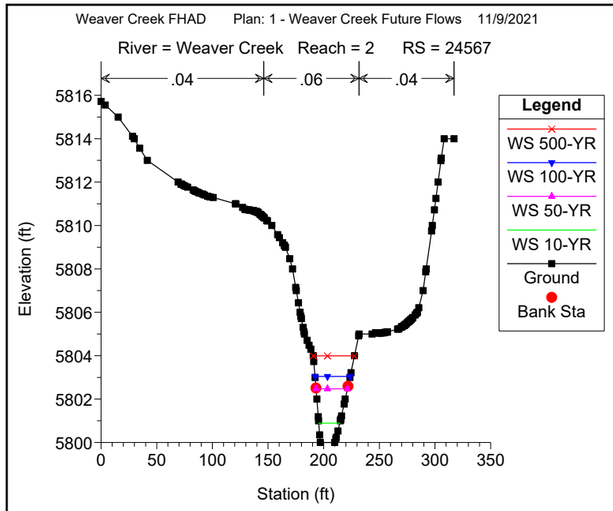

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25083 Culv Crossing 21 - Belleview Avenue
.08
.08
.06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

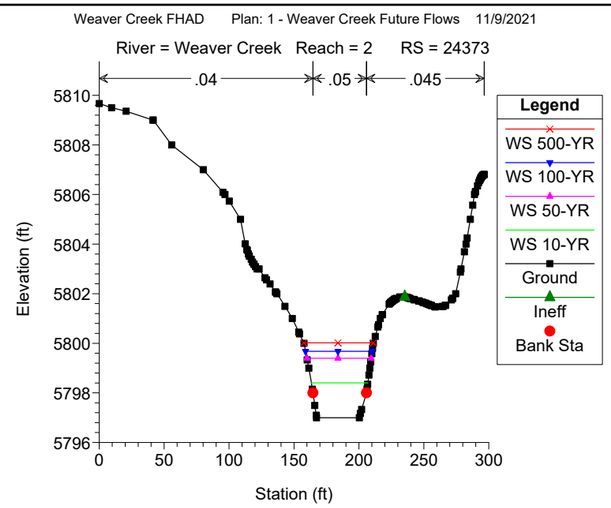

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25083 Culv Crossing 21 - Belleview Avenue
.05
.08
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

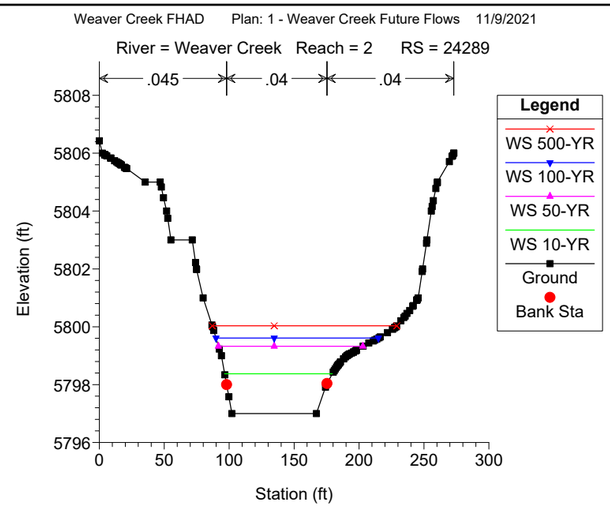

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25044 d/s face Crossing 21
.05
.08
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

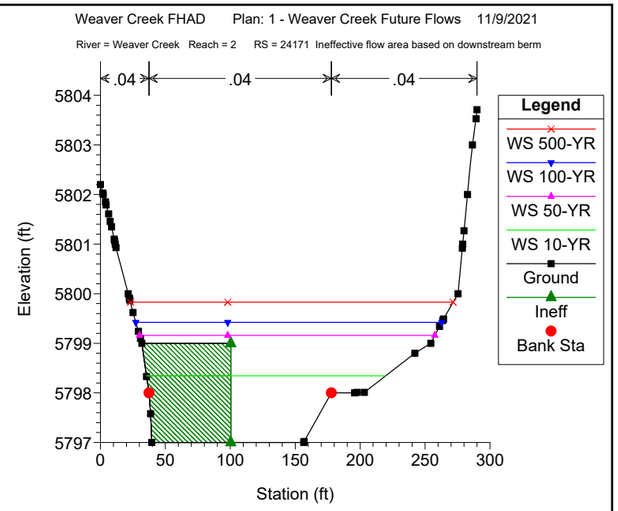

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 25034 next d/s xs Crossing 21
.05
.08
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

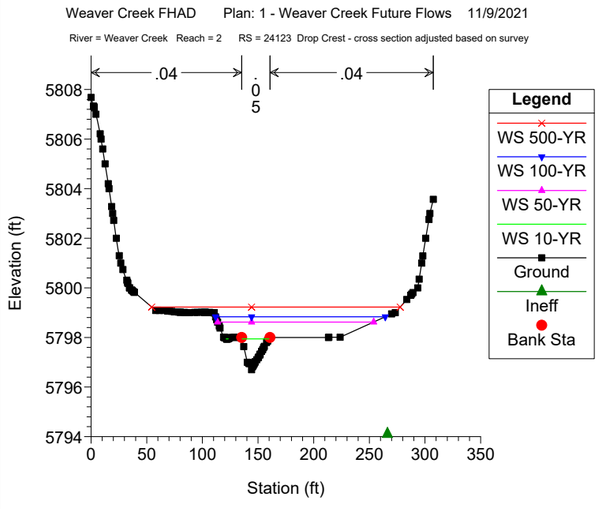

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 24807
.04
.08
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

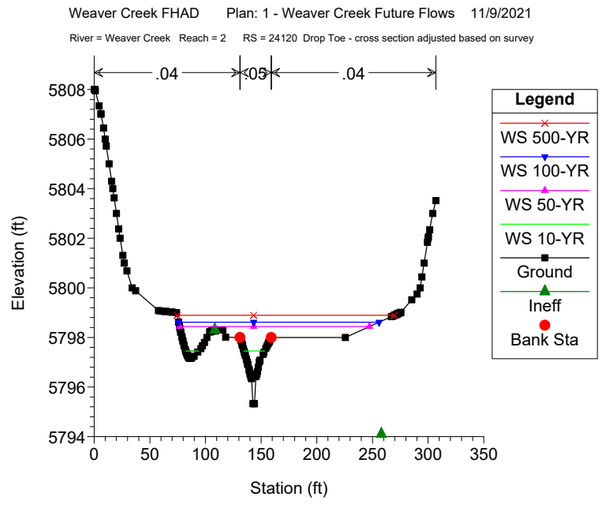

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 24567
.04 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

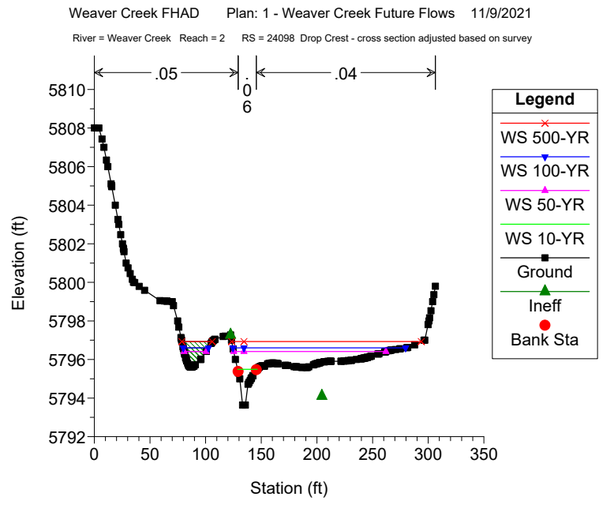

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 24373
.04 .05 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

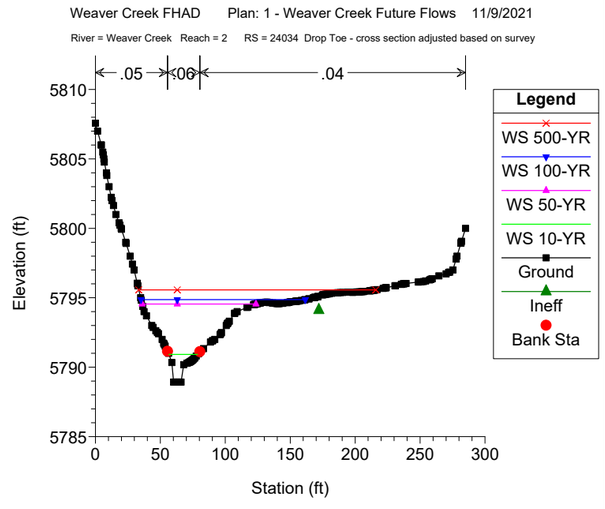

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 24289
.045 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

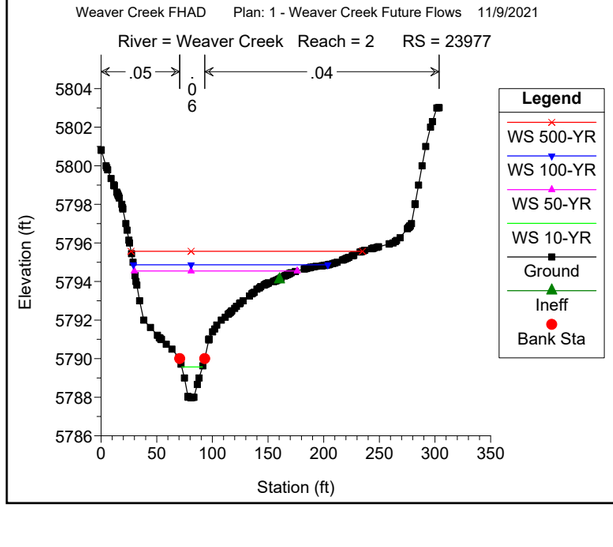

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 24171 Ineffective flow area based on downstream berm
.04 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

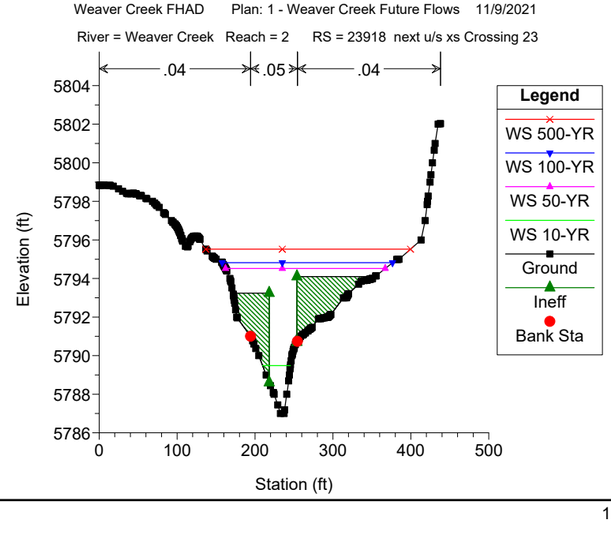

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 24123 Drop Crest - cross section adjusted based on survey
.04 .05 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

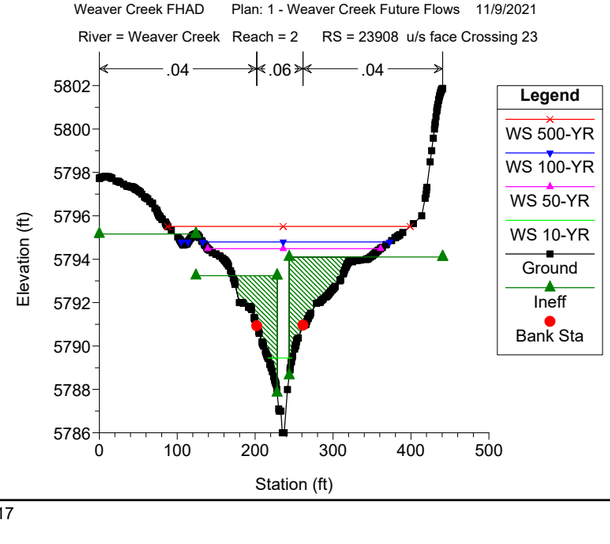

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 24120 Drop Toe - cross section adjusted based on survey
.04 .05 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

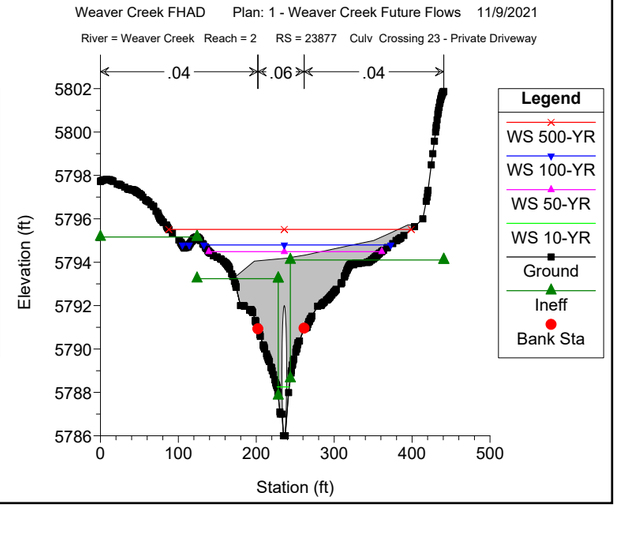

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 24098 Drop Crest - cross section adjusted based on survey
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 24034 Drop Toe - cross section adjusted based on survey
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 23977
.05 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

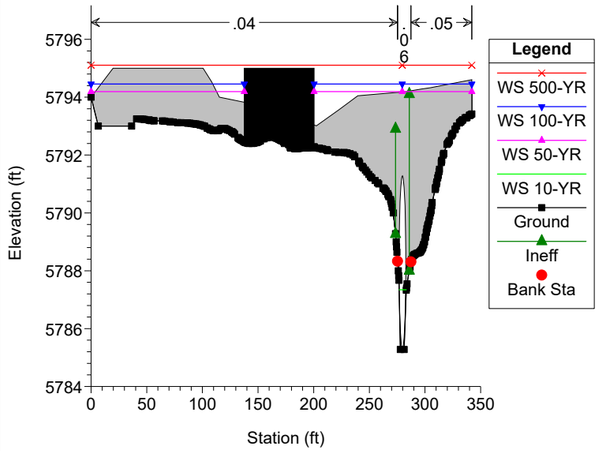

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 23918 next u/s xs Crossing 23
.04 .05 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 23908 u/s face Crossing 23
.04 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 23877 Culv Crossing 23 - Private Driveway
.04 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

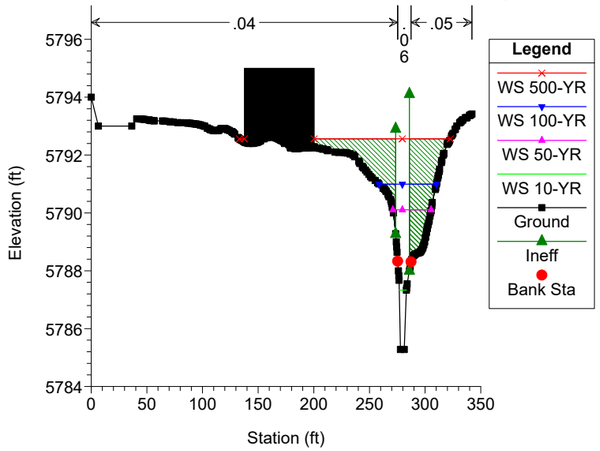
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23877 Culv Crossing 23 - Private Driveway



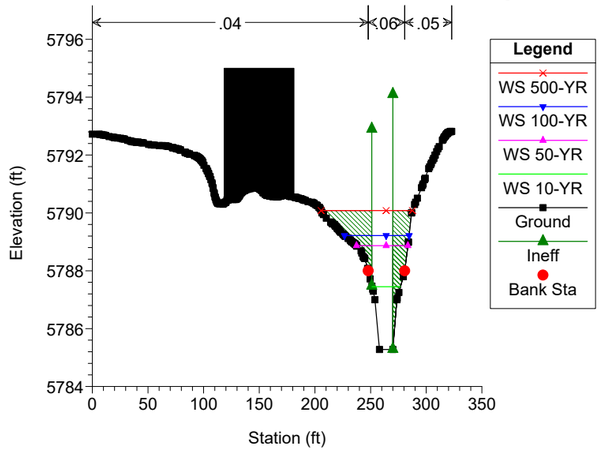
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23845 d/s face Crossing 23



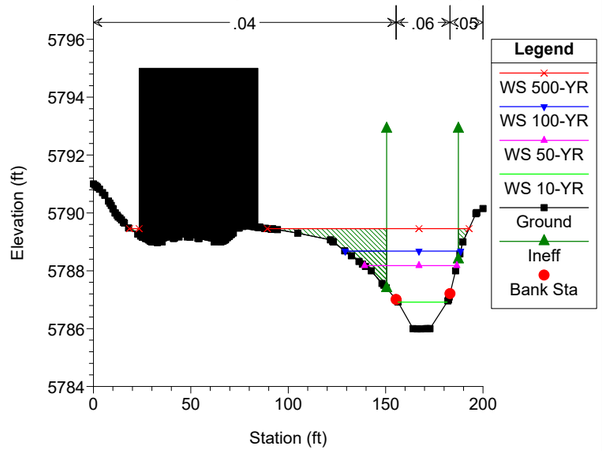
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23835 next d/s xs Crossing 23



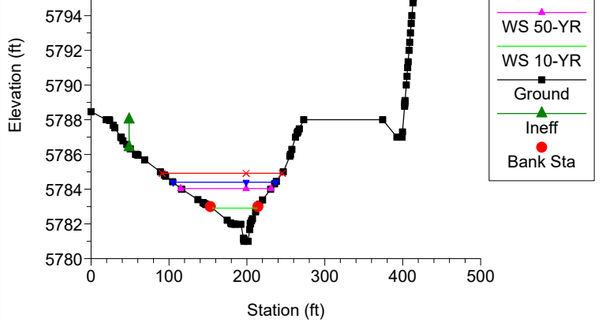
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23810



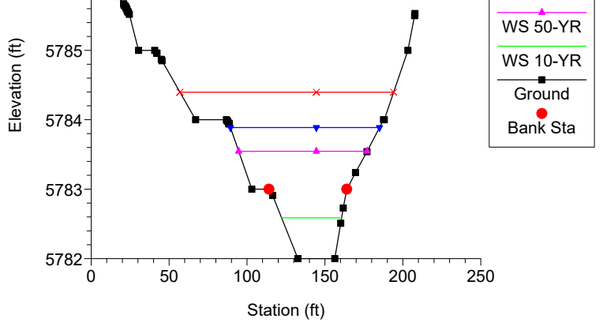
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23535 Crossing 22



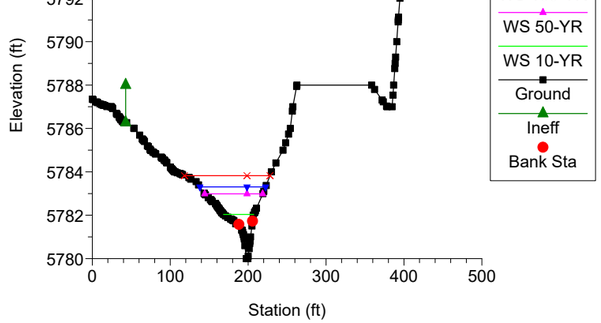
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23520



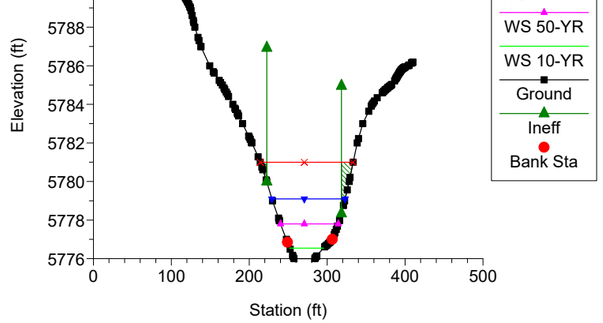
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23504



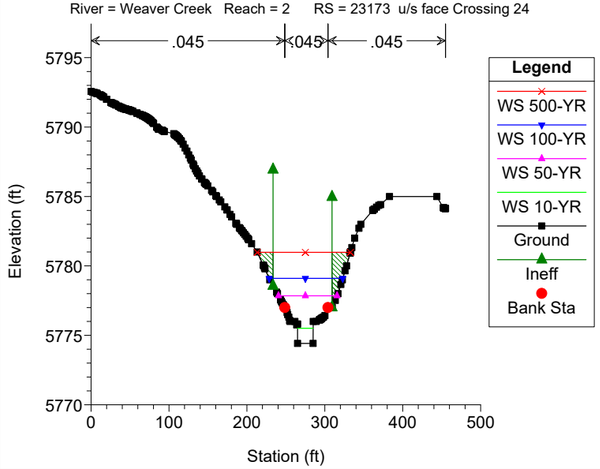
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23183 next u/s xs Crossing 24



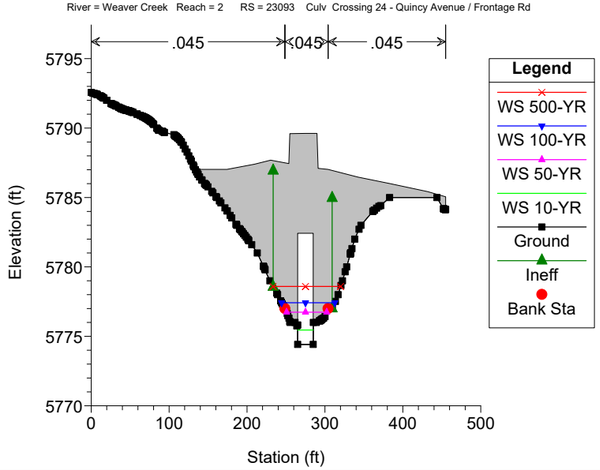
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23173 u/s face Crossing 24



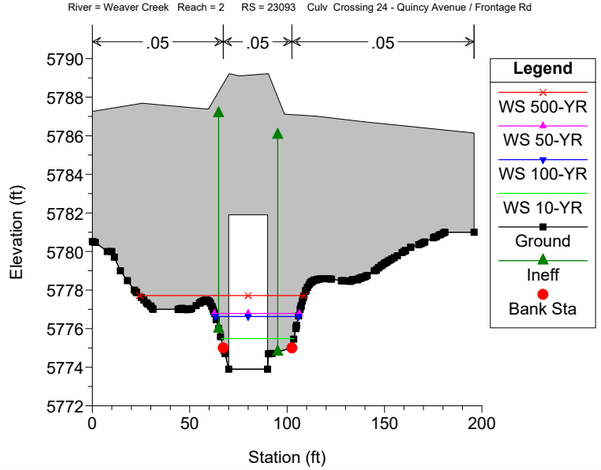
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 23093 Culv Crossing 24 - Quincy Avenue / Frontage Rd



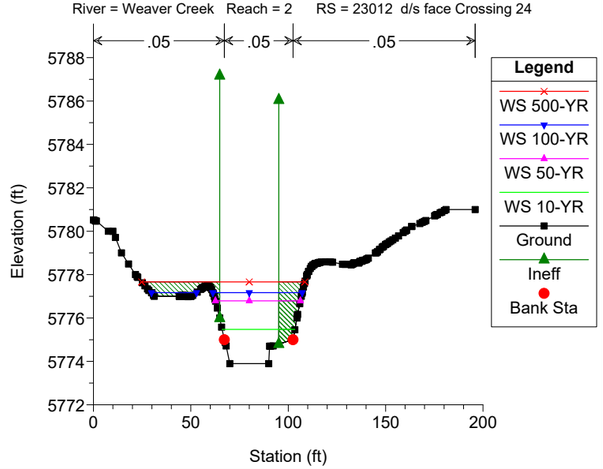
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

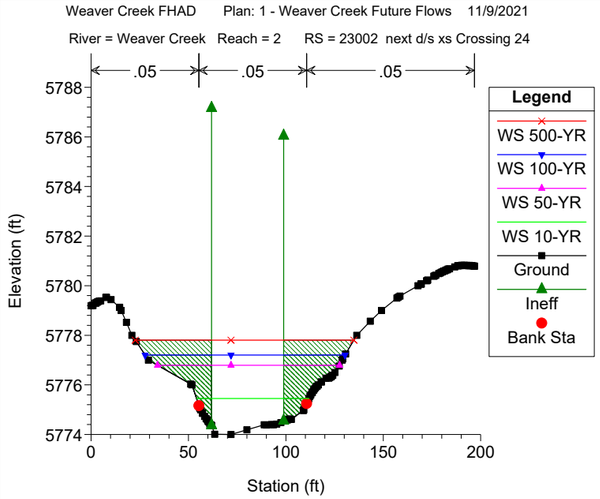
River = Weaver Creek Reach = 2 RS = 23093 Culv Crossing 24 - Quincy Avenue / Frontage Rd

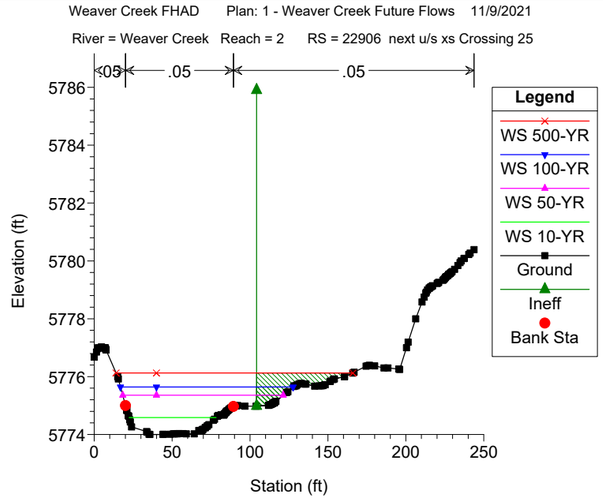


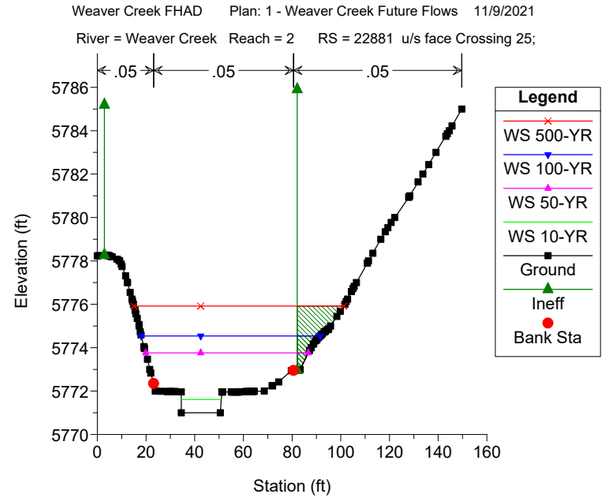
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

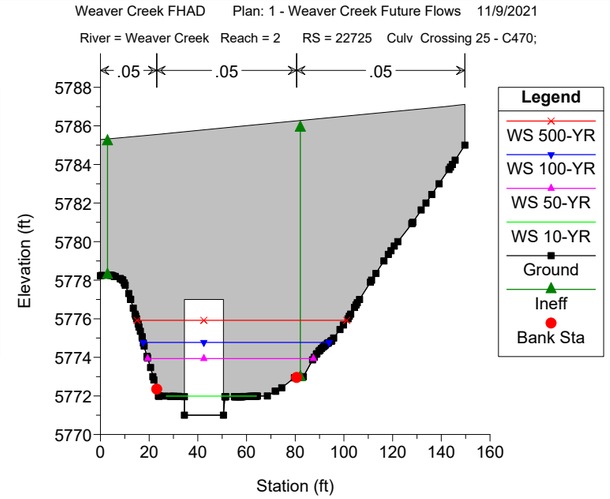
River = Weaver Creek Reach = 2 RS = 23012 d/s face Crossing 24

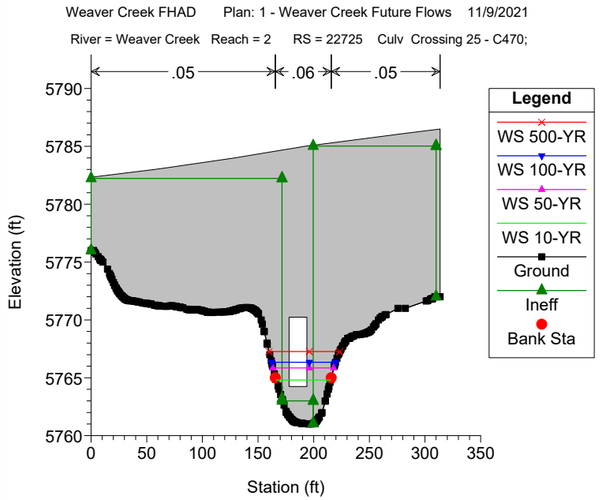


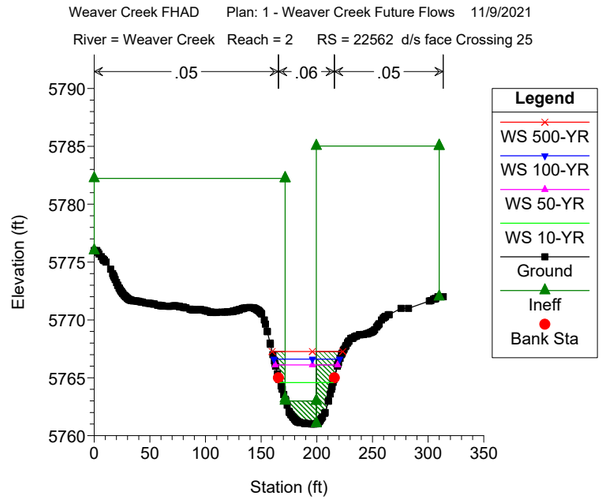

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 23002 next d/s xs Crossing 24
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

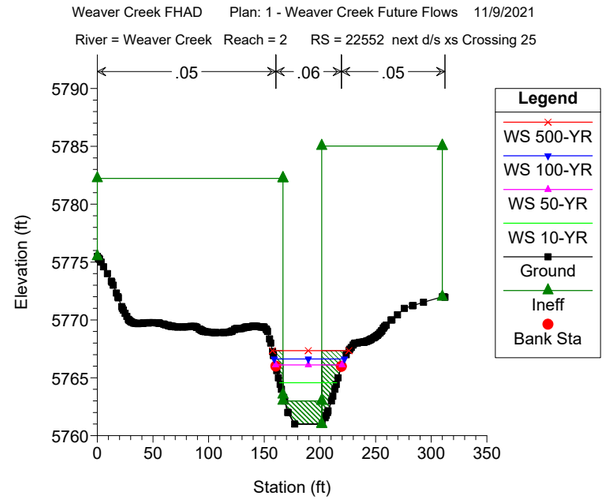

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22906 next u/s xs Crossing 25
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

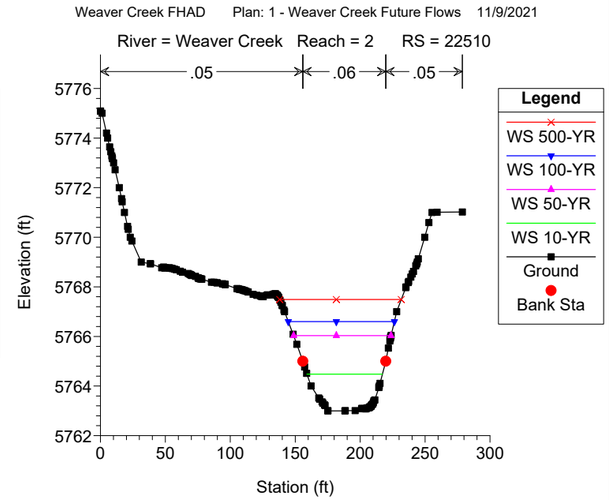

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22881 u/s face Crossing 25;
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

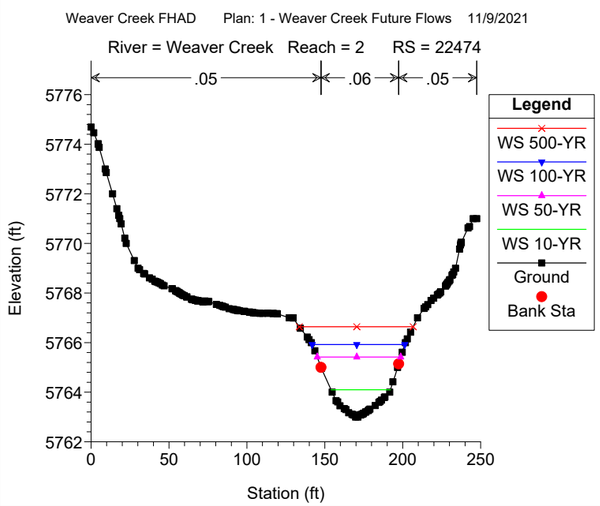

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22725 Culv Crossing 25 - C470;
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

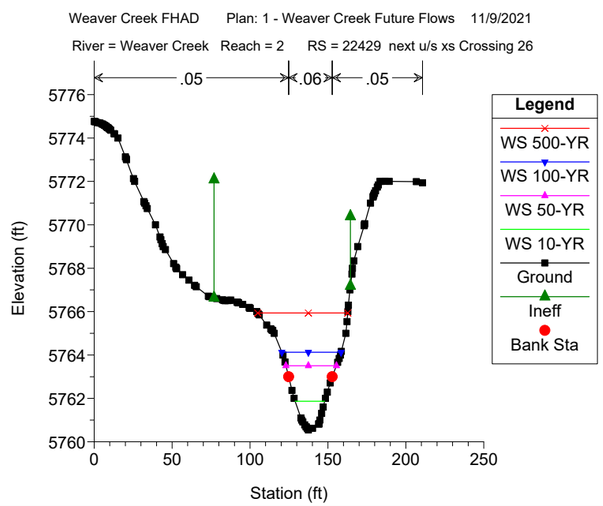

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22725 Culv Crossing 25 - C470;
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

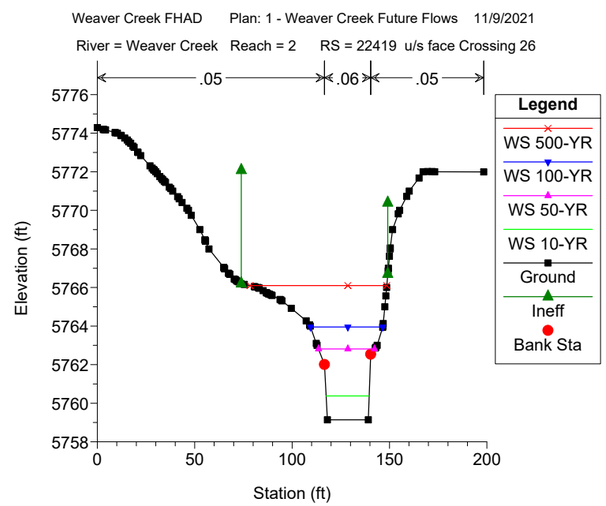

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22562 d/s face Crossing 25
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

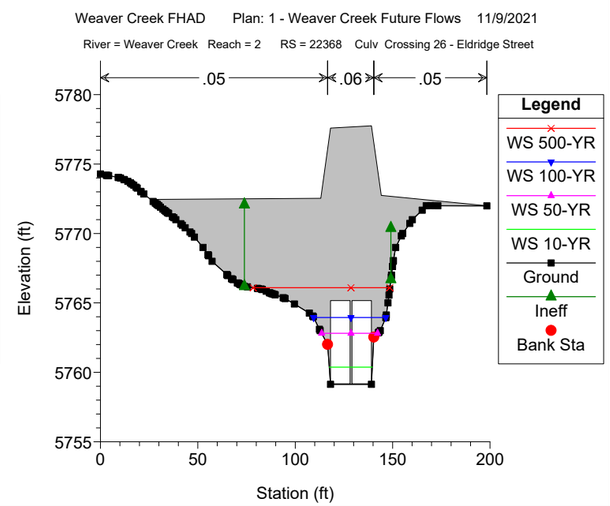

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22552 next d/s xs Crossing 25
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22510
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22474
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

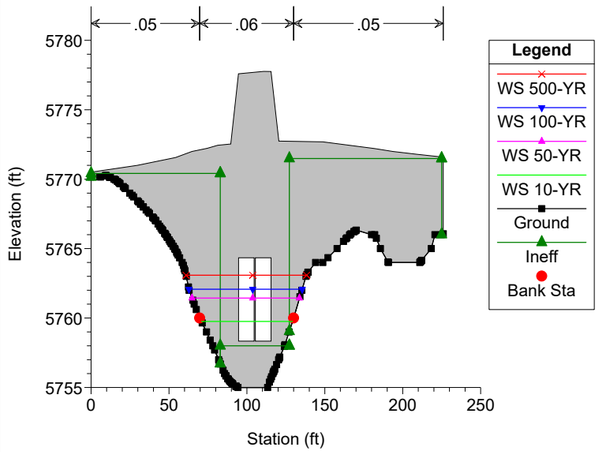

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22429 next u/s xs Crossing 26
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22419 u/s face Crossing 26
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 22368 Culv Crossing 26 - Eldridge Street
.05 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

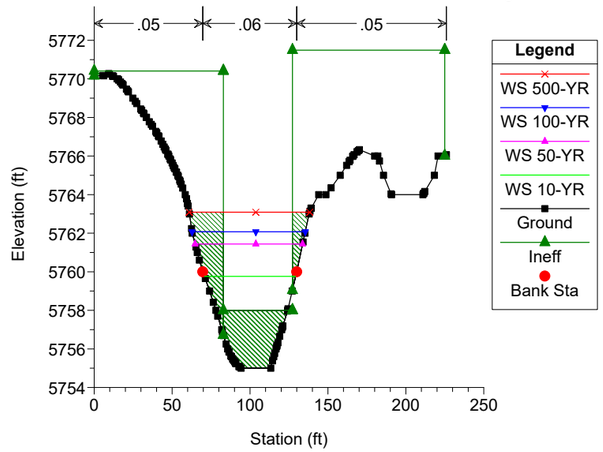
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 22368 Culv Crossing 26 - Eldridge Street



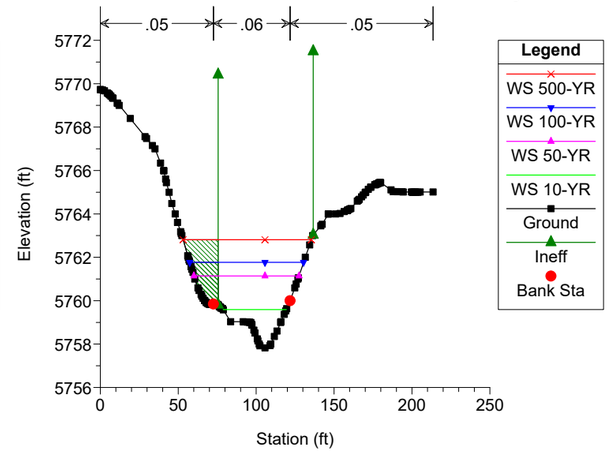
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 22272 d/s face Crossing 26



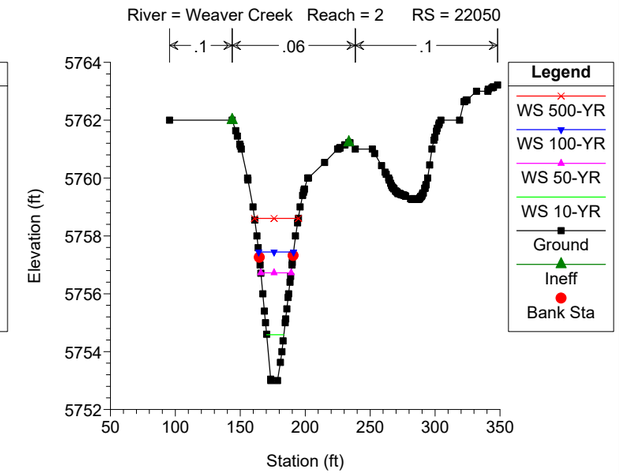
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 22247 next d/s xs Crossing 26



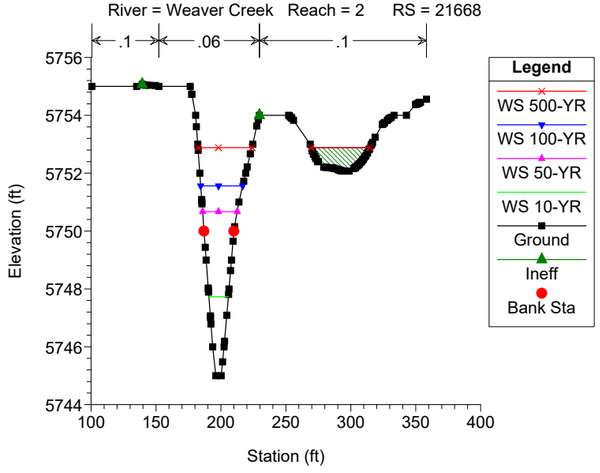
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 22050



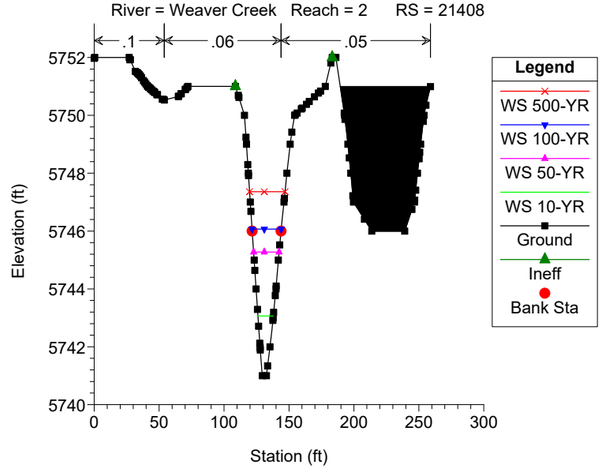
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 21668



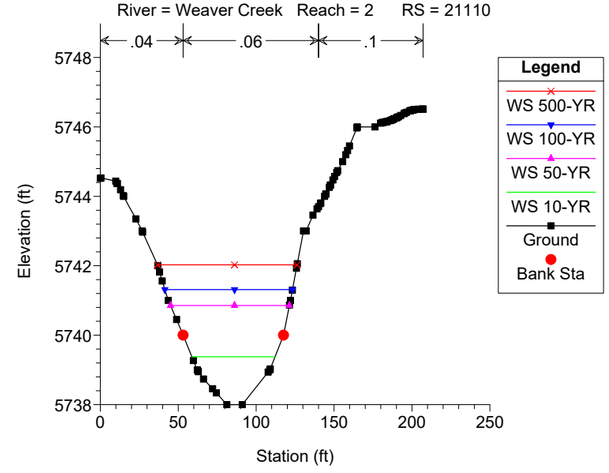
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 21408



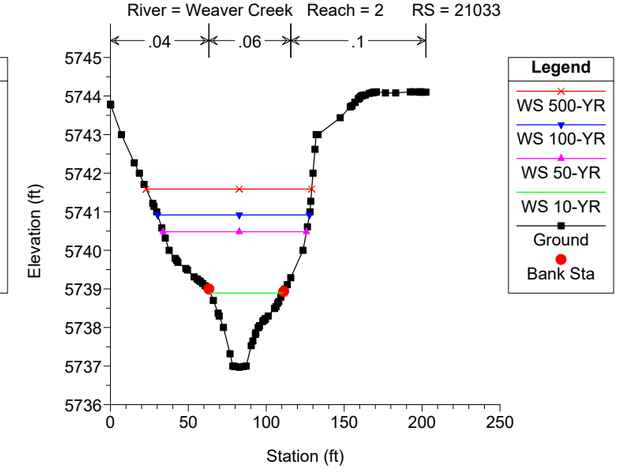
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 21110



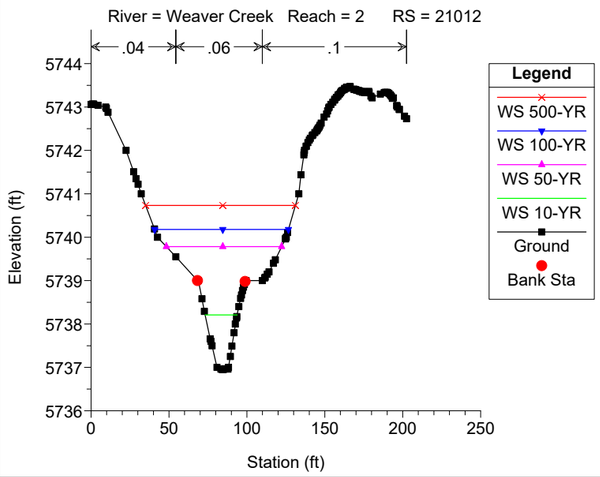
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 21033



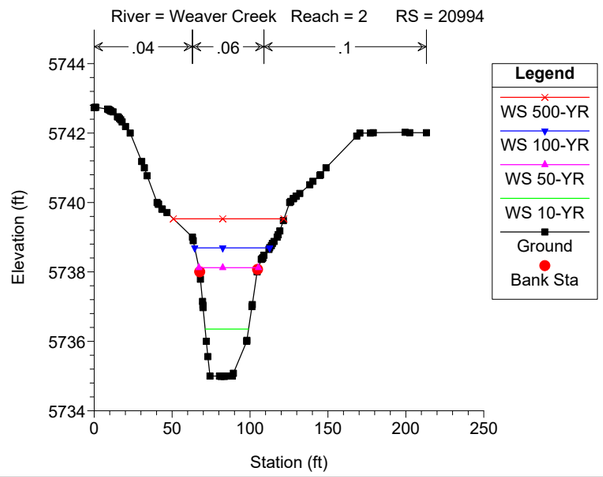
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 21012



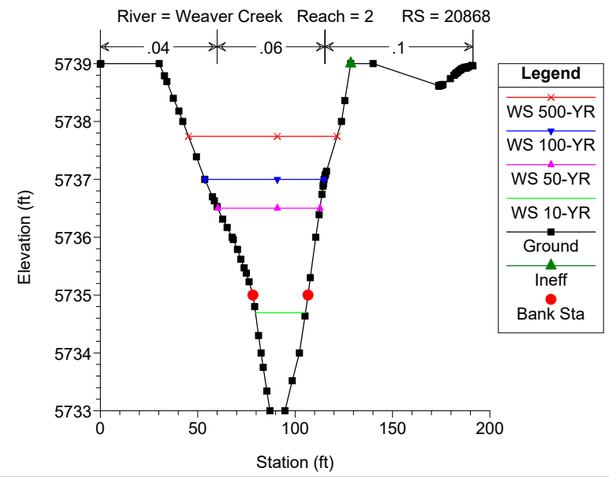
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 20994



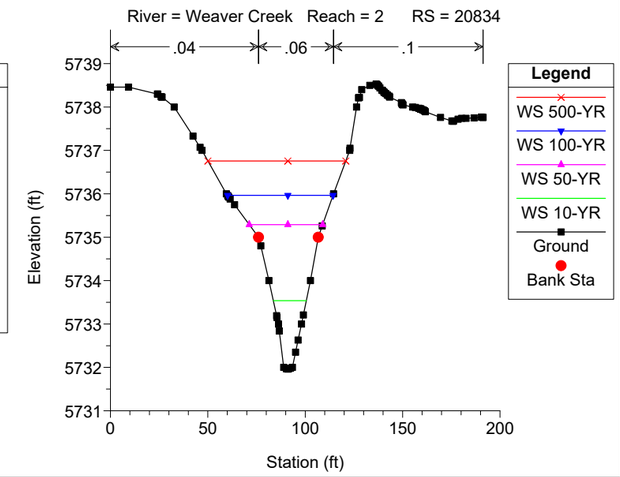
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

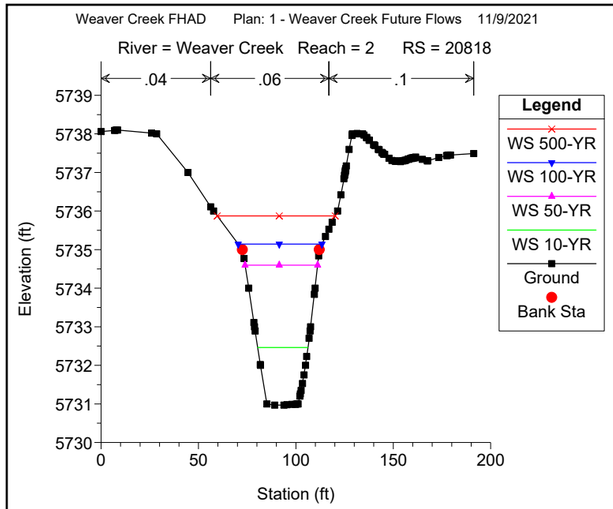
River = Weaver Creek Reach = 2 RS = 20868

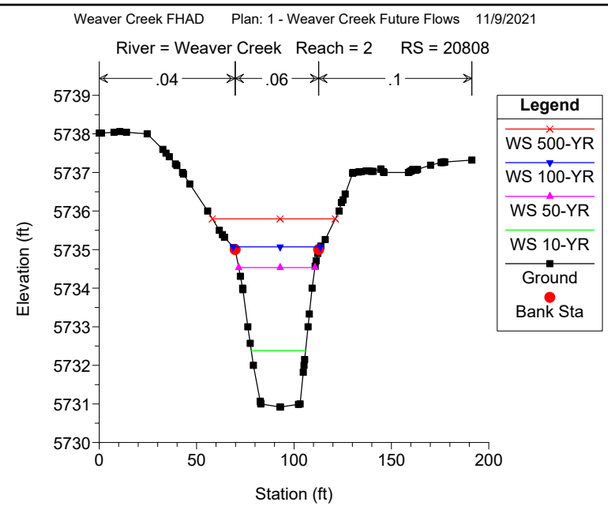


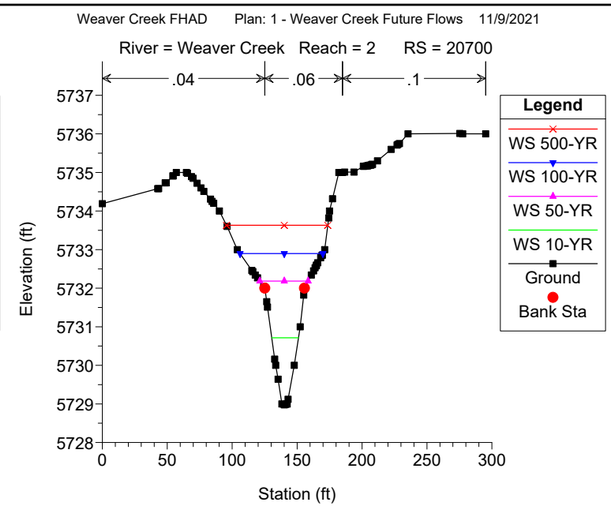
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

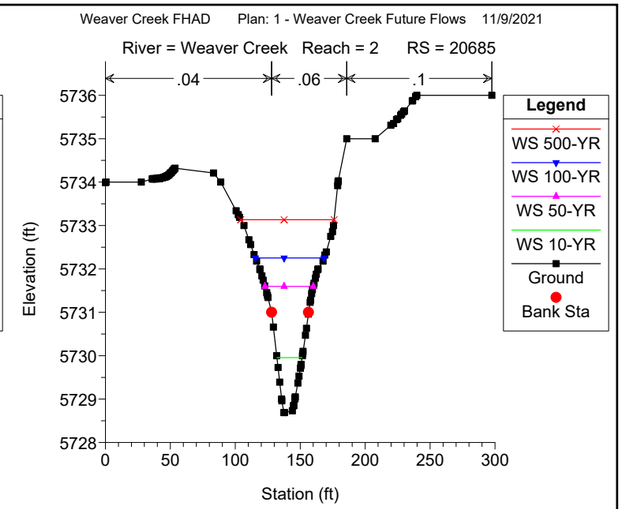
River = Weaver Creek Reach = 2 RS = 20834

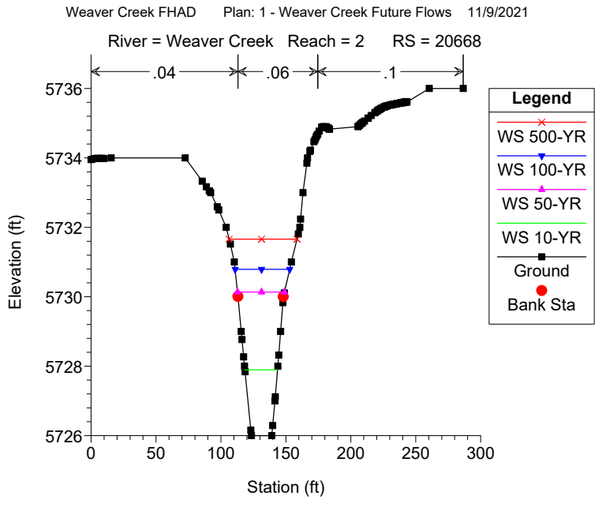


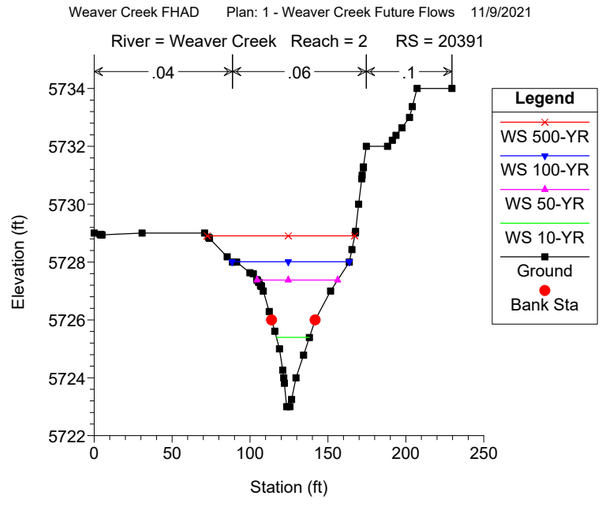

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20818
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

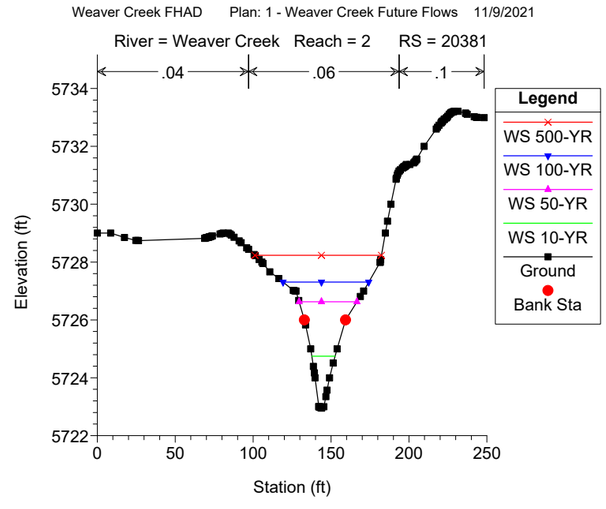

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20808
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

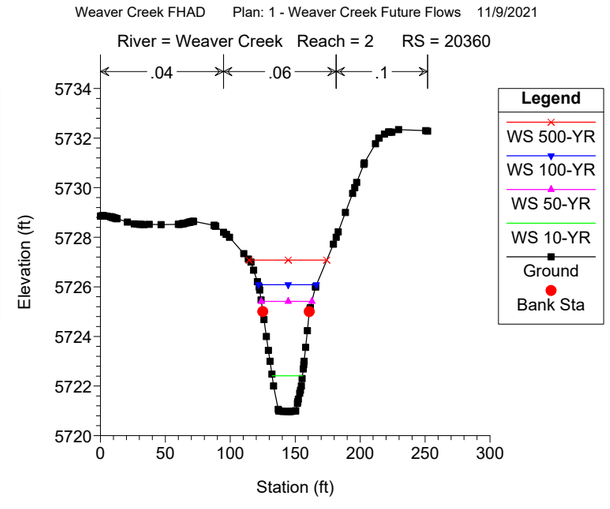

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20700
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

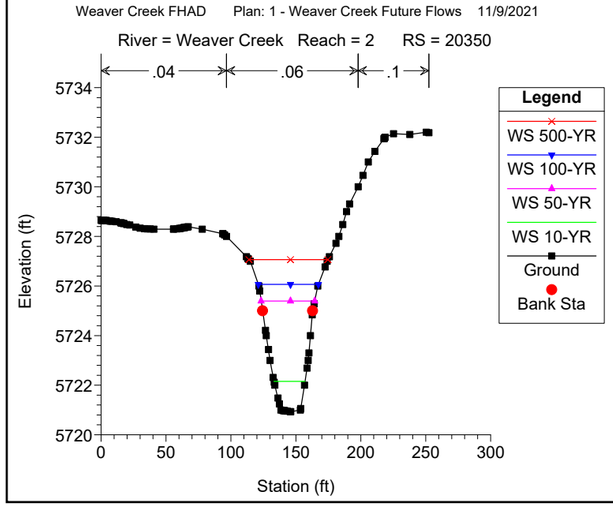

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20685
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

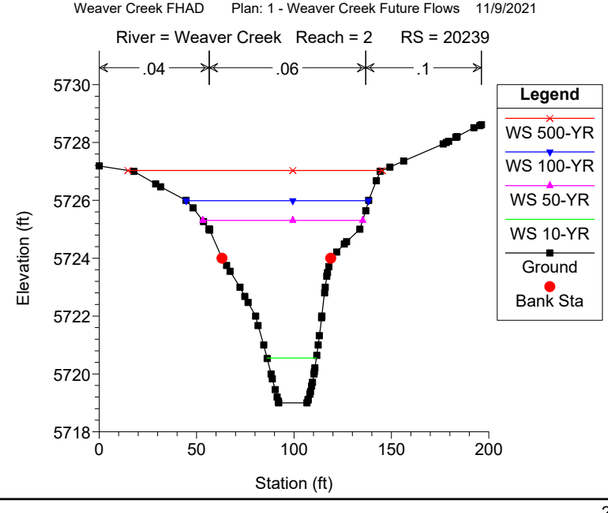

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20668
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

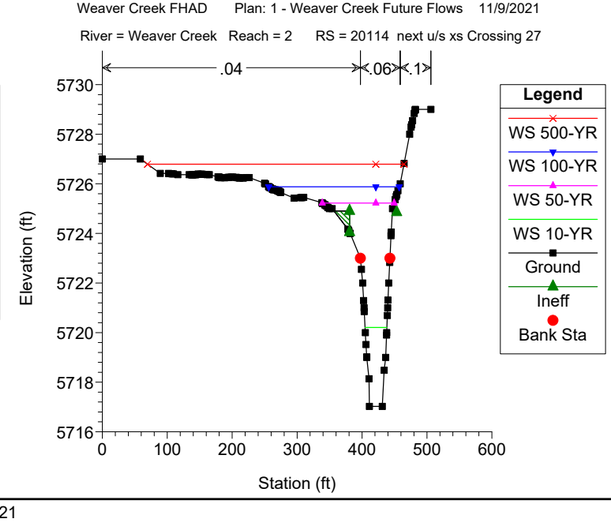

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20391
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

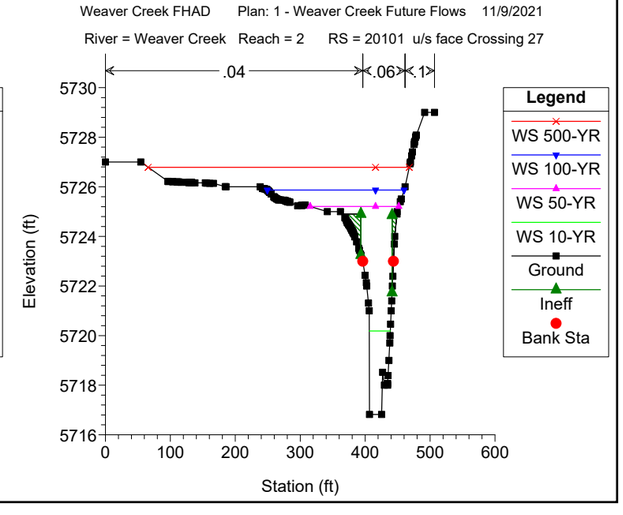

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20381
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20360
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20350
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

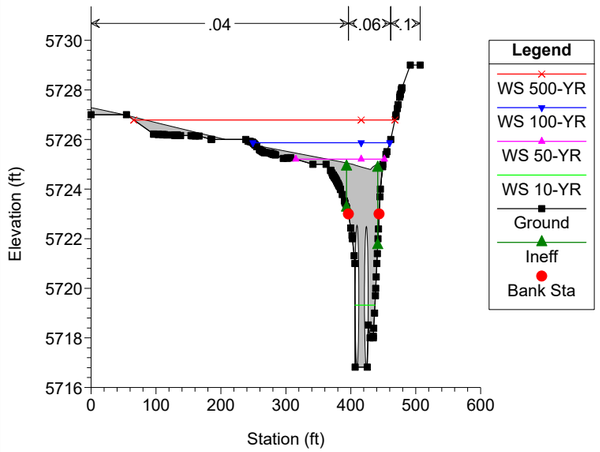

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20239
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20114 next u/s xs Crossing 27
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 20101 u/s face Crossing 27
.04 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

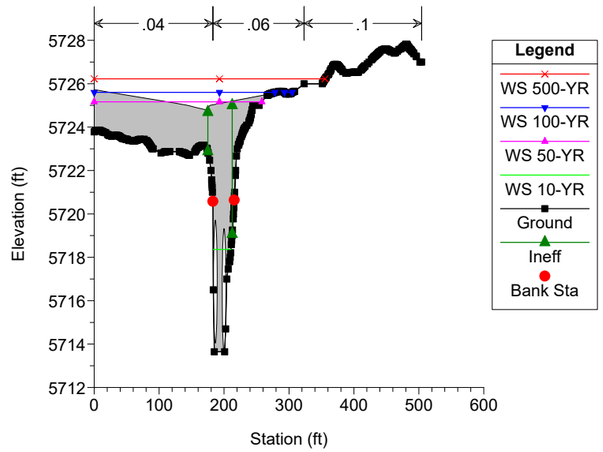
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 20049 Culv Crossing 27 - Cole Street



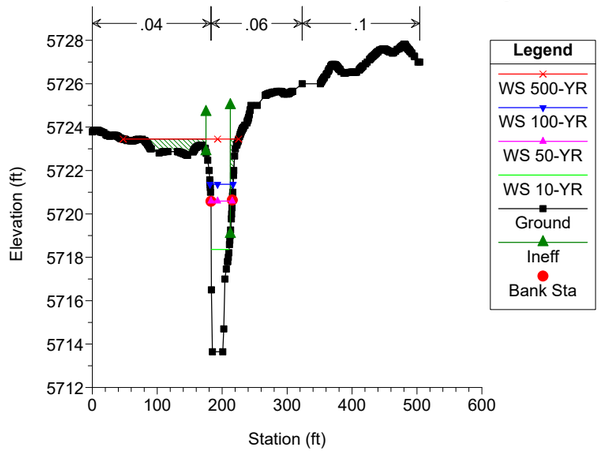
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 20049 Culv Crossing 27 - Cole Street



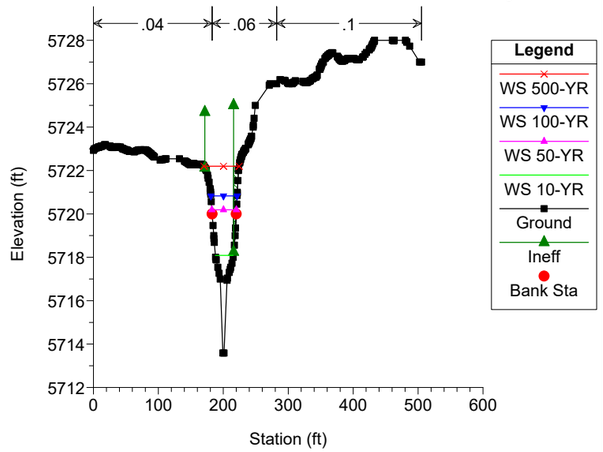
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19996 d/s face Crossing 27



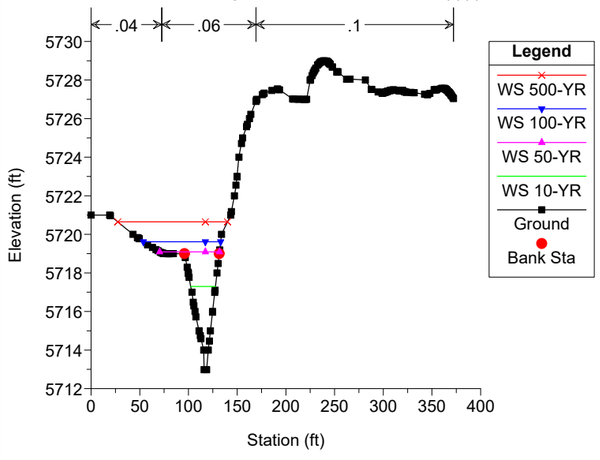
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19986 next d/s xs Crossing 27



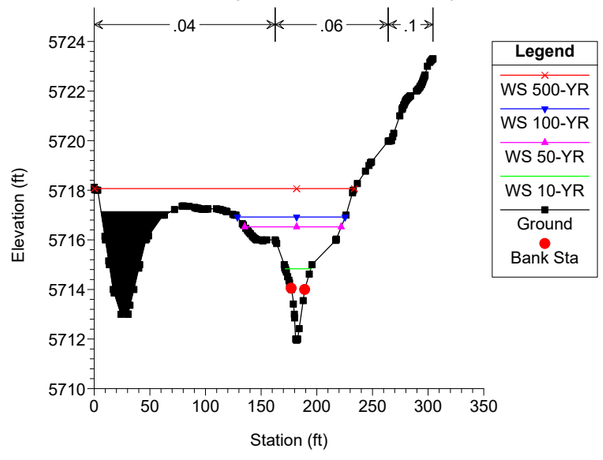
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19890



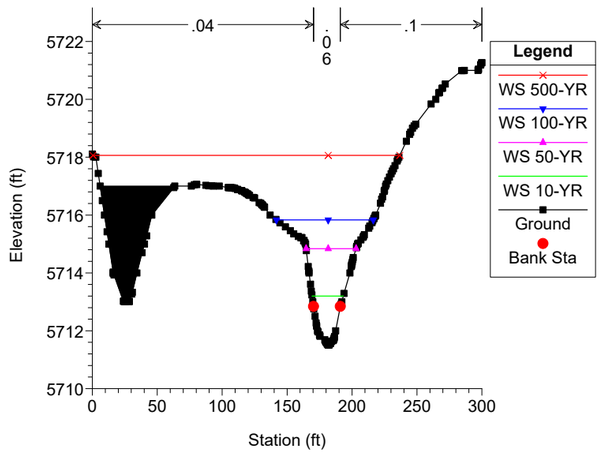
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19727



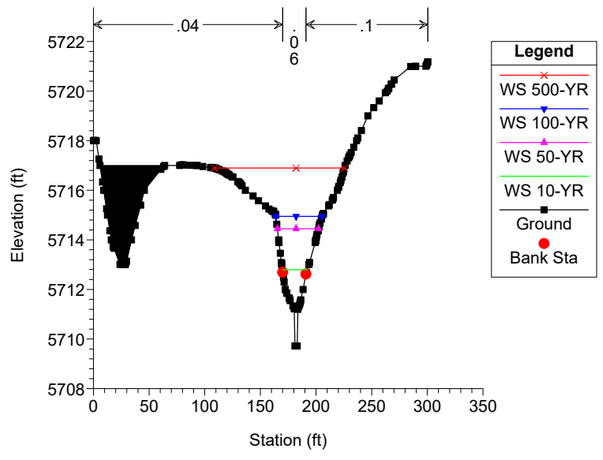
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19716 Drop Crest - cross section modified based on survey shot



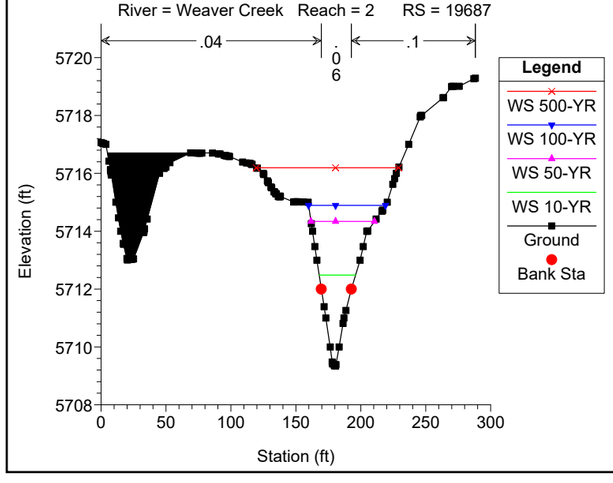
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19715 Drop Toe - cross section modified based on survey shot



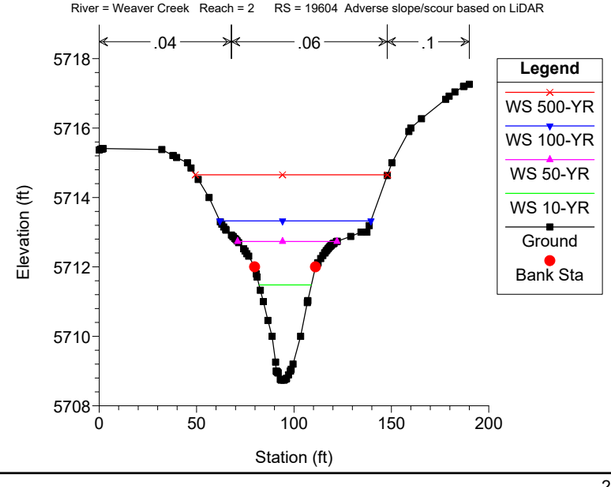
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19687



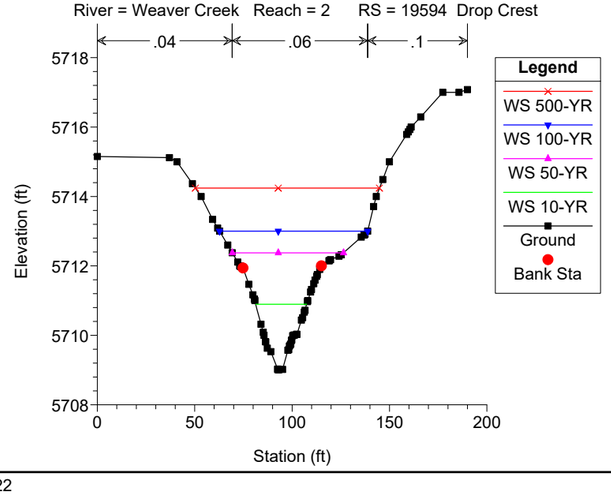
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19604 Adverse slope/scour based on LiDAR



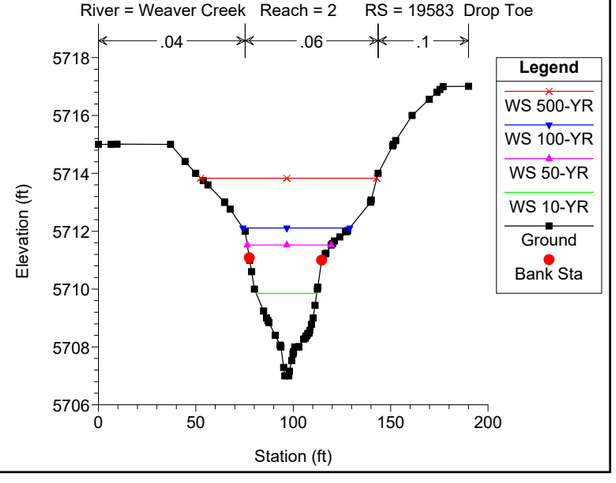
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19594 Drop Crest



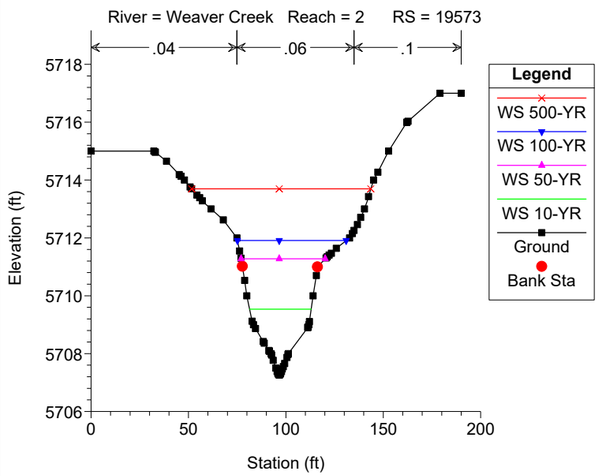
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19583 Drop Toe



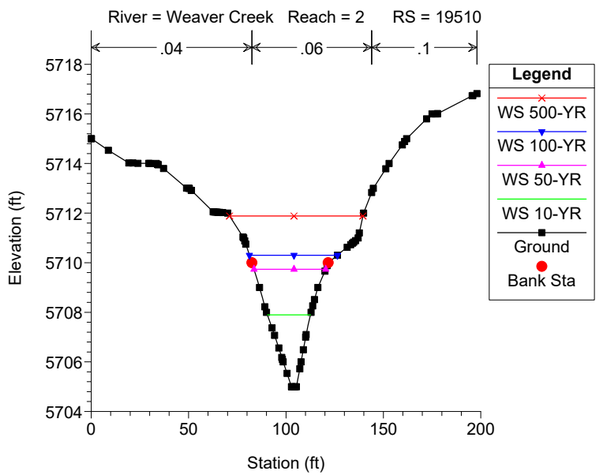
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19573



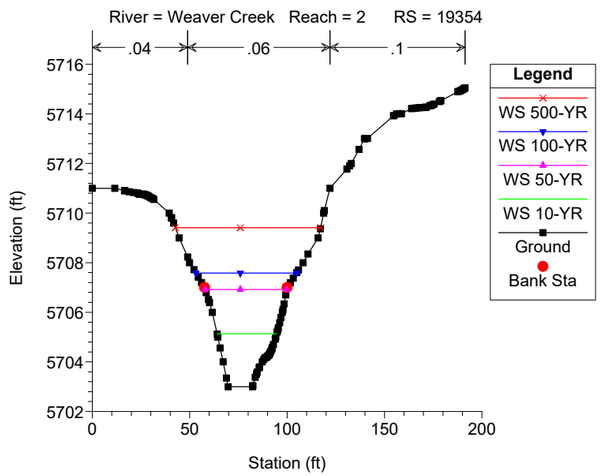
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19510



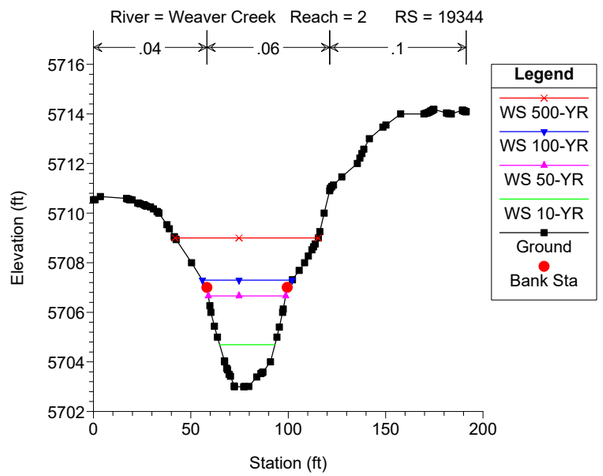
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19354



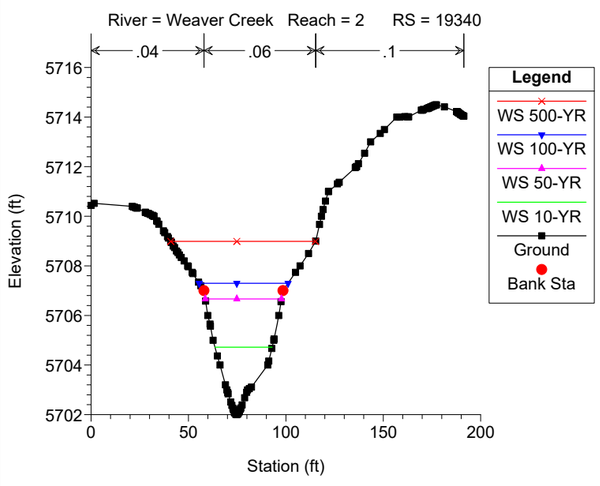
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19344



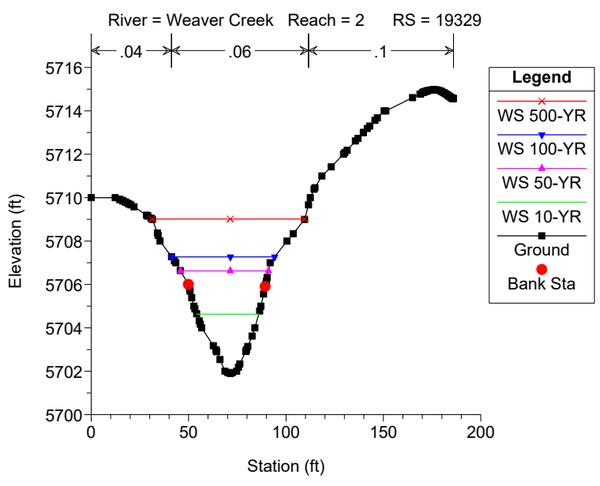
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19340



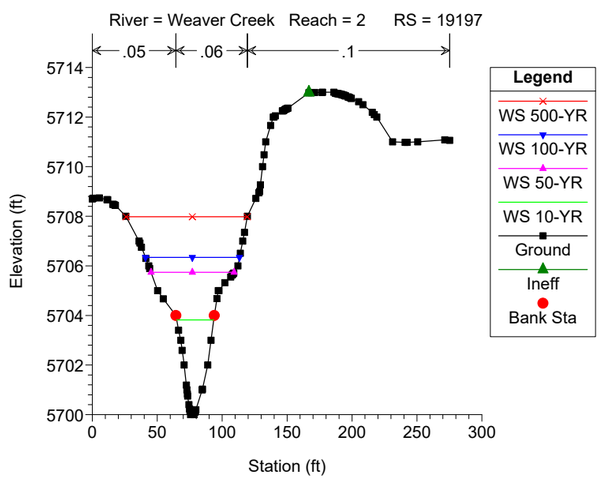
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19329



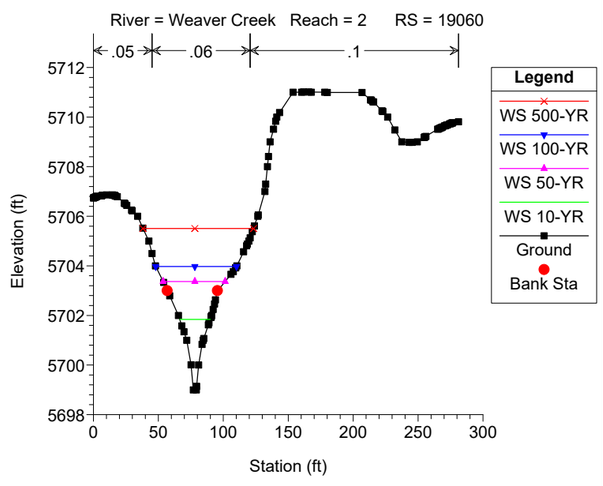
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19197



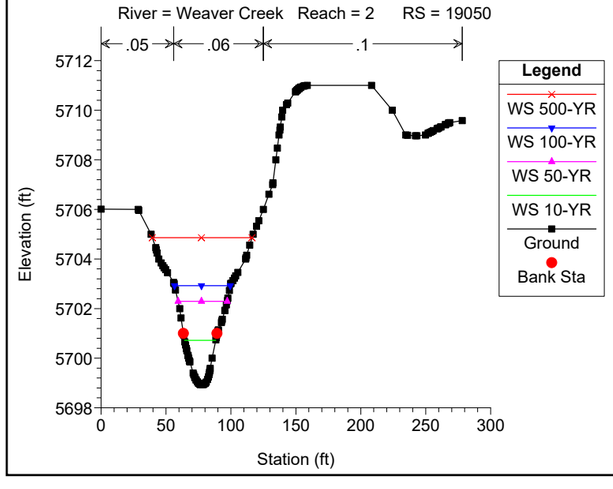
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19060



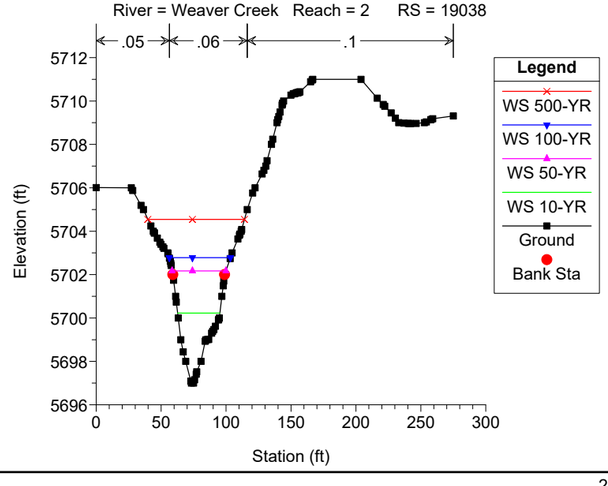
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19050



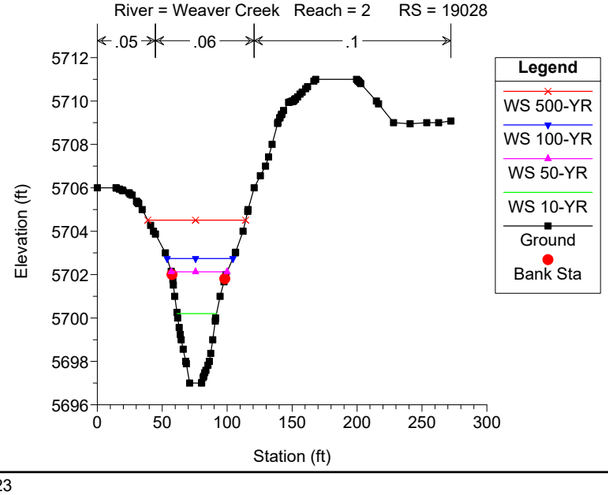
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 19038



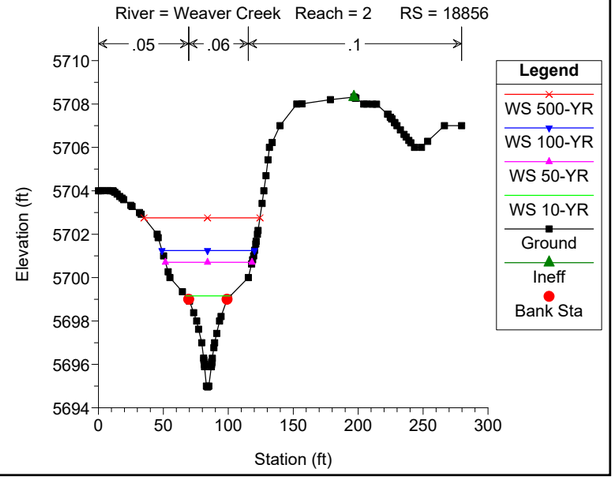
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

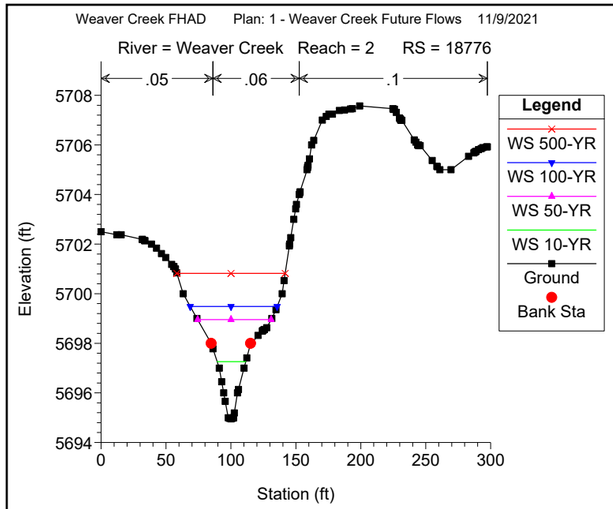
River = Weaver Creek Reach = 2 RS = 19028

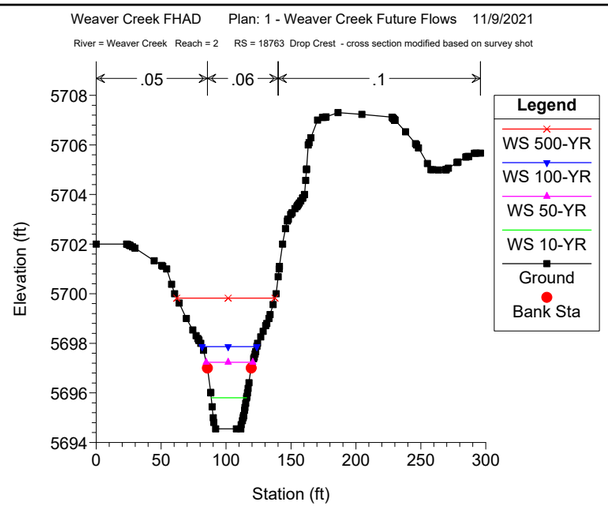


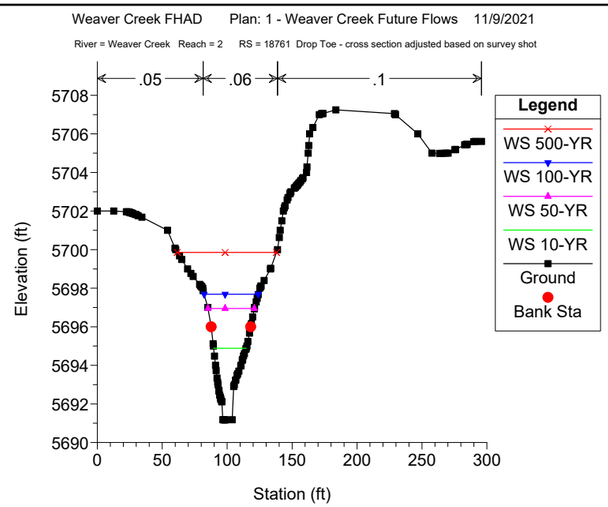
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

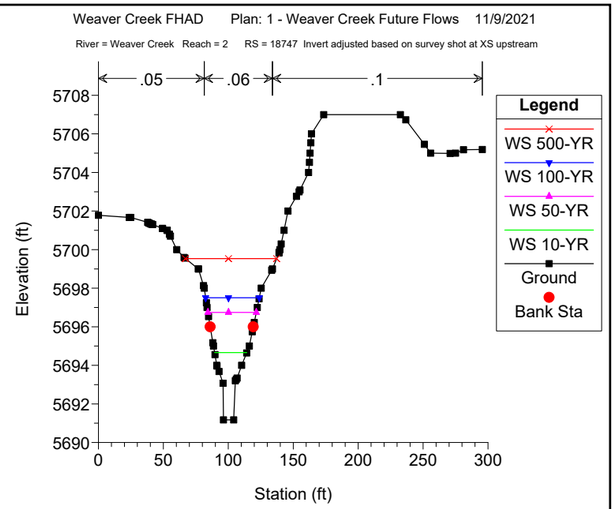
River = Weaver Creek Reach = 2 RS = 18856

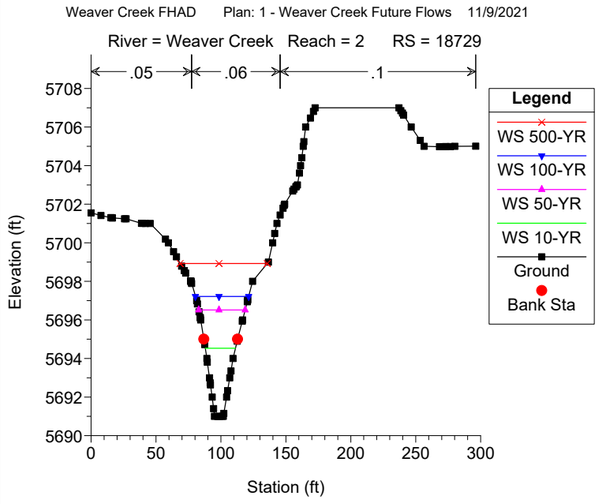


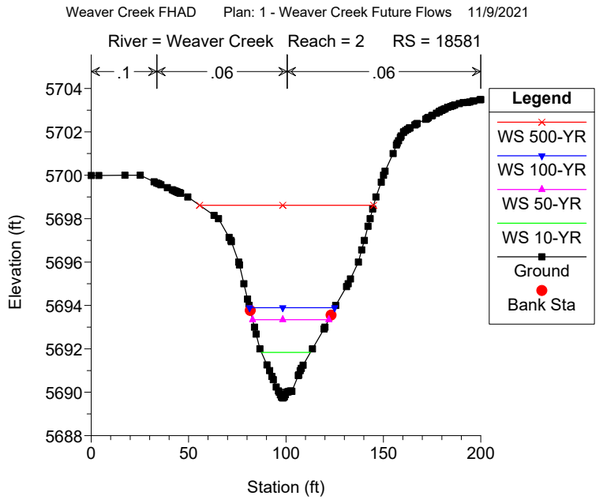

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18776
.05 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

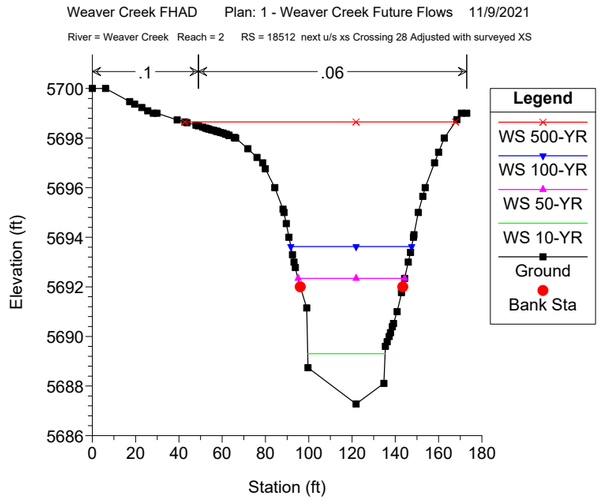

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18763 Drop Crest - cross section modified based on survey shot
.05 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

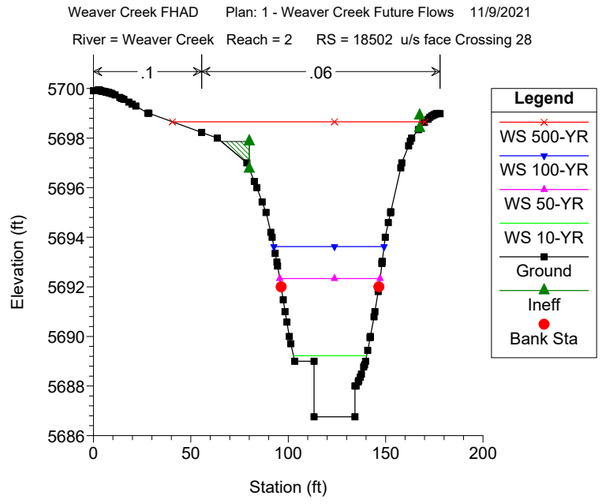

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18761 Drop Toe - cross section adjusted based on survey shot
.05 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

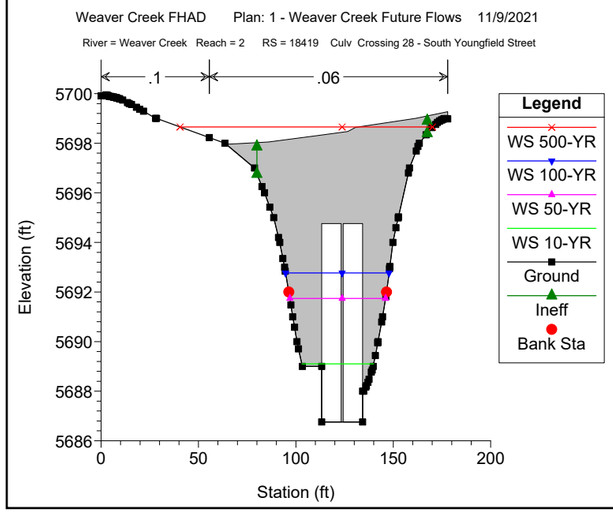

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18747 Invert adjusted based on survey shot at XS upstream
.05 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

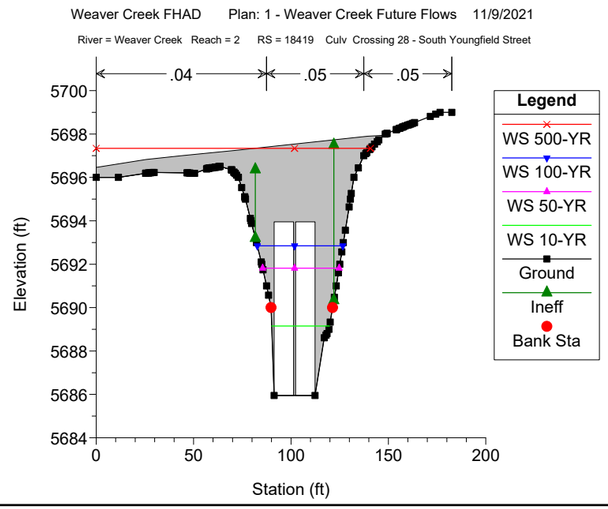

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18729
.05 .06 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

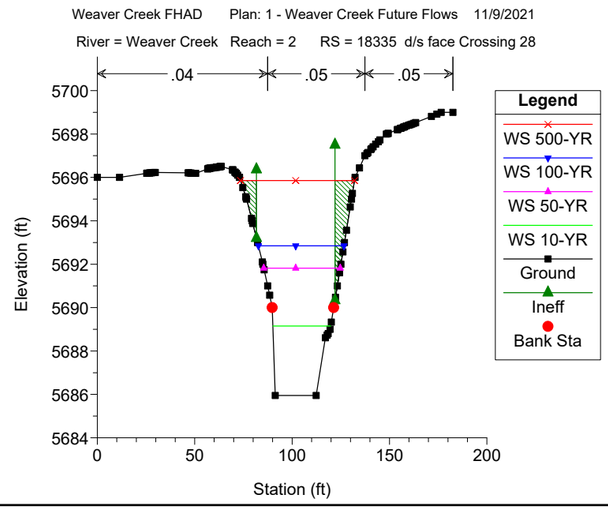

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18581
.1 .06 .06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

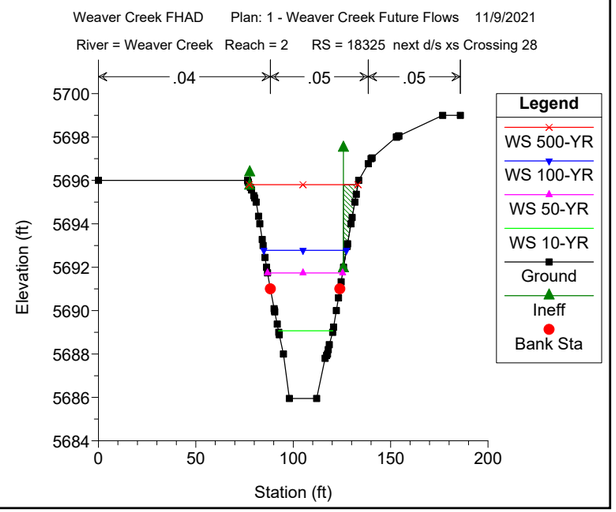

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18512 next u/s xs Crossing 28 Adjusted with surveyed XS
.1 .06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

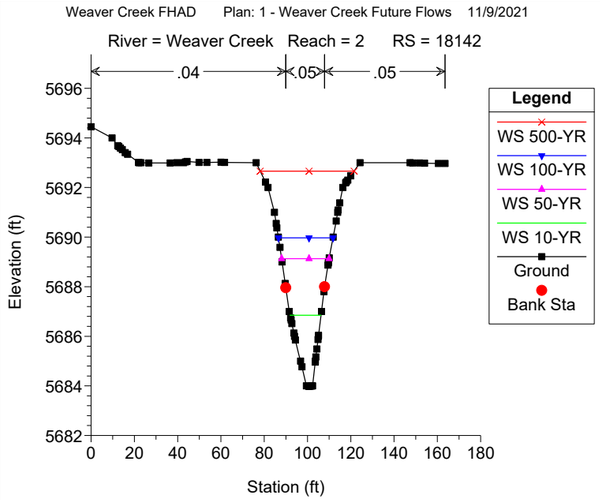

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18502 u/s face Crossing 28
.1 .06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

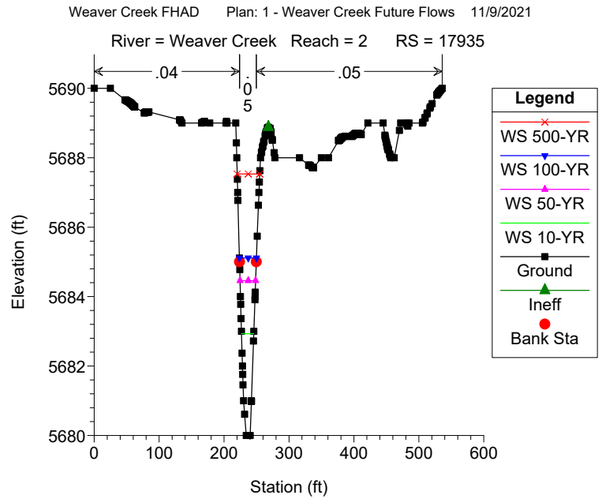

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18419 Culv Crossing 28 - South Youngfield Street
.1 .06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

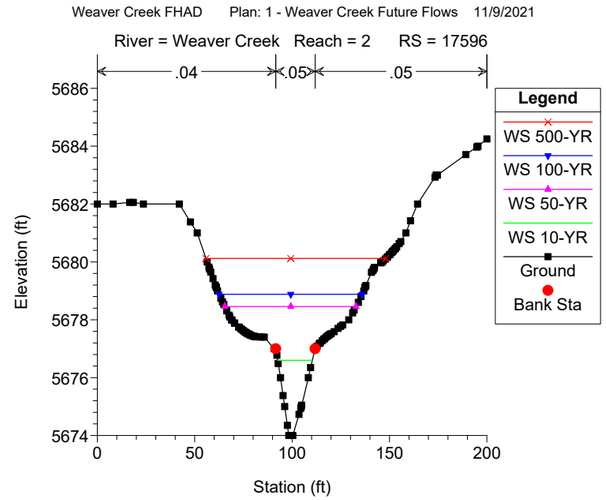

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18419 Culv Crossing 28 - South Youngfield Street
.04 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

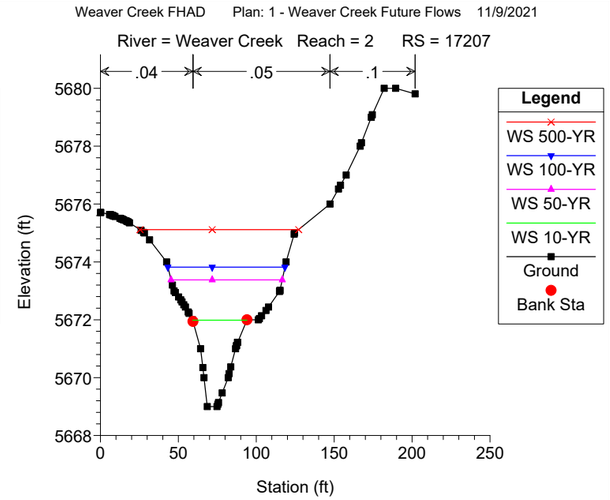

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18335 d/s face Crossing 28
.04 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

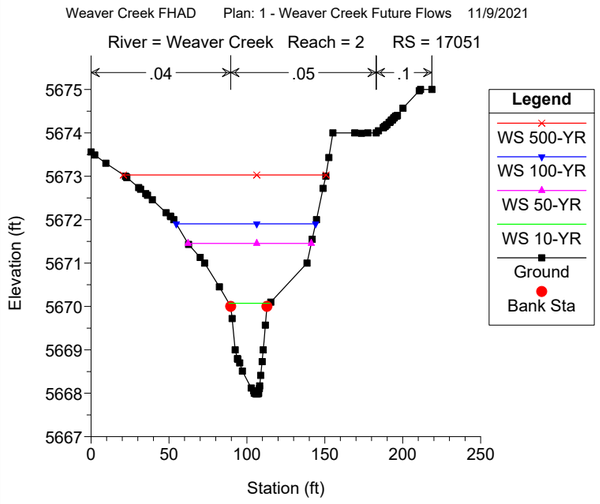

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18325 next d/s xs Crossing 28
.04 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

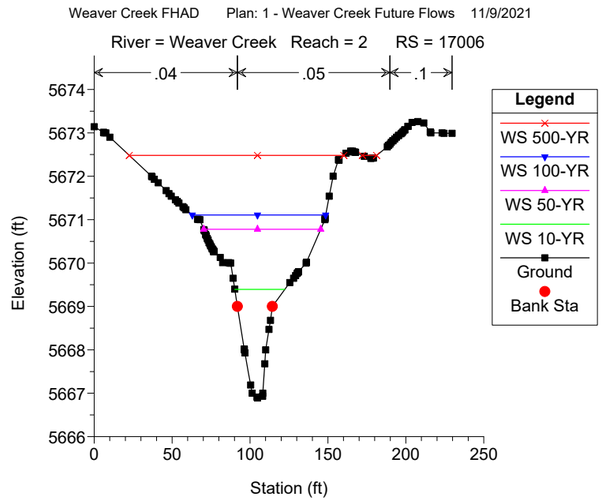

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 18142
.04
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

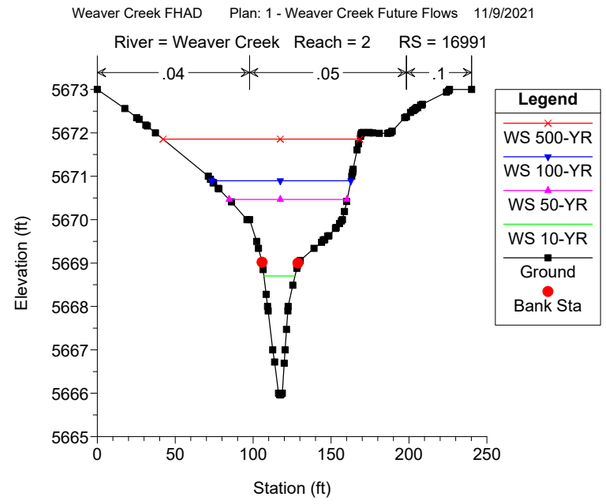

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 17935
.04
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

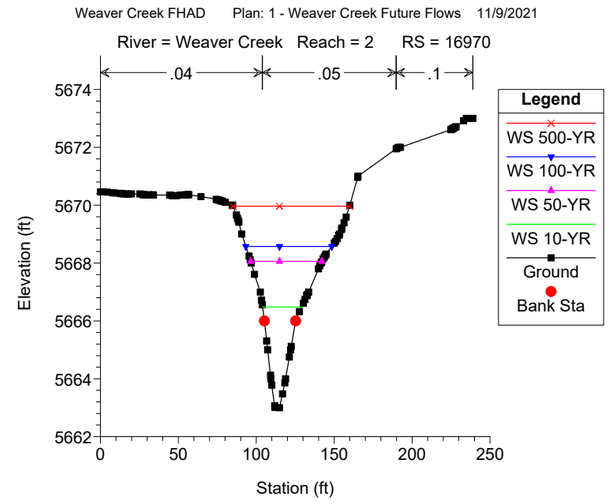

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 17596
.04
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

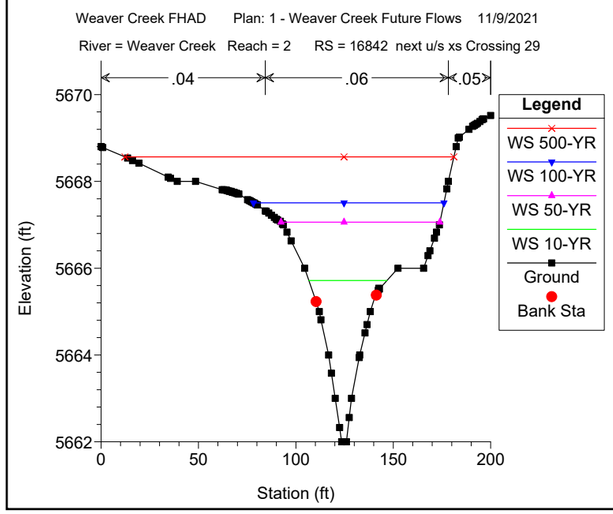

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 17207
.04
.05
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

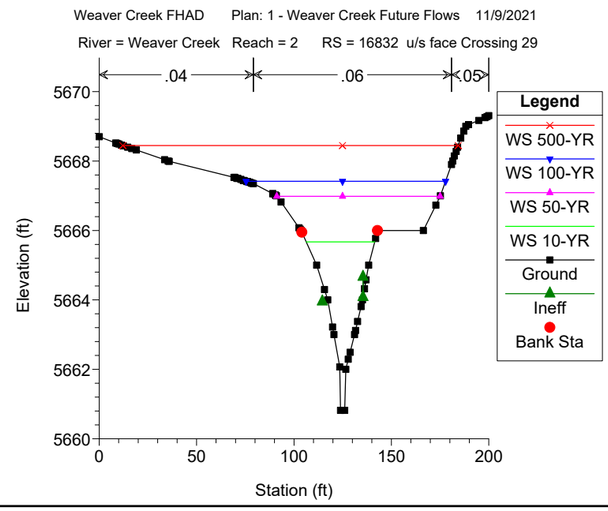

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 17051
.04
.05
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

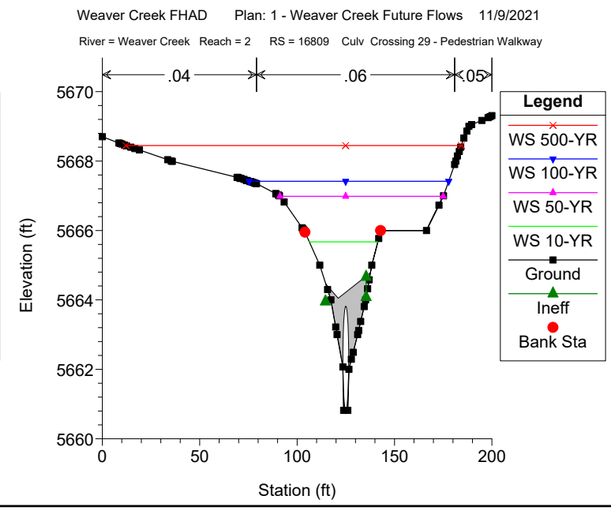

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 17006
.04
.05
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

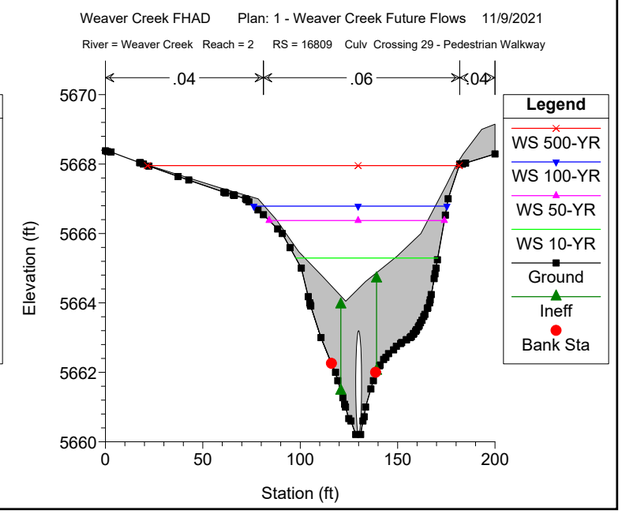

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 16991
.04
.05
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 16970
.04
.05
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 16842 next u/s xs Crossing 29
.04
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

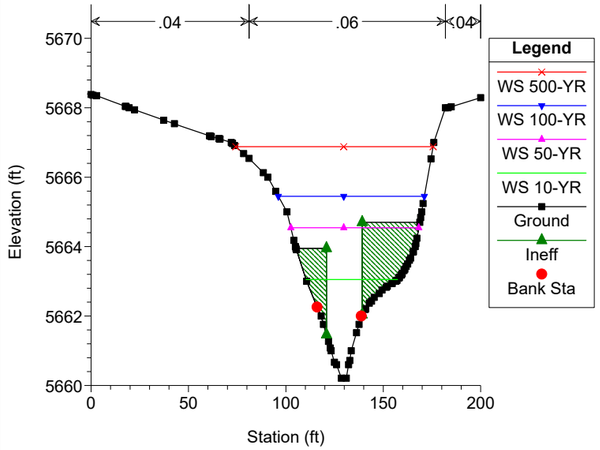

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 16832 u/s face Crossing 29
.04
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 16809 Culv Crossing 29 - Pedestrian Walkway
.04
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 16809 Culv Crossing 29 - Pedestrian Walkway
.04
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

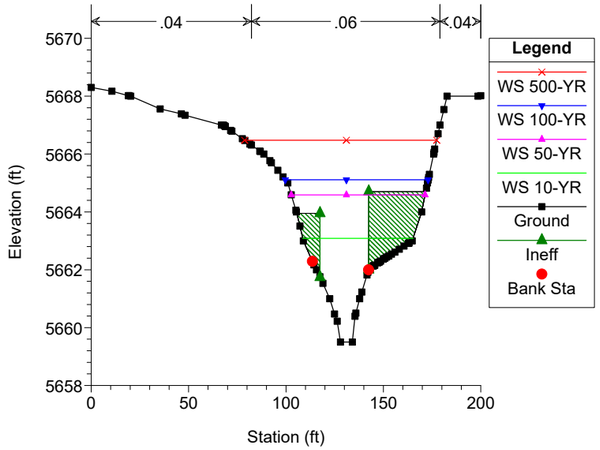
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16786 d/s face Crossing 29



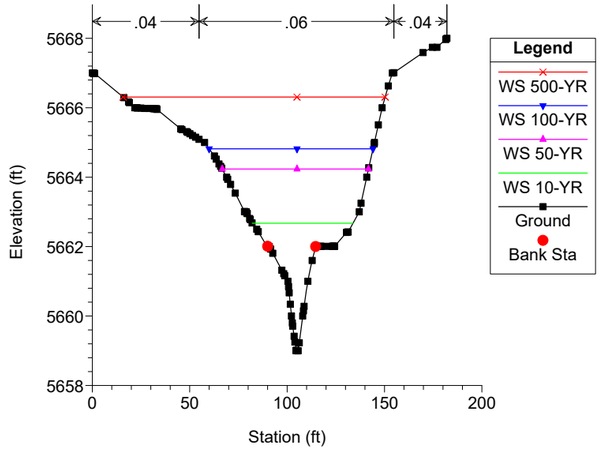
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16776 next d/s xs Crossing 29



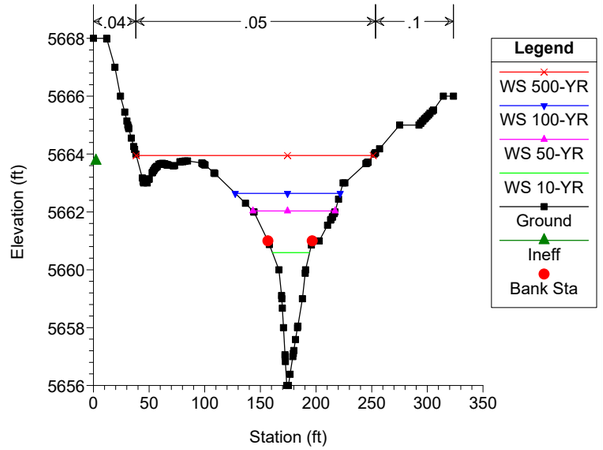
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16720



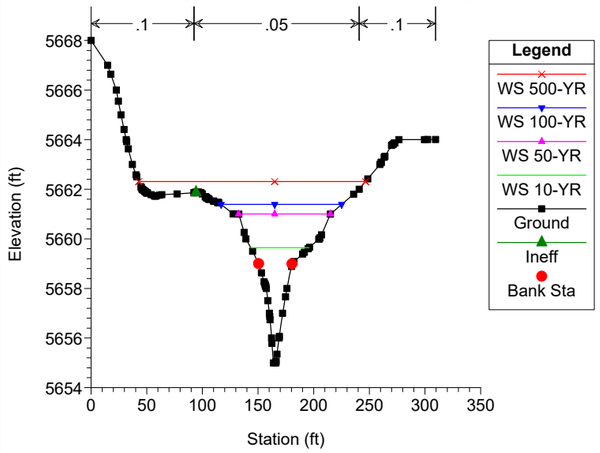
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16485



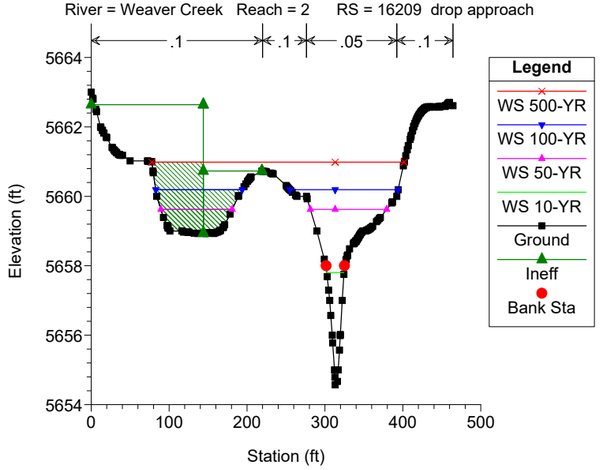
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16323



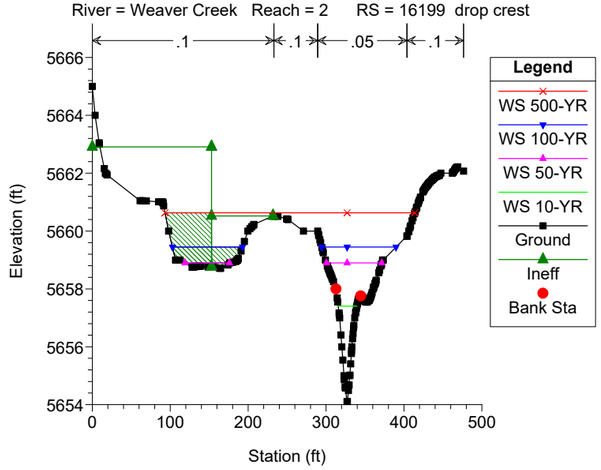
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16209 drop approach



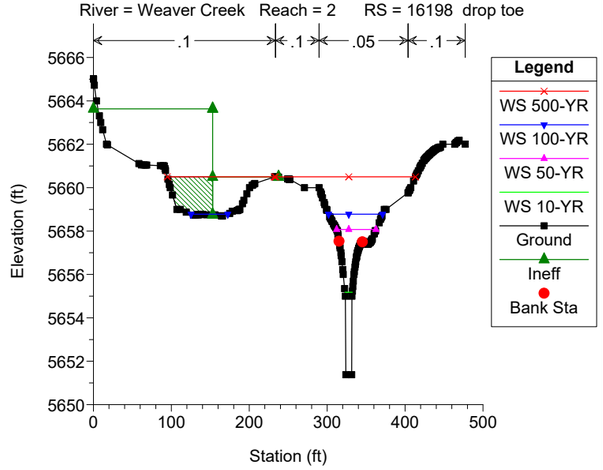
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16199 drop crest



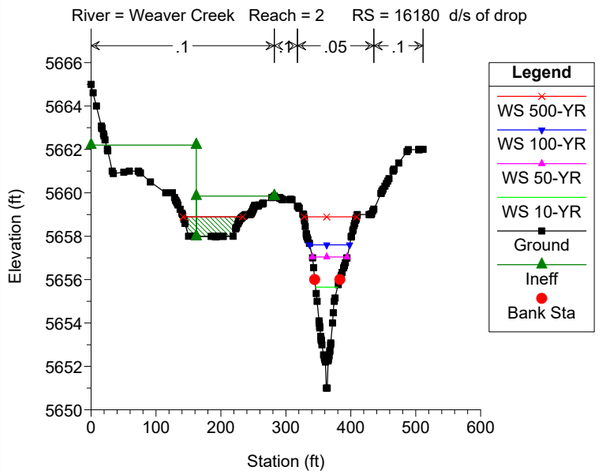
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16198 drop toe



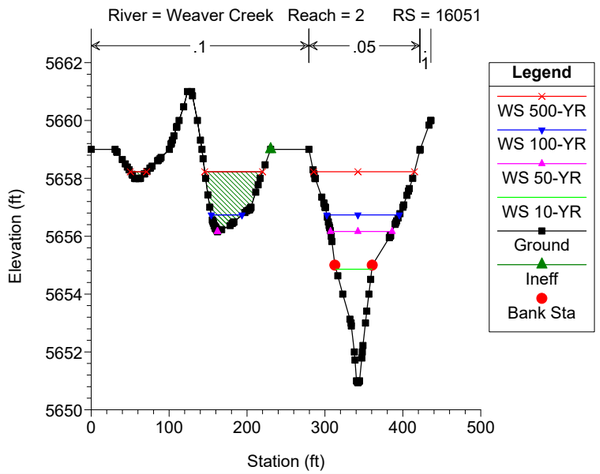
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16180 d/s of drop



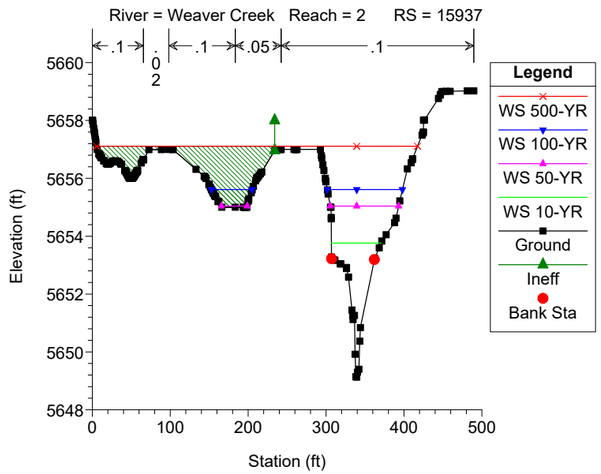
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 16051



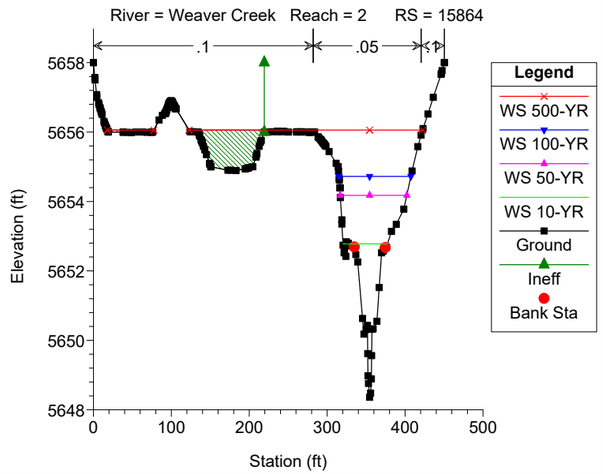
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15937



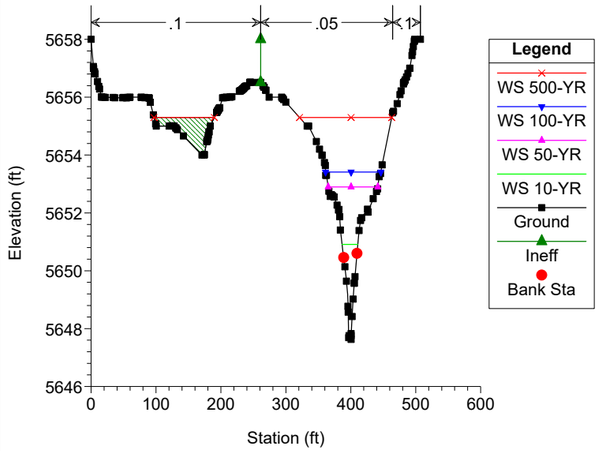
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15864



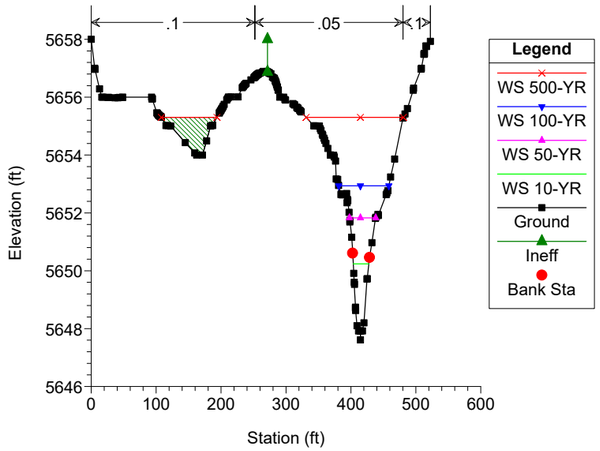
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15782 Channel based on as-constructed topography surveyed by Olsson



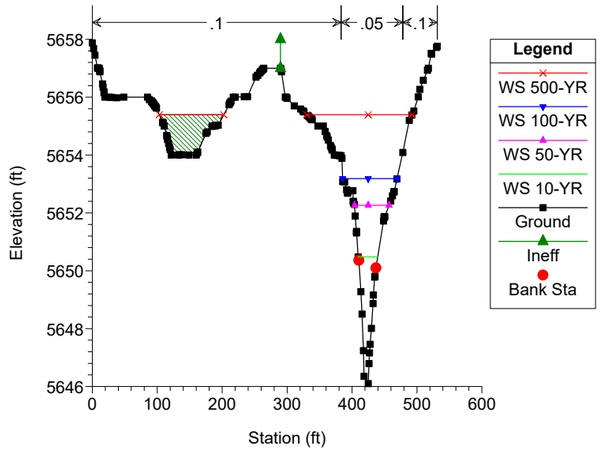
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15773 Channel based on as-constructed topography surveyed by Olsson. C



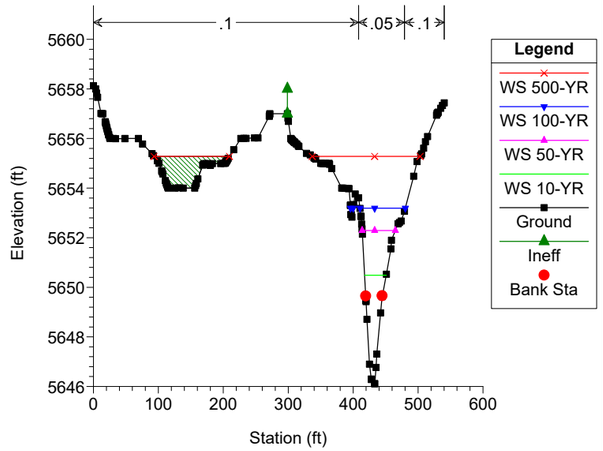
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15768 Channel based on as-constructed topography surveyed by Olsson. C



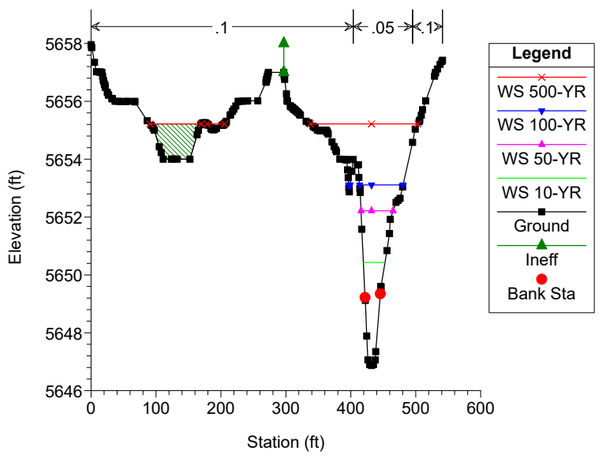
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15760 Channel based on as-constructed topography surveyed by Olsson. C



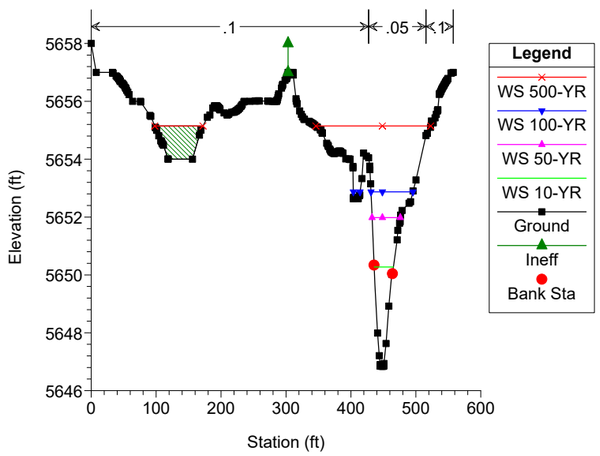
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15758 Channel based on as-constructed topography surveyed by Olsson. C



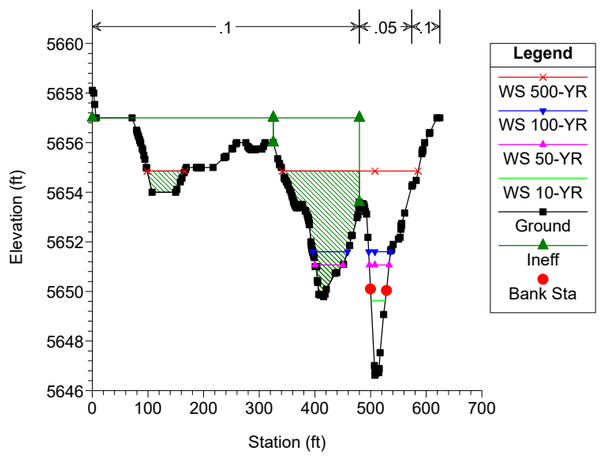
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15748 Channel based on as-constructed topography surveyed by Olsson.



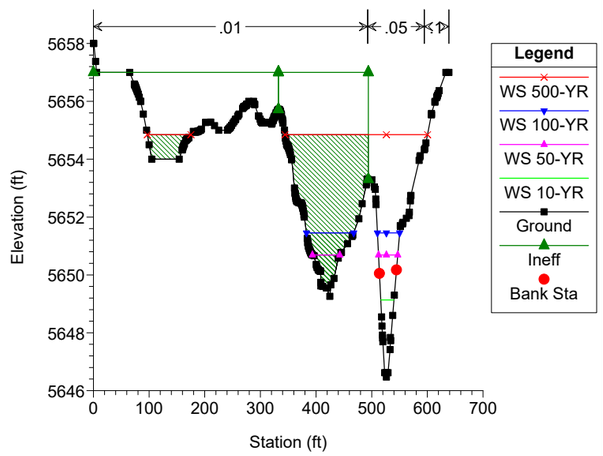
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15719 Channel based on as-constructed topography surveyed by Olsson.



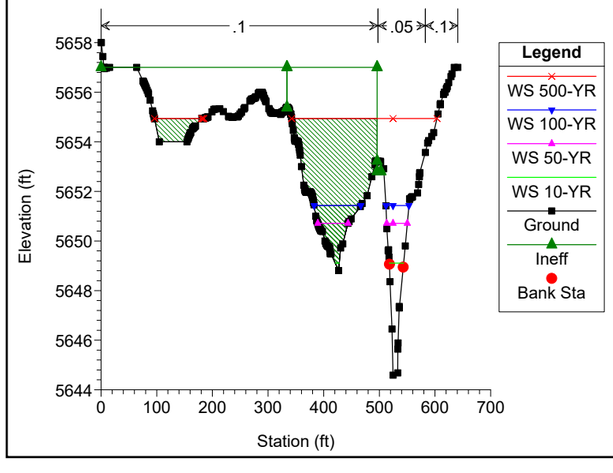
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15710 Channel based on as-constructed topography surveyed by Olsson. C



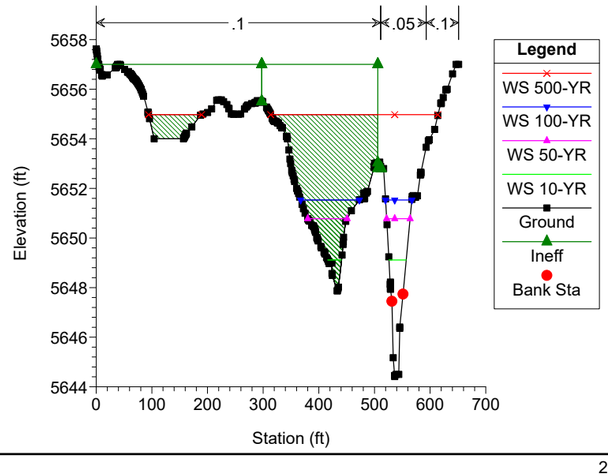
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15706 Channel based on as-constructed topography surveyed by Olsson. C



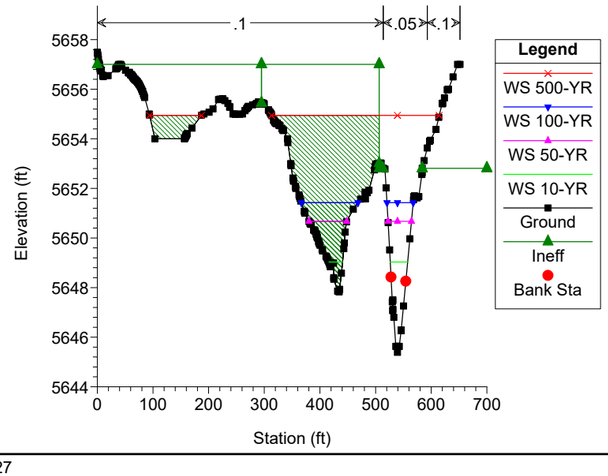
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15697 Channel based on as-constructed topography surveyed by Olsson. C



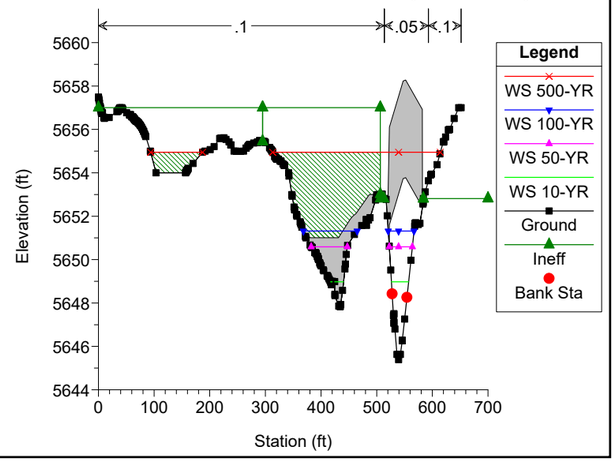
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15696 Channel based on as-constructed topography surveyed by Olsson. C



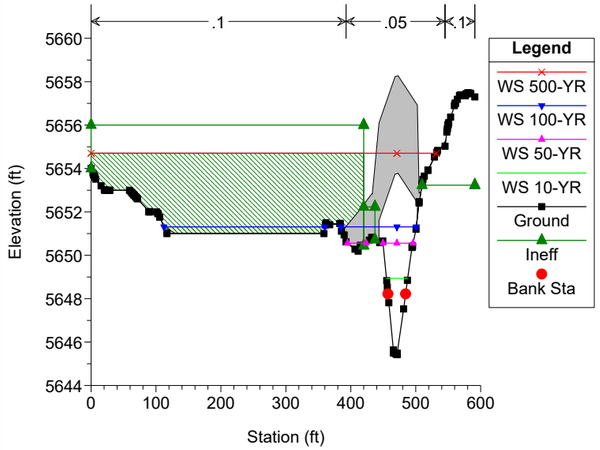
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15686 BR Crossing 30 - Pedestrian Bridge



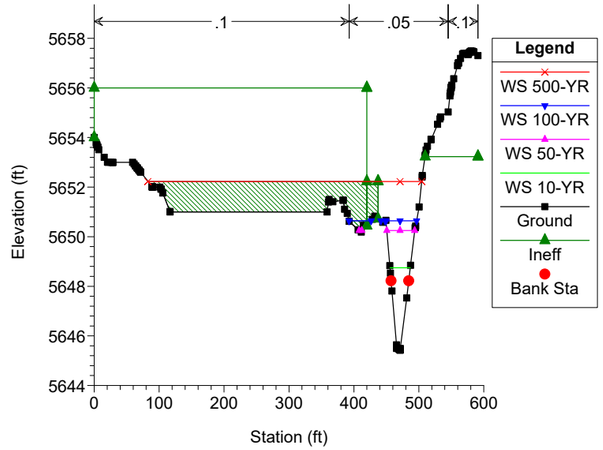
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15686 BR Crossing 30 - Pedestrian Bridge



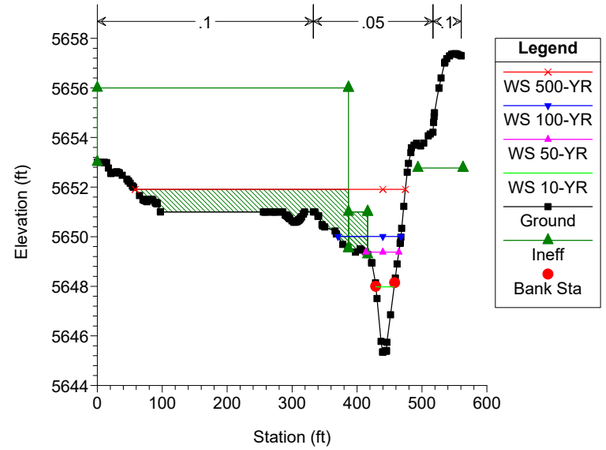
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15669 Channel based on as-constructed topography surveyed by Olsson.



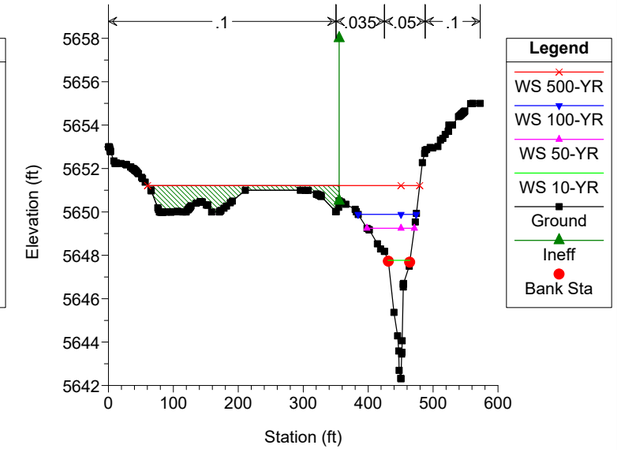
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15639 Channel based on as-constructed topography surveyed by Olsson. n



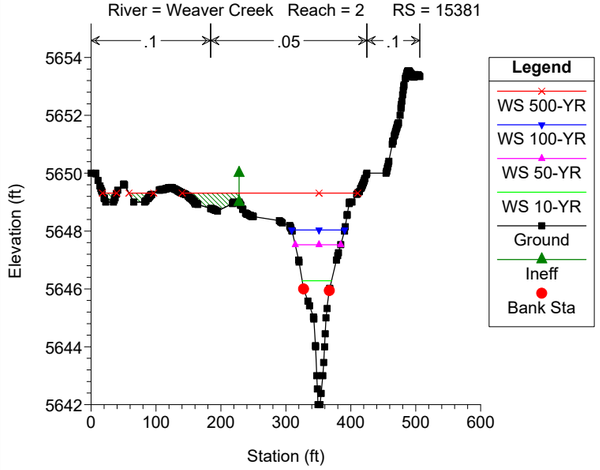
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15600 Channel based on as-constructed topography surveyed by Olsson.



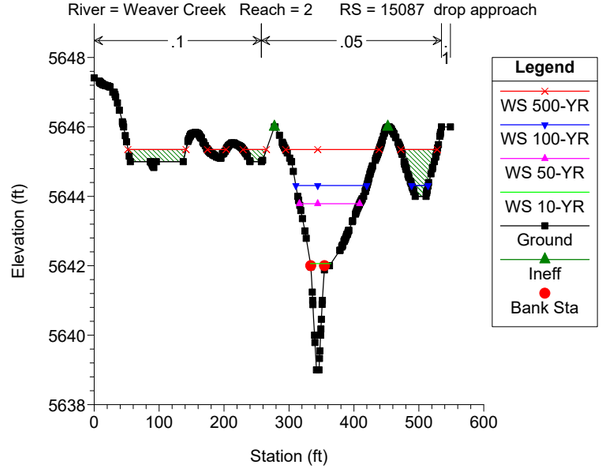
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15381



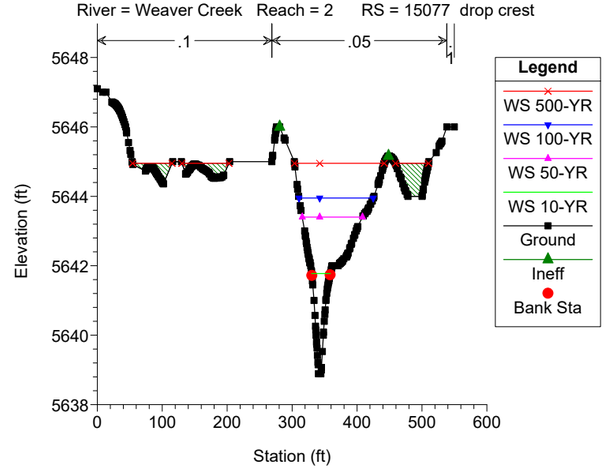
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15087 drop approach



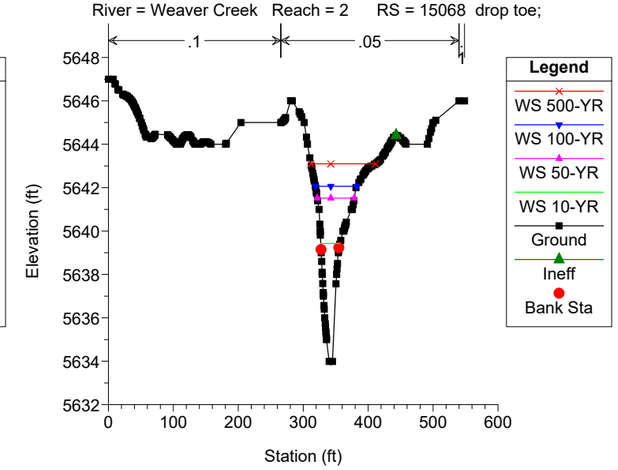
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15077 drop crest



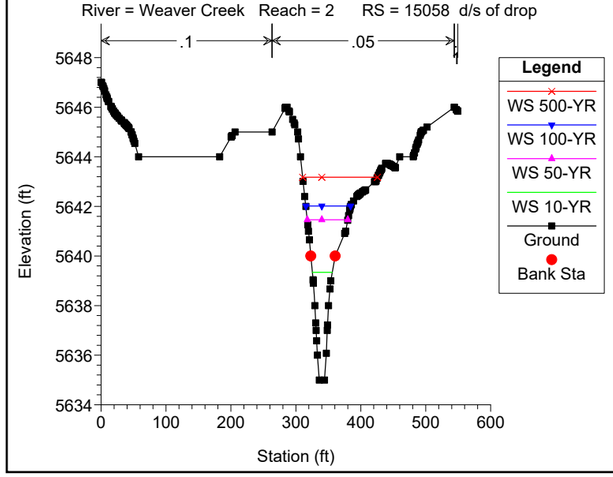
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15068 drop toe;



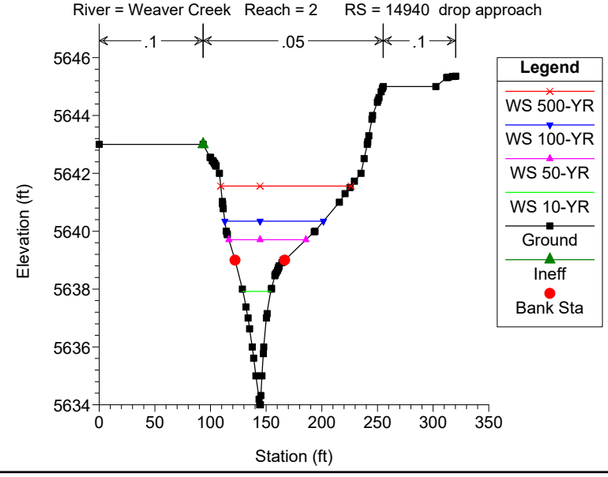
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 15058 d/s of drop



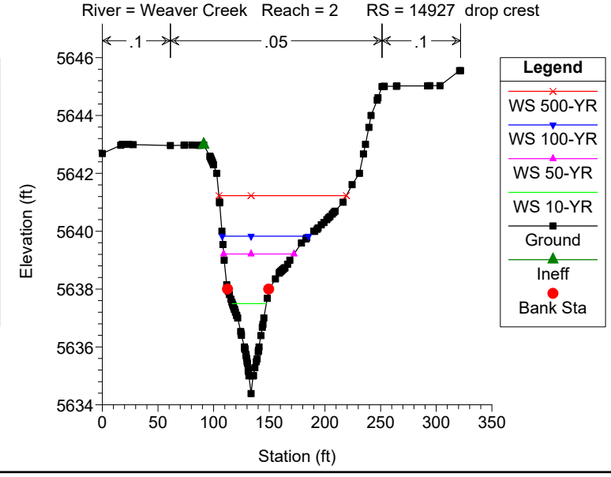
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14940 drop approach



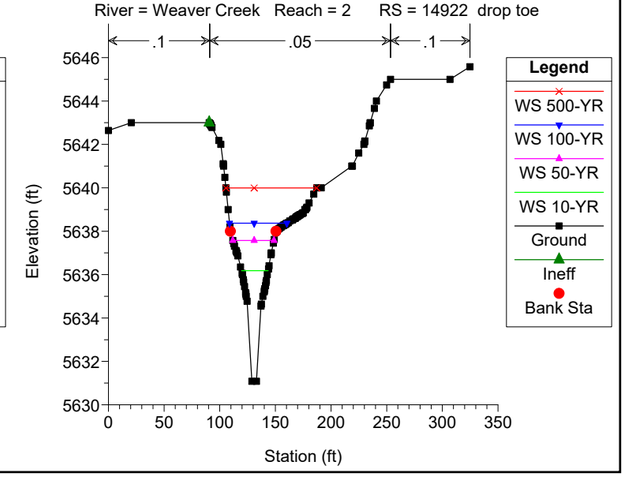
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14927 drop crest



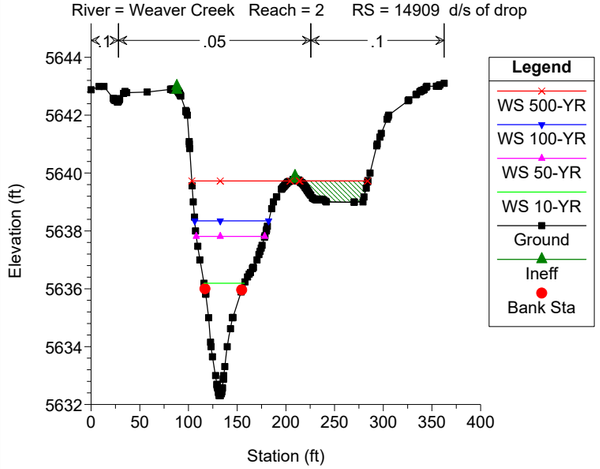
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14922 drop toe



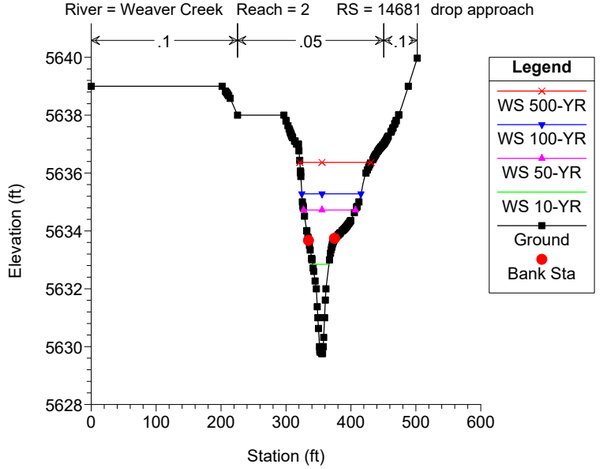
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14909 d/s of drop



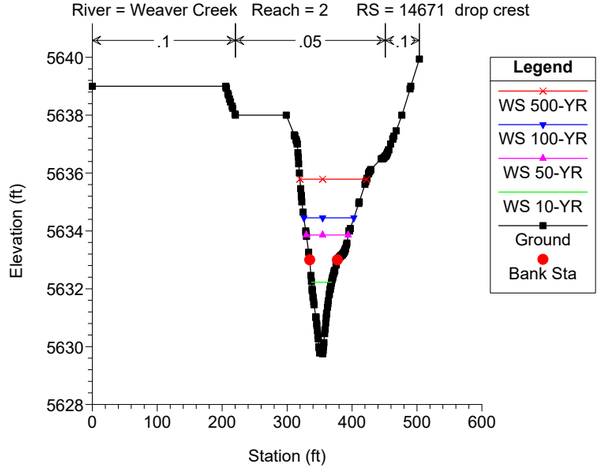
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14681 drop approach



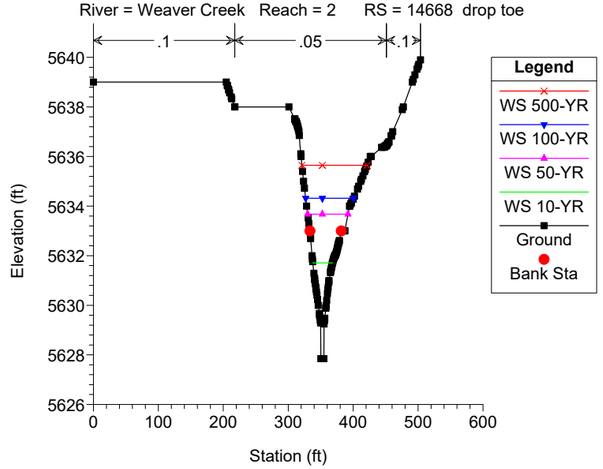
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14671 drop crest



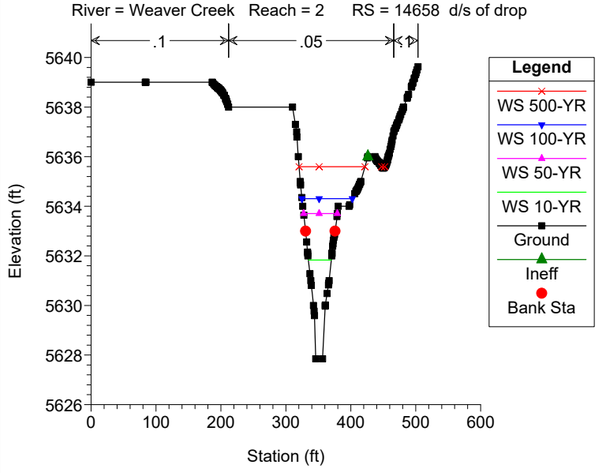
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14668 drop toe



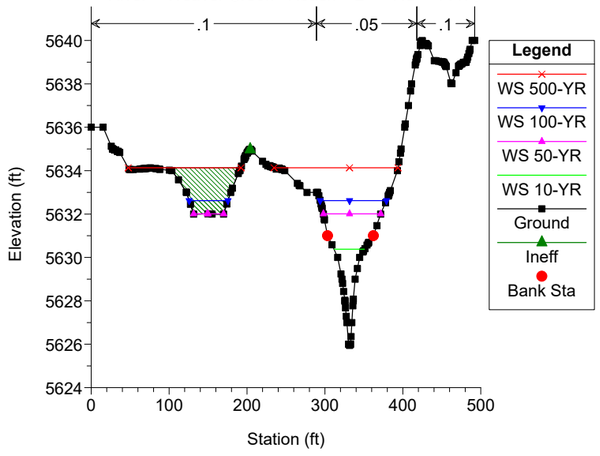
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14658 d/s of drop



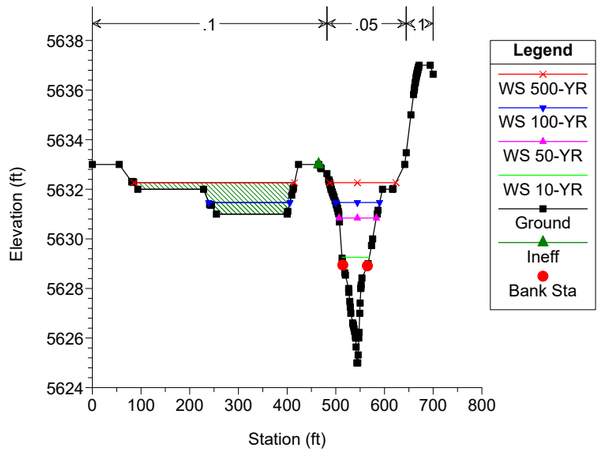
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14475



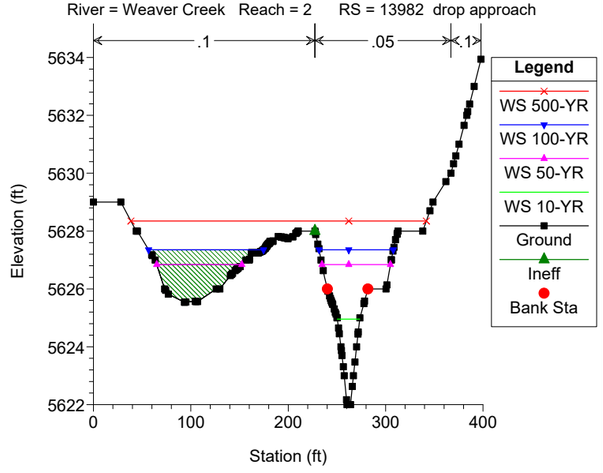
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 14317



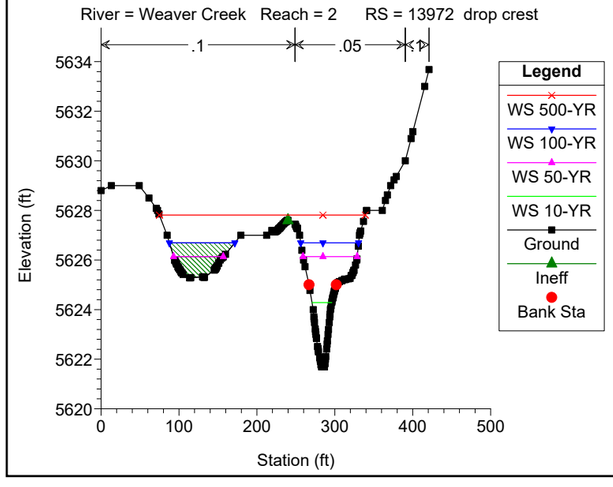
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 13982 drop approach



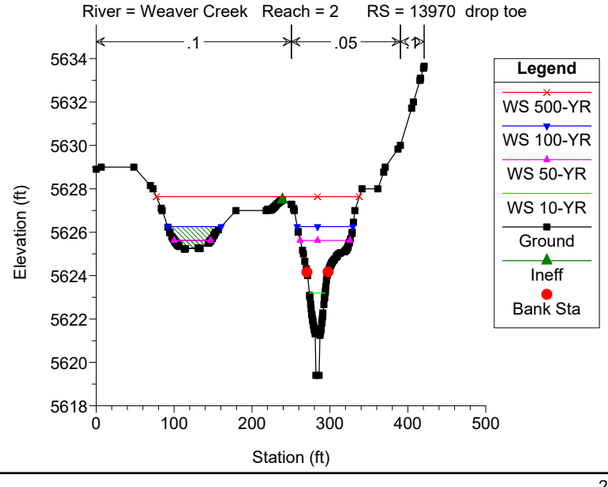
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 13972 drop crest



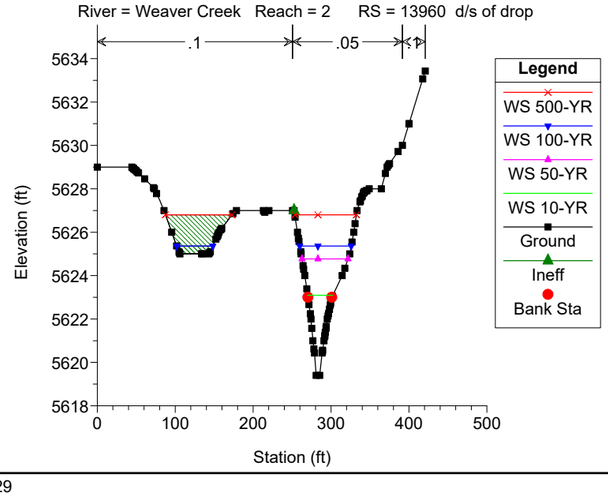
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 13970 drop toe



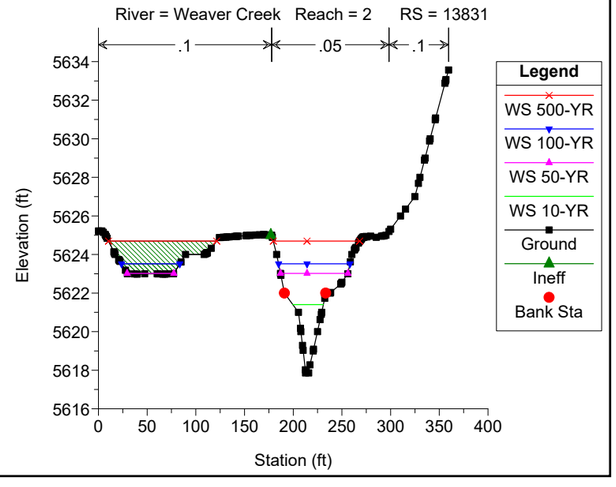
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

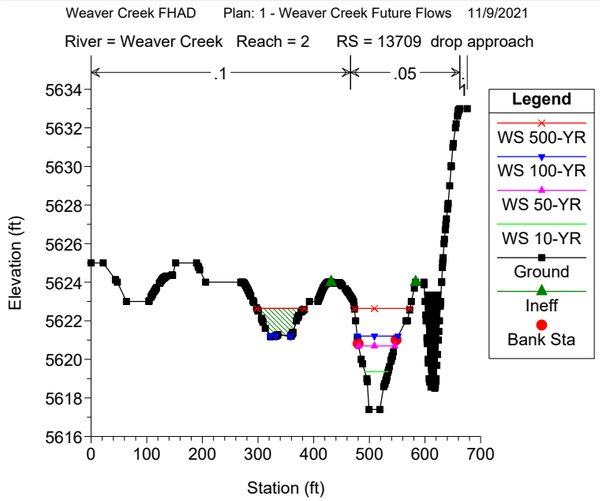
River = Weaver Creek Reach = 2 RS = 13960 d/s of drop

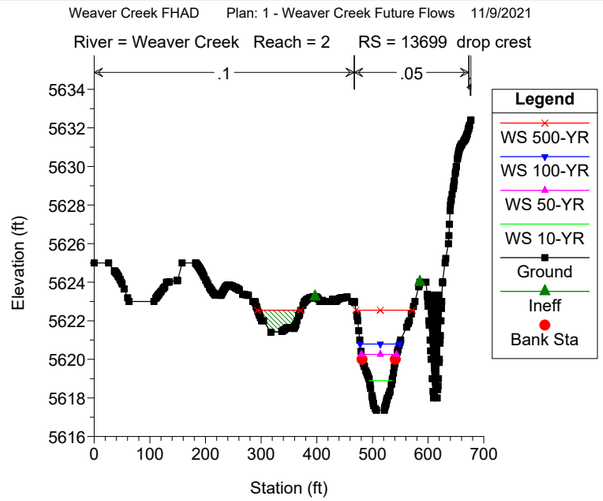


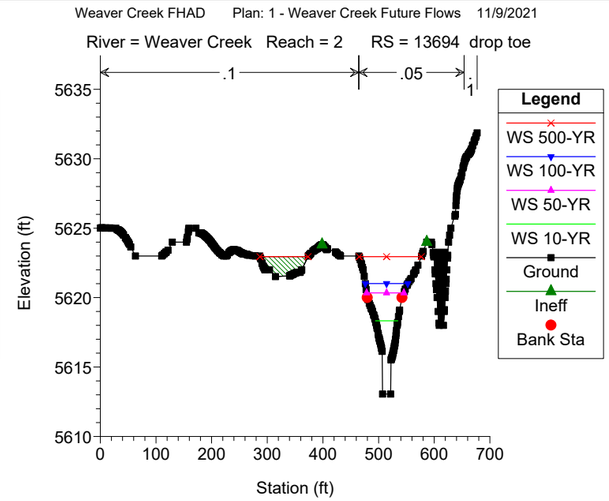
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

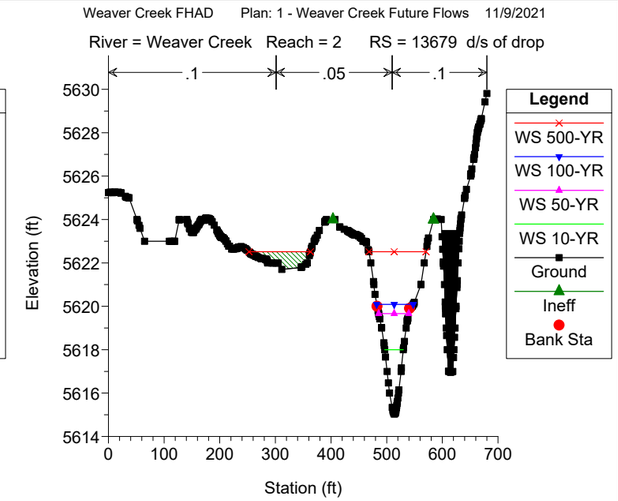
River = Weaver Creek Reach = 2 RS = 13831

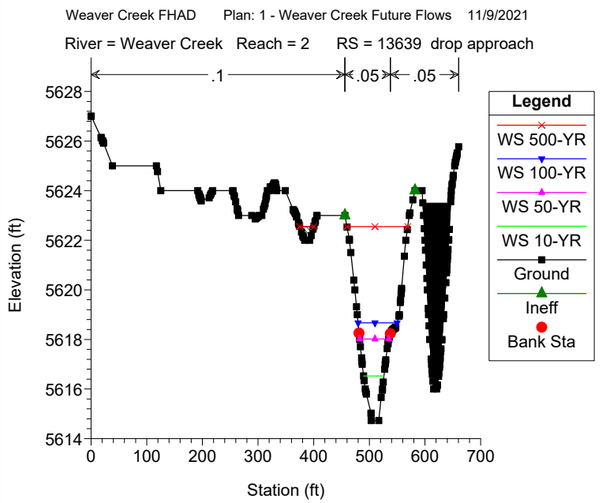


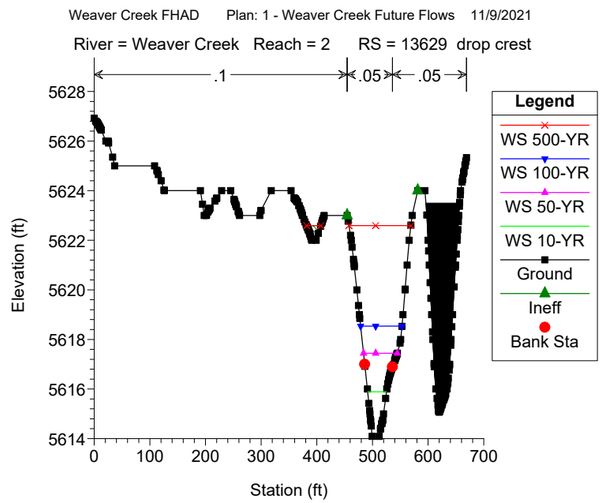

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13709 drop approach
.1
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

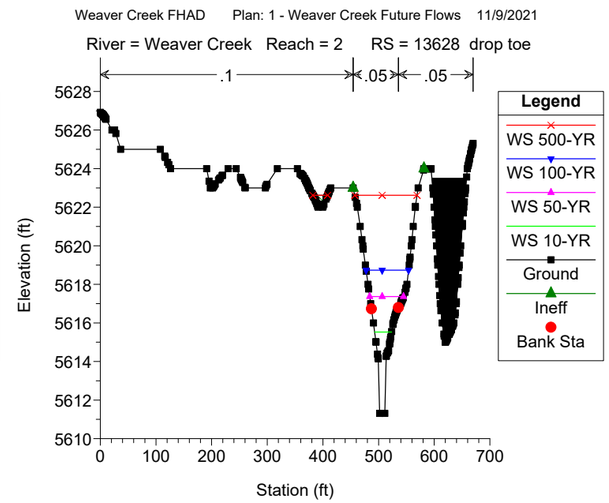

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13699 drop crest
.1
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

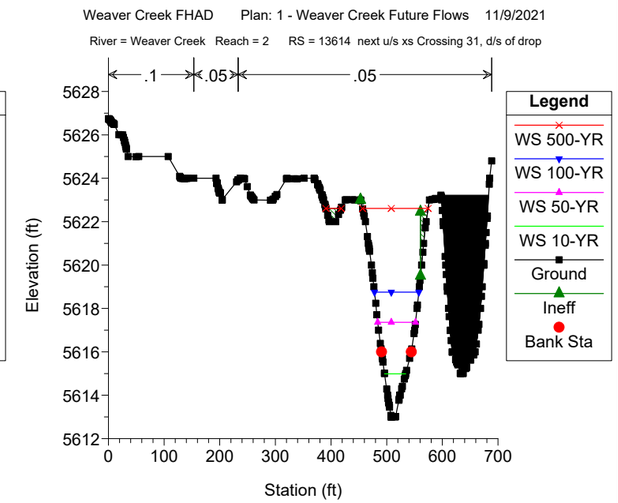

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13694 drop toe
.1
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

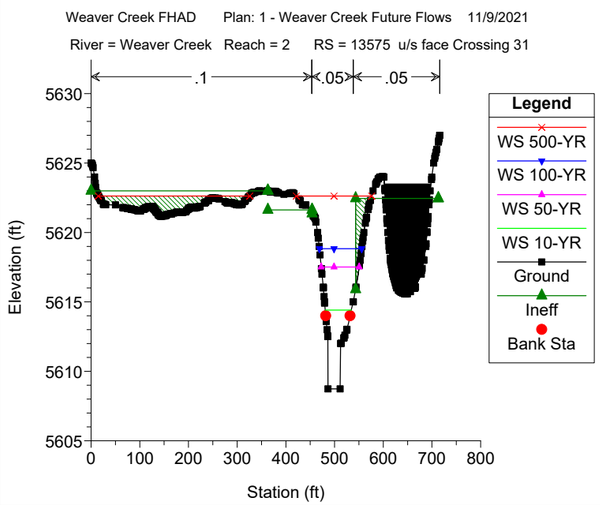

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13679 d/s of drop
.1
.05
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

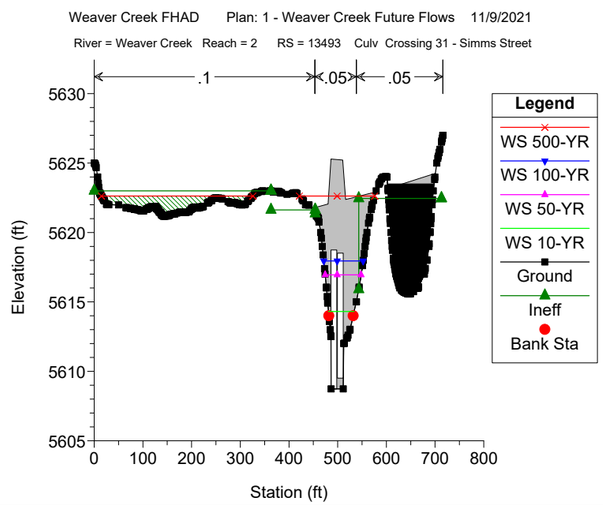

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13639 drop approach
.1
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

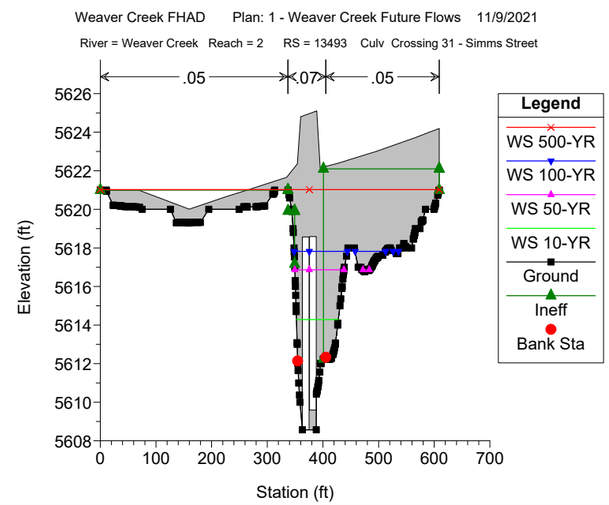

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13629 drop crest
.1
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

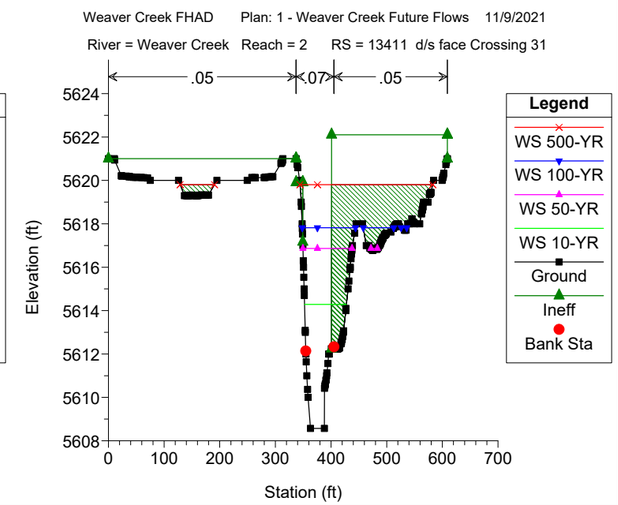

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13628 drop toe
.1
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13614 next u/s xs Crossing 31, d/s of drop
.1
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13575 u/s face Crossing 31
.1
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

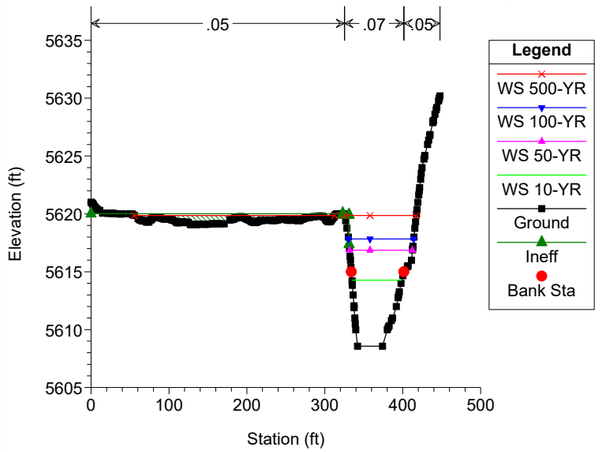

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13493 Culv Crossing 31 - Simms Street
.1
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13493 Culv Crossing 31 - Simms Street
.05
.07
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 13411 d/s face Crossing 31
.05
.07
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

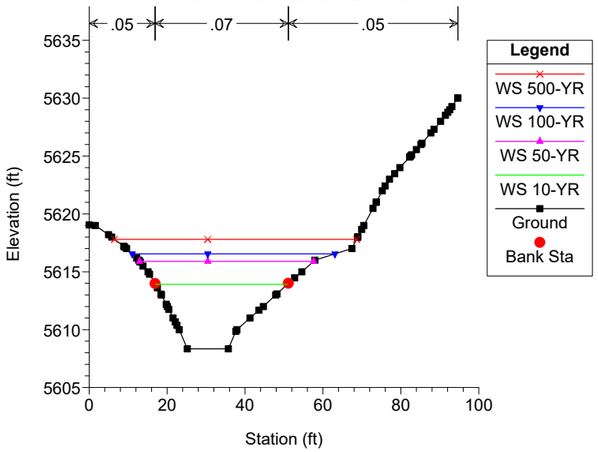
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 13384 next d/s xs Crossing 31



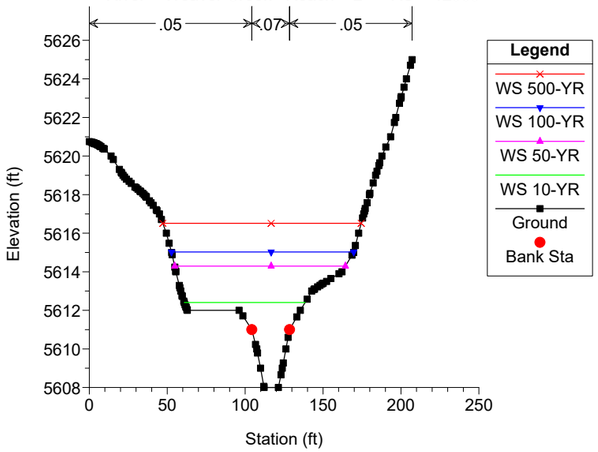
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 13214



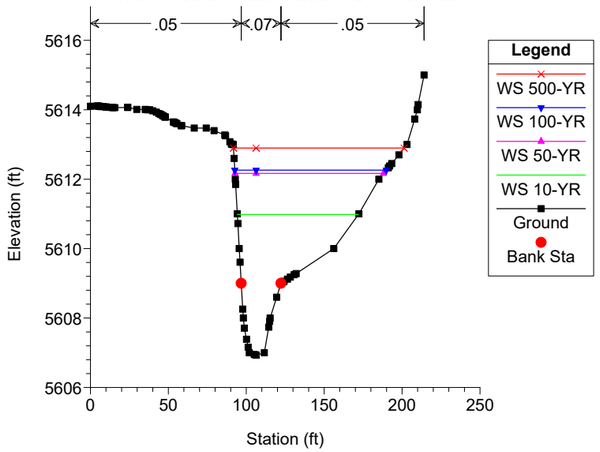
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 12969



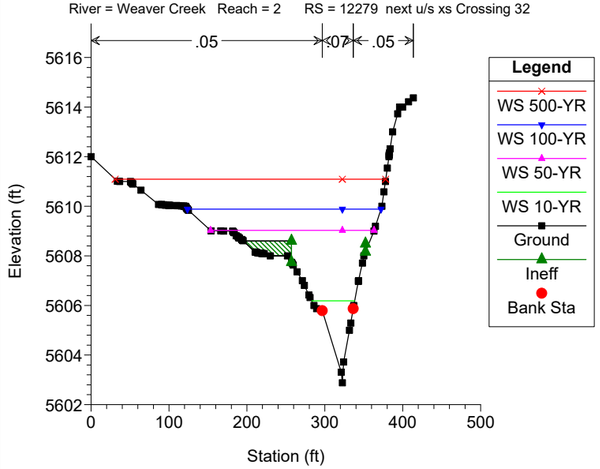
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 12677



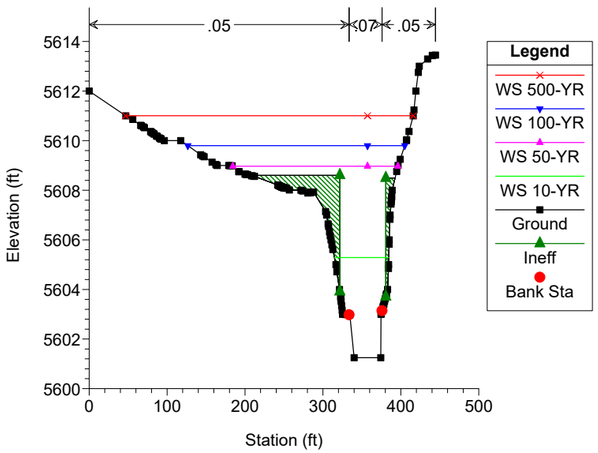
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 12279 next u/s xs Crossing 32



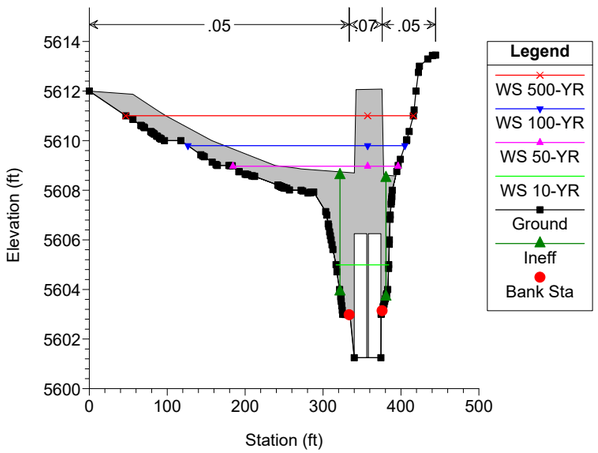
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 12237 u/s face Crossing 32. Invert adjusted based on survey.



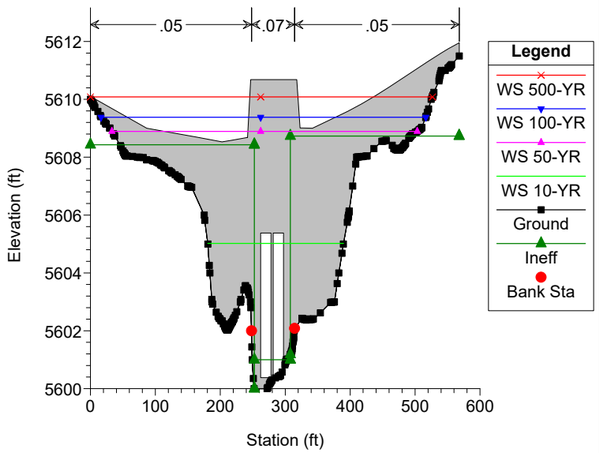
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 12144 Culv Crossing 32 - West Quincy Avenue



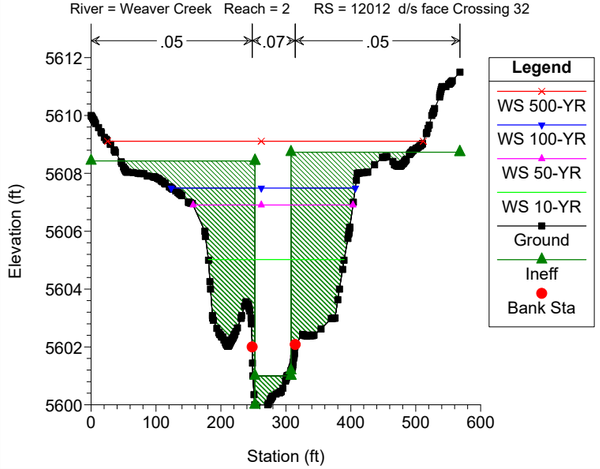
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 12144 Culv Crossing 32 - West Quincy Avenue



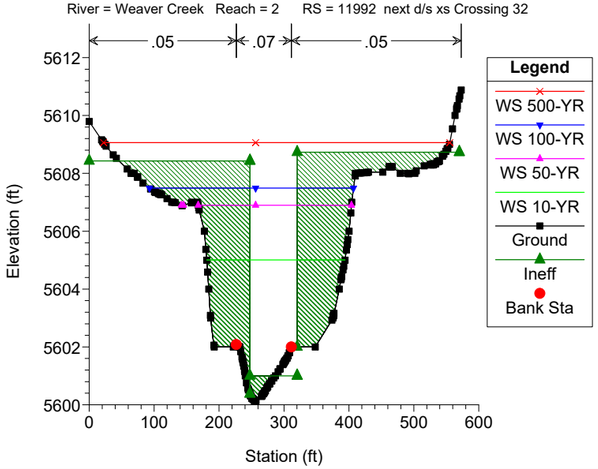
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 12012 d/s face Crossing 32



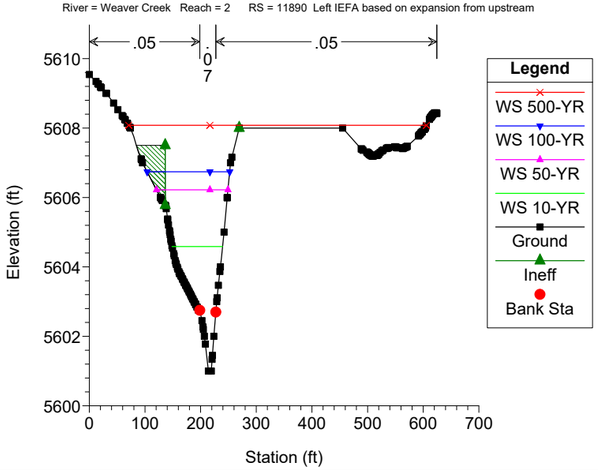
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 11992 next d/s xs Crossing 32



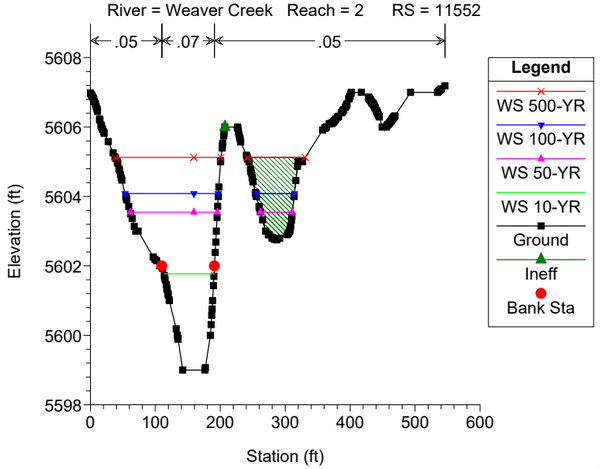
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 11890 Left IEFA based on expansion from upstream



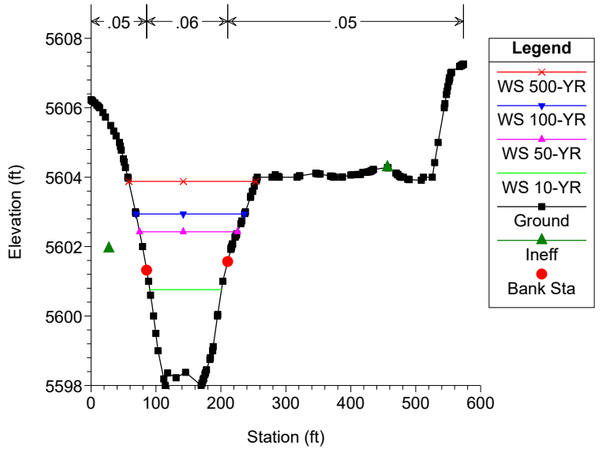
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 11552



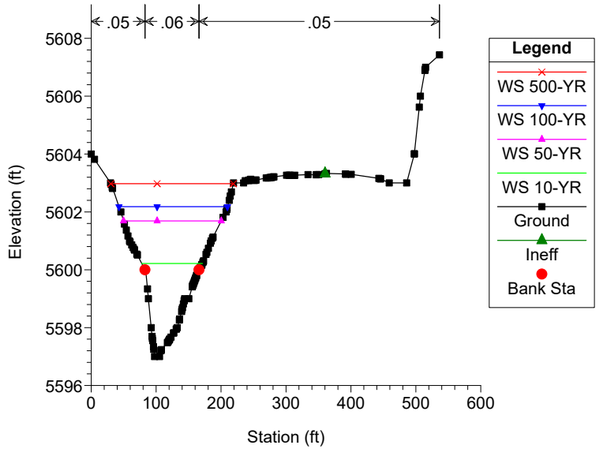
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 11327 Crossing 33 - Adjusted based on survey



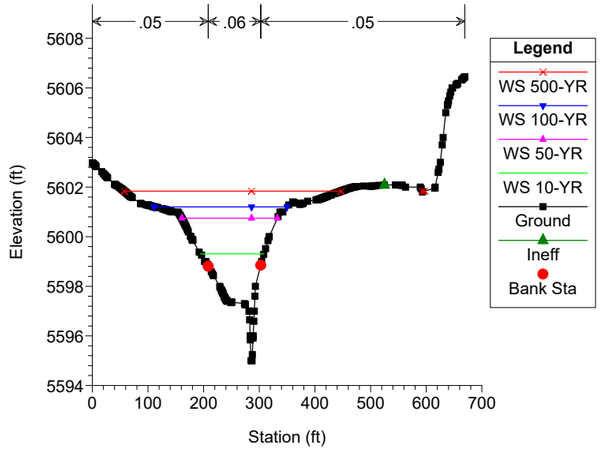
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 11217



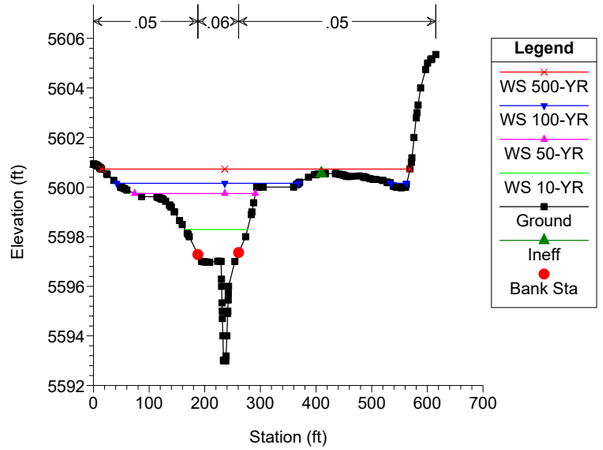
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 11082



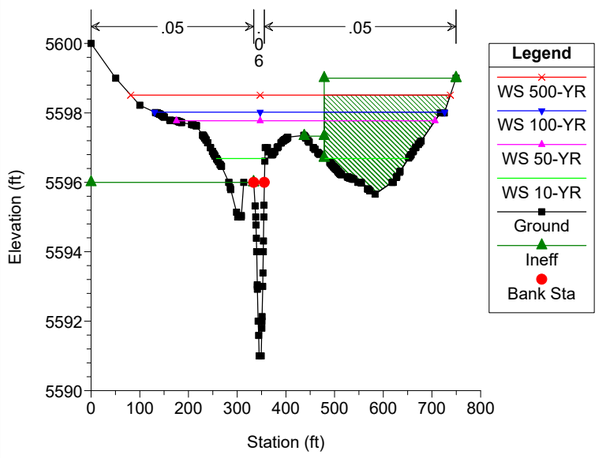
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 10955



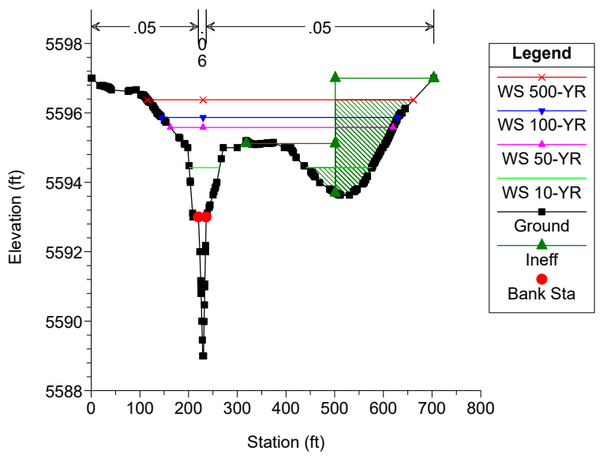
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 10766 Ineffective area based on expansion from upstream



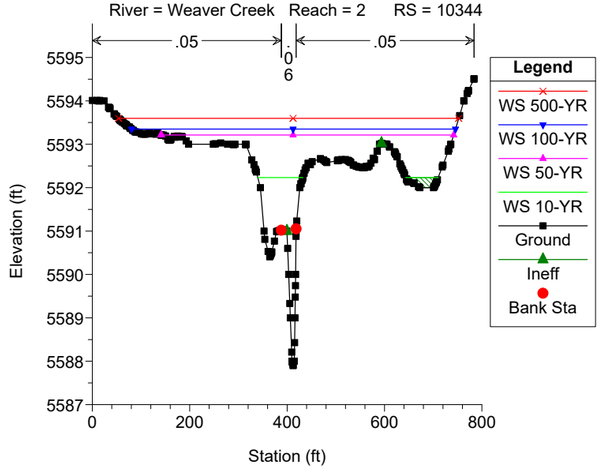
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 10551 Ineffective area based on expansion from upstream



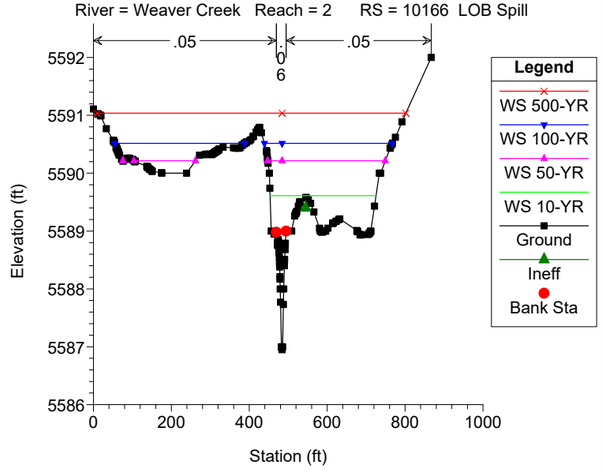
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 10344



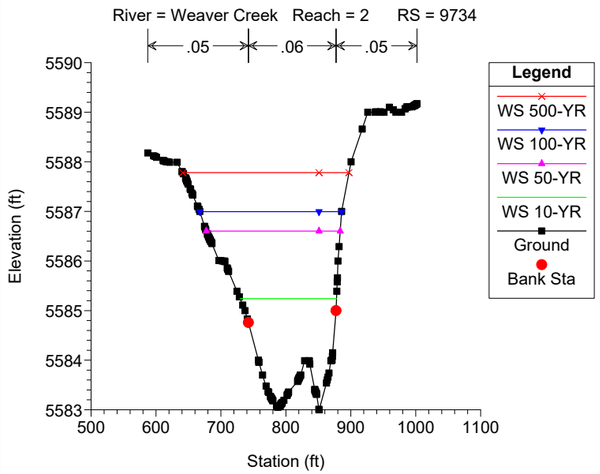
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 10166 LOB Spill



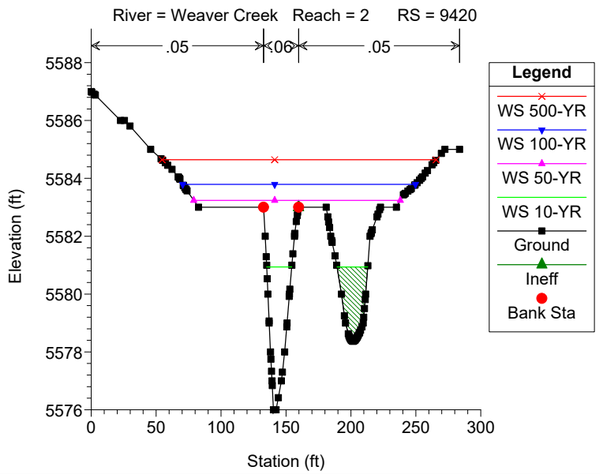
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 9734



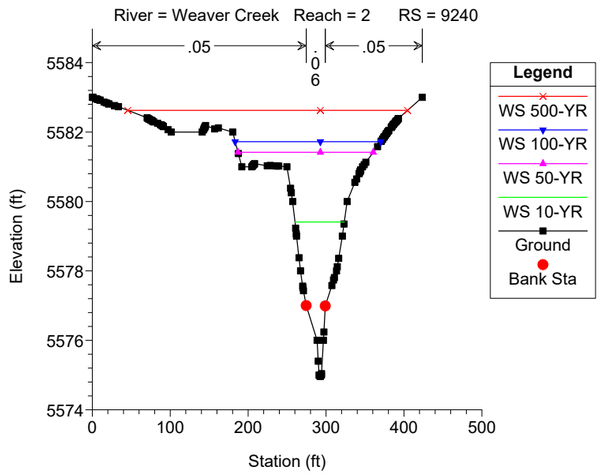
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = 2 RS = 9420



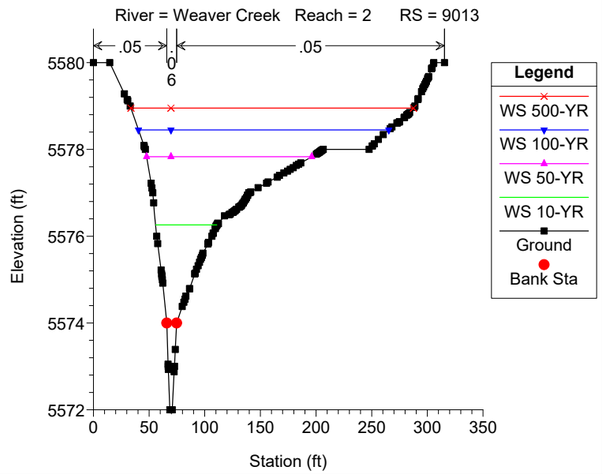
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

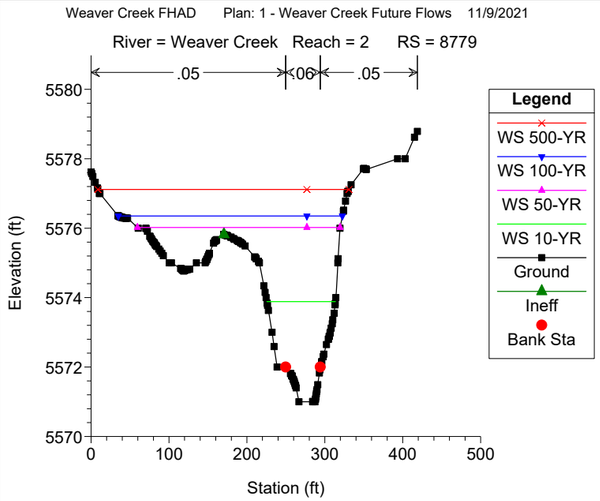
River = Weaver Creek Reach = 2 RS = 9240

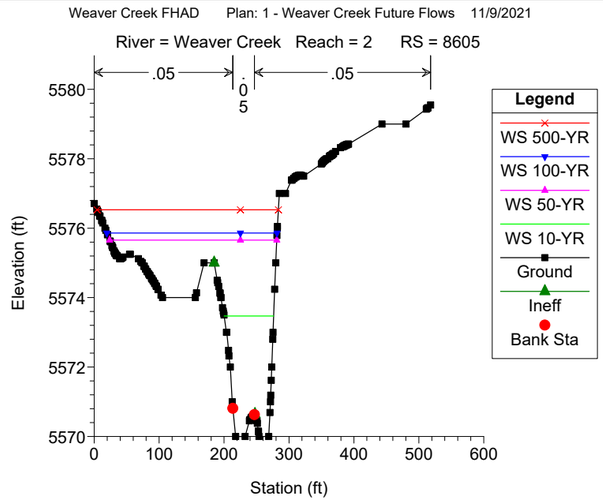


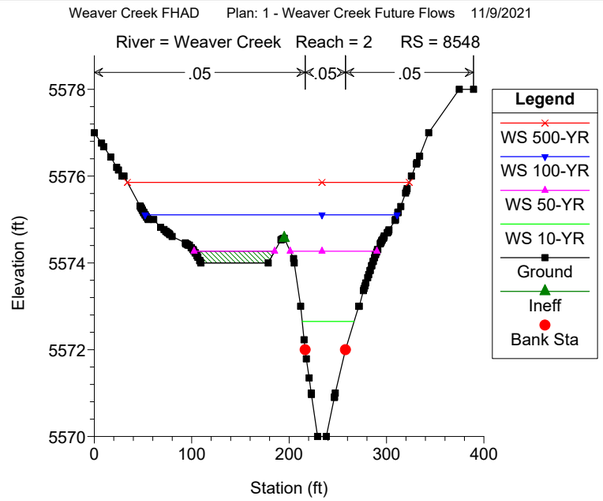
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

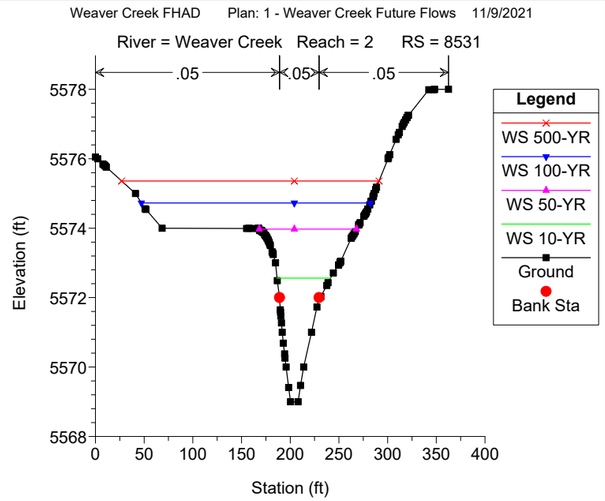
River = Weaver Creek Reach = 2 RS = 9013

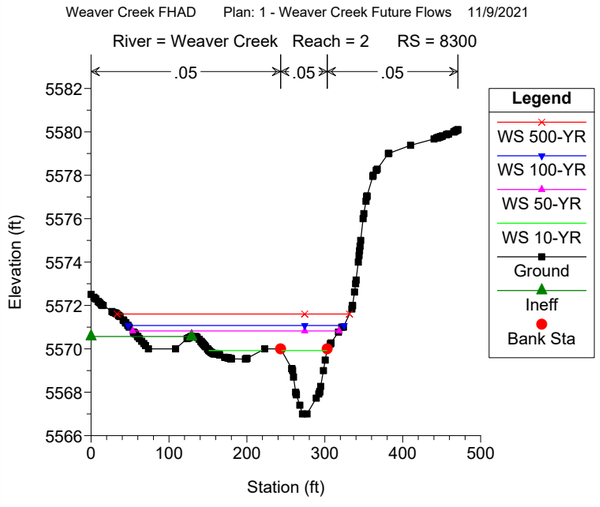


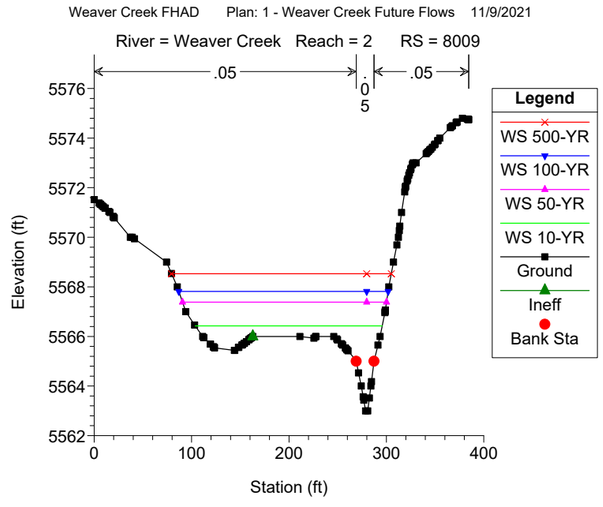

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 8779
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

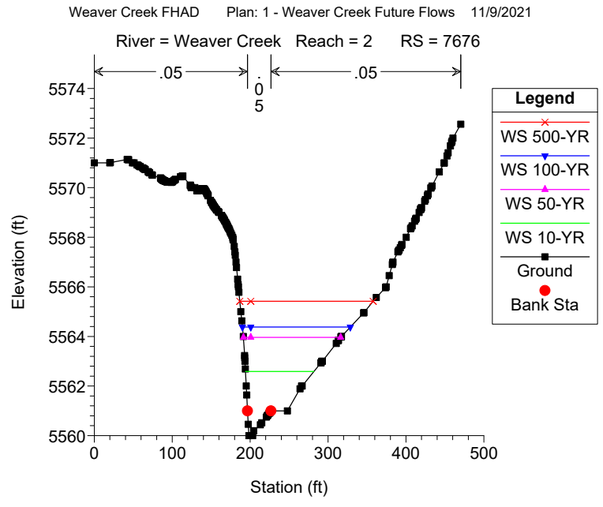

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 8605
.05
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

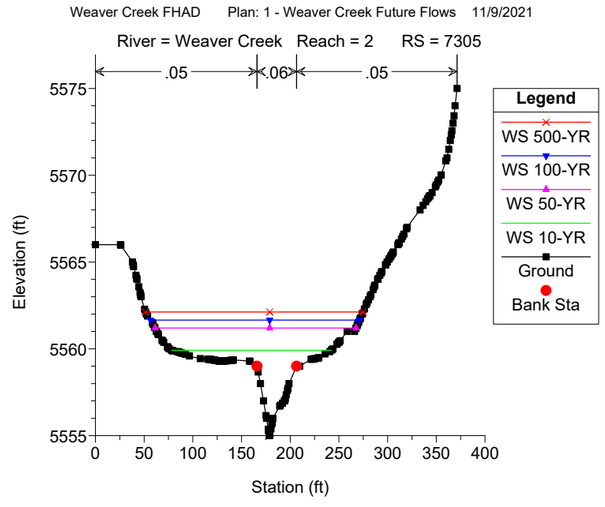

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 8548
.05
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

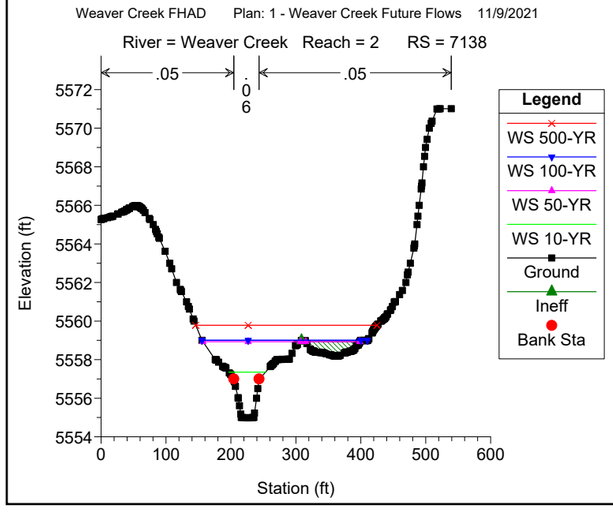

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 8531
.05
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

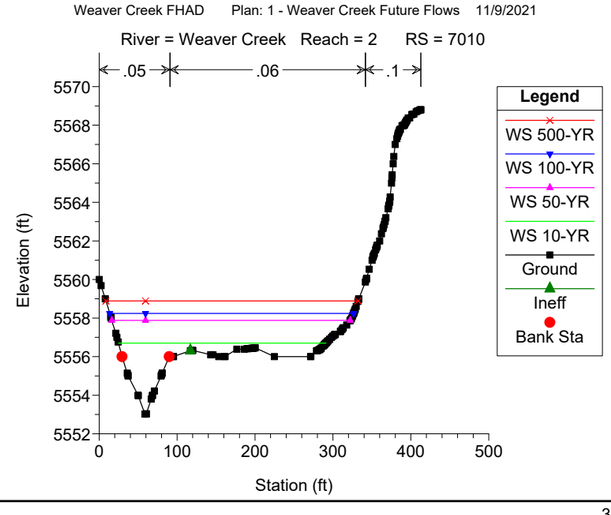

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 8300
.05
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

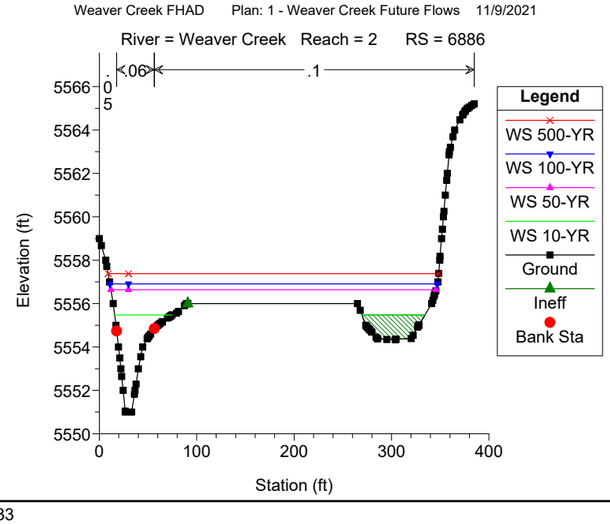

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 8009
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

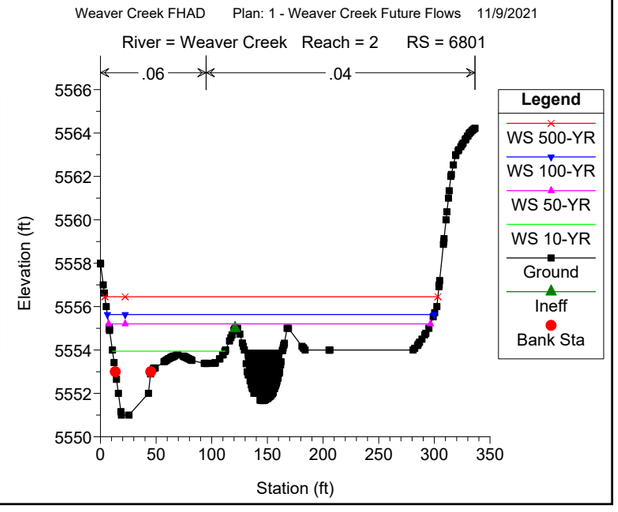

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 7676
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

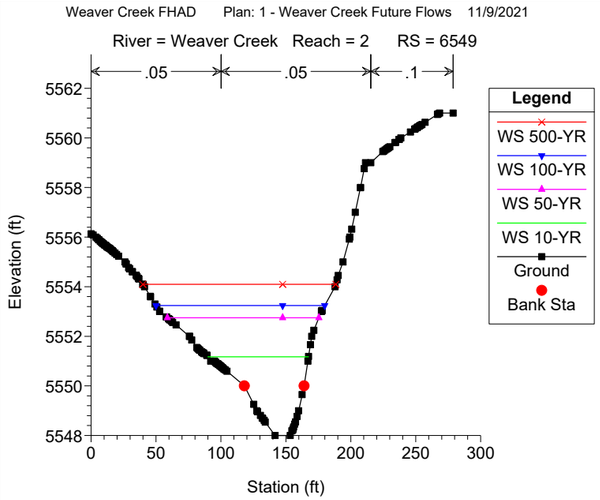

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 7305
.05
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

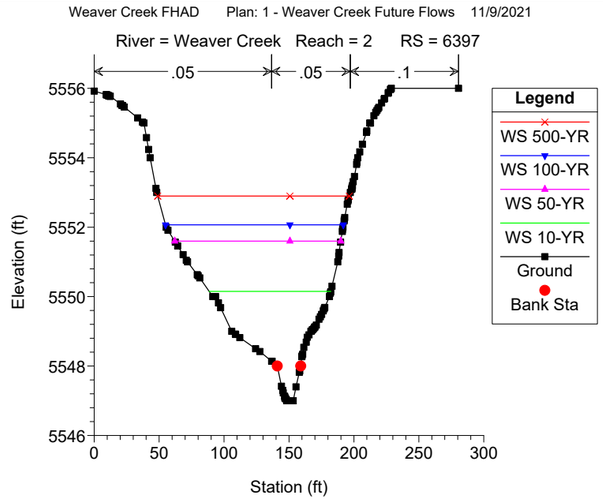

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 7138
.05
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

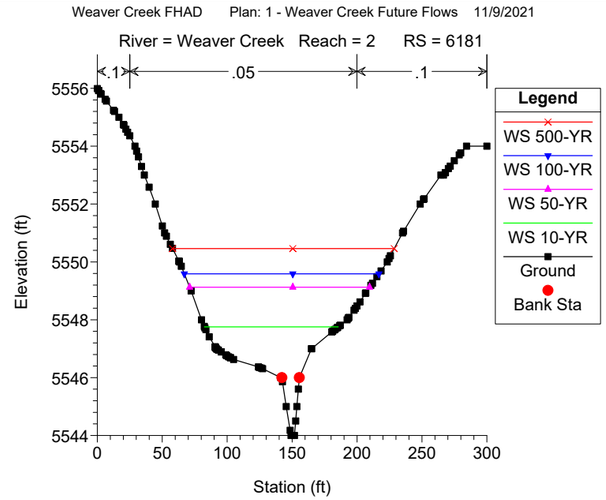

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 7010
.05
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

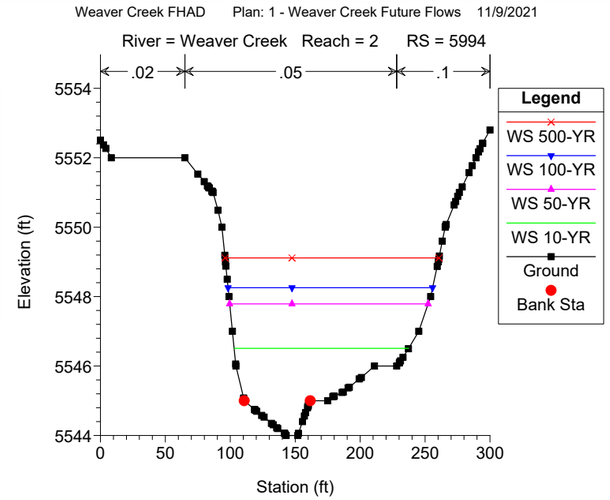

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 6886
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

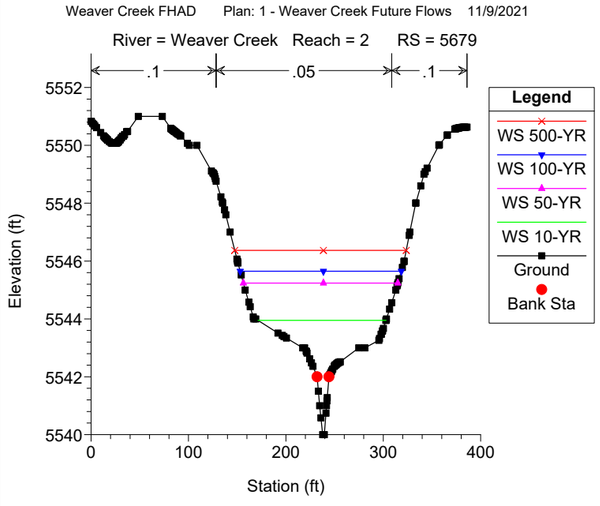

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 6801
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

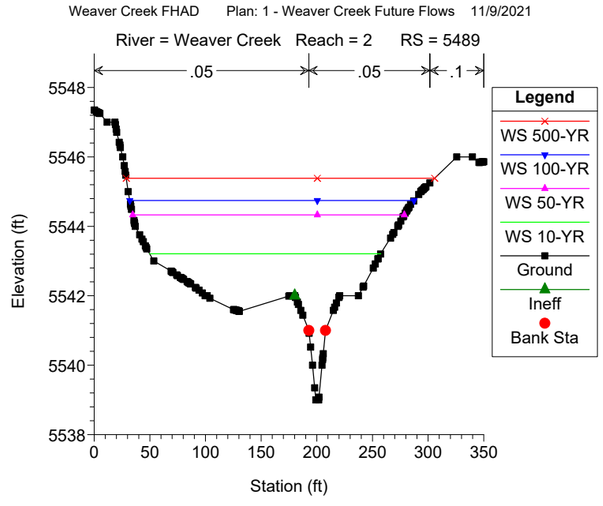

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 6549
.05 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

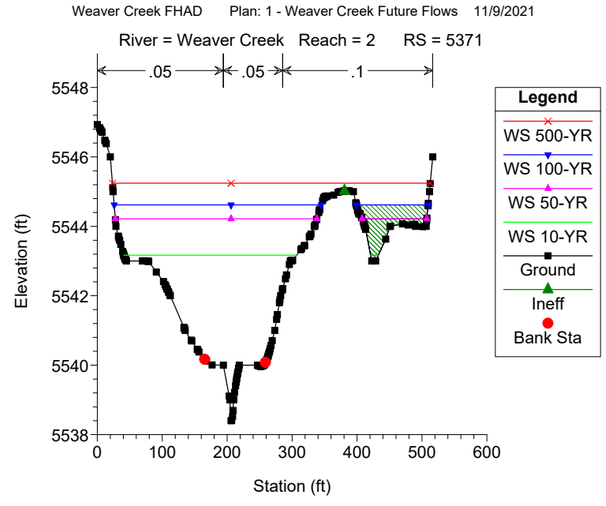

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 6397
.05 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

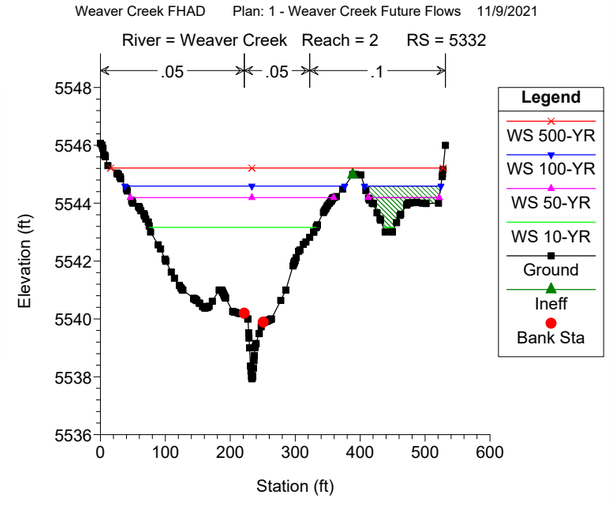

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 6181
.1 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

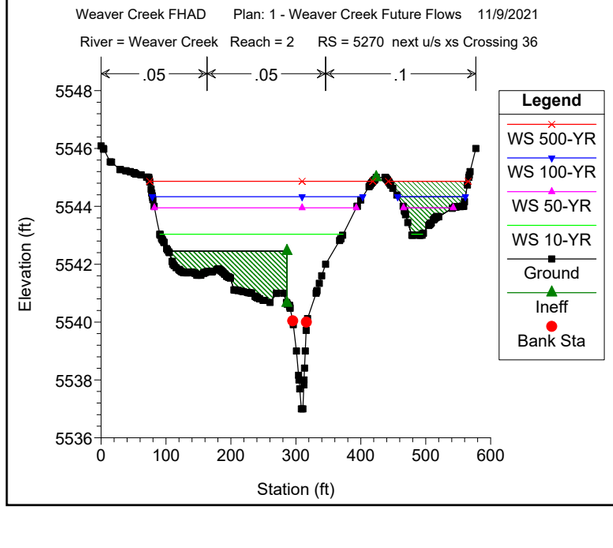

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5994
.02 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

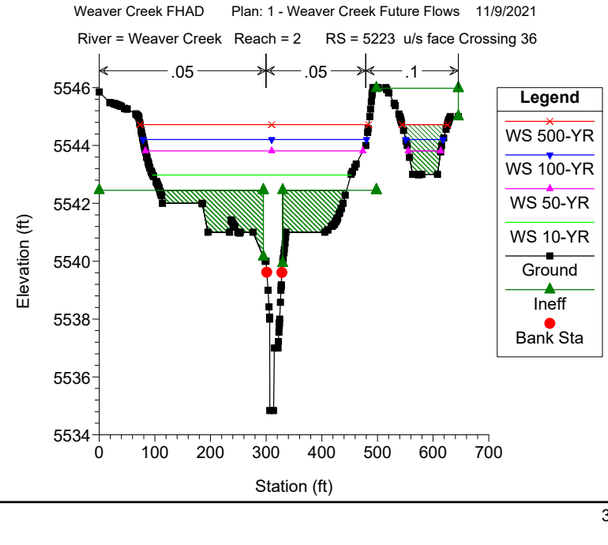

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5679
.1 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

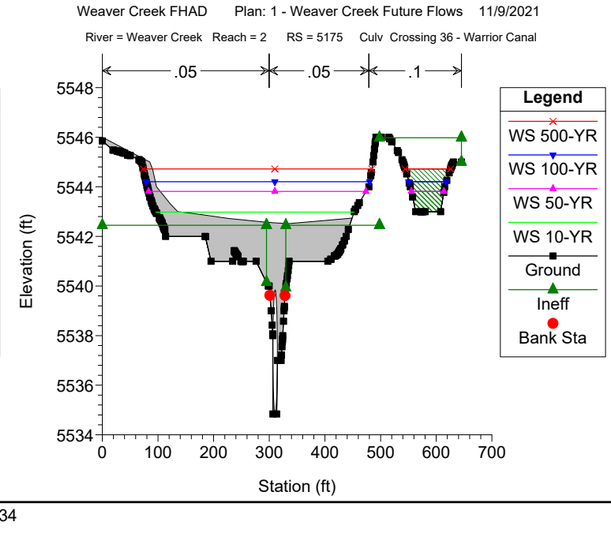

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5489
.05 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

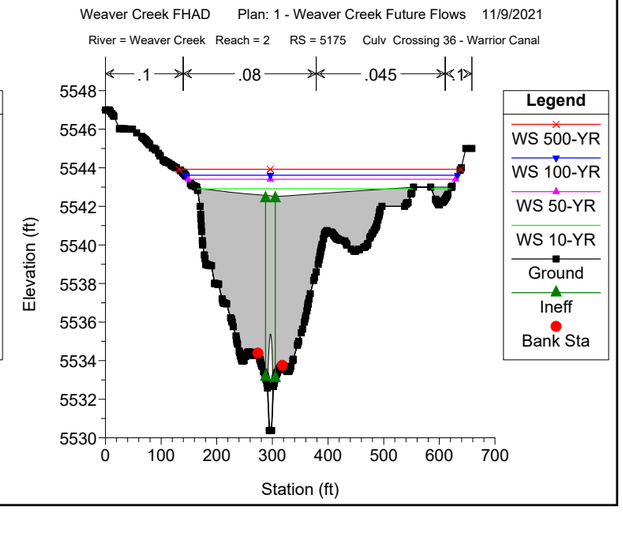

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5371
.05 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

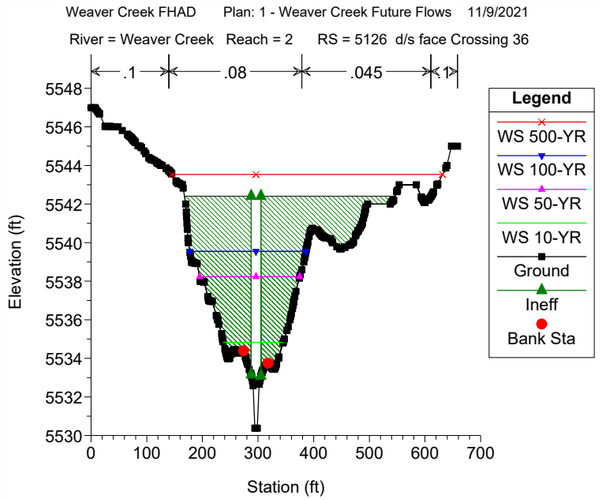

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5332
.05 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

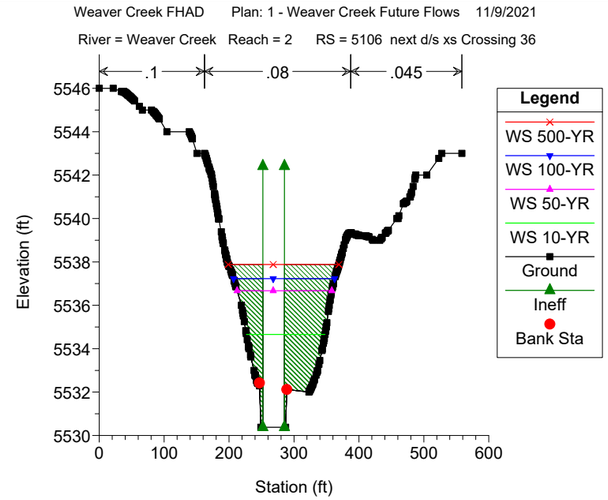

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5270 next u/s xs Crossing 36
.05 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

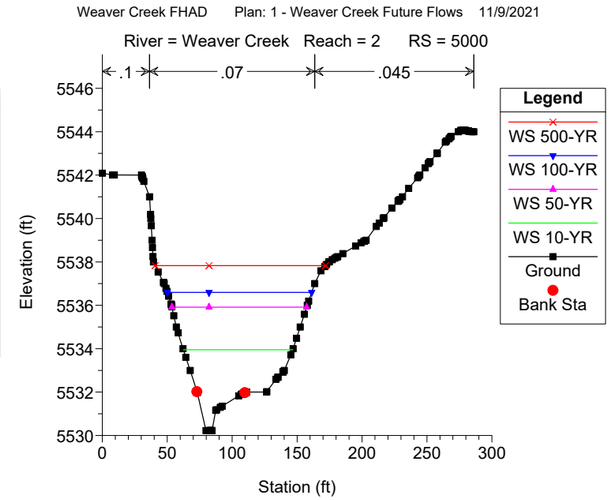

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5223 u/s face Crossing 36
.05 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

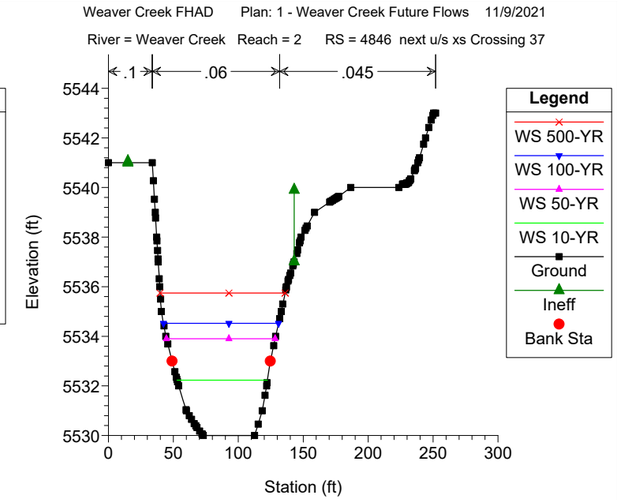

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5175 Culv Crossing 36 - Warrior Canal
.05 .05 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

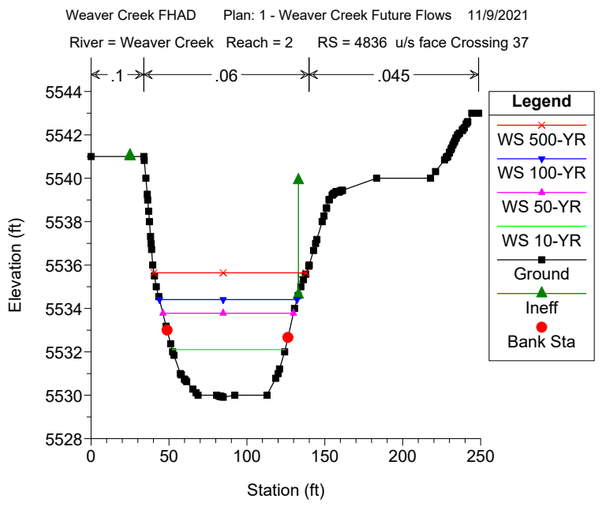

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5175 Culv Crossing 36 - Warrior Canal
.1 .08 .045 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

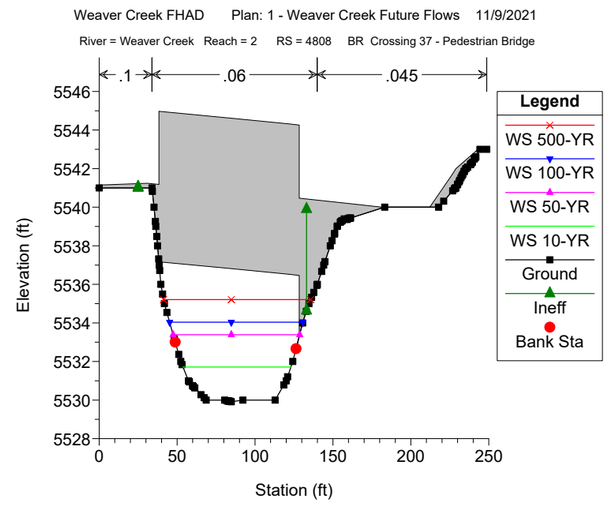

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5126 d/s face Crossing 36
.1
.08
.045
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

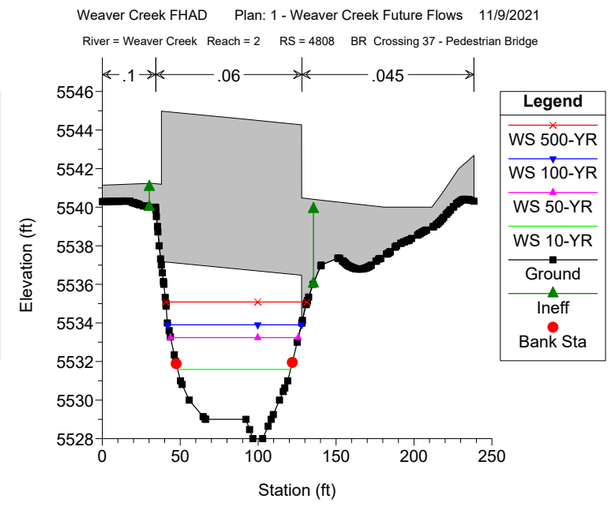

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5106 next d/s xs Crossing 36
.1
.08
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

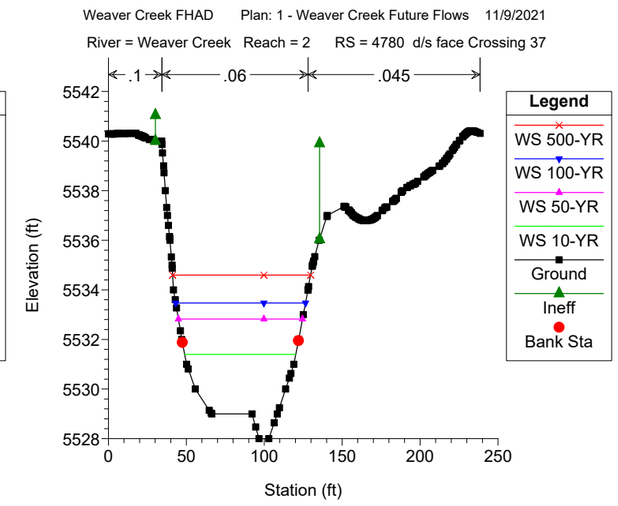

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 5000
.1
.07
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

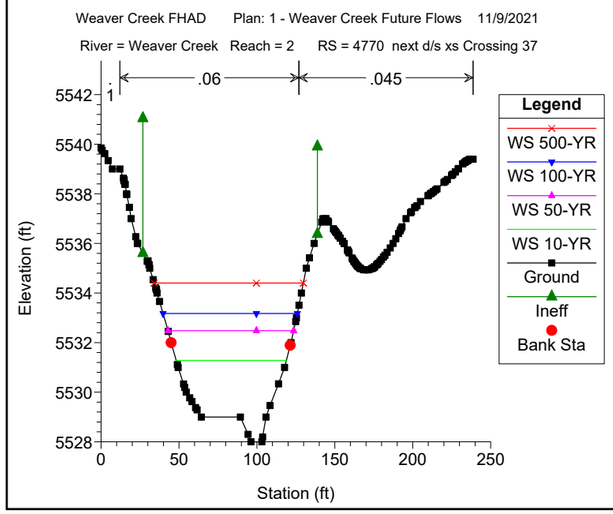

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 4846 next u/s xs Crossing 37
.1
.06
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

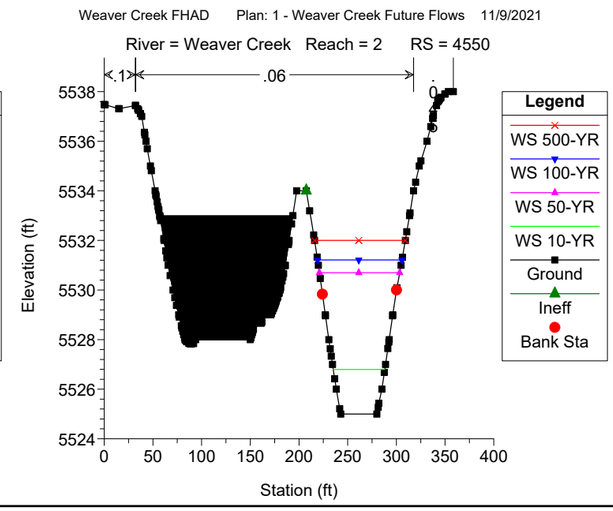

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 4836 u/s face Crossing 37
.1
.06
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

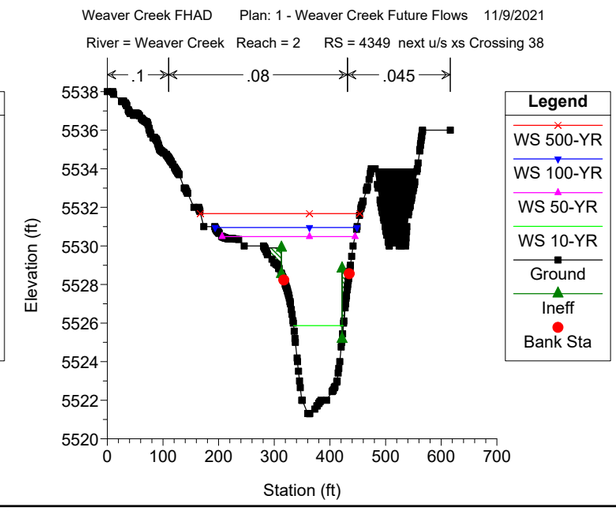

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 4808 BR Crossing 37 - Pedestrian Bridge
.1
.06
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

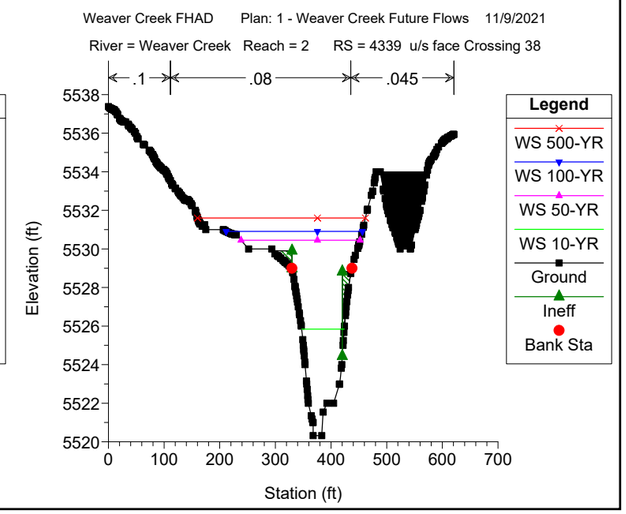

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 4808 BR Crossing 37 - Pedestrian Bridge
.1
.06
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

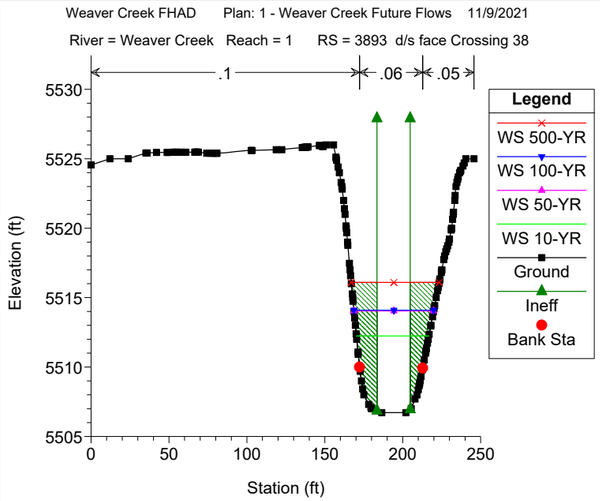

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 4780 d/s face Crossing 37
.1
.06
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

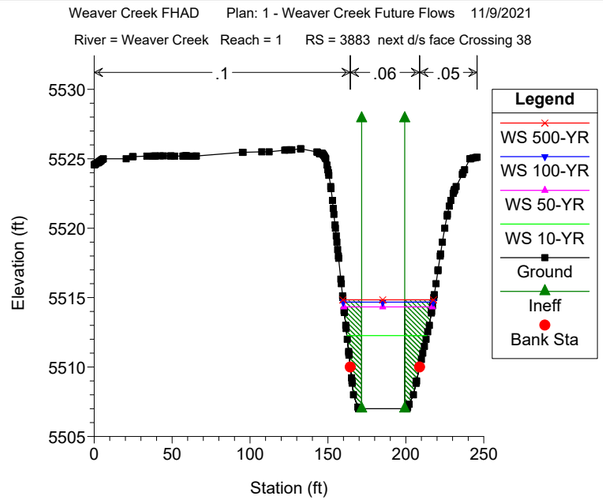

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 4770 next d/s xs Crossing 37
.1
.06
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

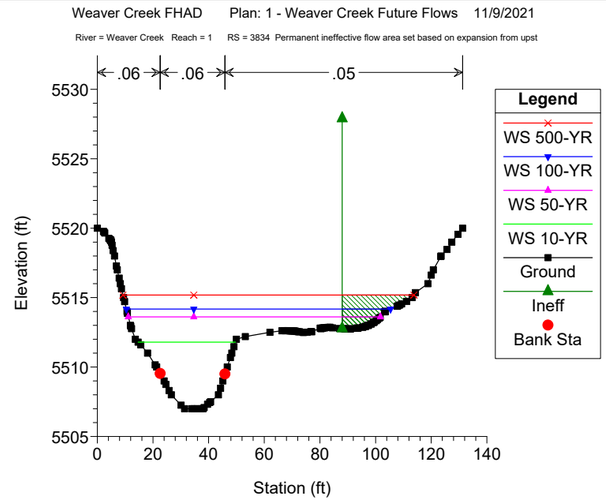

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 4550
.1
.06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

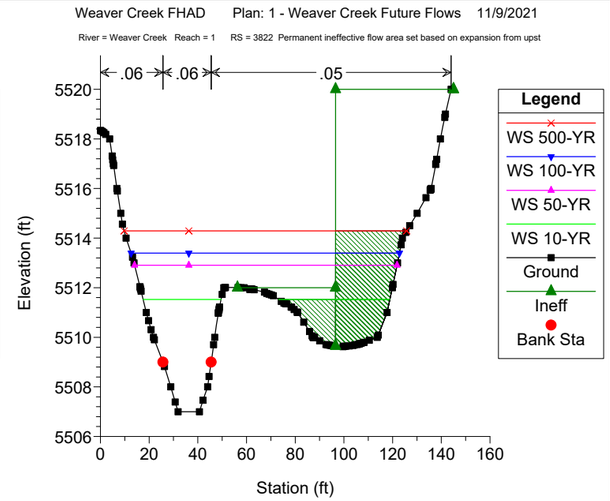

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 4349 next u/s xs Crossing 38
.1
.08
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

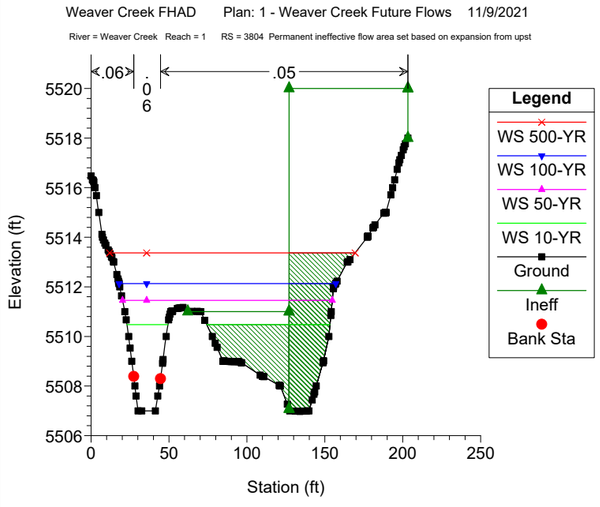

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 2 RS = 4339 u/s face Crossing 38
.1
.08
.045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

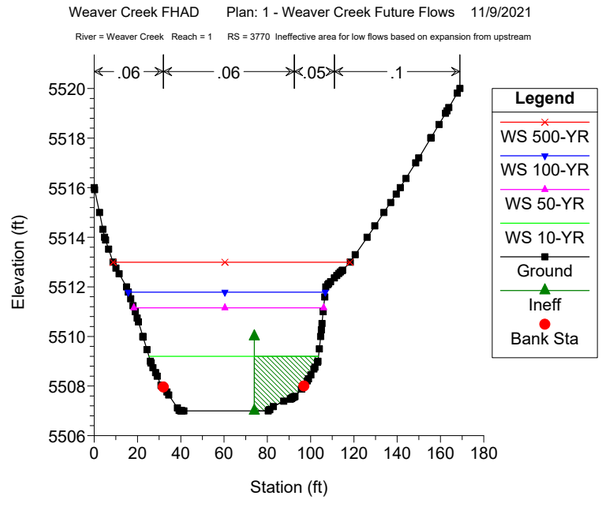

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3893 d/s face Crossing 38
.1
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

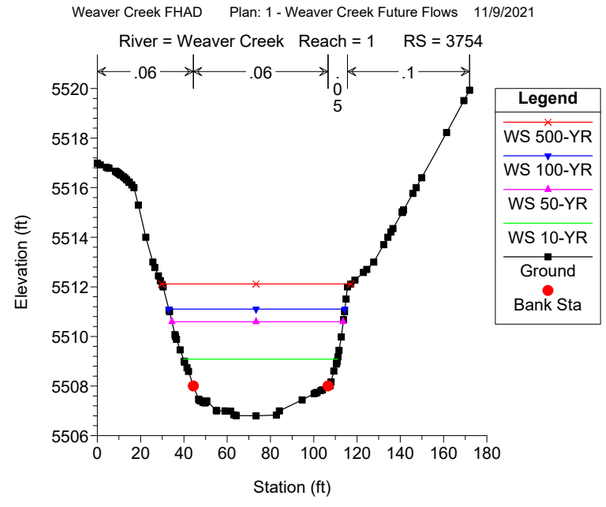

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3883 next d/s face Crossing 38
.1
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

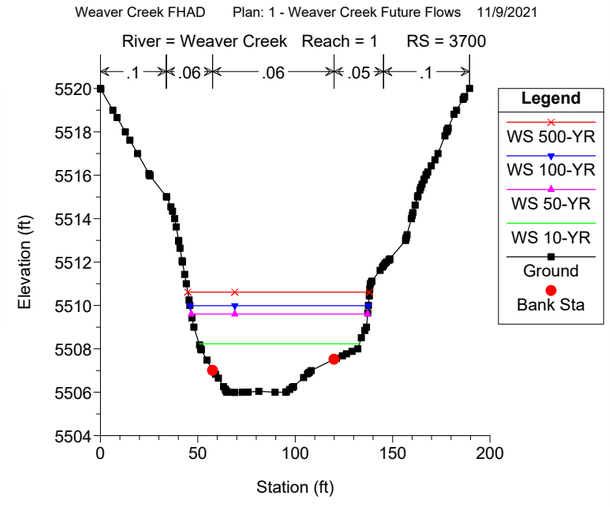

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3834 Permanent ineffective flow area set based on expansion from upst
.06
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

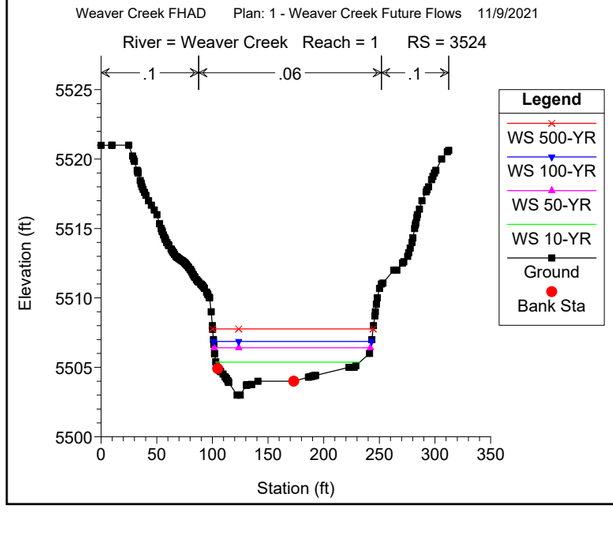

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3822 Permanent ineffective flow area set based on expansion from upst
.06
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

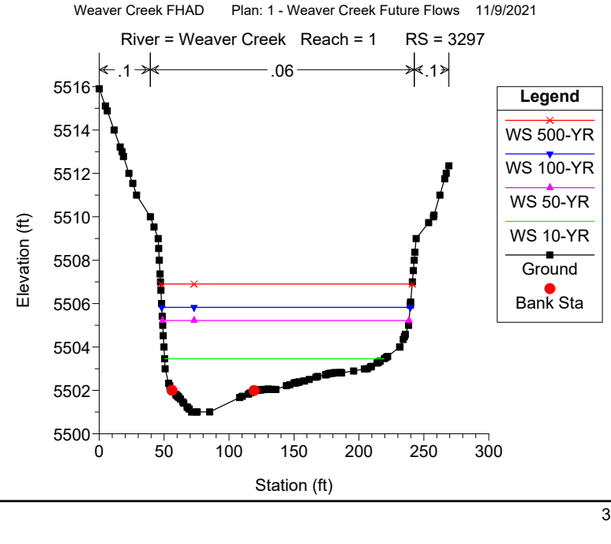

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3804 Permanent ineffective flow area set based on expansion from upst
.06
.05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

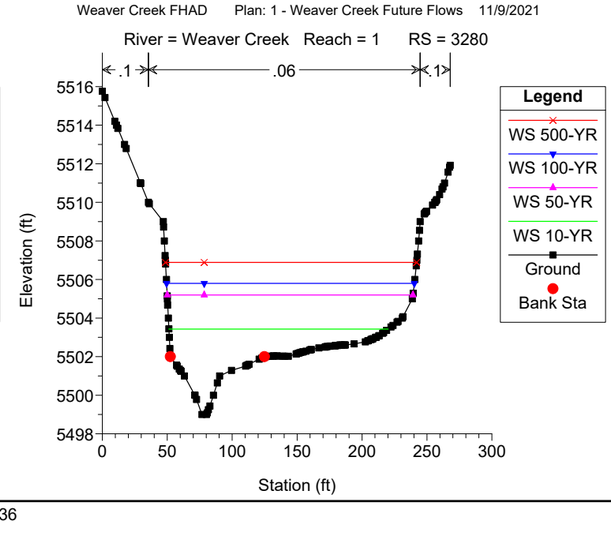

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3770 Ineffective area for low flows based on expansion from upstream
.06
.06
.05
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

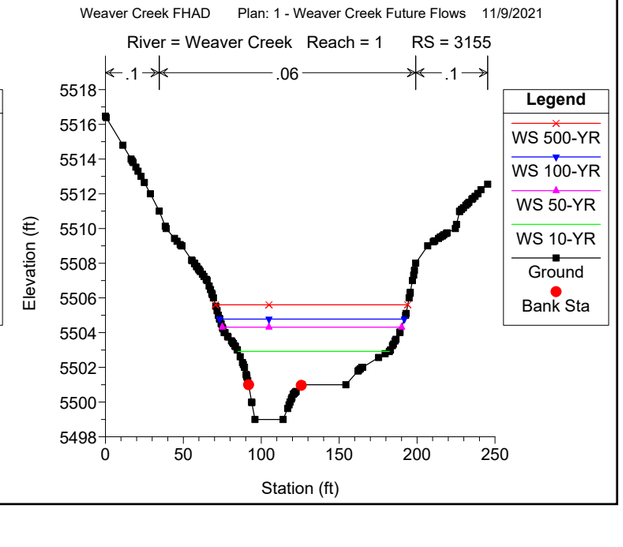

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3754
.06
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

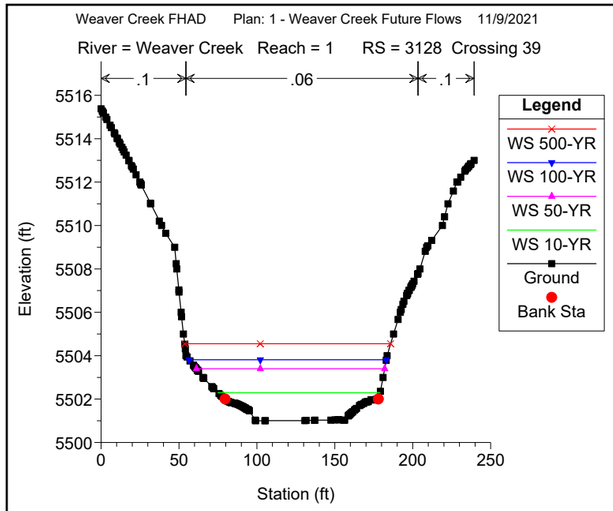

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3700
.1
.06
.06
.05
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

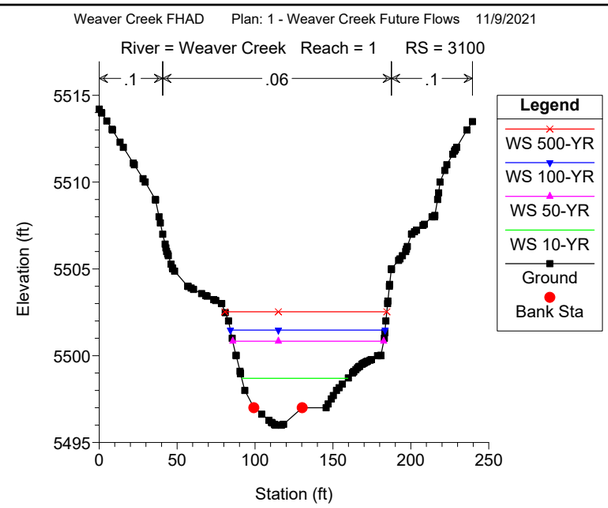

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3524
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

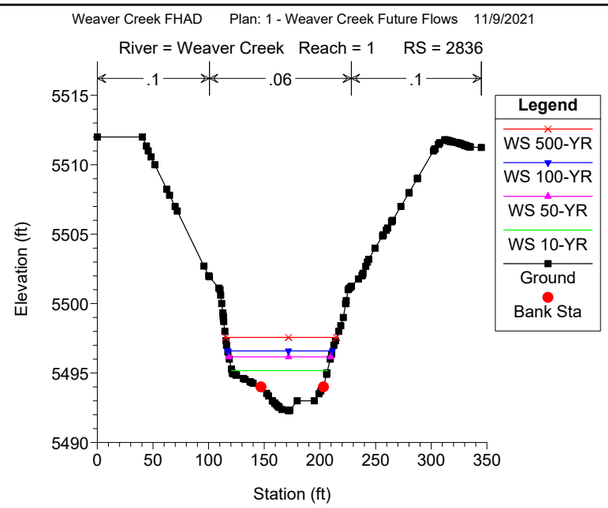

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3297
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

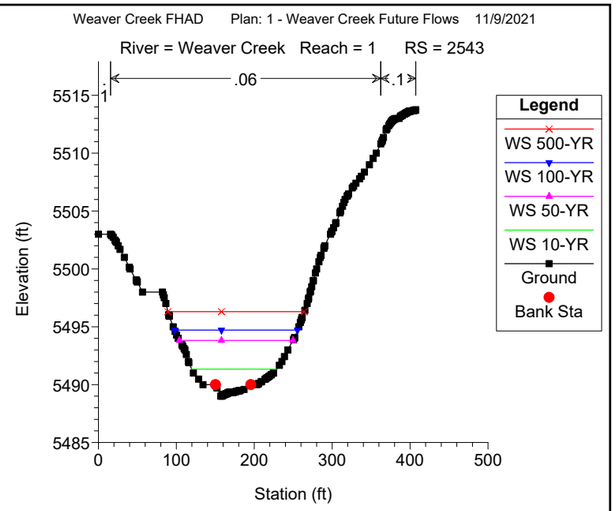

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3280
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

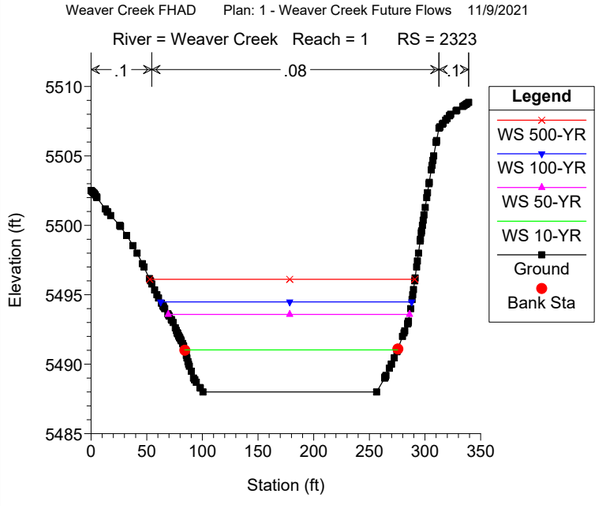

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3155
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

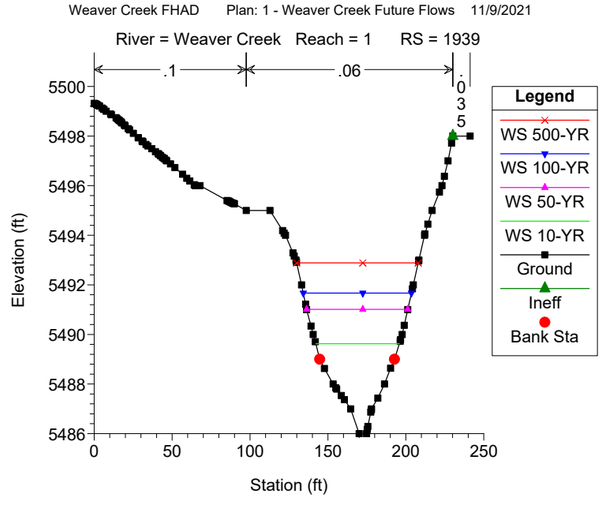

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3128 Crossing 39
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

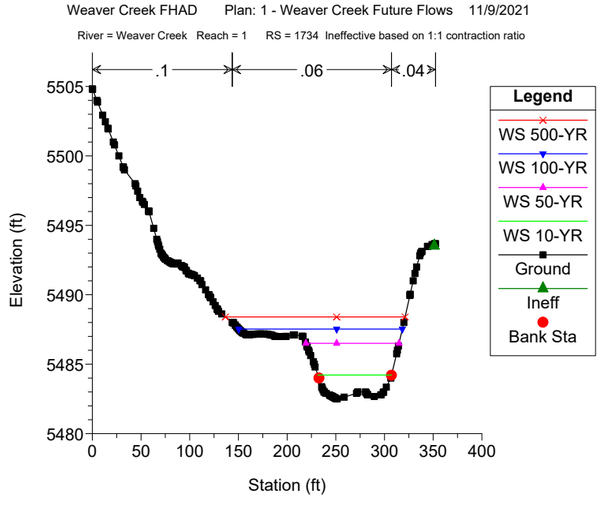

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 3100
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

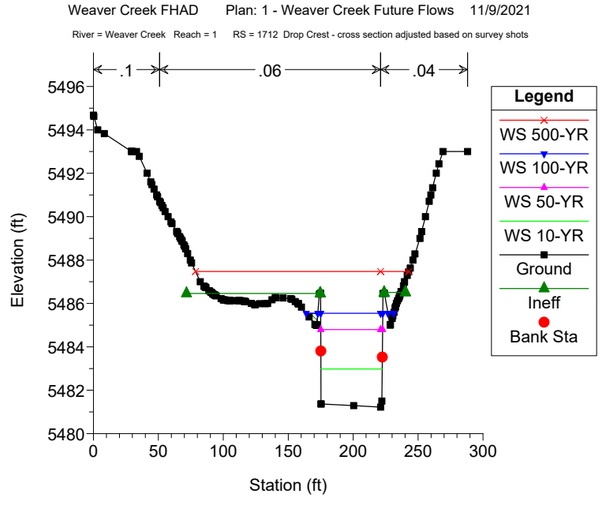

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 2836
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

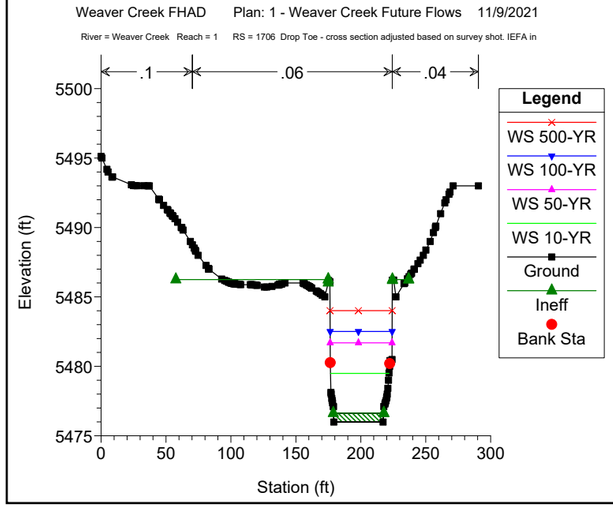

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 2543
.1
.06
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

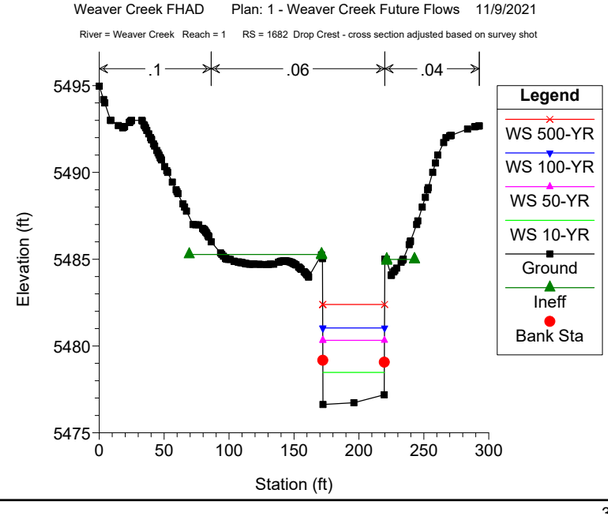

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 2323
.1
.08
.1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

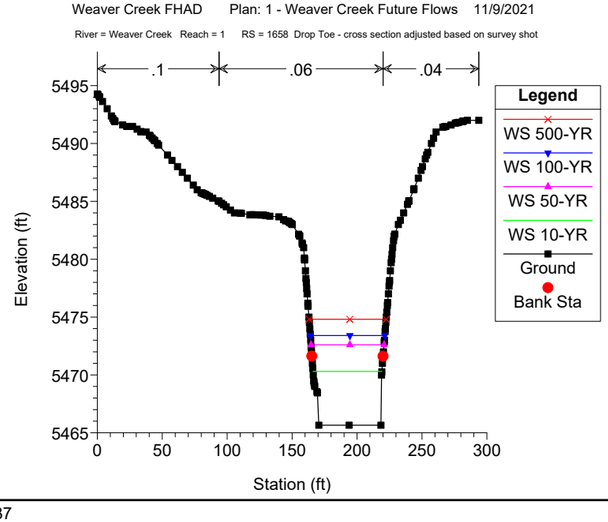

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 1939
.1
.06
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

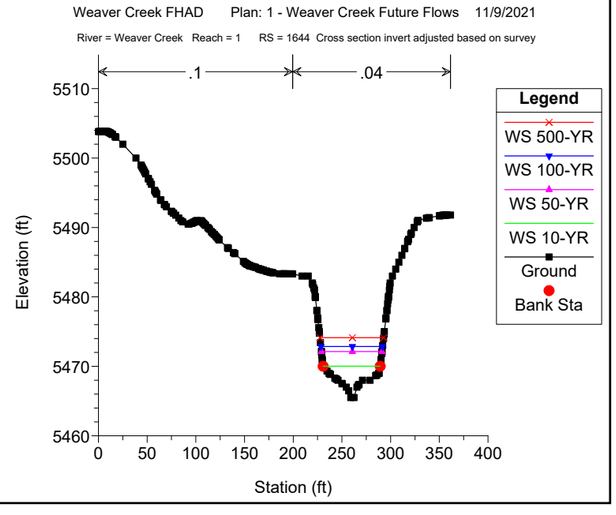

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 1734 Ineffective based on 1:1 contraction ratio
.1
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

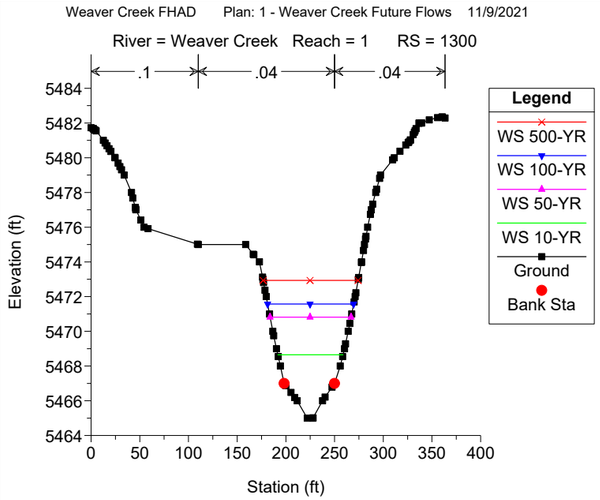

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 1712 Drop Crest - cross section adjusted based on survey shots
.1
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

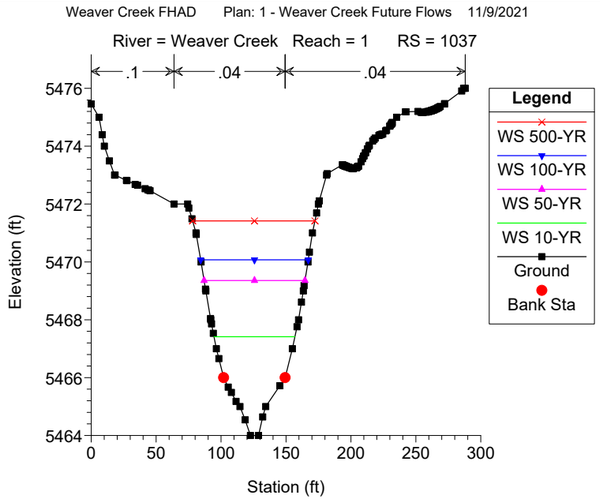

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 1706 Drop Toe - cross section adjusted based on survey shot. IEFA in
.1
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

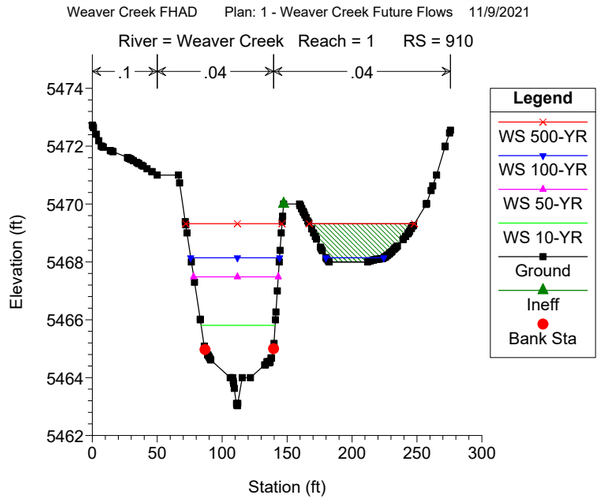

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 1682 Drop Crest - cross section adjusted based on survey shot
.1
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

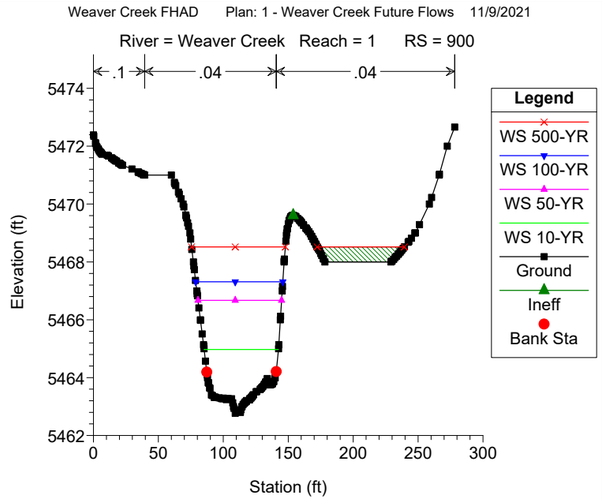

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 1658 Drop Toe - cross section adjusted based on survey shot
.1
.06
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

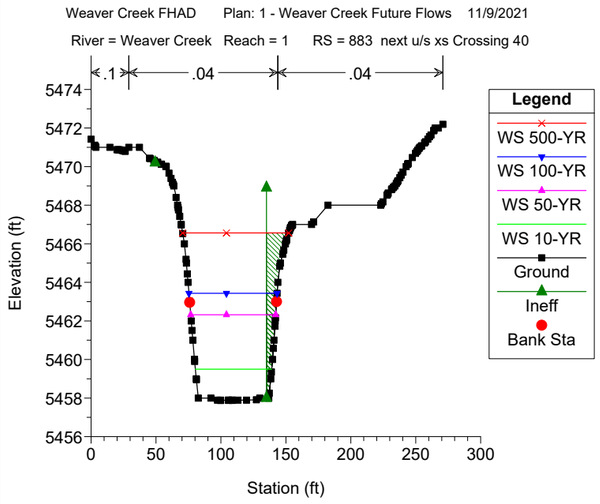

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 1644 Cross section invert adjusted based on survey
.1
.04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

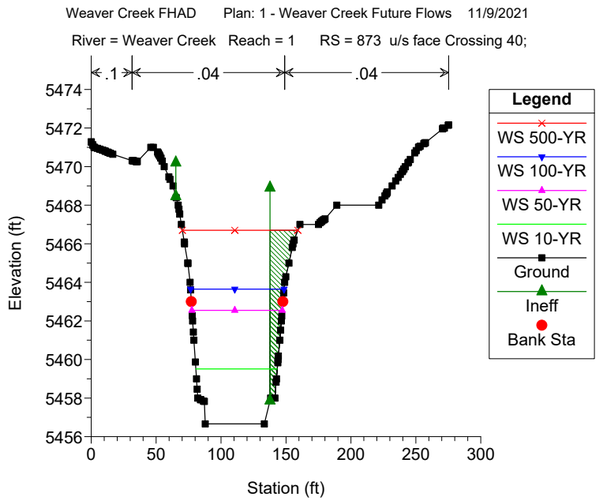

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 1300
.1 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

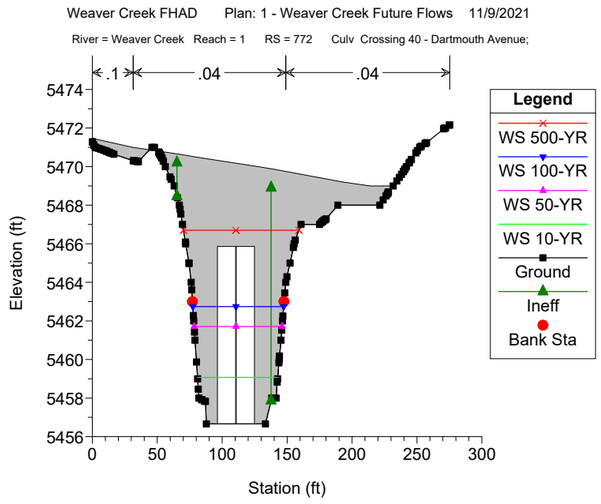

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 1037
.1 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

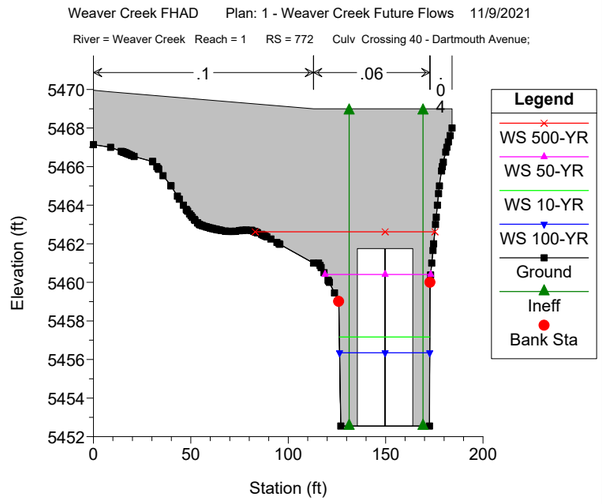

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 910
.1 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

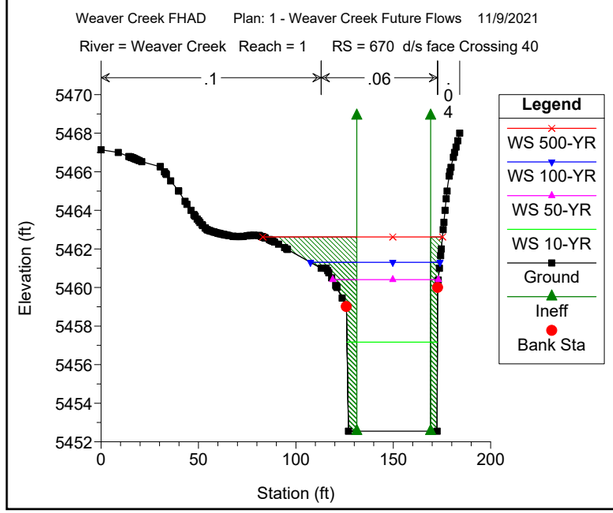

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 900
.1 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

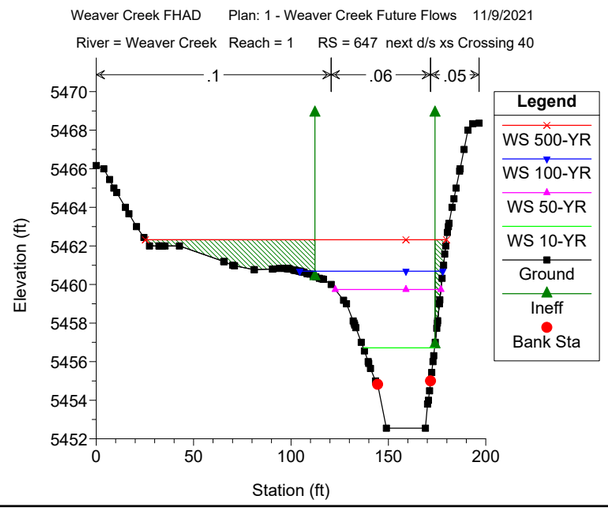

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 883 next u/s xs Crossing 40
.1 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

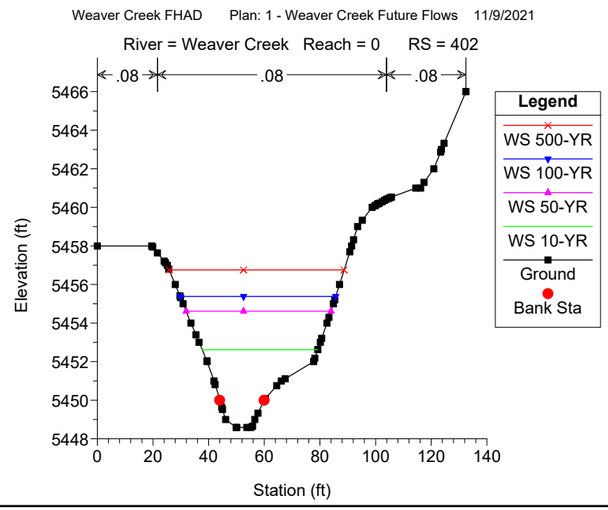

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 873 u/s face Crossing 40;
.1 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

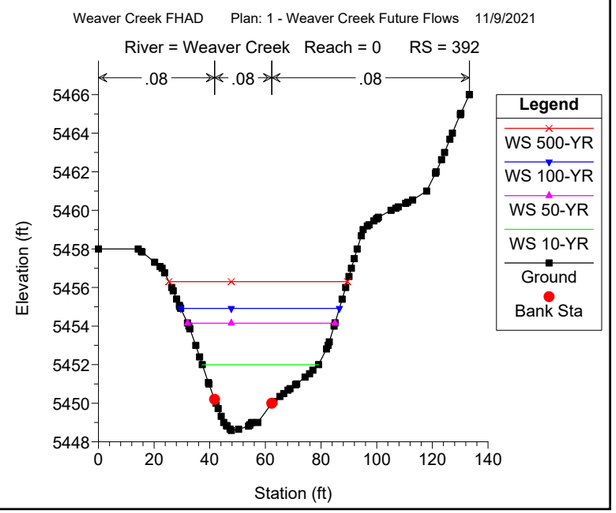

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 772 Culv Crossing 40 - Dartmouth Avenue;
.1 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

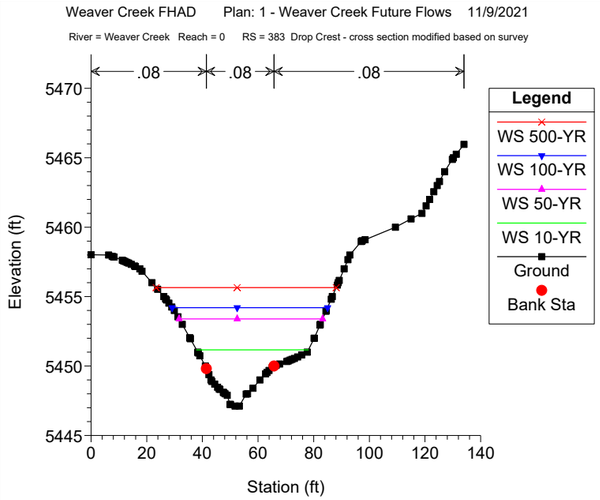

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 772 Culv Crossing 40 - Dartmouth Avenue;
.1 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 50-YR
WS 10-YR
WS 100-YR
Ground
Ineff
Bank Sta

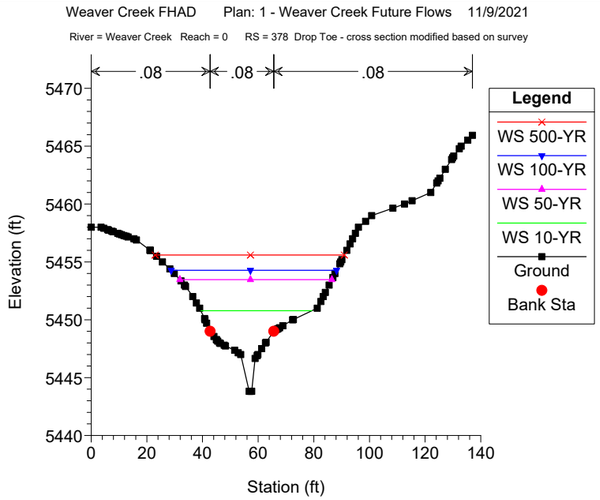

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 670 d/s face Crossing 40
.1 .06 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

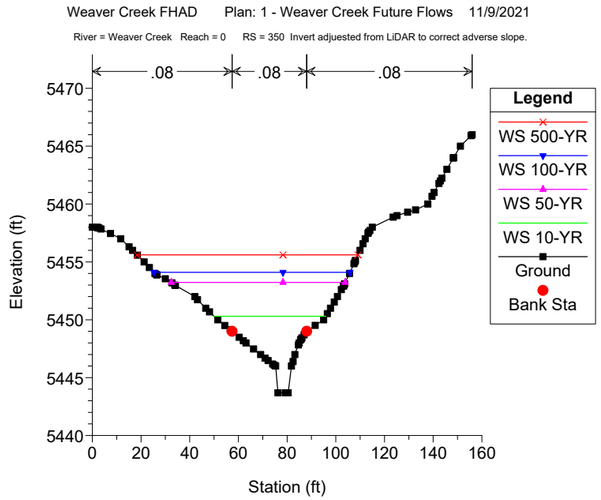

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 1 RS = 647 next d/s xs Crossing 40
.1 .06 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

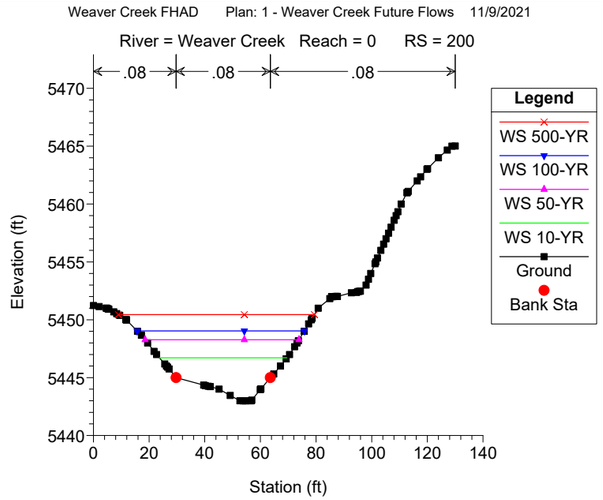

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 0 RS = 402
.08 .08 .08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

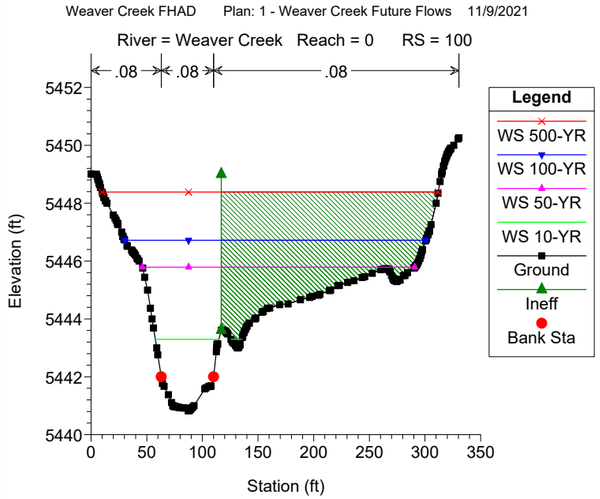

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 0 RS = 392
.08 .08 .08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

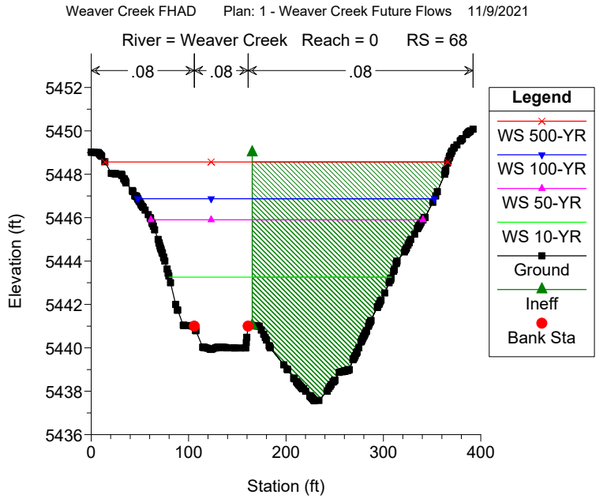

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 0 RS = 383 Drop Crest - cross section modified based on survey
.08 .08 .08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

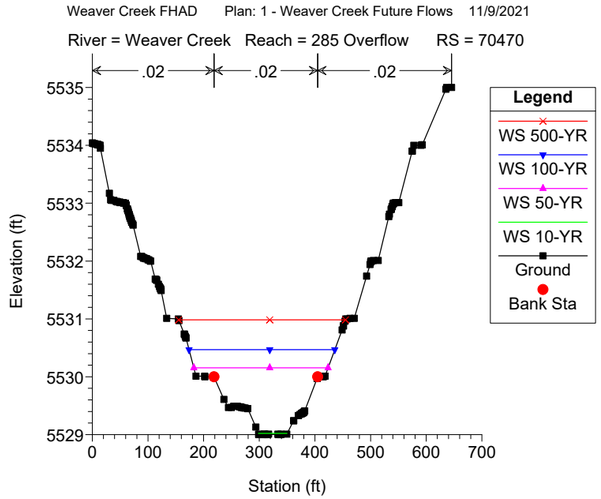

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 0 RS = 378 Drop Toe - cross section modified based on survey
.08 .08 .08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

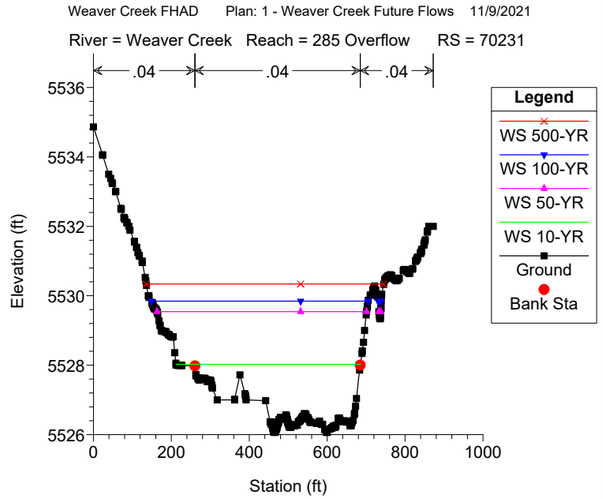

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 0 RS = 350 Invert adjusted from LiDAR to correct adverse slope.
.08 .08 .08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

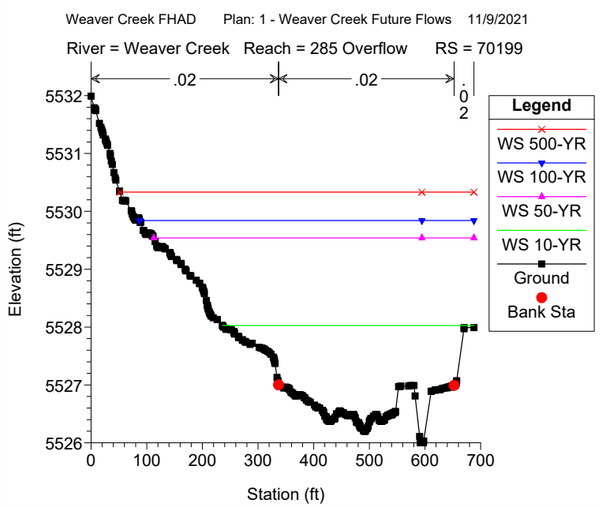

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 0 RS = 200
.08 .08 .08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

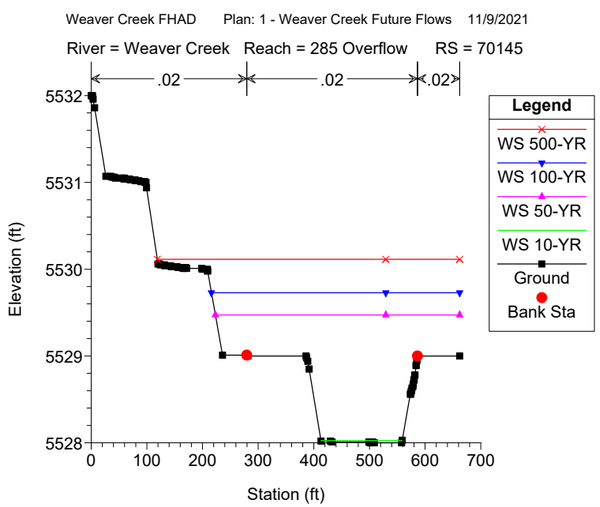

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 0 RS = 100
.08 .08 .08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

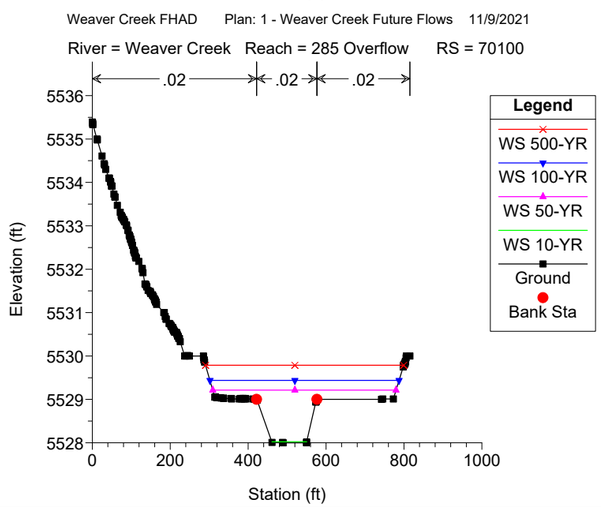

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 0 RS = 68
.08 .08 .08
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

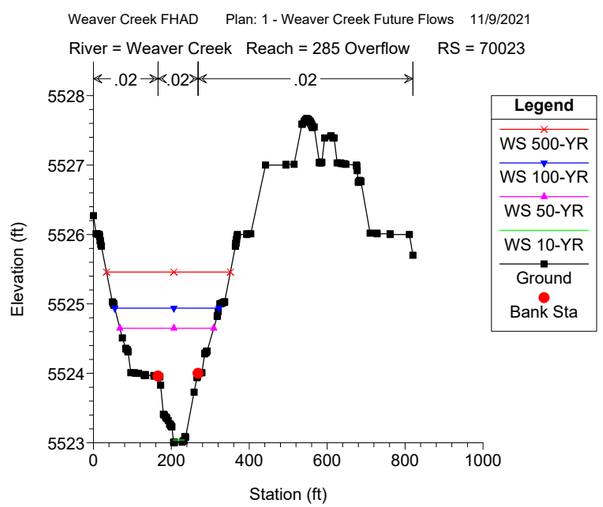

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 285 Overflow RS = 70470
.02 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

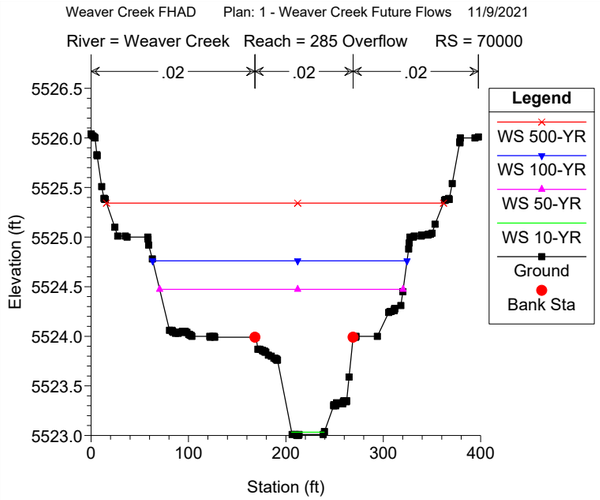

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 285 Overflow RS = 70231
.04 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

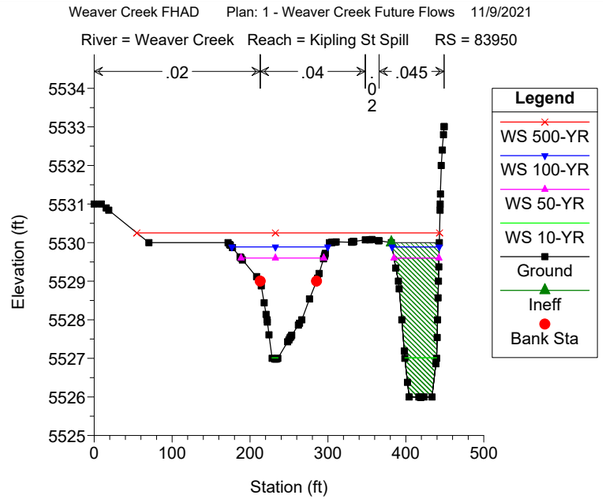

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 285 Overflow RS = 70199
.02 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

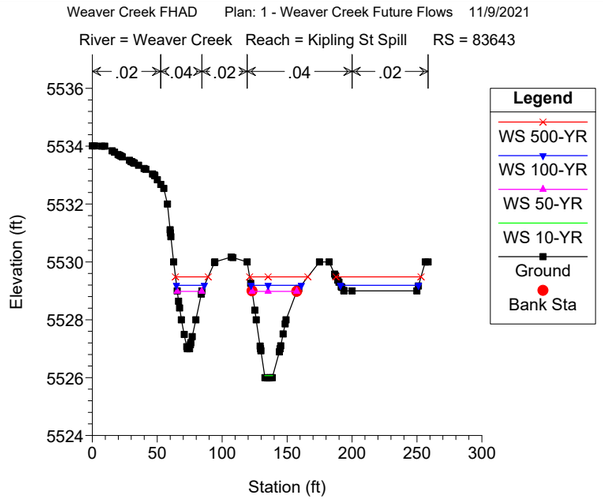

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 285 Overflow RS = 70145
.02 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

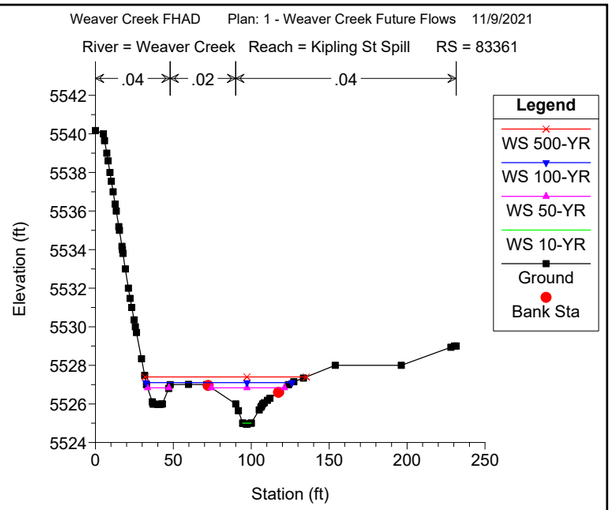

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 285 Overflow RS = 70100
.02 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

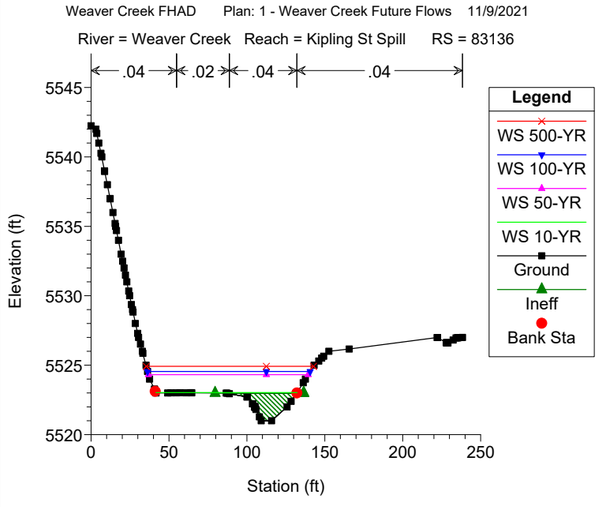

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 285 Overflow RS = 70023
.02 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

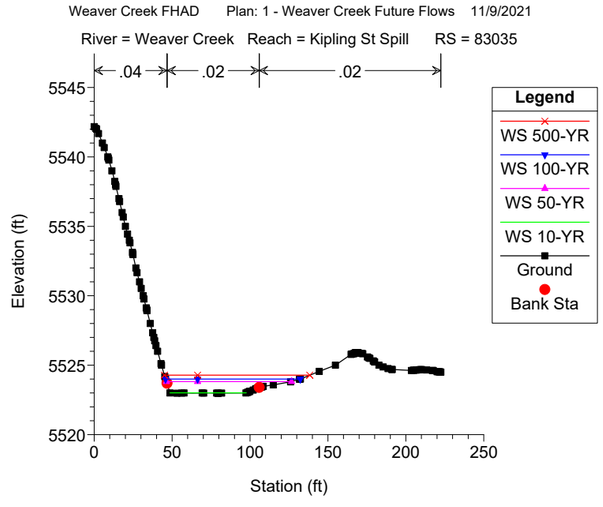

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = 285 Overflow RS = 70000
.02 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

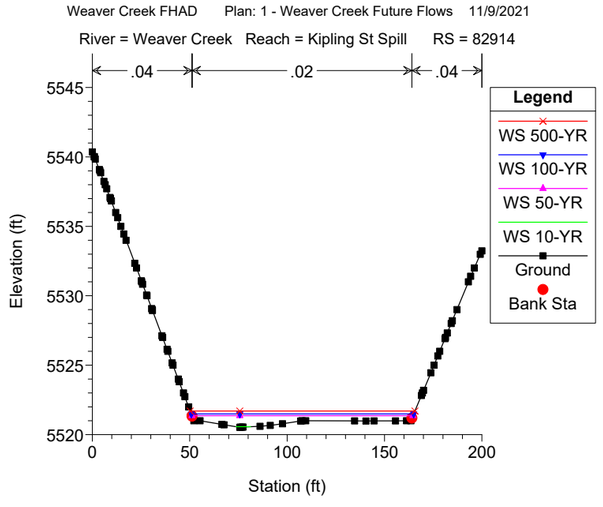

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 83950
.02 .04 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

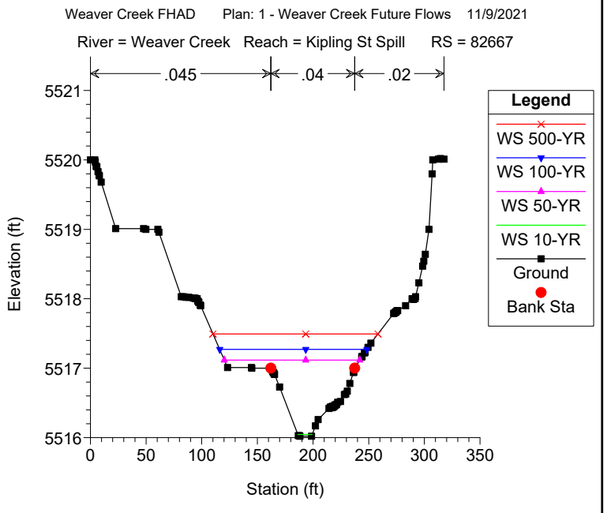

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 83643
.02 .04 .02 .04 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

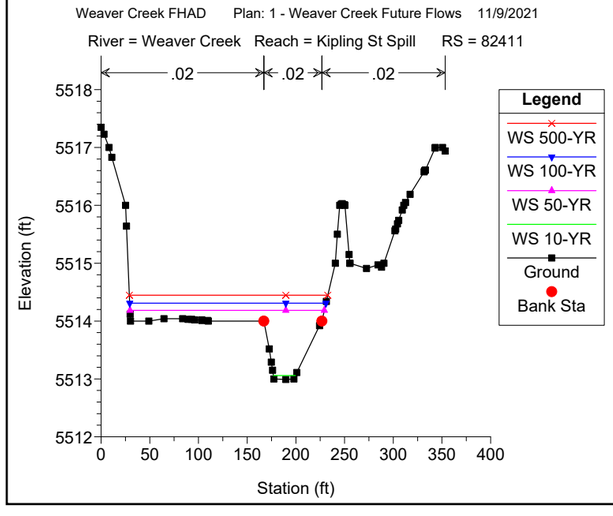

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 83361
.04 .02 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

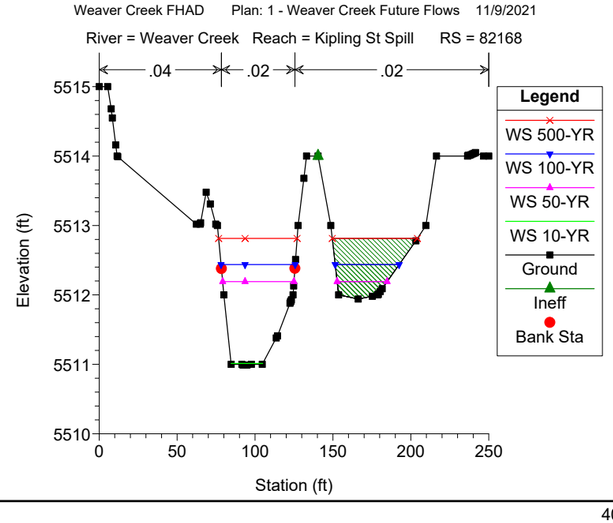

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 83136
.04 .02 .04 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

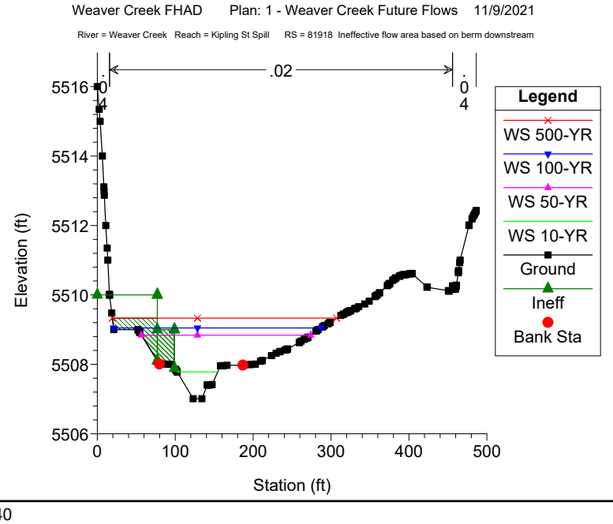

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 83035
.04 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

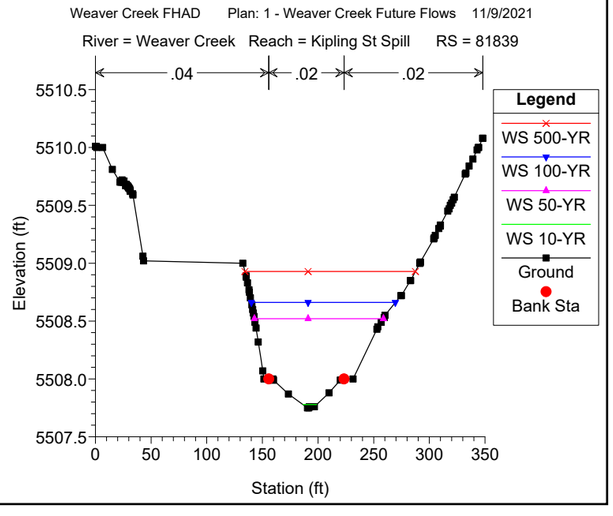

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 82914
.04 .02 .04
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 82667
.045 .04 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 82411
.02 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

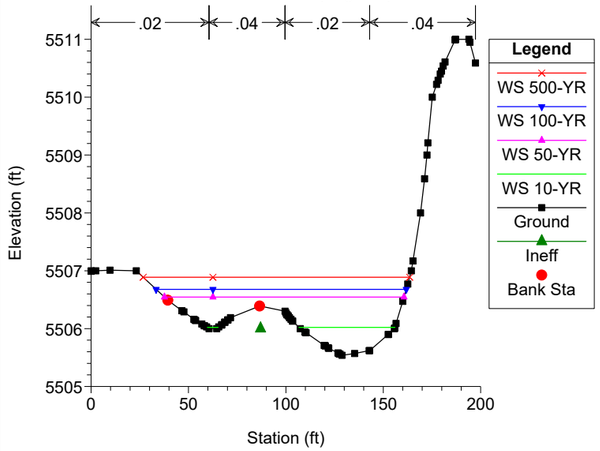

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 82168
.04 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 81918 Ineffective flow area based on berm downstream
.02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Kipling St Spill RS = 81839
.04 .02 .02
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

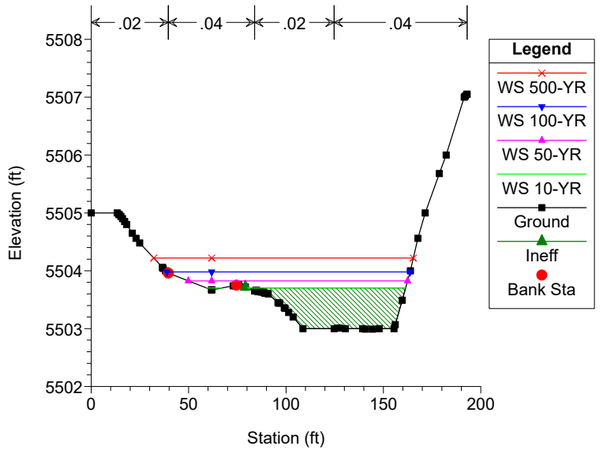
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Kipling St Spill RS = 81765



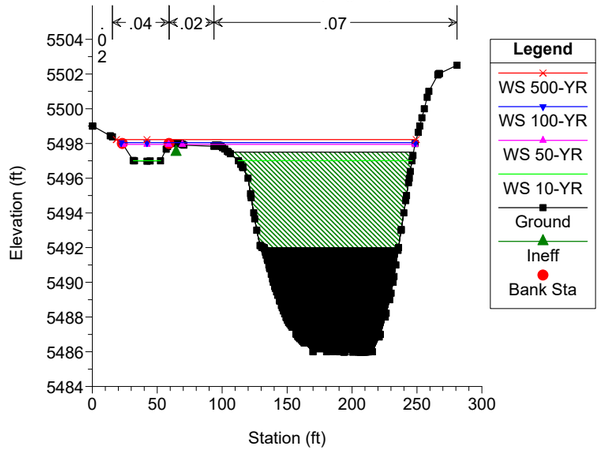
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Kipling St Spill RS = 81632



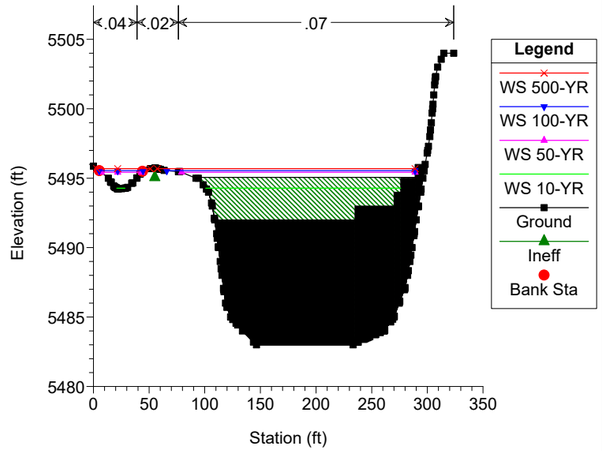
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Kipling St Spill RS = 81327



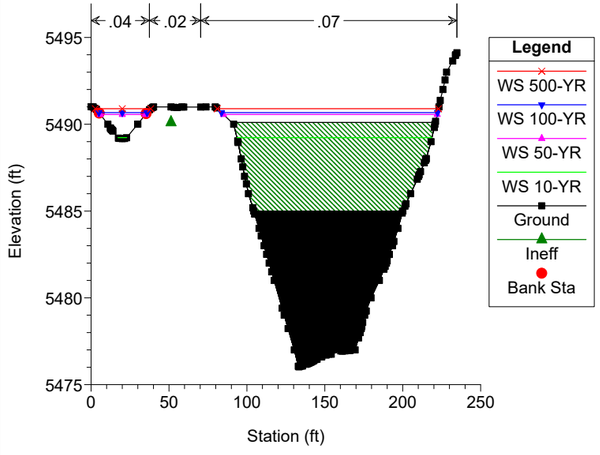
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Kipling St Spill RS = 81194 Multiple blocked obstructions based on contraction to spillway



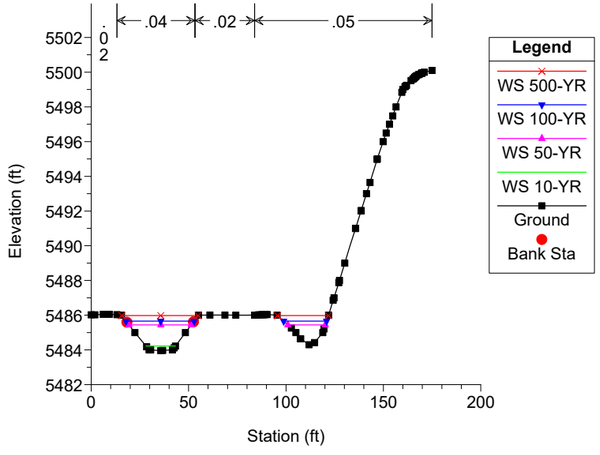
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Kipling St Spill RS = 80974



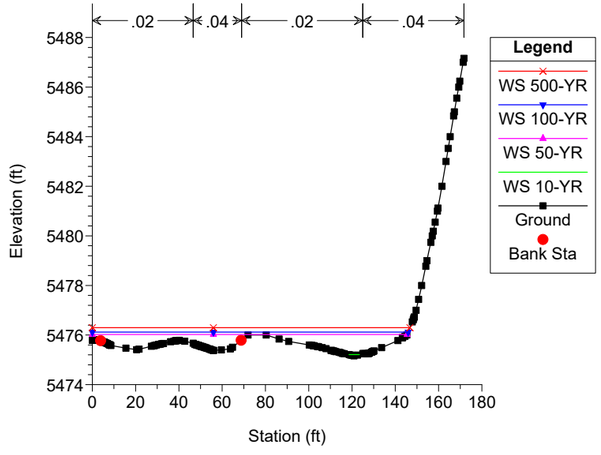
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Kipling St Spill RS = 80785



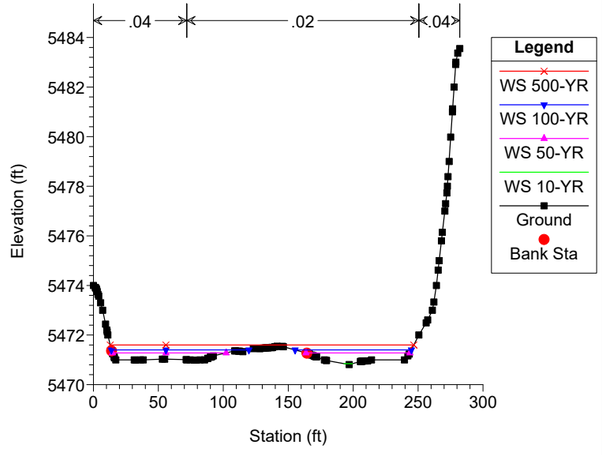
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Kipling St Spill RS = 80353



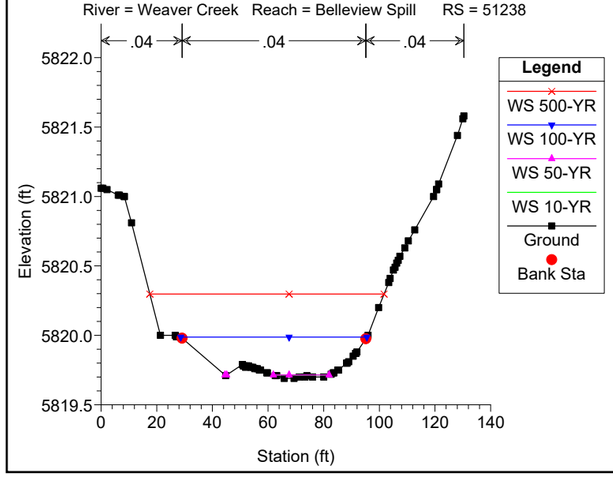
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Kipling St Spill RS = 80162



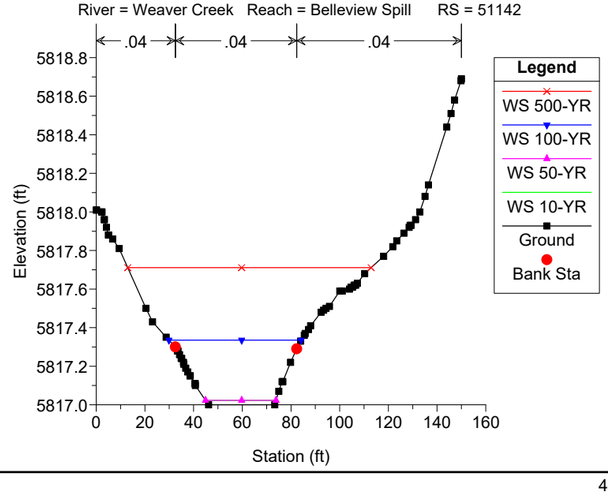
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Belleview Spill RS = 51238



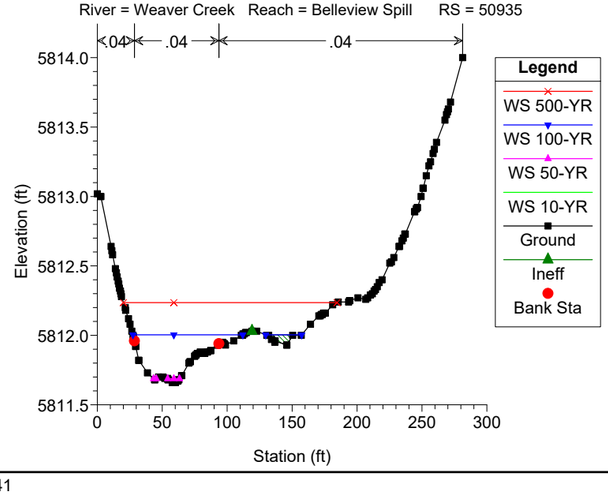
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

River = Weaver Creek Reach = Belleview Spill RS = 51142



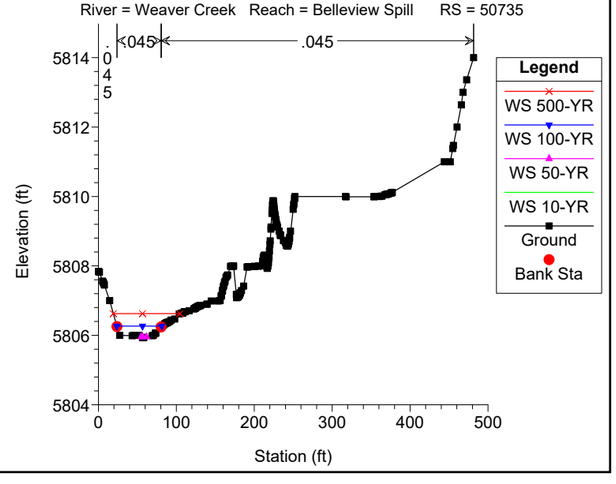
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

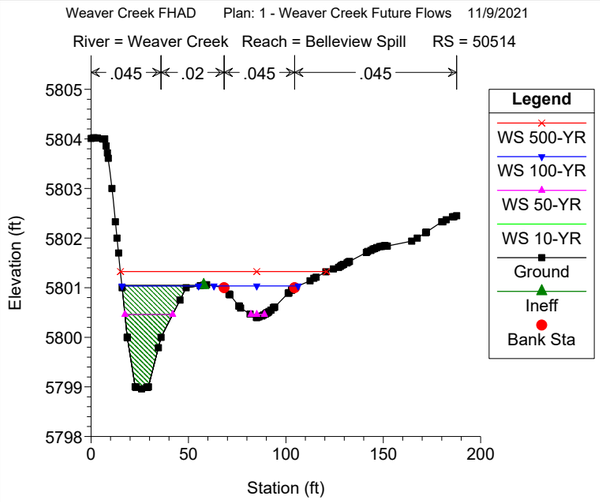
River = Weaver Creek Reach = Belleview Spill RS = 50935

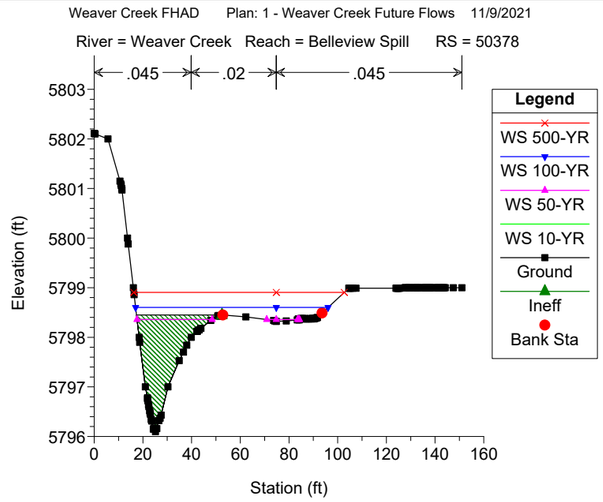


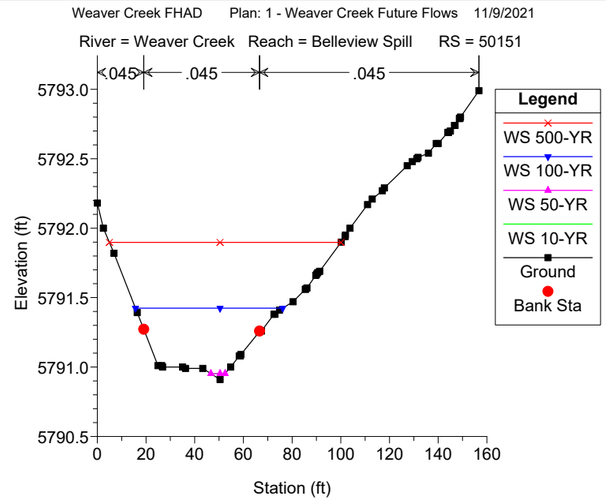
Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021

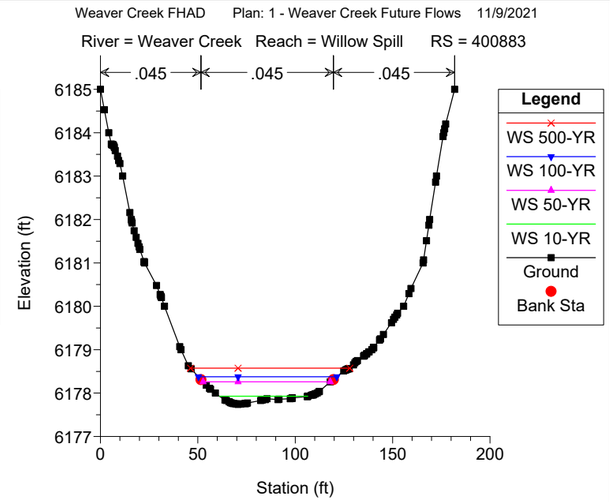
River = Weaver Creek Reach = Belleview Spill RS = 50735

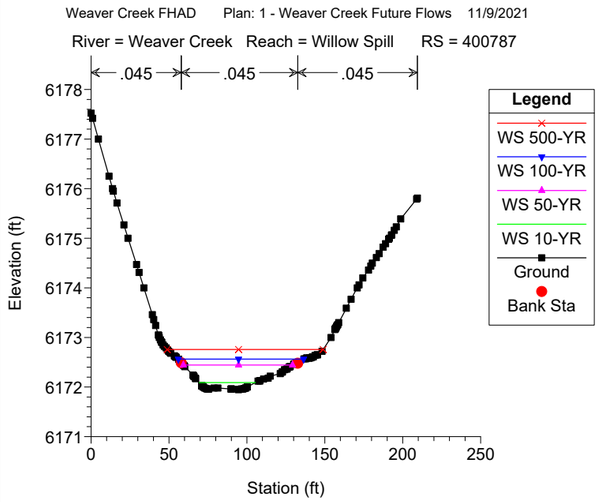


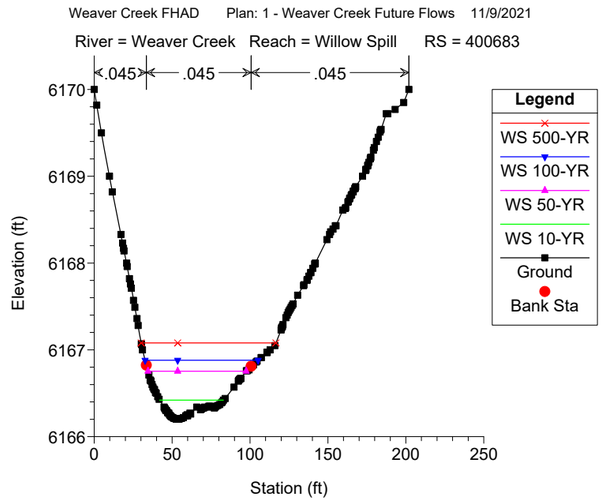

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Belleview Spill RS = 50514
.045 .02 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

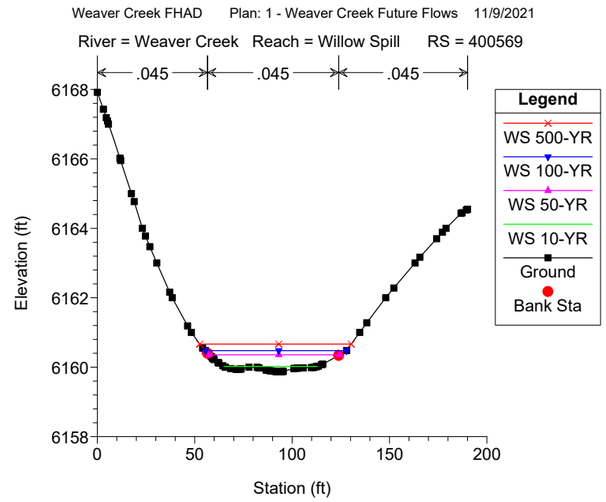

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Belleview Spill RS = 50378
.045 .02 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

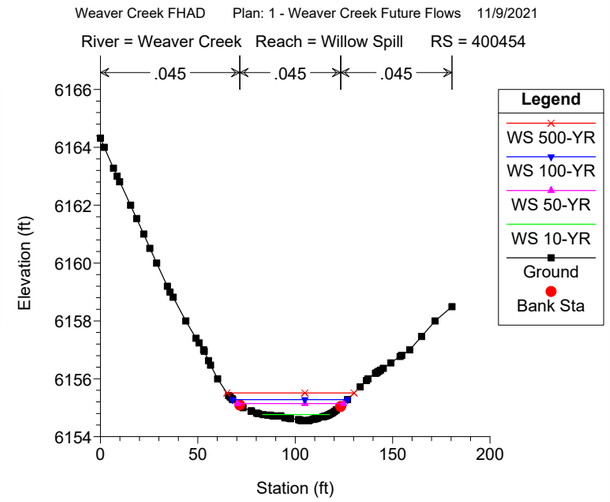

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Belleview Spill RS = 50151
.045 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

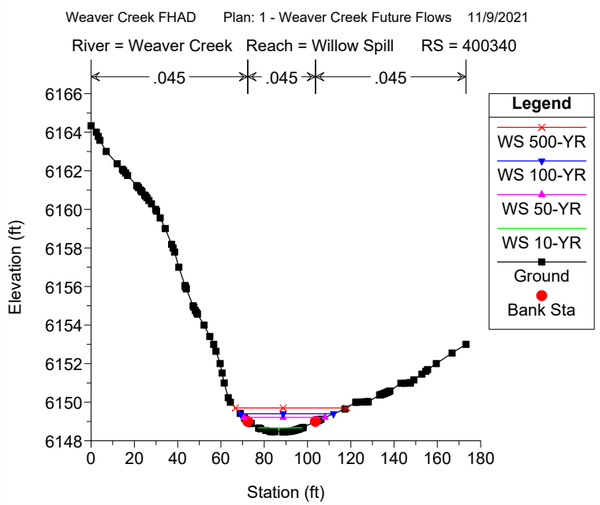

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Willow Spill RS = 400883
.045 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

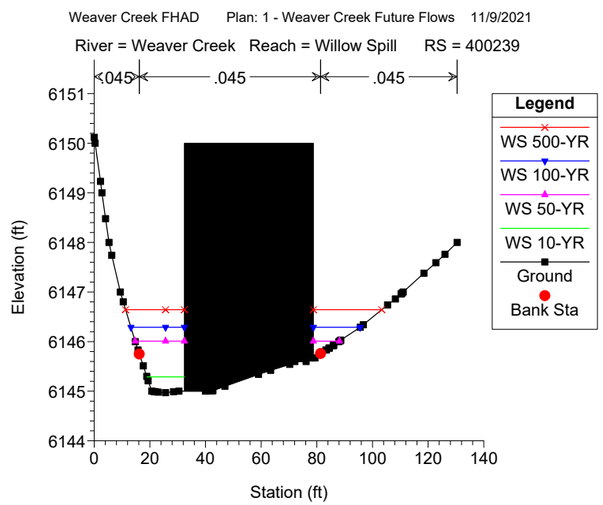

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Willow Spill RS = 400787
.045 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

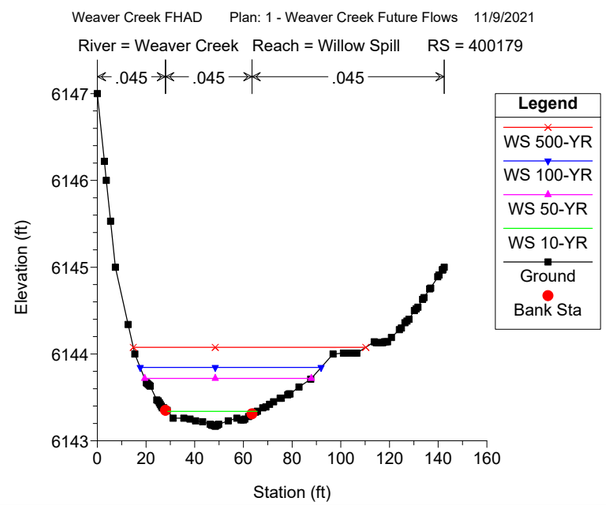

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Willow Spill RS = 400683
.045 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

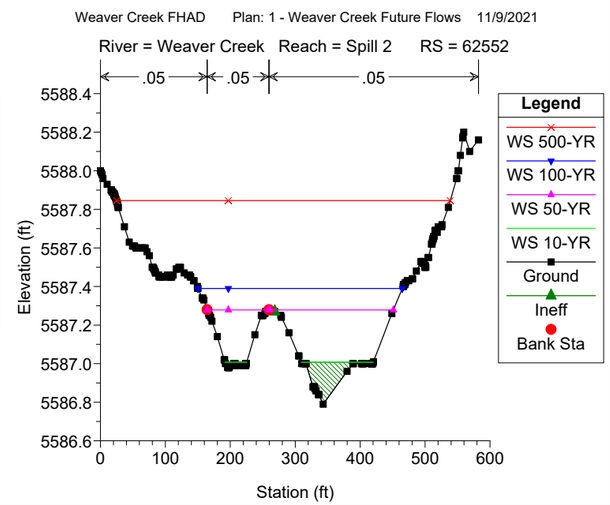

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Willow Spill RS = 400569
.045 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

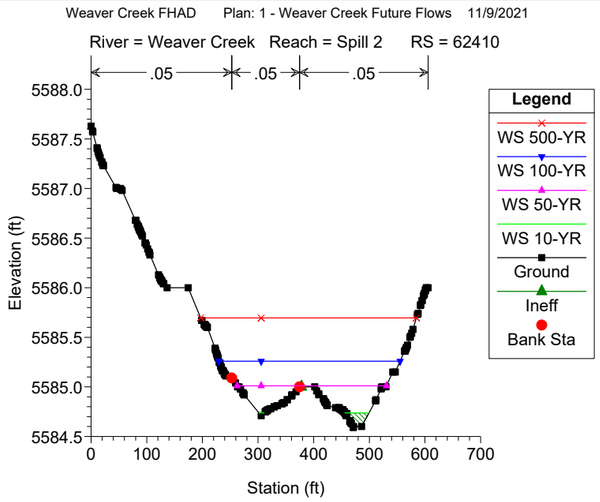

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Willow Spill RS = 400454
.045 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

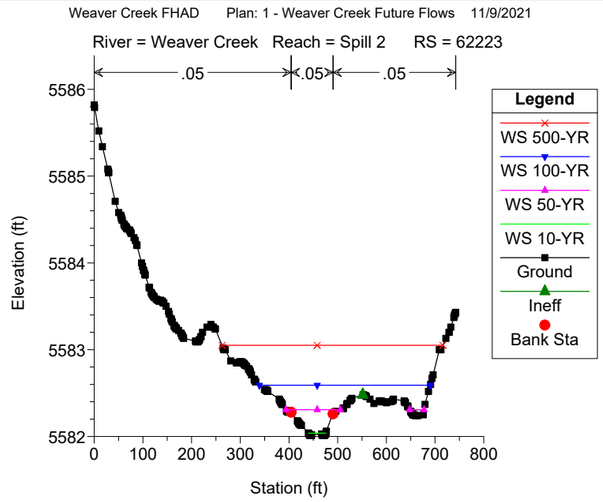

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Willow Spill RS = 400340
.045 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

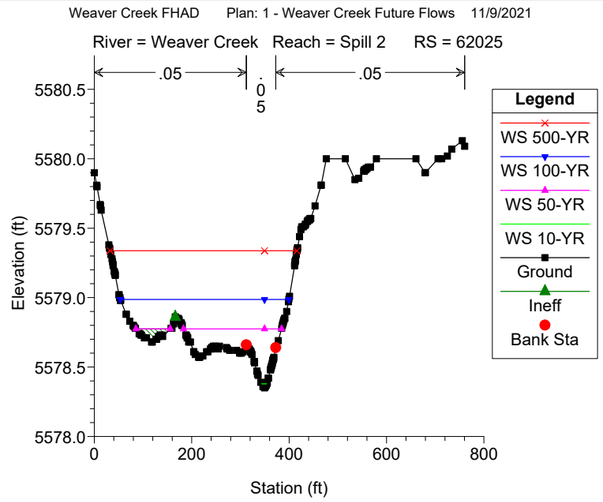

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Willow Spill RS = 400239
.045 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

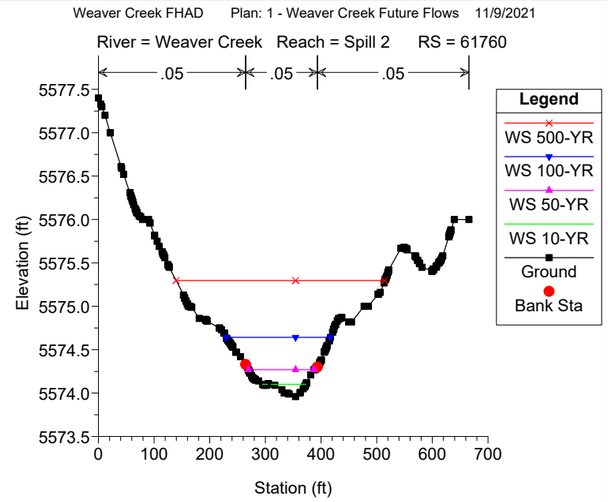

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Willow Spill RS = 400179
.045 .045 .045
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

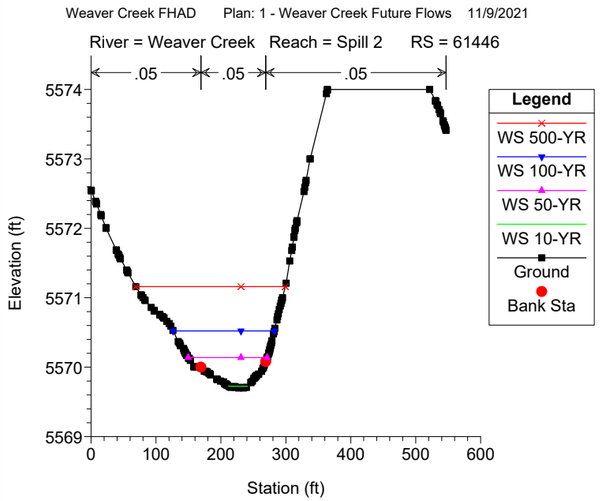

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 62552
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

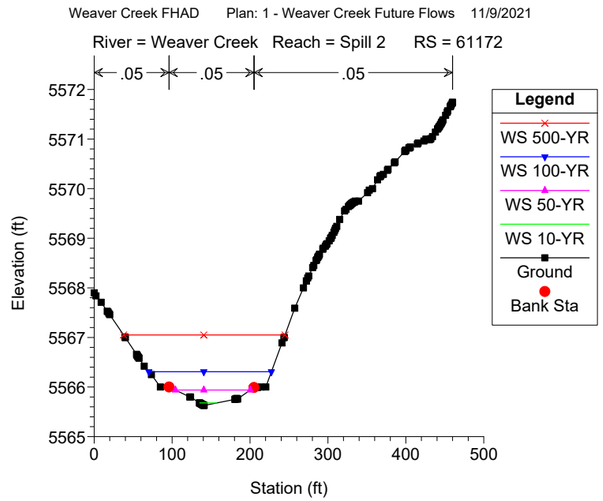

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 62410
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

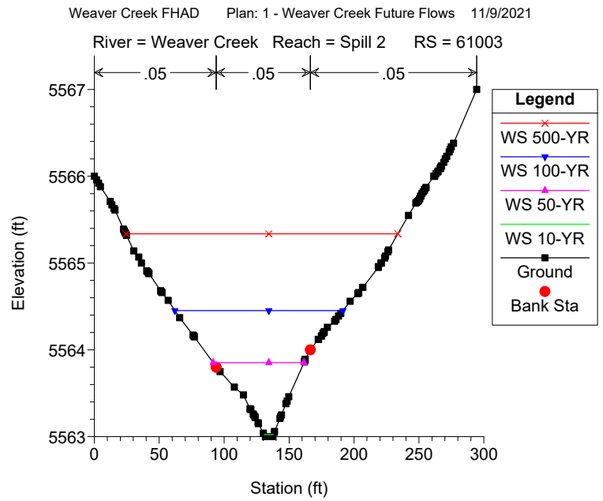

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 62223
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

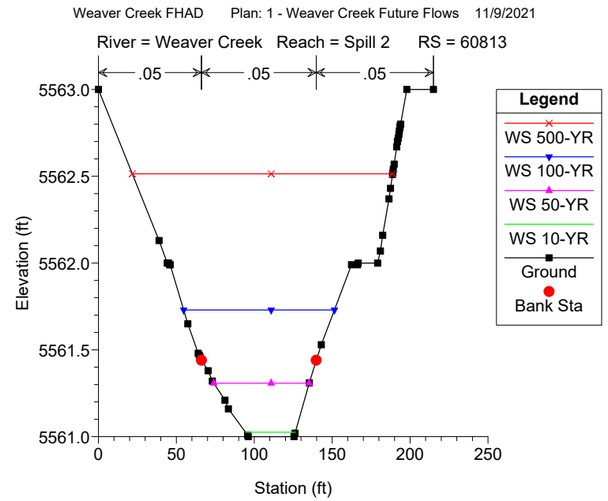

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 62025
.05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Ineff
Bank Sta

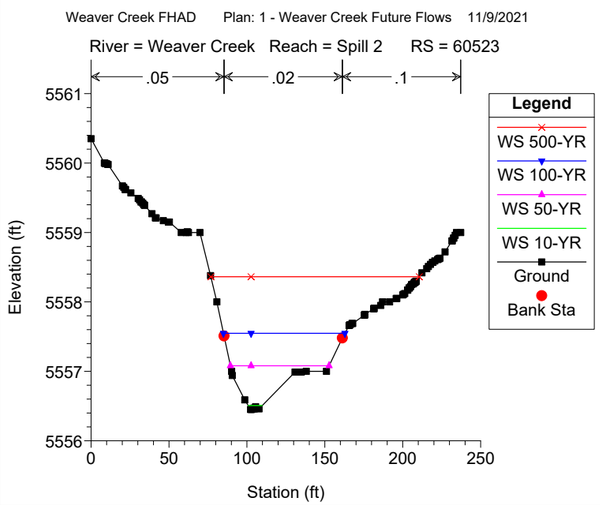

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 61760
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

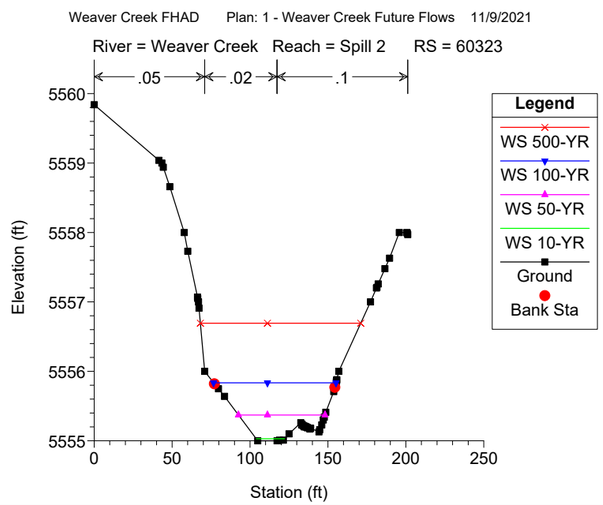

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 61446
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

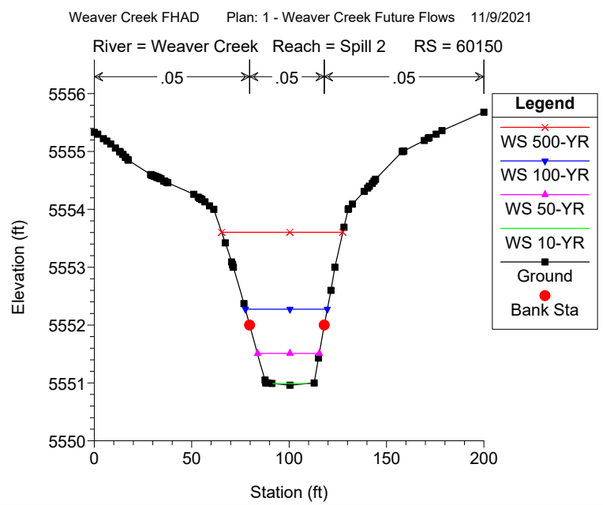

Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 61172
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 61003
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 60813
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 60523
.05 .02 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 60323
.05 .02 .1
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta


Weaver Creek FHAD Plan: 1 - Weaver Creek Future Flows 11/9/2021
River = Weaver Creek Reach = Spill 2 RS = 60150
.05 .05 .05
Elevation (ft)
Station (ft)
Legend
WS 500-YR
WS 100-YR
WS 50-YR
WS 10-YR
Ground
Bank Sta

APPENDIX D

FLOODPLAIN AND FLOODWAY DATA TABLES

Table D-1 - Floodplain and Floodway Data Table - Existing Infrastructure, Future Land Use

Note:
1. Floodway equal to floodplain.
2. Floodplain top width includes high ground or obstruction.
3. Floodplain top width includes IEFA.
4. Floodway top width includes high ground or obstruction.
5. Floodway top width includes IEFA.
6. Floodplain includes IEFA from structure modeling.
7. Floodway includes IEFA from structure modeling.

Reference Location	River Station	Cross Section	Thalweg Elevation	Peak Discharge					Water Surface Elevation					100-Year Floodplain		100-Year Floodway (0.5-ft Rise in EGL)						Note	Comments
				10-Year	25-Year	50-Year	100-Year	500-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Width	Energy Grade Line (EGL)	WSEL	Width	Area	Velocity	HGL Surcharge	EGL Surcharge		
	(ft)			(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
Weaver Creek																							
River station is measured in feet from the confluence with Bear Creek.	+68	68	5439.9	594	1382	1801	2382	3620	5443.26	5445.12	5445.90	5446.88	5448.57	305	5447.17	5447.25	77	522	4.6	0.38	0.42	3	Normal depth based on Bear Creek slope near the confluence.
	1+00	100	5440.8	594	1382	1801	2382	3620	5443.30	5445.05	5445.79	5446.72	5448.39	271	5447.61	5447.20	72	360	6.6	0.49	0.35	3	
	2+00	200	5443.0	594	1382	1801	2382	3620	5446.71	5447.82	5448.28	5449.04	5450.44	60	5451.00	5449.10	44	204	11.7	0.06	0.39		
	3+50	350	5443.7	594	1382	1801	2382	3620	5450.30	5452.39	5453.22	5454.10	5455.61	81	5454.95	5454.37	81	374	6.4	0.27	0.17	1	
	3+78	378	5443.8	594	1382	1801	2382	3620	5450.78	5452.71	5453.47	5454.27	5455.60	59	5455.67	5454.48	59	282	8.4	0.21	0.08	1	
	3+83	383	5447.1	594	1382	1801	2382	3620	5451.17	5452.77	5453.40	5454.21	5455.65	56	5456.25	5454.21	56	223	10.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	3+92	392	5448.6	594	1382	1801	2382	3620	5451.99	5453.52	5454.15	5454.91	5456.30	57	5456.91	5454.91	57	226	10.6	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	4+02	402	5448.6	594	1382	1801	2382	3620	5452.61	5454.01	5454.61	5455.38	5456.76	56	5457.39	5455.38	56	227	10.5	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	6+47	647	5452.6	594	1382	1801	2382	3620	5456.71	5458.89	5459.74	5460.69	5462.32	73	5461.85	5460.69	73	306	8.0	0.00	0.00	6,7	Mapped floodplain includes split flow floodplain in right overbank.
D/S Dartmouth Avenue	6+70	670	5452.6	594	1382	1801	2382	3620	5457.17	5459.50	5460.40	5461.31	5462.62	66	5462.11	5461.31	66	421	7.2	0.00	0.00	6,7	Mapped floodplain includes split flow floodplain in right overbank.
U/S Dartmouth Avenue	8+73	873	5456.7	594	1382	1801	2382	3620	5459.51	5461.72	5462.55	5463.65	5466.70	199	5464.22	5463.65	72	436	6.0	0.00	0.00	6,7	Mapped top width includes area of shallow flooding in right overbank.
	8+83	883	5457.9	594	1382	1801	2382	3620	5459.50	5461.48	5462.32	5463.43	5466.56	208	5464.35	5463.43	68	338	7.7	0.00	0.00	6,7	Mapped top width includes area of shallow flooding in right and left overbanks.
	9+00	900	5462.8	594	1382	1801	2382	3620	5464.97	5466.15	5466.67	5467.31	5468.52	227	5469.05	5467.34	63	228	10.5	0.02	0.07		Mapped top width includes area of shallow flooding in right and left overbanks.
	9+10	910	5463.0	594	1382	1801	2382	3620	5465.81	5467.00	5467.48	5468.14	5469.32	238	5469.88	5468.17	66	233	10.2	0.02	0.02		Mapped top width includes area of shallow flooding in right and left overbanks.
	10+37	1037	5464.0	594	1382	1801	2382	3620	5467.42	5468.76	5469.36	5470.07	5471.42	265	5471.04	5470.08	83	320	7.5	0.01	0.00		Mapped top width includes area of shallow flooding in right and left overbanks.
	13+00	1300	5465.0	594	1382	1801	2382	3620	5468.65	5470.19	5470.82	5471.57	5472.93	296	5472.25	5471.57	88	381	6.3	0.00	0.00		Mapped top width includes area of shallow flooding in right and left overbanks.
	16+44	1644	5465.5	576	1347	1753	2316	3520	5470.02	5471.52	5472.13	5472.86	5474.13	197	5473.81	5472.86	63	300	7.7	0.00	0.00		Mapped top width includes area of shallow flooding in right and left overbanks.
	16+58	1658	5465.7	576	1347	1753	2316	3520	5470.31	5471.94	5472.61	5473.41	5474.81	200	5473.92	5473.41	57	403	5.8	0.00	0.00		Mapped top width includes area of shallow flooding in right and left overbanks.
	16+82	1682	5476.6	576	1347	1753	2316	3520	5478.48	5479.78	5480.33	5481.04	5482.39	203	5483.13	5481.04	48	200	11.6	0.00	0.00		Mapped top width includes area of shallow flooding in right and left overbanks.
	17+06	1706	5476.0	576	1347	1753	2316	3520	5479.50	5481.04	5481.70	5482.51	5484.02	203	5483.73	5482.51	48	287	8.8	0.00	0.00		Mapped top width includes area of shallow flooding in right and left overbanks.
	17+12	1712	5481.2	576	1347	1753	2316	3520	5482.98	5484.26	5484.80	5485.55	5487.47	203	5487.61	5485.55	48	201	11.5	0.00	0.00		Mapped top width includes area of shallow flooding in right and left overbanks.
	17+34	1734	5482.5	576	1347	1753	2316	3520	5484.22	5485.71	5486.50	5487.53	5488.40	202	5488.09	5487.53	100	394	5.9	0.00	0.00		Mapped top width includes area of shallow flooding in right and left overbanks.
	19+39	1939	5486.0	576	1347	1753	2316	3520	5489.63	5490.46	5491.01	5491.67	5492.89	69	5493.37	5491.70	69	233	9.9	0.03	0.00		
	23+23	2323	5488.0	576	1347	1753	2316	3520	5491.03	5492.84	5493.58	5494.49	5496.11	226	5494.54	5494.53	191	1204	1.9	0.04	0.05		
	25+43	2543	5489.0	566	1329	1727	2277	3459	5491.34	5493.09	5493.82	5494.71	5496.31	158	5494.95	5494.72	100	483	4.7	0.01	0.12		
	28+36	2836	5492.3	566	1329	1727	2277	3459	5495.18	5495.84	5496.17	5496.60	5497.57	94	5497.80	5496.99	75	275	8.3	0.39	0.32		
	31+00	3100	5496.0	566	1329	1727	2277	3459	5498.70	5500.29	5500.84	5501.47	5502.53	99	5502.17	5501.50	70	310	7.4	0.02	0.21		
	31+28	3128	5501.0	566	1329	1727	2277	3459	5502.30	5503.07	5503.40	5503.81	5504.55	127	5504.93	5503.83	98	250	9.1	0.02	0.18		
	31+55	3155	5499.0	566	1329	1727	2277	3459	5502.92	5503.92	5504.31	5504.78	5505.60	119	5505.36	5505.01	104	414	5.5	0.22	0.17		
	32+80	3280	5499.0	566	1329	1727	2277	3459	5503.43	5504.70	5505.20	5505.80	5506.88	191	5505.97	5505.91	185	725	3.1	0.11	0.10		
	32+97	3297	5501.0	566	1329	1727	2277	3459	5503.46	5504.72	5505.22	5505.83	5506.90	191	5506.02	5505.93	186	675	3.4	0.10	0.09		
	35+24	3524	5503.0	566	1329	1727	2277	3459	5505.37	5506.07	5506.41	5506.87	5507.76	142	5507.54	5506.87	140	353	6.4	0.01	0.00		
	37+00	3700	5506.0	566	1329	1727	2277	3459	5508.23	5509.26	5509.60	5509.99	5510.61	92	5511.07	5509.99	87	275	8.3	0.00	0.03		
	37+54	3754	5506.8	566	1329	1727	2277	3459	5509.09	5510.17	5510.59	5511.10	5512.12	81	5512.19	5511.10	75	267	8.5	0.00	0.09		
	37+70	3770	5507.0	566	1329	1727	2277	3459	5509.20	5510.64	5511.15	5511.79	5512.99	91	5512.44	5511.84	84	350	6.5	0.06	0.10		
	38+04	3804	5507.0	566	1329	1727	2277	3459	5510.48	5511.01	5511.46	5512.13	5513.37	139	5512.96	5512.19	95	266	8.6	0.05	0.48	3	
	38+22	3822	5507.0	566	1329	1727	2277	3459	5511.53	5512.50	5512.91	5513.40	5514.29	110	5514.76	5513.55	77	258	8.8	0.16	0.25	3	
	38+34	3834	5507.0	566	1329	1727	2277	3459	5511.80	5513.04	5513.61	5514.17	5515.19	95	5515.66	5514.18	72	253	9.0	0.01	0.08	3	
	38+83	3883	5507.0	566	1329	1727	2277	3459	5512.27	5513.99	5514.33	5514.68	5514.84	58	5516.46	5514.76	57	363	10.6	0.08	0.05	6,7	
D/S Hampden Avenue/Highway 285	38+93	3893	5506.7	566	1329	1727	2277	3459	5512.24	5513.83	5514.04	5514.09	5516.10	52	5517.38	5514.20	51	304	14.3	0.10	0.01	6,7	Overtopping of Hampden Avenue/US 285.
U/S Hampden Avenue/Highway 286	43+39	4339	5520.3	566	1329	1727	2277	3459	5525.84	5530.04	5530.45	5530.91	5531.60	245	5531.04	5530.91	148	829	2.9	0.00	0.01	6,7	Overtopping of Hampden Avenue/US 285. The adjacent pond was not included in top width of the 100-year floodplain.
	43+49	4349	5521.3	566	1329	1727	2277	3459	5525.87	5530.06	5530.48	5530.96	5531.67	255	5531.06	5530.96	125	873	2.7	0.00	0.01	6,7	The adjacent pond was not included in top width of the 100-year floodplain.
	45+50	4550	5525.0	566	1329	1727	2277	3459	5526.80	5530.24	5530.70	5531.21	5532.00	87	5531.76	5531.25	82	390	5.8	0.04	0.03		The adjacent pond was not included in top width of the 100-year floodplain.
	47+70	4770	5528.0	541	1273	1649	2177	3329	5531.28	5531.90	5532.48	5533.18	5534.40	86	5534.06	5533.18	80	290	7.5	0.00	0.01		The adjacent pond was not included in top width of the 100-year floodplain.
D/S Pedestrian Bridge	47+80	4780	5528.0	541	1273	1649	2177	3329	5531.40	5532.31	5532.83	5533.47	5534.59	83	5534.24	5533.48	80	313	7.0	0.01	0.01		
U/S Pedestrian Bridge	48+36	4836	5529.9	541	1273	1649	2177	3329	5532.10	5533.29	5533.78	5534.41	5535.64	88	5535.18	5534.41	82	311	7.0	0.00	0.01		
	48+46	4846	5530.0	541	1273	1649	2177	3329	5532.23	5533.42	5533.90	5534.52	5535.74	89	5535.32	5534.53	82	307	7.1	0.00	0.01		
	50+00	5000	5530.2	541	1273	1649	2177	3329	5533.95	5535.36	5535.91	5536.59	5537.83	212	5537.05	5536.63	70	343	6.3	0.03	0.23		Mapped top width includes area of shallow flooding.
	51+06	5106	5530.4	541	1273	1649	2177	3329	5534.66	5536.15	5536.67	5537.23	5537.88	352	5538.66	5537.58	70	449	9.1	0.34	0.21	6,7	Mapped top width includes area of shallow flooding.
D/S Warrior Canal	51+26	5126	5530.4	541	1273	1649	2177	3329	5534.83	5537.20	5538.23	5539.54	5543.53	427	5543.48	5539.62	70	443	15.8	0.07	0.00	6,7	Mapped top width includes area of shallow flooding in right overbank.
U/S Warrior Canal	52+23	5223	5534.8	541	1273	1649	2177	3329	5542.98	5543.49	5543.81	5544.21	5544.72	547	5544.39	5544.58	225	894	3.4	0.38	0.45	2,6,7	Overtopping of Warrior Canal. Mapped top width includes ineffective area and high ground in right overbank.
	52+70	5270	5537.0	541	1273	1649	2177	3329	5543.04	5543.63	5543.95	5544.33	5544.87	482	5544.55	5544.76	220	814	3.4	0.43	0.44	2,6,7	
	53+32	5332	5537.9	541	1273	1649	2177	3329	5543.16	5543.87	5544.19	5544.59	5545.22	487	5544.67	5545.00	210	886	2.5	0.41	0.42	2,3	
	53+71	5371	5538.4	541	1273	1649	2177	3329	5543.17	5543.89	5544.22	5544.62	5545.24	484	5544.71	5545.01	190	825	2.6	0.40	0.42	2,3	
	54+89	5489	5539.0	541	1273	1649	2177	3329	5543.21	5543.99	5544.33	5544.74	5545.38	255	5544.95	5545.12	170	569	3.8	0.38	0.41		
	56+79	5679	5540.0	541	1273	1649	2177	3329	5543.95	5544.90	5545.24	5545.65	5546.37	165	5546.17	5545.89	120	373	5.8	0.24	0.28		
	59+94	5994	5544.0	541	1273	1649	2177	3329	5546.51	5547.41	5547.79	5548.26	5549.12	158	5548.67	5548.42	105	371	5.9	0.17	0.30		
	61+81	6181	5544.0	541	1273	1649	2177	3329	5547.76	5548.75	5549.12	5549.59	5550.46	150	5550.23	5549.84	100	333	6.5	0.25	0.32		
	63+97	6397	5547.0	541	1273	1649	2177	3329	5550.15	5551.21	5551.60	5552.07	5552.90	137	5552.71	5552.13	100	336	6.5	0.06	0.12		
	65+49	6549	5548.0	541	1273	1649	2177	3329	5551.18	5552.33	5552.75	5553.24	5554.10	130	5553.99	5553.28	100	332	6.6	0.04	0.04		
	68+01	6801	5551.0	541	1273	1649	2177	3329	5553.94	5554.79	5555.20	5555.64	5556.46	294	5555.89	5555.77	215	473	4.6	0.13	0.23		
	68+86	6886	5551.0	541	1273	1649	2177	3329	5555.48	5556.52	5556.64	5556.91	5557.38	336	5557.55	5557.27	259	468	4.7	0.36	0.50		
	70+10	7010	5553.0	541	1273	1649	2177	3329	5556.70	5557.54	5557.88	5558.24	5558.89	313	5558.45	5558.67	210	609	3.6	0.43	0.47		
	71+38	7138	5555.0	504	1199	1550	2060	3251	5557.35	5558.62	5558.93	5559.00	5559.78	255	5560.03	5559.32	160	306	6.7	0.32	0.13		
	73+05	7305	5555.0	504	1199	1550	2060	3251	5559.92	5560.83	5561.20	5561.66	5562.13	215	5561.95	5561.73	130	399	5.2	0.07	0.22		
	76+76	7676	5560.0	504	1199	1550	2060	3251	5562.59	5563.61	5563.96	5564.38	5565.42	138	5565.11	5564.66	134	363	5.7	0.28	0.11		
	80+09	8009	5563.0	504	1199	1550	2060	3251	5566.43	5567.07	5567.38	5567.81	5568.53	215	5568.21	5567.82	140	304	6.8	0.01	0.44		
	83+00	8300	5567.0	504	1199	1550	2060	3251	5569.92	5570.63	5570.82	5571.08	5571.60	277	5571.68	5571.58	205	425	4.8	0.50	0.33		
	85+31	8531	5569.0	504	1199	1550	2060	3251	5572.56	5573.60	5573.97	5574.73	5575.36	235	5575.53	5574.73	170	329	6.3	0.00	0.07		
	85+48	8548	5570.0	504	1199	1550	2060	3251	5572.65	5573.82	5574.27	5575.11	5575.86	259	5575.80	5575.13	200	378	5.5	0.02	0.01		
	86+05	8605	5570.0	504	1199	1550	2060	3251	5573.47	5575.06	5575.66	5575.86	5576.53	262	5576.11	5575.86	195	579	3.6	0.00	0.01		
	87+79	8779	5571.0	504	1199	1550	2060	3251	5573.89	5575.48	5576.02	5576.35	5577.12	288	5576.63	5576.35	230	538	3.8	-0.01	0.01	1	Negative surcharge when encroachments set to 100-year floodplain extents.
	90+13	9013	5572.0	504	1199	1550	2060	3251	5576.26	5577.60	5577.83	5578.45	5578.95	225	5579.15	5578.45	225	353	5.8	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	92+40	9240	5575.0	504	1199	1550	2060	3251	5579.41	5580.78	5581.42	5581.72	5582.63	187	5582.36	5581.72	187	379	5.4	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.

Table D-1 - Floodplain and Floodway Data Table - Existing Infrastructure, Future Land Use

Note:
1. Floodway equal to floodplain.
2. Floodplain top width includes high ground or obstruction.
3. Floodplain top width includes IEFA.
4. Floodway top width includes high ground or obstruction.
5. Floodway top width includes IEFA.
6. Floodplain includes IEFA from structure modeling.
7. Floodway includes IEFA from structure modeling.

Reference Location	River Station	Cross Section	Thalweg Elevation	Peak Discharge					Water Surface Elevation					100-Year Floodplain		100-Year Floodway (0.5-ft Rise in EGL)						Note	Comments
				10-Year	25-Year	50-Year	100-Year	500-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Width	Energy Grade Line (EGL)	WSEL	Width	Area	Velocity	HGL Surcharge	EGL Surcharge		
	(ft)			(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	94+20	9420	5576.0	504	1199	1550	2060	3251	5580.94	5583.01	5583.24	5583.79	5584.64	179	5584.47	5583.79	179	341	6.0	0.00	0.00	1	
	97+34	9734	5583.0	504	1199	1550	2060	3251	5585.24	5586.18	5586.60	5587.00	5587.78	218	5587.24	5587.13	140	482	4.3	0.13	0.18		
	101+66	10166	5587.0	504	1199	1550	2060	3251	5589.61	5590.04	5590.21	5590.52	5591.04	712	5590.82	5590.77	233	377	5.5	0.25	0.42	2	
	103+44	10344	5587.9	504	1199	1550	2060	3251	5592.23	5593.05	5593.21	5593.35	5593.60	665	5593.67	5593.53	305	445	4.6	0.18	0.28		
	105+51	10551	5589.0	494	1173	1509	1987	3171	5594.42	5595.39	5595.58	5595.87	5596.38	485	5596.22	5596.02	308	455	4.4	0.15	0.19	3	
	107+66	10766	5591.0	494	1173	1509	1987	3171	5596.69	5597.50	5597.78	5598.02	5598.51	599	5598.51	5598.11	125	313	6.4	0.09	0.29	3	Floodplain mapped wider in right overbank to include local low point
	109+55	10955	5593.0	494	1173	1509	1987	3171	5598.29	5599.36	5599.74	5600.15	5600.73	521	5600.53	5600.46	86	332	6.0	0.31	0.49	2,3	
	110+82	11082	5595.0	494	1173	1509	1987	3171	5599.30	5600.34	5600.75	5601.20	5601.84	239	5601.55	5601.64	126	459	4.3	0.44	0.39		
	112+17	11217	5597.0	494	1173	1509	1987	3171	5600.22	5601.30	5601.69	5602.18	5602.98	167	5602.57	5602.37	100	376	5.3	0.19	0.24		
	113+27	11327	5598.0	494	1173	1509	1987	3171	5600.76	5602.00	5602.43	5602.94	5603.88	167	5603.18	5603.16	130	529	3.8	0.21	0.20		
	115+52	11552	5599.0	494	1173	1509	1987	3171	5601.77	5603.10	5603.55	5604.09	5605.13	261	5604.45	5604.19	100	386	5.2	0.10	0.15	2,3	
	118+90	11890	5601.0	494	1173	1509	1987	3171	5604.59	5605.80	5606.22	5606.74	5608.08	148	5607.18	5606.92	95	352	5.6	0.18	0.24	3	
	119+92	11992	5600.1	455	1082	1391	1865	3074	5605.01	5606.41	5606.90	5607.49	5609.06	314	5607.76	5607.72	103	679	4.0	0.23	0.21	6,7	
D/S West Quincy Avenue	120+12	12012	5600.0	455	1082	1391	1865	3074	5605.02	5606.42	5606.91	5607.49	5609.11	283	5607.91	5607.72	100	646	5.0	0.22	0.20	6,7	Overtopping of West Quincy Avenue.
U/S West Quincy Avenue	122+37	12237	5601.3	455	1082	1391	1865	3074	5605.29	5607.79	5608.97	5609.80	5611.00	278	5609.97	5610.18	120	689	3.2	0.38	0.39	6,7	Overtopping of West Quincy Avenue.
	122+79	12279	5602.9	455	1082	1391	1865	3074	5606.19	5607.62	5609.03	5609.89	5611.09	248	5610.11	5610.24	130	495	3.9	0.36	0.38	6,7	
	126+77	12677	5606.9	376	895	1159	1595	2788	5610.99	5612.09	5612.17	5612.26	5612.90	97	5612.88	5612.26	90	255	6.3	0.00	0.01		
	129+69	12969	5608.0	376	895	1159	1595	2788	5612.41	5613.77	5614.29	5615.03	5616.51	117	5615.33	5615.09	85	332	4.8	0.06	0.13		
	132+14	13214	5608.3	376	895	1159	1595	2788	5613.91	5615.41	5615.90	5616.54	5617.80	52	5617.38	5616.72	50	233	6.8	0.18	0.11		
	133+84	13384	5608.6	376	895	1159	1595	2788	5614.28	5616.18	5616.87	5617.83	5619.87	84	5617.97	5617.92	70	532	3.0	0.09	0.10	6	
D/S Simms Street	134+11	13411	5608.6	376	895	1159	1595	2788	5614.29	5616.18	5616.87	5617.82	5619.81	96	5618.08	5617.91	55	423	4.0	0.09	0.09	6,7	Mapped floodplain excludes adjacent pond in the right overbank.
U/S Simms Street	135+75	13575	5608.7	336	807	1071	1488	2682	5614.41	5616.61	5617.51	5618.83	5622.63	87	5619.00	5618.90	74	483	3.1	0.07	0.07	6	Mapped floodplain excludes adjacent pond in the right overbank.
	136+14	13614	5613.0	272	661	908	1276	2432	5614.98	5616.38	5617.36	5618.75	5622.61	80	5619.12	5618.83	80	283	4.5	0.08	0.06	1	Mapped floodplain excludes adjacent pond in the right overbank.
	136+28	13628	5611.3	272	661	908	1276	2432	5615.53	5616.52	5617.37	5618.73	5622.62	76	5619.22	5618.81	76	246	5.2	0.08	0.05	1	Mapped floodplain excludes adjacent pond in the right overbank.
	136+29	13629	5614.1	272	661	908	1276	2432	5615.89	5616.99	5617.44	5618.54	5622.59	74	5619.32	5618.64	74	196	6.5	0.10	0.04	1	Mapped floodplain excludes adjacent pond in the right overbank.
	136+39	13639	5614.7	272	661	908	1276	2432	5616.53	5617.54	5618.02	5618.67	5622.55	70	5619.83	5618.67	69	150	8.5	0.00	0.00	1	Mapped floodplain excludes adjacent pond in the right overbank.
	136+79	13679	5615.0	272	661	908	1276	2432	5618.00	5619.13	5619.66	5620.09	5622.52	66	5621.15	5620.09	66	155	8.2	0.00	0.00	1	Mapped floodplain excludes adjacent pond in the right overbank.
	136+94	13694	5613.1	272	661	908	1276	2432	5618.33	5619.73	5620.34	5621.01	5622.95	76	5621.37	5621.01	76	270	4.7	0.00	0.00	1	Mapped floodplain excludes adjacent pond in the right overbank. FP = FW, No encroachments defined due to negative surcharges.
	136+99	13699	5617.4	272	661	908	1276	2432	5618.90	5619.86	5620.25	5620.79	5622.55	71	5621.91	5620.79	71	153	8.3	0.00	0.00	1	Mapped floodplain excludes adjacent pond in the right overbank.
	137+09	13709	5617.4	272	661	908	1276	2432	5619.36	5620.28	5620.69	5621.21	5622.64	73	5622.16	5621.21	73	163	7.8	0.00	0.00	1	Mapped floodplain excludes ineffective area in left overbank and adjacent pond.
	138+31	13831	5617.9	272	661	908	1276	2432	5621.40	5622.59	5623.02	5623.51	5624.69	73	5624.51	5623.51	73	170	7.5	0.00	0.00	1	Mapped floodplain excludes ineffective area in left overbank.
	139+60	13960	5619.4	272	661	908	1276	2432	5623.09	5624.28	5624.77	5625.36	5626.80	66	5626.35	5625.36	66	175	7.3	0.00	0.00	1	Mapped floodplain excludes ineffective area in left overbank.
	139+70	13970	5619.4	272	661	908	1276	2432	5623.20	5624.77	5625.62	5626.26	5627.64	72	5627.39	5626.30	71	170	7.5	0.04	0.00	1	Mapped floodplain excludes ineffective area in left overbank.
	139+72	13972	5621.7	272	661	908	1276	2432	5624.28	5625.70	5626.14	5626.69	5627.81	74	5627.77	5626.71	74	168	7.6	0.02	0.00	1	Mapped floodplain excludes ineffective area in left overbank.
	139+82	13982	5622.0	272	661	908	1276	2432	5624.96	5626.39	5626.84	5627.35	5628.35	76	5628.43	5627.40	76	167	7.6	0.04	0.00	1	Mapped floodplain excludes ineffective area in left overbank.
	143+17	14317	5625.0	272	661	908	1276	2432	5629.25	5630.36	5630.84	5631.47	5632.27	90	5631.95	5631.47	76	233	5.5	0.00	0.03		Mapped floodplain excludes ineffective area in left overbank.
	144+75	14475	5626.0	272	661	908	1276	2432	5630.38	5631.53	5632.01	5632.62	5634.13	85	5633.26	5632.67	85	212	6.0	0.05	0.02	1	Mapped floodplain excludes ineffective area in left overbank.
	146+58	14658	5627.9	272	661	908	1276	2432	5631.83	5633.22	5633.70	5634.31	5635.59	78	5635.01	5634.32	71	196	6.5	0.01	0.02		
	146+68	14668	5627.9	272	661	908	1276	2432	5631.71	5633.17	5633.68	5634.32	5635.65	74	5635.15	5634.33	69	181	7.1	0.02	0.02		
	146+71	14671	5629.8	272	661	908	1276	2432	5632.22	5633.39	5633.86	5634.45	5635.79	77	5635.60	5634.51	70	160	8.0	0.06	0.03		
	146+81	14681	5629.8	272	661	908	1276	2432	5632.85	5634.22	5634.72	5635.28	5636.37	91	5636.26	5635.28	75	168	7.6	0.00	0.06		
	149+09	14909	5632.3	272	661	908	1276	2432	5636.19	5637.37	5637.81	5638.35	5639.73	76	5639.04	5638.46	49	177	7.2	0.11	0.29		
	149+22	14922	5631.1	272	661	908	1276	2432	5636.18	5637.10	5637.57	5638.37	5640.00	51	5639.83	5638.38	51	134	9.6	0.02	0.00	1	
	149+27	14927	5634.4	272	661	908	1276	2432	5637.50	5638.64	5639.21	5639.83	5641.23	77	5640.99	5639.83	62	155	8.2	0.00	0.02		
	149+40	14940	5634.0	272	661	908	1276	2432	5637.92	5639.16	5639.70	5640.35	5641.56	89	5641.38	5640.36	83	171	7.5	0.02	-0.01		
	150+58	15058	5635.0	272	661	908	1276	2432	5639.34	5640.94	5641.46	5642.02	5643.18	69	5642.66	5642.03	61	207	6.2	0.02	0.03		
	150+68	15068	5634.0	272	661	908	1276	2432	5639.43	5641.00	5641.52	5642.06	5643.10	64	5642.73	5642.12	62	219	5.8	0.05	0.03		
	150+77	15077	5638.9	272	661	908	1276	2432	5641.78	5643.01	5643.40	5643.95	5644.95	115	5644.79	5643.91	102	196	6.5	-0.04	-0.03		
	150+87	15087	5639.0	272	661	908	1276	2432	5642.06	5643.38	5643.79	5644.31	5645.35	109	5645.17	5644.29	99	198	6.5	-0.02	-0.02		Mapped floodplain does not include ineffective area in right overbank.
	153+81	15381	5642.0	273	533	751	1059	2146	5646.28	5647.04	5647.53	5648.04	5649.31	82	5648.65	5648.02	82	183	5.8	-0.02	-0.01		
	156+00	15600	5642.3	273	533	751	1059	2146	5647.77	5648.69	5649.25	5649.89	5651.21	90	5650.40	5649.93	49	165	6.4	0.04	0.22		
	156+39	15639	5645.4	273	533	751	1059	2146	5647.98	5648.78	5649.38	5650.01	5651.91	97	5651.25	5650.01	49	125	8.5	0.00	0.03	3	
D/S Pedestrian Bridge	156+69	15669	5645.4	273	533	751	1059	2146	5648.75	5649.72	5650.25	5650.64	5652.23	104	5651.77	5650.67	42	131	8.1	0.03	0.04	2,3	
U/S Pedestrian Bridge	156+96	15696	5645.4	273	533	751	1059	2146	5649.03	5650.05	5650.67	5651.42	5654.95	201	5652.21	5651.43	44	159	6.7	0.01	0.00	2,3	
	156+97	15697	5644.4	273	533	751	1059	2146	5649.11	5650.15	5650.78	5651.53	5654.97	200	5652.23	5651.54	43	173	6.1	0.01	0.00	2,3	
	157+06	15706	5644.6	273	533	751	1059	2146	5649.11	5650.11	5650.71	5651.43	5654.94	171	5652.37	5651.43	41	145	7.3	0.00	0.00	2,3	
	157+10	15710	5646.5	273	533	751	1059	2146	5649.14	5650.11	5650.69	5651.45	5654.85	168	5652.94	5651.49	40	113	9.4	0.04	0.00	2,3	
	157+19	15719	5646.6	273	533	751	1059	2146	5649.64	5650.57	5651.07	5651.60	5654.86	140	5653.17	5651.69	39	113	9.4	0.09	0.00	2,3	
	157+48	15748	5646.8	273	533	751	1059	2146	5650.27	5651.30	5651.98	5652.87	5655.15	92	5653.61	5652.83	65	167	6.3	-0.04	-0.02	1	Floodplain includes high ground and shallow flooding in left overbank from upstream
	157+58	15758	5646.9	273	533	751	1059	2146	5650.43	5651.51	5652.22	5653.11	5655.22	84	5653.70	5653.09	67	196	5.4	-0.02	-0.01	1,2	Floodplain includes high ground
	157+60	15760	5646.1	273	533	751	1059	2146	5650.49	5651.58	5652.29	5653.19	5655.28	84	5653.71	5653.17	70	206	5.1	-0.02	-0.01	1,2	Floodplain includes high ground
	157+68	15768	5646.1	273	533	751	1059	2146	5650.48	5651.55	5652.27	5653.19	5655.39	84	5653.77	5653.17	84	199	5.3	-0.02	-0.01	1	
	157+73	15773	5647.6	273	533	751	1059	2146	5650.24	5651.19	5651.83	5652.94	5655.30	81	5653.94	5652.90	81	149	7.1	-0.04	0.00	1	Floodplain and floodway mapped wider in the left overbank based on flow from upstream cross section.
	157+82	15782	5647.6	273	533	751	1059	2146	5650.91	5651.94	5652.90	5653.41	5655.30	85	5654.33	5653.47	85	169	6.3	0.06	0.00	1	
	158+64	15864	5648.4	273	533	751	1059	2146	5652.78	5653.74	5654.18	5654.72	5656.06	92	5655.14	5654.69	92	219	4.8	-0.03	-0.02	1	
	159+37	15937	5649.1	273	533	751	1059	2146	5653.76	5654.55	5655.04	5655.61	5657.11	97	5655.93	5655.61	97	248	4.3	0.00	0.00	1	Mapped floodplain does not include ineffective area in the left overbank.
	160+51	16051	5650.9	273	533	751	1059	2146	5654.86	5655.67	5656.16	5656.73	5658.23	93	5657.19	5656.73	93	212	5.0	0.00	0.00	1	Mapped floodplain does not include ineffective area in the left overbank.
	161+80	16180	5651.0	273	533	751	1059	2146	5655.65	5656.54	5657.04	5657.60	5658.89	61	5658.33	5657.60	59	163	6.5	0.00	0.00		
	161+98	16198	5651.4	273	533	751	1059	2146	5655.18	5657.04	5658.07	5658.78	5660.50	109	5659.86	5658.85	69	144	7.4	0.08	0.00		Flooding in left and right overbanks from upstream. Mapped floodplain does not include ineffective area in left overbank.
	161+99	16199	5654.1	273	533	751	1059	2146	5657.40	5658.42	5658.90	5659.45	5660.63	115	5660.35	5659.54	95	169	6.3	0.10	-0.01		Flooding in left overbank from upstream. Mapped floodplain does not include ineffective area in left overbank.
	162+09	16209	5654.6	273	533	751	1059	2146	5657.80	5658.98	5659.62	5660.19	5660.99	139	5660.87	5660.19	125	195	5.4	0.00	0.00		Mapped floodplain does not include ineffective area in left overbank.
	163+23	16323	5655.0	273	533	751	1059	2146	5659.64	5660.59	5661.00	5661.39	5662.31	108	5661.92	5661.39	108	213	5.0	0.00	0.00	1	
	164+85	16485	5656.0	273	533	751	1059	2146	5660.59	5661.52	5662.03	5662.64	5663.95	94	5663.21	5662.64	84	191	5.5	0.00	0.00		
	167+20	16720	5659.0	183	450	636	897	1963	5662.67	5663.71	5664.24	5664.82	5666.31	84	5665.17	5664.82	84	205	4.4	0.00	0.00	1	
	167+76	16776	5659.5	183	450	636	897	1963	5663.09	5664.13	5664.59	5665.11	5666.48	73	5665.87	5665.11	73	213	6.3	0.00	0.00	1,6,7	
D/S Pedestrian Crossing	167+86	16786	5660.2	183	450	636	897	1963	5663.05	5663.99	5664.54	5665.45	5666.88	75	5666.40	5665.45	75	204	6.6	0.00	0.00	1,6,7	Overtopping of pedestrian crossing. FP = FW, No encroachments defined due to negative surcharges.
U/S Pedestrian Crossing	168+32	16832	5660.8	183	450	636	897	1963	5665.67	5666.60	5666.99	5667.42	5668.45	102	5667.84	5667.42	102	192	4.7	0.00	0.00	1,6,7	Overtopping of pedestrian crossing. FP = FW, No encroachments defined due to negative surcharges.

Table D-1 - Floodplain and Floodway Data Table - Existing Infrastructure, Future Land Use

Note:
1. Floodway equal to floodplain.
2. Floodplain top width includes high ground or obstruction.
3. Floodplain top width includes IEFA.
4. Floodway top width includes high ground or obstruction.
5. Floodway top width includes IEFA.
6. Floodplain includes IEFA from structure modeling.
7. Floodway includes IEFA from structure modeling.

Reference Location	River Station	Cross Section	Thalweg Elevation	Peak Discharge					Water Surface Elevation					100-Year Floodplain		100-Year Floodway (0.5-ft Rise in EGL)						Note	Comments
				10-Year	25-Year	50-Year	100-Year	500-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Width	Energy Grade Line (EGL)	WSEL	Width	Area	Velocity	HGL Surcharge	EGL Surcharge		
	(ft)			(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	168+42	16842	5662.0	183	450	636	897	1963	5665.72	5666.67	5667.06	5667.51	5668.57	98	5667.96	5667.51	98	189	4.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	169+70	16970	5663.0	183	450	636	897	1963	5666.48	5667.58	5668.06	5668.57	5669.97	55	5669.54	5668.57	55	128	7.0	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	169+91	16991	5666.0	183	450	636	897	1963	5668.70	5670.03	5670.46	5670.90	5671.86	89	5671.69	5670.90	89	143	6.3	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	170+06	17006	5666.9	183	450	636	897	1963	5669.39	5670.43	5670.78	5671.11	5672.48	86	5671.93	5671.11	86	141	6.4	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	170+51	17051	5668.0	183	450	636	897	1963	5670.07	5671.05	5671.45	5671.90	5673.03	89	5672.64	5671.91	89	147	6.1	0.00	0.00	1	
	172+07	17207	5669.0	183	450	636	897	1963	5671.99	5672.97	5673.38	5673.82	5675.11	75	5674.31	5673.82	75	172	5.2	0.00	0.00	1	
	175+96	17596	5674.0	183	450	636	897	1963	5676.60	5678.07	5678.46	5678.88	5680.12	73	5679.75	5678.88	73	133	6.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	179+35	17935	5680.0	183	450	636	897	1963	5682.93	5683.86	5684.46	5685.12	5687.53	26	5686.72	5685.12	26	88	10.2	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	181+42	18142	5684.0	183	450	636	897	1963	5686.85	5688.43	5689.13	5689.97	5692.66	25	5691.81	5689.97	25	86	10.5	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	183+25	18325	5686.0	183	450	636	897	1963	5689.07	5690.85	5691.73	5692.78	5695.80	42	5693.12	5692.78	42	195	4.6	0.00	0.00	1,6,7	FP = FW, No encroachments defined due to negative surcharges.
D/S South Youngfield Street	183+35	18335	5686.0	183	450	636	897	1963	5689.15	5690.93	5691.81	5692.85	5695.86	44	5693.15	5692.85	44	212	4.4	0.00	0.00	1,6,7	FP = FW, No encroachments defined due to negative surcharges.
U/S South Youngfield Street	185+02	18502	5686.8	183	450	636	897	1963	5689.22	5691.27	5692.34	5693.63	5698.66	57	5693.80	5693.63	57	268	3.4	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	185+12	18512	5687.3	183	450	636	897	1963	5689.30	5691.29	5692.34	5693.62	5698.65	56	5693.84	5693.62	56	243	3.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	185+81	18581	5689.7	177	439	621	880	1935	5691.84	5692.84	5693.35	5693.90	5698.62	44	5695.09	5693.90	44	101	8.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	187+29	18729	5691.0	177	439	621	880	1935	5694.53	5695.90	5696.52	5697.22	5698.92	41	5697.94	5697.22	41	137	6.4	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	187+47	18747	5691.2	177	439	621	880	1935	5694.66	5696.09	5696.75	5697.50	5699.54	41	5698.15	5697.50	41	139	6.3	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	187+61	18761	5691.2	177	439	621	880	1935	5694.89	5696.31	5696.95	5697.69	5699.86	42	5698.31	5697.69	42	144	6.1	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	187+63	18763	5694.6	177	439	621	880	1935	5695.80	5696.74	5697.23	5697.87	5699.82	42	5699.15	5697.87	42	99	8.9	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	187+76	18776	5695.0	177	439	621	880	1935	5697.26	5698.38	5698.95	5699.48	5700.82	67	5700.45	5699.48	67	122	7.2	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	188+56	18856	5695.0	177	439	621	880	1935	5699.16	5700.25	5700.70	5701.25	5702.76	71	5701.69	5701.25	71	176	5.0	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	190+28	19028	5697.0	177	439	621	880	1935	5700.21	5701.56	5702.13	5702.74	5704.51	51	5703.19	5702.74	51	166	5.3	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	190+38	19038	5697.0	177	439	621	880	1935	5700.23	5701.59	5702.17	5702.78	5704.54	47	5703.30	5702.78	47	154	5.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	190+50	19050	5698.9	177	439	621	880	1935	5700.72	5701.75	5702.29	5702.92	5704.86	43	5704.22	5702.92	43	102	8.6	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	190+60	19060	5699.0	177	439	621	880	1935	5701.84	5702.90	5703.37	5703.98	5705.51	62	5705.01	5703.98	62	114	7.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	191+97	19197	5700.0	177	439	621	880	1935	5703.82	5705.16	5705.74	5706.34	5707.98	72	5706.74	5706.34	72	190	4.6	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	193+29	19329	5701.9	177	439	621	880	1935	5704.63	5706.02	5706.62	5707.27	5709.02	53	5707.78	5707.27	53	159	5.6	0.00	0.00	1	
	193+40	19340	5702.0	177	439	621	880	1935	5704.72	5706.07	5706.66	5707.30	5708.99	46	5707.95	5707.30	46	137	6.4	0.00	0.00	1	
	193+44	19344	5703.0	177	439	621	880	1935	5704.70	5706.07	5706.66	5707.30	5709.00	46	5708.03	5707.30	46	128	6.9	0.00	0.00	1	
	193+54	19354	5703.0	177	439	621	880	1935	5705.13	5706.32	5706.92	5707.58	5709.41	52	5708.20	5707.58	52	141	6.2	0.00	0.00	1	
	195+10	19510	5705.0	177	439	621	880	1935	5707.90	5709.11	5709.74	5710.30	5711.89	45	5711.29	5710.30	45	111	7.9	0.00	0.00	1	
	195+73	19573	5707.3	177	439	621	880	1935	5709.54	5710.71	5711.28	5711.91	5713.69	56	5712.64	5711.91	56	133	6.6	0.00	0.00	1	
	195+83	19583	5707.0	165	421	595	865	1891	5709.85	5710.96	5711.52	5712.11	5713.83	55	5712.81	5712.11	55	134	6.5	0.00	0.00	1	
	195+94	19594	5709.0	165	421	595	865	1891	5710.90	5711.88	5712.38	5713.00	5714.24	76	5713.87	5713.00	76	125	6.9	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	196+04	19604	5708.7	165	421	595	865	1891	5711.48	5712.44	5712.73	5713.33	5714.66	77	5714.22	5713.33	77	127	6.8	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	196+87	19687	5709.3	165	421	595	865	1891	5712.48	5713.72	5714.34	5714.89	5716.19	86	5715.66	5714.89	59	143	6.0	0.00	0.00		Flooding in left overbank from upstream.
	197+15	19715	5709.7	165	421	595	865	1891	5712.79	5713.87	5714.45	5714.95	5716.90	86	5716.51	5715.17	74	105	8.2	0.22	-0.04		Floodplain and floodway mapped wider in the left overbank based on flow from upstream cross section.
	197+16	19716	5711.5	165	421	595	865	1891	5713.20	5714.28	5714.84	5715.83	5718.06	87	5716.83	5715.97	75	142	6.1	0.14	-0.01		Floodplain and floodway mapped wider in the left overbank based on flow from upstream cross section.
	197+27	19727	5712.0	165	421	595	865	1891	5714.83	5716.20	5716.52	5716.92	5718.07	97	5717.61	5716.92	97	149	5.8	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	198+90	19890	5713.0	165	421	595	865	1891	5717.29	5718.55	5719.09	5719.62	5720.65	79	5720.22	5719.66	37	131	6.6	0.04	0.12		
	199+86	19986	5713.6	165	421	595	865	1891	5718.09	5719.54	5720.19	5720.83	5722.20	165	5721.53	5720.95	40	142	6.5	0.12	0.08	6,7	Floodplain mapped wider in the left and right overbanks based on flow from upstream cross section.
D/S Cole Street	199+96	19996	5713.7	165	421	595	865	1891	5718.36	5719.89	5720.59	5721.36	5723.45	193	5721.70	5721.43	35	193	4.6	0.07	0.06	6,7	Overtopping of Cole Street. Floodplain mapped wider in the left and right overbanks based on flow from upstream cross section.
U/S Cole Street	201+01	20101	5716.8	165	421	595	865	1891	5720.19	5723.11	5725.21	5725.87	5726.79	211	5725.95	5726.35	59	386	2.3	0.48	0.49	6,7	Overtopping of Cole Street.
	201+14	20114	5717.0	165	421	595	865	1891	5720.21	5723.13	5725.22	5725.88	5726.79	201	5725.96	5726.37	64	399	2.2	0.49	0.49	6	
	202+39	20239	5719.0	89	310	457	666	1092	5720.55	5723.31	5725.31	5725.99	5727.03	94	5726.07	5726.46	63	317	2.1	0.47	0.47		
	203+50	20350	5720.9	89	310	457	666	1092	5722.15	5723.71	5725.39	5726.07	5727.06	46	5726.35	5726.52	46	180	3.7	0.46	0.40	1	
	203+60	20360	5721.0	89	310	457	666	1092	5722.42	5723.83	5725.42	5726.08	5727.08	45	5726.42	5726.53	45	167	4.0	0.45	0.38	1	
	203+81	20381	5723.0	89	310	457	666	1092	5724.74	5726.06	5726.63	5727.31	5728.24	55	5728.30	5727.33	47	90	7.4	0.02	0.01		
	203+91	20391	5723.0	89	310	457	666	1092	5725.39	5726.80	5727.38	5728.01	5728.91	75	5728.52	5728.01	50	124	5.4	0.00	0.01		
	206+68	20668	5726.0	89	310	457	666	1092	5727.90	5729.49	5730.14	5730.79	5731.66	42	5731.19	5730.79	42	132	5.0	0.00	0.00	1	
	206+85	20685	5728.7	89	310	457	666	1092	5729.96	5731.07	5731.60	5732.25	5733.13	53	5733.20	5732.25	53	90	7.4	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	207+00	20700	5729.0	89	310	457	666	1092	5730.71	5731.85	5732.18	5732.90	5733.63	64	5733.74	5732.90	64	97	6.9	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	208+08	20808	5730.9	89	310	457	666	1092	5732.38	5733.83	5734.54	5735.07	5735.80	45	5735.49	5735.07	45	128	5.2	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	208+18	20818	5731.0	89	310	457	666	1092	5732.46	5733.90	5734.60	5735.15	5735.87	43	5735.62	5735.15	43	120	5.5	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	208+34	20834	5732.0	89	310	457	666	1092	5733.54	5734.75	5735.29	5735.96	5736.76	54	5736.87	5735.96	54	92	7.3	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	208+68	20868	5733.0	89	310	457	666	1092	5734.70	5735.98	5736.50	5737.00	5737.74	61	5737.52	5737.00	61	125	5.3	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	209+94	20994	5735.0	89	310	457	666	1092	5736.35	5737.57	5738.12	5738.69	5739.53	48	5739.27	5738.69	48	112	6.0	0.00	0.00	1	
	210+12	21012	5737.0	89	310	457	666	1092	5738.21	5739.36	5739.78	5740.18	5740.73	86	5740.85	5740.19	67	104	6.4	0.01	0.07		
	210+33	21033	5737.0	89	310	457	666	1092	5738.90	5740.07	5740.48	5740.92	5741.59	97	5741.10	5740.98	73	186	3.6	0.06	0.08		
	211+10	21110	5738.0	89	310	457	666	1092	5739.38	5740.44	5740.86	5741.31	5742.03	82	5741.53	5741.38	72	181	3.7	0.07	0.06	1	
	214+08	21408	5741.0	89	310	457	666	1092	5743.06	5744.54	5745.27	5746.07	5747.36	22	5747.58	5746.07	22	67	9.9	0.00	0.00	1	Mapped floodplain excludes adjacent pond. FP = FW, No encroachments defined due to negative surcharges.
	216+68	21668	5745.0	89	310	457	666	1092	5747.73	5749.89	5750.67	5751.56	5752.88	32	5752.14	5751.56	32	113	5.9	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	220+50	22050	5753.0	89	310	457	666	1092	5754.58	5756.07	5756.72	5757.45	5758.60	27	5758.78	5757.45	27	72	9.3	0.00	0.00	1	
	222+47	22247	5757.8	89	310	457	666	1092	5759.59	5760.63	5761.14	5761.77	5762.81	73	5762.12	5761.77	73	169	4.7	0.00	0.00	1,6,7	
D/S Eldridge Street	222+72	22272	5755.0	89	310	457	666	1092	5759.76	5760.91	5761.44	5762.07	5763.09	73	5762.29	5762.07	73	347	3.7	0.00	0.00	1,6,7	
U/S Eldridge Street	224+19	22419	5759.1	89	310	457	666	1092	5760.38	5761.96	5762.81	5763.95	5766.10	37	5764.45	5763.95	37	122	5.4	0.00	0.00	1	
	224+29	22429	5760.6	89	310	457	666	1092	5761.87	5763.00	5763.50	5764.13	5765.94	38	5765.26	5764.13	38	80	8.3	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	224+74	22474	5763.0	89	310	457	666	1092	5764.10	5765.01	5765.42	5765.92	5766.64	59	5766.46	5765.92	59	115	5.8	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	225+10	22510	5763.0	89	310	457	666	1092	5764.48	5765.55	5766.03	5766.60	5767.49	82	5766.75	5766.60	82	216	3.1	0.00	0.00	1	
	225+52	22552	5761.0	89	310	457	666	1092	5764.57	5765.65	5766.11	5766.62	5767.35	63	5767.06	5766.62	63	259	5.3	0.00	0.00	1,6,7	
D/S C-470	225+62	22562	5761.0	89	310	457	666	1092	5764.59	5765.67	5766.12	5766.61	5767.27	59	5767.28	5766.61	59	235	6.6	0.00	0.00	1,6,7	
U/S C-470	228+81	22881	5771.0	89	310	457	666	1092	5771.61	5773.16	5773.76	5774.54	5775.92	73	5774.80	5774.54	64	165	4.0	0.00	0.00	6	
	229+06	22906	5774.0	89	310	457	666	1092	5774.58	5775.12	5775.36	5775.64	5776.13	111	5776.27	5775.68	83	108	6.2	0.03	0.03	6	
	230+02	23002	5774.0	89	310	457	666	1092	5775.45	5776.42	5776.79	5777.20	5777.81	103	5777.77	5777.21	55	156	6.0	0.01	0.00	6,7	
D/S Quincy Avenue/Frontage Road	230+12	23012	5773.9	89	310	457	666	1092	5775.48	5776.43	5776.79	5777.17	5777.66	77	5778.04	5777.17	45	113	7.4	0.01	0.00	2,6,7	
U/S Quincy Avenue/Frontage Road	231+73	23173	5774.4	71	270	400	589	966	5775.51	5776.99	5777.85	5779.10	5780.98	95	5779.21	5779.10	76	226	2.6	0.00	0.00	6	
	231+83	23183	5776.0	71	270	400	589	966	5776.54	5777.15	5777.80	5779.10	5780.99	94	5779.24	5779.10	80	198	3.0	0.00	0.00	6	
	235+04	23504	5780.0	71	270	400	589	966	5782.04	5782.86	5782.98	5783.31	5783.82	84	5783.90	5783.31	45	82	7.2	0.00	0.26		

Table D-1 - Floodplain and Floodway Data Table - Existing Infrastructure, Future Land Use

Note:
1. Floodway equal to floodplain.
2. Floodplain top width includes high ground or obstruction.
3. Floodplain top width includes IEFA.
4. Floodway top width includes high ground or obstruction.
5. Floodway top width includes IEFA.
6. Floodplain includes IEFA from structure modeling.
7. Floodway includes IEFA from structure modeling.

Reference Location	River Station	Cross Section	Thalweg Elevation	Peak Discharge					Water Surface Elevation					100-Year Floodplain		100-Year Floodway (0.5-ft Rise in EGL)						Note	Comments
				10-Year	25-Year	50-Year	100-Year	500-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Width	Energy Grade Line (EGL)	WSEL	Width	Area	Velocity	HGL Surcharge	EGL Surcharge		
	(ft)			(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	235+20	23520	5782.0	71	270	400	589	966	5782.59	5783.27	5783.55	5783.89	5784.40	96	5784.42	5783.89	50	81	7.3	0.00	0.29		
	235+35	23535	5781.0	71	270	400	589	966	5782.91	5783.72	5784.04	5784.40	5784.92	132	5784.58	5784.67	62	155	3.8	0.27	0.32		
	238+10	23810	5786.0	71	270	400	589	966	5786.92	5787.80	5788.18	5788.68	5789.46	111	5789.66	5788.73	30	69	8.5	0.05	0.20	3	Floodplain mapped wider in the left overbank based on flow from upstream cross section.
	238+35	23835	5785.3	71	270	400	589	966	5787.45	5788.51	5788.87	5789.22	5790.08	120	5790.48	5789.45	34	102	8.5	0.23	0.08	6,7	Floodplain mapped wider in the left overbank based on flow from upstream cross section.
D/S Private Driveway	238+45	23845	5785.3	71	270	400	589	966	5787.33	5789.36	5790.11	5791.00	5792.56	131	5793.08	5791.02	37	97	11.5	0.03	0.00	6,7	Overtopping of driveway. Floodplain mapped wider in the left overbank based on flow from upstream cross section.
U/S Private Driveway	239+08	23908	5786.0	71	270	400	589	966	5789.45	5793.77	5794.49	5794.79	5795.51	240	5794.86	5795.26	96	505	2.3	0.47	0.49	6,7	Overtopping of driveway. Mapped floodplain does not include ineffective area in left overbank.
	239+18	23918	5787.0	71	270	400	589	966	5789.48	5793.82	5794.52	5794.82	5795.52	219	5794.87	5795.31	94	511	1.7	0.49	0.49	6,7	
	239+77	23977	5788.0	71	270	400	589	966	5789.57	5793.85	5794.55	5794.86	5795.57	221	5794.90	5795.36	117	455	1.3	0.49	0.49		Mapped floodplain includes flow in right overbank from upstream cross section.
	240+34	24034	5788.9	71	270	400	589	966	5790.92	5793.85	5794.55	5794.87	5795.57	216	5794.97	5795.35	115	286	2.1	0.49	0.46		Mapped floodplain includes flow in right overbank from upstream cross section.
	240+98	24098	5793.6	71	270	400	589	966	5795.49	5796.25	5796.41	5796.60	5796.93	200	5796.99	5796.76	70	92	6.4	0.16	0.42	2,3	Mapped floodplain includes ineffective flow area.
	241+20	24120	5795.3	71	270	400	589	966	5797.45	5798.32	5798.44	5798.62	5798.89	180	5798.95	5798.85	83	98	6.0	0.24	0.50		
	241+23	24123	5796.7	71	270	400	589	966	5797.94	5798.47	5798.62	5798.83	5799.23	152	5799.21	5799.02	85	103	5.7	0.18	0.32		
	241+71	24171	5797.0	71	270	400	589	966	5798.34	5798.85	5799.16	5799.42	5799.83	236	5799.49	5799.71	157	397	2.2	0.29	0.29		Floodplain and Floodway include permanent IEFA from berm modeling.
	242+89	24289	5797.0	71	270	400	589	966	5798.38	5798.97	5799.33	5799.61	5800.04	125	5799.73	5799.86	78	216	2.7	0.25	0.24		
	243+73	24373	5797.0	71	270	400	589	966	5798.41	5799.05	5799.40	5799.68	5800.02	51	5800.10	5799.92	50	126	4.7	0.24	0.16		
	245+67	24567	5800.0	71	270	400	589	966	5800.89	5801.98	5802.48	5803.04	5803.99	32	5804.20	5803.06	30	69	8.5	0.02	0.00		
	248+07	24807	5805.0	69	261	387	570	934	5806.69	5808.33	5808.98	5809.69	5810.71	32	5810.20	5809.69	26	98	5.8	0.01	0.02		
	250+34	25034	5809.0	69	261	387	570	934	5811.07	5812.77	5813.50	5814.38	5815.65	26	5815.48	5814.41	25	86	8.2	0.04	0.02	6,7	
D/S Belleview Avenue	250+44	25044	5809.2	69	261	387	570	934	5811.46	5812.94	5813.63	5814.60	5816.26	25	5816.76	5814.65	23	72	11.7	0.04	0.00	6,7	
U/S Belleview Avenue	251+21	25121	5810.1	69	261	387	570	934	5813.64	5817.76	5820.89	5823.95	5824.76	95	5824.10	5823.98	95	329	2.7	0.03	0.03	1,6,7	Spill location.
	251+31	25131	5812.0	69	261	387	570	934	5813.64	5817.91	5821.04	5824.07	5824.90	98	5824.12	5824.09	98	420	1.7	0.03	0.03	1,6,7	Spill location.
	253+27	25327	5815.0	69	261	387	570	934	5817.01	5818.90	5821.31	5824.20	5825.17	44	5824.28	5824.23	44	268	2.1	0.03	0.03	1	
	254+75	25475	5819.0	69	261	387	570	934	5820.33	5821.51	5821.97	5824.42	5825.52	58	5824.73	5824.44	36	129	4.4	0.02	0.02		Mapped floodplain includes flow in left overbank from upstream cross section.
	254+86	25486	5820.0	69	261	387	570	934	5821.37	5822.39	5822.83	5824.37	5825.37	67	5825.01	5824.39	46	89	6.4	0.02	0.01		Mapped floodplain and floodway includes flow in left overbank from upstream cross section.
	255+46	25546	5829.0	69	261	387	570	934	5829.80	5830.32	5830.56	5830.84	5831.31	85	5831.43	5831.13	53	83	6.8	0.29	0.48		
	257+40	25740	5829.0	69	261	387	570	934	5831.09	5832.60	5833.20	5833.90	5834.94	40	5834.11	5834.11	40	167	3.4	0.21	0.19	1	
	259+74	25974	5831.1	69	260	385	567	929	5833.26	5835.00	5835.76	5836.66	5837.70	27	5837.88	5836.69	27	67	8.5	0.03	0.00	1	
	262+78	26278	5838.0	69	260	385	567	929	5840.92	5843.16	5843.88	5844.65	5845.91	153	5845.13	5844.73	145	105	5.4	0.08	0.07		Mapped floodplain and floodway includes flow in right overbank from upstream cross section.
	263+40	26340	5850.7	69	260	385	567	929	5851.17	5851.40	5851.52	5851.68	5851.94	186	5852.01	5851.69	170	119	4.8	0.02	0.03		
	264+15	26415	5847.9	69	260	385	567	929	5851.26	5851.68	5851.90	5852.18	5852.65	166	5852.21	5852.24	104	426	1.3	0.06	0.06		
	265+91	26591	5849.0	69	260	385	567	929	5851.26	5851.66	5851.86	5852.11	5852.51	49	5852.75	5852.14	34	81	7.0	0.03	0.17		
	267+42	26742	5852.0	64	236	348	510	833	5853.06	5854.54	5855.15	5855.87	5857.02	51	5856.10	5856.28	37	128	4.0	0.41	0.43		
	267+98	26798	5859.3	64	236	348	510	833	5860.14	5860.62	5860.82	5861.03	5861.44	142	5861.48	5861.23	61	87	5.9	0.21	0.43	2,3	Floodplain includes ineffective area in righ overbank. Potential spill into ditch.
	268+71	26871	5861.0	64	236	348	510	833	5862.09	5862.59	5862.81	5863.11	5863.48	178	5863.24	5863.30	110	182	2.8	0.19	0.19	2,3	Floodplain top width includes high ground and ineffective area in the left overbank.
	269+11	26911	5862.9	64	236	348	510	833	5863.13	5863.23	5863.45	5863.71	5864.14	170	5863.98	5863.88	100	121	4.2	0.16	0.20	2,3	Floodplain top width includes high ground and ineffective area in the left overbank.
	269+27	26927	5860.0	64	236	348	510	833	5863.15	5863.56	5863.78	5864.06	5864.43	167	5864.19	5864.27	94	156	3.3	0.22	0.26		
	271+39	27139	5861.5	64	236	348	510	833	5865.44	5866.69	5867.20	5867.65	5868.29	177	5868.42	5867.92	50	102	6.5	0.27	0.16	6,7	
D/S Belleview Avenue	271+49	27149	5861.5	64	236	348	510	833	5865.52	5866.87	5867.39	5867.89	5868.65	183	5868.79	5868.08	50	96	7.3	0.19	0.12	2,4,6,7	Overtopping of Belleview Avenue.
U/S Belleview Avenue	272+85	27285	5863.6	64	236	348	510	833	5866.39	5870.56	5872.50	5872.74	5873.44	131	5873.18	5873.24	63	278	3.6	0.50	0.40	6,7	Overtopping of Belleview Avenue.
	272+95	27295	5865.0	64	236	348	510	833	5866.57	5870.70	5872.71	5873.16	5873.77	136	5873.24	5873.52	63	294	2.2	0.37	0.38	6,7	
	275+58	27558	5869.0	64	236	348	510	833	5870.83	5871.56	5873.19	5873.77	5874.61	54	5873.98	5874.12	38	144	3.6	0.35	0.34		
	276+30	27630	5871.0	64	236	348	510	833	5871.96	5873.37	5873.79	5874.38	5875.27	39	5874.84	5874.60	32	98	5.2	0.22	0.18		
	277+48	27748	5873.0	64	236	348	510	833	5874.37	5875.27	5875.71	5876.25	5877.12	51	5876.59	5876.28	43	108	4.7	0.03	0.04		
	278+10	27810	5874.0	64	236	348	510	833	5875.05	5876.03	5876.43	5876.92	5877.73	46	5877.38	5876.94	36	90	5.7	0.02	0.09		
	278+53	27853	5874.0	64	236	348	510	833	5875.67	5876.68	5877.05	5877.58	5878.54	90	5878.82	5877.60	28	61	8.9	0.01	0.00	6,7	Mapped floodplain includes flow in left and right overbanks from upstream cross section.
D/S Private Driveway	278+63	27863	5874.0	64	236	348	510	833	5875.91	5877.01	5877.33	5877.77	5879.11	105	5879.52	5877.77	23	64	10.6	0.01	0.00	6,7	Overtopping of driveway. Mapped floodplain includes flow in left and right overbanks from upstream cross section.
U/S Private Driveway	279+15	27915	5874.1	40	169	252	373	616	5876.56	5879.72	5881.43	5883.16	5883.71	138	5883.23	5883.32	42	194	2.1	0.17	0.17	6,7	Overtopping of driveway.
	279+25	27925	5876.0	40	169	252	373	616	5877.04	5879.71	5881.44	5883.18	5883.74	119	5883.24	5883.34	39	190	2.0	0.16	0.16	6,7	
	281+60	28160	5882.0	40	169	252	373	616	5882.56	5882.95	5883.22	5883.54	5884.12	42	5884.25	5883.54	41	56	6.7	0.00	0.00		
	283+89	28389	5885.0	40	169	252	373	616	5886.17	5887.43	5887.79	5888.22	5888.86	32	5888.79	5888.25	26	61	6.1	0.03	0.05		
	283+99	28399	5885.3	40	169	252	373	616	5886.38	5887.55	5887.94	5888.41	5889.15	33	5888.91	5888.42	26	64	5.8	0.02	0.05		
	284+33	28433	5889.1	40	169	252	373	616	5889.70	5890.50	5890.86	5891.30	5891.89	48	5892.16	5891.30	31	51	7.3	0.00	0.00	2,3	
	284+43	28443	5889.2	40	169	252	373	616	5890.27	5891.50	5891.77	5892.11	5892.68	45	5892.78	5892.30	30	54	7.0	0.18	0.36		
	284+60	28460	5889.2	40	169	252	373	616	5890.79	5891.93	5892.25	5892.56	5892.89	45	5893.01	5893.02	34	98	4.6	0.46	0.34	6,7	
D/S Belleview Avenue	284+75	28475	5889.2	40	169	252	373	616	5890.71	5892.10	5892.92	5893.74	5895.05	39	5895.42	5893.74	20	60	10.4	0.00	0.06	6,7	
U/S Belleview Avenue	285+75	28575	5891.3	40	169	252	373	616	5893.98	5897.51	5899.42	5904.00	5910.01	97	5904.05	5904.00	36	316	1.9	0.00	0.00	6,7	
	286+00	28600	5893.0	40	169	252	373	616	5894.23	5897.60	5899.50	5904.05	5910.06	119	5904.06	5904.05	45	405	0.9	0.00	0.00	6	
	287+07	28707	5896.0	40	169	252	373	616	5897.12	5897.78	5899.54	5904.06	5910.07	163	5904.06	5904.06	130	903	0.4	0.00	0.00		
	287+49	28749	5896.7	40	169	252	373	616	5897.57	5898.18	5899.53	5904.06	5910.07	99	5904.07	5904.06	88	492	0.8	0.00	0.00		
	288+62	28862	5899.0	40	169	252	373	616	5899.69	5900.56	5900.74	5904.04	5910.07	57	5904.10	5904.05	52	191	2.0	0.00	0.00		
	289+25	28925	5900.2	40	169	252	373	616	5901.26	5902.10	5902.56	5904.11	5910.07	65	5904.22	5904.11	50	137	2.7	0.00	0.01		
	290+00	29000	5901.0	40	169	252	373	616	5902.27	5903.31	5903.68	5904.26	5910.06	34	5904.80	5904.28	29	63	5.9	0.01	0.02		
	290+85	29085	5902.5	40	169	252	373	616	5903.86	5905.02	5905.47	5905.82	5909.79	54	5907.13	5905.87	29	71	8.9	0.05	0.00	6,7	
D/S Private Driveway	290+95	29095	5902.5	40	169	252	373	616	5904.04	5905.41	5906.08	5906.95	5909.10	51	5908.85	5906.99	28	74	10.9	0.04	0.00	6,7	Overtopping of driveway.
U/S Private Driveway	291+38	29138	5902.8	40	169	252	373	616	5905.28	5909.32	5911.44	5912.07	5912.85	84	5912.12	5912.25	45	271	1.8	0.17	0.17	6,7	Overtopping of driveway
	291+48	29148	5904.0	40	169	252	373	616	5905.33	5909.34	5911.46	5912.11	5912.89	75	5912.13	5912.28	45	297	1.3	0.17	0.17	6	
	294+89	29489	5911.0	37	159	236	350	576	5912.04	5913.07	5913.46	5913.99	5914.72	26	5914.91	5914.00	25	46	7.6	0.01	0.00		
	297+70	29770	5919.0	37	159	236	350	576	5920.07	5921.14	5921.52	5921.95	5922.70	27	5922.54	5921.95	24	56	6.2	0.01	0.02		
	300+57	30057	5928.5	33	138	204	301	494	5929.75	5931.16	5931.71	5932.20	5933.00	33	5933.23	5932.21	21	46	8.8	0.00	0.22	6,7	
D/S Crestbrook Drive	300+68	30068	5928.5	33	138	204	301	494	5930.45	5932.04	5932.52	5933.12	5934.14	42	5933.59	5933.45	20	67	5.2	0.33	0.29	6,7	
U/S Crestbrook Drive	301+43	30143	5929.4	33	138	204	301	494	5931.39	5934.18	5936.45	5938.79	5942.26	44	5938.90	5938.79	44	176	2.6	0.00	0.00	1,6,7	
	301+63	30163	5933.0	33	138	204	301	494	5933.47	5934.53	5936.57	5938.88	5942.35	50	5938.92	5938.88	50	223	1.6	0.00	0.00	1,6,7	

Table D-1 - Floodplain and Floodway Data Table - Existing Infrastructure, Future Land Use

Note:
1. Floodway equal to floodplain.
2. Floodplain top width includes high ground or obstruction.
3. Floodplain top width includes IEFA.
4. Floodway top width includes high ground or obstruction.
5. Floodway top width includes IEFA.
6. Floodplain includes IEFA from structure modeling.
7. Floodway includes IEFA from structure modeling.

Reference Location	River Station	Cross Section	Thalweg Elevation	Peak Discharge					Water Surface Elevation					100-Year Floodplain		100-Year Floodway (0.5-ft Rise in EGL)						Note	Comments
				10-Year	25-Year	50-Year	100-Year	500-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Width	Energy Grade Line (EGL)	WSEL	Width	Area	Velocity	HGL Surcharge	EGL Surcharge		
	(ft)			(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	302+46	30246	5934.9	33	138	204	301	494	5935.73	5936.21	5936.62	5938.91	5942.36	36	5939.02	5938.91	36	114	2.6	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	304+12	30412	5939.0	33	138	204	301	494	5939.93	5941.24	5941.48	5941.82	5942.59	31	5942.59	5941.82	31	45	6.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	305+97	30597	5945.0	33	138	204	301	494	5945.96	5946.59	5947.01	5947.38	5947.76	50	5947.78	5947.38	50	61	4.9	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	309+85	30985	5957.0	33	138	204	301	494	5958.04	5959.11	5959.40	5959.76	5960.28	39	5960.38	5959.76	39	51	6.0	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	312+54	31254	5967.0	33	138	204	301	494	5968.11	5968.87	5969.15	5969.48	5970.06	34	5970.18	5969.48	34	45	6.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	313+53	31353	5972.0	28	119	176	259	425	5972.51	5973.20	5973.44	5973.71	5974.08	36	5974.21	5973.71	36	46	5.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	314+66	31466	5975.0	28	119	176	259	425	5975.91	5976.58	5976.85	5977.18	5977.78	32	5977.66	5977.18	32	47	5.5	0.00	0.00	1	
	314+87	31487	5978.0	28	119	176	259	425	5978.37	5978.92	5979.14	5979.44	5979.92	36	5980.04	5979.44	36	42	6.1	0.01	0.00	1	
	315+94	31594	5979.0	28	119	176	259	425	5980.08	5980.98	5981.35	5981.77	5982.41	27	5982.07	5981.83	25	60	4.3	0.06	0.05		
	318+38	31838	5987.0	21	92	136	201	329	5987.70	5988.46	5988.77	5989.12	5989.59	31	5989.68	5989.15	31	36	5.5	0.03	0.00	1	
	318+83	31883	5989.0	21	92	136	201	329	5989.79	5990.48	5990.86	5991.27	5991.95	39	5992.16	5991.30	39	50	7.4	0.02	0.00	1,6,7	
D/S Willowbrook Drive	318+93	31893	5989.7	21	92	136	201	329	5990.41	5991.40	5991.87	5992.47	5993.51	38	5993.82	5992.51	38	62	9.2	0.03	0.00	1,6,7	Overtopping of Willowbrook Drive.
U/S Willowbrook Drive	319+74	31974	5993.5	21	92	136	201	329	5995.78	6000.83	6004.20	6004.66	6005.17	136	6004.68	6004.71	60	477	1.1	0.06	0.06	6,7	Overtopping of Willowbrook Drive.
	319+94	31994	5995.0	21	92	136	201	329	5995.80	6000.84	6004.21	6004.67	6005.19	138	6004.68	6004.73	54	420	0.5	0.06	0.06	6,7	
	323+16	32316	6004.0	21	92	136	201	329	6004.70	6004.97	6005.17	6005.41	6005.80	37	6005.91	6005.45	28	33	6.1	0.03	0.13		
	326+12	32612	6014.7	21	92	136	201	329	6015.13	6016.04	6016.33	6016.66	6017.16	20	6017.27	6016.74	18	33	6.0	0.09	0.04		
D/S Meadowbrook Drive	326+43	32643	6014.7	21	92	136	201	329	6016.53	6017.60	6018.15	6018.85	6020.06	40	6020.43	6018.89	20	54	9.9	0.04	0.00	6,7	Overtopping of Meadowbrook Drive.
U/S Meadowbrook Drive	327+16	32716	6016.9	21	92	136	201	329	6019.15	6024.20	6029.13	6029.59	6030.04	186	6029.61	6029.68	40	404	1.6	0.09	0.12	6,7	Overtopping of Meadowbrook Drive.
	327+29	32729	6018.7	21	92	136	201	329	6019.46	6024.25	6029.14	6029.60	6030.05	192	6029.61	6029.72	42	370	0.7	0.12	0.12	6,7	
	328+15	32815	6021.0	21	92	136	201	329	6022.34	6024.20	6029.14	6029.61	6030.06	171	6029.62	6029.72	40	205	1.0	0.12	0.12	6,7	
	328+77	32877	6023.9	21	92	136	201	329	6024.76	6025.65	6029.15	6029.60	6030.05	143	6029.63	6029.73	44	159	1.3	0.13	0.12	2,3	Floodplain includes high ground and ineffective area in the right overbank.
	329+96	32996	6030.0	21	92	136	201	329	6031.05	6031.81	6032.13	6032.52	6032.80	74	6032.85	6032.53	71	50	4.0	0.01	0.00		
	331+46	33146	6036.1	21	92	136	201	329	6037.05	6037.81	6038.05	6038.31	6038.71	40	6038.79	6038.31	34	37	5.4	0.00	0.01		
	332+34	33234	6036.6	21	92	136	201	329	6037.75	6038.90	6039.29	6039.72	6040.30	16	6039.98	6039.73	16	49	4.1	0.01	0.01	1	
D/S Colorow Drive	332+44	33244	6036.6	21	92	136	201	329	6038.04	6039.56	6040.01	6040.89	6041.59	19	6041.82	6040.91	15	28	7.5	0.02	0.00	6,7	Overtopping of Colorow Drive.
U/S Colorow Drive	333+25	33325	6038.8	21	92	136	201	329	6040.96	6046.09	6048.80	6049.08	6049.39	152	6049.13	6049.16	79	344	1.7	0.08	0.10	6,7	Overtopping of Colorow Drive.
	333+93	33393	6049.0	21	92	136	201	329	6049.57	6050.21	6050.47	6050.80	6051.42	29	6051.42	6050.81	27	33	6.0	0.01	0.00		
	334+80	33480	6050.0	21	92	136	201	329	6050.74	6051.48	6051.79	6052.17	6052.46	55	6052.25	6052.17	54	92	2.2	0.00	0.00		
	335+55	33555	6052.6	21	92	136	201	329	6053.11	6053.72	6053.99	6054.31	6054.86	24	6054.97	6054.31	24	31	6.5	0.00	0.00		
D/S Pedestrian Bridge	335+75	33575	6053.2	21	92	136	201	329	6053.93	6054.65	6054.95	6055.27	6055.75	25	6055.71	6055.28	24	38	5.3	0.00	0.00		
U/S Pedestrian Bridge	335+97	33597	6054.0	21	92	136	201	329	6054.87	6055.78	6056.16	6056.58	6057.26	29	6056.80	6056.58	29	54	3.7	0.00	0.00	1	Ineffective area in the right overbank not mapped.
	336+07	33607	6054.0	21	92	136	201	329	6054.94	6055.84	6056.21	6056.62	6057.26	25	6056.94	6056.62	25	45	4.5	0.00	0.00	1	FP = FW. No encroachments defined due to negative surcharges
	336+92	33692	6057.0	21	92	136	201	329	6058.00	6059.15	6059.63	6060.17	6061.00	13	6061.15	6060.17	13	25	8.0	0.00	0.00	1	FP = FW. No encroachments defined due to negative surcharges
D/S Pedestrian Bridge	337+02	33702	6058.0	21	92	136	201	329	6058.97	6060.14	6060.62	6061.12	6061.95	13	6062.09	6061.12	13	25	7.9	0.00	0.00	1	
U/S Pedestrian Bridge	337+19	33719	6058.0	21	92	136	201	329	6059.61	6061.03	6061.56	6062.23	6063.62	14	6062.76	6062.23	14	34	5.9	0.00	0.00	1	
	337+34	33734	6059.0	21	92	136	201	329	6060.13	6061.23	6061.72	6062.37	6063.70	16	6063.09	6062.37	16	30	6.8	0.00	0.00	1	
	338+16	33816	6062.9	21	92	136	201	329	6063.66	6064.61	6065.02	6065.52	6066.34	75	6066.47	6065.52	14	26	7.7	0.00	0.00		Mapped floodplain includes flow in left overbank from upstream cross section.
D/S Private Driveway	338+26	33826	6062.9	21	92	136	201	329	6064.04	6065.00	6065.48	6066.09	6067.14	85	6067.45	6066.12	14	29	9.2	0.03	0.00	6,7	Overtopping of driveway. Mapped floodplain includes flow in left overbank from upstream cross section.
U/S Private Driveway	338+68	33868	6064.8	21	92	136	201	329	6067.37	6070.35	6070.59	6070.82	6071.06	121	6070.95	6071.30	42	92	2.6	0.48	0.48	6,7	Overtopping of driveway.
	338+78	33878	6065.5	21	92	136	201	329	6067.45	6070.42	6070.65	6070.85	6071.04	106	6070.99	6071.34	25	80	2.5	0.49	0.47	2, 6,7	Floodplain top width includes high ground in the left overbank.
	338+87	33887	6066.2	21	92	136	201	329	6067.46	6070.43	6070.66	6070.86	6071.05	97	6071.03	6071.35	22	75	2.7	0.49	0.45	2, 6	Floodplain top width includes high ground in the left overbank.
D/S Private Driveway	338+97	33897	6066.6	21	92	136	201	329	6068.24	6070.29	6070.36	6070.71	6071.92	94	6072.00	6070.93	17	38	8.3	0.22	0.02	6,7	Overtopping of driveway. Mapped floodplain includes flow in left overbank from upstream cross section.
U/S Private Driveway	339+53	33953	6068.4	21	92	136	201	329	6070.61	6073.24	6073.76	6074.00	6074.48	127	6074.17	6074.32	24	61	3.3	0.32	0.33	6,7	Overtopping of driveway. Floodplain top width includes high ground and ineffective area in the left overbank. Mapped top width includes area of shallow flooding in POR.
	339+63	33963	6070.9	21	92	136	201	329	6071.71	6073.22	6073.73	6073.88	6074.39	80	6074.38	6074.29	20	45	4.5	0.40	0.23		Mapped floodplain includes shallow flooding area in right overbank.
	339+85	33985	6072.0	21	92	136	201	329	6072.74	6073.50	6073.94	6074.28	6074.89	91	6074.84	6074.48	23	39	5.2	0.20	0.07		Mapped floodplain includes shallow flooding area in right overbank.
	340+57	34057	6073.9	21	92	136	201	329	6074.87	6075.79	6076.02	6076.41	6077.12	119	6077.24	6076.43	17	28	7.2	0.02	0.00		Mapped floodplain includes shallow flooding area in right overbank.
	341+66	34166	6078.0	21	92	136	201	329	6079.07	6080.07	6080.52	6080.93	6081.75	142	6081.83	6080.93	16	27	7.4	0.00	0.00		Mapped floodplain includes shallow flooding area in right overbank.
D/S Pedestrian Bridge	341+86	34186	6079.0	21	92	136	201	329	6079.96	6081.09	6081.50	6082.12	6083.19	168	6082.50	6082.12	24	41	4.9	0.00	0.00	6,7	Mapped floodplain includes shallow flooding area in right overbank.
U/S Pedestrian Bridge	342+13	34213	6080.0	21	92	136	201	329	6081.61	6082.92	6083.24	6083.67	6084.40	185	6084.02	6083.67	23	44	4.6	0.00	0.00		Mapped floodplain includes shallow flooding area in right overbank.
	342+34	34234	6081.0	21	92	136	201	329	6081.82	6083.05	6083.41	6083.86	6084.42	196	6084.54	6083.86	18	31	6.6	0.00	0.00		Mapped floodplain includes shallow flooding area in right overbank.
	343+40	34340	6085.7	19	80	118	174	285	6086.66	6087.30	6087.68	6088.05	6088.53	181	6088.57	6088.05	25	30	5.8	0.00	0.01	3	
	343+74	34374	6087.0	19	80	118	174	285	6087.81	6088.76	6089.02	6089.36	6089.77	149	6089.84	6089.36	36	33	5.2	0.00	0.00	3	
	344+20	34420	6088.7	19	80	118	174	285	6089.73	6090.60	6090.98	6091.42	6092.11	117	6092.21	6091.42	16	25	7.1	0.00	0.00	2,3	Mapped floodplain includes high ground and ineffective area in right overbank
	345+91	34591	6093.0	19	80	118	174	285	6094.21	6095.43	6095.89	6096.32	6096.96	16	6096.76	6096.32	16	33	5.3	0.00	0.00	1	
	347+97	34797	6101.2	19	80	118	174	285	6102.37	6103.52	6103.98	6104.50	6105.36	12	6105.48	6104.50	12	22	7.9	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	350+22	35022	6111.0	19	80	118	174	285	6111.87	6112.86	6113.20	6113.56	6114.15	15	6114.27	6113.56	15	26	6.7	0.00	0.00	1	FP = FW, No encroachments defined due to negative surcharges.
	352+00	35200	6120.5	19	80	118	174	285	6121.10	6121.68	6121.92	6122.22	6122.69	25	6122.81	6122.24	25	29	6.1	0.02	0.00	1	
	353+78	35378	6129.6	19	80	118	174	285	6130.67	6131.49	6131.83	6132.27	6132.99	17	6133.18	6132.30	17	25	7.5	0.03	0.00	1,6,7	
D/S W Roton Arena	353+88	35388	6129.9	19	80	118	174	285	6131.03	6131.88	6132.24	6132.84	6133.86	17	6134.17	6132.87	17	30	9.1	0.03	0.00	1,6,7	Overtopping of W Roton Arena
U/S W Roton Arena	354+33	35433	6133.8	19	80	118	174	285	6135.95	6139.74	6140.91	6141.33	6141.83	38	6141.40	6141.35	30	125	2.1	0.02	0.02	6,7	Overtopping of W Roton Arena
	354+49	35449	6135.8	19	80	118	174	285	6136.49	6139.78	6140.94	6141.38	6141.92	39	6141.42	6141.40	34	113	1.5	0.02	0.02		
	355+91	35591	6142.0	16	66	96	141	228	6142.40	6142.99	6143.27	6143.57	6144.08	18	6144.21	6143.57	18	22	6.4	0.00	0.00	1	
	358+42	35842	6154.0	16	66	96	141	228	6154.53	6155.03	6155.10	6155.39	6155.71	27	6155.82	6155.39	27	27	5.2	0.00	0.00	1	
	360+91	36091	6166.0	16	66	96	141	228	6167.00	6167.99	6168.37	6168.86	6169.60	12	6169.73	6168.90	12	20	7.2	0.03	0.00	1	
	362+52	36252	6176.0	16	66	96	141	228	6176.82	6177.51	6177.82	6178.18	6178.78	15	6178.92	6178.20	15	21	6.8	0.02	0.00	1	
D/S Willow Springs Drive	362+62	36262	6177.0	16	66	96	141	228	6177.65	6178.27	6178.54	6178.86	6179.39	17	6179.56	6178.87	17	21	6.7	0.01	0.00	1,6,7	
U/S Willow Springs Drive	363+54	36354	6185.4	16	66	96	141	228	6186.01	6186.69	6186.96	6187.26	6188.71	270	6188.40	6187.26	123	17	8.6	0.00	0.00	1	Spill Location. Mapped floodplain and floodway includes flow in left overbank from upstream cross section.
	363+60	36360	6189.7	16	66	96	141	228	6190.42	6190.54	6190.57	6190.62	6190.71	267	6190.75	6190.95	120	58	3.9	0.32	0.47	2,4,6,7	Top width includes high ground and ineffective flow area in left overbank.
D/S Golf Cart Path	363+68	36368	6192.0	16	66	96	141	228	6193.10	6194.29	6194.71	6195.26	6195.36	411	6195.39	6195.40	122	293	2.8	0.14	0.27	2,4,6,7	Overtopping of golf cart path.

Table D-1 - Floodplain and Floodway Data Table - Existing Infrastructure, Future Land Use

Note:
1. Floodway equal to floodplain.
2. Floodplain top width includes high ground or obstruction.
3. Floodplain top width includes IEFA.
4. Floodway top width includes high ground or obstruction.
5. Floodway top width includes IEFA.
6. Floodplain includes IEFA from structure modeling.
7. Floodway includes IEFA from structure modeling.

Reference Location	River Station	Cross Section	Thalweg Elevation	Peak Discharge					Water Surface Elevation					100-Year Floodplain		100-Year Floodway (0.5-ft Rise in EGL)						Note	Comments
				10-Year	25-Year	50-Year	100-Year	500-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Width	Energy Grade Line (EGL)	WSEL	Width	Area	Velocity	HGL Surcharge	EGL Surcharge		
	(ft)			(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
U/S Golf Cart Path	364+04	36404	6193.0	16	66	96	141	228	6194.58	6196.95	6197.05	6197.14	6197.27	290	6197.17	6197.40	91	346	1.2	0.26	0.26	6,7	Overtopping of golf cart path.
	364+49	36449	6193.0	14	57	83	121	196	6194.59	6196.96	6197.07	6197.17	6197.32	282	6197.18	6197.43	88	291	0.6	0.26	0.26	6,7	
	365+13	36513	6194.1	14	57	83	121	196	6194.67	6196.97	6197.07	6197.18	6197.33	110	6197.19	6197.43	74	172	0.7	0.25	0.25	6	
	365+88	36588	6194.3	14	57	83	121	196	6195.75	6196.96	6197.06	6197.15	6197.25	30	6197.29	6197.41	30	49	2.5	0.26	0.22		
	366+25	36625	6194.4	14	57	83	121	196	6195.93	6197.06	6197.22	6197.41	6197.90	10	6198.05	6197.46	10	19	6.3	0.04	0.02	1	
D/S Golf Cart Path	366+35	36635	6194.4	14	57	83	121	196	6196.01	6197.27	6197.60	6198.08	6198.94	10	6198.33	6198.08	10	30	4.0	0.01	0.00	1,6,7	
U/S Golf Cart Path	366+66	36666	6194.9	14	57	83	121	196	6196.45	6197.92	6198.57	6199.77	6201.62	14	6199.89	6199.77	11	43	2.8	0.00	0.00	6	Mapped width narrower than model based on because cross section geometry modified for crossing.
	366+76	36676	6195.5	14	57	83	121	196	6196.48	6197.96	6198.62	6199.80	6201.64	15	6199.93	6199.80	15	42	2.9	0.00	0.00	1	
	368+80	36880	6207.0	14	57	83	121	196	6207.66	6208.38	6208.65	6209.01	6209.56	16	6209.65	6209.02	16	19	6.2	0.01	0.00	1	
	369+92	36992	6213.0	14	57	83	121	196	6213.88	6214.51	6214.80	6215.13	6215.66	17	6215.76	6215.18	17	20	5.9	0.04	0.00	1	
	370+72	37072	6224.0	14	57	83	121	196	6224.86	6225.19	6225.29	6225.41	6225.55	135	6225.59	6225.64	94	49	3.8	0.23	0.27	2,3,4,5	
	371+22	37122	6227.8	14	57	83	121	196	6228.09	6228.26	6228.33	6228.43	6228.60	77	6228.65	6228.64	40	27	4.5	0.21	0.30		
	371+75	37175	6225.0	14	57	83	121	196	6228.16	6228.51	6228.69	6228.91	6229.24	26	6228.98	6229.15	26	63	1.9	0.25	0.23	1	
	373+06	37306	6236.0	14	57	83	121	196	6236.77	6237.56	6237.87	6238.20	6238.78	15	6238.88	6238.23	15	19	6.4	0.03	0.00	1	
	374+49	37449	6246.0	14	57	83	121	196	6246.71	6247.38	6247.63	6247.93	6248.41	37	6248.51	6247.95	37	20	6.0	0.02	0.00	1	Flooding and floodway in left overbank from upstream.
	374+62	37462	6249.0	14	57	83	121	196	6249.61	6250.17	6250.31	6250.50	6250.81	38	6250.86	6250.51	38	26	4.7	0.00	0.00	1	
	376+09	37609	6256.9	14	57	83	121	196	6257.79	6258.42	6258.72	6259.07	6259.64	16	6259.73	6259.12	16	20	6.0	0.05	0.00	1	
	376+82	37682	6265.7	14	57	83	121	196	6266.17	6266.69	6266.91	6267.15	6267.58	23	6267.65	6267.16	23	22	5.6	0.01	0.00	1	
	377+83	37783	6274.0	14	57	83	121	196	6274.66	6275.35	6275.63	6275.94	6276.46	17	6276.56	6275.94	17	20	6.2	0.00	0.00	1	
	378+88	37888	6282.7	14	57	83	121	196	6283.18	6283.77	6284.03	6284.33	6284.85	15	6284.99	6284.35	15	19	6.4	0.02	0.00	1	
	380+62	38062	6295.0	14	57	83	121	196	6295.83	6296.65	6296.97	6297.33	6297.93	13	6298.06	6297.37	13	18	6.6	0.04	0.00	1	
	381+68	38168	6303.4	14	57	83	121	196	6304.07	6304.81	6305.14	6305.55	6306.26	9	6306.47	6305.57	9	16	7.5	0.02	0.00	1	
	382+70	38270	6314.0	14	57	83	121	196	6314.98	6316.13	6316.59	6317.17	6318.06	7	6318.24	6317.19	7	15	8.0	0.03	0.00	1	
	383+81	38381	6327.6	14	57	83	121	196	6328.22	6328.88	6329.16	6329.49	6330.00	17	6330.11	6329.52	17	20	5.9	0.03	0.00	1	
	384+29	38429	6331.0	14	57	83	121	196	6331.53	6332.25	6332.54	6332.90	6333.48	13	6333.62	6332.92	13	18	6.7	0.02	0.00	1	
	384+73	38473	6341.4	14	57	83	121	196	6342.26	6343.04	6343.35	6343.73	6344.34	13	6344.46	6343.73	13	18	6.7	0.00	0.00	1	
	385+07	38507	6347.0	14	57	83	121	196	6347.78	6348.75	6349.12	6349.59	6350.35	9	6350.50	6349.59	9	16	7.5	0.00	0.00	1	
	385+80	38580	6358.0	14	57	83	121	196	6358.98	6359.84	6360.14	6360.54	6361.12	15	6361.22	6360.57	15	19	6.3	0.02	0.00	1	
	386+40	38640	6370.5	14	57	83	121	196	6371.16	6371.88	6372.16	6372.52	6373.19	14	6373.24	6372.53	13	18	6.7	0.00	0.00		
	387+35	38735	6379.0	14	57	83	121	196	6379.53	6379.92	6380.06	6380.24	6380.54	37	6380.60	6380.27	29	23	5.2	0.02	0.08		
Upstream study limit. Approx. 1,690 feet upstream of Whale Rock Way.	388+13	38813	6381.2	14	57	83	121	196	6382.01	6382.63	6382.85	6383.08	6383.41	18	6383.52	6383.17	14	23	5.2	0.10	0.09		
Belleview Spill																							
Approximately 100 ft D/Sof W Belleview Ave	1+51	50151	5790.9	0	0	0	33	148	5790.95	5790.95	5790.95	5791.42	5791.90	50	5791.47	--	--	--	--	--	--		
	3+78	50378	5798.3	0	0	0	33	148	5798.36	5798.36	5798.36	5798.60	5798.91	79	5798.69	--	--	--	--	--	--		
	5+14	50514	5800.4	0	0	0	33	148	5800.46	5800.46	5800.46	5801.04	5801.33	85	5801.12	--	--	--	--	--	--	2,3	Top width includes high ground. Floodplain includes ineffective area in left overbank.
	7+35	50735	5805.9	0	0	0	33	148	5805.96	5805.96	5805.96	5806.27	5806.63	58	5806.35	--	--	--	--	--	--		
	9+35	50935	5811.7	0	0	0	33	148	5811.69	5811.69	5811.69	5812.00	5812.24	130	5812.08	--	--	--	--	--	--	2,3	
	11+42	51142	5817.0	0	0	0	33	148	5817.02	5817.02	5817.02	5817.34	5817.71	51	5817.43	--	--	--	--	--	--		
U/S Belleview Avenue	12+38	51238	5819.7	0	0	0	33	148	5819.72	5819.72	5819.72	5819.99	5820.30	75	5820.07	--	--	--	--	--	--		
Willow Spill																							
D/S W Roton Arena	1+79	400179	6143.2	7	50	76	117	197	6143.34	6143.61	6143.72	6143.85	6144.08	74	6144.06	--	--	--	--	--	--		
	2+39	400239	6145.0	7	50	76	117	197	6145.29	6145.78	6146.01	6146.29	6146.64	82	6146.67	--	--	--	--	--	--	2	
	3+40	400340	6148.5	7	50	76	117	197	6148.68	6149.11	6149.21	6149.40	6149.70	43	6149.73	--	--	--	--	--	--		
	4+54	400454	6154.6	7	50	76	117	197	6154.76	6155.04	6155.15	6155.28	6155.51	59	6155.54	--	--	--	--	--	--		
	5+69	400569	6159.9	7	50	76	117	197	6160.02	6160.26	6160.36	6160.48	6160.67	72	6160.70	--	--	--	--	--	--		
	6+83	400683	6166.2	7	50	76	117	197	6166.42	6166.65	6166.75	6166.88	6167.08	73	6167.10	--	--	--	--	--	--		
	7+87	400787	6172.0	7	50	76	117	197	6172.09	6172.36	6172.44	6172.56	6172.76	80	6172.77	--	--	--	--	--	--		
D/S Willow Springs Drive	8+83	400883	6177.7	7	50	76	117	197	6177.93	6178.16	6178.26	6178.38	6178.57	71	6178.60	--	--	--	--	--	--		
Spill 2																							
Approximately 150 ft D/S of S Oak St	1+50	60150	5551.0	0	3	38	192	775	5550.99	5551.06	5551.51	5552.27	5553.60	42	5552.59	--	--	--	--	--	--		
	3+23	60323	5555.0	0	3	38	192	775	5555.03	5555.10	5555.37	5555.83	5556.69	79	5556.12	--	--	--	--	--	--		
	5+23	60523	5556.5	0	3	38	192	775	5556.51	5556.66	5557.08	5557.55	5558.36	78	5557.77	--	--	--	--	--	--		
	8+13	60813	5561.0	0	3	38	192	775	5561.03	5561.07	5561.31	5561.73	5562.51	97	5562.00	--	--	--	--	--	--		
	10+03	61003	5563.0	0	3	38	192	775	5563.03	5563.30	5563.85	5564.45	5565.34	129	5564.54	--	--	--	--	--	--		
	11+72	61172	5565.6	0	3	38	192	775	5565.68	5565.73	5565.94	5566.31	5567.05	157	5566.44	--	--	--	--	--	--		
	14+46	61446	5569.7	0	3	38	192	775	5569.73	5569.84	5570.14	5570.52	5571.16	156	5570.60	--	--	--	--	--	--		
	17+60	61760	5574.0	0	3	38	192	775	5574.10	5574.08	5574.27	5574.64	5575.30	188	5574.74	--	--	--	--	--	--		
	20+25	62025	5578.4	0	3	38	192	775	5578.38	5578.47	5578.78	5578.99	5579.34	346	5579.04	--	--	--	--	--	--		
	22+23	62223	5582.0	0	3	38	192	775	5582.04	5582.09	5582.31	5582.59	5583.05	351	5582.67	--	--	--	--	--	--		
	24+10	62410	5584.7	0	3	38	192	775	5584.74	5584.82	5585.01	5585.26	5585.70	326	5585.30	--	--	--	--	--	--		
Approximatyely 2,000 ft D/S of Quincey Ave	25+52	62552	5587.0	0	3	38	192	775	5587.01	5587.13	5587.28	5587.39	5587.85	315	5587.45	--	--	--	--	--	--		
285 Overflow																							
D/S of Hwy 285 at W Girton Dr.	0+00	70000	5523.0	0	362	736	1259	2401	5523.03	5524.17	5524.47	5524.76	5525.34	262	5525.23	5524.9	156	204	6.2	0.18	0.35		
	0+23	70023	5523.0	0	362	736	1259	2401	5523.04	5524.35	5524.65	5524.94	5525.46	267	5525.32	5525.3	167	255	4.9	0.32	0.35		
	1+00	70100	5528.0	0	362	736	1259	2401	5528.02	5528.74	5529.21	5529.44	5529.79	485	5529.74	5529.5	271	248	5.1	0.04	0.19		
	1+45	70145	5528.0	0	362	736	1259	2401	5528.03	5529.11	5529.47	5529.73	5530.11	446	5529.84	5529.9	374	515	2.5	0.21	0.20		Floodplain top width at right overbank ends at the gutter line (spill location).
	1+99	70199	5526.0	0	362	736	1259	2401	5528.03	5529.16	5529.54	5529.84	5530.33	601	5529.85	5530.0	510	1450	0.9	0.20	0.20		Floodplain top width at right overbank ends at the gutter line (spill location).
	2+31	70231	5526.1	0	362	736	1259	2401	5528.03	5529.16	5529.54	5529.84	5530.34	591	5529.86	5530.0	444	1430	0.9	0.20	0.20	2	
U/S of Hwy 285 at W Hampden Ave Frontage Rd	4+70	70470	5529.0	0	362	736	1259	2401	5529.02	5529.81	5530.15	5530.47	5530.98	262	5530.94	5530.5	210	220	5.7	0.00	0.05		
Kipling St Spill																							
Upstream of S Nelson St	1+62	80162	5471.0	0	35	88	133	189	5470.85	5471.14	5471.28	5471.40	5471.60	150	5471.48	--	--	--	--	--	--	2	Modeled and mapped floodplain top width include high ground

Table D-1 - Floodplain and Floodway Data Table - Existing Infrastructure, Future Land Use

Note:
1. Floodway equal to floodplain.
2. Floodplain top width includes high ground or obstruction.
3. Floodplain top width includes IEFA.
4. Floodway top width includes high ground or obstruction.
5. Floodway top width includes IEFA.
6. Floodplain includes IEFA from structure modeling.
7. Floodway includes IEFA from structure modeling.

Reference Location	River Station	Cross Section	Thalweg Elevation	Peak Discharge					Water Surface Elevation					100-Year Floodplain		100-Year Floodway (0.5-ft Rise in EGL)						Note	Comments
				10-Year	25-Year	50-Year	100-Year	500-Year	10-Year	25-Year	50-Year	100-Year	500-Year	Width	Energy Grade Line (EGL)	WSEL	Width	Area	Velocity	HGL Surcharge	EGL Surcharge		
	(ft)			(cfs)	(cfs)	(cfs)	(cfs)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(sq ft)	(ft/s)	(ft)	(ft)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
	3+53	80353	5475.4	0	122	227	317	489	5475.21	5475.86	5476.02	5476.12	5476.30	146	5476.39	--	--	--	--	--	--		
	7+85	80785	5484.0	0	122	227	317	489	5484.23	5485.07	5485.44	5485.66	5485.98	121	5486.20	--	--	--	--	--	--	2	Mapped floodplain includes flow in left overbank from upstream cross section.
	9+74	80974	5489.2	0	122	227	317	489	5489.23	5490.40	5490.56	5490.67	5490.90	222	5490.92	--	--	--	--	--	--	2	
	11+94	81194	5494.2	0	122	227	317	489	5494.27	5495.30	5495.42	5495.54	5495.69	289	5495.72	--	--	--	--	--	--	2	
	13+27	81327	5497.0	0	122	227	317	489	5497.01	5497.78	5497.95	5498.05	5498.23	227	5498.24	--	--	--	--	--	--		
	16+32	81632	5503.7	0	122	227	317	489	5503.70	5503.73	5503.83	5503.98	5504.22	125	5504.30	--	--	--	--	--	--		
	17+65	81765	5506.0	0	122	227	317	489	5506.02	5506.30	5506.55	5506.68	5506.89	128	5506.96	--	--	--	--	--	--		
	18+39	81839	5507.8	0	122	227	317	489	5507.78	5508.31	5508.52	5508.66	5508.93	129	5508.98	--	--	--	--	--	--		
	19+18	81918	5507.0	0	122	227	317	489	5507.78	5508.56	5508.84	5509.05	5509.33	266	5509.09	--	--	--	--	--	--	3	
	21+68	82168	5511.0	0	122	227	317	489	5511.01	5511.85	5512.19	5512.44	5512.81	48	5512.99	--	--	--	--	--	--		Mapped floodplain does not include ineffective area in right overbank because water does not overtop high ground.
	24+11	82411	5513.0	0	122	227	317	489	5513.06	5513.80	5514.19	5514.31	5514.45	201	5514.52	--	--	--	--	--	--		
	26+67	82667	5516.0	0	122	227	317	489	5516.05	5516.89	5517.12	5517.27	5517.49	163	5517.58	--	--	--	--	--	--		Flooding in right overbank from upstream.
	29+14	82914	5520.5	0	122	227	317	489	5520.57	5521.20	5521.37	5521.49	5521.70	114	5521.81	--	--	--	--	--	--		
	30+35	83035	5523.0	0	122	227	317	489	5523.01	5523.55	5523.82	5524.00	5524.28	87	5524.39	--	--	--	--	--	--		
	31+36	83136	5521.0	0	122	227	317	489	5523.03	5523.96	5524.32	5524.55	5524.92	104	5524.62	--	--	--	--	--	--		
	33+61	83361	5524.9	0	122	227	317	489	5525.00	5526.48	5526.84	5527.10	5527.40	94	5527.50	--	--	--	--	--	--		
	36+43	83643	5526.0	0	122	227	317	489	5526.07	5528.43	5528.98	5529.19	5529.48	186	5529.36	--	--	--	--	--	--	2	
U/S of Hwy 285 at W Hampden Ave Frontage Rd	39+50	83950	5527.0	0	122	227	317	489	5527.01	5529.03	5529.60	5529.89	5530.25	266	5529.95	--	--	--	--	--	--	2,3	

Table D-2 - Agreement Table

Reference Location	Cross Section	River Station	Distance b/a RS (ft)			Cumulative Distance (ft)			Floodplain Width (ft)		Floodway Width (ft)		BFE (ft)		Comments
			Model	Profile	Map	Model	Profile	Map	Model	Map	Model	Map	FDT	Profile	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(17)
Weaver Creek															
River station is measured in fee	68	+68	0	0	0	68	68	68	305	305	77	77	5446.9	5446.9	Normal depth based on Bear Creek slope near the confluence.
	100	1+00	32	32	32	100	100	100	271	271	72	72	5446.7	5446.7	
	200	2+00	100	100	100	200	200	200	60	60	44	44	5449.0	5449.0	
	350	3+50	150	150	150	350	350	350	81	81	81	81	5454.1	5454.1	
	378	3+78	28	28	28	378	378	378	59	59	59	59	5454.3	5454.3	
	383	3+83	5	5	5	383	383	383	56	56	56	56	5454.2	5454.2	FP = FW, No encroachments defined due to negative surcharges.
	392	3+92	9	9	9	392	392	392	57	57	57	57	5454.9	5454.9	FP = FW, No encroachments defined due to negative surcharges.
	402	4+02	10	10	10	402	402	402	56	56	56	56	5455.4	5455.4	FP = FW, No encroachments defined due to negative surcharges.
	647	6+47	245	245	245	647	647	647	73	73	73	73	5460.7	5460.7	
D/S Dartmouth Avenue	670	6+70	23	23	23	670	670	670	66	66	66	66	5461.3	5461.3	
U/S Dartmouth Avenue	873	8+73	203	203	203	873	873	873	72	199	72	72	5463.7	5463.7	Mapped top width includes area of shallow flooding in right overbank.
	883	8+83	10	10	10	883	883	883	68	208	68	68	5463.4	5463.4	Mapped top width includes area of shallow flooding in right and left overbanks.
	900	9+00	17	17	17	900	900	900	67	227	63	63	5467.3	5467.3	Mapped top width includes area of shallow flooding in right and left overbanks.
	910	9+10	10	10	10	910	910	910	149	238	66	66	5468.1	5468.1	Mapped top width includes area of shallow flooding in right and left overbanks.
	1037	10+37	127	127	127	1037	1037	1037	83	265	83	83	5470.1	5470.1	Mapped top width includes area of shallow flooding in right and left overbanks.
	1300	13+00	263	263	263	1300	1300	1300	88	296	88	88	5471.6	5471.6	Mapped top width includes area of shallow flooding in right and left overbanks.
	1644	16+44	344	344	344	1644	1644	1644	63	197	63	63	5472.9	5472.9	Mapped top width includes area of shallow flooding in right and left overbanks.
	1658	16+58	14	14	14	1658	1658	1658	57	200	57	57	5473.4	5473.4	Mapped top width includes area of shallow flooding in right and left overbanks.
	1682	16+82	24	24	24	1682	1682	1682	48	203	48	48	5481.0	5481.0	Mapped top width includes area of shallow flooding in right and left overbanks.
	1706	17+06	24	24	24	1706	1706	1706	48	203	48	48	5482.5	5482.5	Mapped top width includes area of shallow flooding in right and left overbanks.
	1712	17+12	6	6	6	1712	1712	1712	67	203	48	48	5485.6	5485.6	Mapped top width includes area of shallow flooding in right and left overbanks.
	1734	17+34	22	22	22	1734	1734	1734	168	202	100	100	5487.5	5487.5	Mapped top width includes area of shallow flooding in right and left overbanks.
	1939	19+39	205	205	205	1939	1939	1939	69	69	69	69	5491.7	5491.7	
	2323	23+23	384	384	384	2323	2323	2323	226	226	191	191	5494.5	5494.5	
	2543	25+43	220	220	220	2543	2543	2543	158	158	100	100	5494.7	5494.7	
	2836	28+36	293	293	293	2836	2836	2836	94	94	75	75	5496.6	5496.6	
	3100	31+00	264	264	264	3100	3100	3100	99	99	70	70	5501.5	5501.5	
	3128	31+28	28	28	28	3128	3128	3128	127	127	98	98	5503.8	5503.8	
	3155	31+55	27	27	27	3155	3155	3155	119	119	104	104	5504.8	5504.8	
	3280	32+80	125	125	125	3280	3280	3280	191	191	185	185	5505.8	5505.8	
	3297	32+97	17	17	17	3297	3297	3297	191	191	186	186	5505.8	5505.8	
	3524	35+24	227	227	227	3524	3524	3524	142	142	140	140	5506.9	5506.9	
	3700	37+00	176	176	176	3700	3700	3700	92	92	87	87	5510.0	5510.0	
	3754	37+54	54	54	54	3754	3754	3754	81	81	75	75	5511.1	5511.1	
	3770	37+70	16	16	16	3770	3770	3770	91	91	84	84	5511.8	5511.8	
	3804	38+04	34	34	34	3804	3804	3804	139	139	95	95	5512.1	5512.1	
	3822	38+22	18	18	18	3822	3822	3822	110	110	77	77	5513.4	5513.4	
	3834	38+34	12	12	12	3834	3834	3834	95	95	72	72	5514.2	5514.2	
	3883	38+83	49	49	49	3883	3883	3883	58	58	57	57	5514.7	5514.7	
D/S Hampden Avenue/Highway 285	3893	38+93	10	10	10	3893	3893	3893	51	52	51	51	5514.1	5514.1	Overtopping of Hampden Avenue/US 285.
U/S Hampden Avenue/Highway 286	4339	43+39	446	446	446	4339	4339	4339	245	245	148	148	5530.9	5530.9	Overtopping of Hampden Avenue/US 285. The adjacent pond was not included in top width of the 100-year floodplain.
	4349	43+49	10	10	10	4349	4349	4349	255	255	125	125	5531.0	5531.0	The adjacent pond was not included in top width of the 100-year floodplain.
	4550	45+50	201	201	201	4550	4550	4550	87	87	82	82	5531.2	5531.2	The adjacent pond was not included in top width of the 100-year floodplain.
	4770	47+70	220	220	220	4770	4770	4770	86	86	80	80	5533.2	5533.2	The adjacent pond was not included in top width of the 100-year floodplain.
D/S Pedestrian Bridge	4780	47+80	10	10	10	4780	4780	4780	83	83	80	80	5533.5	5533.5	
U/S Pedestrian Bridge	4836	48+36	56	56	56	4836	4836	4836	88	88	82	82	5534.4	5534.4	
	4846	48+46	10	10	10	4846	4846	4846	89	89	82	82	5534.5	5534.5	
	5000	50+00	154	154	154	5000	5000	5000	111	212	70	70	5536.6	5536.6	Mapped top width includes area of shallow flooding.
	5106	51+06	106	106	106	5106	5106	5106	156	352	70	70	5537.2	5537.2	Mapped top width includes area of shallow flooding.
D/S Warrior Canal	5126	51+26	20	20	20	5126	5126	5126	209	427	70	70	5539.5	5539.5	Mapped top width includes area of shallow flooding in right overbank.
U/S Warrior Canal	5223	52+23	97	97	97	5223	5223	5223	540	547	225	225	5544.2	5544.2	Overtopping of Warrior Canal. Mapped top width includes ineffective area and high ground in right overbank.
	5270	52+70	47	47	47	5270	5270	5270	482	482	220	220	5544.3	5544.3	
	5332	53+32	62	62	62	5332	5332	5332	487	487	210	210	5544.6	5544.6	
	5371	53+71	39	39	39	5371	5371	5371	484	484	190	190	5544.6	5544.6	
	5489	54+89	118	118	118	5489	5489	5489	255	255	170	170	5544.7	5544.7	
	5679	56+79	190	190	190	5679	5679	5679	165	165	120	120	5545.7	5545.7	
	5994	59+94	315	315	315	5994	5994	5994	158	158	105	105	5548.3	5548.3	
	6181	61+81	187	187	187	6181	6181	6181	150	150	100	100	5549.6	5549.6	
	6397	63+97	216	216	216	6397	6397	6397	137	137	100	100	5552.1	5552.1	

Table D-2 - Agreement Table

Reference Location	Cross Section	River Station	Distance b/a RS (ft)			Cumulative Distance (ft)			Floodplain Width (ft)		Floodway Width (ft)		BFE (ft)		Comments
			Model	Profile	Map	Model	Profile	Map	Model	Map	Model	Map	FDT	Profile	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(17)
	6549	65+49	152	152	152	6549	6549	6549	130	130	100	100	5553.2	5553.2	
	6801	68+01	252	252	252	6801	6801	6801	294	294	215	215	5555.6	5555.6	
	6886	68+86	85	85	85	6886	6886	6886	336	336	259	259	5556.9	5556.9	
	7010	70+10	124	124	124	7010	7010	7010	313	313	210	210	5558.2	5558.2	
	7138	71+38	128	128	128	7138	7138	7138	255	255	160	160	5559.0	5559.0	
	7305	73+05	167	167	167	7305	7305	7305	215	215	130	130	5561.7	5561.7	
	7676	76+76	371	371	371	7676	7676	7676	138	138	134	134	5564.4	5564.4	
	8009	80+09	333	333	333	8009	8009	8009	215	215	140	140	5567.8	5567.8	
	8300	83+00	291	291	291	8300	8300	8300	277	277	205	205	5571.1	5571.1	
	8531	85+31	231	231	231	8531	8531	8531	235	235	170	170	5574.7	5574.7	
	8548	85+48	17	17	17	8548	8548	8548	259	259	200	200	5575.1	5575.1	
	8605	86+05	57	57	57	8605	8605	8605	262	262	195	195	5575.9	5575.9	
	8779	87+79	174	174	174	8779	8779	8779	288	288	230	230	5576.4	5576.4	Negative surcharge when encroachments set to 100-year floodplain extents.
	9013	90+13	234	234	234	9013	9013	9013	225	225	225	225	5578.5	5578.5	FP = FW, No encroachments defined due to negative surcharges.
	9240	92+40	227	227	227	9240	9240	9240	187	187	187	187	5581.7	5581.7	FP = FW, No encroachments defined due to negative surcharges.
	9420	94+20	180	180	180	9420	9420	9420	179	179	179	179	5583.8	5583.8	
	9734	97+34	314	314	314	9734	9734	9734	218	218	140	140	5587.0	5587.0	
	10166	101+66	432	432	432	10166	10166	10166	712	712	233	233	5590.5	5590.5	
	10344	103+44	178	178	178	10344	10344	10344	665	665	305	305	5593.4	5593.4	
	10551	105+51	207	207	207	10551	10551	10551	485	485	308	308	5595.9	5595.9	
	10766	107+66	215	215	215	10766	10766	10766	596	599	125	125	5598.0	5598.0	Floodplain mapped wider in right overbank to include local low point
	10955	109+55	189	189	189	10955	10955	10955	521	521	86	86	5600.2	5600.2	
	11082	110+82	127	127	127	11082	11082	11082	239	239	126	126	5601.2	5601.2	
	11217	112+17	135	135	135	11217	11217	11217	167	167	100	100	5602.2	5602.2	
	11327	113+27	110	110	110	11327	11327	11327	167	167	130	130	5602.9	5602.9	
	11552	115+52	225	225	225	11552	11552	11552	261	261	100	100	5604.1	5604.1	
	11890	118+90	338	338	338	11890	11890	11890	148	148	96	95	5606.7	5606.7	
	11992	119+92	102	102	102	11992	11992	11992	314	314	103	103	5607.5	5607.5	
D/S West Quincy Avenue	12012	120+12	20	20	20	12012	12012	12012	283	283	100	100	5607.5	5607.5	Overtopping of West Quincy Avenue.
U/S West Quincy Avenue	12237	122+37	225	225	225	12237	12237	12237	278	278	120	120	5609.8	5609.8	Overtopping of West Quincy Avenue.
	12279	122+79	42	42	42	12279	12279	12279	248	248	130	130	5609.9	5609.9	
	12677	126+77	398	398	398	12677	12677	12677	97	97	90	90	5612.3	5612.3	
	12969	129+69	292	292	292	12969	12969	12969	117	117	85	85	5615.0	5615.0	
	13214	132+14	245	245	245	13214	13214	13214	52	52	50	50	5616.5	5616.5	
	13384	133+84	170	170	170	13384	13384	13384	84	84	70	70	5617.8	5617.8	
D/S Simms Street	13411	134+11	27	27	27	13411	13411	13411	188	96	55	55	5617.8	5617.8	Mapped floodplain excludes adjacent pond in the right overbank.
U/S Simms Street	13575	135+75	164	164	164	13575	13575	13575	87	87	74	74	5618.8	5618.8	Mapped floodplain excludes adjacent pond in the right overbank.
	13614	136+14	39	39	39	13614	13614	13614	80	80	80	80	5618.8	5618.8	Mapped floodplain excludes adjacent pond in the right overbank.
	13628	136+28	14	14	14	13628	13628	13628	76	76	76	76	5618.7	5618.7	Mapped floodplain excludes adjacent pond in the right overbank.
	13629	136+29	1	1	1	13629	13629	13629	74	74	74	74	5618.5	5618.5	Mapped floodplain excludes adjacent pond in the right overbank.
	13639	136+39	10	10	10	13639	13639	13639	70	70	69	69	5618.7	5618.7	Mapped floodplain excludes adjacent pond in the right overbank.
	13679	136+79	40	40	40	13679	13679	13679	66	66	66	66	5620.1	5620.1	Mapped floodplain excludes adjacent pond in the right overbank.
	13694	136+94	15	15	15	13694	13694	13694	76	76	76	76	5621.0	5621.0	Mapped floodplain excludes adjacent pond in the right overbank. FP = FW, No encroachments defined due to negative surcharges.
	13699	136+99	5	5	5	13699	13699	13699	71	71	71	71	5620.8	5620.8	Mapped floodplain excludes adjacent pond in the right overbank.
	13709	137+09	10	10	10	13709	13709	13709	230	73	73	73	5621.2	5621.2	Mapped floodplain excludes ineffective area in left overbank and adjacent pond.
	13831	138+31	122	122	122	13831	13831	13831	235	73	73	73	5623.5	5623.5	Mapped floodplain excludes ineffective area in left overbank.
	13960	139+60	129	129	129	13960	13960	13960	224	66	66	66	5625.4	5625.4	Mapped floodplain excludes ineffective area in left overbank.
	13970	139+70	10	10	10	13970	13970	13970	238	72	72	71	5626.3	5626.3	Mapped floodplain excludes ineffective area in left overbank.
	13972	139+72	2	2	2	13972	13972	13972	243	74	74	74	5626.7	5626.7	Mapped floodplain excludes ineffective area in left overbank.
	13982	139+82	10	10	10	13982	13982	13982	251	76	76	76	5627.4	5627.4	Mapped floodplain excludes ineffective area in left overbank.
	14317	143+17	335	335	335	14317	14317	14317	351	90	76	76	5631.5	5631.5	Mapped floodplain excludes ineffective area in left overbank.
	14475	144+75	158	158	158	14475	14475	14475	253	85	85	85	5632.6	5632.6	Mapped floodplain excludes ineffective area in left overbank.
	14658	146+58	183	183	183	14658	14658	14658	78	78	71	71	5634.3	5634.3	

Table D-2 - Agreement Table

Reference Location	Cross Section	River Station	Distance b/a RS (ft)			Cumulative Distance (ft)			Floodplain Width (ft)		Floodway Width (ft)		BFE (ft)		Comments
			Model	Profile	Map	Model	Profile	Map	Model	Map	Model	Map	FDT	Profile	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(17)
	14668	146+68	10	10	10	14668	14668	14668	74	74	68	69	5634.3	5634.3	
	14671	146+71	3	3	3	14671	14671	14671	77	77	70	70	5634.5	5634.5	
	14681	146+81	10	10	10	14681	14681	14681	91	91	75	75	5635.3	5635.3	
	14909	149+09	228	228	228	14909	14909	14909	76	76	49	49	5638.4	5638.4	
	14922	149+22	13	13	13	14922	14922	14922	51	51	51	51	5638.4	5638.4	
	14927	149+27	5	5	5	14927	14927	14927	77	77	62	62	5639.8	5639.8	
	14940	149+40	13	13	13	14940	14940	14940	89	89	83	83	5640.4	5640.4	
	15058	150+58	118	118	118	15058	15058	15058	69	69	61	61	5642.0	5642.0	
	15068	150+68	10	10	10	15068	15068	15068	64	64	62	62	5642.1	5642.1	
	15077	150+77	9	9	9	15077	15077	15077	115	115	102	102	5644.0	5644.0	
	15087	150+87	10	10	10	15087	15087	15087	204	109	99	99	5644.3	5644.3	Mapped floodplain does not include ineffective area in right overbank.
	15381	153+81	294	294	294	15381	15381	15381	82	82	81	82	5648.0	5648.0	
	15600	156+00	219	219	219	15600	15600	15600	90	90	49	49	5649.9	5649.9	
	15639	156+39	39	39	39	15639	15639	15639	97	97	49	49	5650.0	5650.0	
D/S Pedestrian Bridge	15669	156+69	30	30	30	15669	15669	15669	104	104	42	42	5650.6	5650.6	
U/S Pedestrian Bridge	15696	156+96	27	27	27	15696	15696	15696	201	201	44	44	5651.4	5651.4	
	15697	156+97	1	1	1	15697	15697	15697	200	200	43	43	5651.5	5651.5	
	15706	157+06	9	9	9	15706	15706	15706	171	171	41	41	5651.4	5651.4	
	15710	157+10	4	4	4	15710	15710	15710	168	168	40	40	5651.5	5651.5	
	15719	157+19	9	9	9	15719	15719	15719	140	140	39	39	5651.6	5651.6	
	15748	157+48	29	29	29	15748	15748	15748	92	92	64	65	5652.9	5652.9	Floodplain includes high ground and shallow flooding in left overbank from upstream
	15758	157+58	10	10	10	15758	15758	15758	84	84	67	67	5653.1	5653.1	Floodplain includes high ground
	15760	157+60	2	2	2	15760	15760	15760	84	84	69	70	5653.2	5653.2	Floodplain includes high ground
	15768	157+68	8	8	8	15768	15768	15768	84	84	83	84	5653.2	5653.2	
	15773	157+73	5	5	5	15773	15773	15773	77	81	77	81	5652.9	5652.9	Floodplain and floodway mapped wider in the left overbank based on flow from upstream cross section.
	15782	157+82	9	9	9	15782	15782	15782	85	85	85	85	5653.4	5653.4	
	15864	158+64	82	82	82	15864	15864	15864	92	92	92	92	5654.7	5654.7	
	15937	159+37	73	73	73	15937	15937	15937	245	97	96	97	5655.6	5655.6	Mapped floodplain does not include ineffective area in the left overbank.
	16051	160+51	114	114	114	16051	16051	16051	241	93	93	93	5656.7	5656.7	Mapped floodplain does not include ineffective area in the left overbank.
	16180	161+80	129	129	129	16180	16180	16180	61	61	59	59	5657.6	5657.6	
	16198	161+98	18	18	18	16198	16198	16198	246	109	69	69	5658.8	5658.8	Flooding in left and right overbanks from upstream. Mapped floodplain does not include ineffective area in left overbank.
	16199	161+99	1	1	1	16199	16199	16199	287	115	95	95	5659.5	5659.5	Flooding in left overbank from upstream. Mapped floodplain does not include ineffective area in left overbank.
	16209	162+09	10	10	10	16209	16209	16209	311	139	125	125	5660.2	5660.2	Mapped floodplain does not include ineffective area in left overbank.
	16323	163+23	114	114	114	16323	16323	16323	108	108	108	108	5661.4	5661.4	
	16485	164+85	162	162	162	16485	16485	16485	94	94	84	84	5662.6	5662.6	
	16720	167+20	235	235	235	16720	16720	16720	84	84	84	84	5664.8	5664.8	
	16776	167+76	56	56	56	16776	16776	16776	73	73	73	73	5665.1	5665.1	
D/S Pedestrian Crossing	16786	167+86	10	10	10	16786	16786	16786	75	75	75	75	5665.5	5665.5	Overtopping of pedestrian crossing. FP = FW, No encroachments defined due to negative surcharges.
U/S Pedestrian Crossing	16832	168+32	46	46	46	16832	16832	16832	102	102	102	102	5667.4	5667.4	Overtopping of pedestrian crossing. FP = FW, No encroachments defined due to negative surcharges.
	16842	168+42	10	10	10	16842	16842	16842	98	98	98	98	5667.5	5667.5	FP = FW, No encroachments defined due to negative surcharges.
	16970	169+70	128	128	128	16970	16970	16970	55	55	55	55	5668.6	5668.6	FP = FW, No encroachments defined due to negative surcharges.
	16991	169+91	21	21	21	16991	16991	16991	89	89	89	89	5670.9	5670.9	FP = FW, No encroachments defined due to negative surcharges.
	17006	170+06	15	15	15	17006	17006	17006	86	86	86	86	5671.1	5671.1	FP = FW, No encroachments defined due to negative surcharges.
	17051	170+51	45	45	45	17051	17051	17051	89	89	89	89	5671.9	5671.9	
	17207	172+07	156	156	156	17207	17207	17207	75	75	75	75	5673.8	5673.8	
	17596	175+96	389	389	389	17596	17596	17596	73	73	73	73	5678.9	5678.9	FP = FW, No encroachments defined due to negative surcharges.
	17935	179+35	339	339	339	17935	17935	17935	26	26	26	26	5685.1	5685.1	FP = FW, No encroachments defined due to negative surcharges.
	18142	181+42	207	207	207	18142	18142	18142	25	25	25	25	5690.0	5690.0	FP = FW, No encroachments defined due to negative surcharges.
	18325	183+25	183	183	183	18325	18325	18325	42	42	42	42	5692.8	5692.8	FP = FW, No encroachments defined due to negative surcharges.
D/S South Youngfield Street	18335	183+35	10	10	10	18335	18335	18335	44	44	44	44	5692.9	5692.9	FP = FW, No encroachments defined due to negative surcharges.
U/S South Youngfield Street	18502	185+02	167	167	167	18502	18502	18502	57	57	57	57	5693.6	5693.6	FP = FW, No encroachments defined due to negative surcharges.
	18512	185+12	10	10	10	18512	18512	18512	56	56	56	56	5693.6	5693.6	FP = FW, No encroachments defined due to negative surcharges.
	18581	185+81	69	69	69	18581	18581	18581	44	44	44	44	5693.9	5693.9	FP = FW, No encroachments defined due to negative surcharges.
	18729	187+29	148	148	148	18729	18729	18729	41	41	41	41	5697.2	5697.2	FP = FW, No encroachments defined due to negative surcharges.

Table D-2 - Agreement Table

Reference Location	Cross Section	River Station	Distance b/a RS (ft)			Cumulative Distance (ft)			Floodplain Width (ft)		Floodway Width (ft)		BFE (ft)		Comments
			Model	Profile	Map	Model	Profile	Map	Model	Map	Model	Map	FDT	Profile	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(17)
	18747	187+47	18	18	18	18747	18747	18747	41	41	41	41	5697.5	5697.5	FP = FW, No encroachments defined due to negative surcharges.
	18761	187+61	14	14	14	18761	18761	18761	42	42	42	42	5697.7	5697.7	FP = FW, No encroachments defined due to negative surcharges.
	18763	187+63	2	2	2	18763	18763	18763	42	42	42	42	5697.9	5697.9	FP = FW, No encroachments defined due to negative surcharges.
	18776	187+76	13	13	13	18776	18776	18776	67	67	67	67	5699.5	5699.5	FP = FW, No encroachments defined due to negative surcharges.
	18856	188+56	80	80	80	18856	18856	18856	71	71	71	71	5701.3	5701.3	FP = FW, No encroachments defined due to negative surcharges.
	19028	190+28	172	172	172	19028	19028	19028	51	51	51	51	5702.7	5702.7	FP = FW, No encroachments defined due to negative surcharges.
	19038	190+38	10	10	10	19038	19038	19038	47	47	47	47	5702.8	5702.8	FP = FW, No encroachments defined due to negative surcharges.
	19050	190+50	12	12	12	19050	19050	19050	43	43	43	43	5702.9	5702.9	FP = FW, No encroachments defined due to negative surcharges.
	19060	190+60	10	10	10	19060	19060	19060	62	62	62	62	5704.0	5704.0	FP = FW, No encroachments defined due to negative surcharges.
	19197	191+97	137	137	137	19197	19197	19197	72	72	72	72	5706.3	5706.3	FP = FW, No encroachments defined due to negative surcharges.
	19329	193+29	132	132	132	19329	19329	19329	53	53	53	53	5707.3	5707.3	
	19340	193+40	11	11	11	19340	19340	19340	46	46	46	46	5707.3	5707.3	
	19344	193+44	4	4	4	19344	19344	19344	46	46	46	46	5707.3	5707.3	
	19354	193+54	10	10	10	19354	19354	19354	52	52	52	52	5707.6	5707.6	
	19510	195+10	156	156	156	19510	19510	19510	45	45	45	45	5710.3	5710.3	
	19573	195+73	63	63	63	19573	19573	19573	56	56	56	56	5711.9	5711.9	
	19583	195+83	10	10	10	19583	19583	19583	55	55	55	55	5712.1	5712.1	
	19594	195+94	11	11	11	19594	19594	19594	76	76	76	76	5713.0	5713.0	FP = FW, No encroachments defined due to negative surcharges.
	19604	196+04	10	10	10	19604	19604	19604	77	77	77	77	5713.3	5713.3	FP = FW, No encroachments defined due to negative surcharges.
	19687	196+87	83	83	83	19687	19687	19687	59	86	59	59	5714.9	5714.9	Flooding in left overbank from upstream.
	19715	197+15	28	28	28	19715	19715	19715	41	86	41	74	5715.0	5715.0	Floodplain and floodway mapped wider in the left overbank based on flow from upstream cross section.
	19716	197+16	1	1	1	19716	19716	19716	75	87	75	75	5715.8	5715.8	Floodplain and floodway mapped wider in the left overbank based on flow from upstream cross section.
	19727	197+27	11	11	11	19727	19727	19727	97	97	97	97	5716.9	5716.9	FP = FW, No encroachments defined due to negative surcharges.
	19890	198+90	163	163	163	19890	19890	19890	79	79	37	37	5719.6	5719.6	
	19986	199+86	96	96	96	19986	19986	19986	40	165	40	40	5720.8	5720.8	Floodplain mapped wider in the left and right overbanks based on flow from upstream cross section.
D/S Cole Street	19996	199+96	10	10	10	19996	19996	19996	35	193	35	35	5721.4	5721.4	Overtopping of Cole Street. Floodplain mapped wider in the left and right overbanks based on flow from upstream cross section.
U/S Cole Street	20101	201+01	105	105	105	20101	20101	20101	211	211	59	59	5725.9	5725.9	Overtopping of Cole Street.
	20114	201+14	13	13	13	20114	20114	20114	201	201	64	64	5725.9	5725.9	
	20239	202+39	125	125	125	20239	20239	20239	94	94	63	63	5726.0	5726.0	
	20350	203+50	111	111	111	20350	20350	20350	46	46	46	46	5726.1	5726.1	
	20360	203+60	10	10	10	20360	20360	20360	45	45	45	45	5726.1	5726.1	
	20381	203+81	21	21	21	20381	20381	20381	55	55	47	47	5727.3	5727.3	
	20391	203+91	10	10	10	20391	20391	20391	75	75	50	50	5728.0	5728.0	
	20668	206+68	277	277	277	20668	20668	20668	42	42	42	42	5730.8	5730.8	
	20685	206+85	17	17	17	20685	20685	20685	53	53	53	53	5732.3	5732.3	FP = FW, No encroachments defined due to negative surcharges.
	20700	207+00	15	15	15	20700	20700	20700	64	64	64	64	5732.9	5732.9	FP = FW, No encroachments defined due to negative surcharges.
	20808	208+08	108	108	108	20808	20808	20808	45	45	45	45	5735.1	5735.1	FP = FW, No encroachments defined due to negative surcharges.
	20818	208+18	10	10	10	20818	20818	20818	43	43	43	43	5735.2	5735.2	FP = FW, No encroachments defined due to negative surcharges.
	20834	208+34	16	16	16	20834	20834	20834	54	54	54	54	5736.0	5736.0	FP = FW, No encroachments defined due to negative surcharges.
	20868	208+68	34	34	34	20868	20868	20868	61	61	61	61	5737.0	5737.0	FP = FW, No encroachments defined due to negative surcharges.
	20994	209+94	126	126	126	20994	20994	20994	48	48	48	48	5738.7	5738.7	
	21012	210+12	18	18	18	21012	21012	21012	86	86	67	67	5740.2	5740.2	
	21033	210+33	21	21	21	21033	21033	21033	97	97	73	73	5740.9	5740.9	
	21110	211+10	77	77	77	21110	21110	21110	82	82	72	72	5741.3	5741.3	
	21408	214+08	298	298	298	21408	21408	21408	22	22	22	22	5746.1	5746.1	Mapped floodplain excludes adjacent pond. FP = FW, No encroachments defined due to negative surcharges.
	21668	216+68	260	260	260	21668	21668	21668	32	32	32	32	5751.6	5751.6	FP = FW, No encroachments defined due to negative surcharges.
	22050	220+50	382	382	382	22050	22050	22050	27	27	27	27	5757.5	5757.5	
	22247	222+47	197	197	197	22247	22247	22247	73	73	73	73	5761.8	5761.8	
D/S Eldridge Street	22272	222+72	25	25	25	22272	22272	22272	73	73	73	73	5762.1	5762.1	
U/S Eldridge Street	22419	224+19	147	147	147	22419	22419	22419	37	37	37	37	5764.0	5764.0	
	22429	224+29	10	10	10	22429	22429	22429	38	38	38	38	5764.1	5764.1	FP = FW, No encroachments defined due to negative surcharges.
	22474	224+74	45	45	45	22474	22474	22474	59	59	59	59	5765.9	5765.9	FP = FW, No encroachments defined due to negative surcharges.
	22510	225+10	36	36	36	22510	22510	22510	82	82	82	82	5766.6	5766.6	
	22552	225+52	42	42	42	22552	22552	22552	63	63	63	63	5766.6	5766.6	
D/S C-470	22562	225+62	10	10	10	22562	22562	22562	59	59	59	59	5766.6	5766.6	
U/S C-470	22881	228+81	319	319	319	22881	22881	22881	74	73	64	64	5774.5	5774.5	
	22906	229+06	25	25	25	22906	22906	22906	111	111	83	83	5775.6	5775.6	
	23002	230+02	96	96	96	23002	23002	23002	103	103	55	55	5777.2	5777.2	
D/S Quincy Avenue/Frontage R	23012	230+12	10	10	10	23012	23012	23012	77	77	45	45	5777.2	5777.2	
U/S Quincy Avenue/Frontage R	23173	231+73	161	161	161	23173	23173	23173	95	95	76	76	5779.1	5779.1	
	23183	231+83	10	10	10	23183	23183	23183	94	94	80	80	5779.1	5779.1	
	23504	235+04	321	321	321	23504	23504	23504	84	84	45	45	5783.3	5783.3	
	23520	235+20	16	16	16	23520	23520	23520	96	96	50	50	5783.9	5783.9	
	23535	235+35	15	15	15	23535	23535	23535	132	132	62	62	5784.4	5784.4	
	23810	238+10	275	275	275	23810	23810	23810	59	111	30	30	5788.7	5788.7	Floodplain mapped wider in the left overbank based on flow from upstream cross section.
	23835	238+35	25	25	25	23835	23835	23835	58	120	34	34	5789.2	5789.2	Floodplain mapped wider in the left overbank based on flow from upstream cross section.
D/S Private Driveway	23845	238+45	10	10	10	23845	23845	23845	52	131	37	37	5791.0	5791.0	Overtopping of driveway. Floodplain mapped wider in the left overbank based on flow from upstream cross section.
U/S Private Driveway	23908	239+08	63	63	63	23908	23908	23908	267	240	96	96	5794.8	5794.8	Overtopping of driveway. Mapped floodplain does not include ineffective area in left overbank.
	23918	239+18	10	10	10	23918	23918	23918	219	219	94	94	5794.8	5794.8	
	23977	239+77	59	59	59	23977	23977	23977	175	221	117	117	5794.9	5794.9	Mapped floodplain includes flow in right overbank from upstream cross section.
	24034	240+34	57	57	57	24034	24034	24034	126	216	115	115	5794.9	5794.9	Mapped floodplain includes flow in right overbank from upstream cross section.

Table D-2 - Agreement Table

Reference Location	Cross Section	River Station	Distance b/a RS (ft)			Cumulative Distance (ft)			Floodplain Width (ft)		Floodway Width (ft)		BFE (ft)		Comments
			Model	Profile	Map	Model	Profile	Map	Model	Map	Model	Map	FDT	Profile	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(17)
	24098	240+98	64	64	64	24098	24098	24098	200	200	70	70	5796.6	5796.6	Mapped floodplain includes ineffective flow area.
	24120	241+20	22	22	22	24120	24120	24120	180	180	83	83	5798.6	5798.6	
	24123	241+23	3	3	3	24123	24123	24123	152	152	85	85	5798.8	5798.8	
	24171	241+71	48	48	48	24171	24171	24171	236	236	157	157	5799.4	5799.4	Floodplain and Floodway include permanent IEFA from berm modeling.
	24289	242+89	118	118	118	24289	24289	24289	125	125	78	78	5799.6	5799.6	
	24373	243+73	84	84	84	24373	24373	24373	51	51	50	50	5799.7	5799.7	
	24567	245+67	194	194	194	24567	24567	24567	32	32	30	30	5803.0	5803.0	
	24807	248+07	240	240	240	24807	24807	24807	32	32	26	26	5809.7	5809.7	
	25034	250+34	227	227	227	25034	25034	25034	26	26	25	25	5814.4	5814.4	
D/S Belleview Avenue	25044	250+44	10	10	10	25044	25044	25044	25	25	23	23	5814.6	5814.6	
U/S Belleview Avenue	25121	251+21	77	77	77	25121	25121	25121	95	95	95	95	5824.0	5824.0	Spill location.
	25131	251+31	10	10	10	25131	25131	25131	98	98	98	98	5824.1	5824.1	Spill location.
	25327	253+27	196	196	196	25327	25327	25327	44	44	44	44	5824.2	5824.2	
	25475	254+75	148	148	148	25475	25475	25475	36	58	36	36	5824.4	5824.4	Mapped floodplain includes flow in left overbank from upstream cross section.
	25486	254+86	11	11	11	25486	25486	25486	29	67	29	46	5824.4	5824.4	Mapped floodplain and floodway includes flow in left overbank from upstream cross section.
	25546	255+46	60	60	60	25546	25546	25546	85	85	53	53	5830.8	5830.8	
	25740	257+40	194	194	194	25740	25740	25740	40	40	40	40	5833.9	5833.9	
	25974	259+74	234	234	234	25974	25974	25974	27	27	27	27	5836.7	5836.7	
	26278	262+78	304	304	304	26278	26278	26278	29	153	27	145	5844.7	5844.7	Mapped floodplain and floodway includes flow in right overbank from upstream cross section.
	26340	263+40	62	62	62	26340	26340	26340	186	186	170	170	5851.7	5851.7	
	26415	264+15	75	75	75	26415	26415	26415	166	166	104	104	5852.2	5852.2	
	26591	265+91	176	176	176	26591	26591	26591	49	49	34	34	5852.1	5852.1	
	26742	267+42	151	151	151	26742	26742	26742	51	51	37	37	5855.9	5855.9	
	26798	267+98	56	56	56	26798	26798	26798	142	142	61	61	5861.0	5861.0	Floodplain includes ineffective area in righ overbank. Potential spill into ditch.
	26871	268+71	73	73	73	26871	26871	26871	178	178	110	110	5863.1	5863.1	Floodplain top width includes high ground and ineffective area in the left overbank.
	26911	269+11	40	40	40	26911	26911	26911	170	170	100	100	5863.7	5863.7	Floodplain top width includes high ground and ineffective area in the left overbank.
	26927	269+27	16	16	16	26927	26927	26927	167	167	94	94	5864.1	5864.1	
	27139	271+39	212	212	212	27139	27139	27139	177	177	50	50	5867.7	5867.7	
D/S Belleview Avenue	27149	271+49	10	10	10	27149	27149	27149	183	183	50	50	5867.9	5867.9	Overtopping of Belleview Avenue.
U/S Belleview Avenue	27285	272+85	136	136	136	27285	27285	27285	131	131	64	63	5872.7	5872.7	Overtopping of Belleview Avenue.
	27295	272+95	10	10	10	27295	27295	27295	136	136	63	63	5873.2	5873.2	
	27558	275+58	263	263	263	27558	27558	27558	54	54	38	38	5873.8	5873.8	
	27630	276+30	72	72	72	27630	27630	27630	39	39	32	32	5874.4	5874.4	
	27748	277+48	118	118	118	27748	27748	27748	51	51	43	43	5876.3	5876.3	
	27810	278+10	62	62	62	27810	27810	27810	46	46	36	36	5876.9	5876.9	
	27853	278+53	43	43	43	27853	27853	27853	33	90	28	28	5877.6	5877.6	Mapped floodplain includes flow in left and right overbanks from upstream cross section.
D/S Private Driveway	27863	278+63	10	10	10	27863	27863	27863	26	105	23	23	5877.8	5877.8	Overtopping of driveway. Mapped floodplain includes flow in left and right overbanks from upstream cross section.
U/S Private Driveway	27915	279+15	52	52	52	27915	27915	27915	138	138	42	42	5883.2	5883.2	Overtopping of driveway.
	27925	279+25	10	10	10	27925	27925	27925	119	119	39	39	5883.2	5883.2	
	28160	281+60	235	235	235	28160	28160	28160	42	42	41	41	5883.5	5883.5	
	28389	283+89	229	229	229	28389	28389	28389	32	32	26	26	5888.2	5888.2	
	28399	283+99	10	10	10	28399	28399	28399	33	33	26	26	5888.4	5888.4	
	28433	284+33	34	34	34	28433	28433	28433	48	48	31	31	5891.3	5891.3	
	28443	284+43	10	10	10	28443	28443	28443	45	45	30	30	5892.1	5892.1	
	28460	284+60	17	17	17	28460	28460	28460	45	45	34	34	5892.6	5892.6	
D/S Belleview Avenue	28475	284+75	15	15	15	28475	28475	28475	39	39	20	20	5893.7	5893.7	
U/S Belleview Avenue	28575	285+75	100	100	100	28575	28575	28575	97	97	36	36	5904.0	5904.0	
	28600	286+00	25	25	25	28600	28600	28600	119	119	45	45	5904.1	5904.1	
	28707	287+07	107	107	107	28707	28707	28707	163	163	130	130	5904.1	5904.1	
	28749	287+49	42	42	42	28749	28749	28749	99	99	88	88	5904.1	5904.1	
	28862	288+62	113	113	113	28862	28862	28862	57	57	52	52	5904.0	5904.0	
	28925	289+25	63	63	63	28925	28925	28925	65	65	50	50	5904.1	5904.1	
	29000	290+00	75	75	75	29000	29000	29000	34	34	29	29	5904.3	5904.3	
	29085	290+85	85	85	85	29085	29085	29085	54	54	30	29	5905.8	5905.8	
D/S Private Driveway	29095	290+95	10	10	10	29095	29095	29095	51	51	28	28	5907.0	5907.0	Overtopping of driveway.
U/S Private Driveway	29138	291+38	43	43	43	29138	29138	29138	84	84	45	45	5912.1	5912.1	Overtopping of driveway
	29148	291+48	10	10	10	29148	29148	29148	75	75	45	45	5912.1	5912.1	
	29489	294+89	341	341	341	29489	29489	29489	26	26	25	25	5914.0	5914.0	
	29770	297+70	281	281	281	29770	29770	29770	27	27	24	24	5922.0	5922.0	
	30057	300+57	287	287	287	30057	30057	30057	33	33	21	21	5932.2	5932.2	
D/S Crestbrook Drive	30068	300+68	11	11	11	30068	30068	30068	42	42	20	20	5933.1	5933.1	
U/S Crestbrook Drive	30143	301+43	75	75	75	30143	30143	30143	44	44	44	44	5938.8	5938.8	
	30163	301+63	20	20	20	30163	30163	30163	50	50	50	50	5938.9	5938.9	
	30246	302+46	83	83	83	30246	30246	30246	36	36	36	36	5938.9	5938.9	FP = FW, No encroachments defined due to negative surcharges.
	30412	304+12	166	166	166	30412	30412	30412	31	31	31	31	5941.8	5941.8	FP = FW, No encroachments defined due to negative surcharges.
	30597	305+97	185	185	185	30597	30597	30597	50	50	50	50	5947.4	5947.4	FP = FW, No encroachments defined due to negative surcharges.
	30985	309+85	388	388	388	30985	30985	30985	39	39	39	39	5959.8	5959.8	FP = FW, No encroachments defined due to negative surcharges.
	31254	312+54	269	269	269	31254	31254	31254	34	34	34	34	5969.5	5969.5	FP = FW, No encroachments defined due to negative surcharges.
	31353	313+53	99	99	99	31353	31353	31353	36	36	36	36	5973.7	5973.7	FP = FW, No encroachments defined due to negative surcharges.
	31466	314+66	113	113	113	31466	31466	31466	32	32	32	32	5977.2	5977.2	
	31487	314+87	21	21	21	31487	31487	31487	36	36	36	36	5979.4	5979.4	
	31594	315+94	107	107	107	31594	31594	31594	27	27	25	25	5981.8	5981.8	

Table D-2 - Agreement Table

Reference Location	Cross Section	River Station	Distance b/a RS (ft)			Cumulative Distance (ft)			Floodplain Width (ft)		Floodway Width (ft)		BFE (ft)		Comments
			Model	Profile	Map	Model	Profile	Map	Model	Map	Model	Map	FDT	Profile	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(17)
	31838	318+38	244	244	244	31838	31838	31838	31	31	31	31	5989.1	5989.1	
	31883	318+83	45	45	45	31883	31883	31883	39	39	39	39	5991.3	5991.3	
D/S Willowbrook Drive	31893	318+93	10	10	10	31893	31893	31893	38	38	38	38	5992.5	5992.5	Overtopping of Willowbrook Drive.
U/S Willowbrook Drive	31974	319+74	81	81	81	31974	31974	31974	136	136	60	60	6004.7	6004.7	Overtopping of Willowbrook Drive.
	31994	319+94	20	20	20	31994	31994	31994	138	138	54	54	6004.7	6004.7	
	32316	323+16	322	322	322	32316	32316	32316	37	37	28	28	6005.4	6005.4	
	32612	326+12	296	296	296	32612	32612	32612	20	20	18	18	6016.7	6016.7	
D/S Meadowbrook Drive	32643	326+43	31	31	31	32643	32643	32643	40	40	20	20	6018.9	6018.9	Overtopping of Meadowbrook Drive.
U/S Meadowbrook Drive	32716	327+16	73	73	73	32716	32716	32716	186	186	40	40	6029.6	6029.6	Overtopping of Meadowbrook Drive.
	32729	327+29	13	13	13	32729	32729	32729	192	192	42	42	6029.6	6029.6	
	32815	328+15	86	86	86	32815	32815	32815	171	171	40	40	6029.6	6029.6	
	32877	328+77	62	62	62	32877	32877	32877	143	143	44	44	6029.6	6029.6	Floodplain includes high ground and ineffective area in the right overbank.
	32996	329+96	119	119	119	32996	32996	32996	74	74	71	71	6032.5	6032.5	
	33146	331+46	150	150	150	33146	33146	33146	40	40	34	34	6038.3	6038.3	
	33234	332+34	88	88	88	33234	33234	33234	17	16	16	16	6039.7	6039.7	
D/S Colorow Drive	33244	332+44	10	10	10	33244	33244	33244	19	19	15	15	6040.9	6040.9	Overtopping of Colorow Drive.
U/S Colorow Drive	33325	333+25	81	81	81	33325	33325	33325	152	152	79	79	6049.1	6049.1	Overtopping of Colorow Drive.
	33393	333+93	68	68	68	33393	33393	33393	29	29	27	27	6050.8	6050.8	
	33480	334+80	87	87	87	33480	33480	33480	55	55	54	54	6052.2	6052.2	
	33555	335+55	75	75	75	33555	33555	33555	24	24	24	24	6054.3	6054.3	
D/S Pedestrian Bridge	33575	335+75	20	20	20	33575	33575	33575	25	25	24	24	6055.3	6055.3	
U/S Pedestrian Bridge	33597	335+97	22	22	22	33597	33597	33597	88	29	29	29	6056.6	6056.6	Ineffective area in the right overbank not mapped.
	33607	336+07	10	10	10	33607	33607	33607	25	25	25	25	6056.6	6056.6	FP = FW. No encroacments defined due to negative surcharges
	33692	336+92	85	85	85	33692	33692	33692	13	13	13	13	6060.2	6060.2	FP = FW. No encroacments defined due to negative surcharges
D/S Pedestrian Bridge	33702	337+02	10	10	10	33702	33702	33702	13	13	13	13	6061.1	6061.1	
U/S Pedestrian Bridge	33719	337+19	17	17	17	33719	33719	33719	14	14	14	14	6062.2	6062.2	
	33734	337+34	15	15	15	33734	33734	33734	16	16	16	16	6062.4	6062.4	
	33816	338+16	82	82	82	33816	33816	33816	14	75	14	14	6065.5	6065.5	Mapped floodplain includes flow in left overbank from upstream cross section.
D/S Private Driveway	33826	338+26	10	10	10	33826	33826	33826	14	85	14	14	6066.1	6066.1	Overtopping of driveway. Mapped floodplain includes flow in left overbank from upstream cross section.
U/S Private Driveway	33868	338+68	42	42	42	33868	33868	33868	121	121	42	42	6070.8	6070.8	Overtopping of driveway.
	33878	338+78	10	10	10	33878	33878	33878	106	106	25	25	6070.9	6070.9	Floodplain top width includes high ground in the left overbank.
	33887	338+87	9	9	9	33887	33887	33887	97	97	22	22	6070.9	6070.9	Floodplain top width includes high ground in the left overbank.
D/S Private Driveway	33897	338+97	10	10	10	33897	33897	33897	18	94	17	17	6070.7	6070.7	Overtopping of driveway. Mapped floodplain includes flow in left overbank from upstream cross section.
U/S Private Driveway	33953	339+53	56	56	56	33953	33953	33953	81	127	24	24	6074.0	6074.0	Overtopping of driveway. Floodplain top width includes high ground and ineffective area in the left overbank. Mapped top width includes area of shallow flooding in ROB
	33963	339+63	10	10	10	33963	33963	33963	21	80	20	20	6073.9	6073.9	Mapped floodplain includes shallow flooding area in right overbank.
	33985	339+85	22	22	22	33985	33985	33985	23	91	23	23	6074.3	6074.3	Mapped floodplain includes shallow flooding area in right overbank.
	34057	340+57	72	72	72	34057	34057	34057	17	119	17	17	6076.4	6076.4	Mapped floodplain includes shallow flooding area in right overbank.
	34166	341+66	109	109	109	34166	34166	34166	16	142	16	16	6080.9	6080.9	Mapped floodplain includes shallow flooding area in right overbank.
D/S Pedestrian Bridge	34186	341+86	20	20	20	34186	34186	34186	24	168	24	24	6082.1	6082.1	Mapped floodplain includes shallow flooding area in right overbank.
U/S Pedestrian Bridge	34213	342+13	27	27	27	34213	34213	34213	23	185	23	23	6083.7	6083.7	Mapped floodplain includes shallow flooding area in right overbank.
	34234	342+34	21	21	21	34234	34234	34234	19	196	19	18	6083.9	6083.9	Mapped floodplain includes shallow flooding area in right overbank.
	34340	343+40	106	106	106	34340	34340	34340	181	181	25	25	6088.1	6088.1	
	34374	343+74	34	34	34	34374	34374	34374	149	149	36	36	6089.4	6089.4	
	34420	344+20	46	46	46	34420	34420	34420	117	117	16	16	6091.4	6091.4	Mapped floodplain includes high ground and ineeffective area in right overbank
	34591	345+91	171	171	171	34591	34591	34591	16	16	16	16	6096.3	6096.3	
	34797	347+97	206	206	206	34797	34797	34797	12	12	12	12	6104.5	6104.5	FP = FW, No encroachments defined due to negative surcharges.
	35022	350+22	225	225	225	35022	35022	35022	15	15	15	15	6113.6	6113.6	FP = FW, No encroachments defined due to negative surcharges.
	35200	352+00	178	178	178	35200	35200	35200	25	25	25	25	6122.2	6122.2	
	35378	353+78	178	178	178	35378	35378	35378	17	17	17	17	6132.3	6132.3	
D/S W Roton Arena	35388	353+88	10	10	10	35388	35388	35388	17	17	17	17	6132.8	6132.8	Overtopping of W Roton Arena
U/S W Roton Arena	35433	354+33	45	45	45	35433	35433	35433	38	38	30	30	6141.3	6141.3	Overtopping of W Roton Arena
	35449	354+49	16	16	16	35449	35449	35449	39	39	34	34	6141.4	6141.4	
	35591	355+91	142	142	142	35591	35591	35591	18	18	18	18	6143.6	6143.6	
	35842	358+42	251	251	251	35842	35842	35842	27	27	27	27	6155.4	6155.4	
	36091	360+91	249	249	249	36091	36091	36091	12	12	12	12	6168.9	6168.9	
	36252	362+52	161	161	161	36252	36252	36252	15	15	15	15	6178.2	6178.2	
D/S Willow Springs Drive	36262	362+62	10	10	10	36262	36262	36262	17	17	17	17	6178.9	6178.9	
U/S Willow Springs Drive	36354	363+54	92	92	92	36354	36354	36354	9	270	9	123	6187.3	6187.3	Spill Location. Mapped floodplain and floodway includes flow in left overbank from upstream cross section.
	36360	363+60	6	6	6	36360	36360	36360	267	267	120	120	6190.6	6190.6	Top width includes high ground and ineffective flow area in left overbank.
D/S Golf Cart Path	36368	363+68	8	8	8	36368	36368	36368	411	411	122	122	6195.3	6195.3	Overtopping of golf cart path.
U/S Golf Cart Path	36404	364+04	36	36	36	36404	36404	36404	290	290	91	91	6197.1	6197.1	Overtopping of golf cart path.
	36449	364+49	45	45	45	36449	36449	36449	282	282	88	88	6197.2	6197.2	
	36513	365+13	64	64	64	36513	36513	36513	110	110	74	74	6197.2	6197.2	
	36588	365+88	75	75	75	36588	36588	36588	30	30	30	30	6197.2	6197.2	
	36625	366+25	37	37	37	36625	36625	36625	10	10	10	10	6197.4	6197.4	
D/S Golf Cart Path	36635	366+35	10	10	10	36635	36635	36635	10	10	9	10	6198.1	6198.1	
U/S Golf Cart Path	36666	366+66	31	31	31	36666	36666	36666	15	14	12	11	6199.8	6199.8	Mapped width narrower than model based on because cross section geometry modified for crossing.
	36676	366+76	10	10	10	36676	36676	36676	15	15	15	15	6199.8	6199.8	
	36880	368+80	204	204	204	36880	36880	36880	16	16	16	16	6209.0	6209.0	
	36992	369+92	112	112	112	36992	36992	36992	17	17	17	17	6215.1	6215.1	
	37072	370+72	80	80	80	37072	37072	37072	135	135	94	94	6225.4	6225.4	

Table D-2 - Agreement Table

Reference Location	Cross Section	River Station	Distance b/a RS (ft)			Cumulative Distance (ft)			Floodplain Width (ft)		Floodway Width (ft)		BFE (ft)		Comments
			Model	Profile	Map	Model	Profile	Map	Model	Map	Model	Map	FDT	Profile	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(17)
	37122	371+22	50	50	50	37122	37122	37122	77	77	40	40	6228.4	6228.4	
	37175	371+75	53	53	53	37175	37175	37175	26	26	26	26	6228.9	6228.9	
	37306	373+06	131	131	131	37306	37306	37306	15	15	15	15	6238.2	6238.2	
	37449	374+49	143	143	143	37449	37449	37449	18	37	18	37	6247.9	6247.9	Flooding and floodway in left overbank from upstream.
	37462	374+62	13	13	13	37462	37462	37462	38	38	38	38	6250.5	6250.5	
	37609	376+09	147	147	147	37609	37609	37609	16	16	16	16	6259.1	6259.1	
	37682	376+82	73	73	73	37682	37682	37682	23	23	23	23	6267.2	6267.2	
	37783	377+83	101	101	101	37783	37783	37783	17	17	17	17	6275.9	6275.9	
	37888	378+88	105	105	105	37888	37888	37888	15	15	15	15	6284.3	6284.3	
	38062	380+62	174	174	174	38062	38062	38062	13	13	13	13	6297.3	6297.3	
	38168	381+68	106	106	106	38168	38168	38168	9	9	9	9	6305.6	6305.6	
	38270	382+70	102	102	102	38270	38270	38270	7	7	7	7	6317.2	6317.2	
	38381	383+81	111	111	111	38381	38381	38381	17	17	17	17	6329.5	6329.5	
	38429	384+29	48	48	48	38429	38429	38429	13	13	13	13	6332.9	6332.9	
	38473	384+73	44	44	44	38473	38473	38473	13	13	13	13	6343.7	6343.7	
	38507	385+07	34	34	34	38507	38507	38507	9	9	9	9	6349.6	6349.6	
	38580	385+80	73	73	73	38580	38580	38580	15	15	15	15	6360.5	6360.5	
	38640	386+40	60	60	60	38640	38640	38640	14	14	13	13	6372.5	6372.5	
	38735	387+35	95	95	95	38735	38735	38735	37	37	29	29	6380.2	6380.2	
Upstream study limit. Approx. 1,690 feet upstream of Whale Rock Way.	38813	388+13	78	78	78	38813	38813	38813	18	18	14	14	6383.1	6383.1	
Belleview Spill															
Approximately 100 ft D/Sof W Belleview Ave	50151	1+51	0	0	0	151	151	151	60	50	--	--	5791.4	5791.4	
	50378	3+78	227	227	227	378	378	378	79	79	--	--	5798.6	5798.6	
	50514	5+14	136	136	136	514	514	514	90	85	--	--	5801.0	5801.0	Top width includes high ground. Floodplain includes ineffective area in left overbank.
	50735	7+35	221	221	221	735	735	735	58	58	--	--	5806.3	5806.3	
	50935	9+35	200	200	200	935	935	935	130	130	--	--	5812.0	5812.0	
	51142	11+42	207	207	207	1142	1142	1142	54	51	--	--	5817.3	5817.3	
U/S Belleview Avenue	51238	12+38	96	96	96	1238	1238	1238	67	75	--	--	5820.0	5820.0	
Willow Spill															
D/S W Roton Arena	400179	1+79	0	0	0	179	179	179	74	74	--	--	6143.9	6143.9	
	400239	2+39	60	60	60	239	239	239	82	82	--	--	6146.3	6146.3	
	400340	3+40	101	101	101	340	340	340	43	43	--	--	6149.4	6149.4	
	400454	4+54	113	113	113	454	454	454	59	59	--	--	6155.3	6155.3	
	400569	5+69	115	115	115	569	569	569	72	72	--	--	6160.5	6160.5	
	400683	6+83	114	114	114	683	683	683	73	73	--	--	6166.9	6166.9	
	400787	7+87	104	104	104	787	787	787	80	80	--	--	6172.6	6172.6	
D/S Willow Springs Drive	400883	8+83	96	96	96	883	883	883	71	71	--	--	6178.4	6178.4	
Spill 2															
Approximately 150 ft D/S of S Oak St	60150	1+50	0	0	0	27	27	27	42	42	--	--	5552.3	5552.3	
	60323	3+23	173	173	173	200	200	200	79	79	--	--	5555.8	5555.8	
	60523	5+23	200	200	200	400	400	400	78	78	--	--	5557.6	5557.6	
	60813	8+13	290	290	290	690	690	690	97	97	--	--	5561.7	5561.7	
	61003	10+03	190	190	190	880	880	880	129	129	--	--	5564.5	5564.5	
	61172	11+72	169	169	169	1049	1049	1049	157	157	--	--	5566.3	5566.3	
	61446	14+46	274	274	274	1323	1323	1323	156	156	--	--	5570.5	5570.5	
	61760	17+60	314	314	314	1637	1637	1637	188	188	--	--	5574.6	5574.6	
	62025	20+25	265	265	265	1902	1902	1902	346	346	--	--	5579.0	5579.0	
	62223	22+23	198	198	198	2100	2100	2100	351	351	--	--	5582.6	5582.6	
	62410	24+10	187	187	187	2287	2287	2287	326	326	--	--	5585.3	5585.3	
Approximatyely 2,000 ft D/S of Quincey Ave	62552	25+52	142	142	142	2429	2429	2429	315	315	--	--	5587.4	5587.4	
285 Overflow															
D/S of Hwy 285 at W Girton Dr.	70000	0+00	0	0	0	0	0	0	261	262	156	156	5524.8	5524.8	
	70023	0+23	23	23	23	23	23	23	268	267	167	167	5524.9	5524.9	
	70100	1+00	77	77	77	100	100	100	485	485	270	271	5529.4	5529.4	
	70145	1+45	45	45	45	145	145	145	446	446	374	374	5529.7	5529.7	Floodplain top width at right overbank ends at the gutter line (spill location).
	70199	1+99	54	54	54	199	199	199	601	601	510	510	5529.8	5529.8	Floodplain top width at right overbank ends at the gutter line (spill location).
	70231	2+31	32	32	32	231	231	231	591	591	444	444	5529.8	5529.8	
U/S of Hwy 285 at W Hampden Ave Frontage Rd	70470	4+70	239	239	239	470	470	470	262	262	210	210	5530.5	5530.5	

Table D-2 - Agreement Table

Reference Location	Cross Section	River Station	Distance b/a RS (ft)			Cumulative Distance (ft)			Floodplain Width (ft)		Floodway Width (ft)		BFE (ft)		Comments
			Model	Profile	Map	Model	Profile	Map	Model	Map	Model	Map	FDT	Profile	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(17)
Kipling St Spill															
Upstream of S Nelson St	80162	1+62	0	0	0	173	173	173	231	150	--	--	5471.4	5471.4	Modeled and mapped floodplain top width include high ground
	80353	3+53	191	191	191	364	364	364	146	146	--	--	5476.1	5476.1	
	80785	7+85	432	432	432	796	796	796	103	121	--	--	5485.7	5485.7	Mapped floodplain includes flow in left overbank from upstream cross section.
	80974	9+74	189	189	189	985	985	985	217	222	--	--	5490.7	5490.7	
	81194	11+94	220	220	220	1205	1205	1205	284	289	--	--	5495.5	5495.5	
	81327	13+27	133	133	133	1338	1338	1338	227	227	--	--	5498.1	5498.1	
	81632	16+32	305	305	305	1643	1643	1643	125	125	--	--	5504.0	5504.0	
	81765	17+65	133	133	133	1776	1776	1776	128	128	--	--	5506.7	5506.7	
	81839	18+39	74	74	74	1850	1850	1850	129	129	--	--	5508.7	5508.7	
	81918	19+18	79	79	79	1929	1929	1929	266	266	--	--	5509.1	5509.1	
	82168	21+68	250	250	250	2179	2179	2179	114	48	--	--	5512.4	5512.4	Mapped floodplain does not include ineffective area in right overbank because water does not overtop high ground.
	82411	24+11	243	243	243	2422	2422	2422	201	201	--	--	5514.3	5514.3	
	82667	26+67	256	256	256	2678	2678	2678	132	163	--	--	5517.3	5517.3	Flooding in right overbank from upstream.
	82914	29+14	247	247	247	2925	2925	2925	114	114	--	--	5521.5	5521.5	
	83035	30+35	121	121	121	3046	3046	3046	87	87	--	--	5524.0	5524.0	
	83136	31+36	101	101	101	3147	3147	3147	104	104	--	--	5524.6	5524.6	
	83361	33+61	225	225	225	3372	3372	3372	94	94	--	--	5527.1	5527.1	
	83643	36+43	282	282	282	3654	3654	3654	186	186	--	--	5529.2	5529.2	
U/S of Hwy 285 at W Hampden	83950	39+50	307	307	307	3961	3961	3961	266	266	--	--	5529.9	5529.9	

APPENDIX E

FLOOD MAPS

CLICK HERE TO VIEW FULL SIZED MAPS

APPENDIX F

FLOOD PROFILES

CLICK HERE TO VIEW FULL SIZED PROFILES