



**CLOMR
FEMA Study & Floodway Report
Sunshine Valley**

Reeve & Associates, Inc.

Solutions You Can Build On

**Case No:
South Fork Ogden River
South Branch TBD**

For:

**Park City Premier Properties,
LLC**

**6028 S. Ridgeline Dr. Suite 200
Ogden, UT 84405**

Submitted to:

**LOMC Clearinghouse
3601 Eisenhower Avenue, Suite 500
Alexandria, VA 22304-6426**

&

**Weber County Engineering
2380 Washington Blvd Suite #240
Ogden, UT 84401**

PH: (801) 399-8374

Prepared: August 2018

Prepared by:

Reeve & Associates, Inc.

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Ref: 4825-21

MT-2 REVISION REQUEST SUBMITTAL CHECKLIST

PART A: GENERAL REQUIREMENTS

ELEMENTS	Yes	N/A
NARRATIVE: Please provide a written description about the purpose of the request and the scope of the proposed/as-built project and the methodology used to analyze the project effects.	X	
MT-2 APPLICATION FORMS: Please provide completed forms applicable to your request. Ensure that MT-2 Form 1 was signed by the requester, certifying engineer, and each community affected by the revision.	X	
HYDROLOGIC ANALYSIS: If applicable, please provide a FEMA acceptable hydrologic analysis in digital format, drainage area map and associated backup information (e.g., calculations used to determine lag time, CN and loss values as well as landuse and soil maps). FEMA-acceptable models can be accessed at www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/numerical-models-meeting-minimum-requirements .		X
HYDRAULIC ANALYSIS: Please provide a FEMA acceptable hydraulic analysis in digital format. FEMA-acceptable models can be accessed at www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/numerical-models-meeting-minimum-requirements .	X	
CERTIFIED TOPOGRAPHIC WORK MAP: Please provide a certified topographic work map that meets the mapping requirements outlined in MT-2 Form 2. If available, please provide digital Computer-Aided Design (CAD) or Geographic Information System (GIS) data that is spatially referenced.	X	
ANNOTATED FIRM: Please submit a revised FIRM, at the scale of the effective FIRM, which shows the revised boundary delineation of the base floodplain, 0.2-percent-annual-chance floodplain, and regulatory floodway and how it ties into the boundary delineation shown on the effective FIRM at the downstream and upstream ends of the revised reach.	X	
REVIEW FEE PAYMENT: Please include the appropriate review fee payment. The current fee schedule is available on the FEMA Web site at www.fema.gov/forms-documents-and-software/flood-map-related-fees .	X	
MEET 65.10 REQUIREMENT: If the request intends to show that a berm/levee/flood wall provides flood protection, please submit all of the data requirements outlined in Section 65.10 of the NFIP regulations.		X
OPERATION AND MAINTENANCE PLAN: If the request involves a berm, levee, flood wall, dam, and/or detention basin project, please submit an officially adopted maintenance and operation plan.		X
PROPOSED/AS-BUILT PLANS: If applicable, please submit proposed/as-built plans, certified by a registered Professional Engineer, for all the project elements.		X
FLOODWAY NOTICE: If the revision result in changing or establishing floodway boundaries, please provide floodway public notice or a statement by your community that it has notified all affected property owners, in compliance with NFIP regulation Subparagraph 65.7(b)(1).		X
PROPERTY OWNER NOTIFICATION: If the revision result in any widening/shifting/establishing of the base floodplain and/or any BFE increases/establishing BFEs, please provide copy of the individual legal notices sent to all the property owners affected by any increases in the flood hazard information.		X

PART B: CLOMR SPECIFIC REQUIREMENTS

Endangered Species Act COMPLIANCE: Please submit documentation of compliance with the ESA Requirements. To learn more about ESA Compliance, please see the MT-2 Instructions manual.	X	
65.12 REGULATORY REQUIREMENTS: If the Base (1-percent-annual-chance) Flood Elevation (BFE) increases greater than 0.00 foot as a result of encroachment within a floodway or 1.0 foot within Zone AE that has no floodway/Zone A, between the pre-project (existing) conditions and the proposed conditions as a result of the proposed project. Please submit a). Certification that no structures are affected by the increased BFE; b). Documentation of individual legal notice to all affected property owners, explaining the impact of the proposed action on their property; and c). An evaluation of alternatives that would not result in an increase in BFE.		X

Note: Applicants are encouraged to submit their revision request using the Online LOMC tool. To learn more about Online LOMC tool, visit the FEMA website at www.fema.gov/online-lomc.

Reeve & Associates, Inc.



August 2018

Weber County Engineering
2380 Washington Blvd Suite #240
Ogden, UT 84401
PH: (801) 399-8374

Sunshine Valley

We are submitting a South Fork Ogden River South Branch Floodway Report for the proposed Sunshine Valley subdivision located near E 500 South S 9500 East in Weber County, Utah.

The purpose of this report is to support floodplain development and a CLOMR request to FEMA in a Zone AE. This CLOMR includes a hydraulic model and calculations to show the effective FIRM as affected by the proposed changes.

If you have any questions, or we can be of further assistance, please let us know.

Sincerely,

Nate Reeve, P.E.
Principal Engineer
Reeve & Associates, Inc.
nreeve@reeve-assoc.com

Kenneth Hunter, E.I.T
Project Engineer
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khunter@reeve-assoc.com

Solutions You Can Build On™
Civil Engineering / Land Planning / Structural Engineering / Landscape Architecture / Land Surveying

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August 2018

LOMC Clearinghouse
3601 Eisenhower Avenue, Suite 500
Alexandria, VA 22304-6426

Sunshine Valley- ESA

As part of the CLOMR application, we are submitting to you documentation showing compliance with the Endangered Species Act for the proposed Sunshine Valley residential subdivision to be located near E 500 South S 9500 East in Weber County, Utah.

This documentation is prepared according to the requirements in the *FEMA Guidance for Flood Risk Analysis and Mapping: Documentation of Endangered Species Act Compliance* published in May 2016. Per section 3.1 *ESA Compliance Documentation for Non-Federal Projects*: The requestor must document the following:

No potential for “Take” exists (meaning that the project has no potential to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) to threatened and endangered species. The requestor will be responsible for the potential for take determination and the determination is not required to come from, or be concurred by, the Services.

The IPaC (Information for Planning and Conservation) tool provided by the U.S Fish & Wildlife Service determines there are four endangered or threatened species potentially located in Salt Lake County. More information on these species as well as the potential for “Take” are listed in the included Table 1 below.

The proposed site is currently used for heavy equipment and construction vehicle storage. Existing vegetation on the site is limited mainly to weeds and short grasses with the majority of the site consisting of unpaved gravel and soil.



Table 1 – ESA Species in Project Area

	<i>Name</i>	<i>Type</i>	<i>Status</i>	<i>Potential for "Take"</i>
Species	Yellow-Billed Cuckoo	Bird	Threatened	No; Typical Habitat (dense woodland) not found on site.
	Canada Lynx	Mammal	Threatened	No; Typical Habitat (boreal forest/taiga) not found on site.
Facilities	Wildlife Refuges			None within boundaries
	Fish Hatcheries			None within boundaries
Critical Habitats				None within boundaries
Wetlands	R4SBC -Intermittent streambed seasonally flooded wetland			To remain.

Due to the information outlined above it is our professional opinion that the proposed project will have no adverse effect on the threatened species listed above. If you have any questions, or we can be of further assistance, please let us know.

Sincerely,

Nate Reeve, P.E.
Principal Engineer
Reeve & Associates, Inc.
nreeve@reeve-assoc.com

Kenneth Hunter, E.I.T
Project Engineer
Reeve & Associates
khunter@reeve-assoc.com



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Sunshine Valley

Weber County, UT

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1.0 Introduction & Project Narrative

1.1 Project Background and Location

The purpose of this report is to provide supporting data, calculations, and models for submission of a CLOMR request to FEMA. The site of study is located near E 500 South S 9500 East in Weber County, Utah. This property is owned by Park City Premier Properties, LLC. The area analyzed is the Ogden River South Fork South Branch. This river branch passes through the northern portion of the listed property. The purpose of this request is to support the submittal of subdivision development plans by showing the impacts said development would have on the existing conditions.

Proposed changes to the site with the potential to impact the floodplain include construction of a paved road for access to the residential lots, and associated grade changes for driveways and building pads. A private bridge over the river will also be required to be removed/modified to access the furthest lots. Previous studies have been completed for downstream reaches along this same river that demonstrate that the 100 year flows are contained within the channel.

1.2 Property Description

The property is 1,423,723 s.f. (32.68 acres) in size and slopes generally from east to west at a grade of approximately 1.0%. The site is bordered to the east by S 9500 E and to the north, south and west by rural residential development or undeveloped areas. Ogden River South Fork South Branch flows from northeast to southwest across the property.

The relevant FIRM maps are 49057C0263F and 49057C0476F for Weber County revised June 2, 2015. The area of analysis extends from a point approximately 350 feet from the crossing under S 9500 E and extends approximately 1600 feet downstream from this point. This distance is past the property boundary limits. The eastern portion of the site (east of the bridge) is almost completely within the effective FEMA flood zone AE. This is the zone of the approximate 1 percent annual chance (100 year) storm, with established BFE. The western portion of the site (west of the bridge) is mostly located outside of any regulatory floodways.

Figure 1 provides a vicinity map for the project area with the project boundary shown. Figure 2 shows the extents of Zone AE. The related FIRM panels are included with this submittal.



Figure #1
Vicinity Map – Proposed Sunshine Valley - Weber County, UT

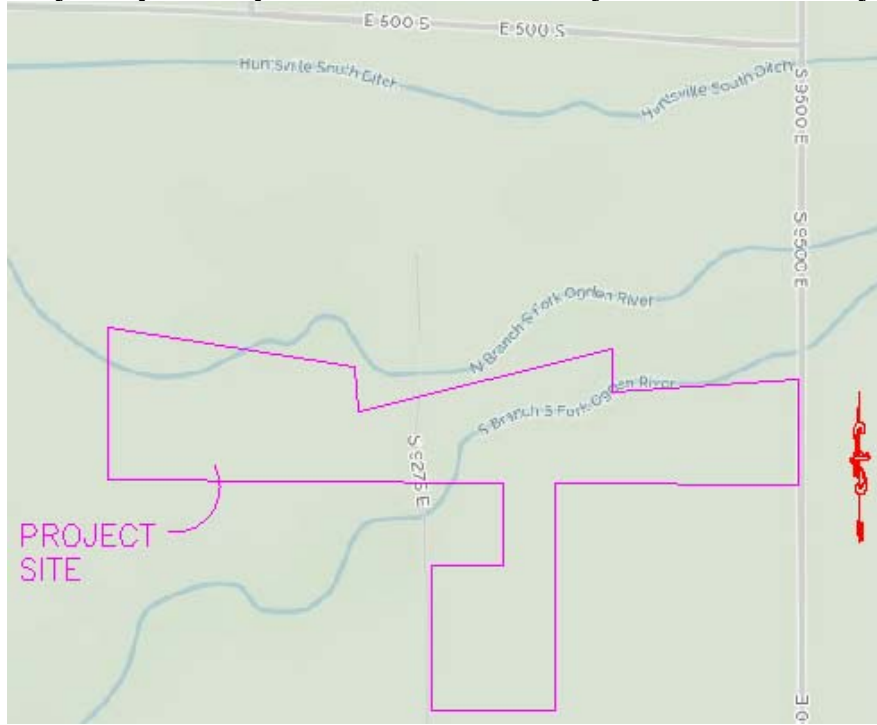


Figure #2
Zone "A" Limits – Threemile Creek



2.0 Modeling Methods

2.1 Hydrologic Method

Due to the previous studies conducted along this reach, flow volume for this location has already been established through a combination of measurements taken upstream at a diversion dam and regression equations calculated for the contributing area downstream from the structure. Calculations summarizing the hydrologic calculations are included in the appendix. The total flow for analysis of this site is 1376 cfs.

2.2 Hydraulic Method

In order to obtain an accurate model of South Fork Ogden River South Branch, a survey crew was sent out to record detailed topography of the area. This topography includes the area of study for the floodplain, as well as river sections at approximate 100-foot intervals. This data was imported into AutoCAD Civil 3D, and cross sections to match the 100-foot intervals and as required for the existing and proposed bridges were created for both the existing and proposed conditions. These cross sections were exported to HEC-RAS 5.0.3 developed by the US Army Corps of Engineers. Flow conditions were modeled as steady flow, with a subcritical flow regime. Outputs for these models, including cross sections, profiles and summary tables, are included in the appendix. These output results demonstrate the need for revision of this portion of the FIRM panels, and demonstrate that the 100-year design storm flows are contained completely within the existing channel. Due to this, the proposed roadway additions and building lots located within the currently effective Zone AE will have no negative impact on the existing conditions.

As part of the improvements for this site the existing bridge will be removed and a new bridge designed for vehicle traffic added at the same location, though oriented differently at the crossing. These bridges have been included in the existing and proposed models and the impacts shown in the results accordingly.

2.3 Presentation of Results

From the cross-sections produced from the topographic data, it is clear that Ogden River South Fork South Branch has natural banks on both the north and south that contain the flows. No changes are proposed or required to the channel alignment or banks, except as is required for construction of the modeled bridge. The included documents provide the revised floodway limits as determined by the study for use in updating the FIRM panels. As a result of these revised boundaries, it is apparent that no negative impacts can occur as lot grading and roadway additions are located outside of the limits of the revised floodway.



3.0 Conclusion

This study concludes that the proposed 100-year floodplain (Zone AE) will not be adversely affected should this development be completed as designed. In addition, the delineation should be revised to match this study's results and remove the majority of the property from the current floodplain.



Appendix

Topographic Work Map Hydrologic Calculations Summary

HEC-RAS Output

- Existing/Proposed Profile

-Existing/Proposed Cross Sections

-Existing/Proposed Table Outputs



Sunshine Valley Estates

Odgen River South Fork - South Branch

8/29/2018 KHH

100 YEAR STORM FLOW QUANTITIES

100 year flow at diversion dam - previously provided by Weber County

$$Q_{100} = 2180 \text{ at diversion dam}$$

REGRESSION EQUATIONS FOR ADDITIONAL PEAK DISCHARGES

Q - peak discharge, in cubic feet per second
 A - drainage area, in square miles
 E - mean basin elevation, in thousands of feet

$$Q = (2.08 \times 10^6) \times (A^{0.757}) \times (e^{-5.63})$$

	A	E	Q	
Basin 1	0.8957	5.6325	114	from diversion dam to fork

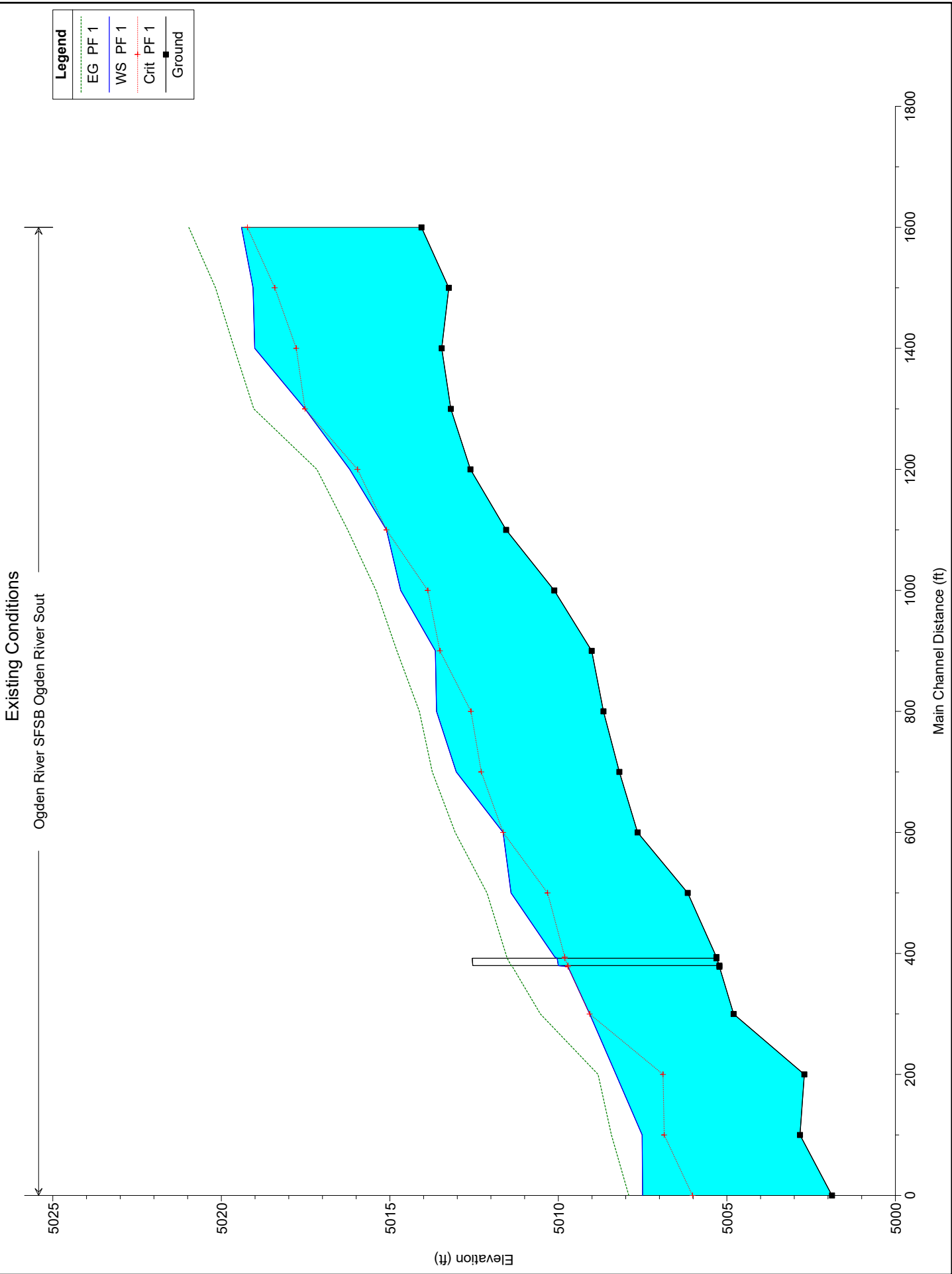
Upstream of Fork of South Brand and North Branch

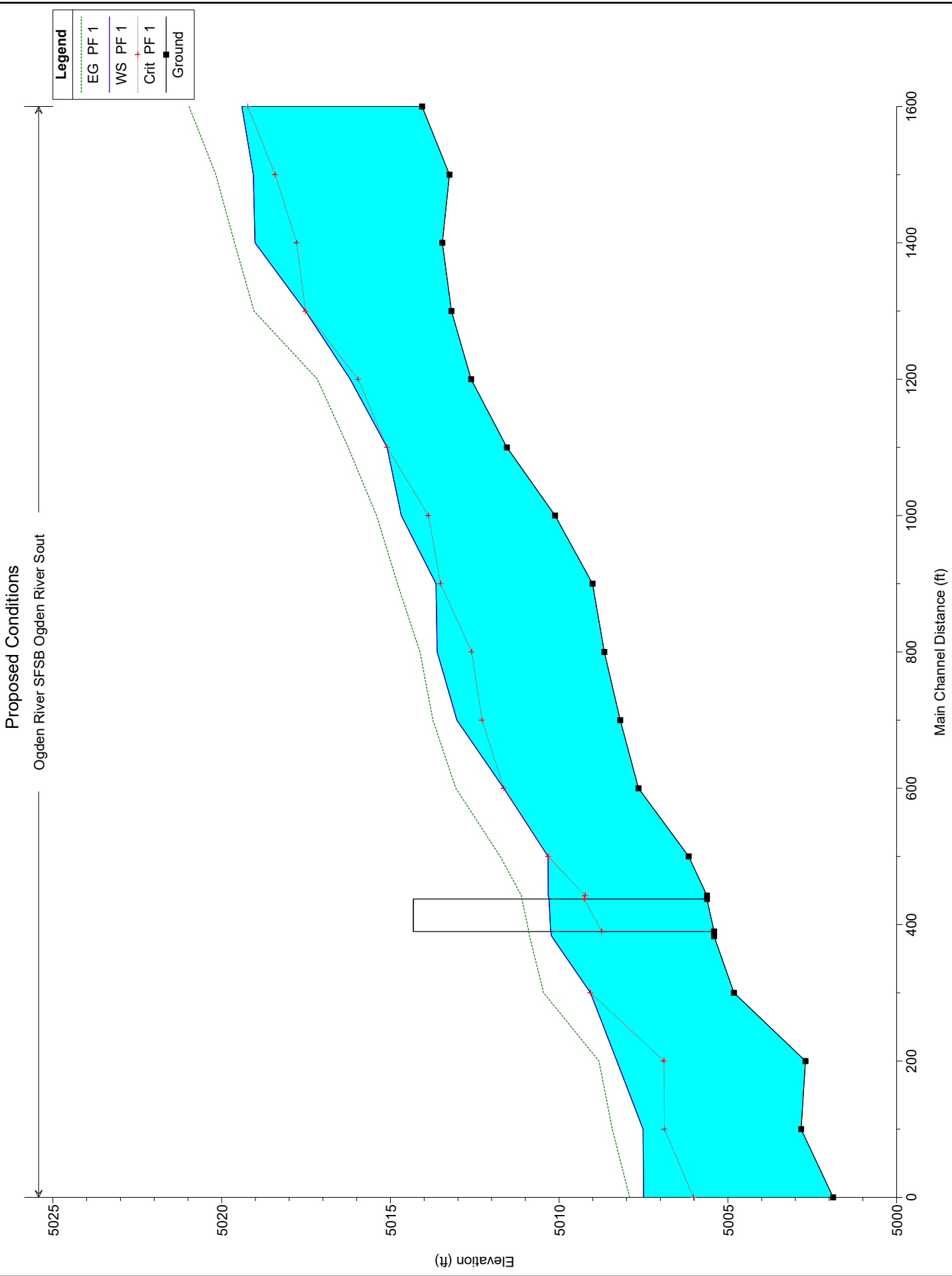
2180	from county
114	upstream of fork

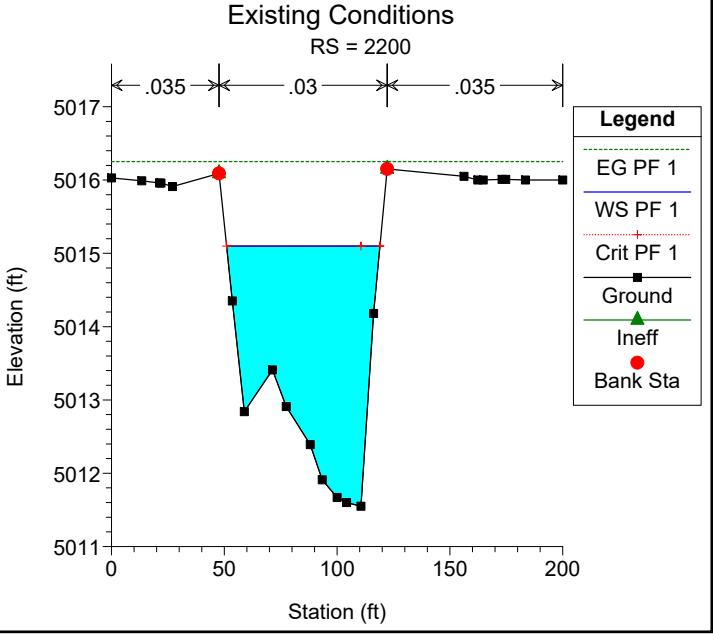
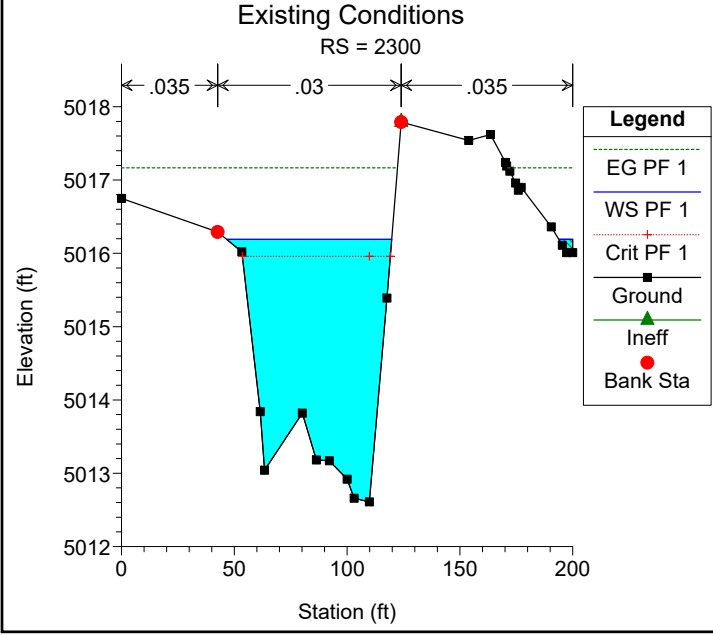
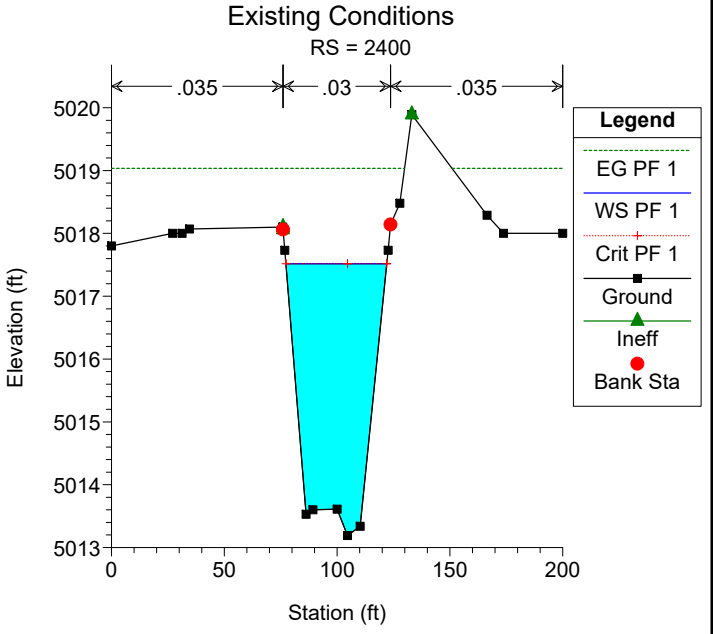
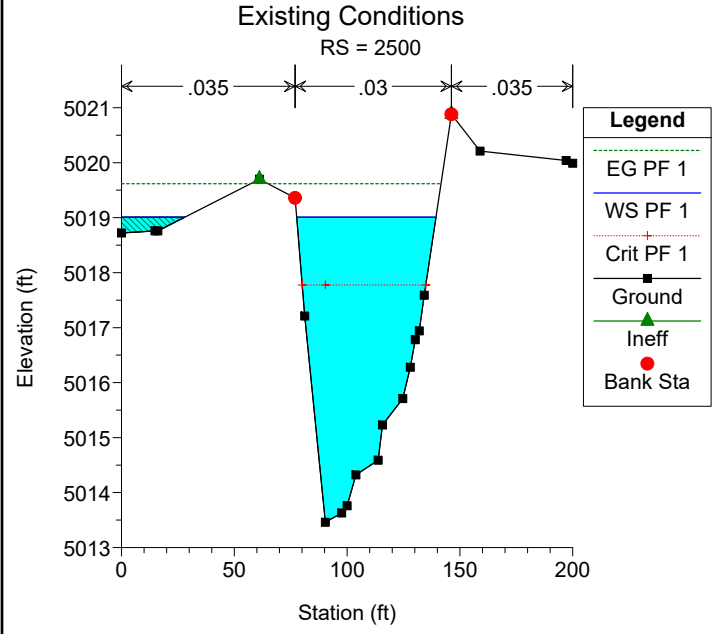
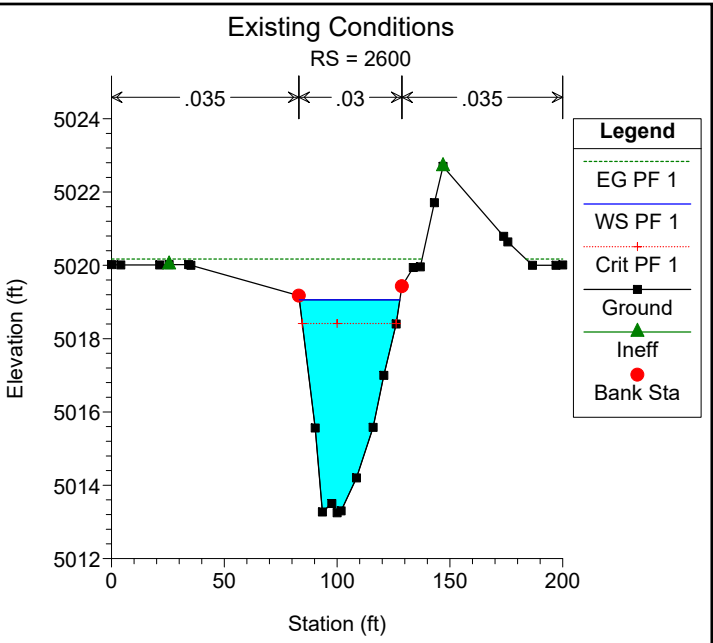
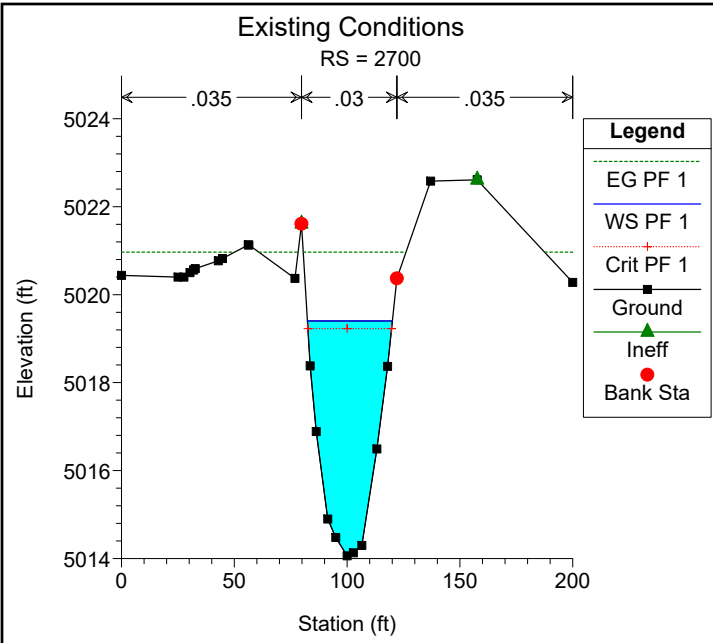
$$\text{Total flow upstream of fork} = \frac{2180 + 114}{1} = 2294$$

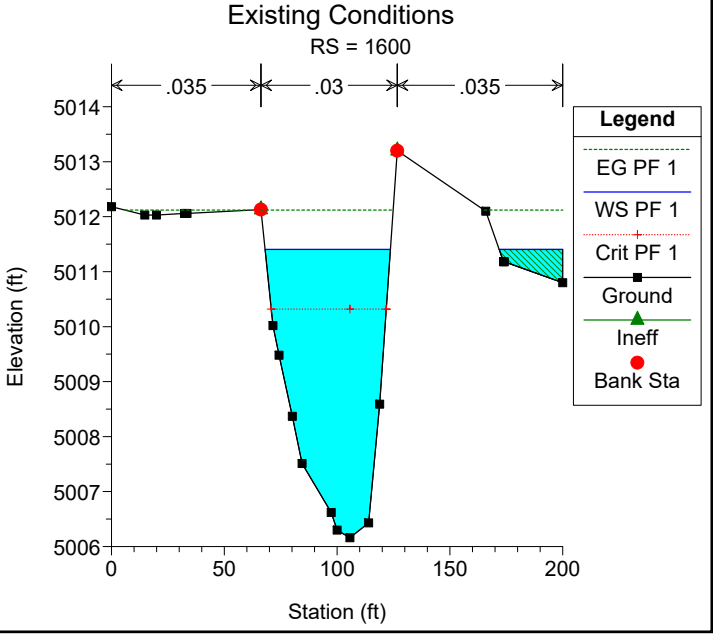
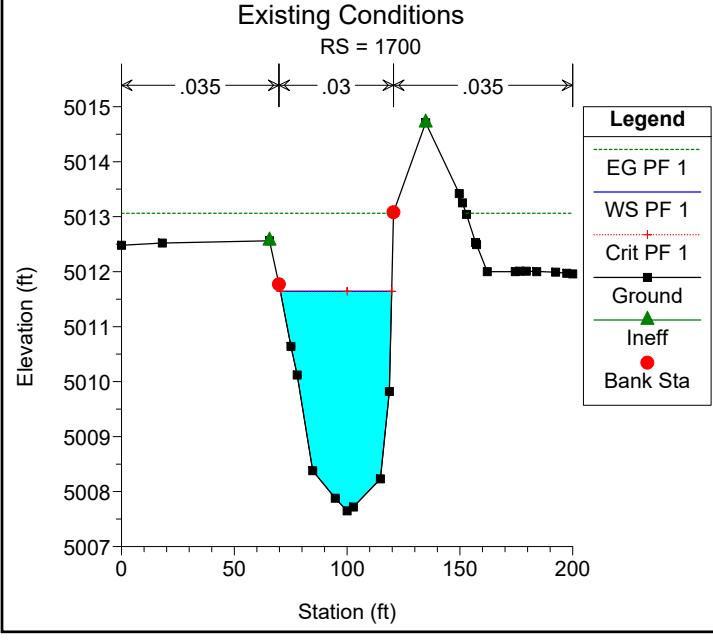
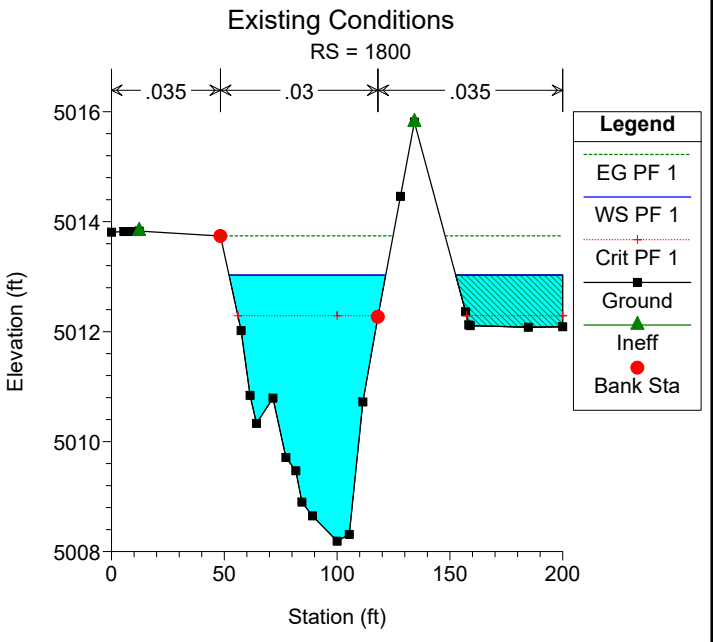
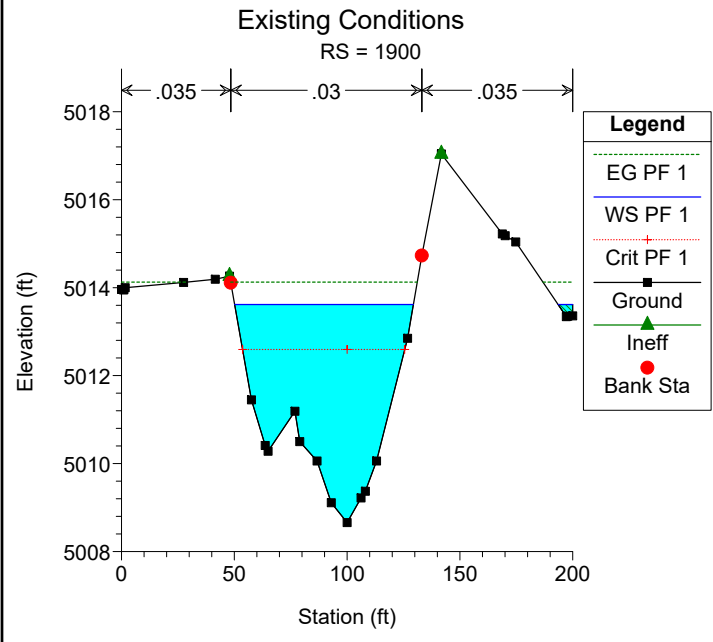
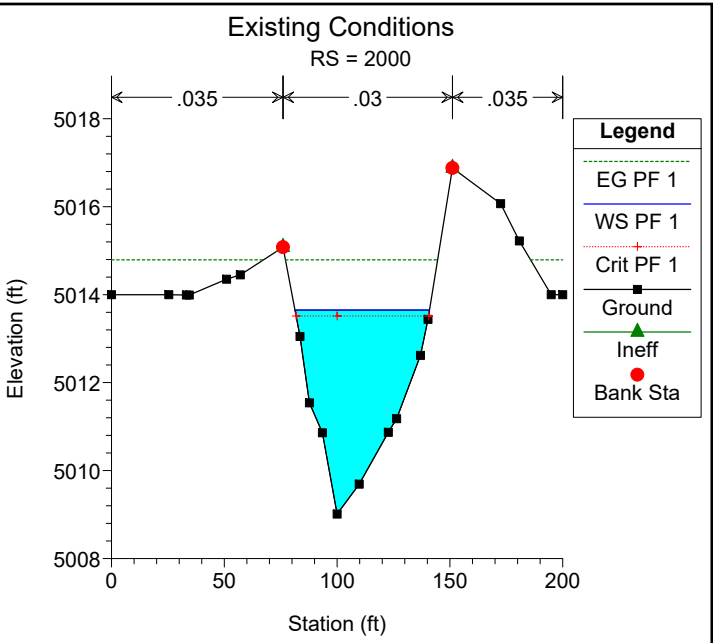
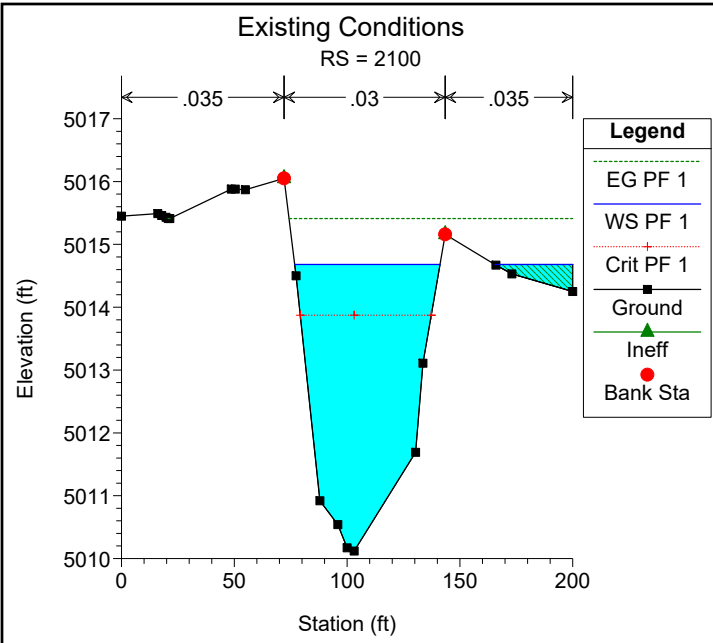
Per previous FEMA hydrologic studies for this portion of the Ogden River, the south branch is to be analyzed with 60% of the total flow at the fork

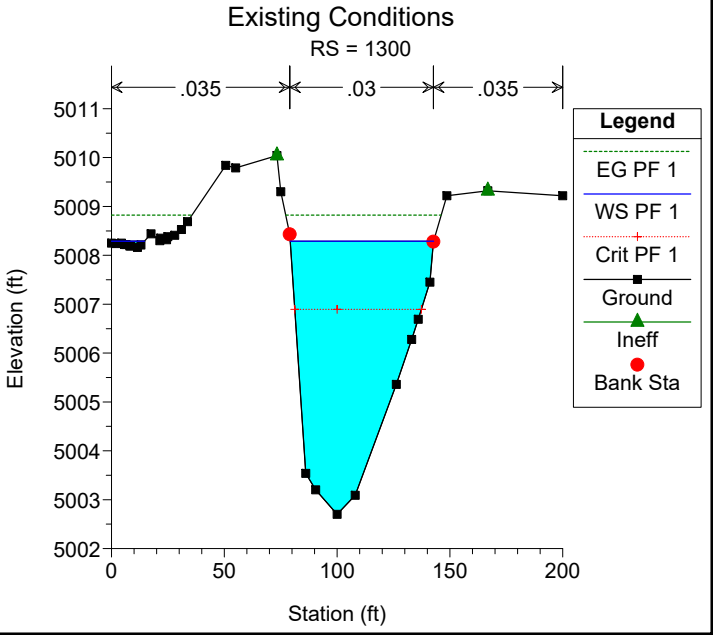
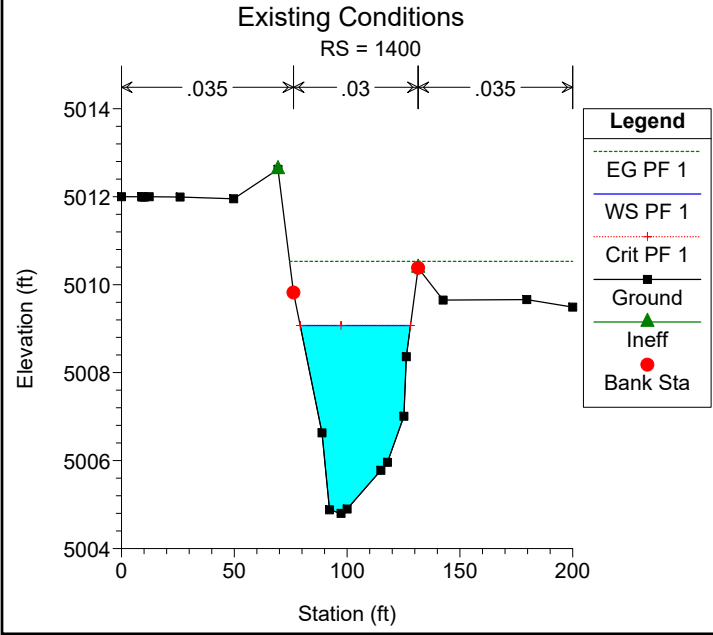
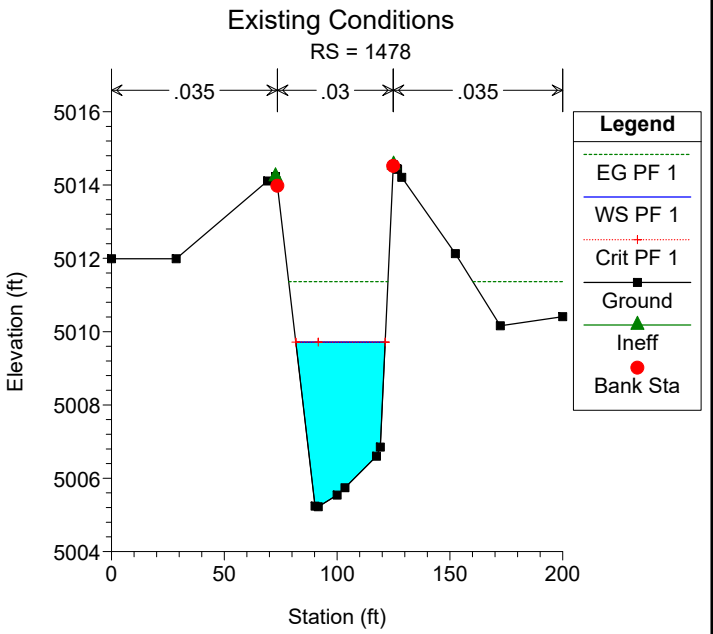
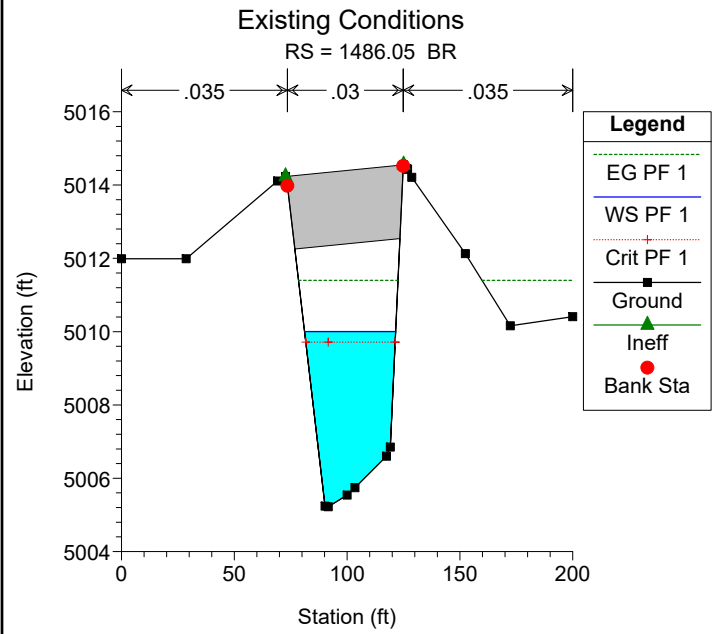
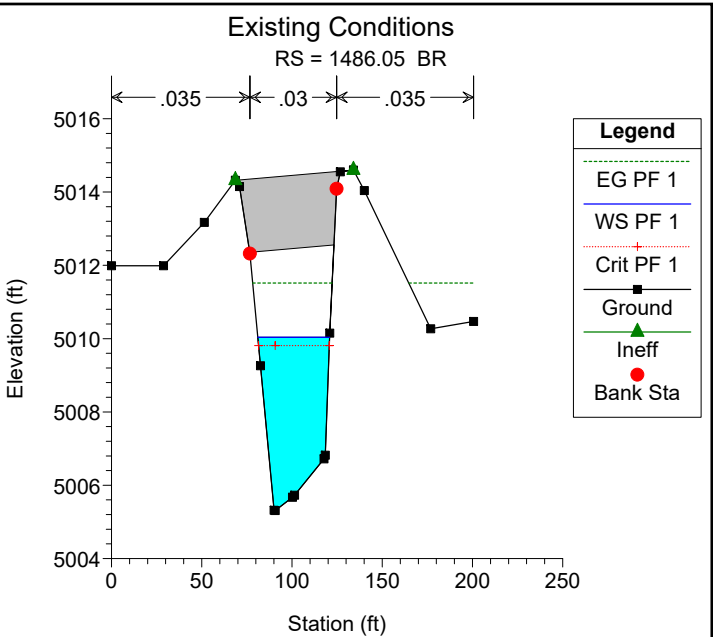
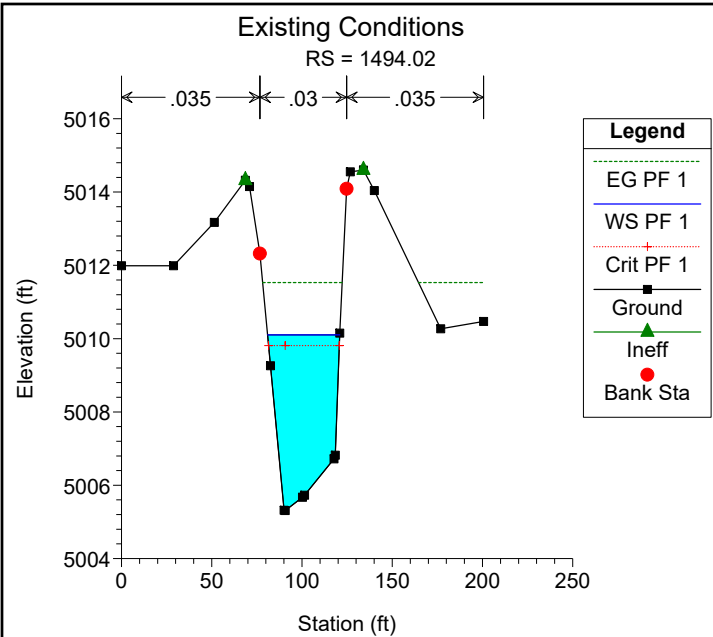
$$\text{TOTAL IN SOUTH BRANCH OF FORK} = 1376$$

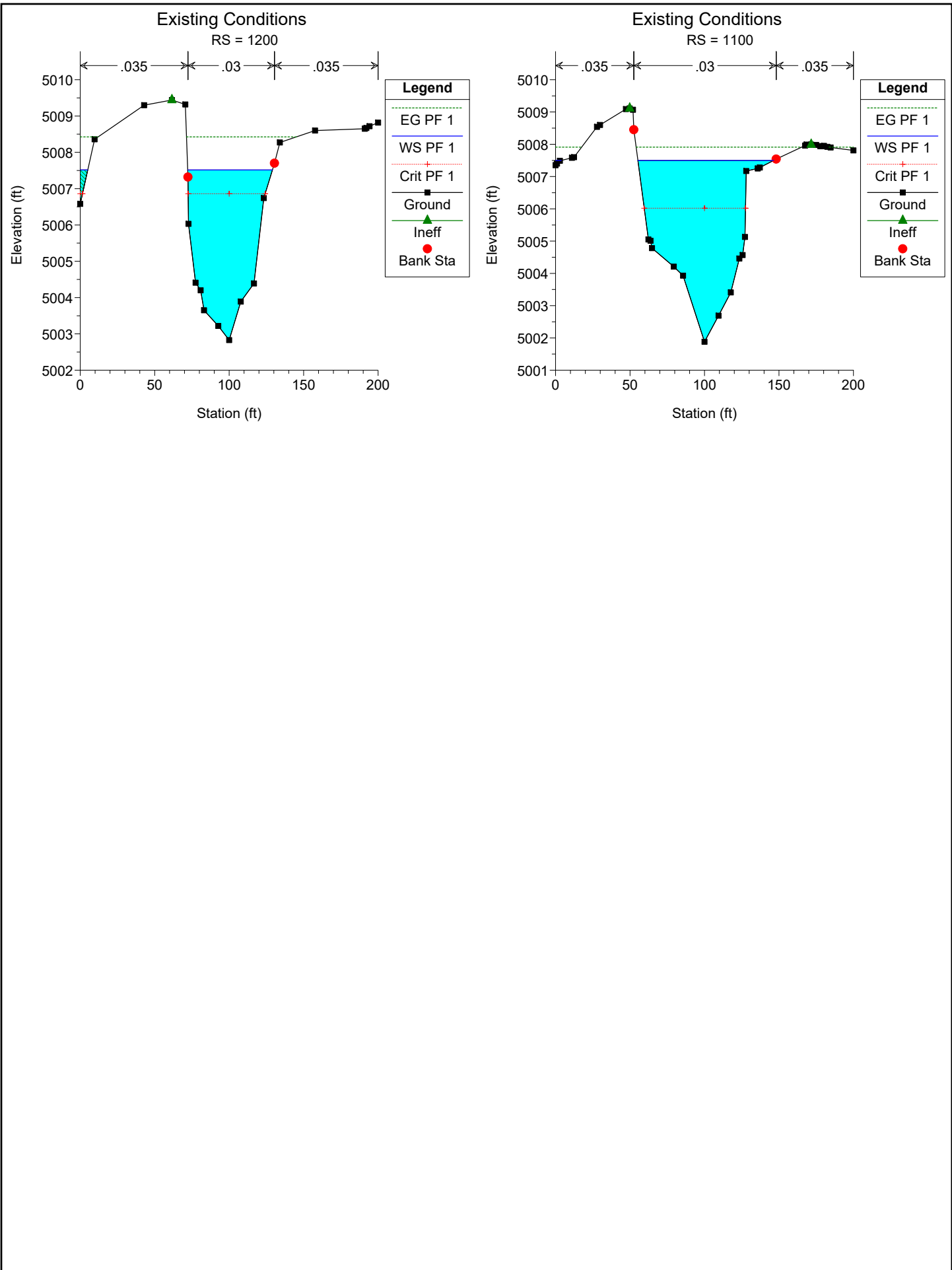


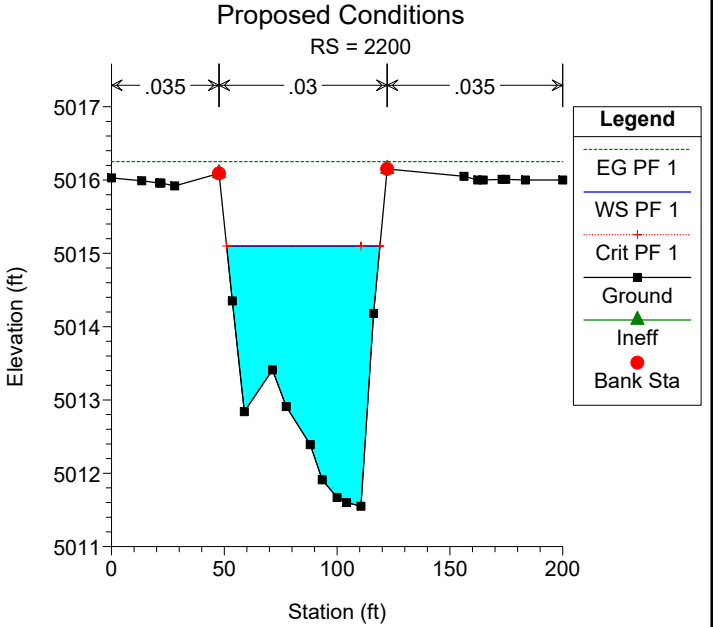
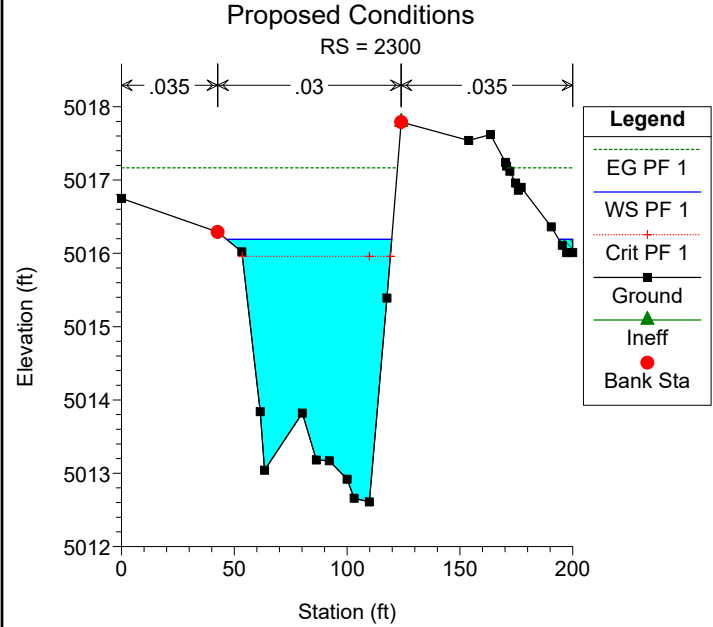
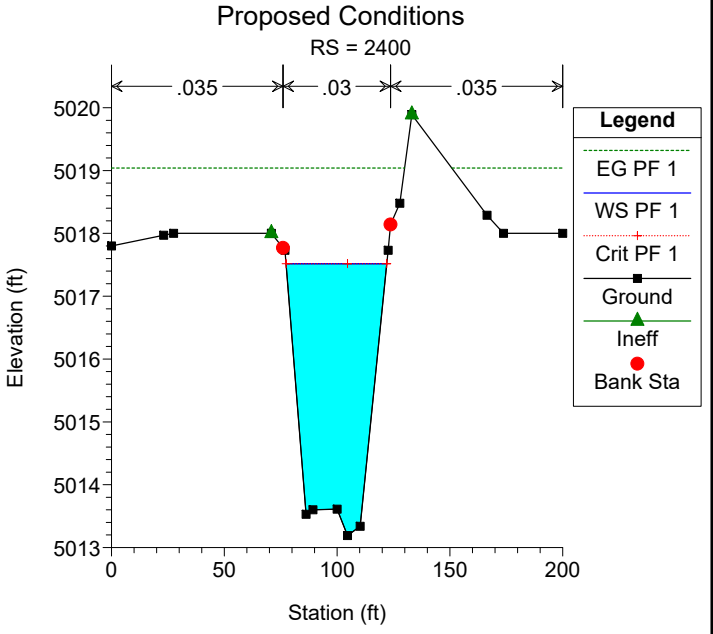
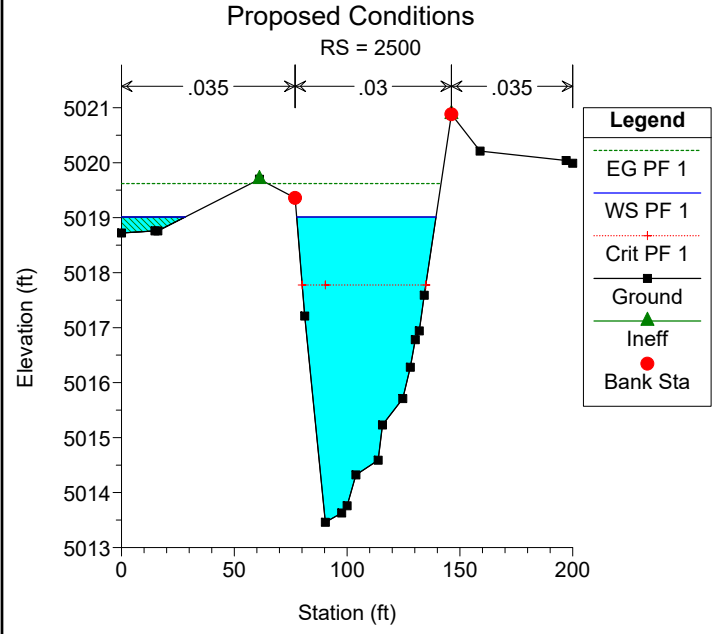
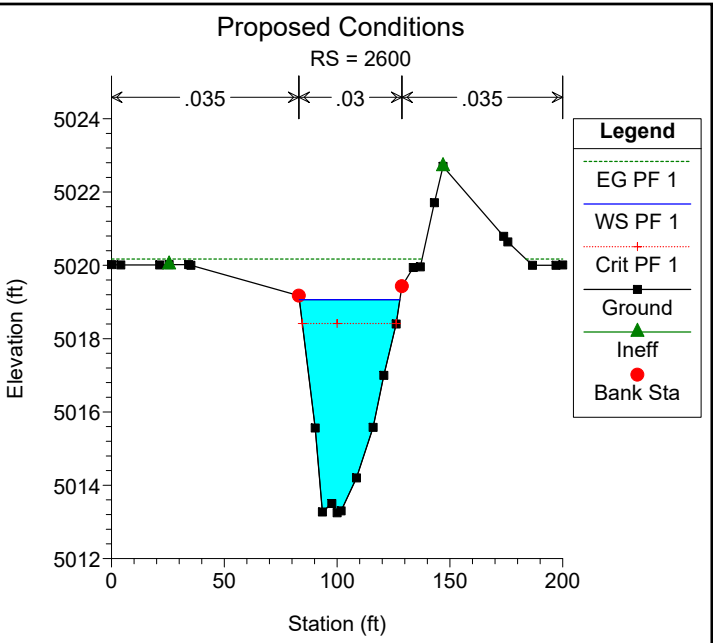
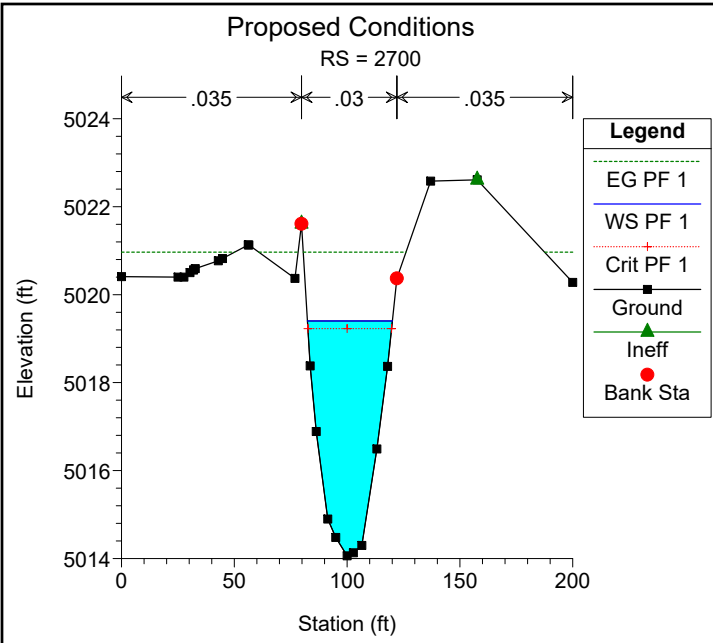


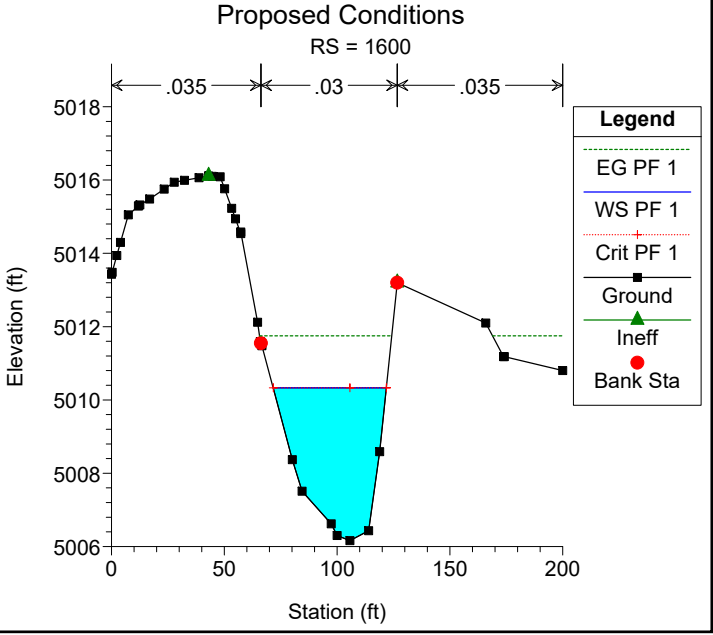
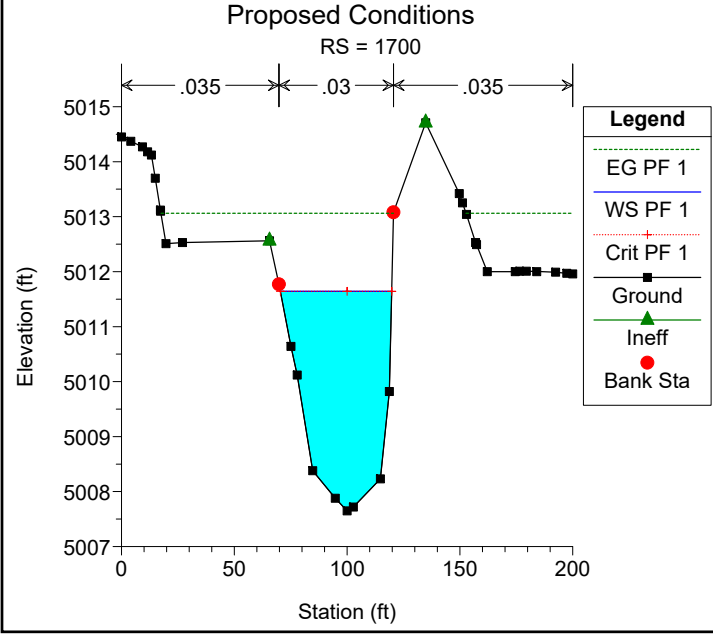
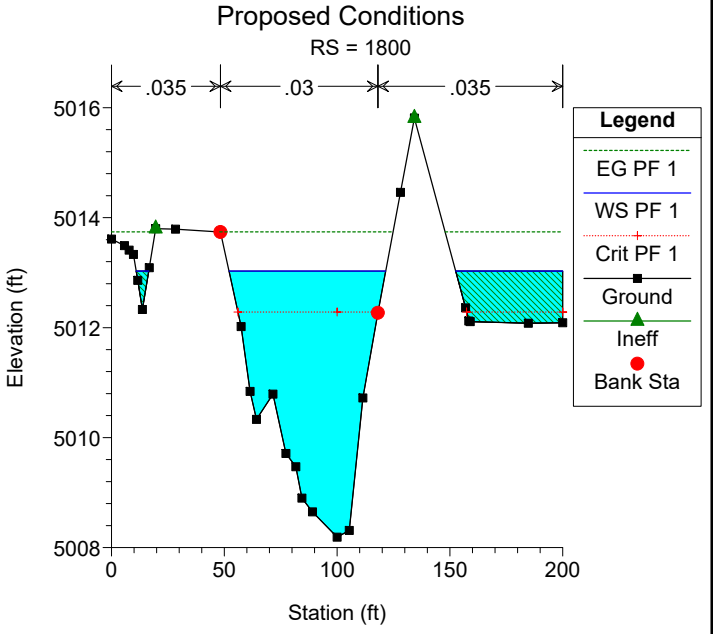
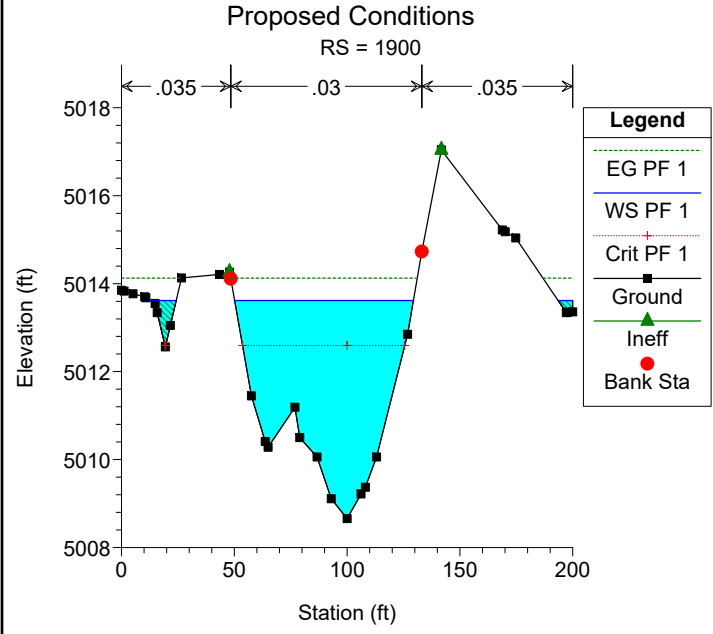
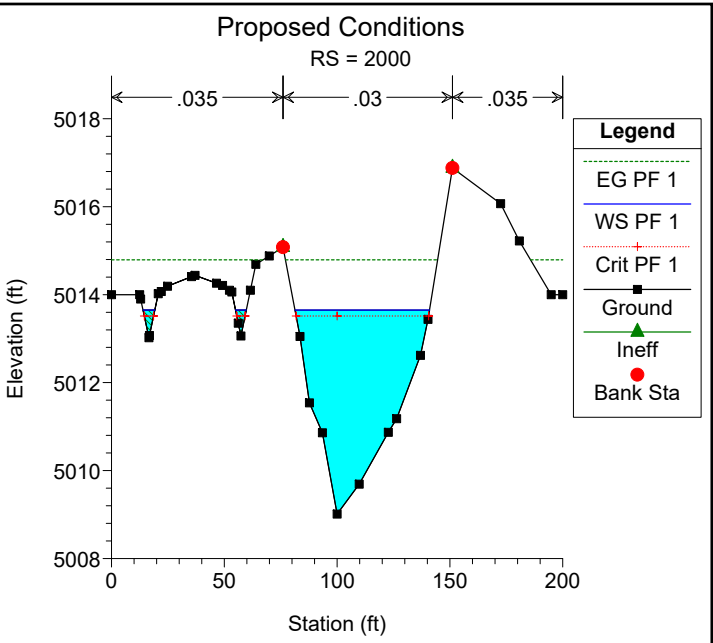
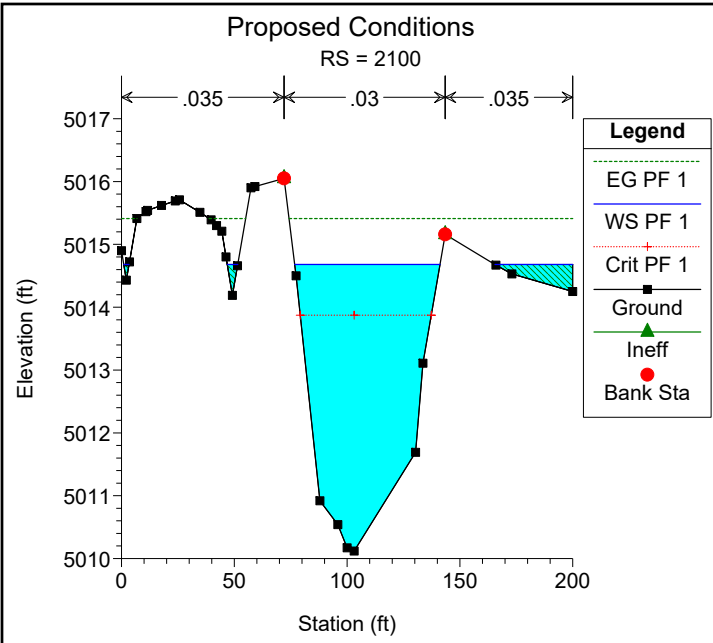


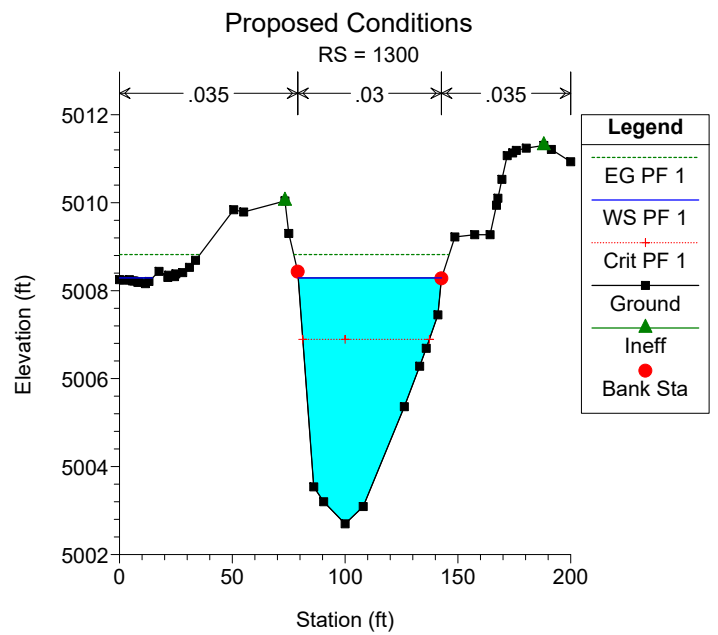
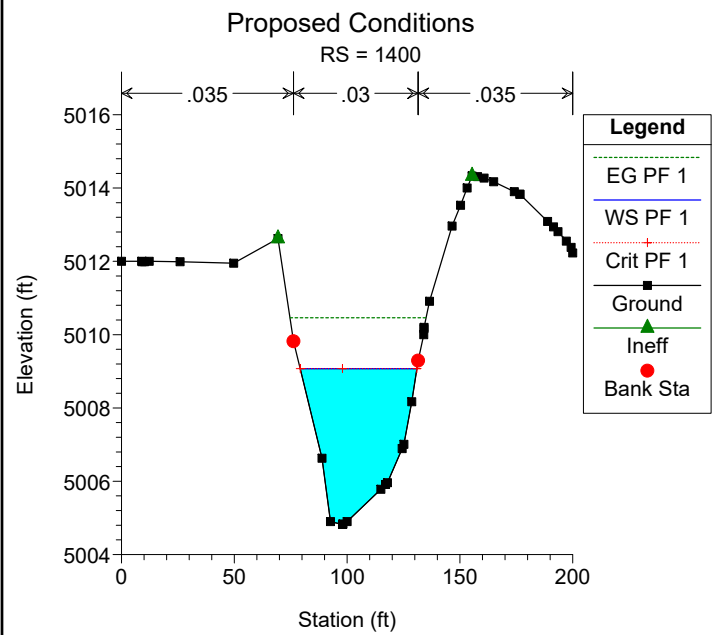
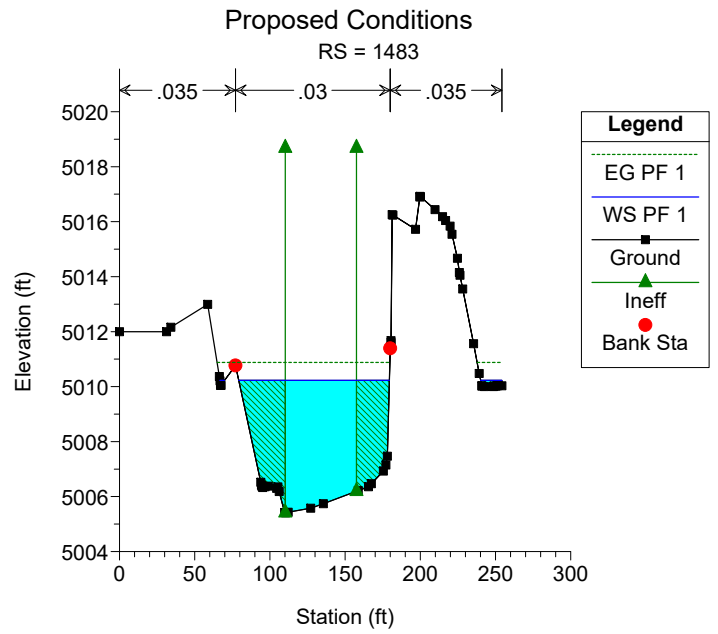
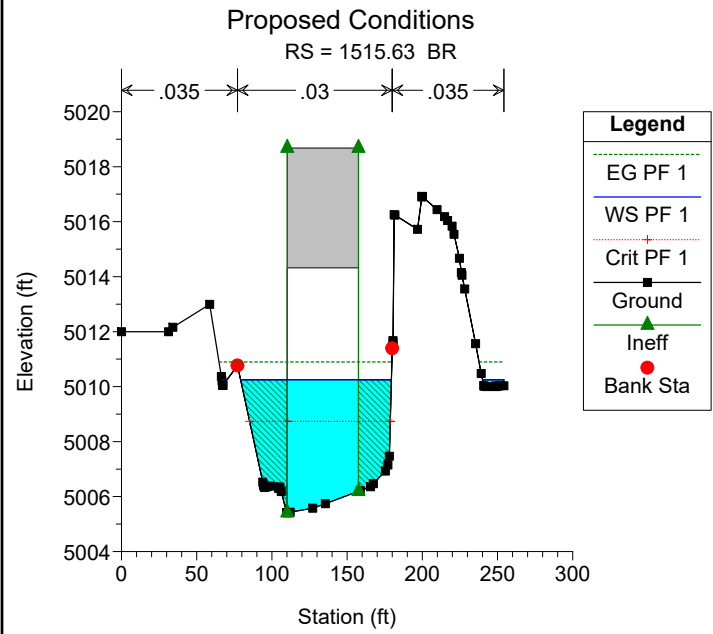
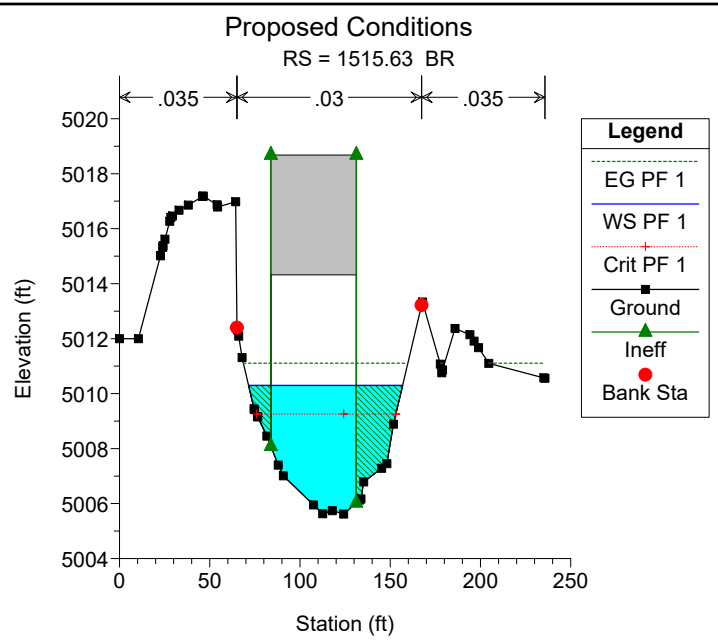
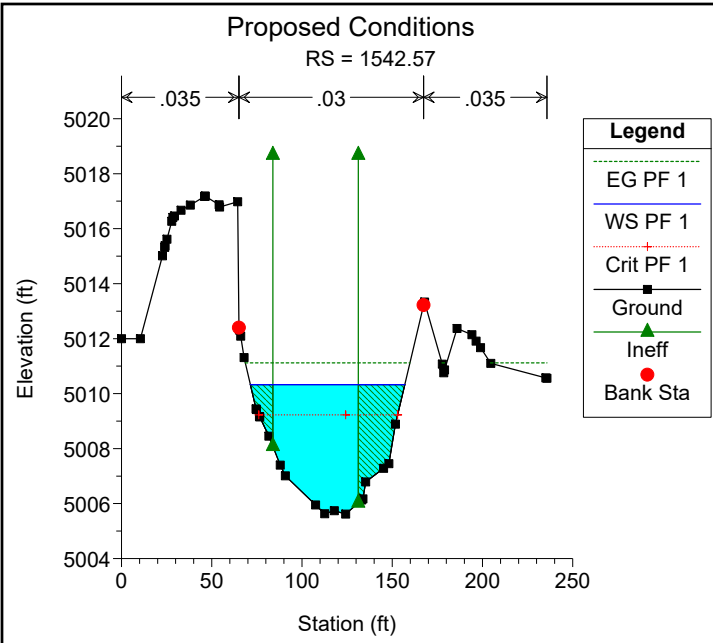






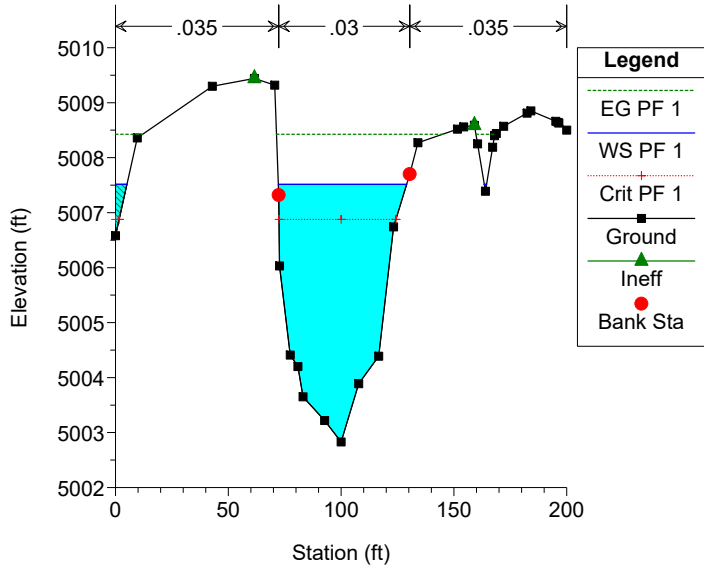






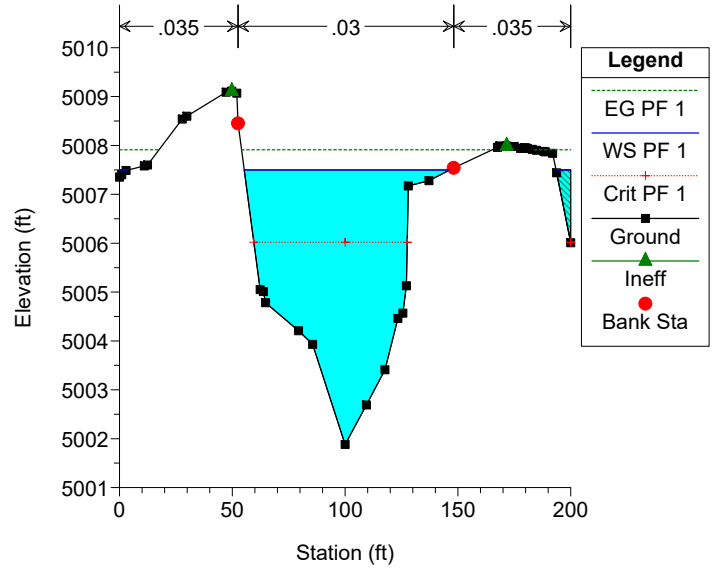
Proposed Conditions

RS = 1200



Proposed Conditions

RS = 1100



HEC-RAS Plan: 100yr EX River: Ogdan River SFSB Reach: Ogdan River Sout Profile: PF 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Ogdan River Sout	2700	PF 1	1376.00	5014.06	5019.40	5019.23	5020.97	0.007884	10.03	137.15	37.68	0.93
Ogdan River Sout	2600	PF 1	1376.00	5013.25	5019.06	5018.41	5020.17	0.005551	8.46	162.62	44.56	0.78
Ogdan River Sout	2500	PF 1	1376.00	5013.46	5019.01	5017.78	5019.62	0.003040	6.25	220.04	89.78	0.58
Ogdan River Sout	2400	PF 1	1376.00	5013.19	5017.52	5017.52	5019.04	0.009179	9.89	139.19	44.70	0.99
Ogdan River Sout	2300	PF 1	1376.00	5012.61	5016.19	5015.96	5017.17	0.008245	7.92	173.73	79.37	0.91
Ogdan River Sout	2200	PF 1	1376.00	5011.55	5015.10	5015.10	5016.25	0.009895	8.62	159.72	67.95	0.99
Ogdan River Sout	2100	PF 1	1376.00	5010.12	5014.68	5013.87	5015.41	0.004337	6.87	200.33	98.87	0.69
Ogdan River Sout	2000	PF 1	1376.00	5009.01	5013.65	5013.52	5014.79	0.008164	8.57	160.55	59.62	0.92
Ogdan River Sout	1900	PF 1	1376.00	5008.66	5013.62	5012.59	5014.13	0.003109	5.73	240.14	85.73	0.58
Ogdan River Sout	1800	PF 1	1376.00	5008.19	5013.03	5012.29	5013.74	0.004279	6.77	204.17	116.87	0.68
Ogdan River Sout	1700	PF 1	1376.00	5007.65	5011.64	5011.64	5013.06	0.009372	9.56	143.94	49.37	0.99
Ogdan River Sout	1600	PF 1	1376.00	5006.16	5011.41	5010.32	5012.12	0.003471	6.78	203.05	83.72	0.63
Ogdan River Sout	1494.02	PF 1	1376.00	5005.31	5010.10	5009.81	5011.53	0.007440	9.57	143.72	39.99	0.89
Ogdan River Sout	1486.05		Bridge									
Ogdan River Sout	1478	PF 1	1376.00	5005.22	5009.72	5009.72	5011.36	0.009315	10.30	133.58	39.64	0.99
Ogdan River Sout	1400	PF 1	1376.00	5004.80	5009.07	5009.07	5010.53	0.009668	9.70	141.91	48.86	1.00
Ogdan River Sout	1300	PF 1	1376.00	5002.70	5008.29	5006.89	5008.82	0.002545	5.86	234.99	78.17	0.54
Ogdan River Sout	1200	PF 1	1376.00	5002.83	5007.51	5006.86	5008.43	0.005377	7.66	179.63	61.93	0.76
Ogdan River Sout	1100	PF 1	1376.00	5001.88	5007.50	5006.02	5007.91	0.002636	5.13	267.97	95.01	0.53

HEC-RAS Plan: 100yr PRO River: Ogden River SFSB Reach: Ogden River Sout Profile: PF 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Ogden River Sout	2700	PF 1	1376.00	5014.06	5019.40	5019.23	5020.97	0.007875	10.03	137.21	37.69	0.93
Ogden River Sout	2600	PF 1	1376.00	5013.25	5019.06	5018.41	5020.17	0.005535	8.45	162.79	44.57	0.78
Ogden River Sout	2500	PF 1	1376.00	5013.46	5019.01	5017.78	5019.62	0.003029	6.25	220.31	90.02	0.58
Ogden River Sout	2400	PF 1	1376.00	5013.19	5017.52	5017.52	5019.04	0.009190	9.90	139.06	44.63	0.99
Ogden River Sout	2300	PF 1	1376.00	5012.61	5016.19	5015.96	5017.17	0.008245	7.92	173.73	79.37	0.91
Ogden River Sout	2200	PF 1	1376.00	5011.55	5015.10	5015.10	5016.25	0.009895	8.62	159.72	67.95	0.99
Ogden River Sout	2100	PF 1	1376.00	5010.12	5014.68	5013.87	5015.41	0.004337	6.87	200.33	105.88	0.69
Ogden River Sout	2000	PF 1	1376.00	5009.01	5013.65	5013.52	5014.79	0.008164	8.57	160.55	69.65	0.92
Ogden River Sout	1900	PF 1	1376.00	5008.66	5013.62	5012.59	5014.13	0.003109	5.73	240.14	97.14	0.58
Ogden River Sout	1800	PF 1	1376.00	5008.19	5013.03	5012.29	5013.74	0.004279	6.77	204.17	122.47	0.68
Ogden River Sout	1700	PF 1	1376.00	5007.65	5011.64	5011.64	5013.06	0.009372	9.56	143.94	49.37	0.99
Ogden River Sout	1600	PF 1	1376.00	5006.16	5010.33	5010.33	5011.75	0.009438	9.56	143.99	50.16	0.99
Ogden River Sout	1542.57	PF 1	1376.00	5005.62	5010.32	5009.23	5011.12	0.003233	7.15	192.37	85.57	0.63
Ogden River Sout	1515.63		Bridge									
Ogden River Sout	1483	PF 1	1376.00	5005.41	5010.23		5010.88	0.002317	6.48	212.36	117.29	0.54
Ogden River Sout	1400	PF 1	1376.00	5004.82	5009.07	5009.07	5010.46	0.009447	9.45	145.56	51.74	0.99
Ogden River Sout	1300	PF 1	1376.00	5002.70	5008.29	5006.89	5008.82	0.002544	5.85	235.03	78.19	0.54
Ogden River Sout	1200	PF 1	1376.00	5002.83	5007.52	5006.88	5008.43	0.005372	7.66	179.68	62.95	0.76
Ogden River Sout	1100	PF 1	1376.00	5001.88	5007.50	5006.02	5007.91	0.002638	5.14	267.91	101.50	0.53

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