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Brimbin

Stormwater Management Strategy

301015-02225 – EN-REP-0003

July 2013

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STORMWATER MANAGEMENT STRATEGY

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Front Cover: *Part of the site of the proposed new town of Brimbin (source: Manning River Times, 13 March 2013)*

PROJECT 301015-02225 - BRIMBIN

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
0	FINAL	TM	DS	DS	21-Jul-2013		

CONTENTS

EXECUTIVE SUMMARY

Background

This report outlines a stormwater management strategy for a proposed residential and industrial development at Brimbin, approximately 10 kilometres north of Taree. This study is intended to accompany a rezoning application for the Brimbin site.

The objective of this report is to satisfactorily address stormwater management issues associated with potential development of the site, including:

- Riparian corridors
- Extent of flooding
- Stormwater quantity management (including the need for stormwater detention)
- Stormwater quality management (including water sensitive urban design measures)

It is anticipated that the outcomes of this report will form the basis of future controls to be prepared for the site by Greater Taree City Council (GTCC) in conjunction with the developer.

Proposed Development

The overall development of the Brimbin site would incorporate residential development with schools, neighbourhood centres, retail and commercial areas, employment lands (light to general industry), landscape and recreational areas. This will also include all associated infrastructure including water supply and sewerage, roads, drainage, electricity, gas, telecommunications and transport routes.

The total area of the proposed Brimbin development precinct is approximately 3,800 hectares (refer to Brimbin Structure Plan contained in **Appendix 1)**. Of this total area, approximately 1,500 hectares is identified as being non-developable (e.g. conservation, rural landscape, lakes). The remaining area (approximately 2,300 hectares) is intended to comprise residential, commercial, industrial, primary production, environmental living and private recreation development.

The major part of the proposed Brimbin development is approximately 874 hectares designated for residential development including low density, medium density, seniors living and large lot residential (approximately 4000 m^2 per lot) development. It is anticipated that the residential development yield of the Brimbin site would be up to 8000 dwellings, which is consistent with projections contained in the *Mid-North Coast Regional Strategy* (NSW Department of Planning, 2009).

Other major components of the proposed development include:

- approximately 740 hectares of Environmental Living (Zone E4) proposed in the eastern most portion of the site adjacent to the Lansdowne River, the majority of which would be for private conservation.
- approximately 400 hectares of Primary Production (Zone RU4), which would be designated for small scale rural and primary production.
- approximately 112 hectares of General Industrial (Zone IN1), consisting of light to general industrial development that would generate employment opportunities for future residents of Brimbin and surrounding areas.
- approximately 26 hectares of retail, commercial and civic land.

Site Hydrology

The existing Brimbin site contains two major internal catchments that ultimately discharge into the Dawson and Manning Rivers. There are three major creek systems within the site (refer to **Figure 1**):

- Creek A, which generally drains in a south-west to westerly direction and discharges into the Dawson River.
- Creek B, which generally drains in a westerly direction and discharges into the Dawson River at the north-western corner of the site.
- Pontobark Creek, which generally drains in a south to south-easterly direction and discharges into Dickensons Creek and the Manning River floodplain.

There are also a number of other minor catchments that drain towards the Brimbin site boundary and towards either the Dawson River or Manning River floodplain.

Hydrological modelling of the existing and post-development scenarios has been undertaken to determine peak flow rates in a range of design storm events (2 year, 20 year and 100 year ARI). These peak flow rates have been adopted to determine preliminary flood extents within the site and requirements for on-site stormwater detention (OSD).

Preliminary Flood Extents

One-dimensional flood modelling has been undertaken of the major creeklines and tributaries within the site using the industry standard program HEC-RAS. Peak flow estimates for the 100 year ARI storm event were then routed through existing creeklines to determine preliminary flood extents within the site and potential constraints that flooding may pose on future development.

The Dawson River forms the western boundary of the site. Flooding of the Dawson River also forms a constraint to potential development of the site.

The results included in this assessment are preliminary flood levels for each cross-section location and long-sections for each creekline. These results have been included as **Appendix 3**. Preliminary flood extents for the site in the 100 year ARI storm event based on the water surface levels calculated in HEC-RAS are presented in **Figure 3**.

It is noted that the 100 year ARI flood extent is generally contained within a proposed 100 metre wide riparian corridor for each of the creeklines and tributaries within the site.

Stormwater Quantity

In order to establish a stormwater quantity strategy for the Brimbin site, each of the internal catchments were modelled in XP-RAFTS. The Brimbin Structure Plan has formed the basis of the stormwater quantity analysis in terms of estimating the extent of impervious areas in the ultimate development scenario. The stormwater quantity strategy was prepared to satisfy the following criteria:

- Protect existing water courses
- Prevent increases in flood levels throughout and downstream of site
- Preserve existing infrastructure

The recommended strategy to manage stormwater quantity on the site is to provide a series of off-line detention basins at a number of key locations along major waterways within the site. The approximate extent and dimensions of these basins is shown in **Figure 4**.

The provision of detention basins would attenuate peak flows and satisfy the objectives of protecting existing water courses and preventing increases in flood levels. Detention storage can be provided in many combinations of measures within the development site. These measures include OSD tanks within residential lots, bio-retention swales / basins, open space areas and above constructed wetlands. Any detention facilities for the site would need to be located off-line allowing them to be constructed outside riparian corridors and placing them clear of the 100 year ARI flood extent.

Stormwater Quality

Stormwater quality within the site will be managed via a “treatment train” configuration of bio-retention swales, Gross Pollutant Traps (GPTs), bio-retention basins and constructed wetlands. From individual lots runoff will be discharged into a trunk drainage network where, together with runoff from roads and swales, it will be treated in catchment-wide treatment areas (either bio-retention basins or constructed wetlands) before being discharged into downstream waterways.

The MUSIC software package has been used to estimate average annual pollutant exports for the existing and post-development scenarios. In order to achieve NSW Office of Water pollutant reduction targets, as well as GTCC conditions requiring no net increase in average annual pollutant discharge, the proposed stormwater treatment train effectiveness has been assessed by comparing the average annual load of TSS, TP and TN arriving at a number of key locations within the site under three scenarios:

1. Existing (*pre-development*)
2. Post-development (*no treatment*)
3. Post-development (*with treatment*)

The MUSIC model results indicate that the following stormwater treatment measures will be required within the site:

- Gross Pollutant Traps at the upstream extent of bio-retention basins and constructed wetlands.
- Bio-retention swales and/or basins with a gross surface area of approximately 1.5% of the total catchment area.
- Constructed wetlands with a gross surface area of approximately 1% of the total catchment area.

Conclusion

This report has estimated the requirements for stormwater management for potential future development of the Brimbin site based on the Brimbin Structure Plan. The advice provided in this report is based on the Brimbin Structure Plan and preliminary hydrological and water quality modelling.

The objectives of the stormwater management strategy recommended for the Brimbin development precinct would be achieved by:

- Providing on-site stormwater detention to ensure no increase in peak flow rates following development when compared to existing site conditions.
- Removing pollutants from runoff to a sufficient extent to meet both Council and State government guidelines and adopt a stormwater treatment train approach that is consistent with current best practice WSUD.

The recommended stormwater quantity and quality management strategies are intended to be included as future development controls for the Brimbin site to be prepared by Council in conjunction with the developer. They will also need to be verified through detailed investigation and design at the subdivision Development Application and Construction Certificate stages.

1 INTRODUCTION

WorleyParsons has been engaged by Roche Group to prepare a preliminary stormwater management strategy for the proposed Brimbin development precinct (the site). The objective of this report is to satisfactorily address stormwater management issues associated with potential development of the site, including:

- Riparian corridors
- Extent of flooding
- Stormwater quantity management (including the need for stormwater detention)
- Stormwater quality management (including water sensitive urban design measures)

It is anticipated that the outcomes of this report will form the basis of future controls to be prepared for the site by Greater Taree City Council (GTCC) in conjunction with the developer.

1.1 Site Description

The site is located approximately 10 kilometres north of Taree and covers approximately 3,800 hectares. The site is generally bound by existing rural land holdings to the north, Lansdowne River to the east, Brimbin Road and adjoins properties fronting Kundle Kundle Road to the south and the Dawson River to the west.

Approximately half of the site is currently used for agricultural purposes, primarily consisting of cleared grazing lands. The remaining half of the site consists of dense native vegetation including forested areas, estuarine wetlands and riparian vegetation.

Under the Greater Taree Local Environmental Plan (LEP) 2010, the site consists of portions of land zoned as RU 1 (Primary Production), RU 4 (Rural Small Holdings) and E2 (Environmental Conservation).

The site is subject to a rezoning application to convert it to a mixture of residential, commercial, industrial and rural residential development. In conjunction with Roche Group, Roberts Day has prepared the Brimbin Structure Plan (July 2013) for the site showing the intended land uses in the ultimate development scenario, refer to **Appendix 1**.

2 PROPOSED DEVELOPMENT

2.1 Types of Development

The overall development of the Brimbin site would incorporate residential development with schools, neighbourhood centres, retail and commercial areas, employment lands (light to general industry), landscape and recreational areas. This will also include all associated infrastructure including water supply and sewerage, roads, drainage, electricity, gas, telecommunications and transport routes.

The proposed development composition of the site is presented in the Brimbin Structure Plan, contained in **Appendix 1**.

The overall development of the Brimbin site would incorporate residential development with schools, neighbourhood centres, retail and commercial areas, employment lands (light to general industry), landscape and recreational areas. This will also include all associated infrastructure including water supply and sewerage, roads, drainage, electricity, gas, telecommunications and transport routes.

The total area of the proposed Brimbin development precinct is approximately 3,800 hectares (refer to Brimbin Structure Plan contained in **Appendix 1)**. Of this total area, approximately 1,500 hectares is identified as being non-developable (e.g. conservation, rural landscape, lakes). The remaining area (approximately 2,300 hectares) is intended to comprise residential, commercial, industrial and rural development. The Brimbin Structure Plan has been adopted to estimate the ultimate potable water demand, sewerage loadings and recycled water demand for the site.

The major part of the proposed Brimbin development is approximately 874 hectares designated for residential development including low density, medium density, seniors living and large lot residential (approximately 4000 m^2 per lot) development. It is anticipated that the residential development yield of the Brimbin site would be up to 8000 dwellings, which is consistent with projections contained in the *Mid-North Coast Regional Strategy* (NSW Department of Planning, 2009).

Other major components of the proposed development include:

- approximately 740 hectares of Environmental Living (Zone E4) in the eastern most portion of the site adjacent to the Lansdowne River.
- approximately 400 hectares of Primary Production (Zone RU4), which would be designated for small scale rural and primary production.
- approximately 112 hectares of General Industrial (Zone IN1), consisting of light to general industrial development that would generate employment opportunities for future residents of Brimbin and surrounding areas.

2.2 Staging and Rate of Development

Due to the proximity to existing infrastructure and urban development at Taree, staging of the proposed residential development is expected to commence from the southern portion of the site adjacent to Lansdowne Road. Non-residential development would commence within close proximity to the recreational lake and Lansdowne Road. The development would then generally proceed towards the north and north-west.

It is anticipated that the development would occur at an average rate of 300 residential lots per year, with other non-residential development to be staged progressively in proportion to residential development.

Given the extent of the site, the rate of development is almost certain to change throughout the life of the development. Based on the initial assumption of an average of 300 residential lots per year and not accounting for the future urban release area, ultimate development of the site could take up to 30 years.

3 SITE HYDROLOGY

3.1 Catchment Characteristics

The existing Brimbin site contains two major internal catchments that ultimately discharge into the Dawson and Manning Rivers. There are three major creek systems within the site (refer to **Figure 1**):

- Creek A, which generally drains in a south-west to westerly direction and discharges into the Dawson River.
- Creek B, which generally drains in a westerly direction and discharges into the Dawson River at the north-western corner of the site.
- Pontobark Creek, which generally drains in a south to south-easterly direction and discharges into Dickensons Creek and the Manning River floodplain.

There are also a number of other minor catchments that drain towards the Brimbin site boundary and towards either the Dawson River to the west, the Manning River to the south or the Lansdowne River to the east.

The delineation of catchments within the Brimbin site is shown in **Figure 2** and the catchment characteristics are presented in **Table 3-1**.

Table 3-1 Brimbin catchment characteristics

Catchment Name	Catchment Size (ha)	Average Slope (%)
A1A	49.4	12%
A1B	45.1	7%
A1C	88.5	8%
A1D	47.1	6%
A2	73.7	8%
A3	56.7	8%
A4	44.8	7%
A5	73.1	3%
B1	281.1	3%
B2	35.7	3%
B3	34.3	2%

Catchment Name	Catchment Size (ha)	Average Slope (%)
B4	65.8	3%
B5	29.2	6%
B6	42.6	4%
B7	46.8	4%
C3	26.3	5%
C4	32.2	3%
C5	70.1	5%
LAKE	96.5	6%
EX1	242.2	6%
EX2	365.6	2%
EX3	76.8	5%
TOTAL AREA (ha)	**1923.5**	

3.2 Hydrological Modelling

Hydrological modelling of the existing and proposed site conditions was undertaken using XP-RAFTS. XP-RAFTS is a non-linear rainfall/runoff program developed by WP Software that can be used to estimate peak flows for catchments, using actual storm events, or design rainfall data derived from '*Australian Rainfall and Runoff' (AR&R), Engineers Australia, 1987*. The XP-RAFTS model layout is presented in **Appendix 2**.

To model a catchment within XP-RAFTS, the catchment is divided into sub-catchments based on watershed boundaries. Data required for each sub-catchment includes catchment area, catchment slope, proportion of impervious area, rainfall losses and surface roughness parameters (i.e. Manning's "n" values).

For the purposes of this study the 2 year, 20 year and 100 year Average Recurrence Interval (ARI) storm events were modelled.

The existing and post-development model scenarios adopt the same catchment parameters with different percentage impervious to reflect the change in land use upon development of the site. This is due to the assumption that bulk earthworks will not significantly alter major catchment boundaries within the site.

3.3 Input Parameters

Intensity-frequency-duration (*IFD*) data was sourced for the Taree area from the Bureau of Meteorology online IFD data system, which is based on parameters in AR&R 1987. The adopted IFD parameters are included in **Table 3-2**.

Table 3-2 IFD Data for the Brimbin site (Bureau of Meteorology)

Duration	2 year ARI Intensity (mm/hr)	50 year ARI Intensity (mm/hr)
1 hour	35.60	67.20
12 hour	8.80	17.20
72 hour	2.98	5.78

Note: Location skew (G) = 0.05, F_2 = 4.34, F_{50} = 16.18

The adopted rainfall losses (initial and continuing) and surface roughness factors (Mannings "n") for the XP-RAFTS models are presented in **Table 3-3**.

Table 3-3 Rainfall Loss Parameters

	Pervious Areas	Impervious Areas
Initial Loss (IL)	10mm	2.5mm
Continuing Loss (CL)	2.5mm	0mm
Mannings "n"	0.030	0.015

3.4 Results

Based on the model input parameters outlined in **Section 3.3**, and an assumption that the existing site is 95% pervious, the peak flow rates for each catchment were approximated. A comparison of existing and post-development peak flow rates as modelled in XP-RAFTS is included in **Section 5**.

4 PRELIMINARY FLOOD EXTENTS

One-dimensional flood modelling has been undertaken of the major creeklines and tributaries within the Brimbin site, including the Dawson River which forms the western boundary of the site. Peak flows under the 100 year ARI storm event were run to determine preliminary flood extents within the site and potential constraints that flooding may pose on potential future development of the site.

The eastern portion of the site that has been designated for 'Environmental Living' in the Brimbin Structure Plan (refer to **Appendix 1**) is relatively low lying (i.e. below RL 10m AHD) and is subject to inundation due to elevated water levels in the Lansdowne River. Flood modelling within this portion of the site has not been undertaken. However, available flood extent information shows that the majority of the eastern portion of the site is within the Flood Planning Area designated in the *Greater Taree Local Environmental Plan 2010* Flood Planning Map – Sheet FLD_014. This would be a result of backwater flooding of the Lansdowne River from the Manning River. It is understood that a small portion in the western extent of the 'Environmental Living' area that is outside of the Flood Planning Area is intended to be developed, with the remainder of the area being retained for private conservation.

4.1 HEC-RAS Modelling

HEC-RAS has been used for the hydraulic analysis to predict flood profiles during a 100 year ARI storm event. HEC-RAS is a water surface profile program capable of analysing steady state, gradually varied channel flow. Subcritical, supercritical and mixed flow water surface profile computations are possible. It is based on the industry standard United States Army Corps of Engineers HEC-2 program.

HEC-RAS has been used to establish water levels at cross-sections located strategically along the major creeklines and tributaries within the site. The geometry of the cross-sections was based upon aerial laser survey (ALS) data for the site that has been provided by McGlashan & Crisp. This data is of sufficient detail to prepare preliminary hydraulic models to map preliminary flood extents to a level of detail required for determining potential constraints on development. More detailed flooding assessments will be required during subsequent approval processes associated with future development of the site.

4.2 Model Parameters

HEC-RAS requires several parameters to be entered into a model such that a mixed-state mode flow analysis can be undertaken. These parameters include channel roughness coefficients (Manning's "n" values), upstream boundary conditions and downstream boundary conditions.

4.2.1 Roughness Coefficients

Channel and floodplain roughness coefficients implemented within the HEC-RAS models produced were based upon an assessment of published Mannings "n" values. The selected roughness coefficients are:

- Left and right overbank: n = 0.1
- Channel: n = 0.035

The Mannings "n" coefficient for the left and right banks (0.1) is significantly higher than that adopted in the XP-RAFTS modelling (0.035) to account for major obstructions within the channel banks such as trees and dense vegetation.

4.2.2 Boundary Conditions

In order to model in the mixed state mode, upstream boundary conditions must be specified. For the HEC-RAS models of the major creeklines, the upstream boundary conditions were adopted based on the normal depth of the channel, as controlled by the channel slope. The channel slopes for the creeklines within the Brimbin site were determined by topography (based on the ALS contours) of the upper extents of each individual creekline. The upstream boundary conditions were adopted as the normal depth of the channel with a 1% slope. Given each of the creeklines are steeper than 1% this is a conservative assumption.

The major creeklines were modelled as continuous networks. Therefore, only one ultimate downstream boundary condition was required for each creekline system.

For Dawson River and Pontobark Creek, the downstream boundary condition was adopted as the normal depth of the channel as precise flood levels at the downstream extents of the model are not known. A sensitivity analysis was run for a series of tailwater levels. This analysis determined that flood levels within the Brimbin site are not sensitive to tailwater levels in both the Dawson River and Pontobark Creek. Therefore, the adopted boundary conditions are deemed to be appropriate for the purposes of this study.

The adopted boundary conditions for the other creeks within the site are detailed below in **Table 4-1**.

Table 4-1 Adopted Downstream Boundary Conditions

River / Creek	Downstream Tailwater Level (RL m AHD)	Comments
Creek A	10.43	Derived from results of Dawson River HEC-RAS model
Creek B	14.15	Derived from results of Dawson River HEC-RAS model

At points of confluence between two creeks the downstream boundary condition established was a junction. HEC-RAS enables two junctions to be modelled without any additional user input.

4.2.3 Flow Data

Peak flow rates for the 100 year ARI storm event under the existing scenario were adopted for the hydraulic analysis. Stormwater detention measures provided throughout the site will ensure that peak flow rates within major creeklines will not increase as a result of development of the site.

4.3 Results

The results included in this assessment are preliminary flood levels for each cross-section location and long-sections for each creekline. These results have been included as **Appendix 3**. Preliminary flood extents for the site in the 100 year ARI storm event based on the water surface levels calculated in HEC-RAS and available Flood Planning Maps (Greater Taree LEP 2010) are presented in **Figure 3**.

It is noted that the 100 year flood extent is generally contained within a proposed 100 metre wide riparian corridor for each of the creeklines and tributaries within the site.

5 STORMWATER QUANTITY

In order to establish a stormwater quantity strategy for the Brimbin site, each of the internal catchments were modelled in XP-RAFTS. The Brimbin Structure Plan (refer to **Appendix 1**) has formed the basis of the stormwater quantity analysis in terms of estimating the extent of impervious areas in the ultimate development scenario.

The stormwater quantity strategy was prepared to satisfy the following criteria:

- Protect existing water courses
- Prevent increases in flood levels throughout the site
- Preserve existing infrastructure

5.1 Methodology

In order to satisfy the objectives of the stormwater quantity management strategy, it is proposed to match post-development peak flow rates with existing peak flow rates at a number of key locations along the major watercourses within the site (refer to **Figure 4**). This will be achieved through the provision of on-site stormwater detention (OSD) for the 2 year, 20 year and 100 year ARI storm events. The 2 year ARI was selected as it generally correlates with the minor bank forming flow of natural water courses. The 20 year ARI was selected because major stormwater infrastructure is typically designed to cater for peak flows up to the 20 year ARI. The 100 year ARI was selected as this event is used for flood planning levels.

The existing scenario model was developed on the basis that the site is 95% pervious. The percentage impervious for post-development model scenario was estimated based on the Brimbin Structure Plan and using values for a typical urban catchment.

OSD will be provided within the site to ensure that post-development peak flow rates match existing peak flow rates for a range of storm events up to the 100 year ARI event. In order to determine the required OSD volume, stage-storage and stage-discharge relationships were incorporated into basin nodes placed strategically throughout the site.

5.2 Results

The peak flow rates for the existing and post-development scenarios for the Brimbin site are presented in **Table 5-1**.

Table 5-1 Peak Flow Rate Comparison

Catchment	Area (ha)	Estimated Peak Flows (m^3/s)								
		Existing			Post-Development			% Increase		
		2yr	20yr	100yr	2yr	20yr	100yr	2yr	20yr	100yr
A1A	49.4	8.7	16.2	20.5	11.1	19.2	23.6	27%	19%	15%
A1B	45.1	22.4	44.2	57.0	27.1	49.7	62.9	21%	12%	10%
A1C	88.5	37.2	70.8	91.1	43.0	76.4	97.9	16%	8%	8%
A1D	47.1	45.1	85.8	110.6	54.5	97.3	124.4	21%	13%	12%
A2	73.7	9.2	19.8	26.1	12.3	23.6	30.2	33%	19%	16%
A3	56.7	7.0	14.8	19.6	12.1	21.3	26.5	73%	44%	35%
A4	44.8	5.4	12.0	16.0	10.8	19.0	23.3	102%	58%	46%
A5	73.1	6.2	12.5	17.2	12.7	22.8	29.1	105%	82%	69%
B1	281.1	20.2	42.2	56.1	43.8	74.0	92.3	117%	76%	65%
B2	35.7	3.5	7.4	10.2	9.5	15.7	19.5	170%	113%	92%
B3	34.3	2.5	5.4	7.1	3.5	6.7	8.8	39%	24%	24%
B4	65.8	5.8	11.9	16.5	13.2	23.1	28.9	129%	94%	76%
B5	29.2	3.9	8.1	10.7	6.6	11.8	14.5	69%	45%	36%
B6	42.6	4.2	9.3	12.8	8.6	15.4	19.1	104%	66%	49%
B7	46.8	4.0	8.0	11.3	7.1	13.4	17.0	78%	68%	51%
C3	26.3	34.0	73.0	97.0	55.2	98.6	124.1	62%	35%	28%
C4	32.2	28.7	62.5	83.7	49.4	88.4	111.4	72%	41%	33%
C5	70.1	17.2	37.5	49.8	33.0	57.3	71.1	92%	53%	43%
LAKE	96.5	11.7	24.8	32.8	24.3	41.8	51.0	107%	68%	55%
EX1	242.2	26.7	57.8	78.7	54.6	98.0	122.3	104%	70%	55%
EX2	365.6	42.7	85.3	113.8	148.0	247.6	301.9	247%	190%	165%
EX3	76.8	8.5	18.3	24.8	18.5	32.6	40.2	118%	78%	62%

The post-development peak runoff flow rate would have to be maintained at existing rates to alleviate the potential for destabilising of existing creeks. In addition, the post-development flow frequency should mimic the existing runoff characteristics of the site as much as possible. This is achieved by retention and temporary detention of stormwater runoff at key locations within the site.

Table 5-2 summarises the indicative detention volumes required at key locations along major creeklines within the site to attenuate the post-development peak flows to the existing peak flows for a range of storm events up to the 100 year ARI event. It is noted that these volumes have been determined based on the land uses indicated in the Brimbin Structure Plan. Should these proposed land uses change the detention storage volume would need to be revised.

Table 5-2 Detention Storage Volumes

Catchment	Contributing Area (ha)	Detention Storage Volume (m^3)	Volume per unit area (m^3/ha)
A1A	49.4	1900	39
A1B	45.1	130	3
A1C	88.5	1690	19
A1D	47.1	1710	36
A2	73.7	2990	41
A3	56.7	5690	100
A4	44.8	5180	116
A5	73.1	8180	112
B1	281.1	52020	185
B2	35.7	8110	227
B3	34.3	720	21
B4	65.8	11340	172
B5	29.2	2600	89
B6	42.6	5300	124
B7	46.8	3930	84
C3	26.3	3350	127
C4	32.2	2190	68
C5	70.1	6490	93

Catchment	Contributing Area (ha)	Detention Storage Volume (m^3)	Volume per unit area (m^3/ha)
LAKE	96.5	12310	128
EX1	242.2	28970	120
EX2	365.6	101590	278
EX3	76.8	10600	138
TOTAL	**1923.5**	**276990**	**144**

The calculated volume per hectare of detention required to attenuate post-development peak flow rates back to existing peak flow rates varies across the site. This is primarily due to the intended future land use of each catchment (i.e. a land use resulting in greater impervious fraction will require a higher detention storage volume). The location of each internal catchment within the site also influences the volume of detention storage required.

It is recommended that the average detention volume per hectare be adopted across the site, along with appropriate outlet controls for each detention facility. This storage would maintain and in some cases even reduce the peak flow rates from the proposed development to rates below those of the existing conditions for storm events up to and including the 100 year ARI event.

5.3 Recommended Stormwater Quantity Strategy

The recommended strategy to manage stormwater quantity on the site is to provide a series of detention basins at a number of key locations along major waterways within the site. The approximate extent and dimensions of these basins is shown in **Figure 4**.

The provision of detention basins would attenuate peak flows and satisfy the objectives of protecting existing water courses and preventing increases in flood levels. Detention storage can be provided in many combinations of measures within the development site. These measures include OSD tanks within residential lots, bio-retention swales / basins, open space areas and above constructed wetlands. Any detention facilities for the site would need to be located offline allowing them to be constructed outside riparian corridors and placing them clear of floodways.

Further detailed hydrological modelling will be required in subsequent stages of the development to confirm the required detention volumes.

6 STORMWATER QUALITY

Stormwater quality within the proposed Brimbin development will be managed via a “treatment train” configuration of bio-retention swales, Gross Pollutant Traps (GPTs), bio-retention basins and constructed wetlands. From individual lots runoff will be discharged into a trunk drainage network where, together with runoff from roads and swales, it will be treated in catchment-wide treatment areas (either bio-retention basins or constructed wetlands) before being discharged into downstream waterways.

GTCC requires that the development does not increase the mean annual pollutant load discharged into downstream waters when compared to existing site conditions. In addition to Council’s requirement, the NSW Office of Water (formerly Department of Environment and Climate Change) recommends the following reduction targets be achieved [1]:

- 90% reduction in the average annual gross pollutant (size >5mm) load
- 85% reduction in the average annual Total Suspended Solids (TSS) load
- 65% reduction in the average annual Total Phosphorus (TP) load
- 45% reduction in the average annual Total Nitrogen (TN) load

In order to satisfy these conditions, the stormwater treatment train effectiveness has been assessed by comparing the average annual load of TSS, TP and TN arriving at a number of key locations within the site under three scenarios:

1. Existing (pre-development)
2. Post-development (no treatment)
3. Post-development (with treatment)

Key locations within the site that have been identified as potential points of stormwater quality control are shown in **Figure 4**.

6.1 MUSIC Modelling

The MUSIC (Model for Urban Stormwater Improvement Conceptualisation) software package has been used to estimate average annual pollutant exports for the existing and post-development scenarios, thereby allowing the effectiveness of the proposed stormwater treatment train to be assessed.

[1] Reduction targets are relative to the ‘Post-development without treatment’ scenario

MUSIC is a continual-run conceptual water quality assessment model developed by the Cooperative Research Centre for Catchment Hydrology (CRCCH). MUSIC can be used to estimate the long-term annual average stormwater volume generated by a catchment as well as the expected pollutant loads generated by the catchment. MUSIC is able to conceptually simulate the performance of a group of stormwater treatment measures (treatment train) to assess whether a proposed water quality strategy is able to meet specified water quality objectives.

MUSIC has been used because it has the following attributes:

- It can account for the temporal variation in storm rainfall throughout the year.
- Modelling steps can be as low as 6 minutes to allow accurate modelling of treatment devices.
- It can model a range of treatment devices.
- It can be used to estimate pollutant loads at any location within the catchment.
- It is based on logical and commonly accepted algorithms.

The model's algorithms are based on the known performance characteristics of common stormwater quality improvement measures. These data, derived from research undertaken by CRCCH and other organisations, represent the most reliable information currently available in the stormwater management industry.

In order to assess the existing, post-development without treatment and post-development with treatment conditions it is necessary to input relevant parameters into MUSIC. The parameters include catchment features, climate data, land usage and proposed treatment measures. The MUSIC model parameters are discussed in the following sections. The layout of each of the three modelling scenarios is included in **Appendix 4**.

6.1.1 Rainfall Data

Rainfall data used in the MUSIC modelling was sourced from the Bureau of Meteorology (BoM). The nearest rain gauge to the Brimbin site is at Robertson Street, Taree (Station No. 061054), which is approximately 10 km from the site. The mean annual rainfall at this station over a period of 128 years is approximately 1175 mm. A six year period of pluviograph data was selected between January 1976 and December 1981 to be adopted in the MUSIC modelling. This range of rainfall generated an annual average of 1131 mm, which is in line with the long term average for the Taree station. It also represents a mix of average, wet and dry years.

6.1.2 Evaporation

Monthly areal potential evapotranspiration values were obtained for the site from the 'Climate Atlas of Australia, Evapotranspiration' (Bureau of Meteorology, 2001) and are shown in **Table 6-1**.

Table 6-1 Monthly Areal Potential Evapotranspiration

Month	Areal Potential Evapotranspiration (mm)
January	180
February	135
March	135
April	90
May	65
June	50
July	50
August	70
September	100
October	135
November	150
December	165

6.1.3 Catchment Parameters

The existing scenario was modelled in MUSIC for each catchment by adopting a simple, single node model. For the existing scenario, each catchment adopted the agricultural EMC values as per Chapter 3 (Urban Stormwater Pollutant Characteristics) of the Engineers Australia publication *Australian Runoff Quality (ARQ) – A Guide to Water Sensitive Urban Design* (2006). The existing scenario assumed that all catchments are 95% pervious.

Catchment parameters for the proposed scenario were modelled based on the proposed landuse as identified in the Brimbin Structure Plan, refer to **Appendix 1**. An approximate pervious and impervious percentage was assigned to each of the land usage categories.

6.1.4 Pollutant Concentrations

The stormwater pollutant Event Mean Concentrations (EMCs) that were used in the modelling were derived from Chapter 3 of ARQ (*2006*). The pollutant concentrations that have been adopted in the MUSIC modelling are presented in **Table 6-2**.

Table 6-2 Adopted Runoff Pollutant Concentrations for MUSIC source nodes

Land Use Category		$\log_{10}$ TSS (mg/l)		$\log_{10}$ TP (mg/l)		$\log_{10}$ TN (mg/l)	
		Base Flow	Storm Flow	Base Flow	Storm Flow	Base Flow	Storm Flow
Agricultural	Mean	1.301	2.279	-1.046	-0.260	0.041	0.602
	Std. Dev.	0.399	0.462	0.523	0.465	0.437	0.394
Urban	Mean	1.204	2.255	-0.854	-0.456	0.114	0.447
	Std. Dev.	0.495	0.348	0.554	0.381	0.489	0.252

6.1.5 Soil Data and Model Calibration

Table 6-3 outlines the soil properties recommended by DECC for adoption in MUSIC modelling. These values have been adopted in the Brimbin MUSIC model and resulted in a volumetric run-off co-efficient of 0.21 for the existing scenario (100% pervious non-urban catchment) and 0.53 for the proposed scenario. These volumetric run-off coefficients are within the anticipated ranges for the specified percentage imperviousness, meaning the prescribed soil properties are behaving as anticipated.

Table 6-3 Soil Parameters

	Unit	Catchment Type	
		Agricultural	General Urban
Impervious Area Parameters			
Rainfall Threshold	mm/day	1	1
Pervious Area Parameters			
Soil Capacity	mm	120	120
Initial Storage	%	30	30
Field Capacity	mm	80	80
Infiltration Coefficient a	-	200	200
Infiltration Coefficient b	-	1	1
Groundwater Properties			
Initial Depth	mm	10	10
Daily Recharge Rate	%	25	25
Daily Drainage Rate	%	5	5
Daily Deep Seepage Rate	%	5	0

6.2 Proposed Treatment Measures

A series of water sensitive urban design (WSUD) measures are proposed to be adopted within the Brimbin site to satisfy stormwater runoff quality targets. The components of the proposed WSUD treatment train are presented in the following sections.

6.2.1 Gross Pollutant Traps

It is proposed to install Gross Pollutant Traps (GPTs) as a means of primary stormwater treatment. GPTs capture litter, debris, coarse sediment, oils and greases. Pollutant capture efficiency differs between various proprietary GPTs. Recent research into proprietary units such as HumeGARD™ and Rocla CDS units suggests the following efficiencies could be achieved:

- Gross pollutants: up to 85%
- Total Suspended Solids: up to 50%
- Total Phosphorus: up to 20%

- Total Nitrogen: up to 13%

6.2.2 Bio-retention Swales

A network of bio-retention swales would be located along selected local roads to convey stormwater runoff from roads and general urban areas. These roads would typically be constructed with a one-way crossfall, meaning that swales would only need to be constructed on the low side of the road. The following are general parameters that would be adopted for bio-retention swales:

- Longitudinal slope: between 2% and 4%, depending on longitudinal grade of road
- Base width: 1m
- Top width: 3m
- Depth: 500mm
- Exfiltration rate: 3.6 mm/hour (lower range of medium clays)

These parameters would need to be confirmed during subsequent stages of the development.

Plate 6-1 Example of a bio-retention swale at Warriewood

6.2.3 Bio-retention Basins

The purpose of bio-retention is to provide a filtering effect when stormwater runoff flows on the surface through a vegetation layer to remove pollutants in the runoff. Bio-retention basins generally consist of an open space containing landscaping of native grasses, shrubs and trees with an underlying volume of filter media that provides enhanced filtration.

The basins would be filled with sand and/or fine gravel filter media to a depth of approximately 500mm, with 200mm of sandy loam topsoil over the filter media. A network of perforated pipes would be installed in the base of the filter media to collect filtered stormwater prior to discharge to downstream waters.

Bio-retention basins would be constructed in natural low points on the site to assist in capturing and treating stormwater. It is also proposed to provide detention storage within the basins to attenuate peak flows (refer to **Section 5**).

Plate 6-2 Example of a bio-retention basin at Manly Golf Course

6.2.4 Constructed Wetlands

A constructed wetland is a treatment measure that is generally used for the removal of suspended solids and nutrients. Constructed wetland systems use sedimentation, filtration and pollutant uptake processes to remove pollutants from stormwater runoff. It is proposed that constructed wetlands would also be constructed to provide allowance for detention volume (extended detention) to aid in stormwater quantity management.

The MUSIC model of a wetland system included two cells: an inlet pond followed by the main wetland or macrophyte cell. Stormwater can bypass the whole system, when it falls below or exceeds certain pre-defined flow rates. The macrophyte cell has a permanent volume of water, with a low flow outlet pipe that has an invert notionally set at the standing water level of this permanent pool. An overflow weir is located at an elevation equal to the extended detention depth above the standing water level of the permanent pool.

Constructed wetlands are most effective when placed low in a catchment where a large proportion of runoff can be collected and treated. The edges of ponds would include a macrophyte berm or gentle slope to enable the establishment of permanent reed beds of varying widths.

Plate 6-3 Example of a constructed wetland at Warriewood

6.3 Results

MUSIC models representing the existing and two developed scenarios (treated and untreated) were developed incorporating the parameters discussed in the preceding sections (rainfall, percentage imperviousness, evaporation, soil data, pollutant concentrations and stormwater treatment measures). Models were used to simulate the pollutant export generated during a mean rainfall and evaporation year.

6.3.1 Existing Scenario

The estimated existing mean annual pollutant loads for each outlet within the Brimbin site are presented in **Table 6-4**.

Table 6-4 Mean Annual Pollutant Loads – Existing Scenario

Location	Flow (ML/year)	Pollutant Load (kg/year)		
		TSS	TP	TN
A1A	516	71,400	204	1,520
A1B	944	131,000	373	2,780

Location	Flow (ML/year)	Pollutant Load (kg/year)		
		TSS	TP	TN
A1C	1,500	208,000	594	4,420
A1D	2,010	278,000	793	5,910
A2	309	42,800	122	909
A3	238	32,900	94	700
A4	188	26,000	74	554
A5	307	42,400	121	902
B1	1,180	163,000	466	3,470
B2	294	40,600	116	864
B4	276	38,200	109	812
B5	123	17,000	48	361
B6	179	24,700	71	526
B7	196	27,100	78	577
C2	1,930	267,000	762	5,670
C3	1,440	200,000	570	4,240
C4	1,210	167,000	478	3,560
C5	895	124,000	353	2,630
LAKE	405	56,000	160	1,190
EX1	1,090	150,000	429	3,200
EX2-1	978	135,000	386	2,880
EX2-2	556	77,000	220	1,640
EX3	322	44,600	127	948
Total – Western Catchments	**3,100**	**428,000**	**1,220**	**9,100**
Total – Eastern Catchments	**5,260**	**727,000**	**2,080**	**15,500**

6.3.2 Proposed Development with no treatment

The proposed development scenario with no treatment was modelled to determine the likely impact of urbanisation on pollutant loads at each of the outlets.

The estimated mean annual pollutant loads for the proposed development without treatment scenario are presented in **Table 6-5**.

Table 6-5 Mean Annual Pollutant Loads – Proposed Development Scenario with no treatment

Location	Flow (ML/year)	Pollutant Load (kg/year)		
		TSS	TP	TN
A1A	884	127,000	295	2,280
A1B	1,730	254,000	586	4,480
A1C	2,840	421,000	968	7,370
A1D	3,750	554,000	1,270	9,720
A2	473	65,000	154	1,210
A3	472	71,000	162	1,230
A4	373	56,100	128	971
A5	518	73,800	172	1,330
B1	2,390	367,000	845	6,310
B2	541	79,600	183	1,400
B4	548	82,300	188	1,420
B5	243	36,600	84	633
B6	342	50,800	117	887
B7	300	41,200	98	766
C2	3,840	578,000	1,320	9,980
C3	2,870	433,000	988	7,470
C4	2,410	363,000	829	6,270
C5	1,800	272,000	620	4,690
LAKE	864	132,000	300	2,260
EX1	2,060	305,000	700	5,330

Location	Flow (ML/year)	Pollutant Load (kg/year)		
		TSS	TP	TN
EX2-1	2,130	329,000	744	5,570
EX2-2	1,210	186,000	421	3,150
EX3	639	96,100	220	1,660
Total – Western Catchments	**5,810**	**858,000**	**1,970**	**15,000**
Total – Eastern Catchments	**10,700**	**1,640,000**	**3,730**	**28,100**

6.3.3 Proposed Development with treatment

The post-development scenario with treatment has been modelled in MUSIC to determine the type and extent of stormwater treatment measures that would be required to meet the NSW Office of Water reduction targets and the objective of no increase in the volume of pollutants discharged to receiving waters under the post-development scenario when compared to the existing scenario.

The size of each of the treatment measures within the proposed development was varied in order to determine the area of land required to satisfy the pollutant reduction targets. The land area required to be allocated to stormwater runoff treatment measures is presented in **Table 6-6**.

Table 6-6 Land take for adopted stormwater runoff treatment measures

	Land take (ha)	
	Bio-retention swales and basins	Constructed Wetlands
A1A	0.74	0.49
A1B	0.68	0.45
A1C	1.33	0.89
A1D	0.71	0.47
A2	1.11	0.74
A3	0.85	0.57
A4	0.68	0.45
A5	1.10	0.73
B1	4.22	2.81

	Land take (ha)	
	Bio-retention swales and basins	**Constructed Wetlands**
B2	1.05	0.70
B4	0.99	0.66
B5	0.44	0.29
B6	0.64	0.43
B7	0.70	0.47
C2	0.75	0.50
C3	0.40	0.26
C4	0.49	0.32
C5	1.05	0.70
LAKE	1.45	0.97
EX1	3.89	2.59
EX2-1	3.50	2.33
EX2-2	1.99	1.33
EX3	1.15	0.77
TOTAL	**29.89**	**19.92**
PERCENTAGE OF SITE AREA DEDICATED TO TREATMENT	**1.5%**	**1.0%**

A summary of the preliminary design parameters for the adopted stormwater treatment measures is included below.

- Gross Pollutant Trap one per bio-retention basin and constructed wetland
- Bio-retention Swales and Basins
  - Saturated Hydraulic Conductivity: 180 mm/hour
  - Filter depth: 500mm
  - Exfiltration rate: 3.6 mm/hour
- Constructed Wetlands

- o Proportion of deep water zone to macrophyte zone: 50%/50%
- o Extended detention depth: 300 mm
- o Permanent pool volume depth: 1500 mm
- o Exfiltration rate: 3.6 mm/hour

6.4 Construction Phase Water Quality

During the construction of subdivision works within the Brimbin site, erosion and sediment control measures would be designed and implemented in accordance with the NSW Department of Housing "Managing Urban Stormwater – Soils and Construction" (Blue Book) and to the satisfaction of Council's requirements. These controls would help mitigate the impacts of land disturbance on soils, landforms and receiving waters during the construction stage.

7 CONCLUSION

This report has estimated the requirements for stormwater management for potential future development of the Brimbin site based on the Brimbin Structure Plan (refer to **Appendix 1**). The advice provided in this report is based on the Brimbin Structure Plan and preliminary hydrological and water quality modelling prepared by WorleyParsons. The stormwater management strategy for the development would need to be verified through detailed investigation and design at the subdivision Development Application and Construction Certificate stages.

The objectives of the stormwater management strategy recommended for the Brimbin development precinct would be achieved by:

- Providing on-site stormwater detention to ensure no increase in peak flow rates following development when compared to existing site conditions.
- Removing pollutants from runoff to a sufficient extent to meet both Council and State government guidelines and adopt a stormwater treatment train approach that is consistent with current best practice WSUD.

The recommended stormwater quantity and quality management strategies are intended to be included as future development controls for the Brimbin site to be prepared by Council in conjunction with the developer.

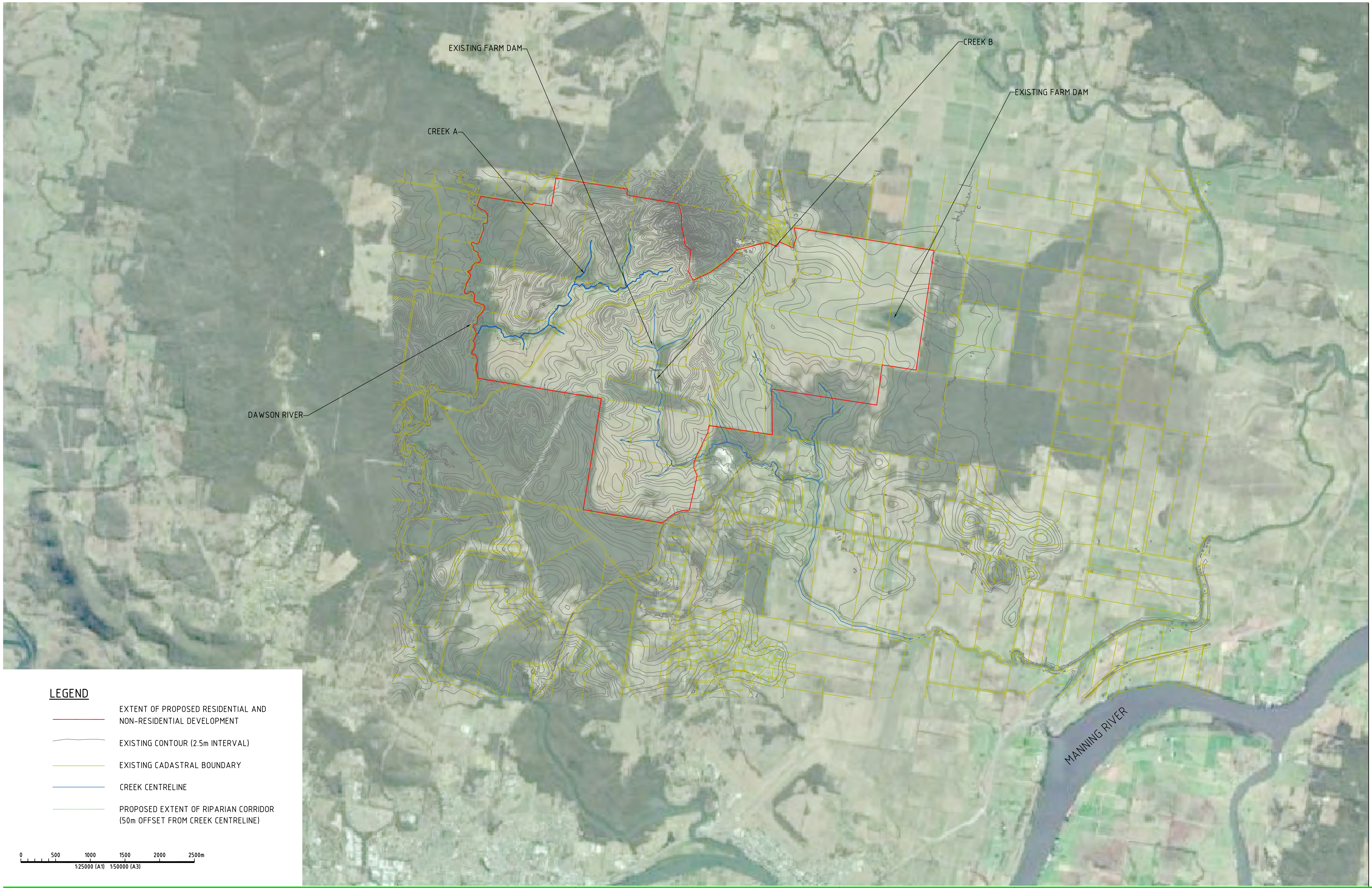
8 REFERENCES

Engineers Australia, *Australian Rainfall and Runoff – A Guide to Flood Estimation*, 1987

Engineers Australia, *Australian Runoff Quality*, 2006

Greater Taree Local Environmental Plan 2010

Figures



WorleyParsons resources & energy

EcoNomics

ISSUE	DATE	ISSUE DESCRIPTION
A	10.12.10	STORMWATER MANAGEMENT STRATEGY REV A

NORTH

FIGURE 1
BRIMBIN STORMWATER MANAGEMENT STRATEGY
SITE PLAN & MAJOR WATERCOURSES

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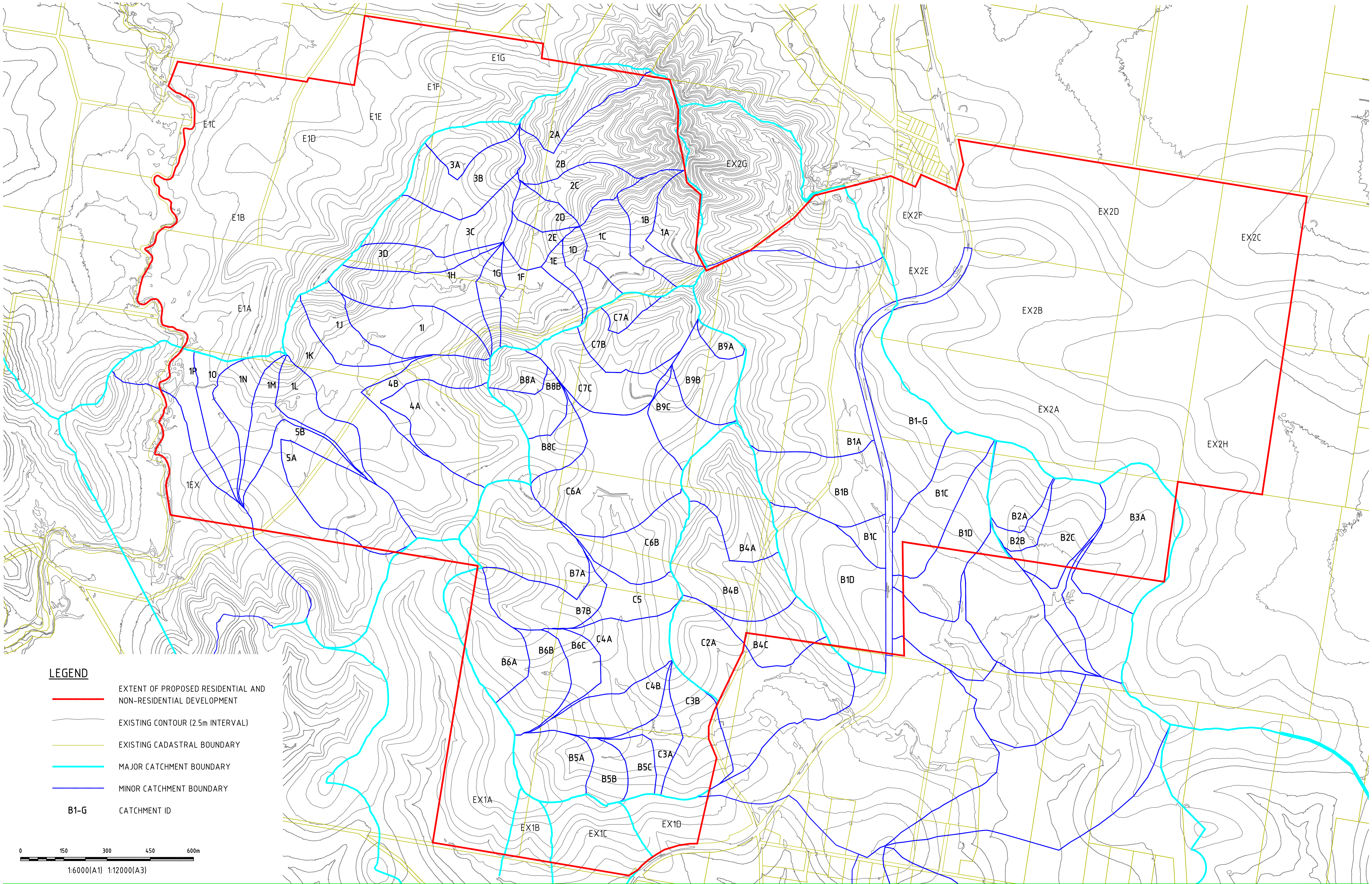

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ISSUE	DATE	ISSUE DESCRIPTION
A	10.12.10	STORMWATER MANAGEMENT STRATEGY REV A

NORTH

FIGURE 2
CATCHMENT PLAN

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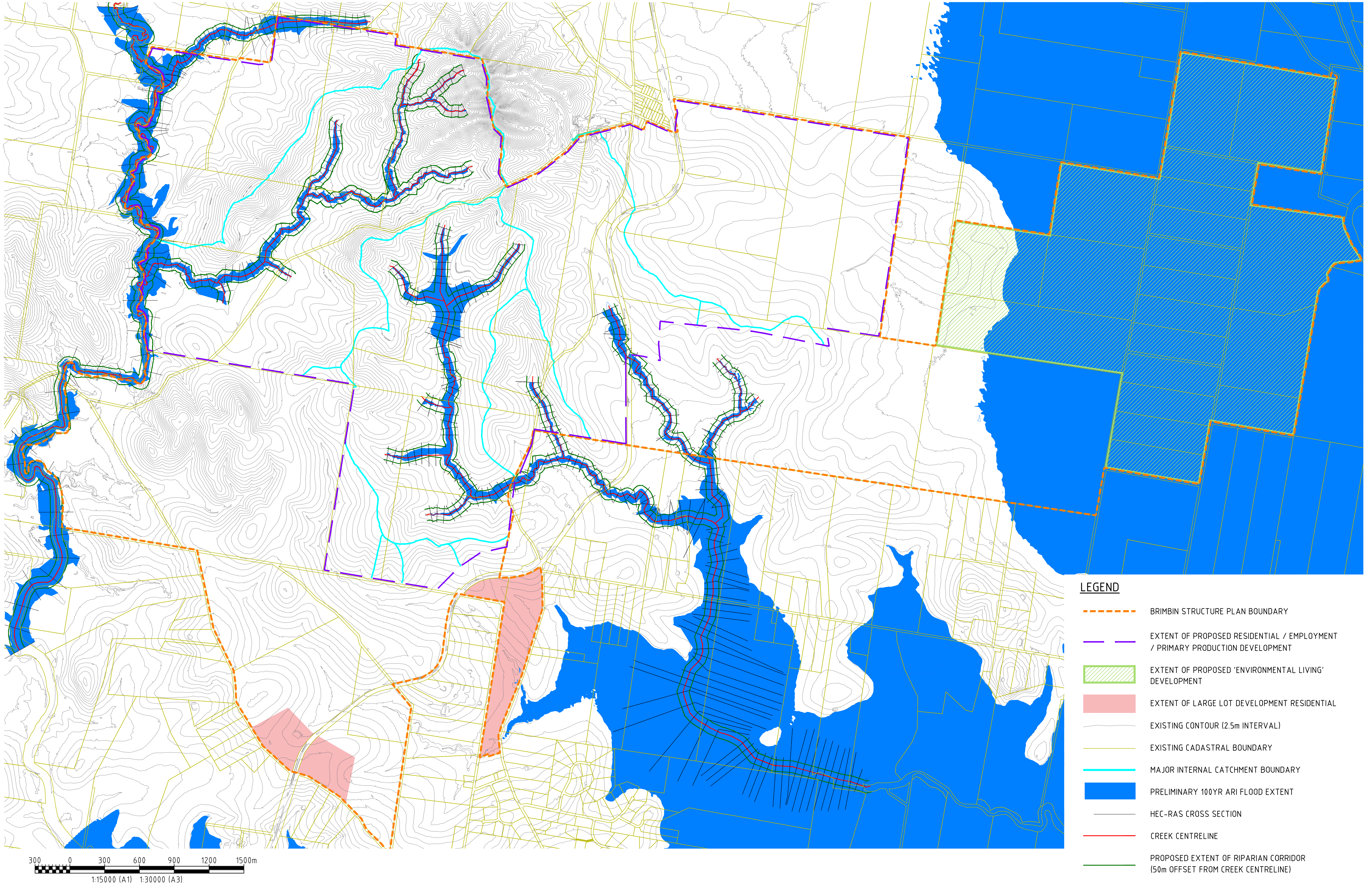

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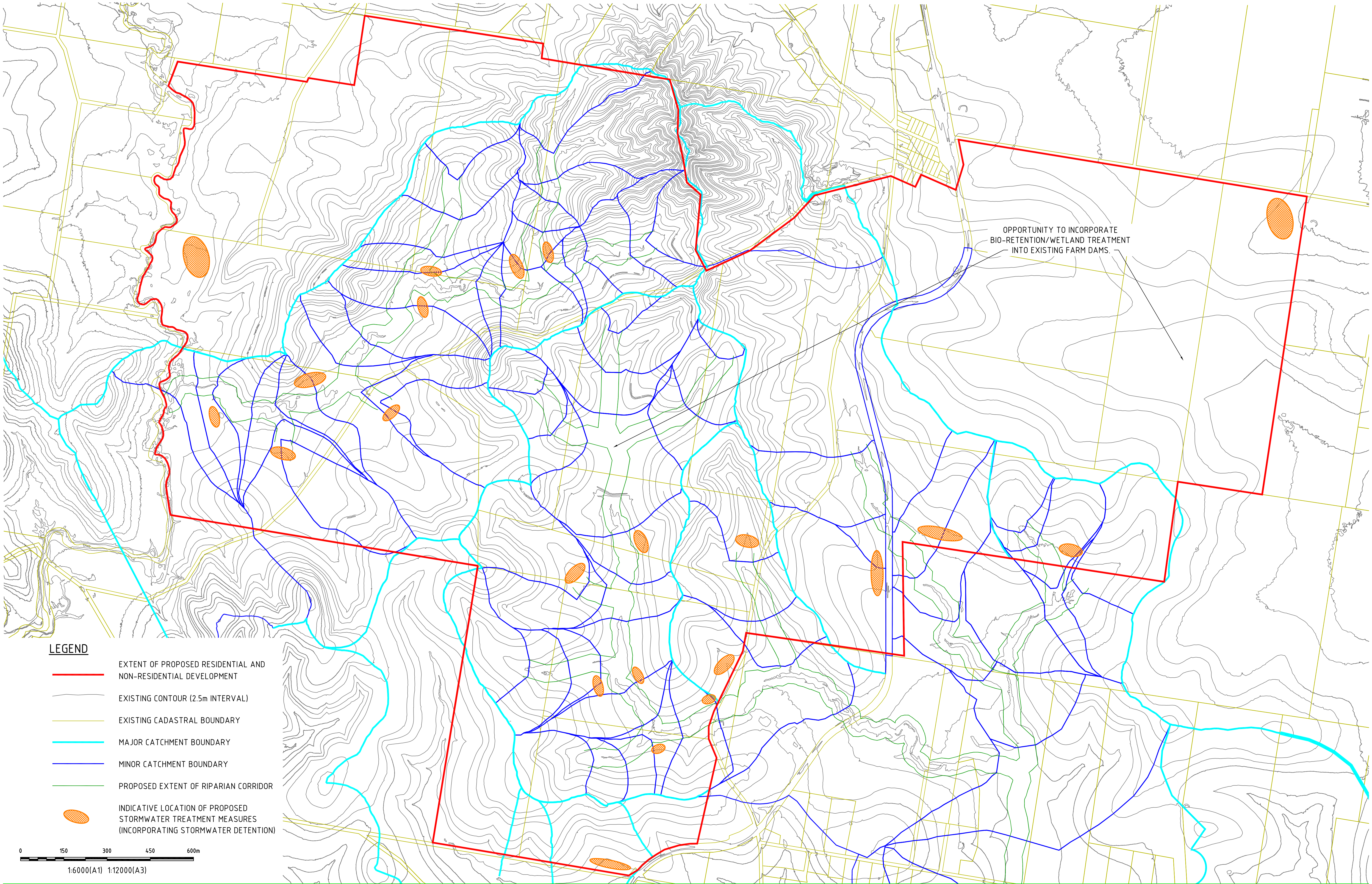
EcoNomics

ISSUE	DATE	ISSUE DESCRIPTION
C	23.05.13	REVISED BRIMBIN STRUCTURE PLAN MAY 2013
B	20.01.11	STORMWATER MANAGEMENT STRATEGY REV B
A	10.12.10	STORMWATER MANAGEMENT STRATEGY REV A

FIGURE 3
PRELIMINARY 100 YEAR ARI FLOOD EXTENT PLAN

LOCATION: W:_Infrastructure\Projects\301015\02225_Brimbin IWCM\10.0 Engineering\10.01 Cl-Civils\Catchment DATA\Figure 3.dwg DATE & TIME: 23-May-13, 2:45:26 PM



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ISSUE	DATE	ISSUE DESCRIPTION
A	10.12.10	STORMWATER MANAGEMENT STRATEGY REV A

NORTH

FIGURE 4
PRELIMINARY STORMWATER QUALITY & QUANTITY MANAGEMENT STRATEGY

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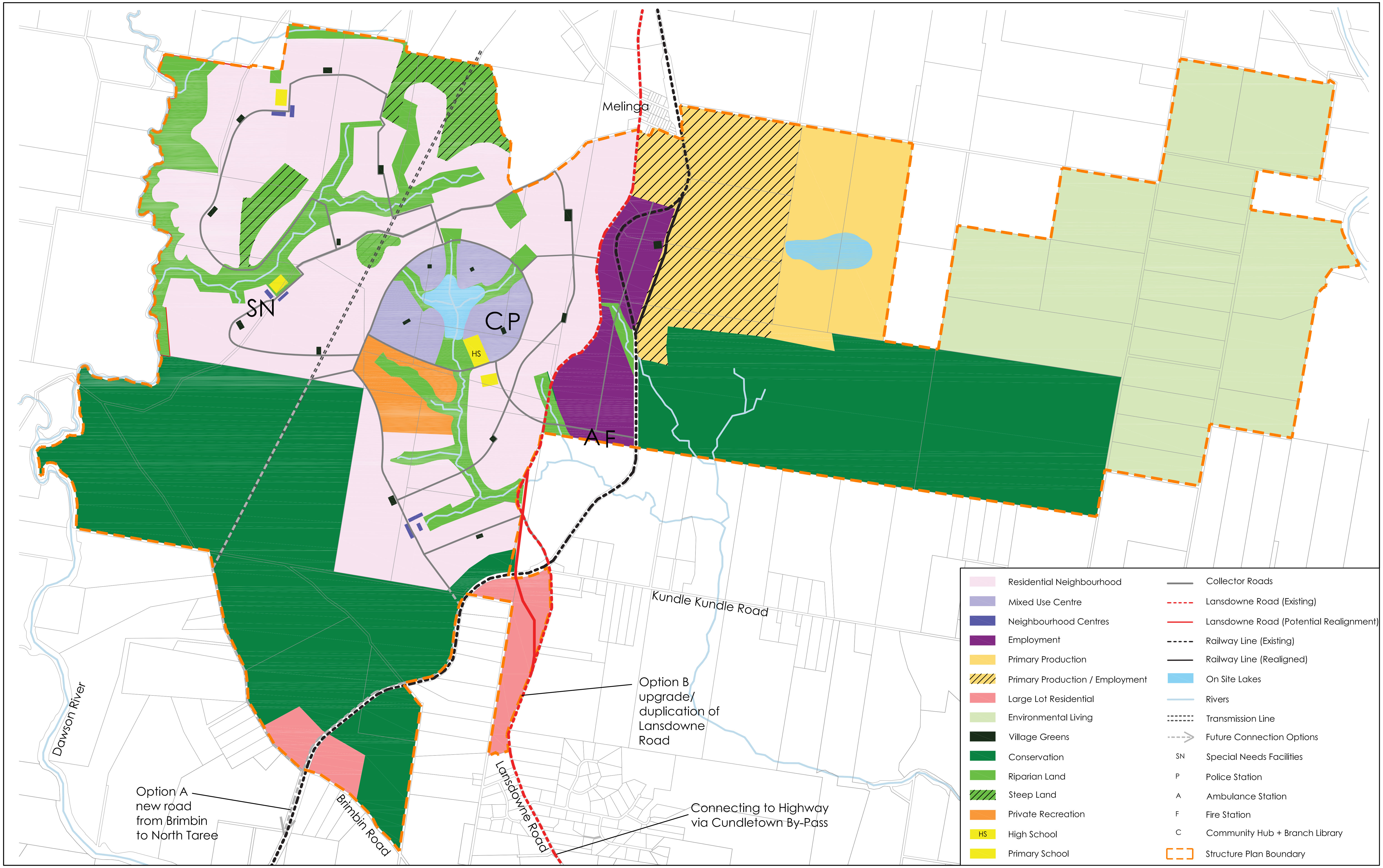
Appendix 1 Brimbin Structure Plan (Roberts Day, July 2013)



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ROCHE GROUP

BRIMBIN STRUCTURE PLAN
JULY 2013

N

0 metres 300 600 900 1200 1500

SCALE 1:30,000 **SHEET** A3

Brimbin New Town
PROJECT

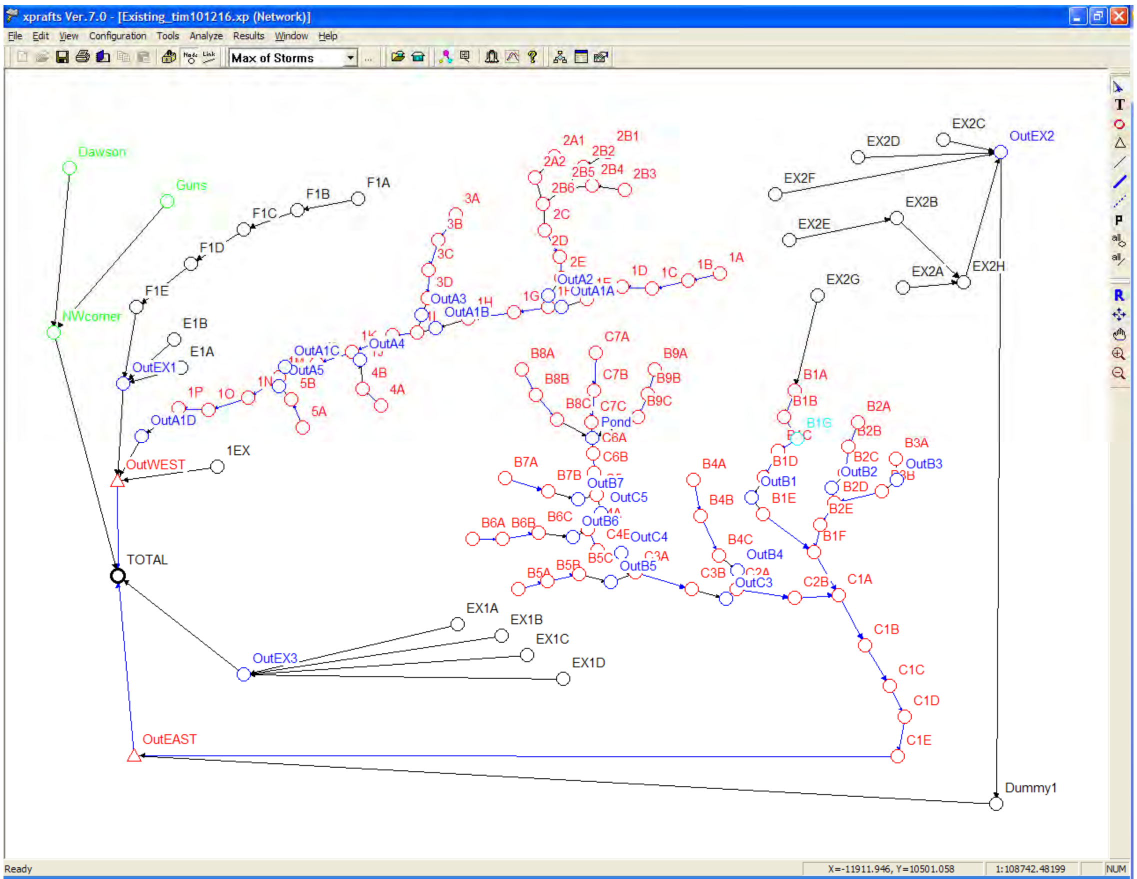
Roche Group
CLIENT

RCH TAR RD1201
DRAWING NUMBER

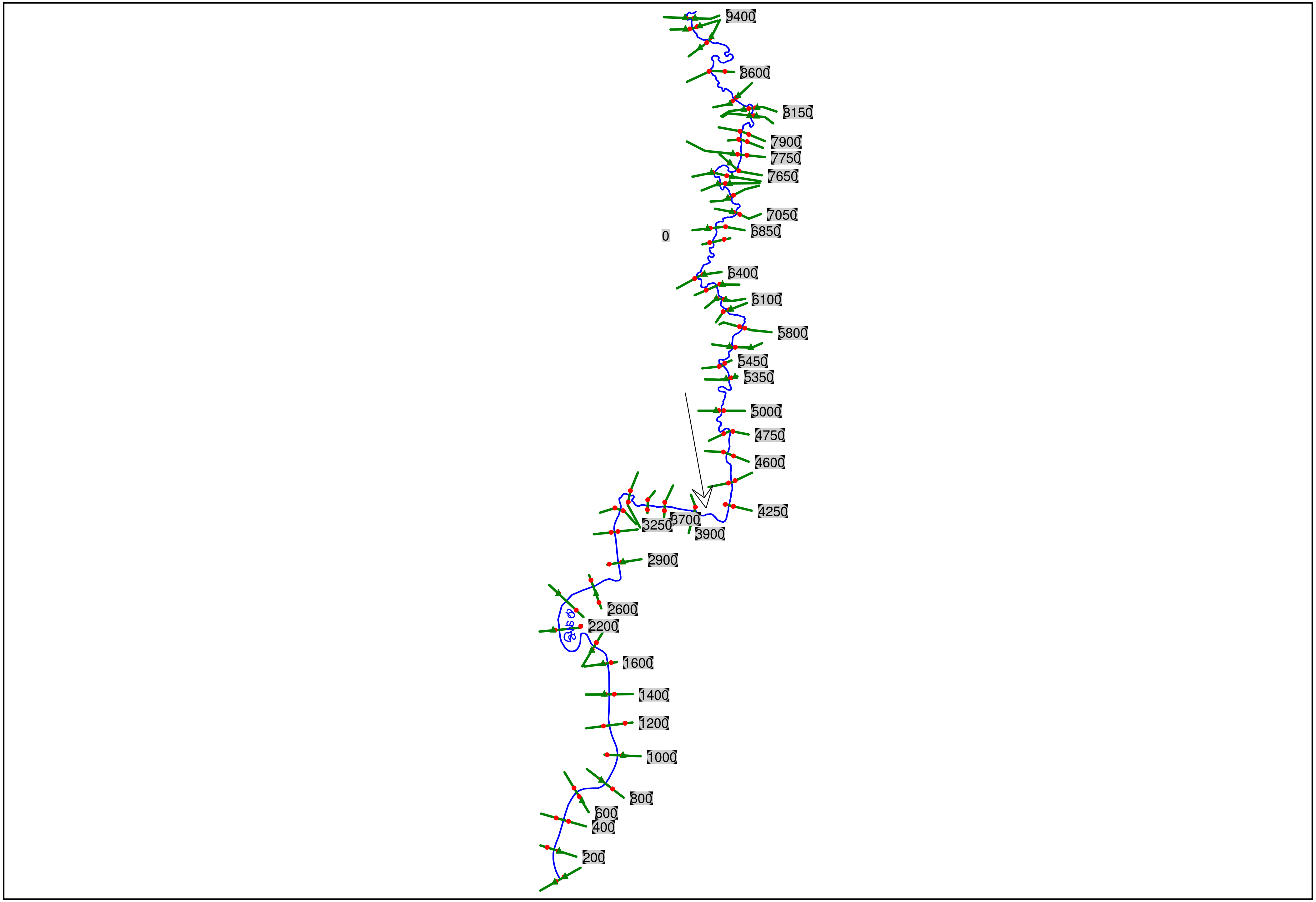
REVISION	DESCRIPTION	YYMMDD	DRAWN	APPR'D
G	Annotations	130710	SG	SG
F	Riparian Zone	130524	SG	SG
E	Correct Boundary	130520	SG	SG
D	Alts to Enviro Living	130304	SG	SG
C	Alts to Conservation	120723	SG	SG
B	Staging Plan	120312	JS	AK
A	Structure Plan	111017	JS	SG

Appendix 2 XP-RAFTS Model Layout

ROCHE GROUP
BRIMBIN
STORMWATER MANAGEMENT STRATEGY



Appendix 3 HEC-RAS Model Results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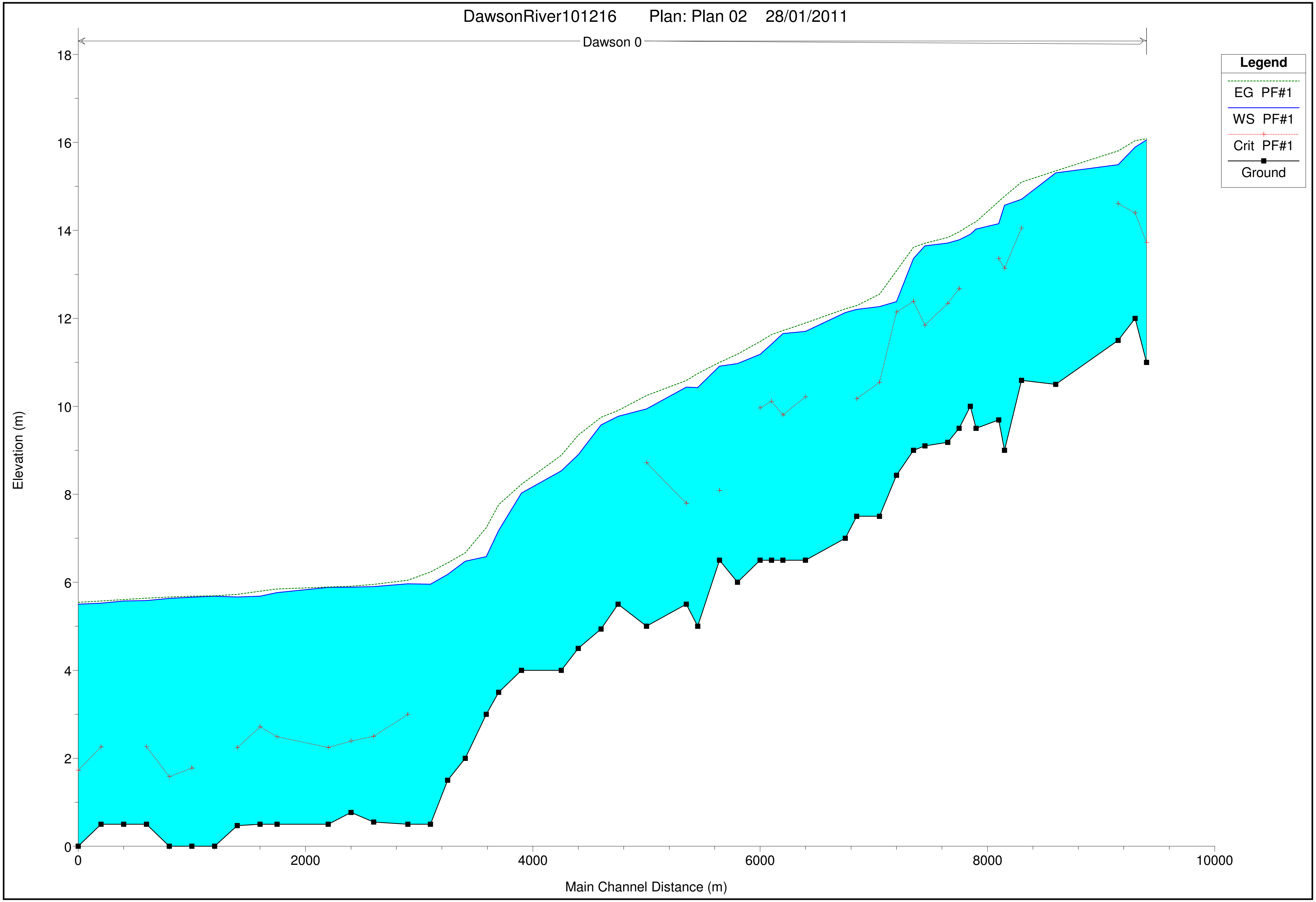

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Crit PF#1
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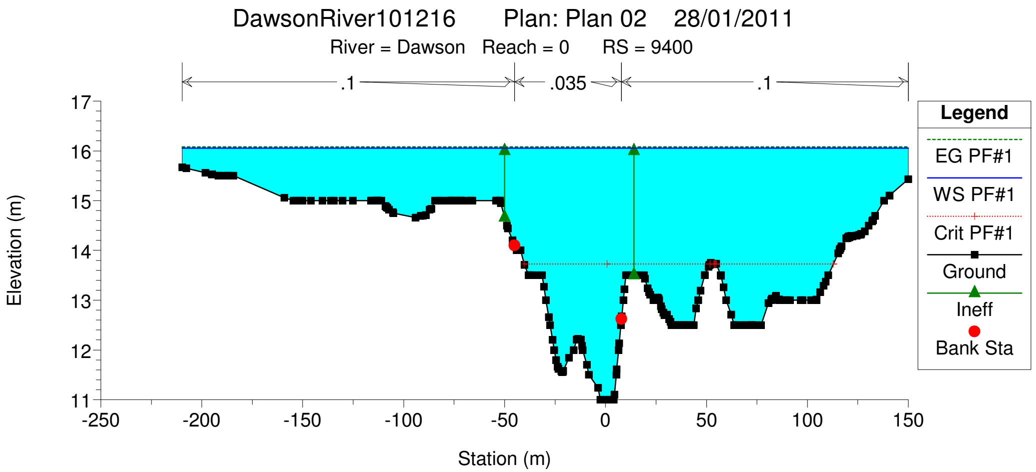
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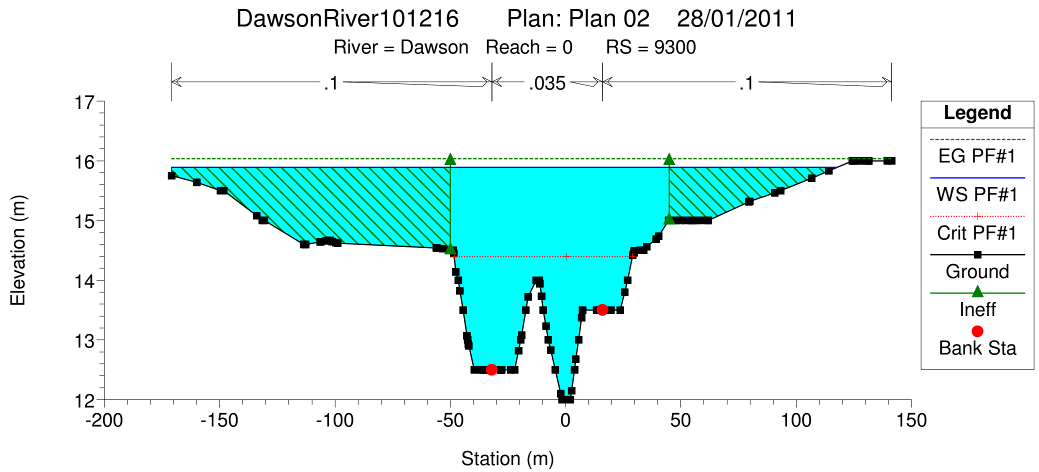
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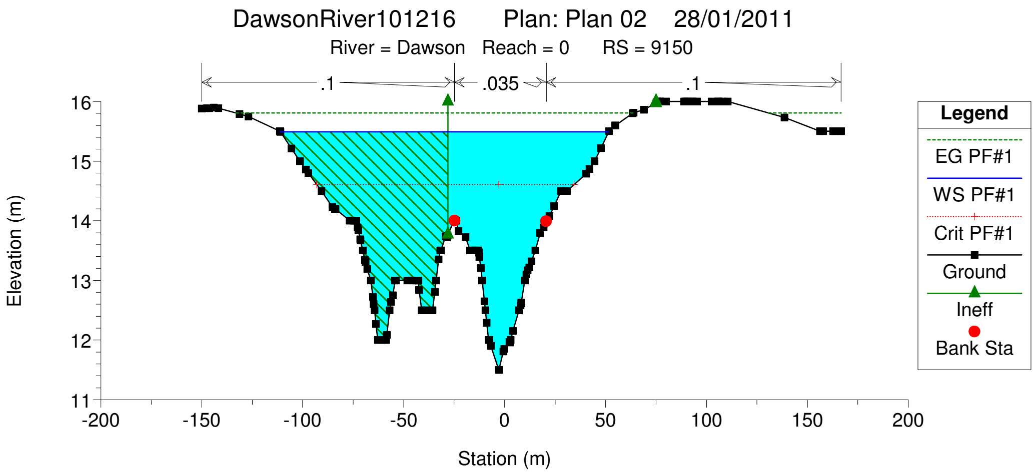
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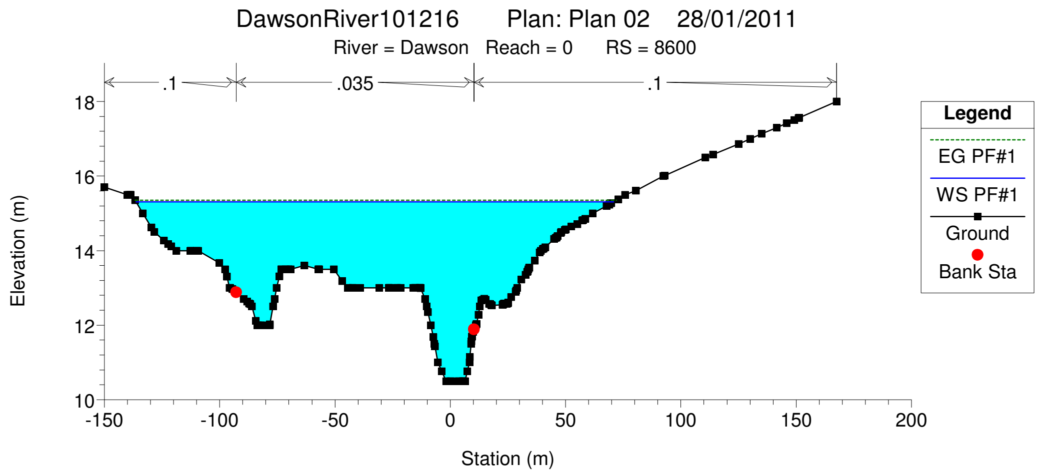
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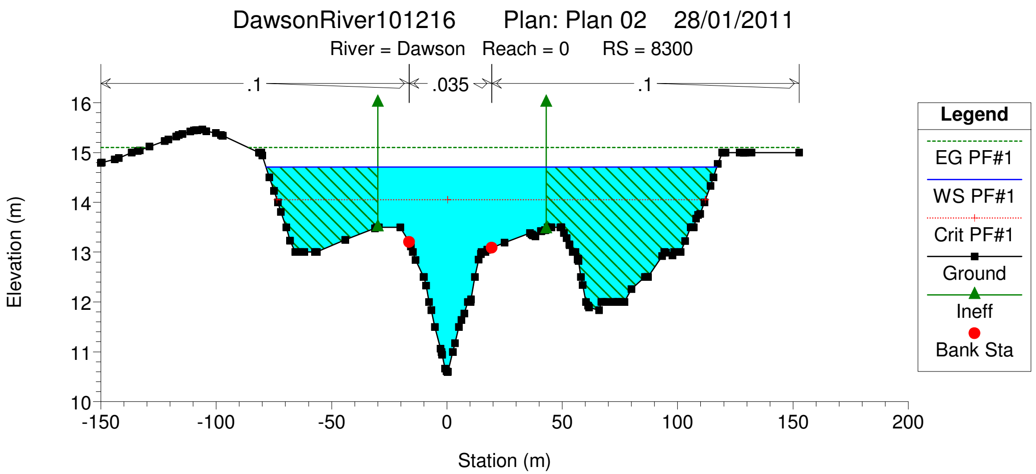
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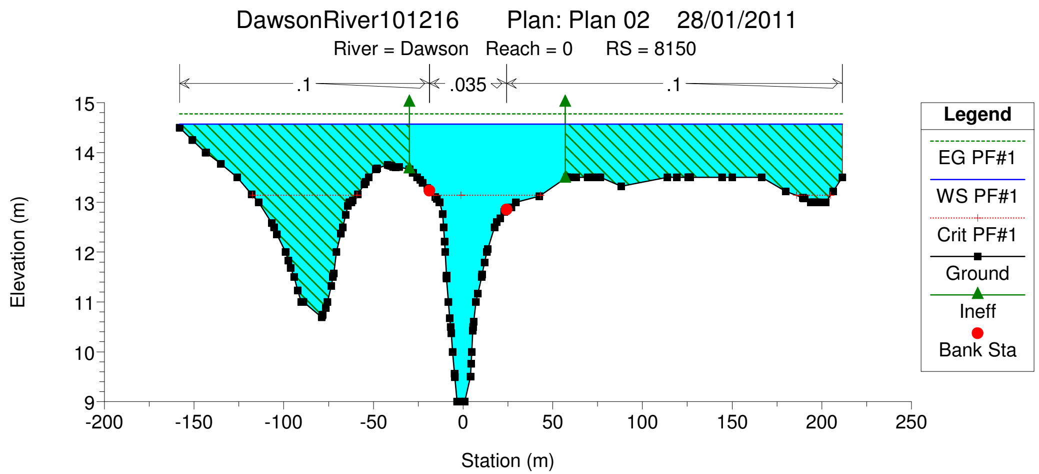
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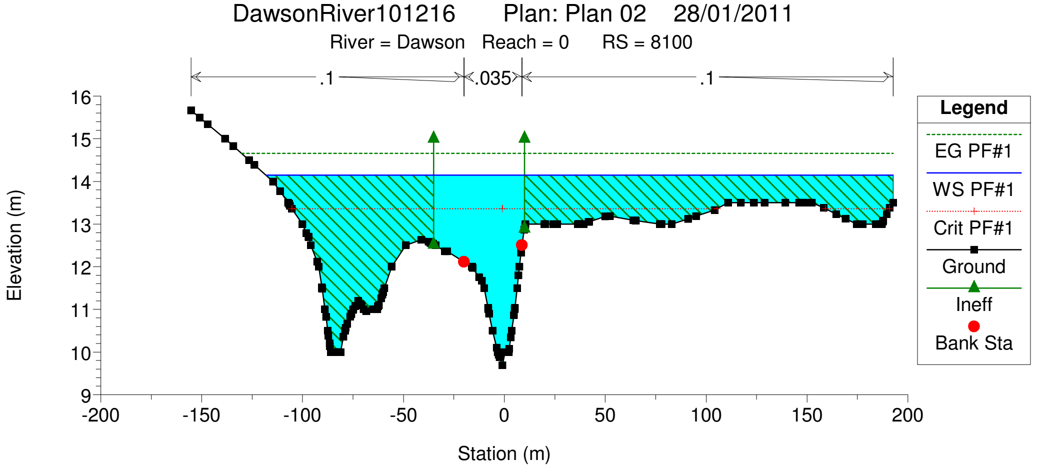
Bank Sta


DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 8100
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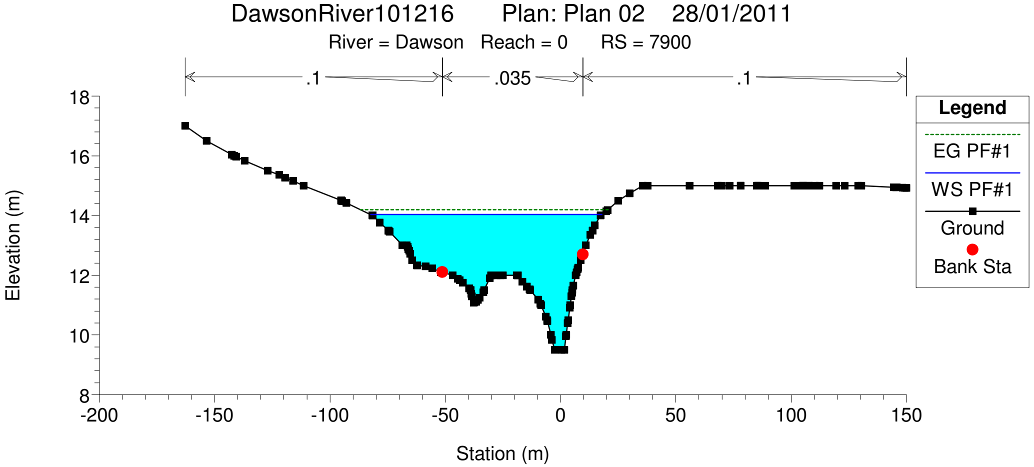
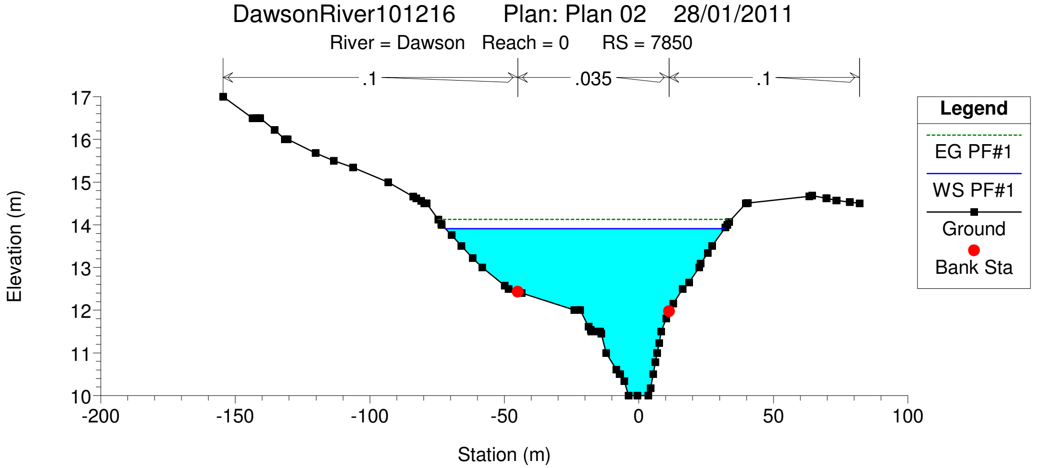
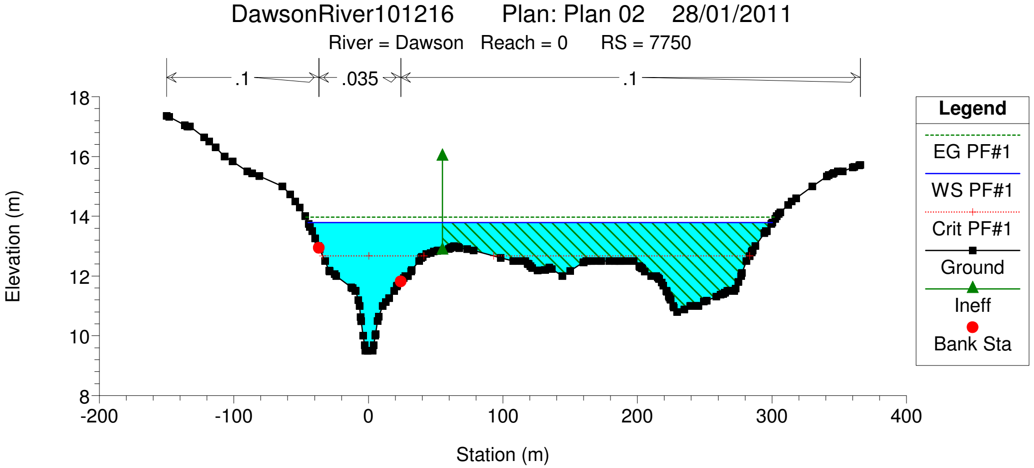
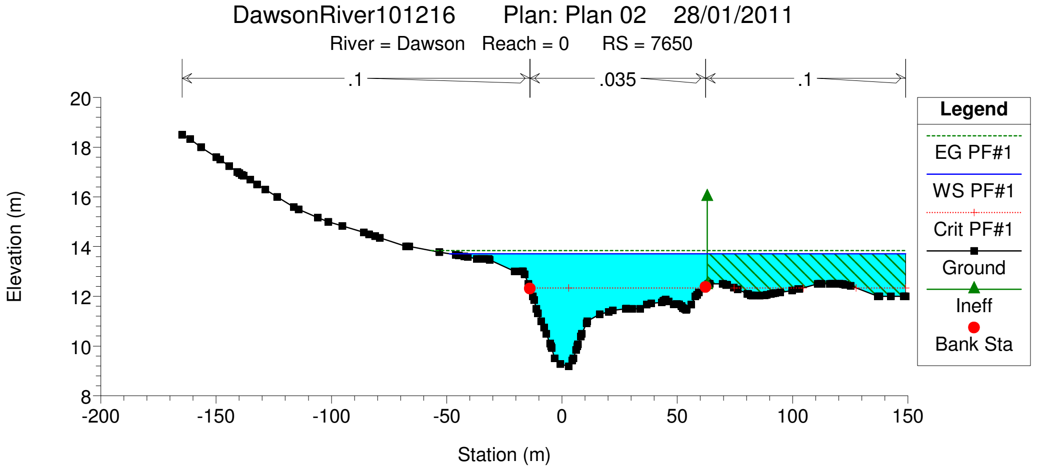
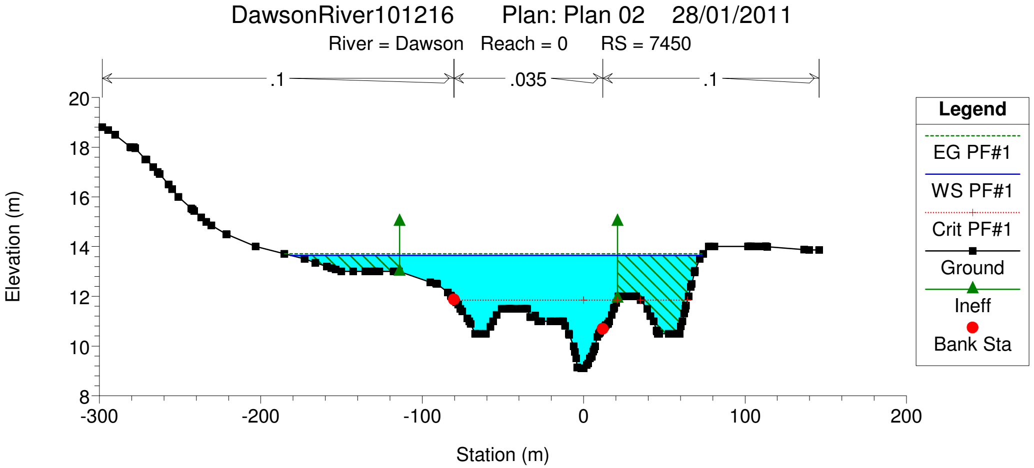
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

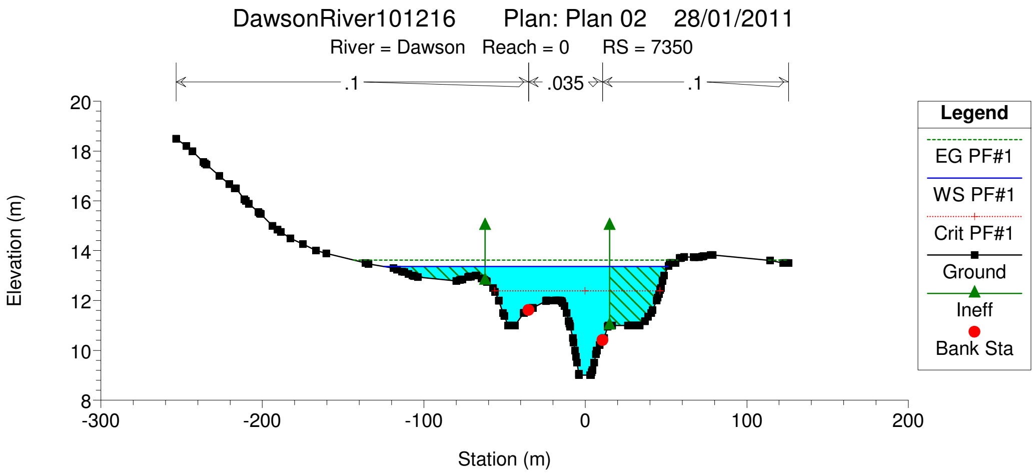

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 7900
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

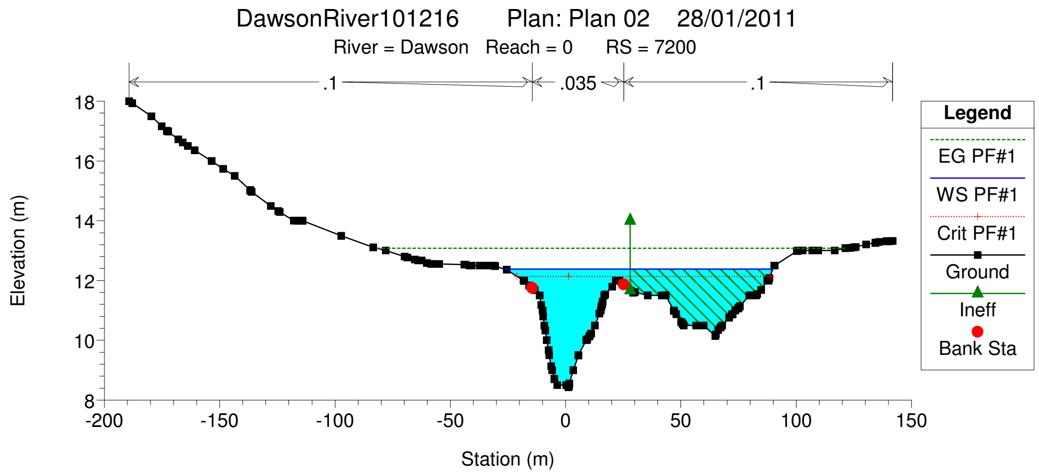

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 7850
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

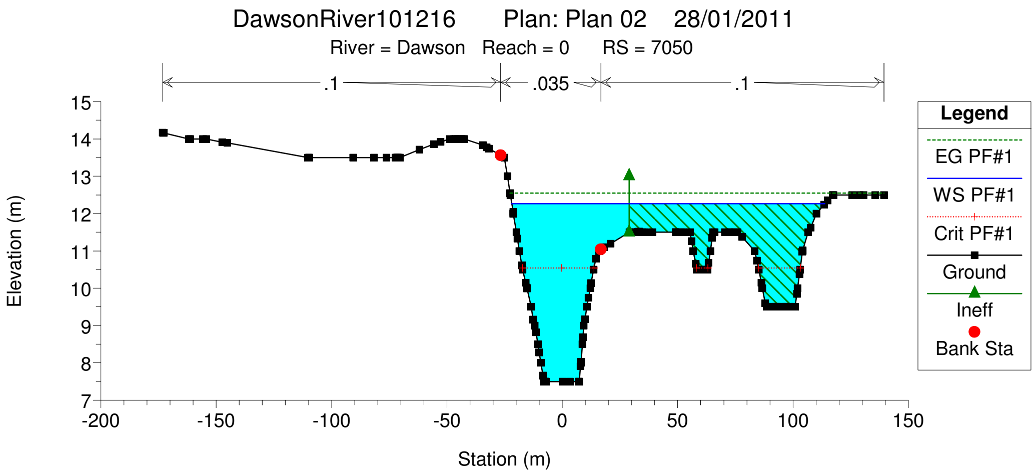

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 7750
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

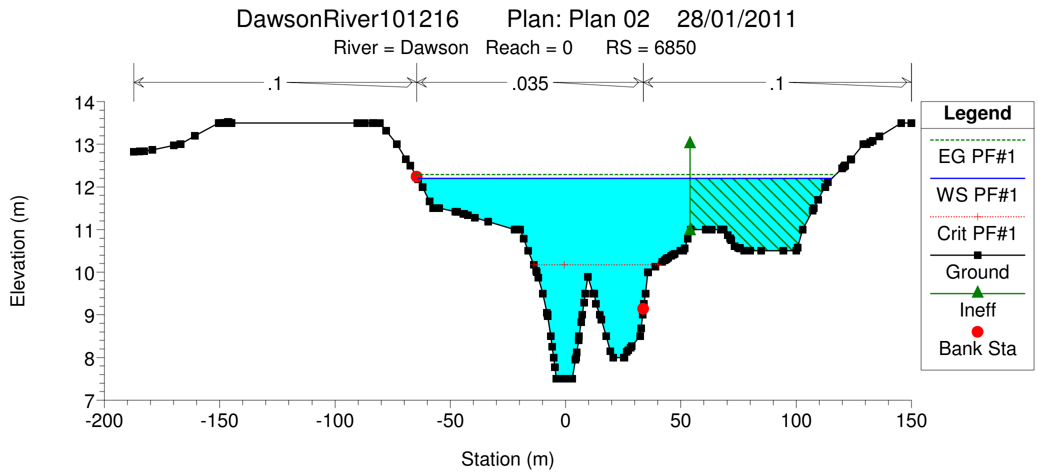

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 7650
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

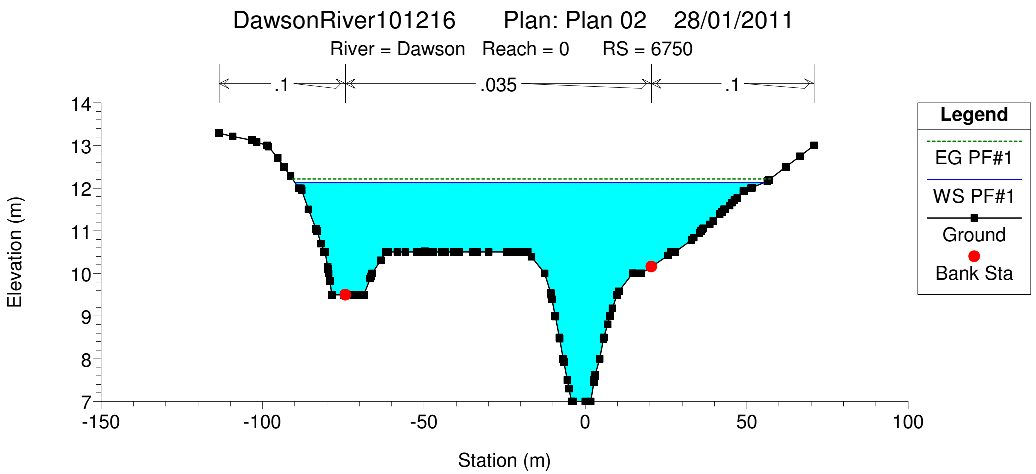

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 7450
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

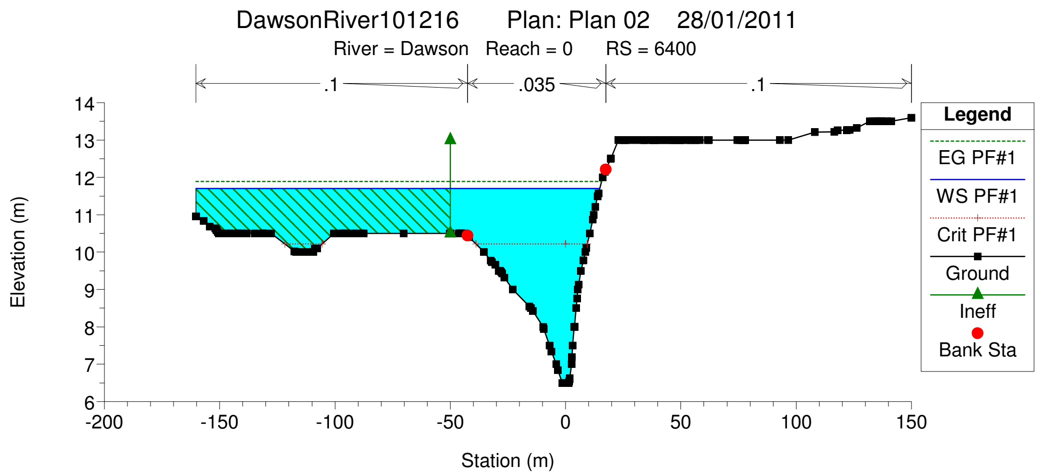

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 7350
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

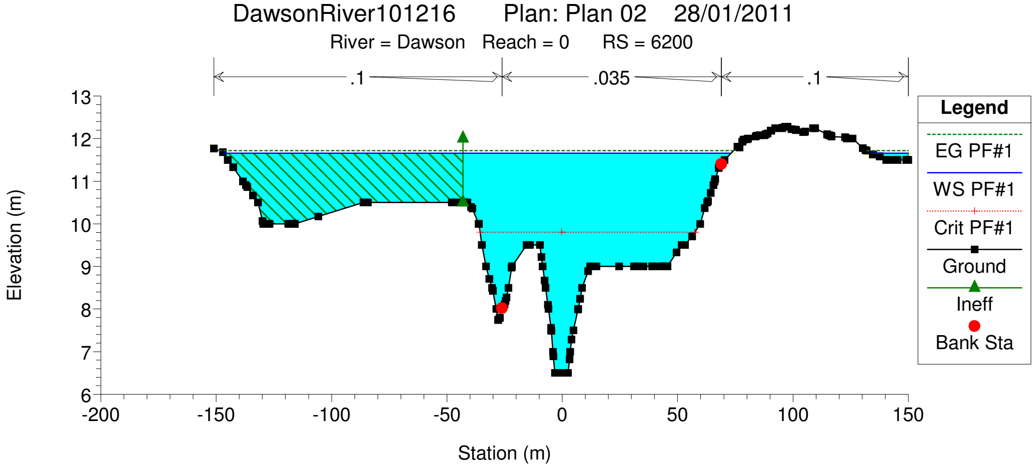

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 7200
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

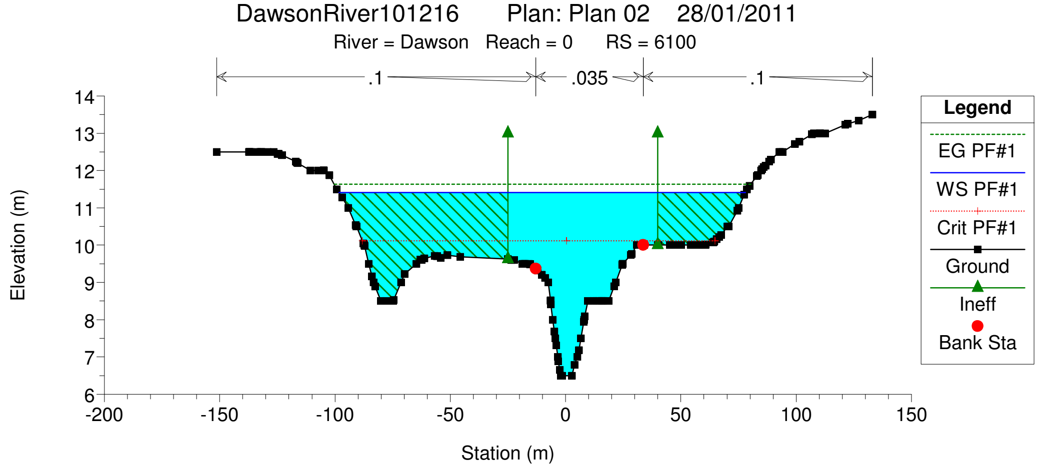

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 7050
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

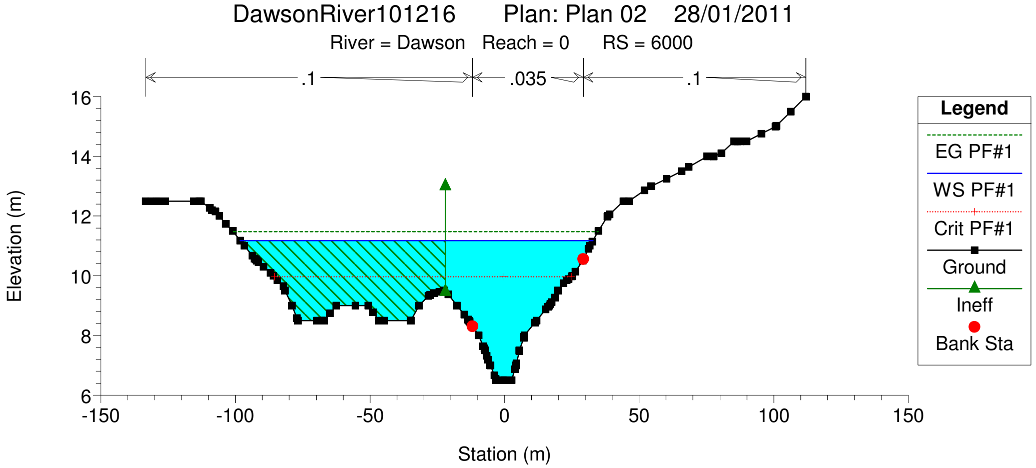

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 6850
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

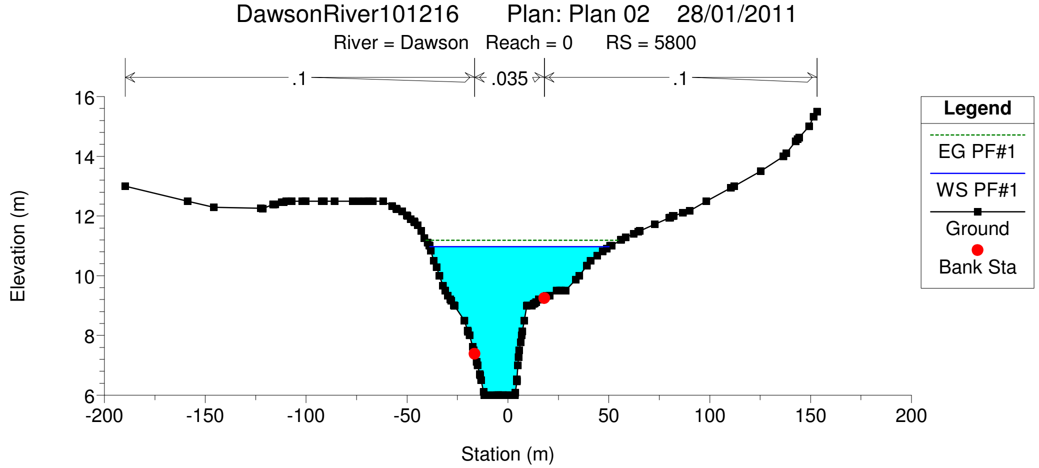

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 6750
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

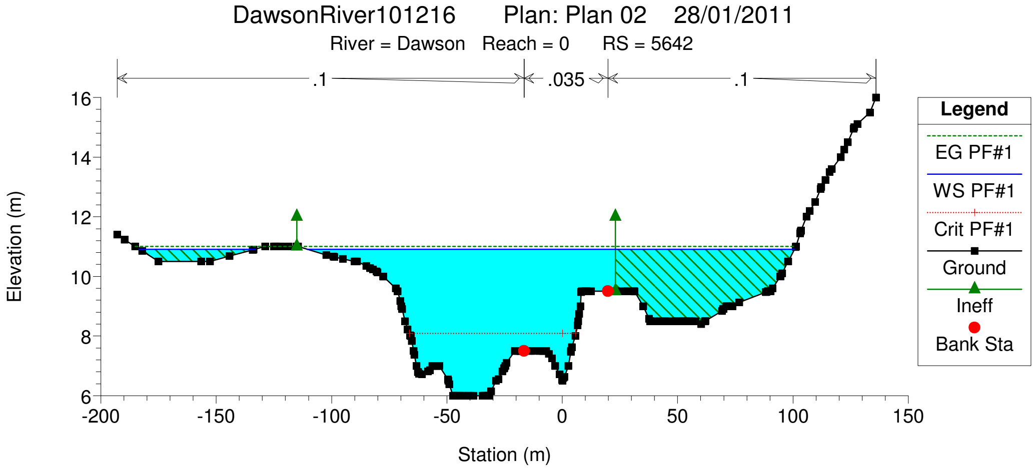

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 6400
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

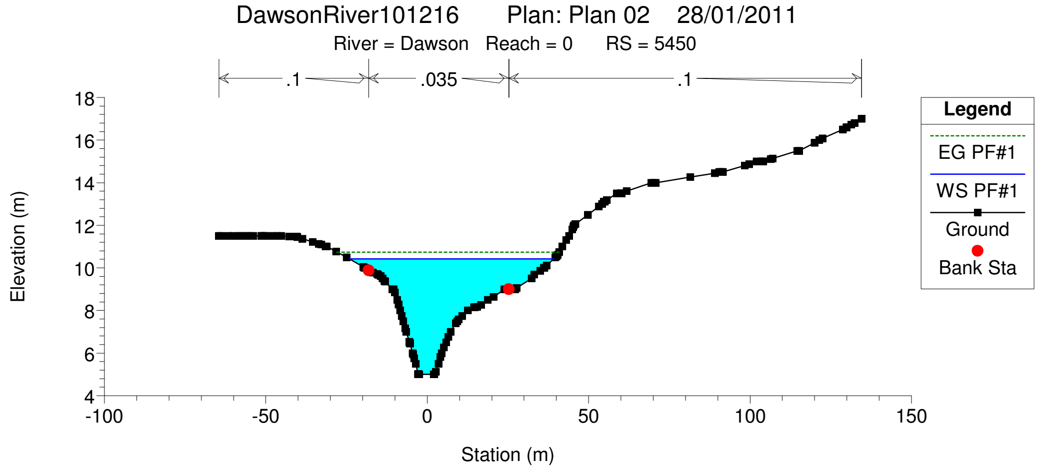

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 6200
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

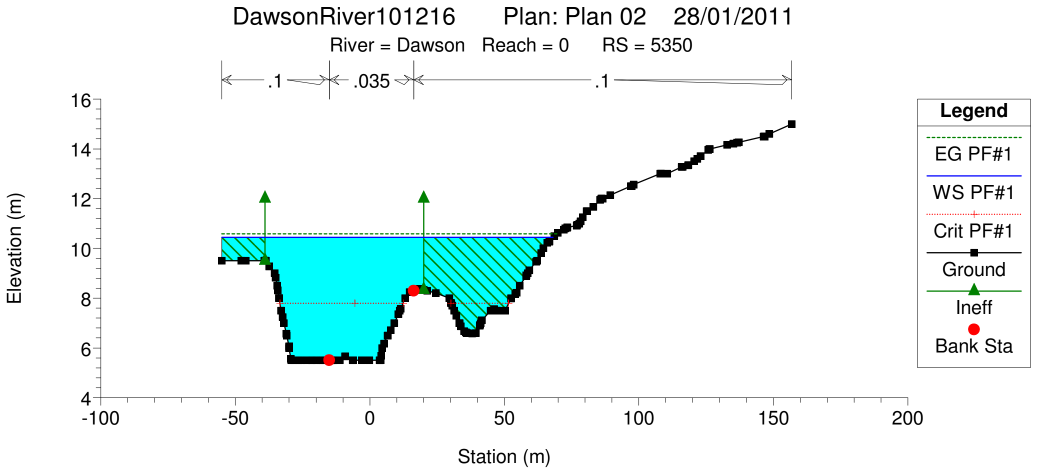

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 6100
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

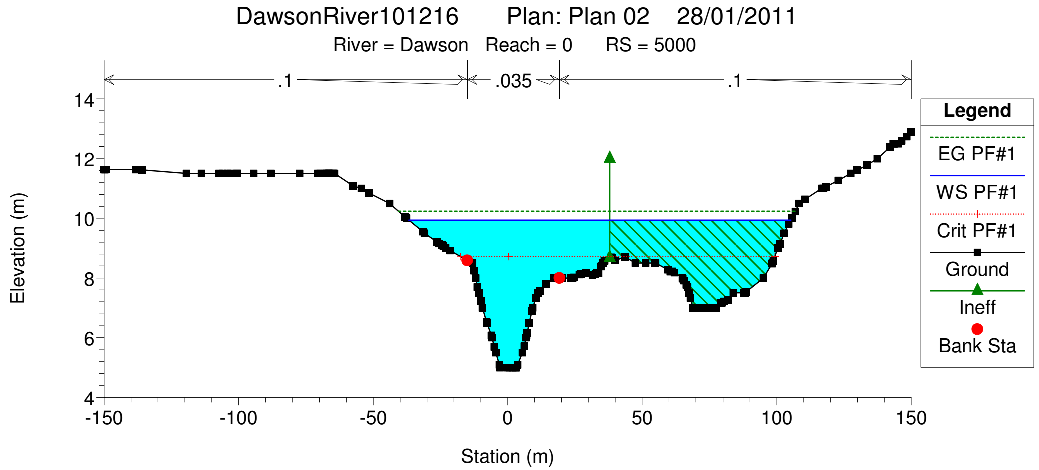

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 6000
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

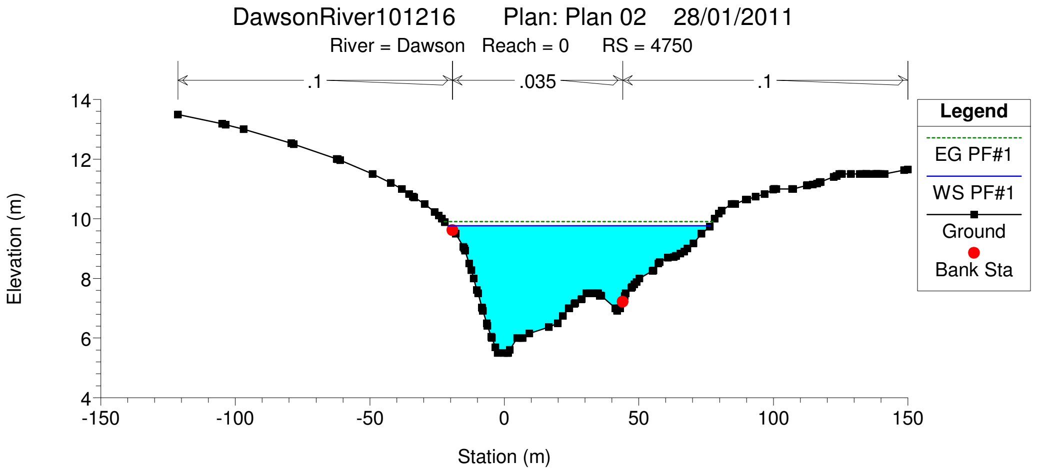

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 5800
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

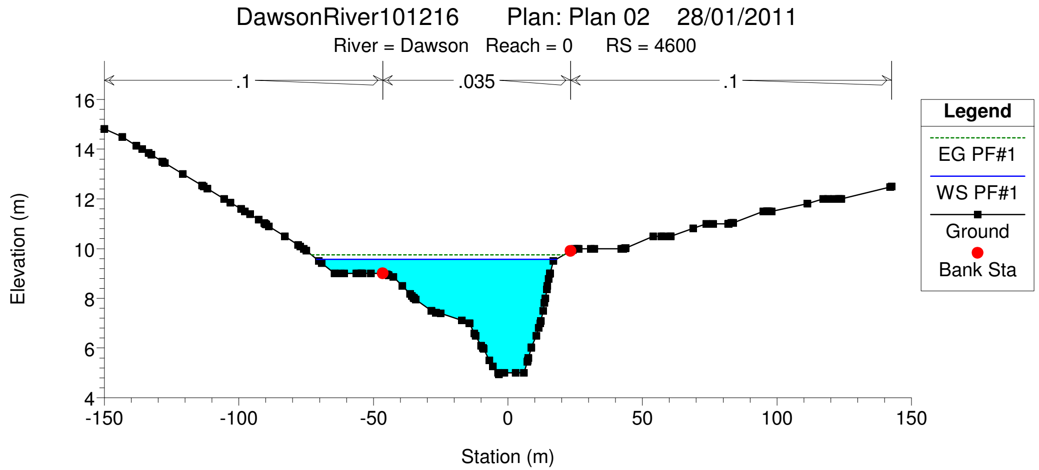

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 5642
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

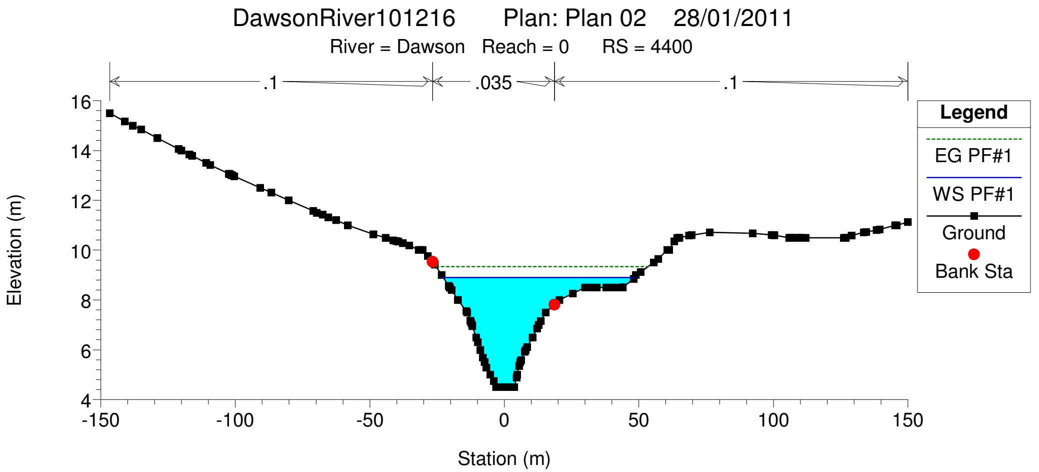

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 5450
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

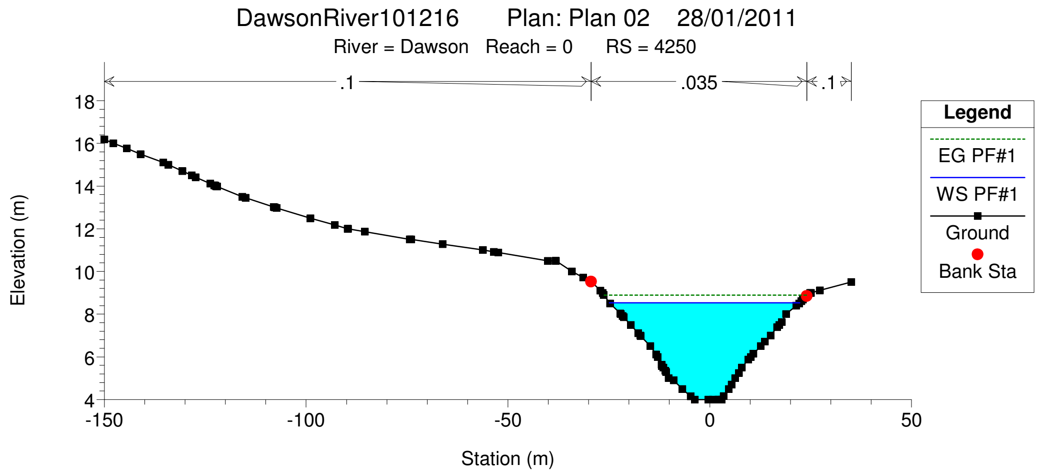

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 5350
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

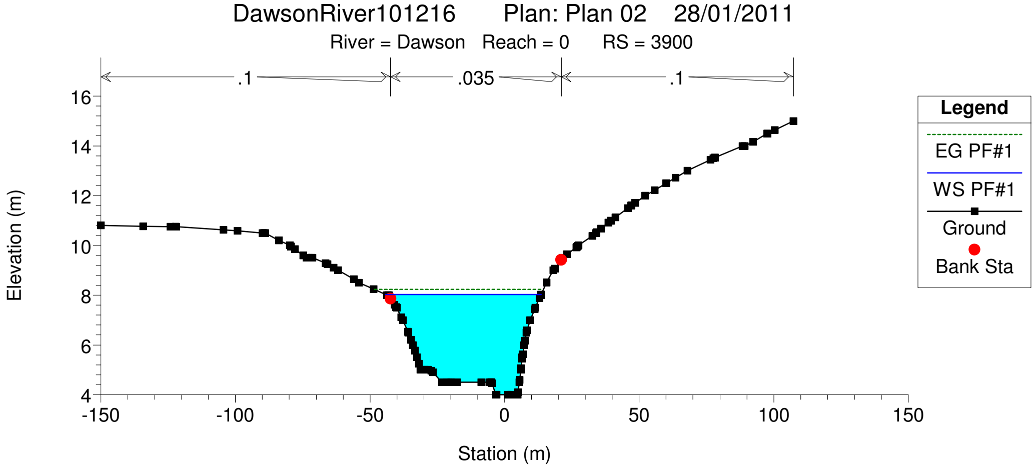

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 5000
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta


DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 4750
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

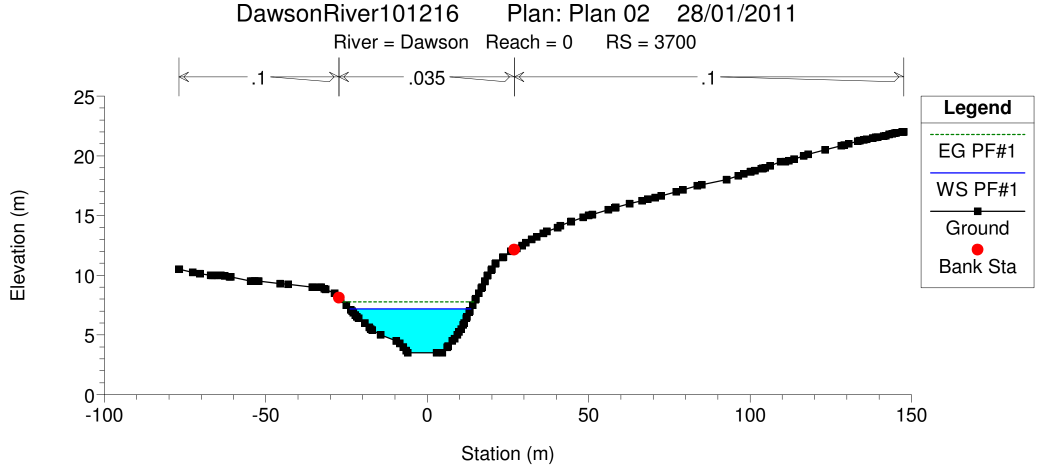

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 4600
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 4400
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

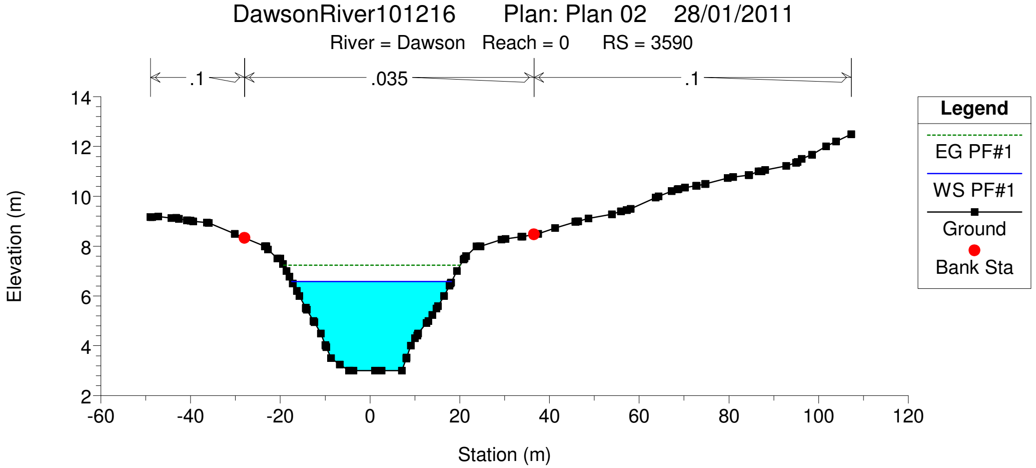

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 4250
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta



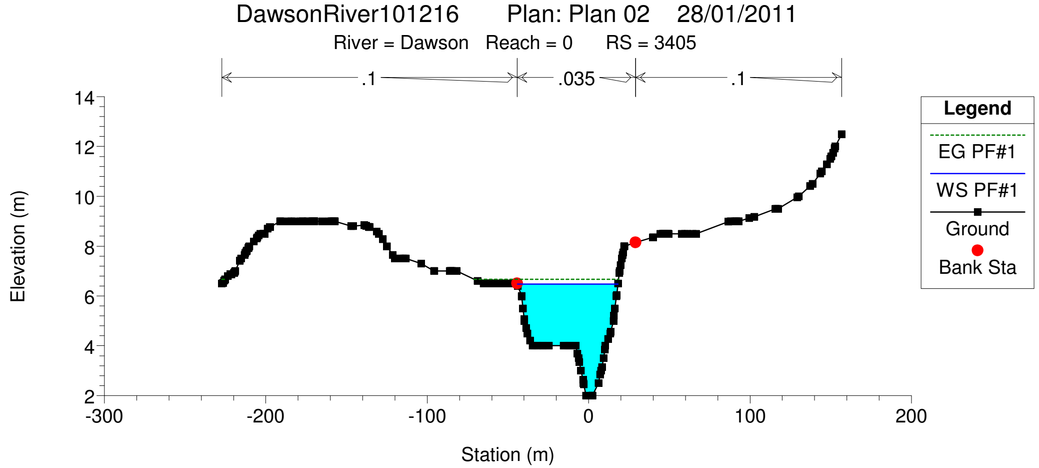
DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 3900
.1
.035
.1
Elevation (m)
Station (m)
16
14
12
10
8
6
4
-150
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Ground
Bank Sta



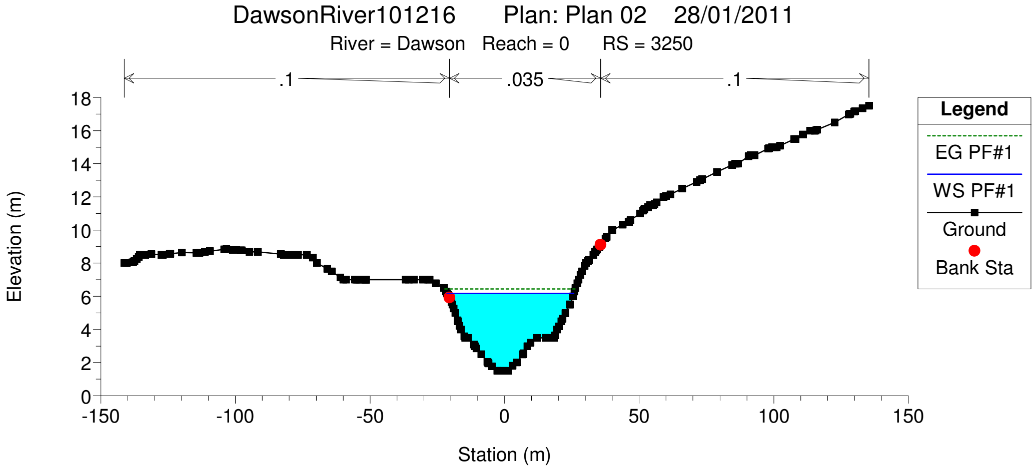
DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 3700
.1
.035
.1
Elevation (m)
Station (m)
25
20
15
10
5
0
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Ground
Bank Sta



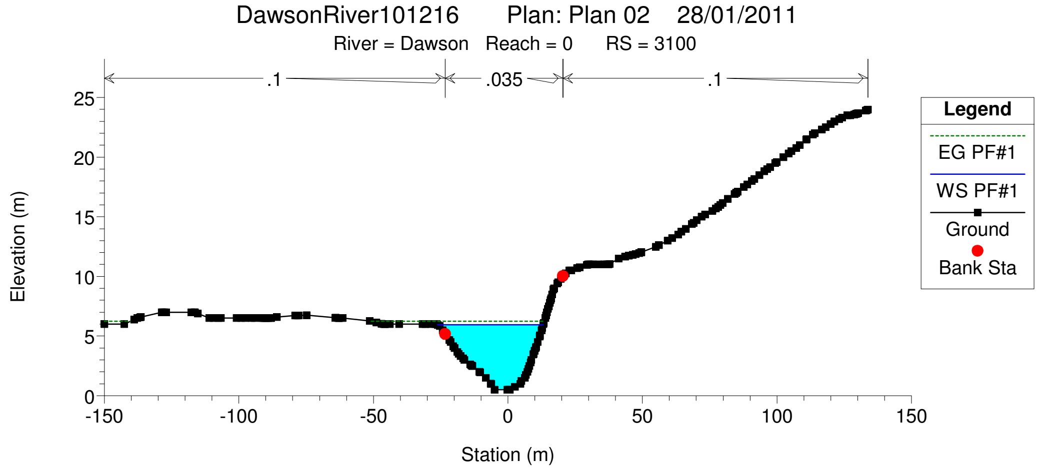
DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 3590
.1
.035
.1
Elevation (m)
Station (m)
14
12
10
8
6
4
2
-60
-40
-20
0
20
40
60
80
100
120
Legend
EG PF#1
WS PF#1
Ground
Bank Sta



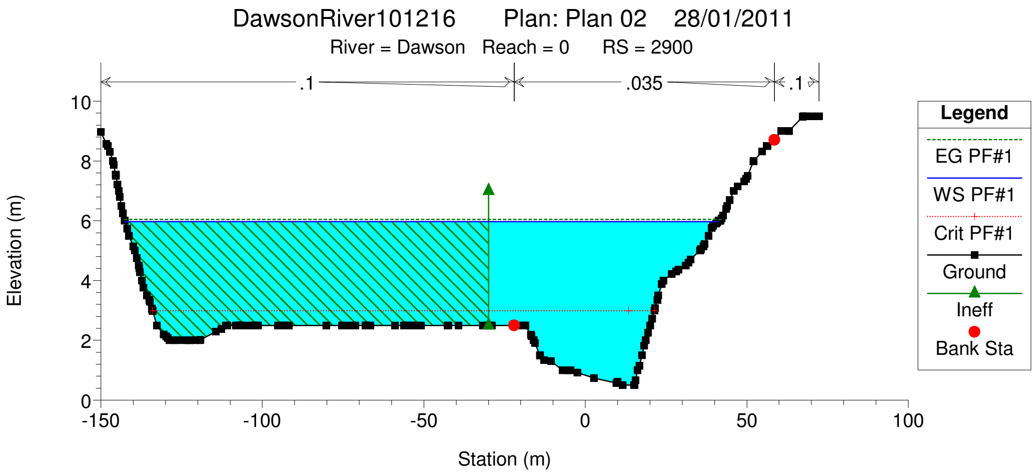
DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 3405
.1
.035
.1
Elevation (m)
Station (m)
14
12
10
8
6
4
2
-300
-200
-100
0
100
200
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

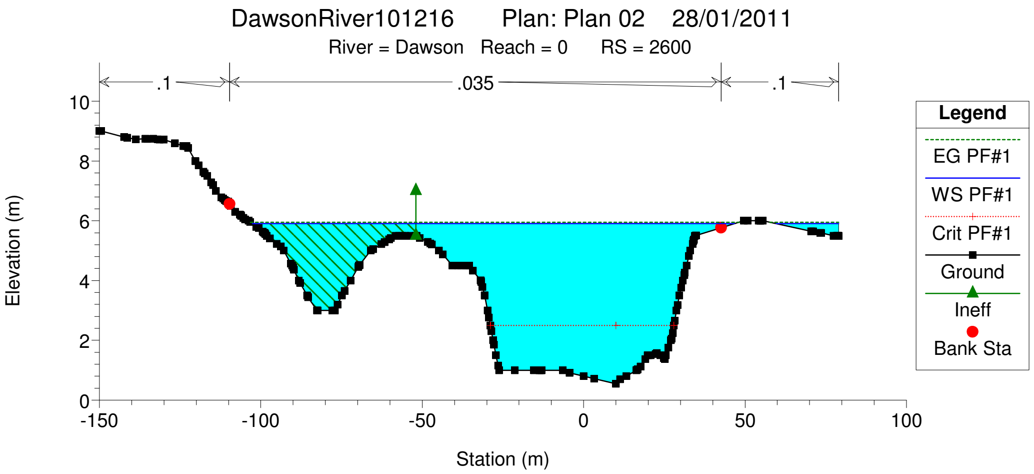


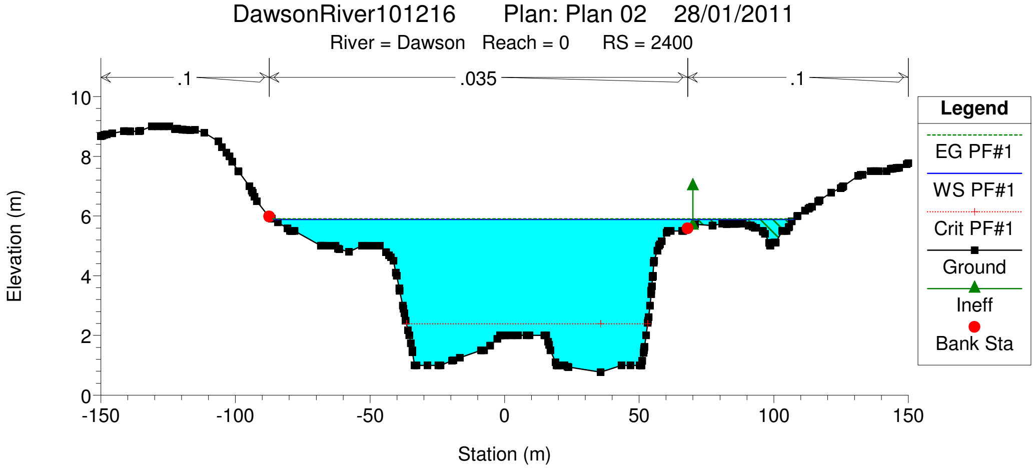
DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 3250
.1
.035
.1
Elevation (m)
Station (m)
18
16
14
12
10
8
6
4
2
0
-150
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

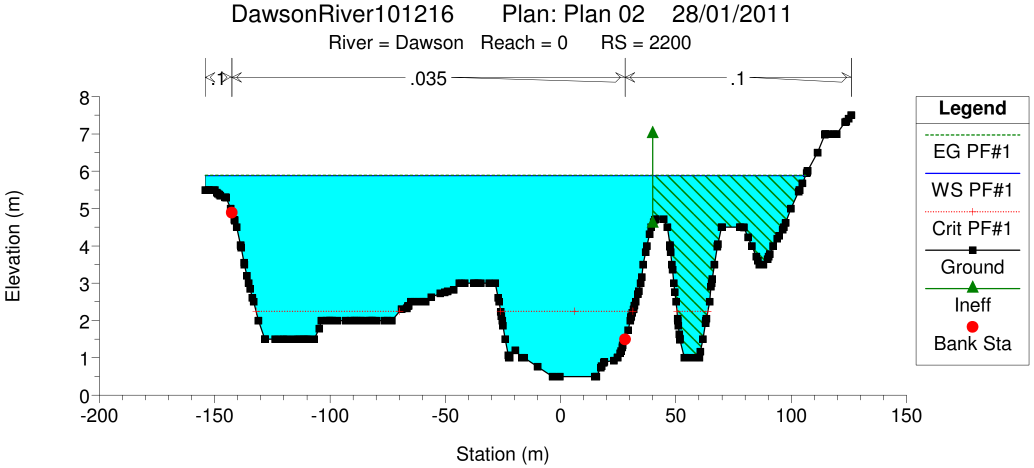


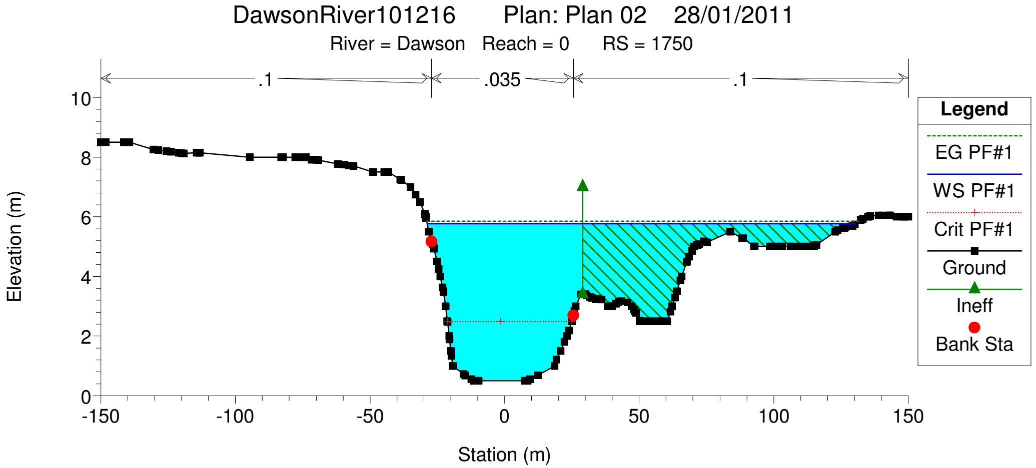
DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 3100
.1
.035
.1
Elevation (m)
Station (m)
25
20
15
10
5
0
-150
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

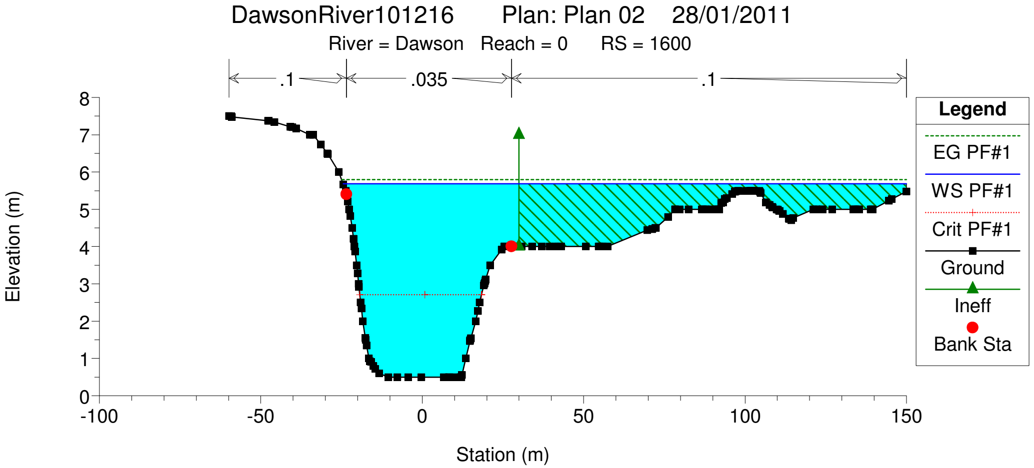

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 2900
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

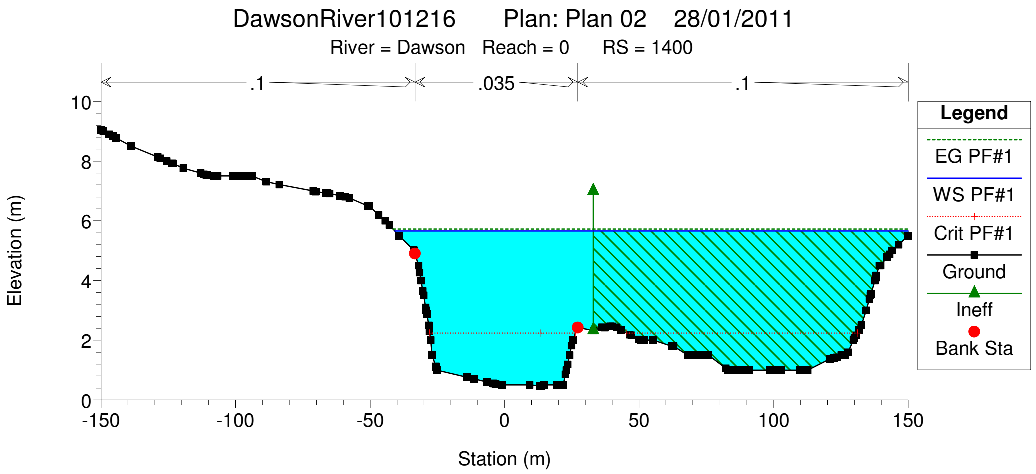

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 2600
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

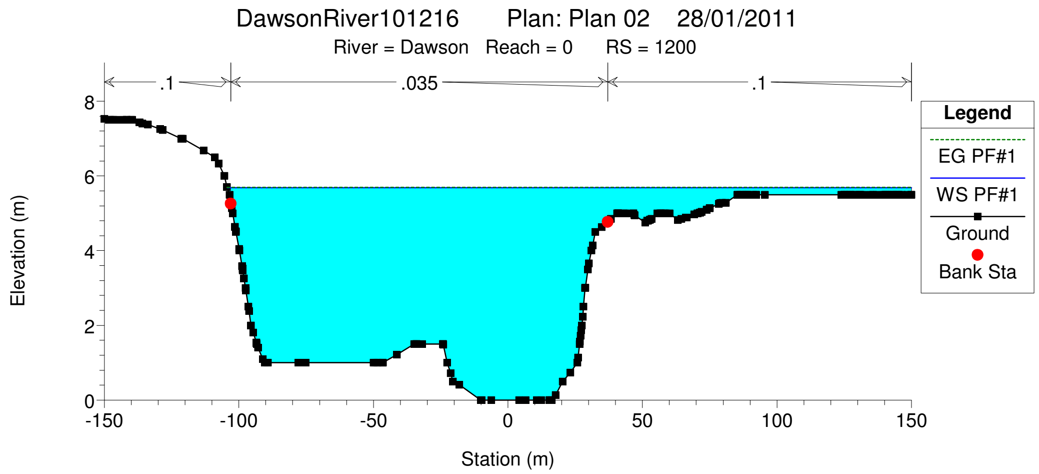

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 2400
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

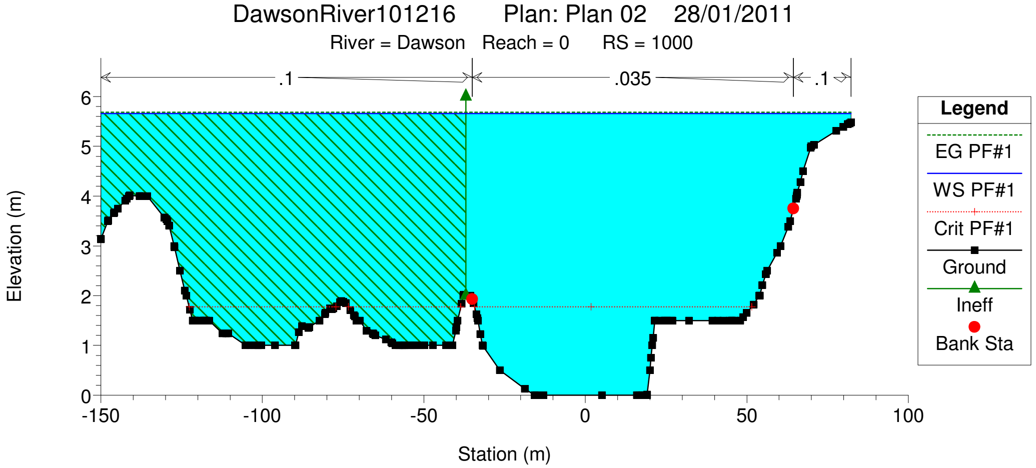

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 2200
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

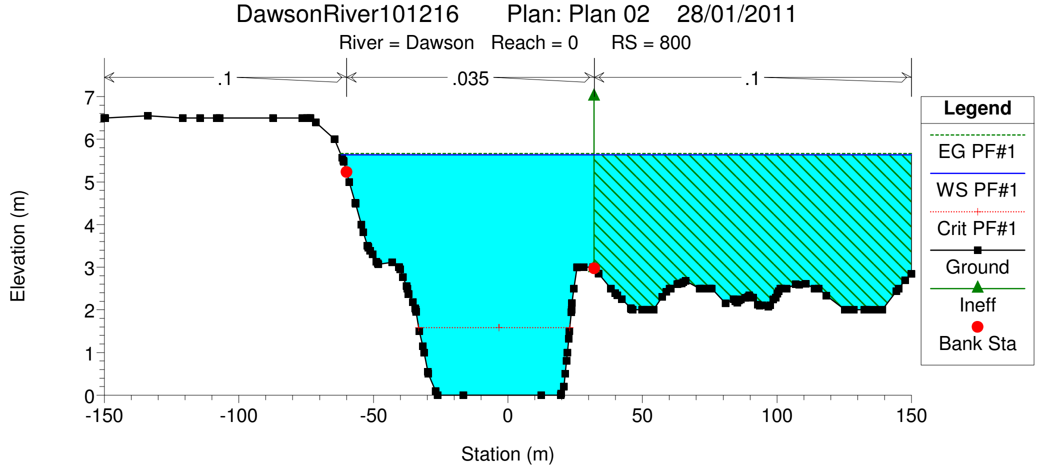

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 1750
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

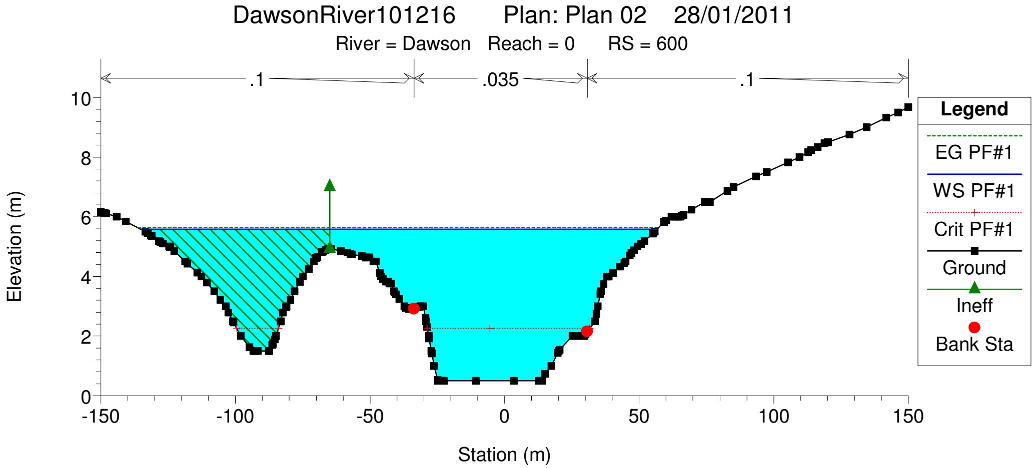

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 1600
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

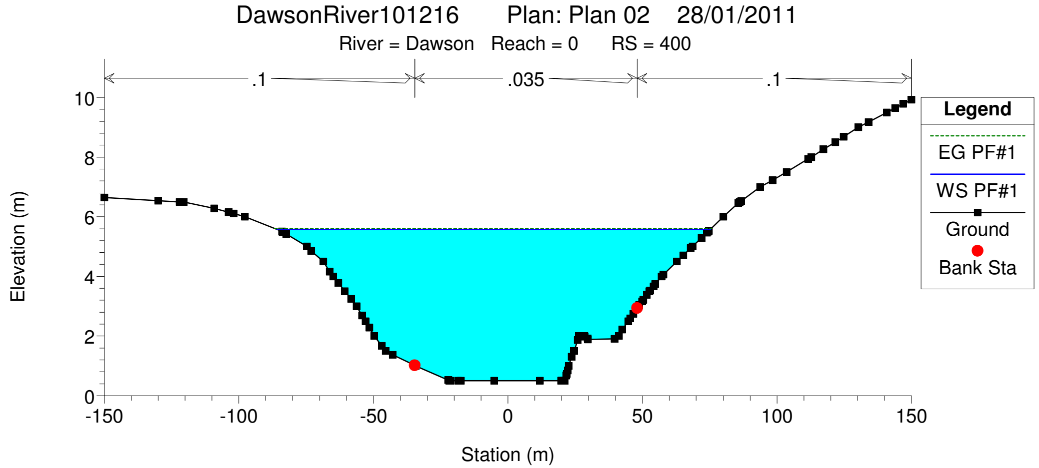

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 1400
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)

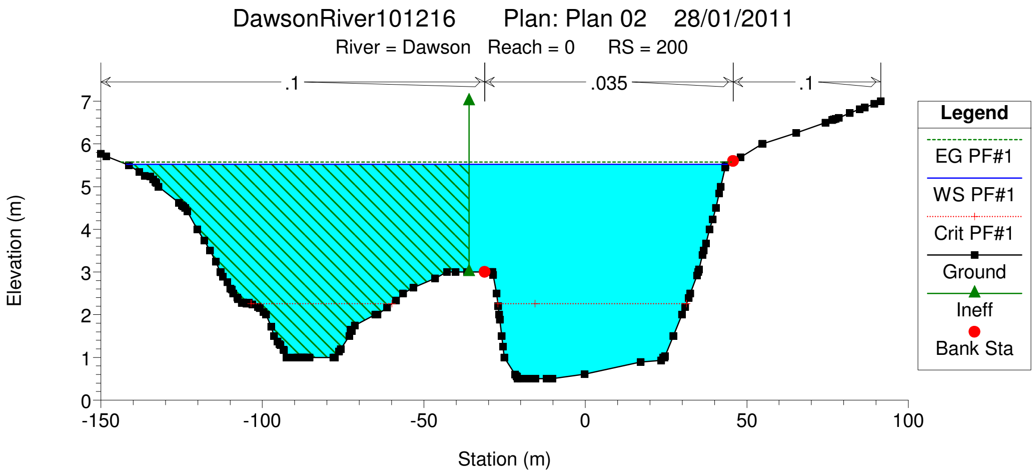

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 1200
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

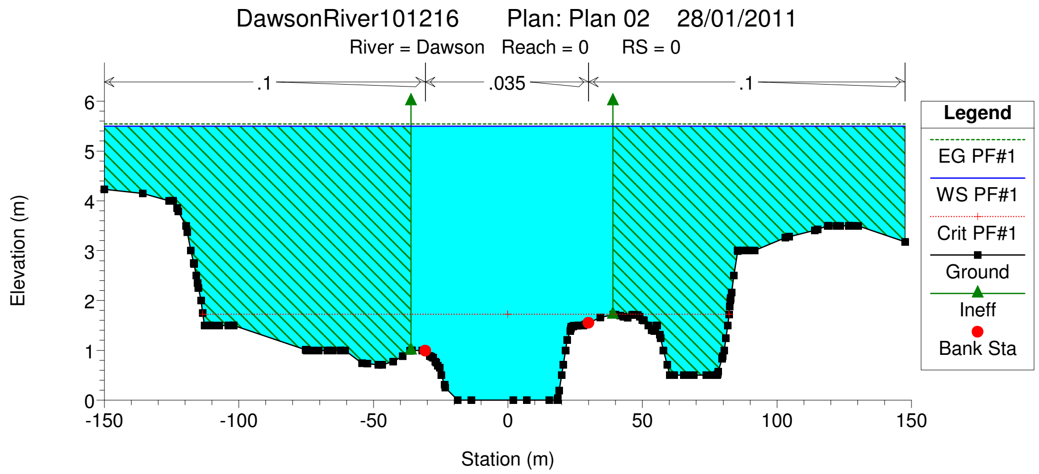

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 1000
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)

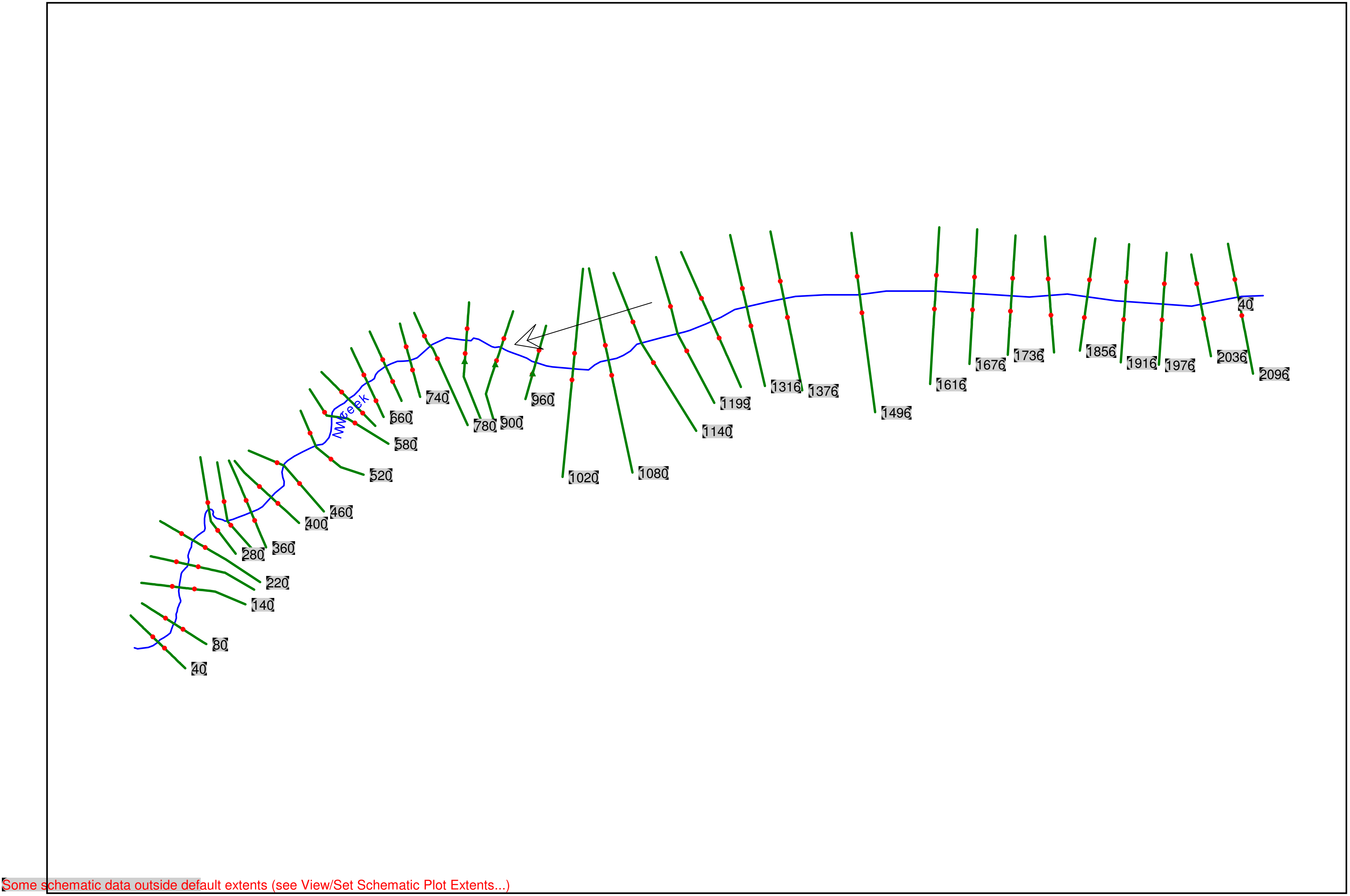

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 800
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)

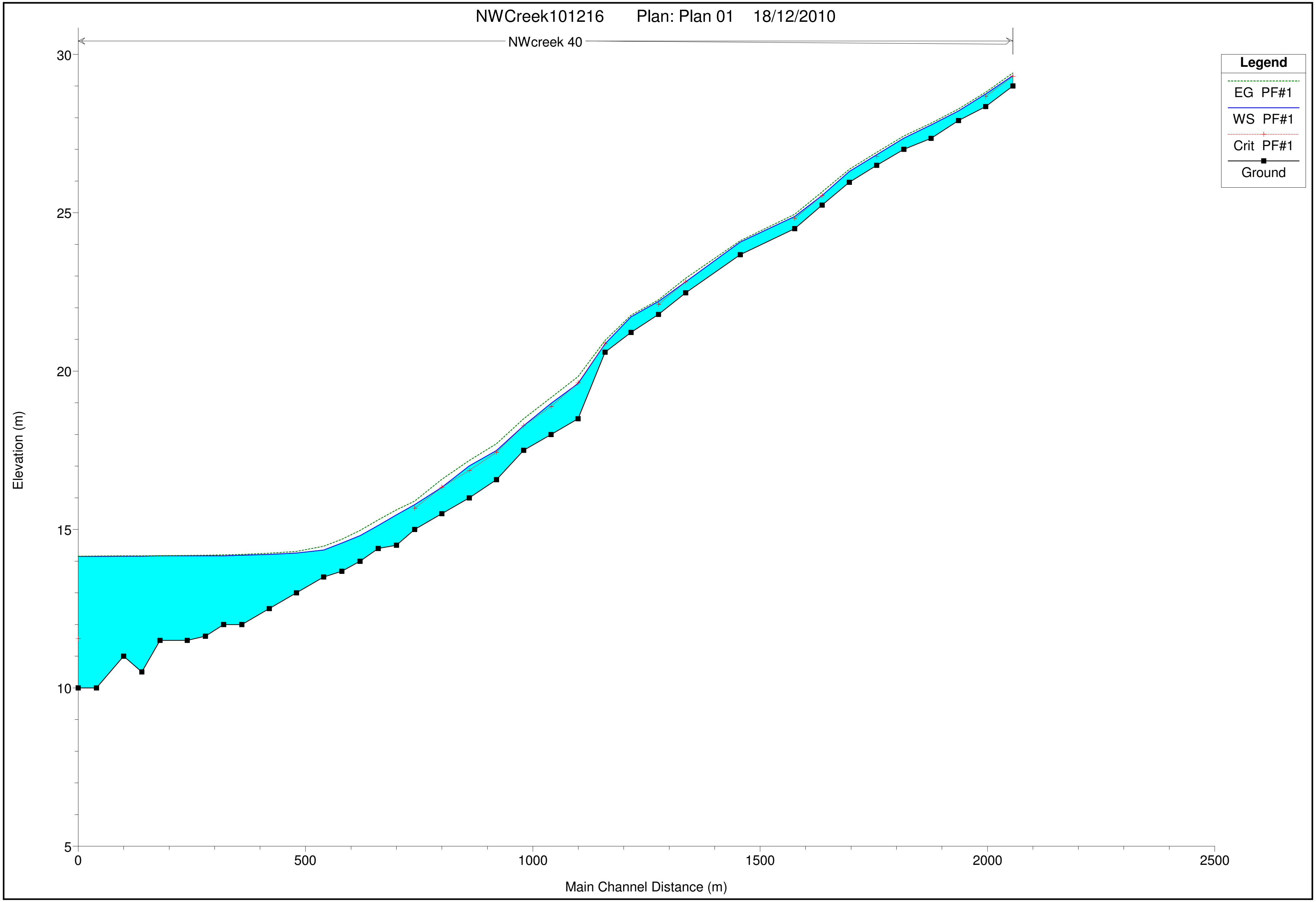

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 600
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)


DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 400
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

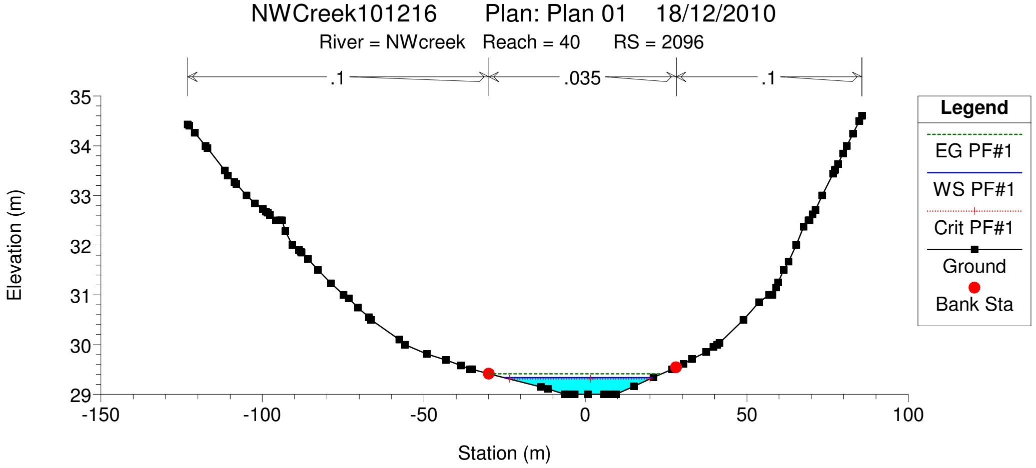

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 200
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

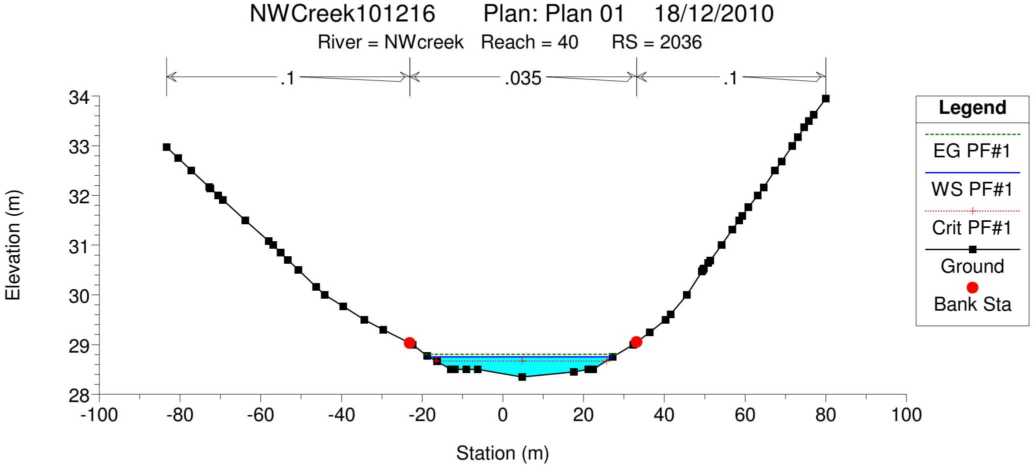

DawsonRiver101216 Plan: Plan 02 28/01/2011
River = Dawson Reach = 0 RS = 0
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

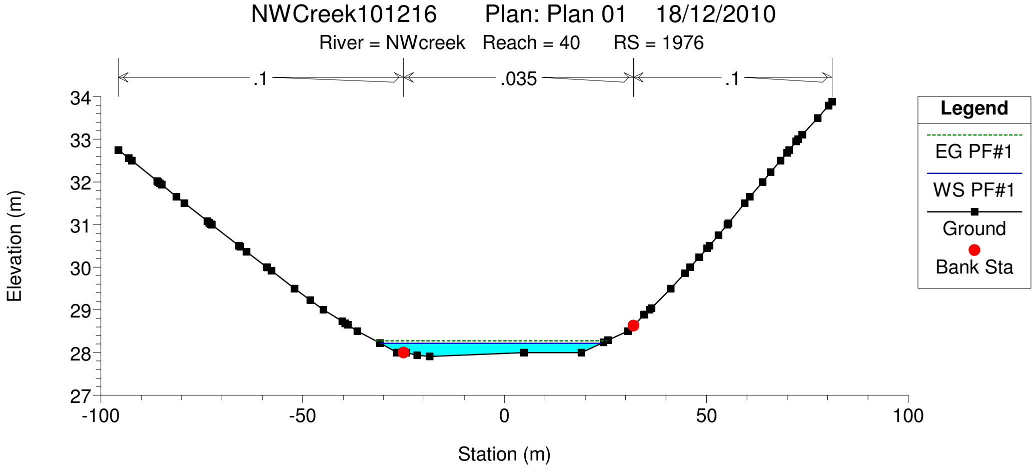

40
80
140
220
280
360
400
460
520
580
660
740
780
900
960
1020
1080
1140
1199
1316
1376
1496
1616
1676
1736
1856
1916
1976
2036
2096
40
Some schematic data outside default extents (see View/Set Schematic Plot Extents...)

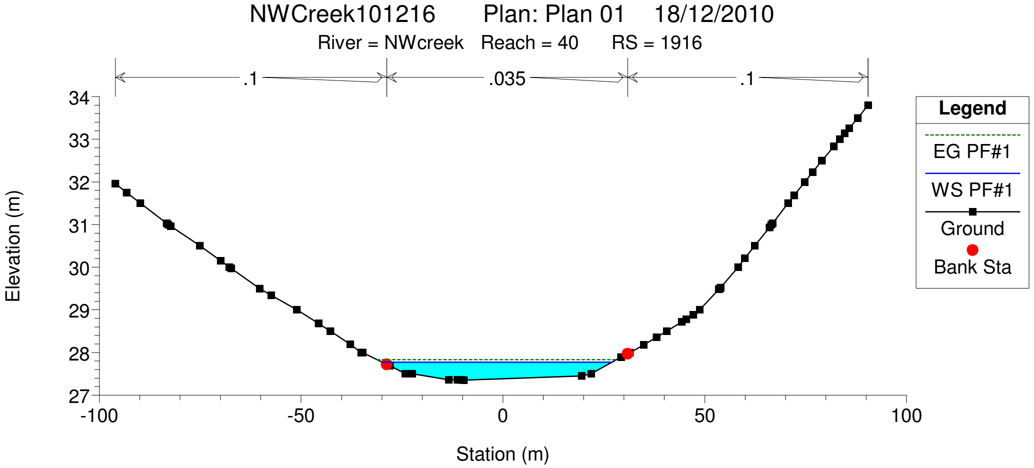


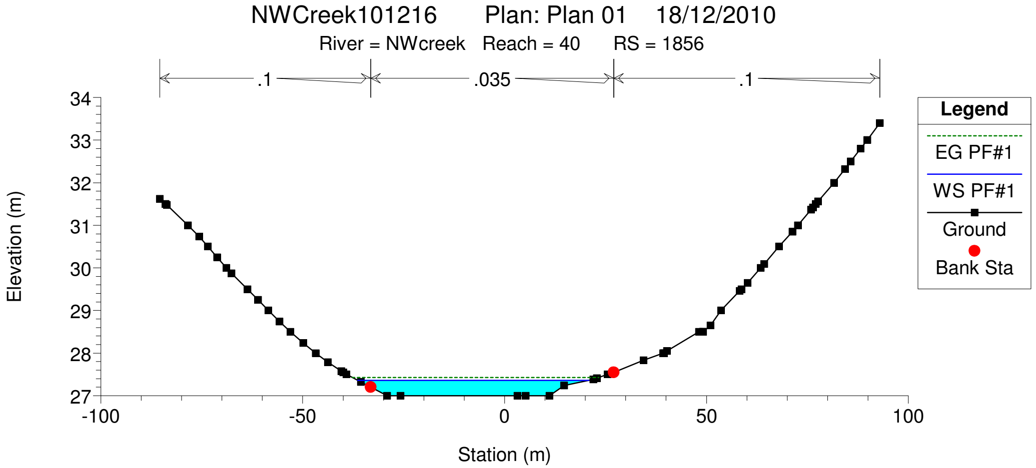
NWCreek101216 Plan: Plan 01 18/12/2010
NWcreek 40
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Elevation (m)
Main Channel Distance (m)
30
25
20
15
10
5
0
500
1000
1500
2000
2500

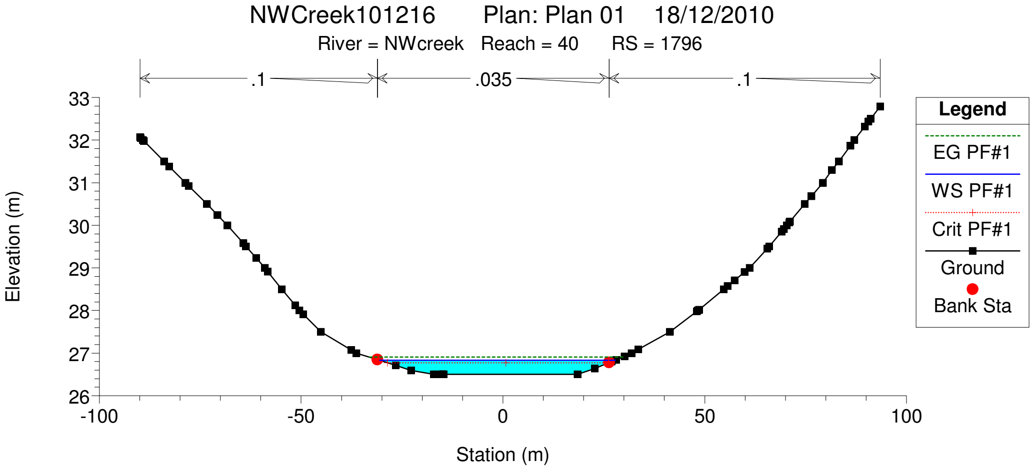

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 2096
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

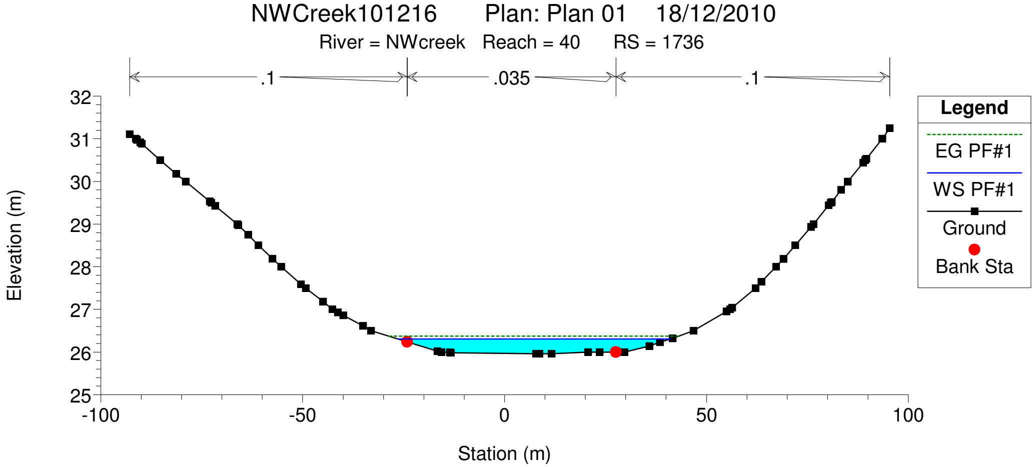

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 2036
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

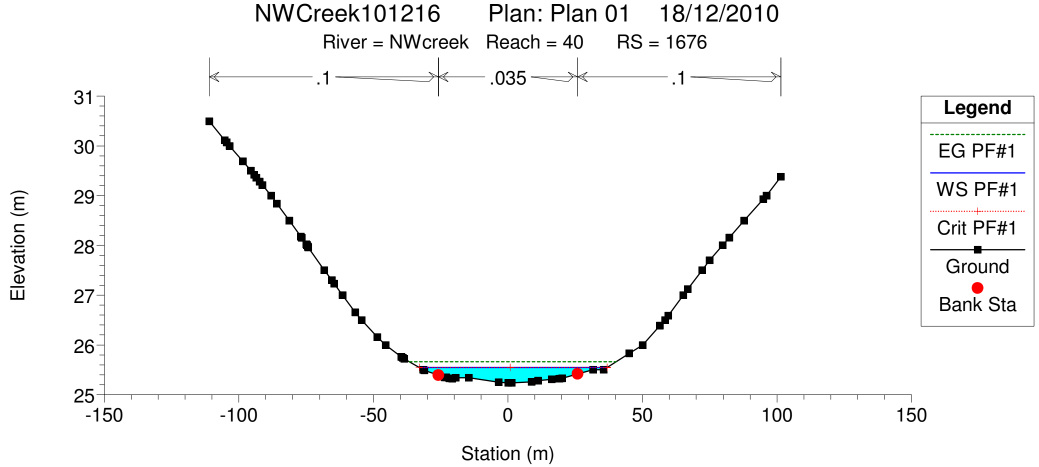

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1976
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

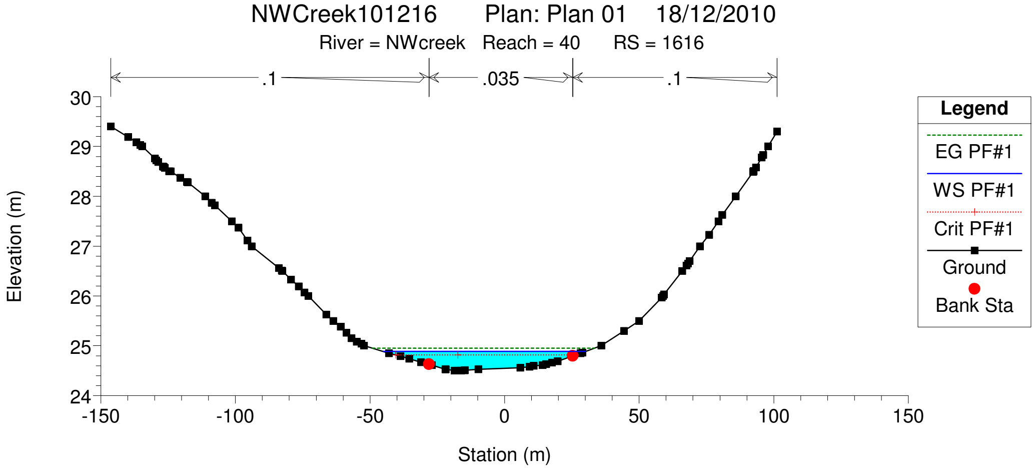

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1916
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

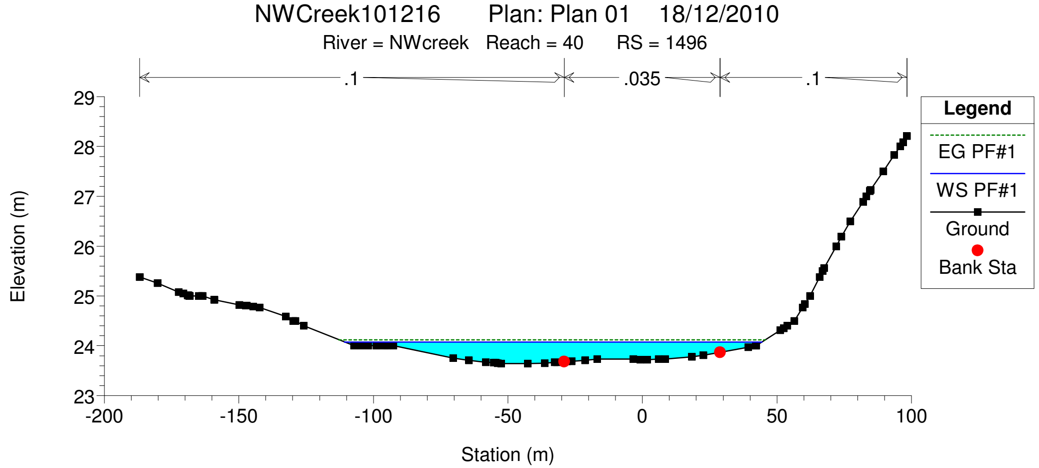

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1856
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

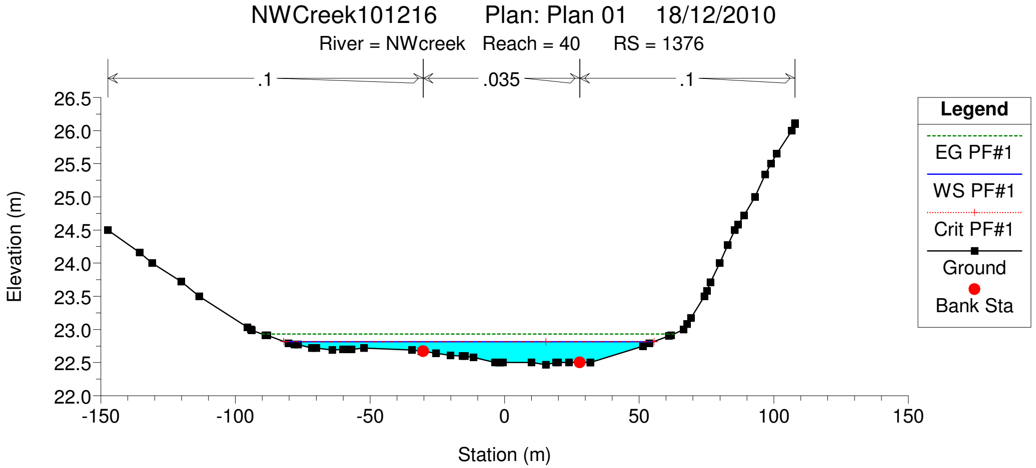

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1796
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

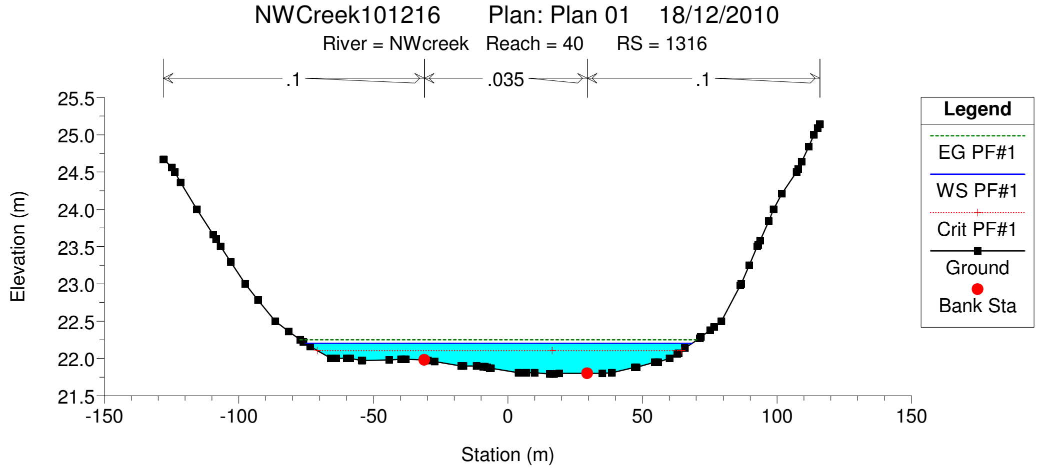

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1736
.1
.035
.1
Elevation (m)
Station (m)
32
31
30
29
28
27
26
25
-100
-50
0
50
100
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

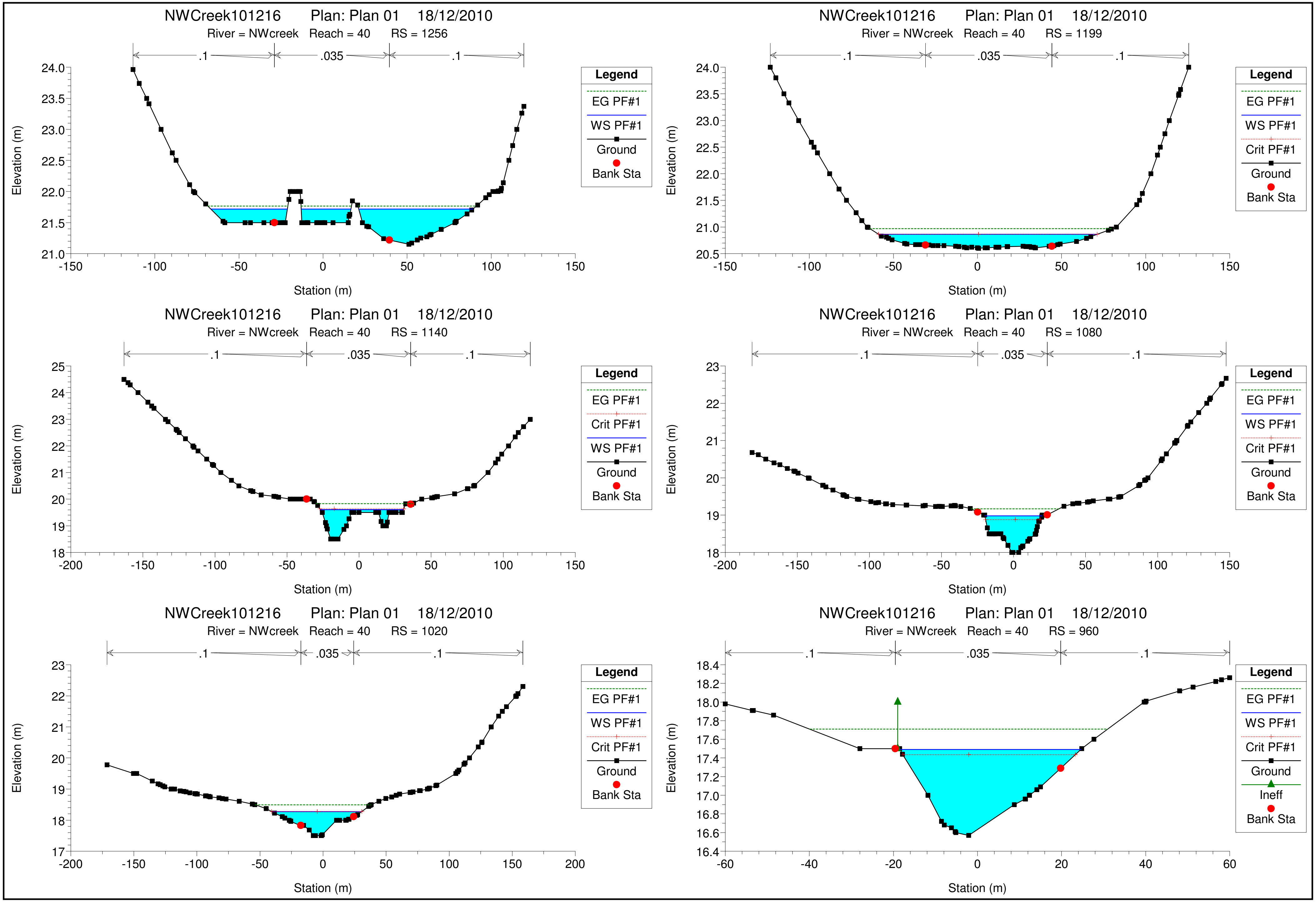

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1676
.1
.035
.1
Elevation (m)
Station (m)
31
30
29
28
27
26
25
-150
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1616
.1
.035
.1
Elevation (m)
Station (m)
30
29
28
27
26
25
24
-150
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

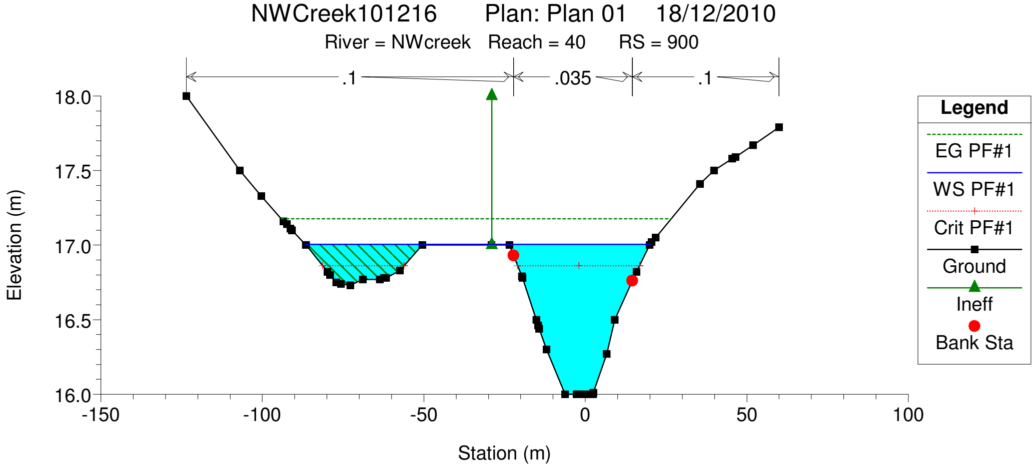

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1496
.1
.035
.1
Elevation (m)
Station (m)
29
28
27
26
25
24
23
-200
-150
-100
-50
0
50
100
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

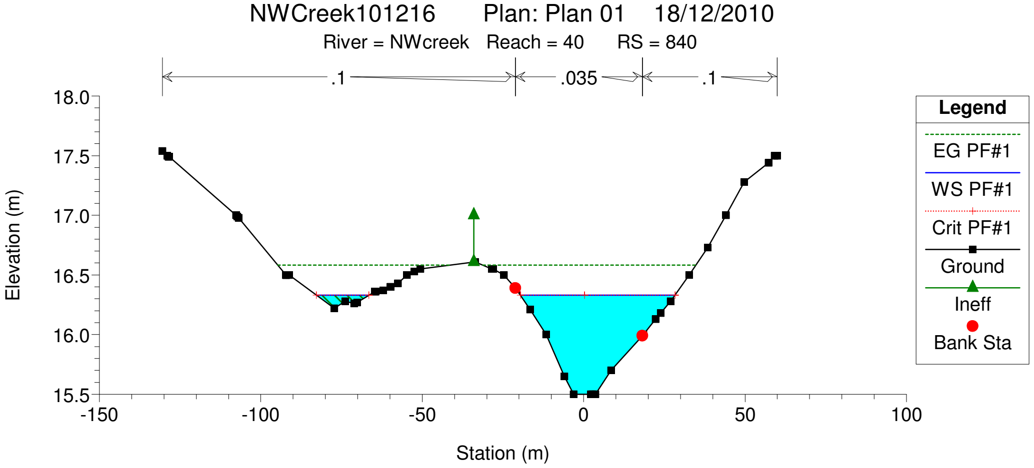

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1376
.1
.035
.1
Elevation (m)
Station (m)
26.5
26.0
25.5
25.0
24.5
24.0
23.5
23.0
22.5
22.0
-150
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

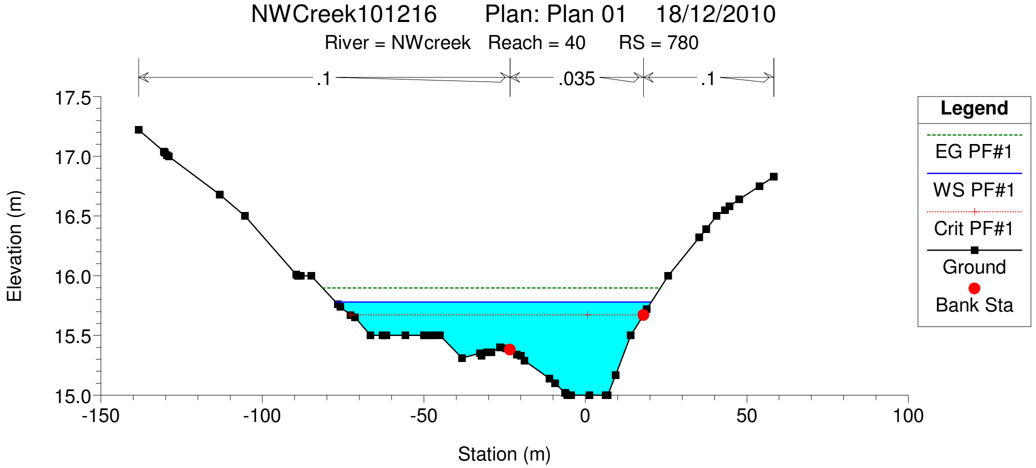

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1316
.1
.035
.1
Elevation (m)
Station (m)
25.5
25.0
24.5
24.0
23.5
23.0
22.5
22.0
21.5
-150
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

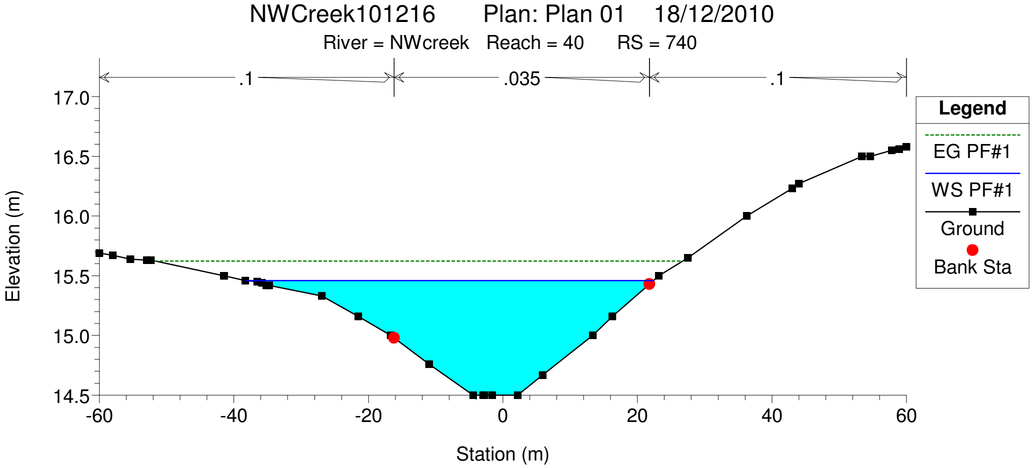


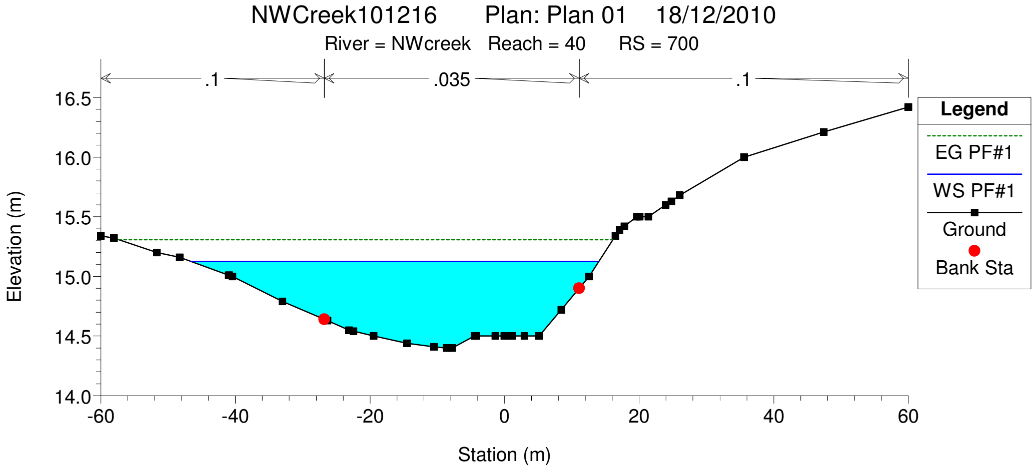
NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1256
.1 .035 .1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1199
.1 .035 .1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1140
.1 .035 .1
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1080
.1 .035 .1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 1020
.1 .035 .1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 960
.1 .035 .1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta
Elevation (m)
Station (m)

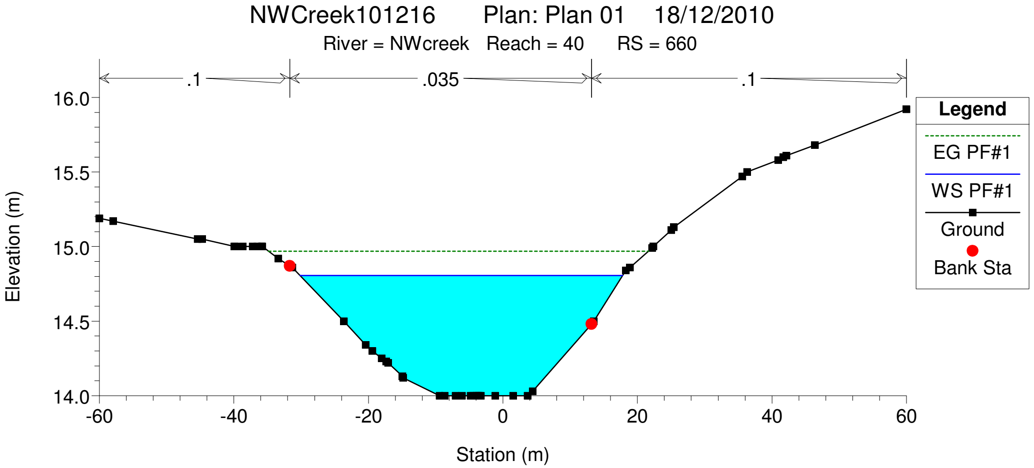

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 900
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

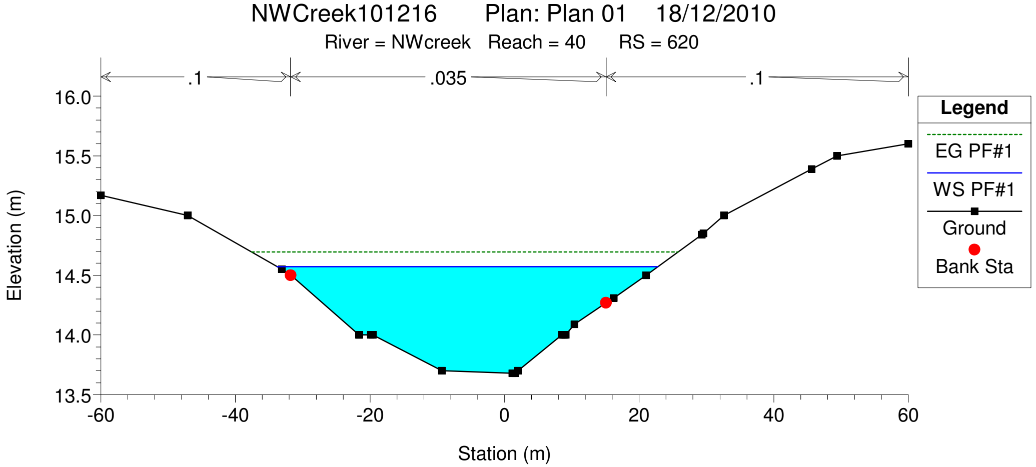

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 840
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Ineff
Bank Sta

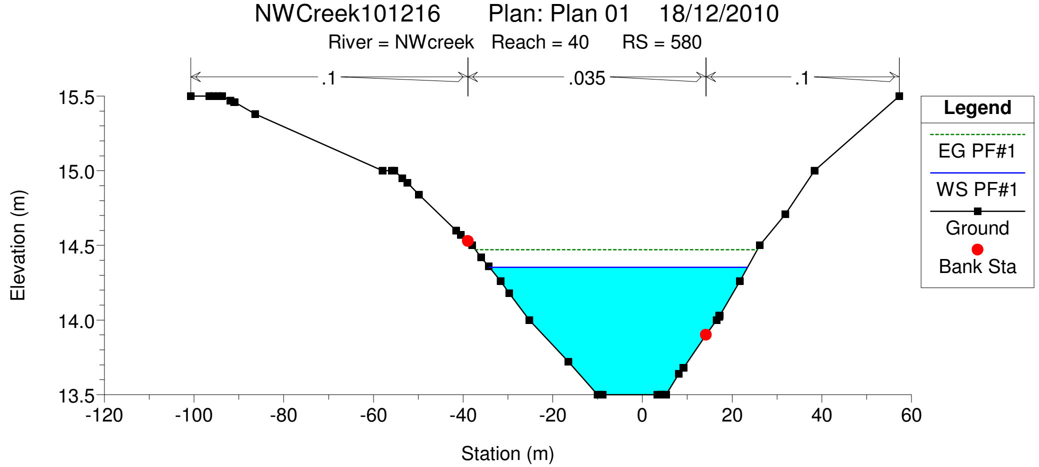

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 780
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

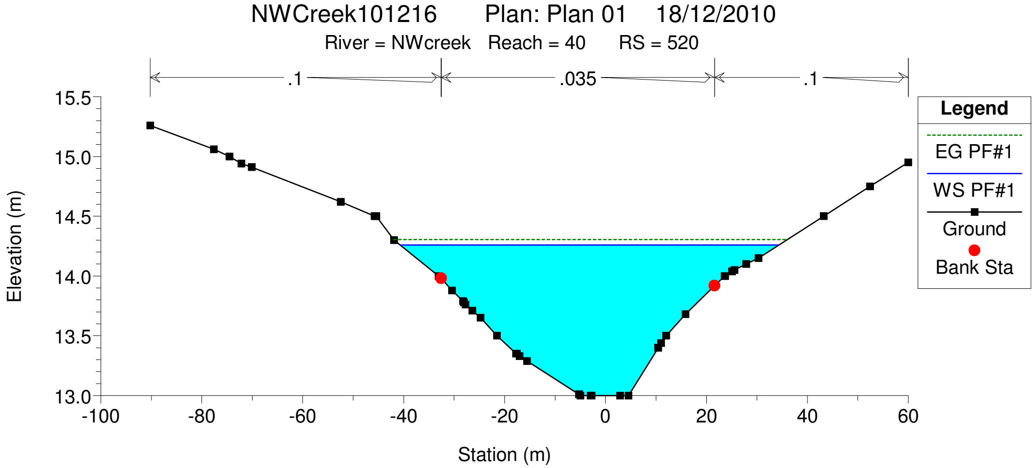

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 740
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

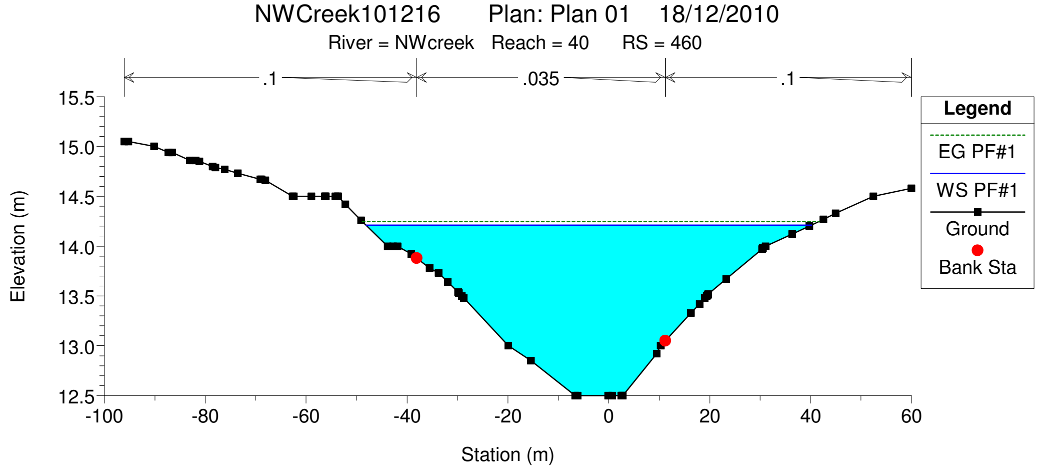

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 700
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

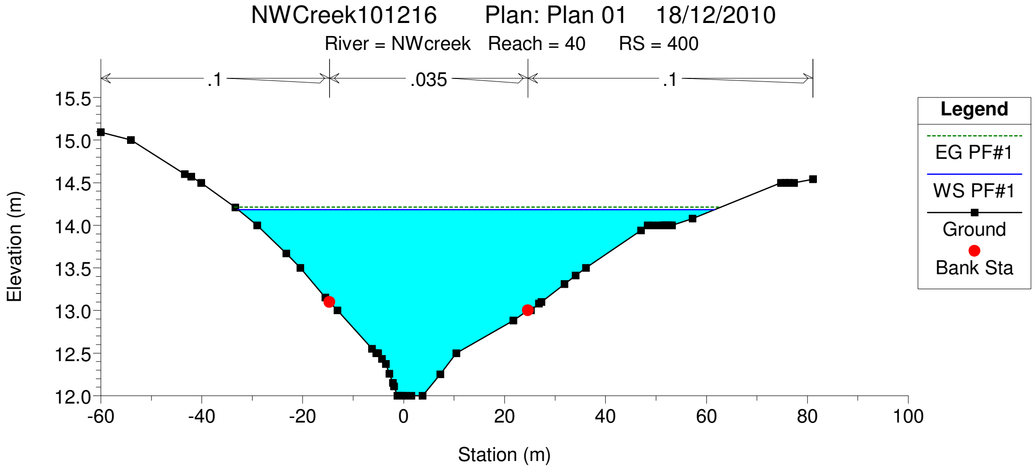

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 660
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

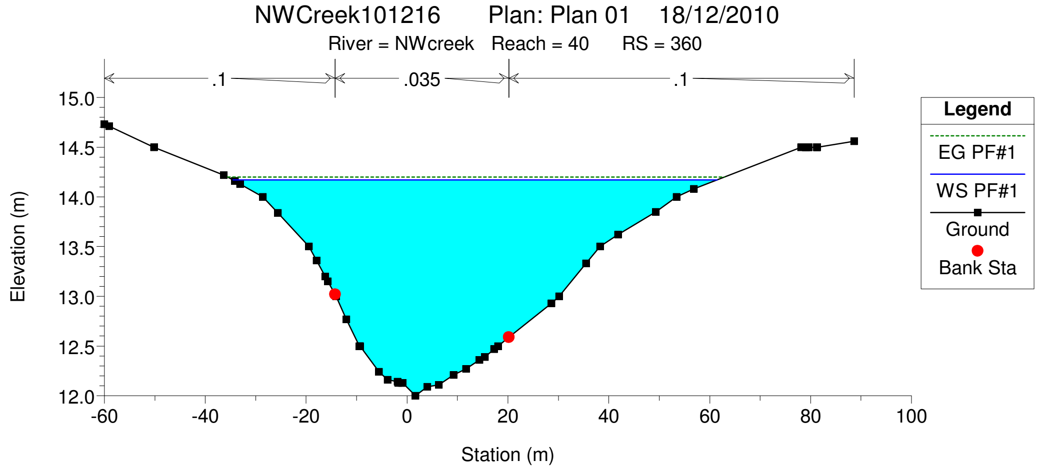

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 620
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

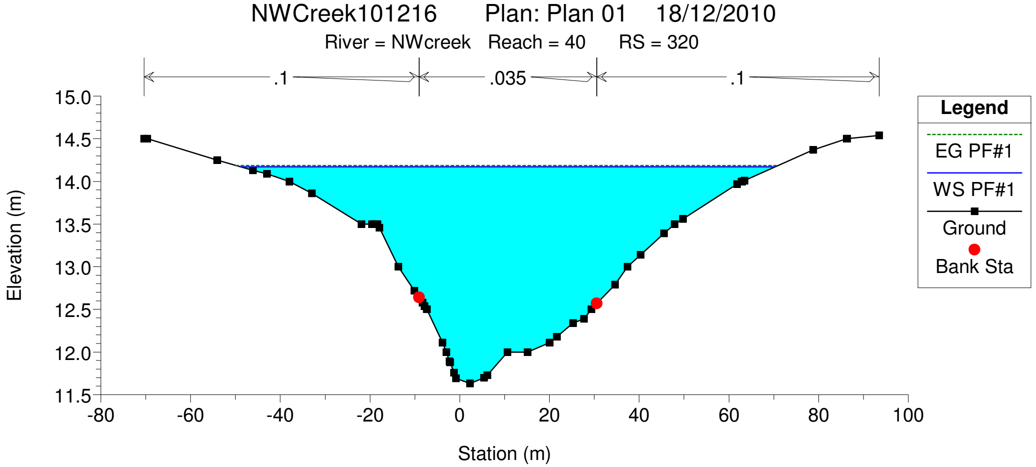

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 580
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

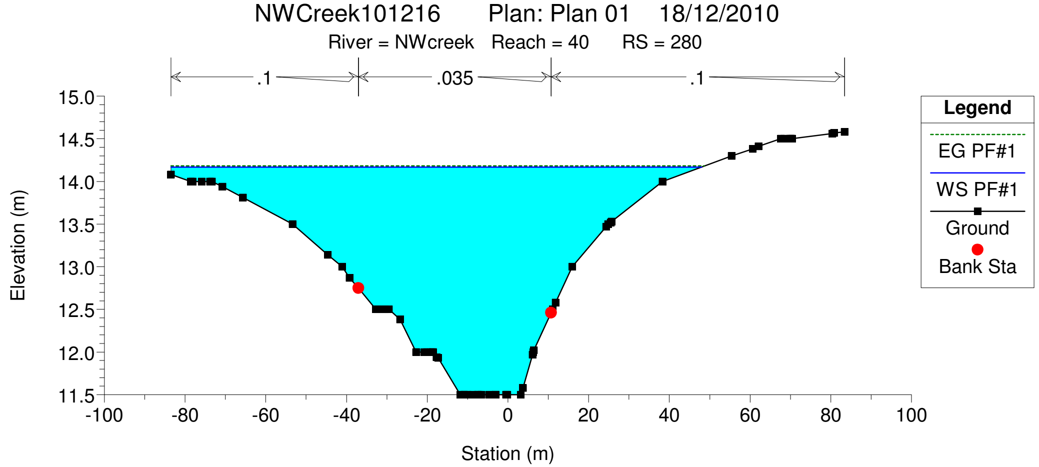

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 520
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

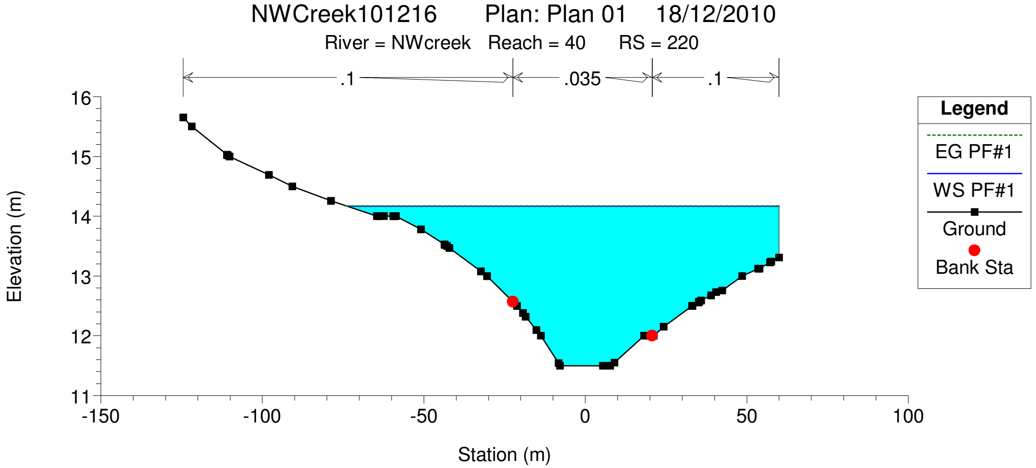

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 460
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

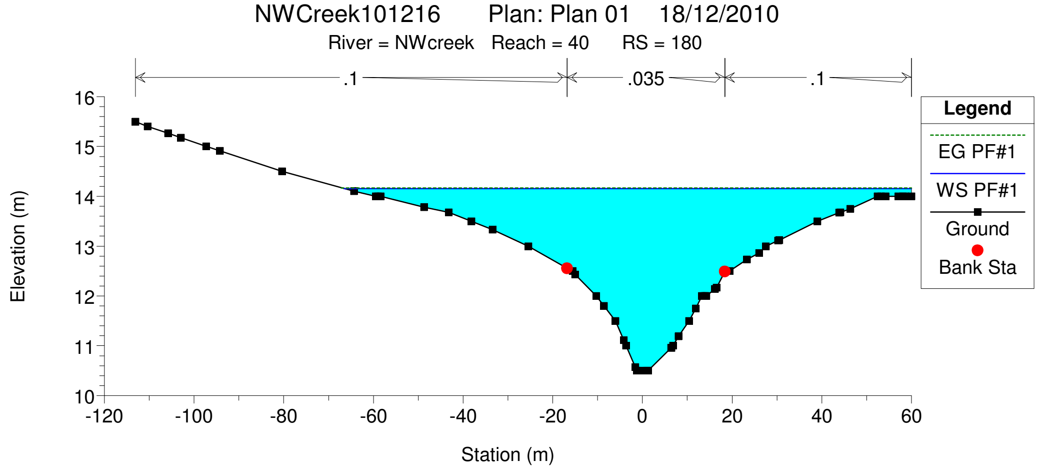

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 400
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

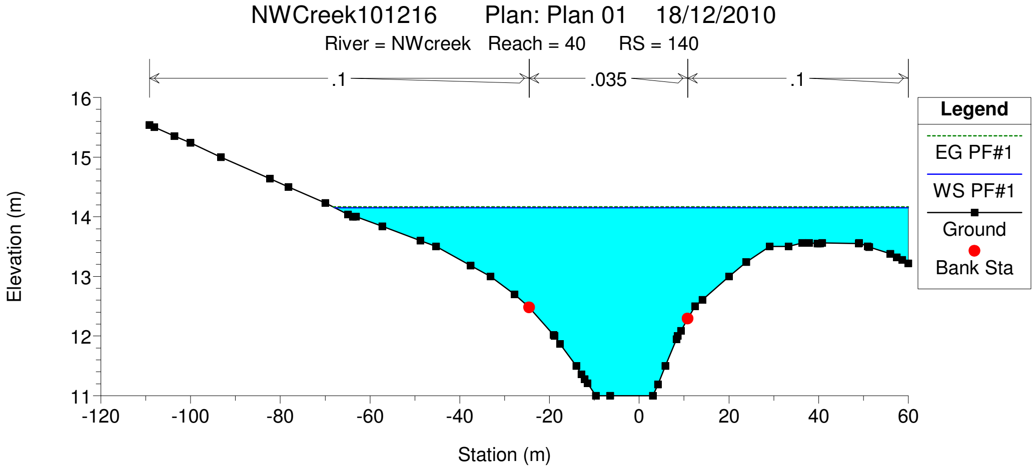

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 360
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

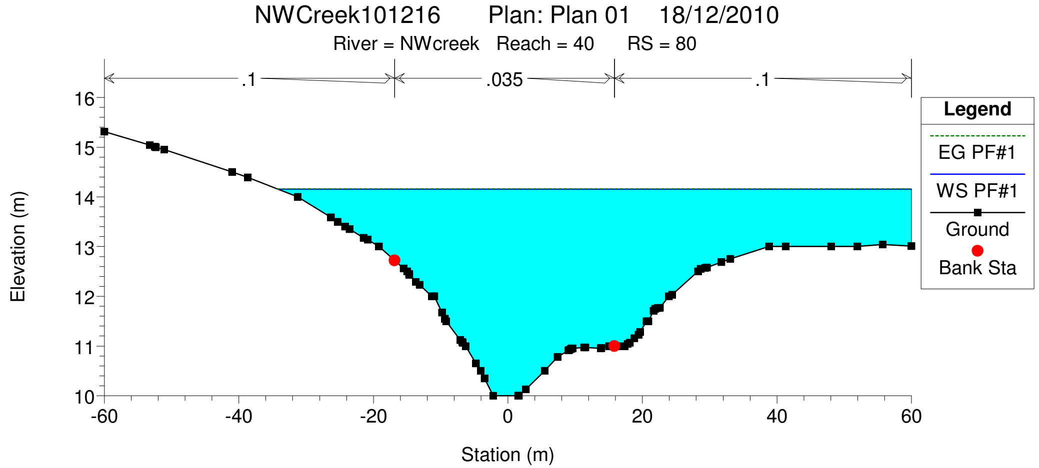

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 320
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
15.0
14.5
14.0
13.5
13.0
12.5
12.0
11.5
-80
-60
-40
-20
0
20
40
60
80
100

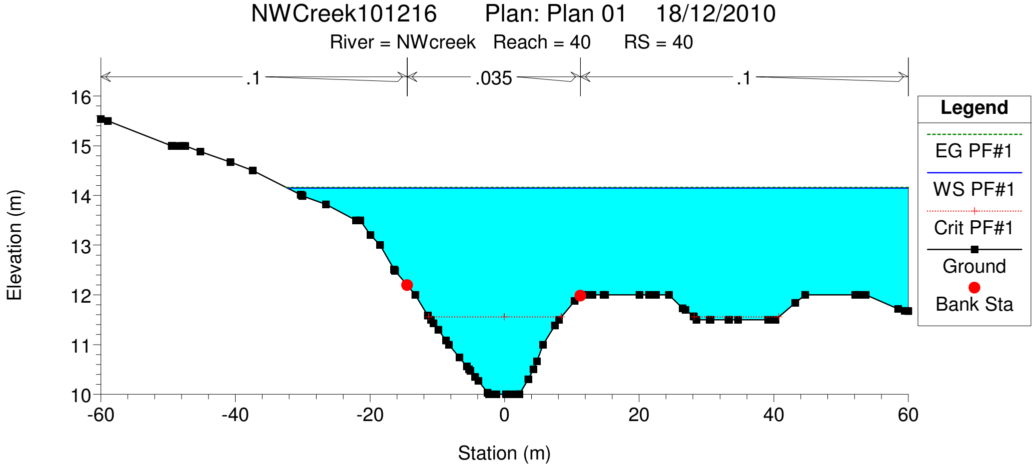

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 280
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
15.0
14.5
14.0
13.5
13.0
12.5
12.0
11.5
-100
-80
-60
-40
-20
0
20
40
60
80
100


NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 220
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
16
15
14
13
12
11
-150
-100
-50
0
50
100

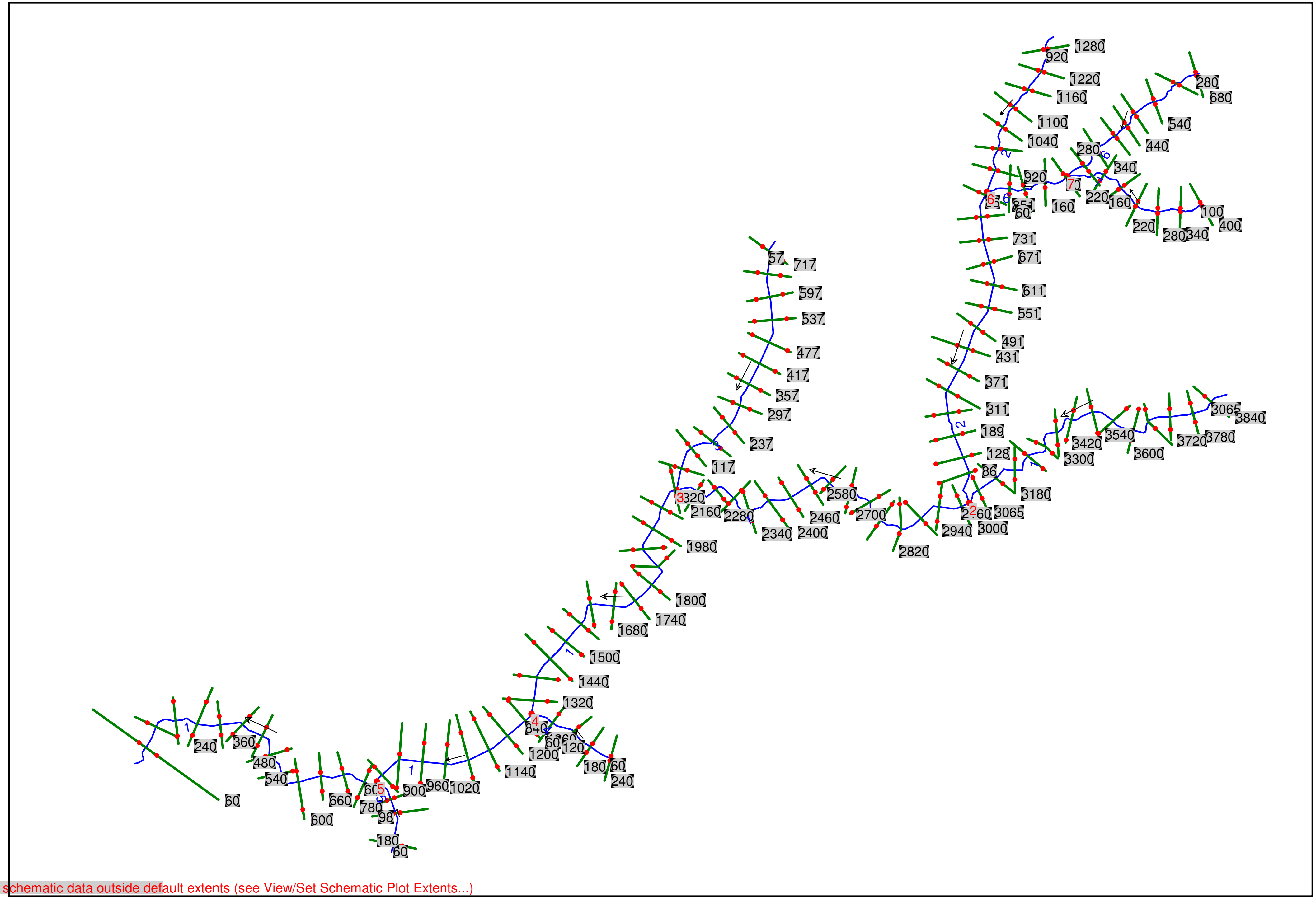

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 180
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
16
15
14
13
12
11
10
-120
-100
-80
-60
-40
-20
0
20
40
60


NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 140
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
16
15
14
13
12
11
-120
-100
-80
-60
-40
-20
0
20
40
60

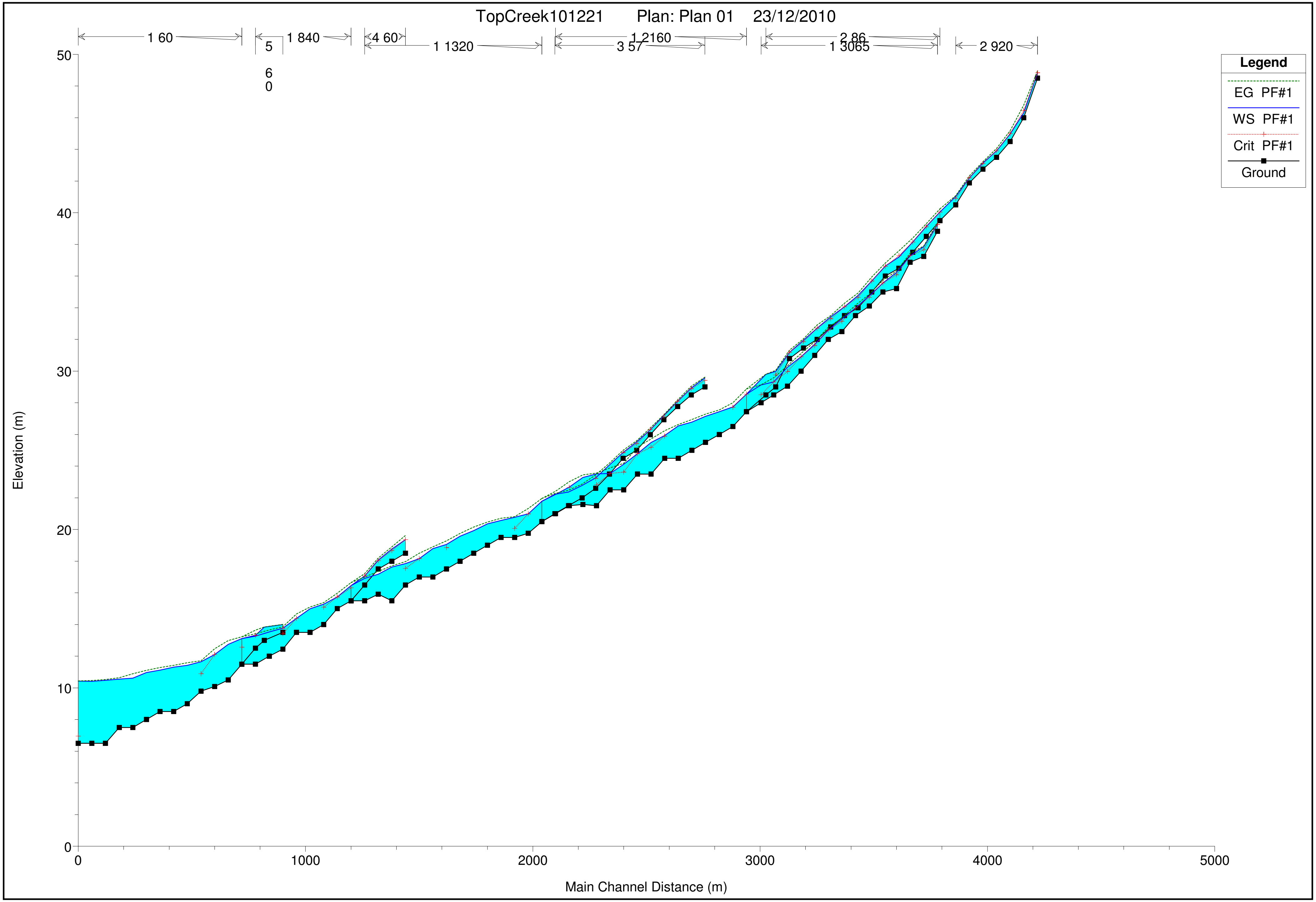

NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 80
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
16
15
14
13
12
11
10
-60
-40
-20
0
20
40
60



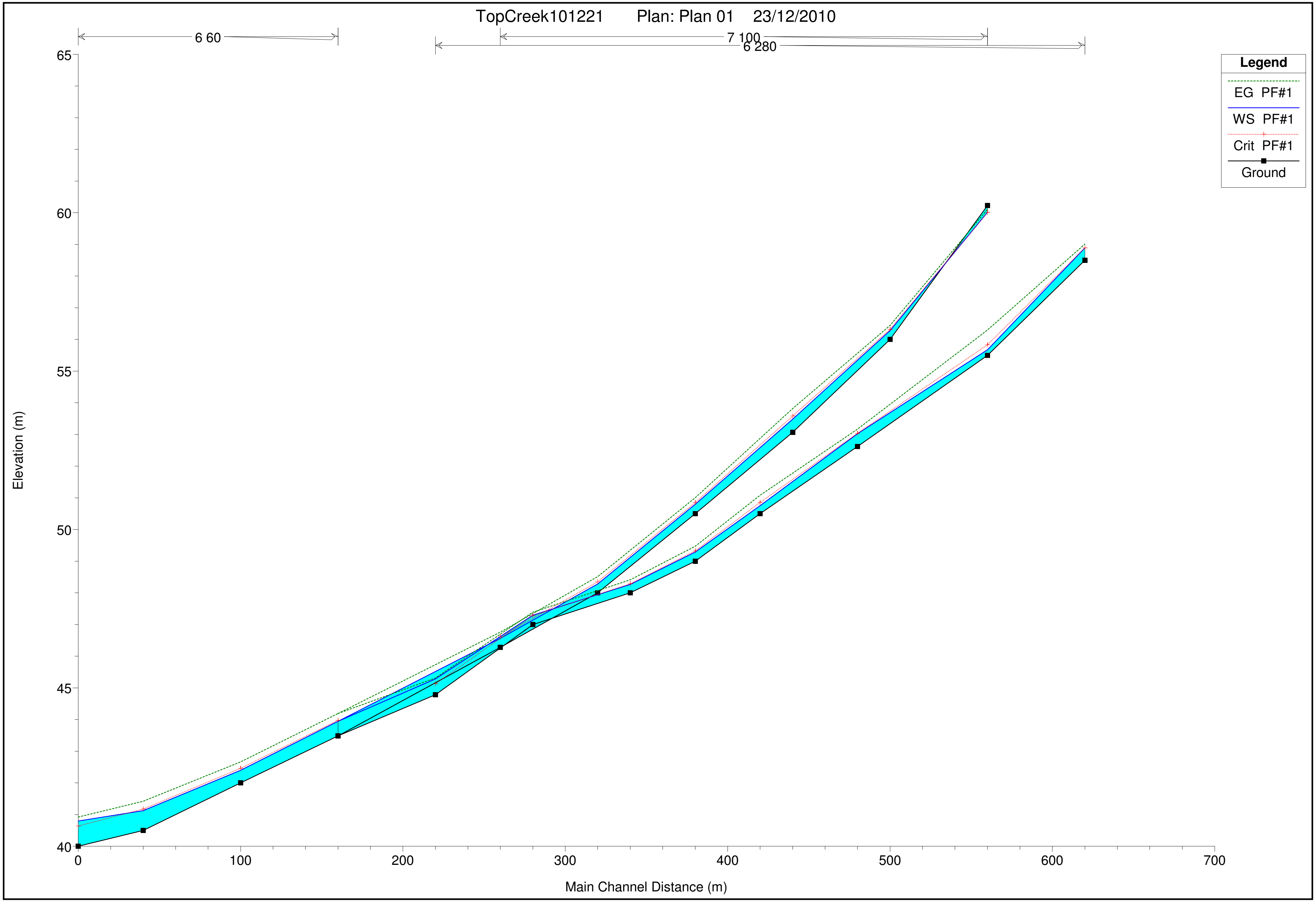
NWCreek101216 Plan: Plan 01 18/12/2010
River = NWcreek Reach = 40 RS = 40
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)



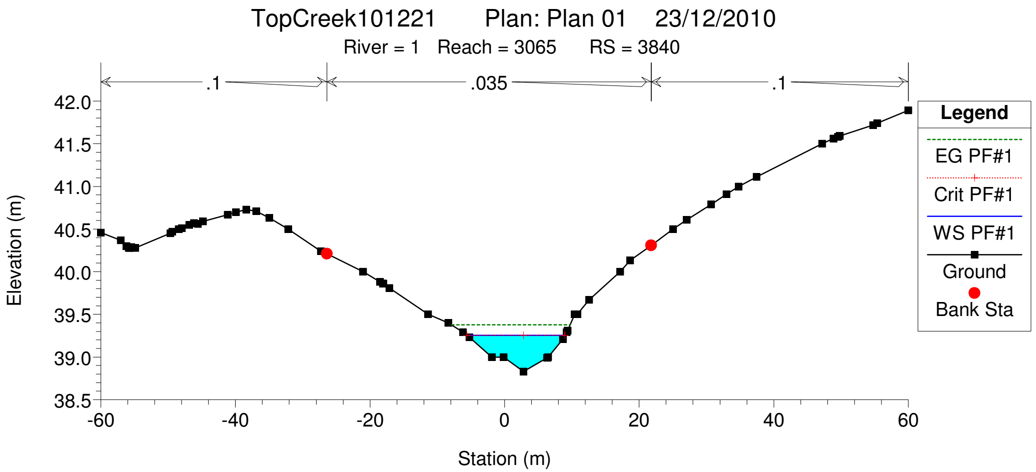
Some schematic data outside default extents (see View/Set Schematic Plot Extents...)

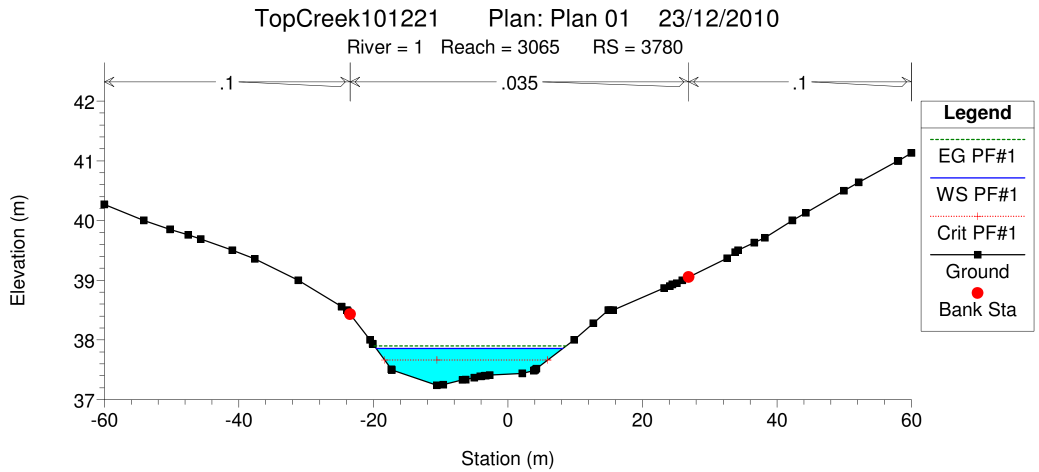


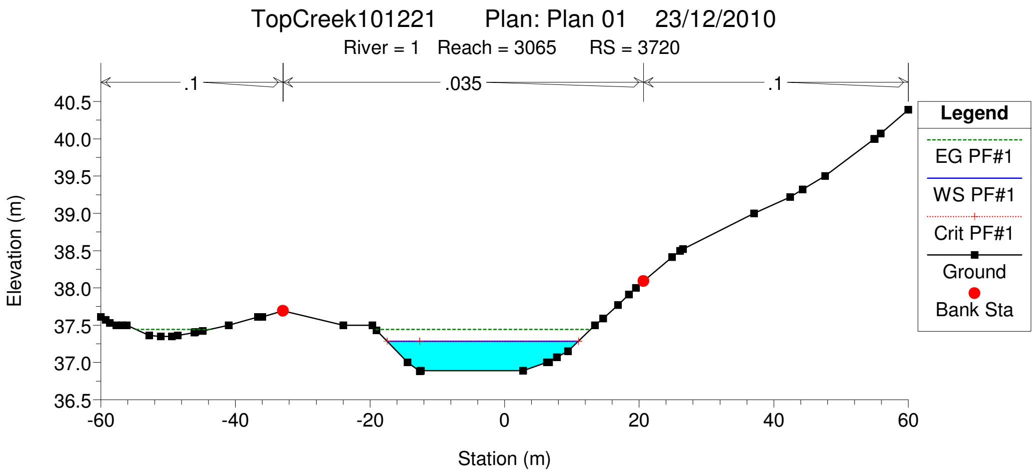
TopCreek101221 Plan: Plan 01 23/12/2010
1 60
5
6
0
1 840
4 60
1 1320
1 2160
3 57
2 86
1 3065
2 920
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Elevation (m)
Main Channel Distance (m)
0
10
20
30
40
50
1000
2000
3000
4000
5000

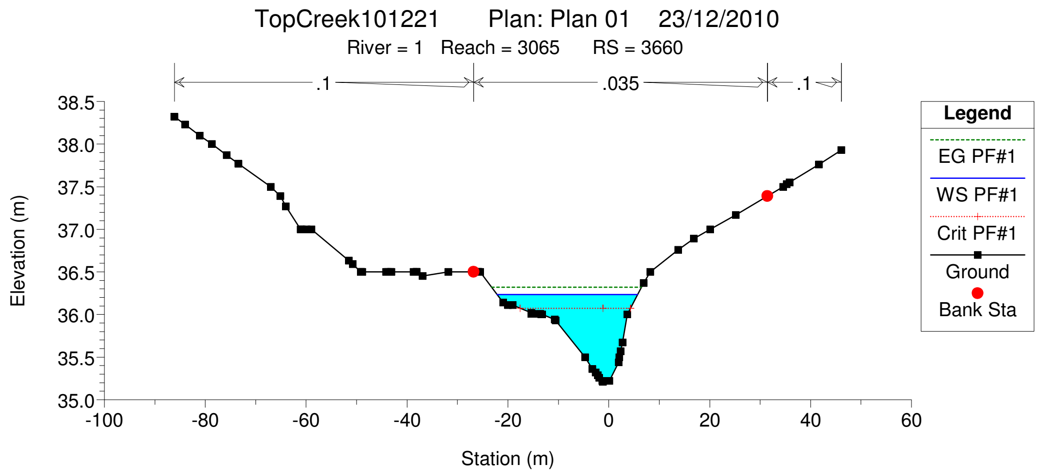


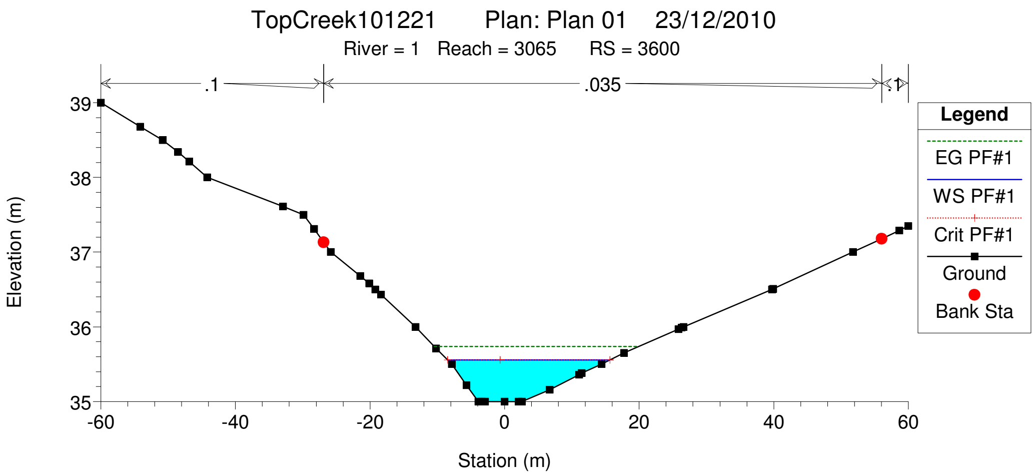
TopCreek101221 Plan: Plan 01 23/12/2010
6 60
7 100
6 280
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Elevation (m)
Main Channel Distance (m)
65
60
55
50
45
40
0
100
200
300
400
500
600
700

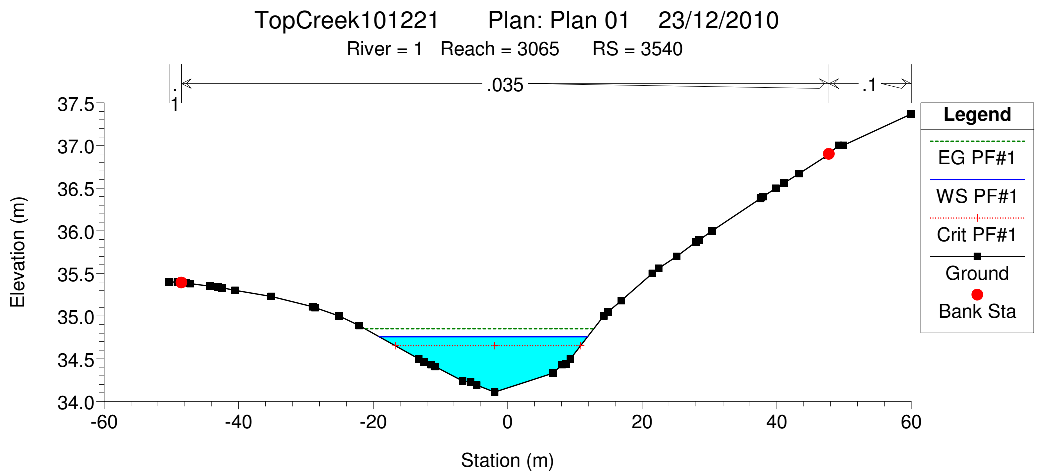

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3840
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

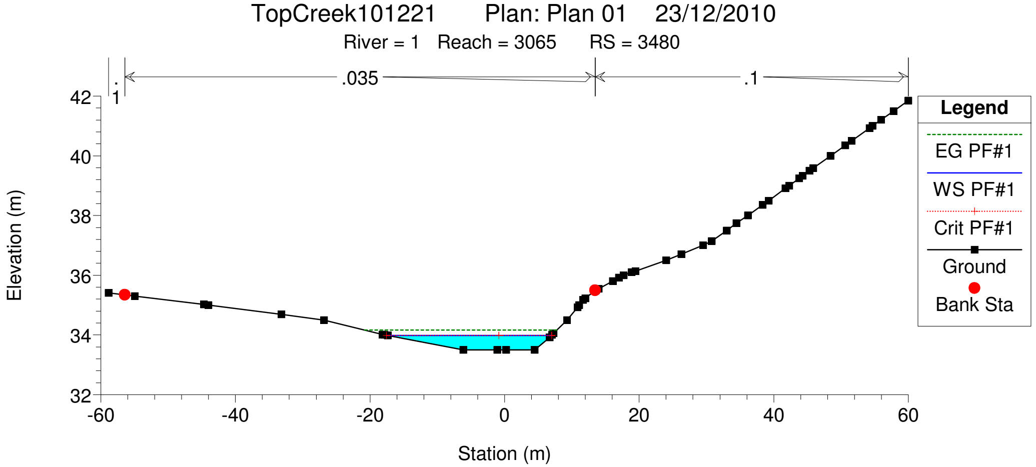

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3780
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

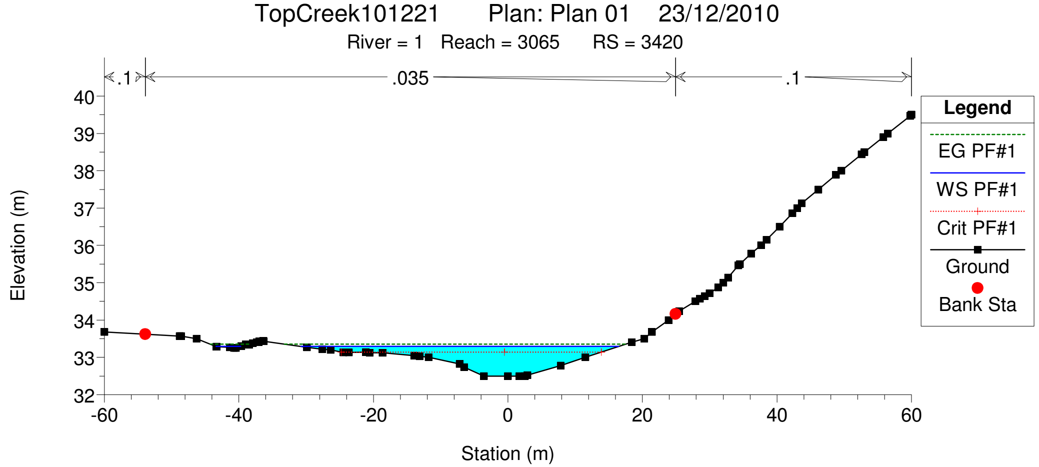

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3720
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

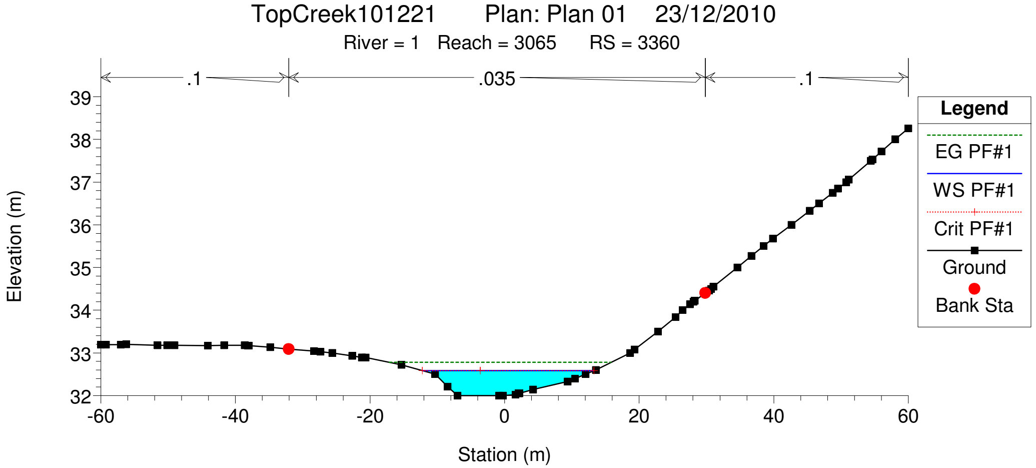

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3660
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

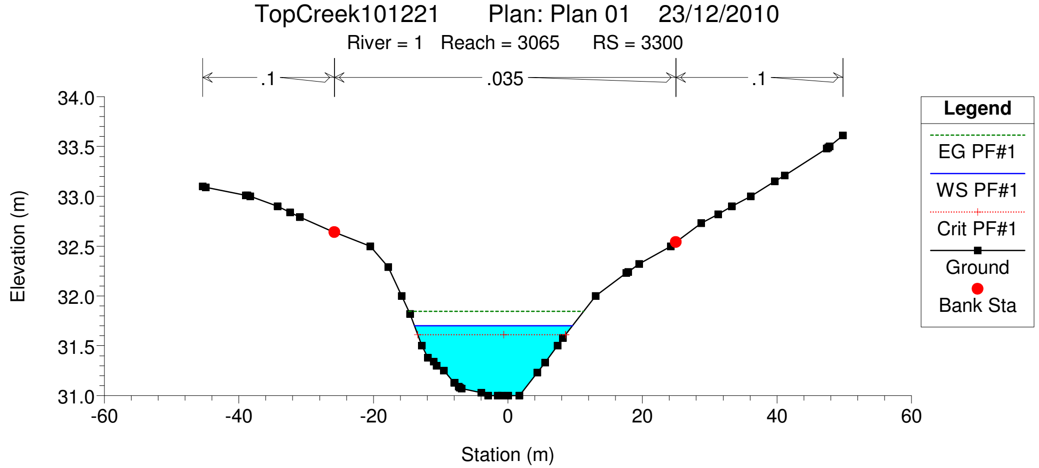

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3600
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

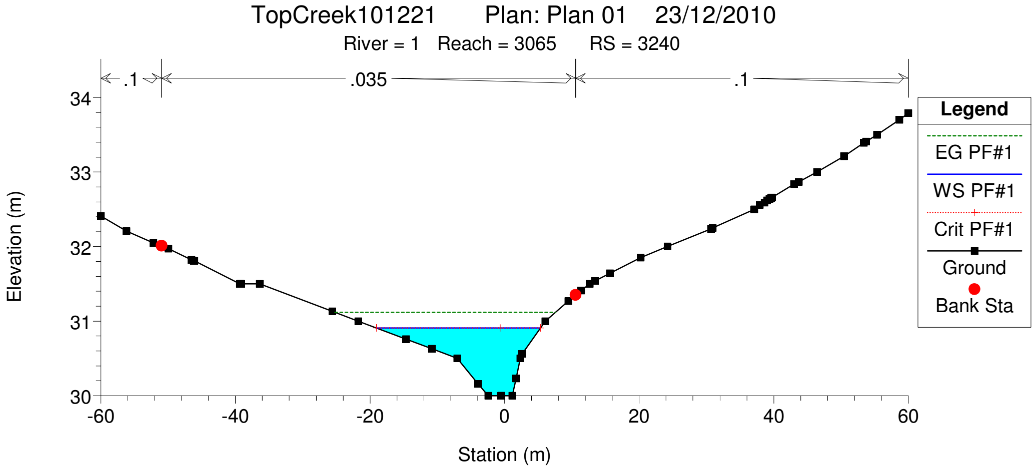

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3540
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

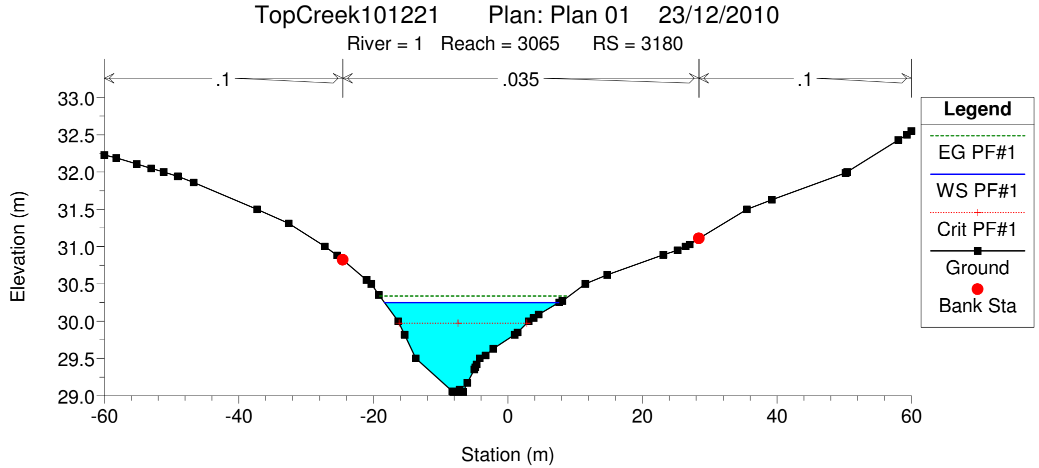

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3480
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

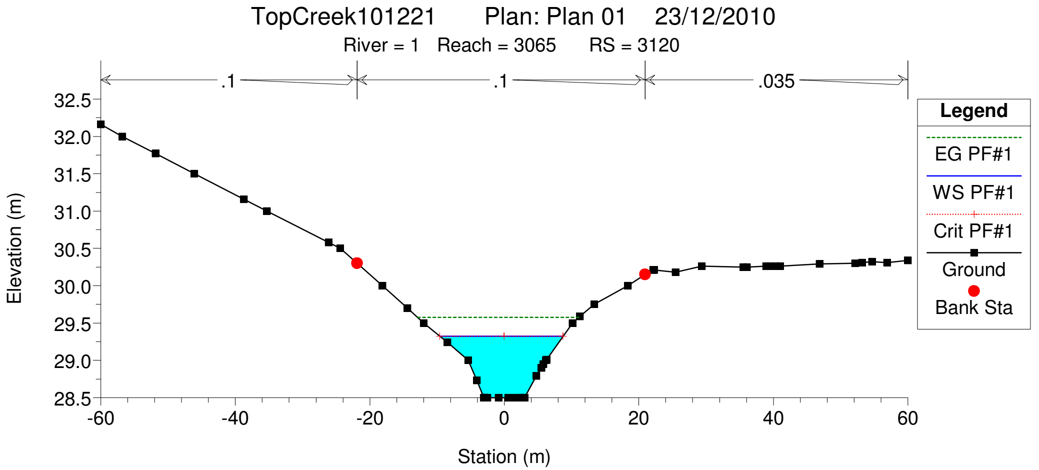

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3420
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

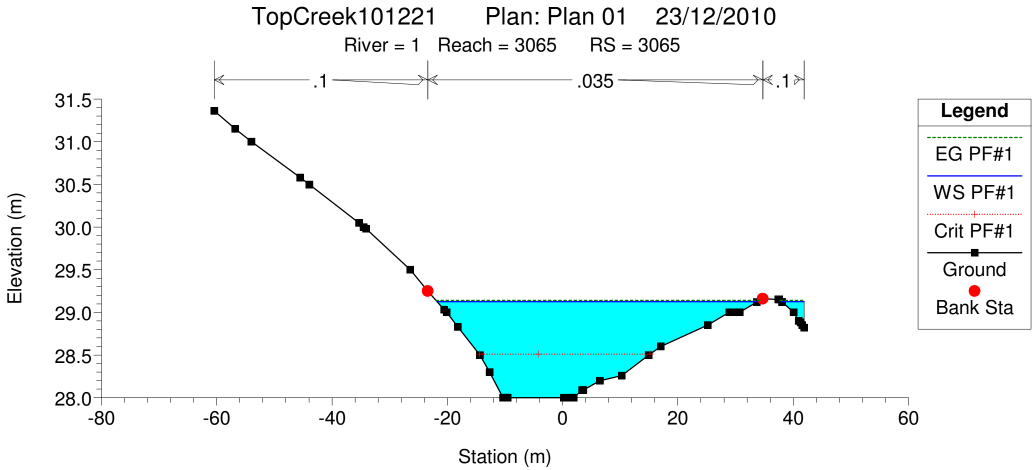

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3360
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

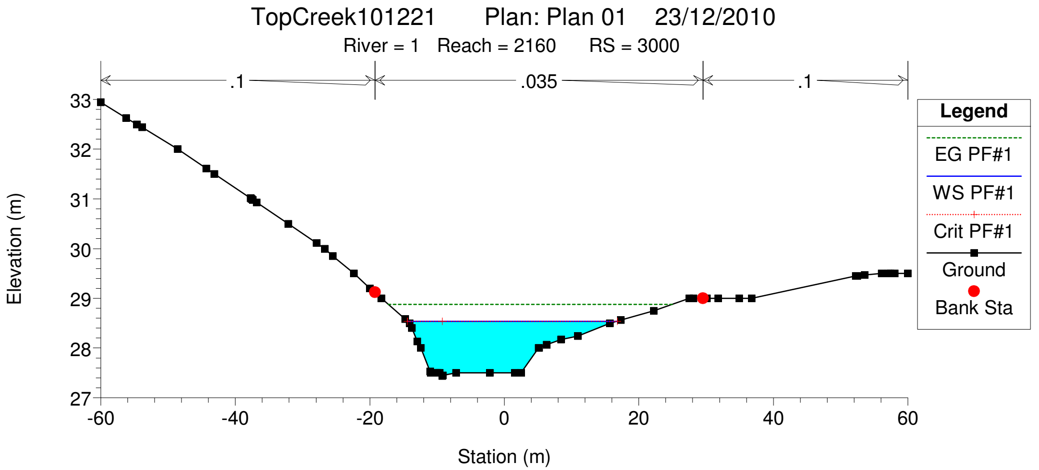

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3300
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

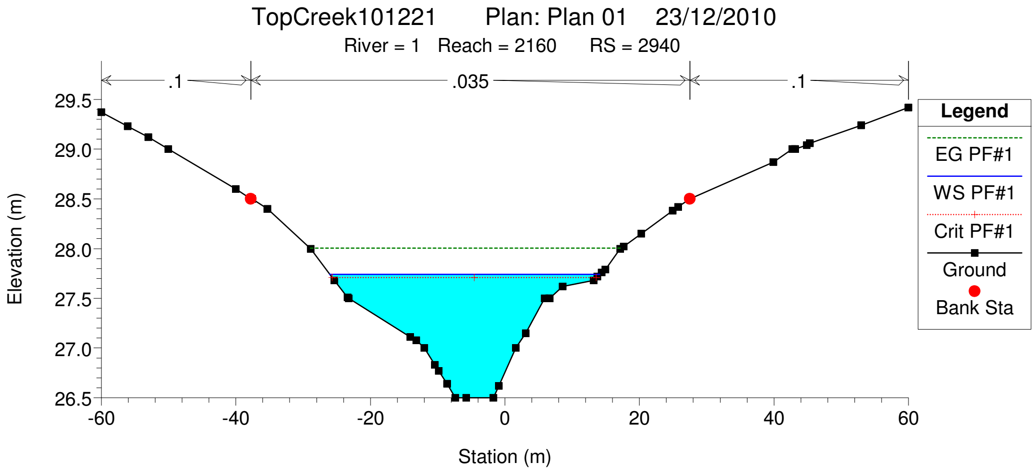

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3240
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

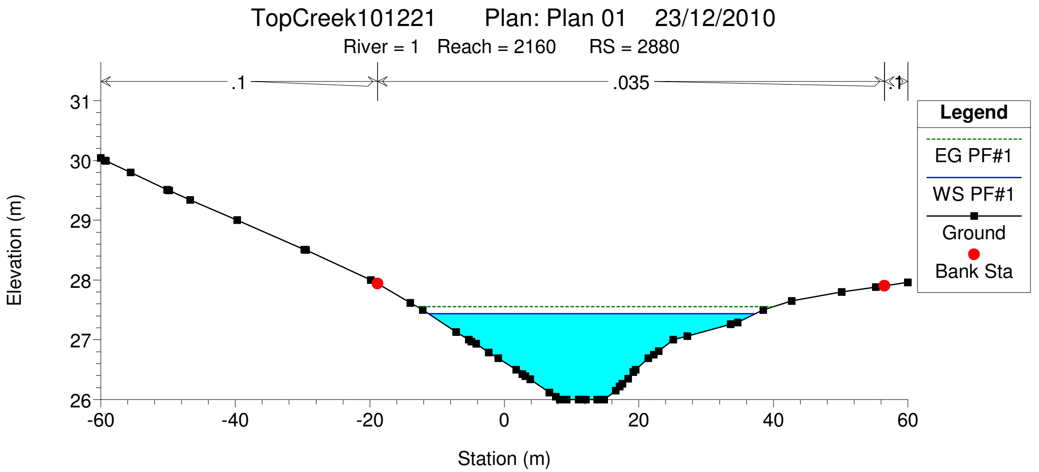

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3180
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

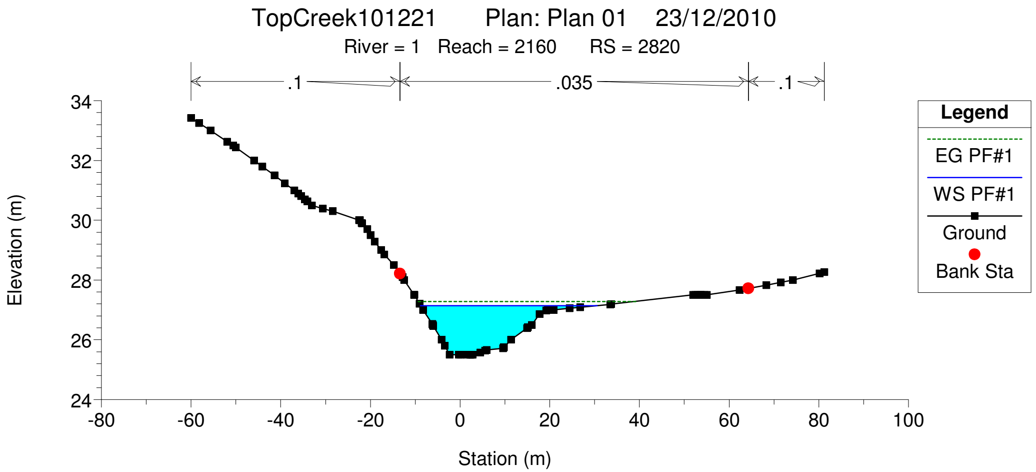

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3120
.1
.1
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

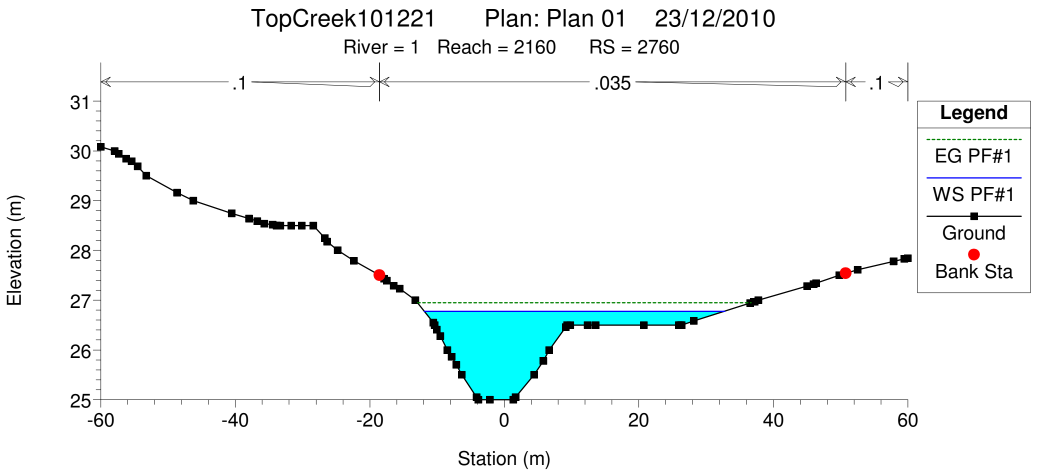

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 3065 RS = 3065
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

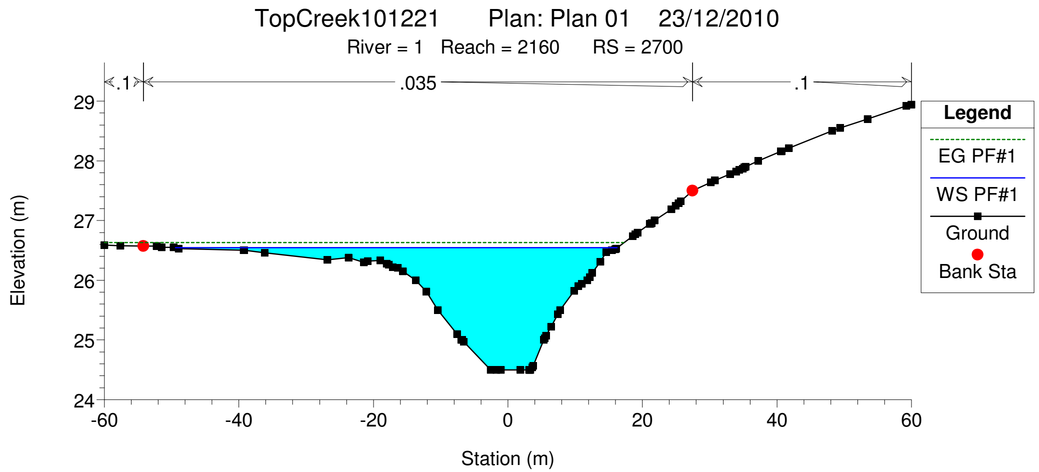

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 3000
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

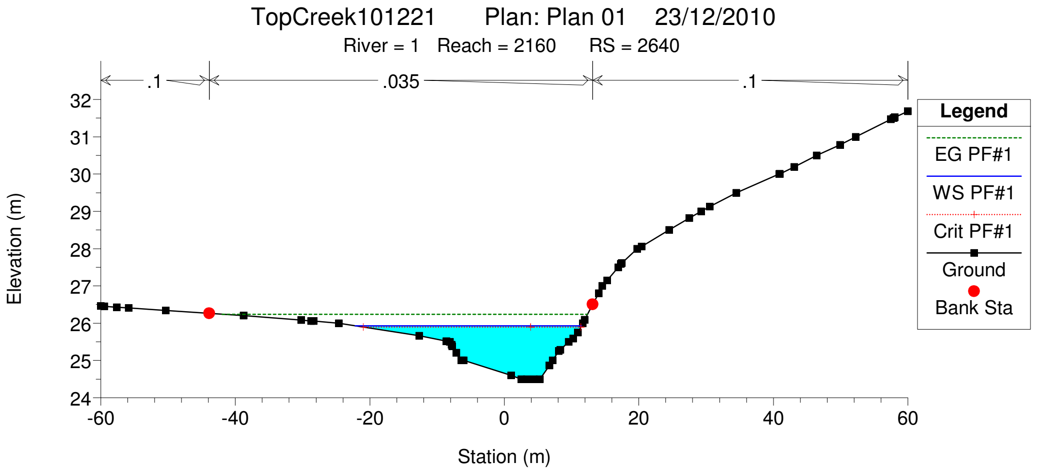

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2940
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

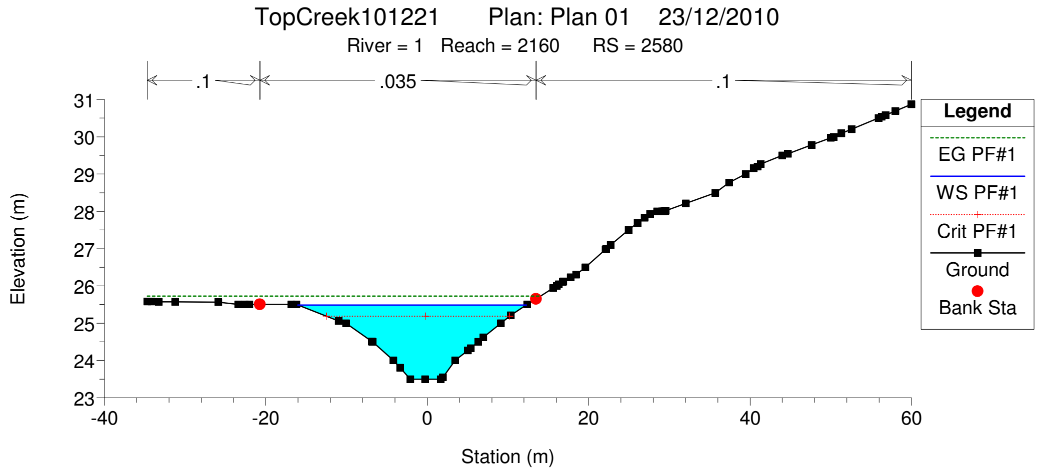

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2880
.1
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

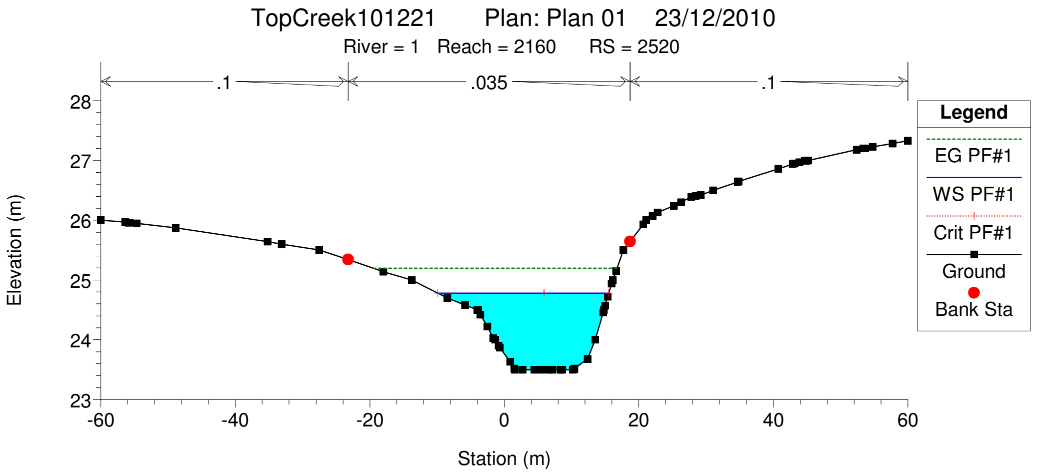

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2820
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

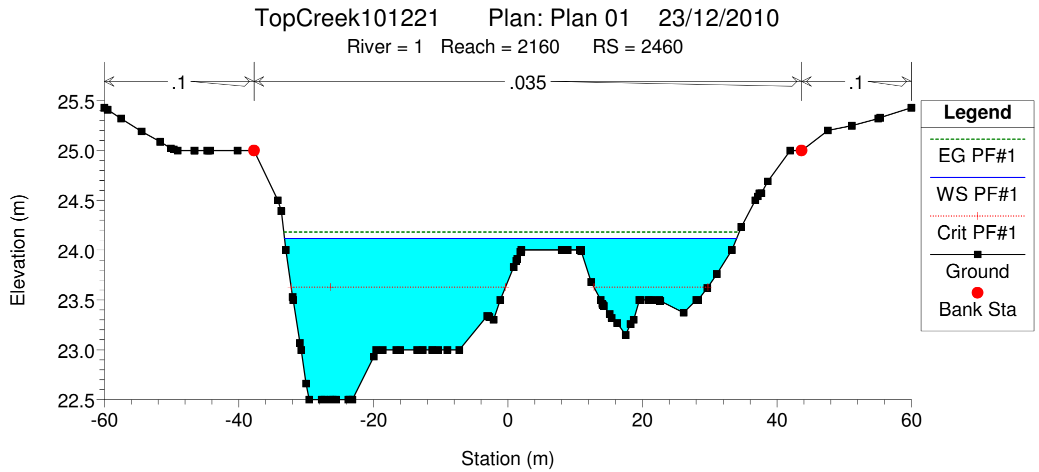

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2760
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

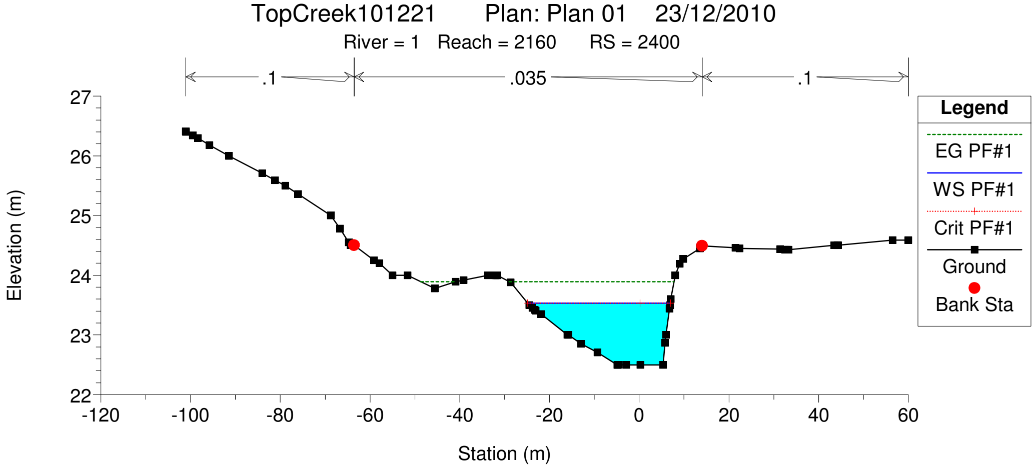

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2700
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

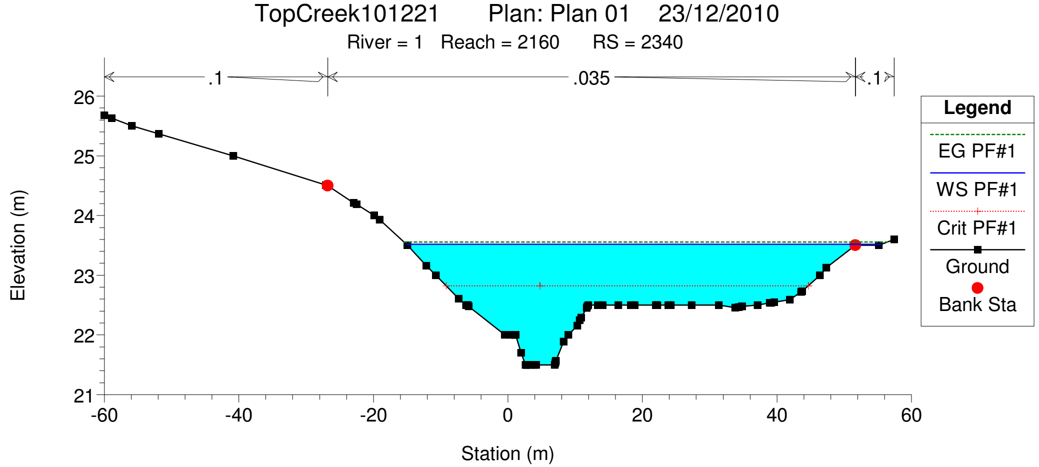

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2640
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

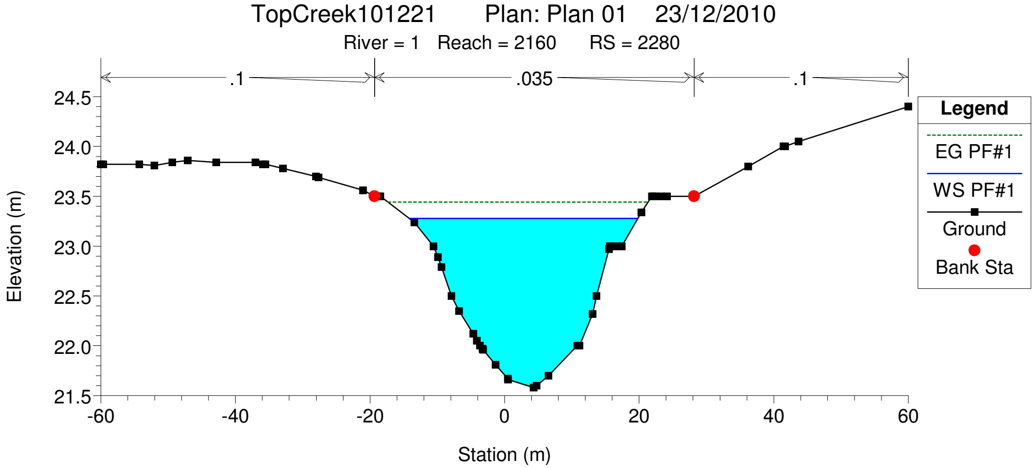

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2580
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

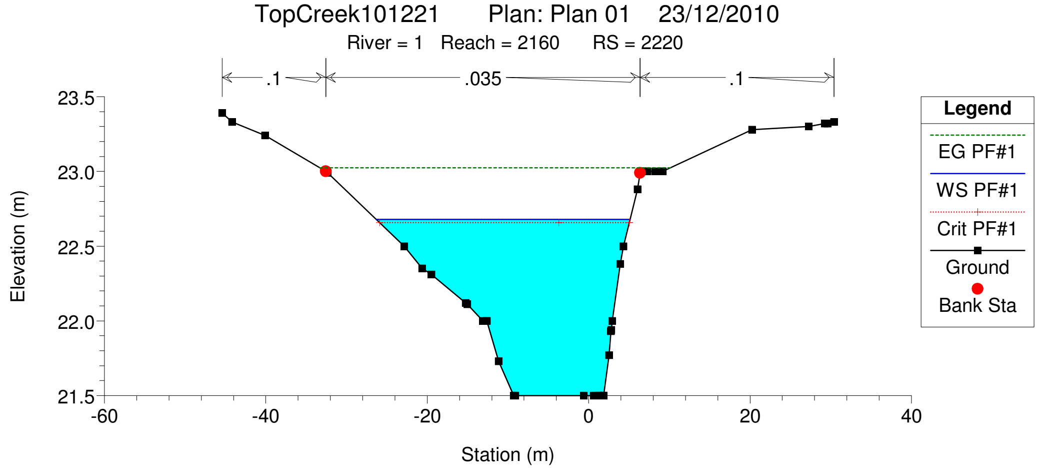

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2520
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

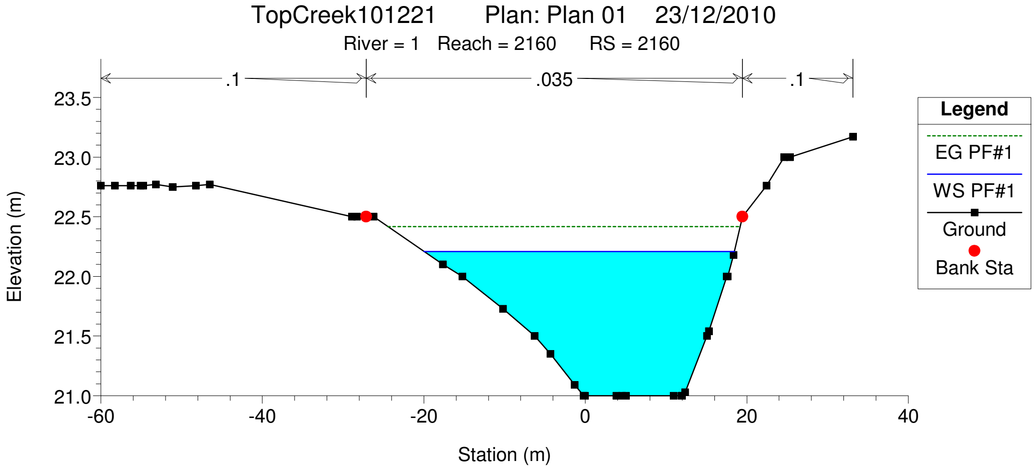

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2460
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

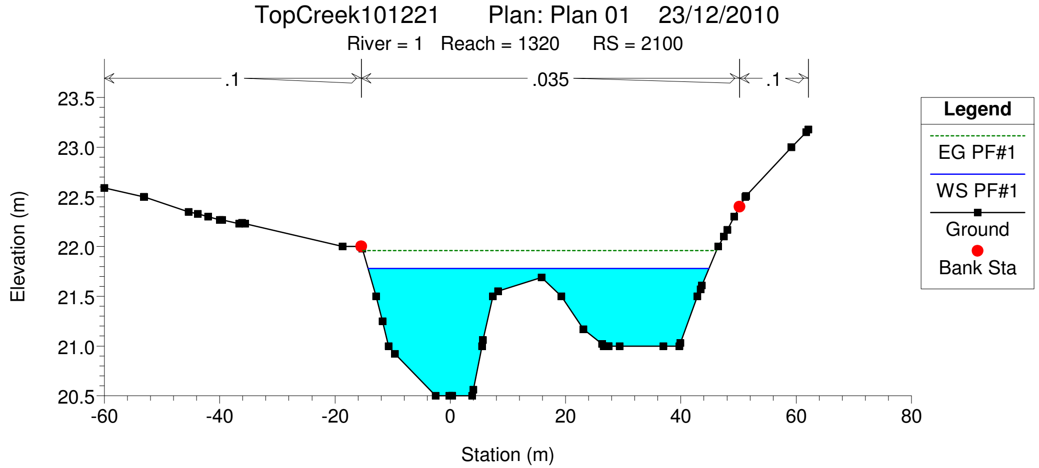

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2400
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
22
23
24
25
26
27
-120
-100
-80
-60
-40
-20
0
20
40
60

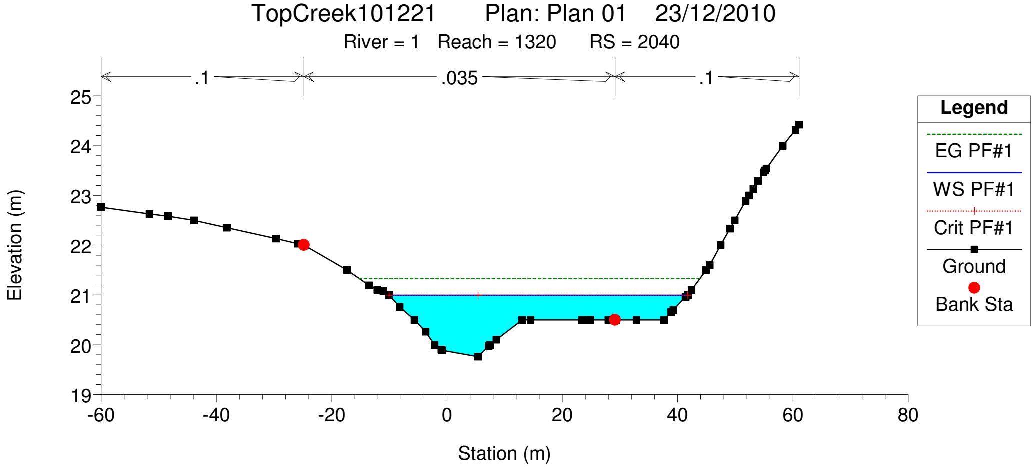

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2340
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
21
22
23
24
25
26
-60
-40
-20
0
20
40
60

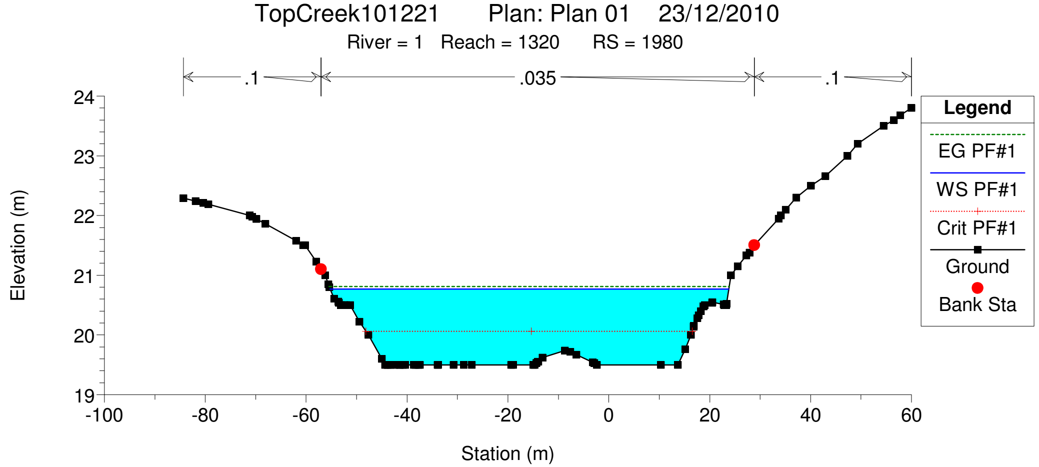

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2280
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
21.5
22.0
22.5
23.0
23.5
24.0
24.5
-60
-40
-20
0
20
40
60

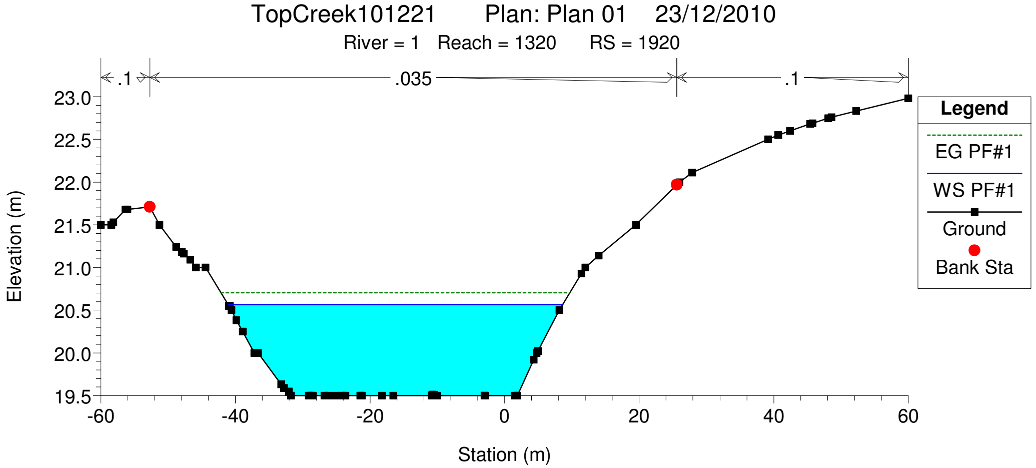

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2220
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
21.5
22.0
22.5
23.0
23.5
-60
-40
-20
0
20
40

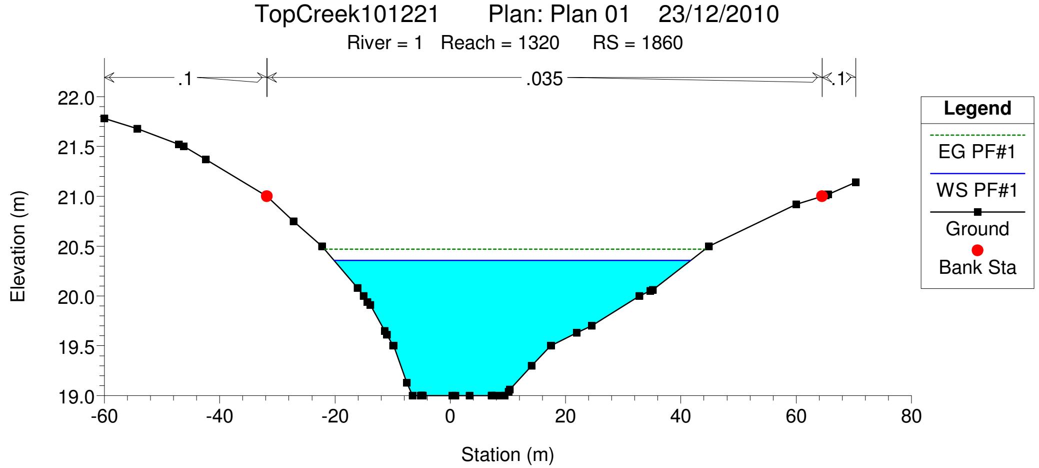

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 2160 RS = 2160
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
21.0
21.5
22.0
22.5
23.0
23.5
-60
-40
-20
0
20
40

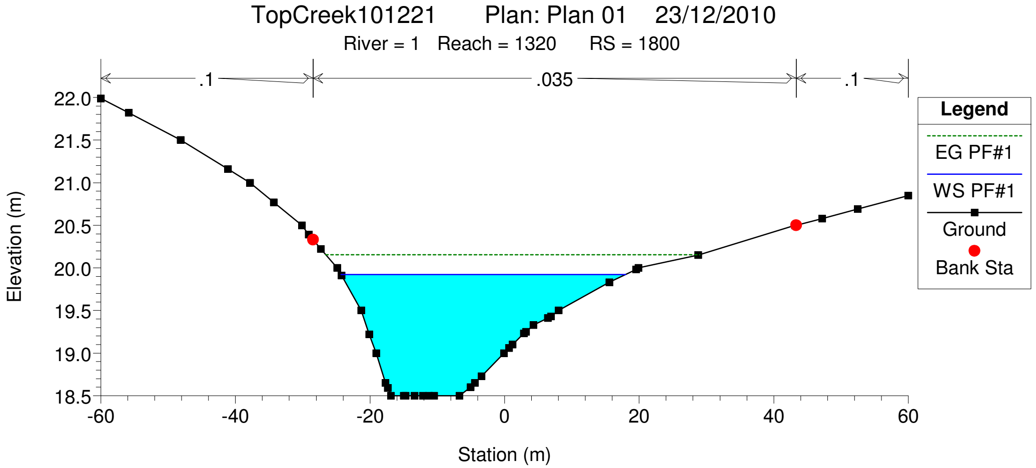

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 2100
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
20.5
21.0
21.5
22.0
22.5
23.0
23.5
-60
-40
-20
0
20
40
60
80

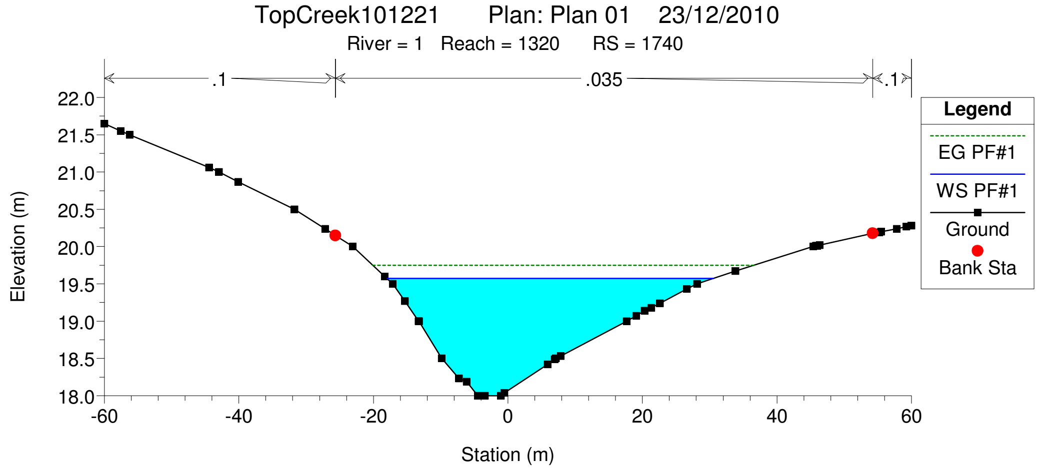

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 2040
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

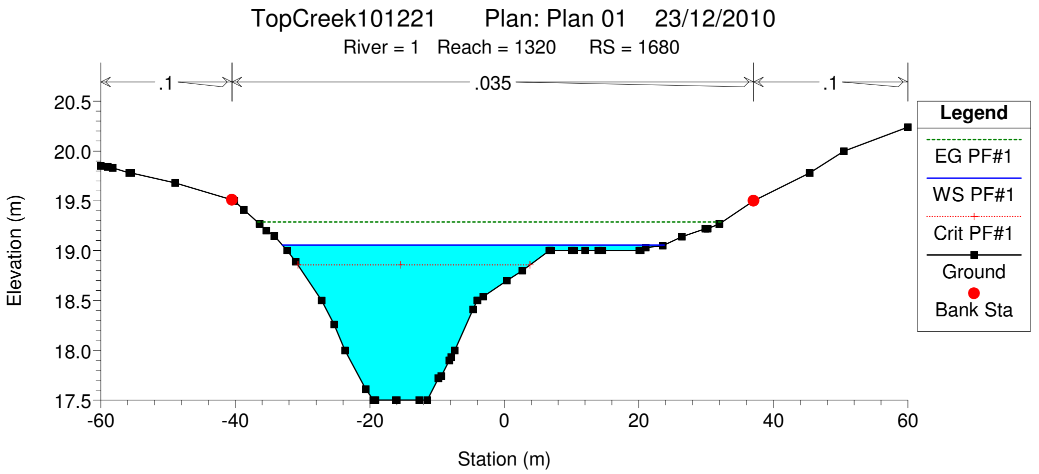

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1980
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

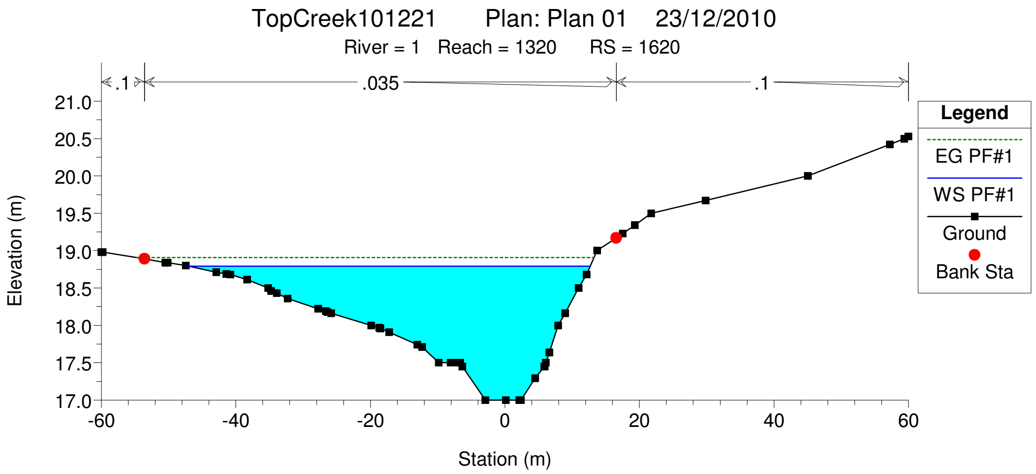

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1920
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

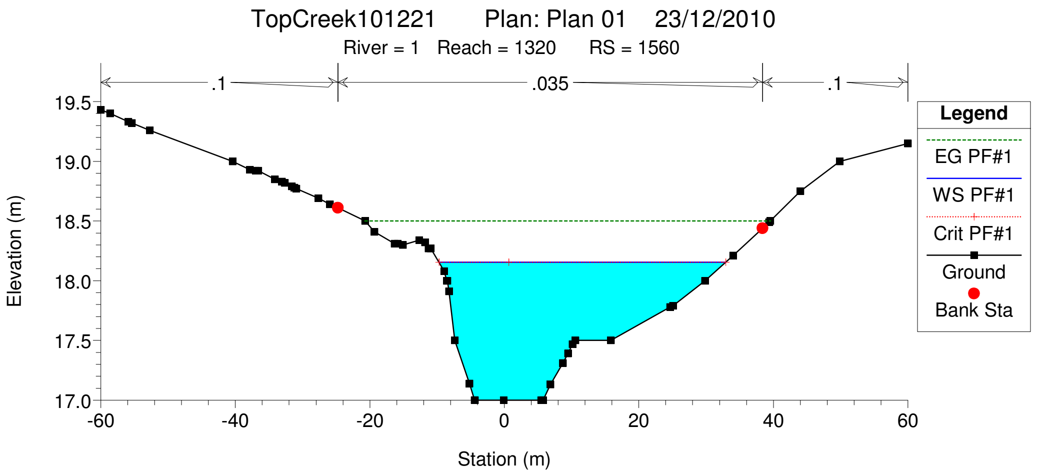

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1860
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

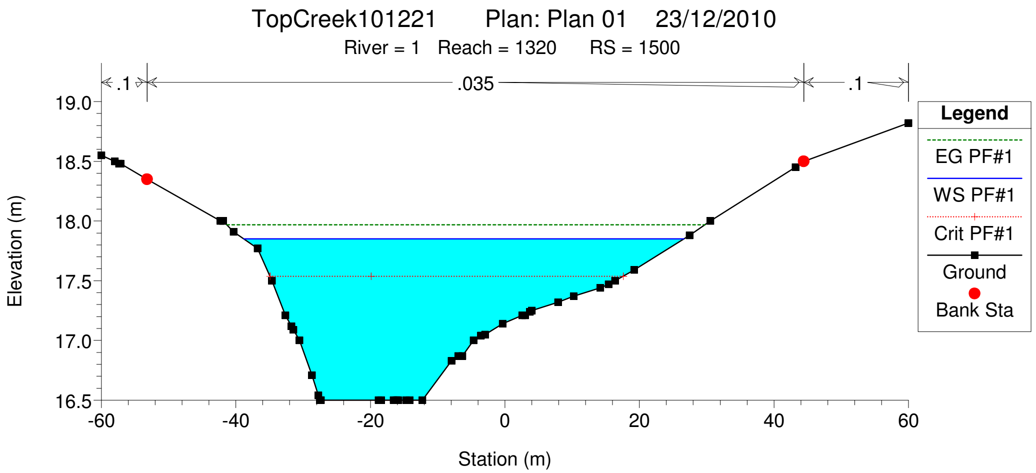

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1800
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1740
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1680
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
20.5
20.0
19.5
19.0
18.5
18.0
17.5
-60
-40
-20
0
20
40
60


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1620
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
21.0
20.5
20.0
19.5
19.0
18.5
18.0
17.5
17.0
-60
-40
-20
0
20
40
60


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1560
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
19.5
19.0
18.5
18.0
17.5
17.0
-60
-40
-20
0
20
40
60


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1500
.1
.035
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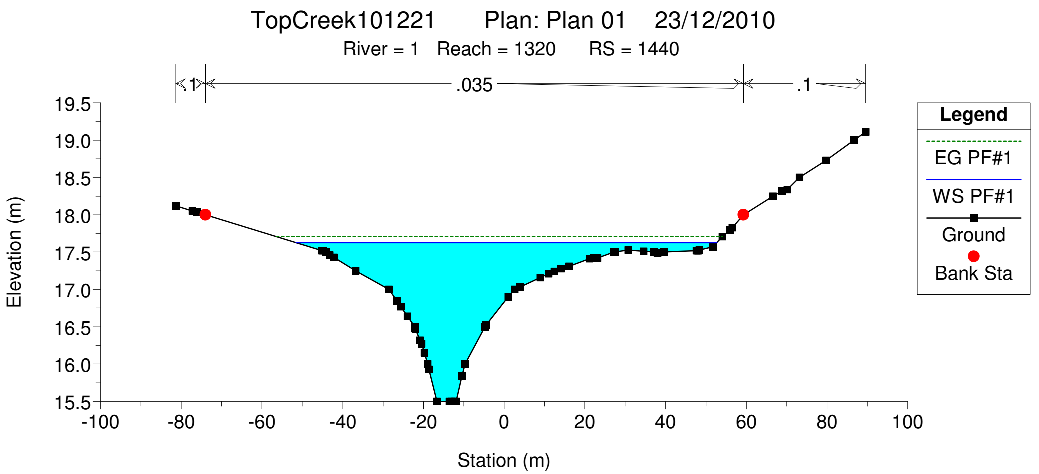
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
19.0
18.5
18.0
17.5
17.0
16.5
-60
-40
-20
0
20
40
60


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1440
.1
.035
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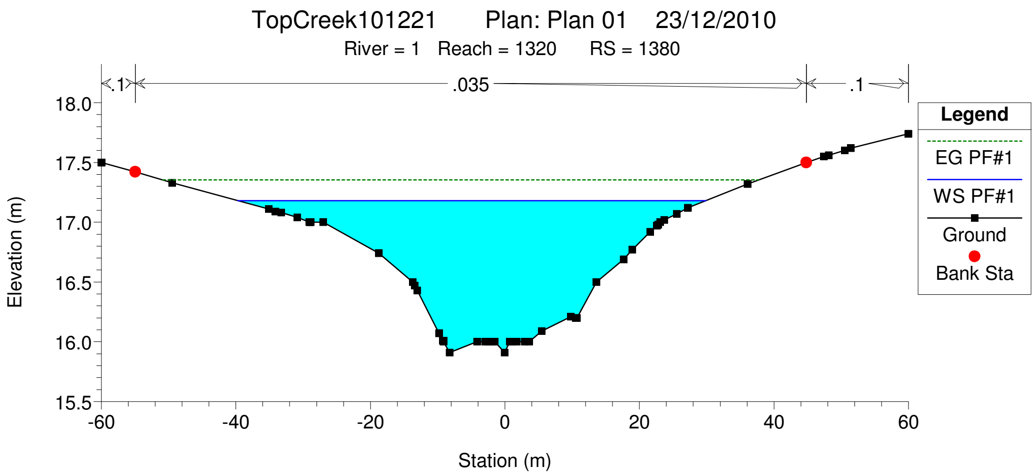
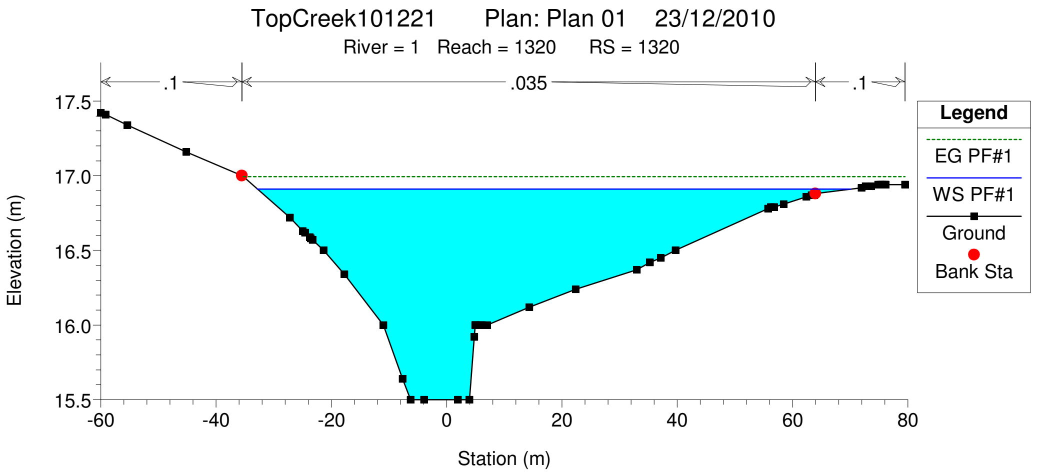
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
19.5
19.0
18.5
18.0
17.5
17.0
16.5
16.0
15.5
-100
-80
-60
-40
-20
0
20
40
60
80
100


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1380
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
18.0
17.5
17.0
16.5
16.0
15.5
-60
-40
-20
0
20
40
60


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 1320 RS = 1320
.1
.035
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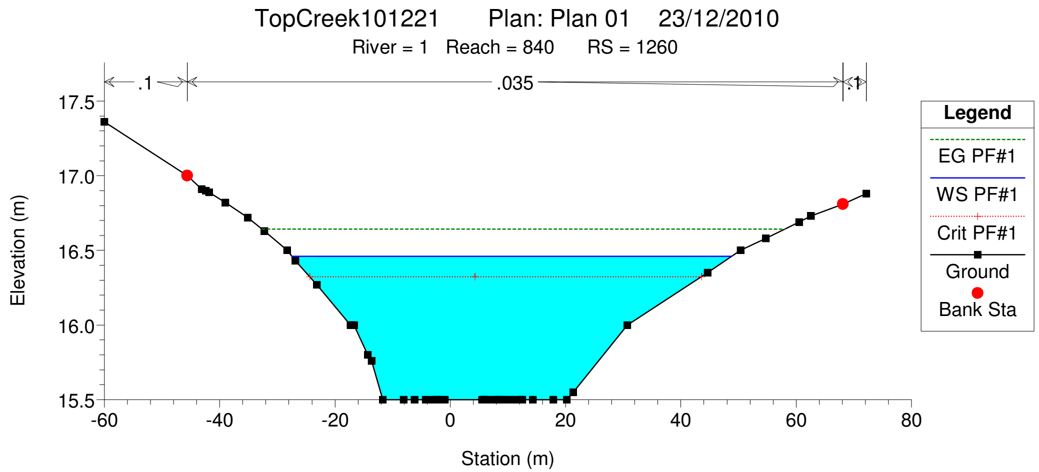
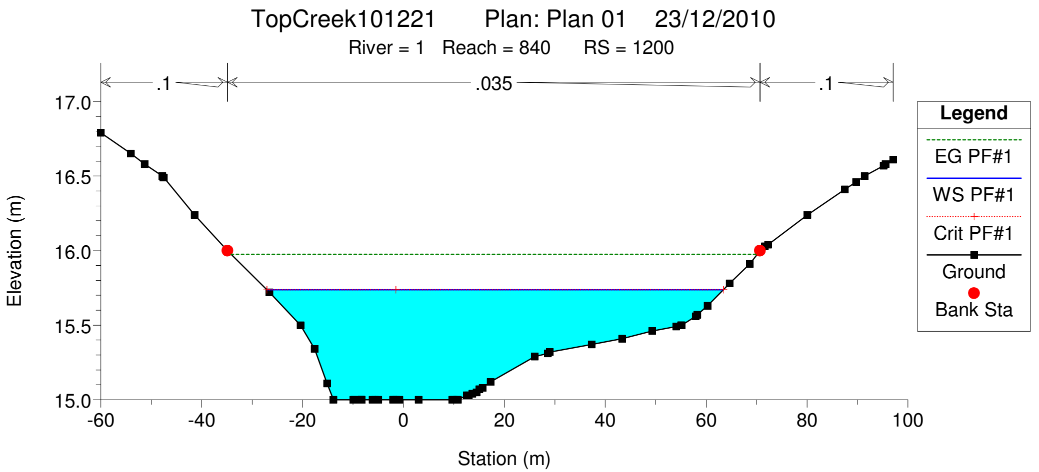
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 840 RS = 1260
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 840 RS = 1200
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.035
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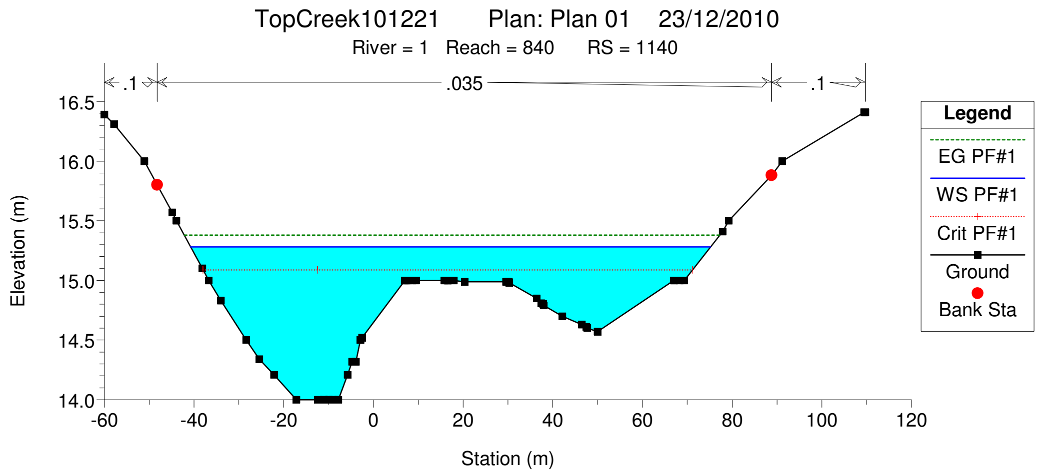
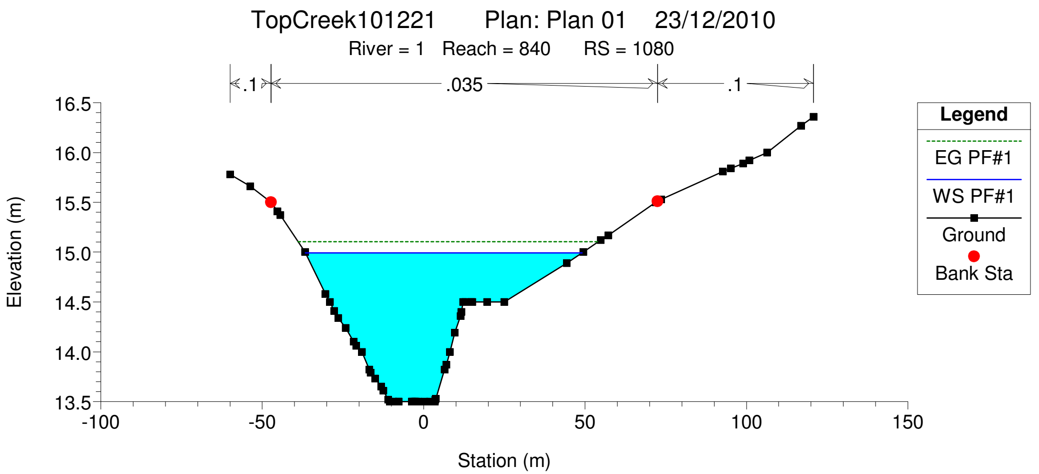
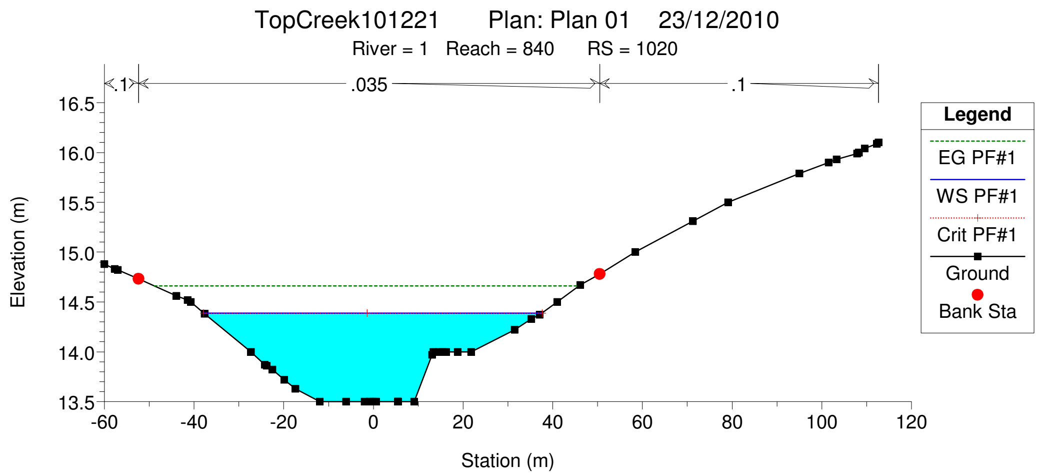
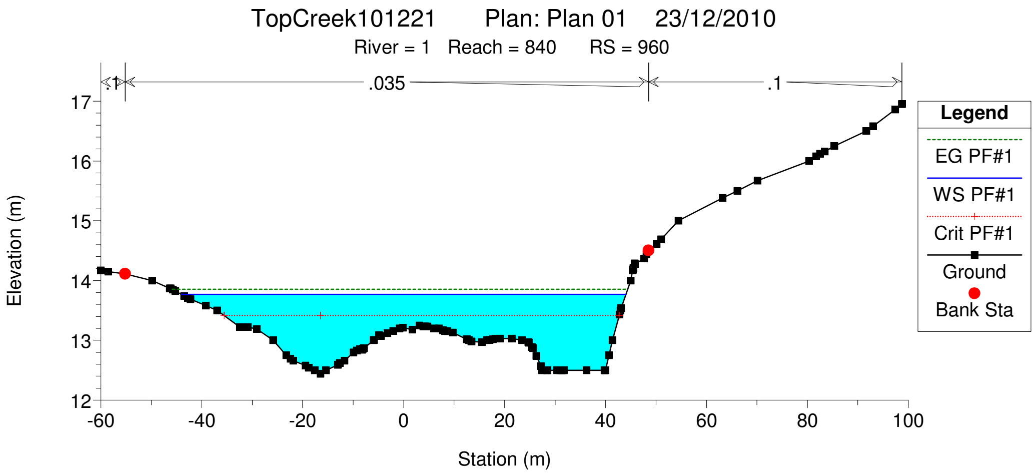
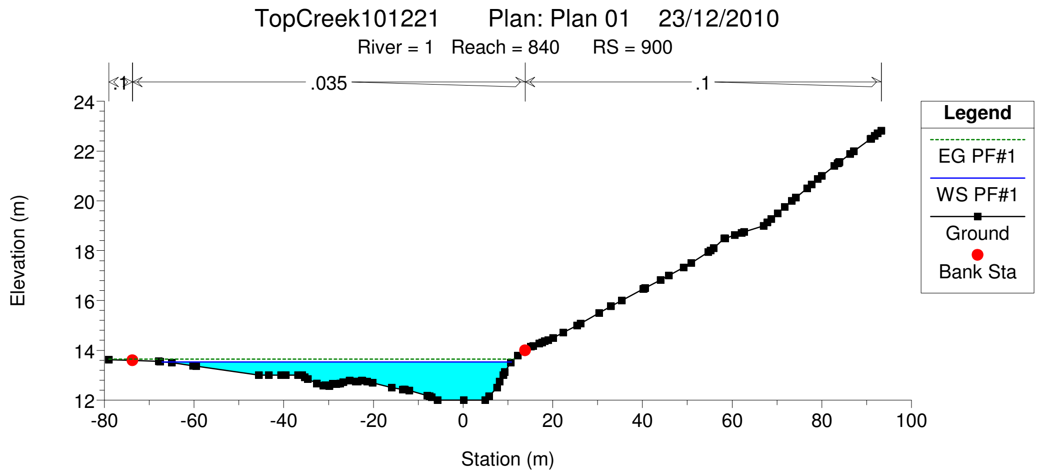
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

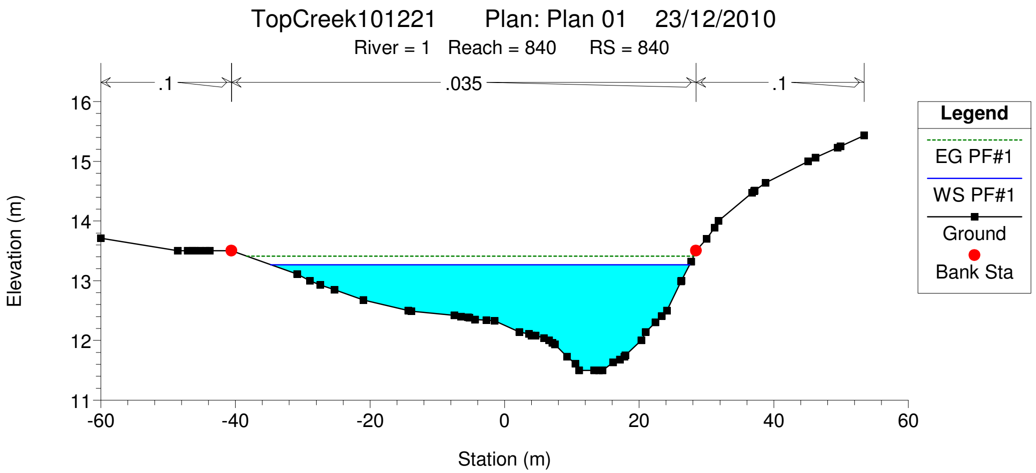

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 840 RS = 1140
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

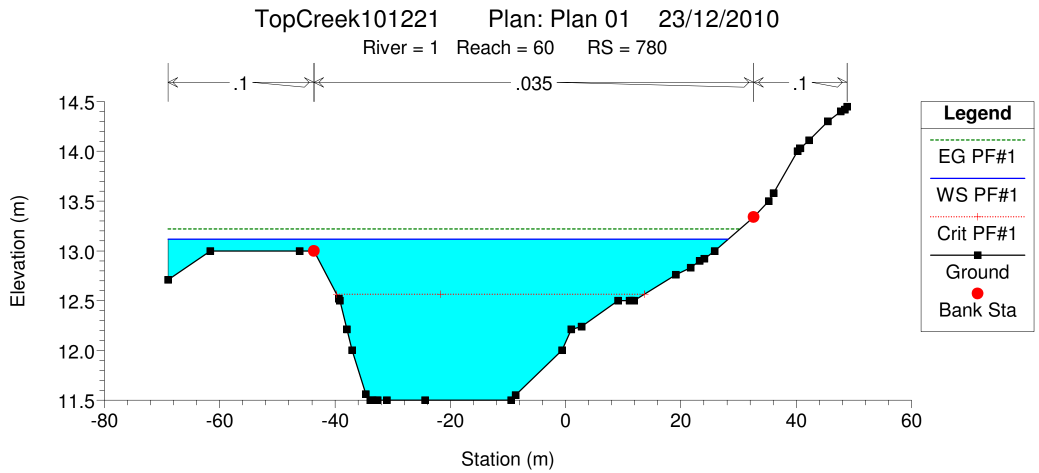

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 840 RS = 1080
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

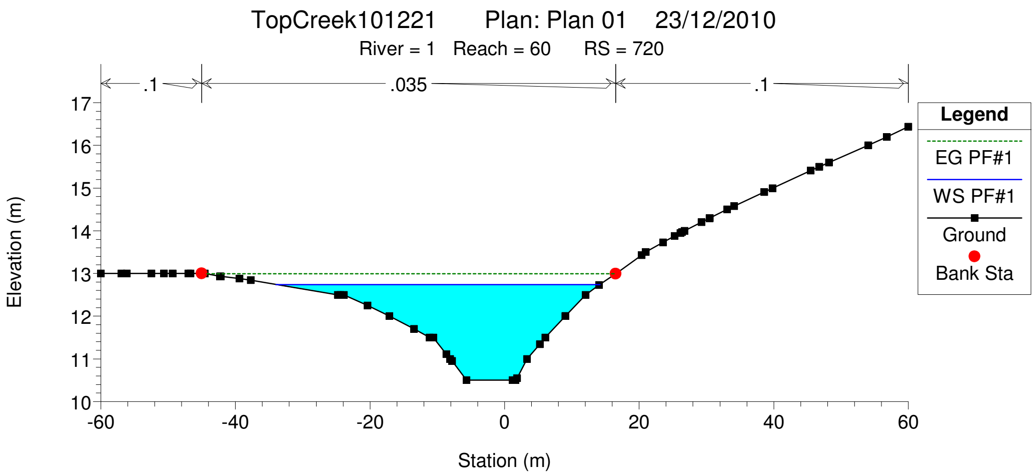

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 840 RS = 1020
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

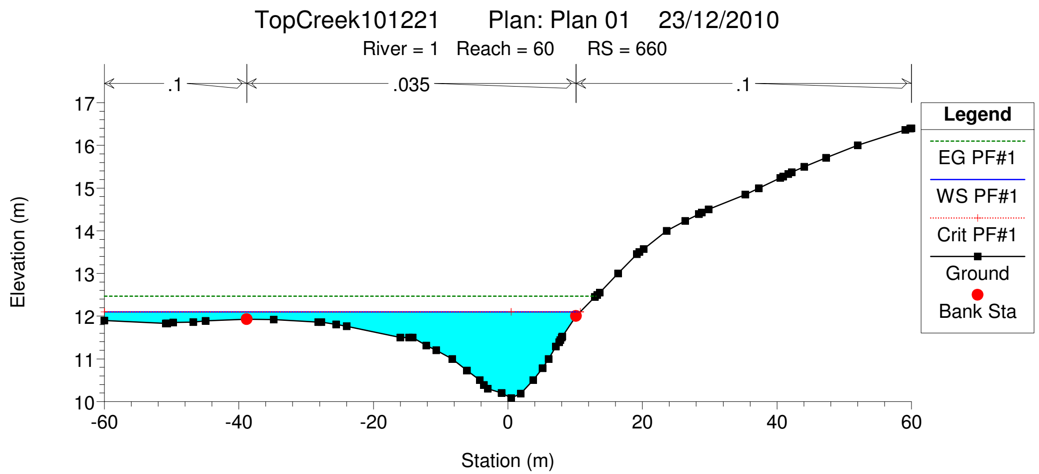

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 840 RS = 960
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

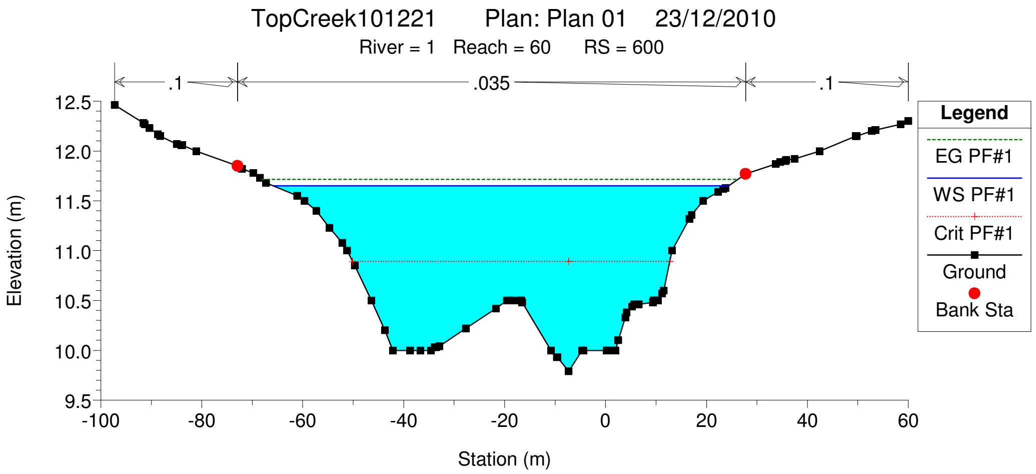

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 840 RS = 900
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

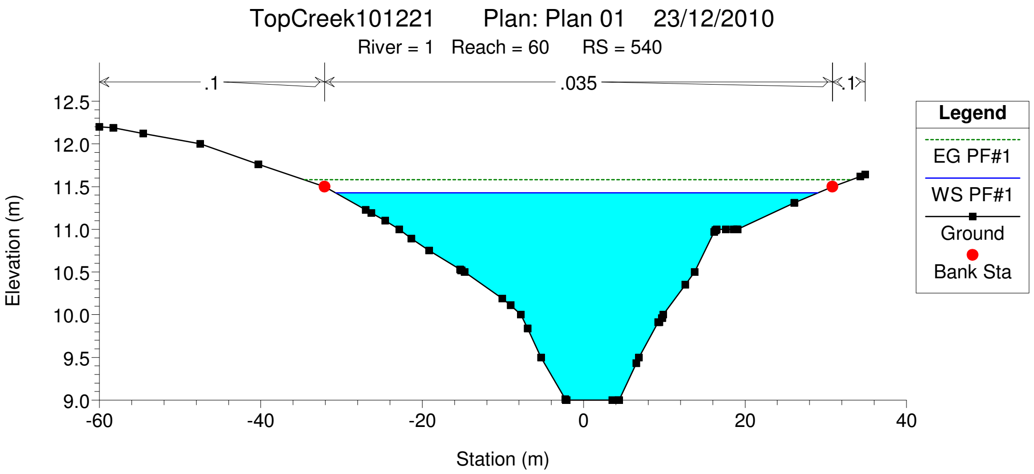

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 840 RS = 840
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

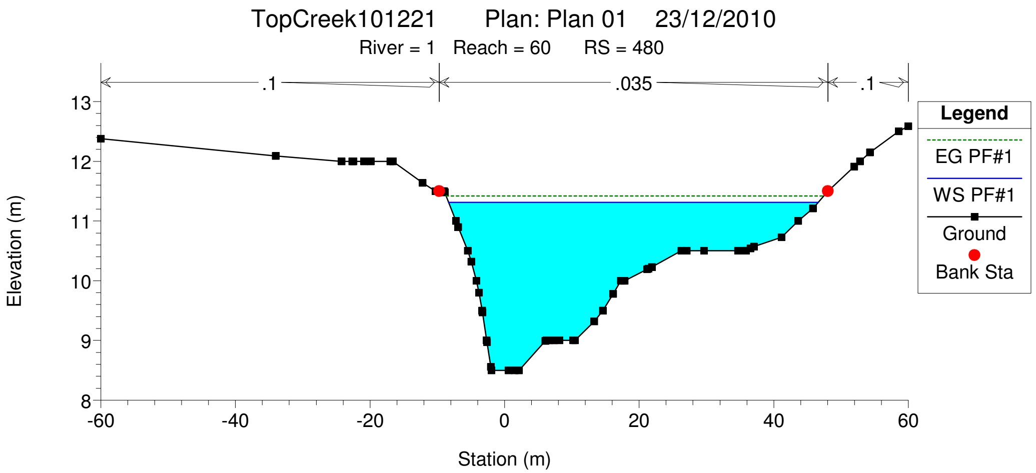

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 780
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

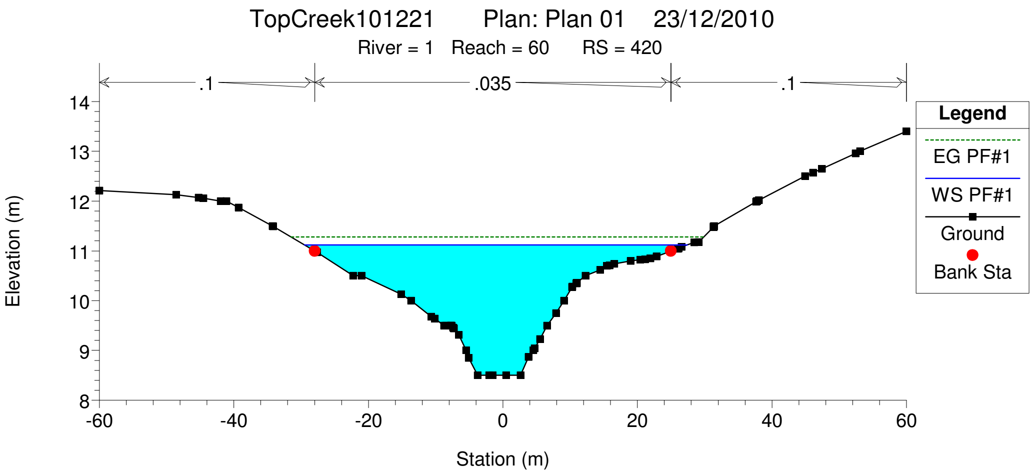

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 720
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

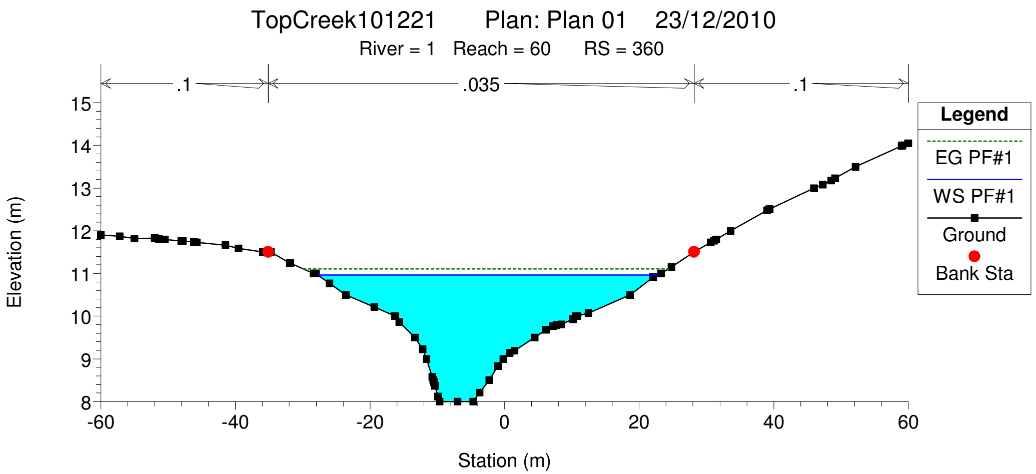

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 660
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

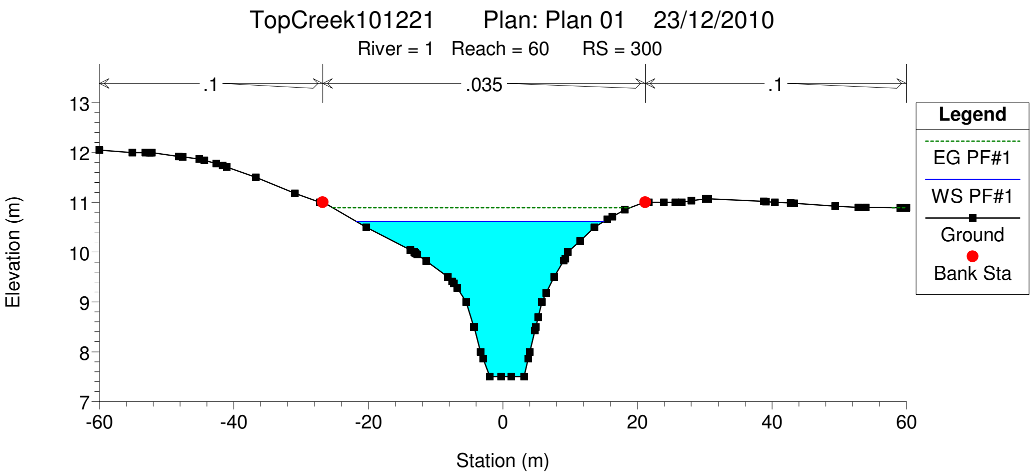

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 600
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

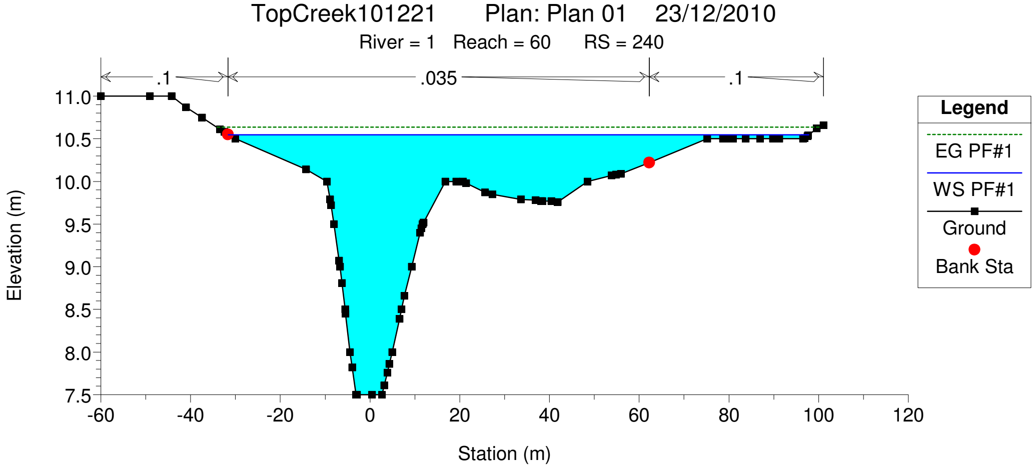

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 540
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

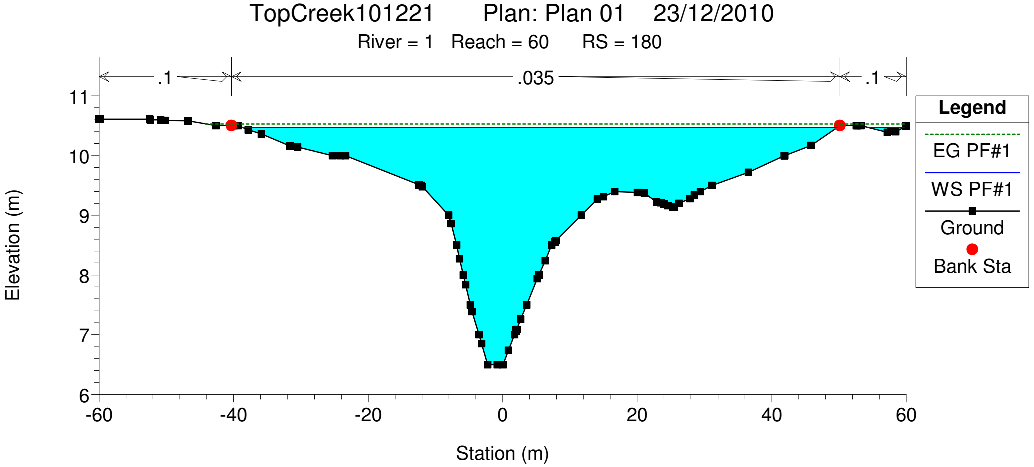

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 480
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

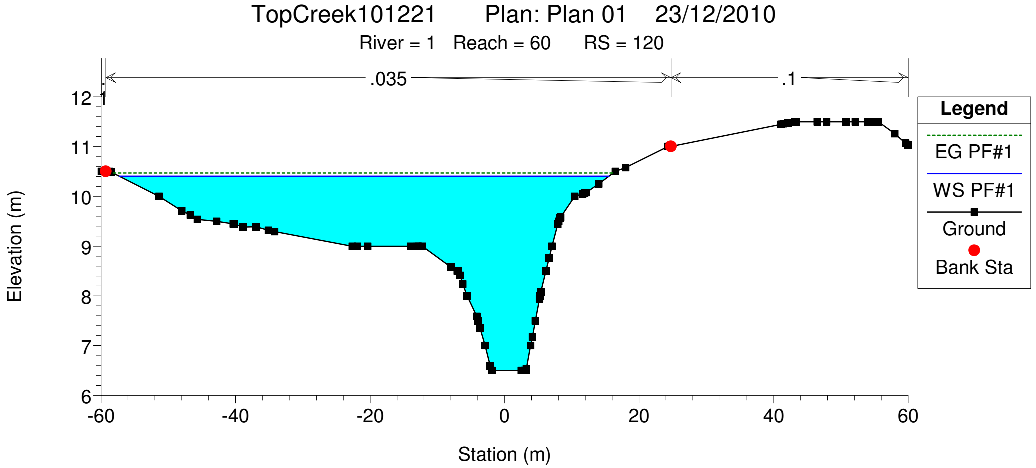

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 420
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

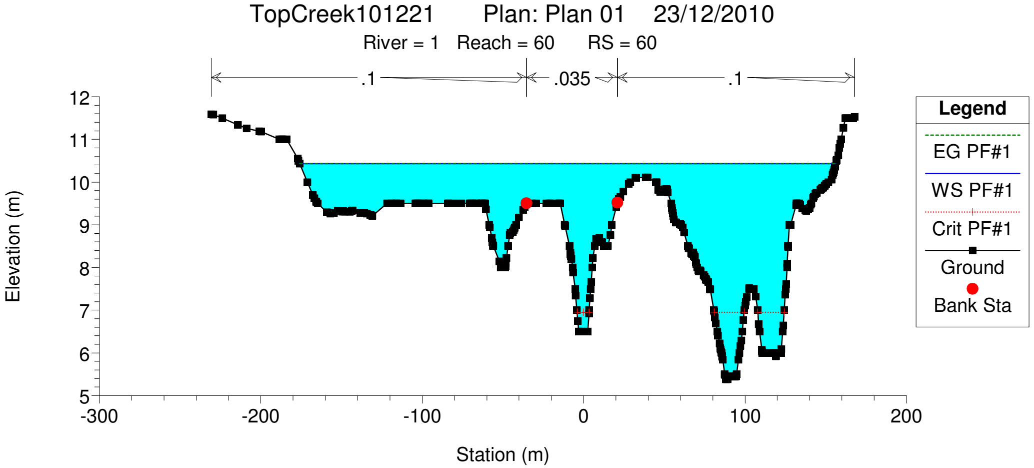

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 360
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

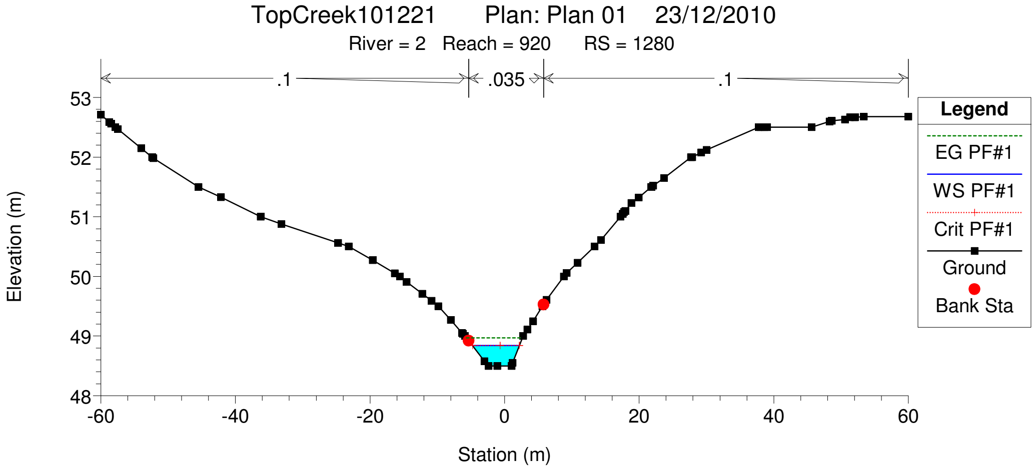

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 300
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

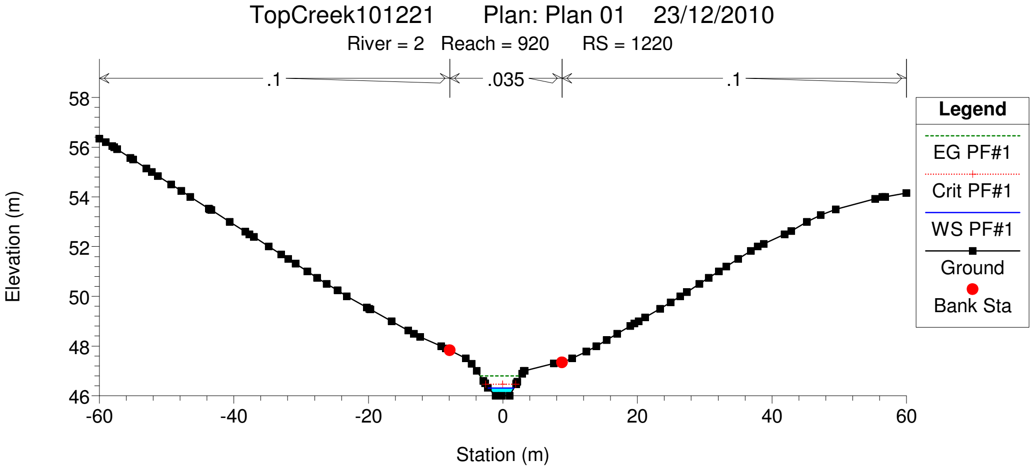

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 240
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

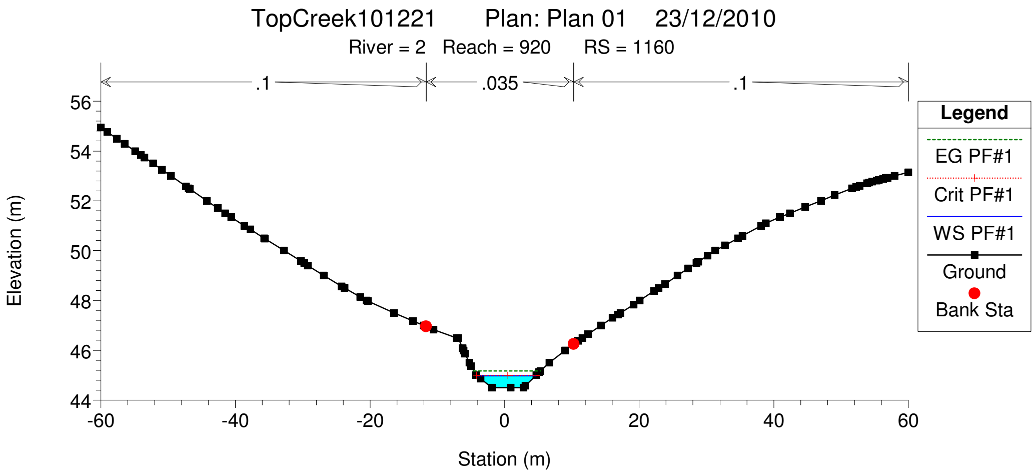

TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 180
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 120
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 1 Reach = 60 RS = 60
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 920 RS = 1280
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 920 RS = 1220
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 920 RS = 1160
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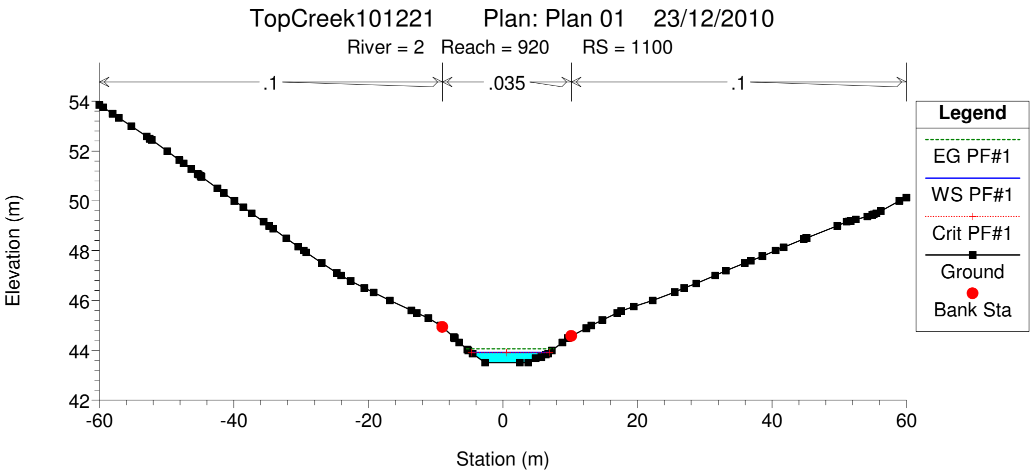
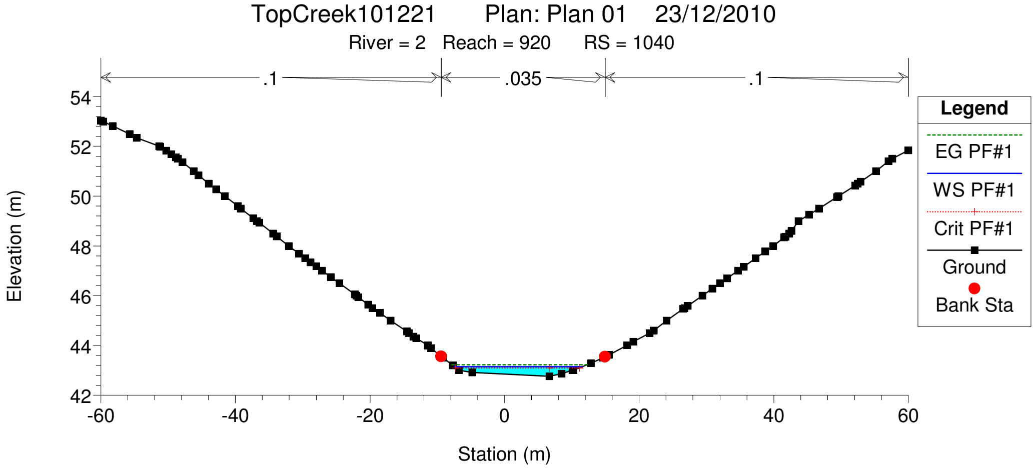
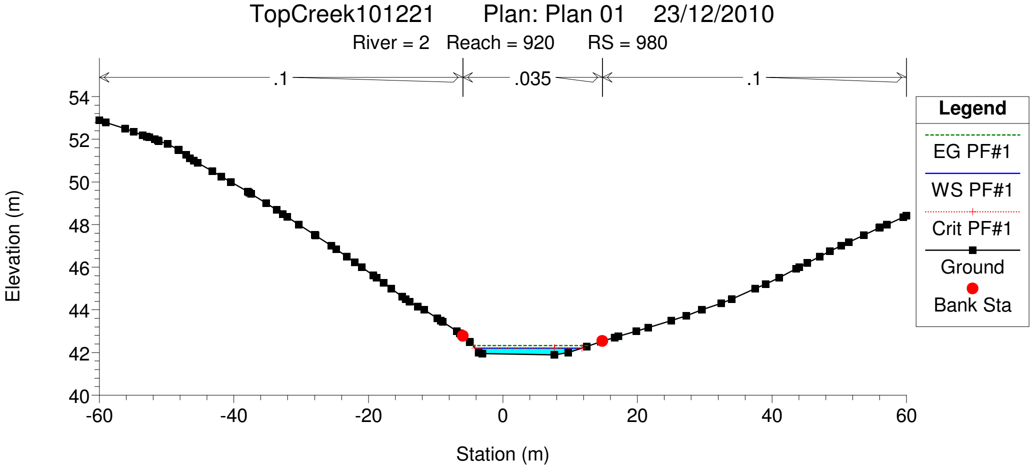
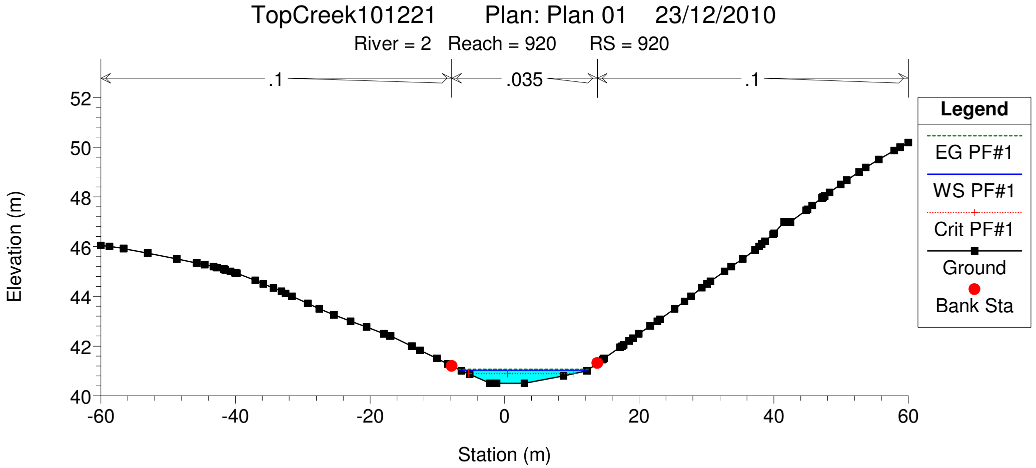
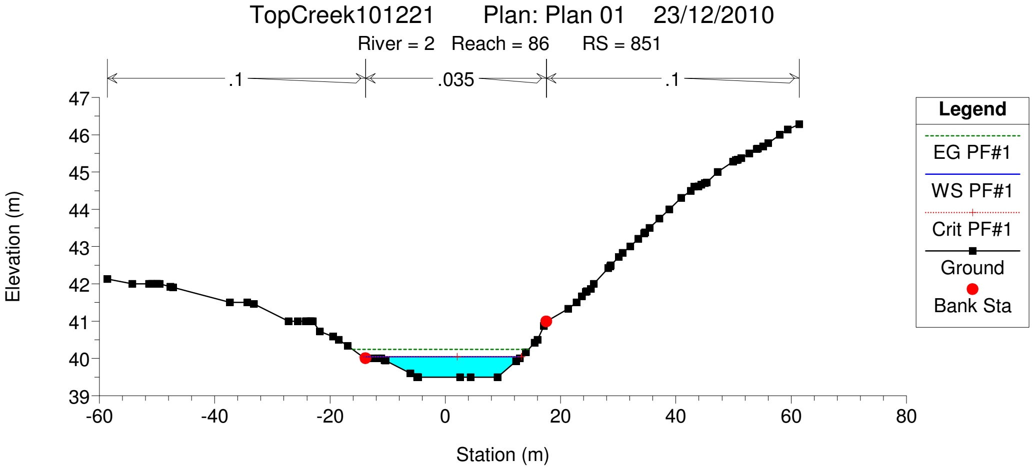
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

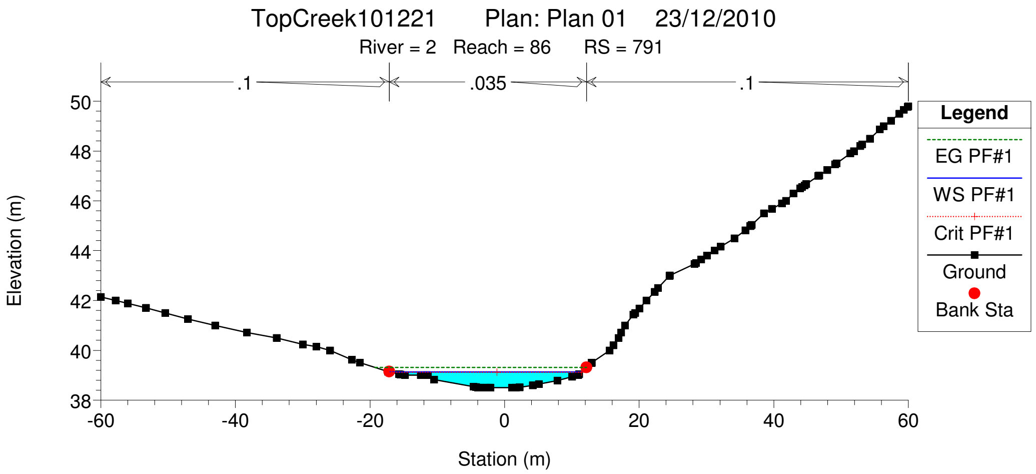

TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 920 RS = 1100
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

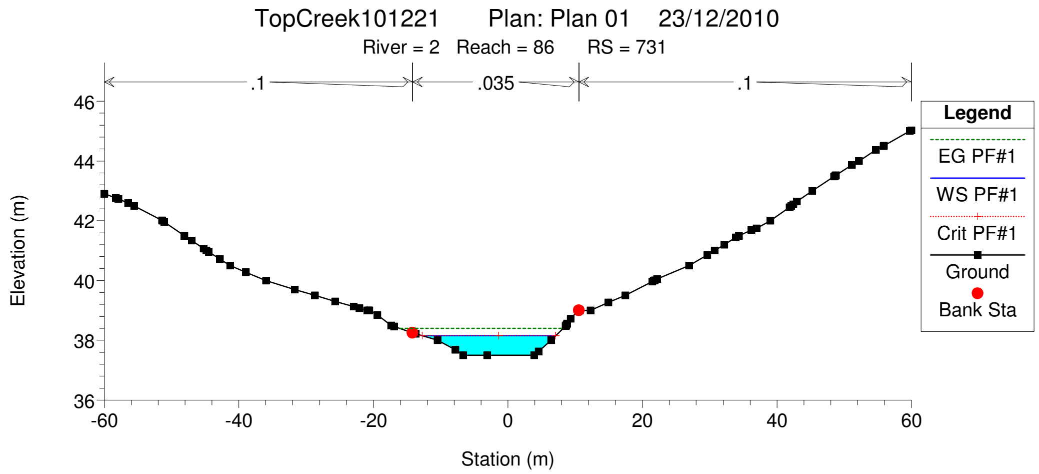

TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 920 RS = 1040
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 920 RS = 980
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 920 RS = 920
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 851
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 791
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 731
.1
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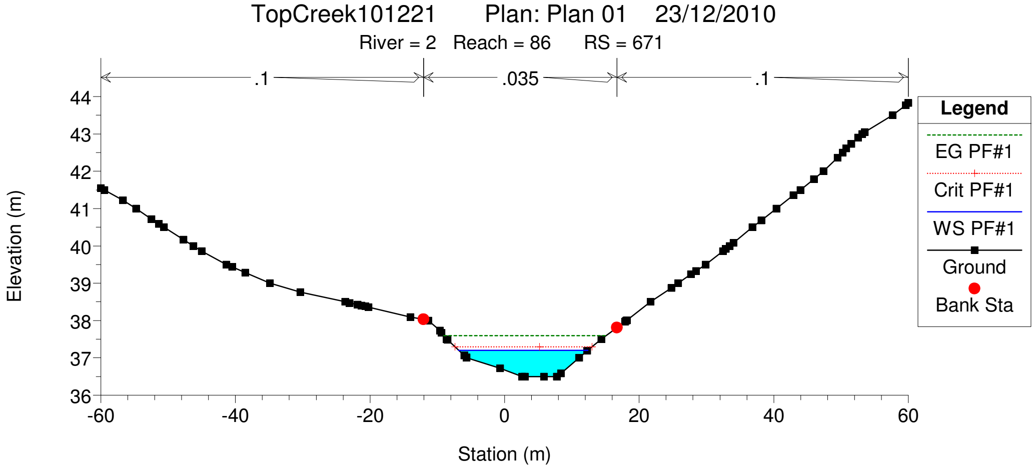
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 671
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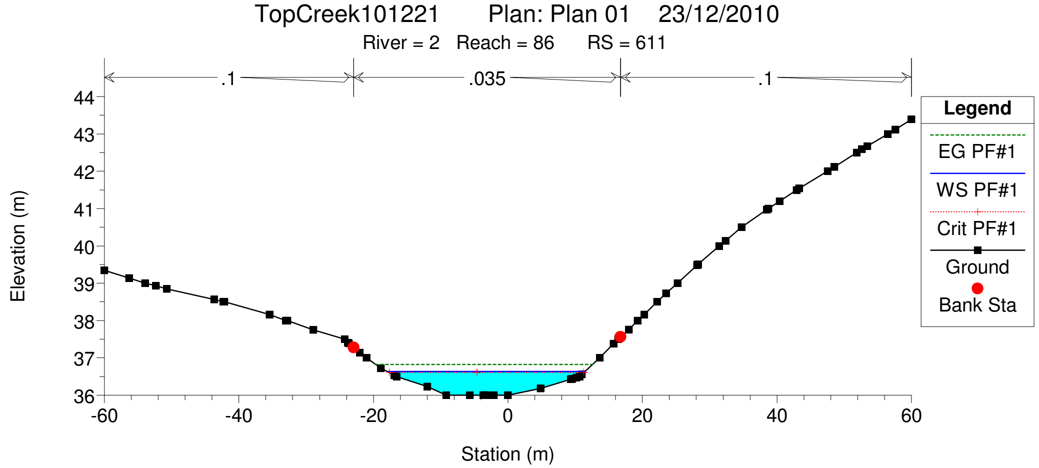
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 611
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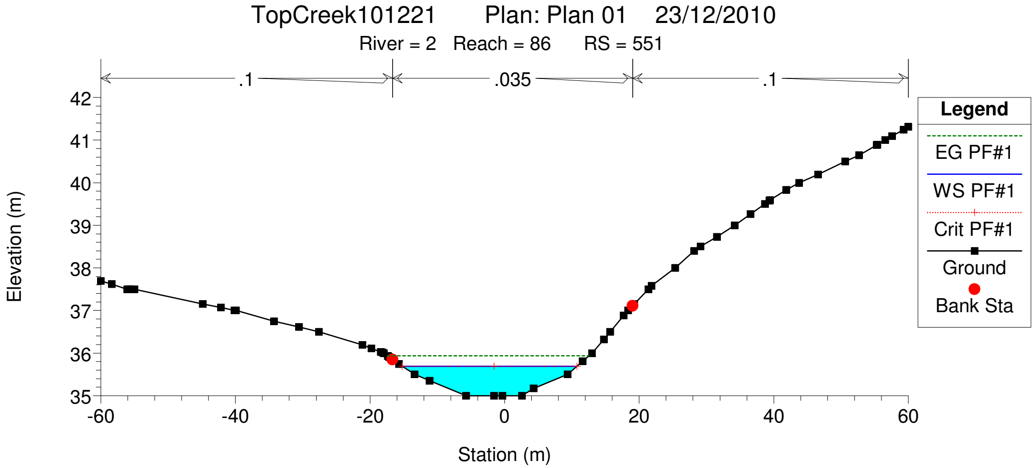
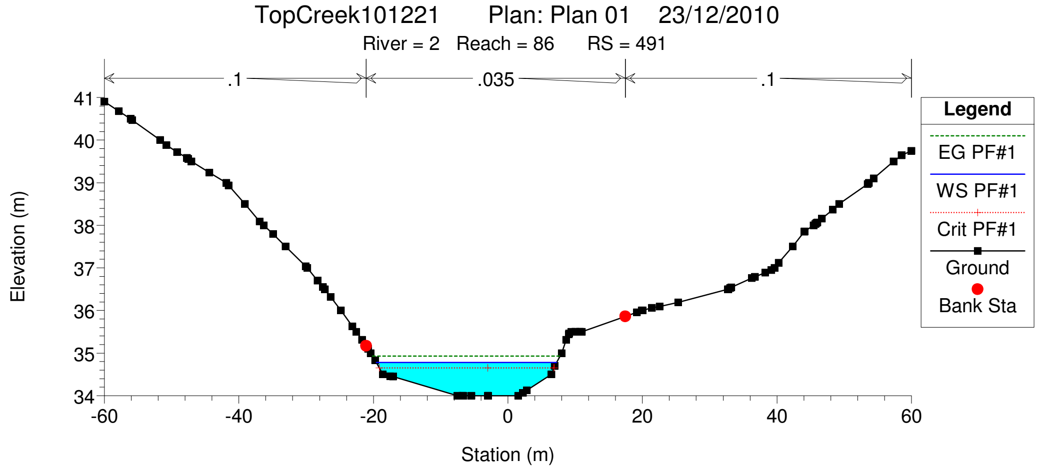
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 551
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 491
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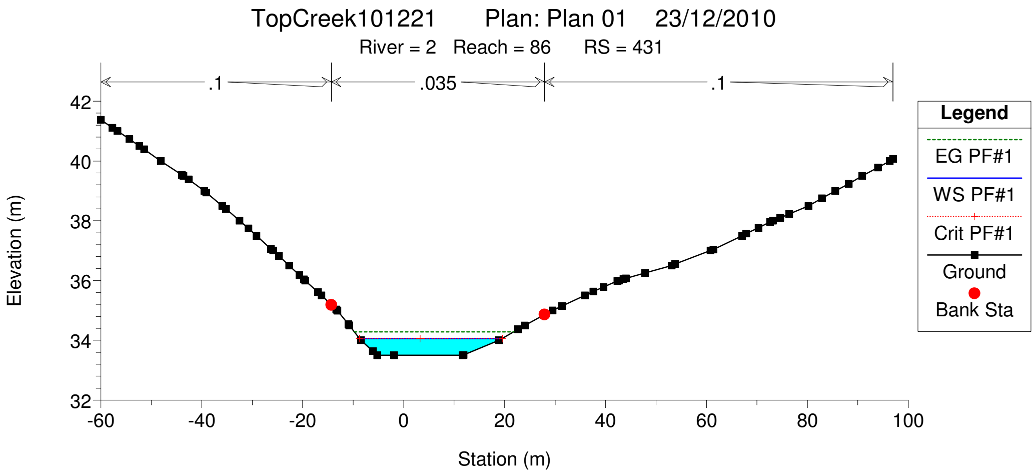
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 431
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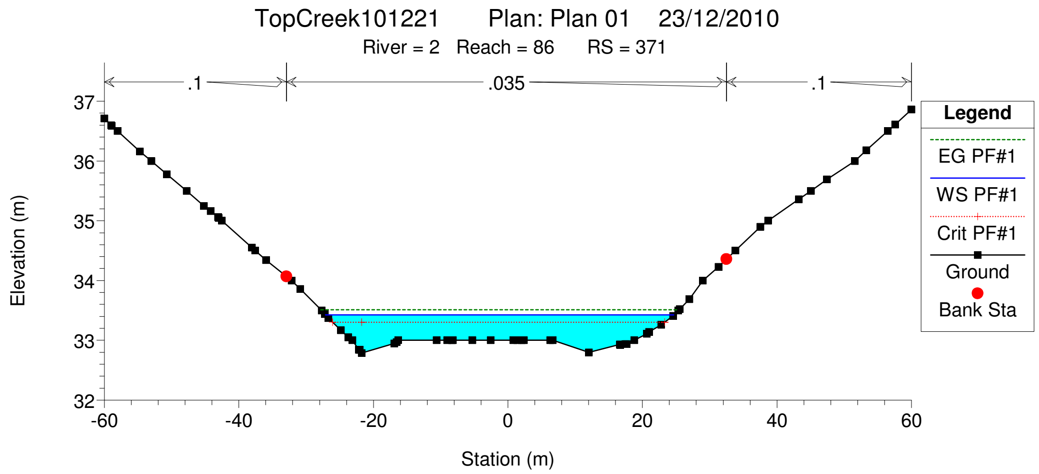
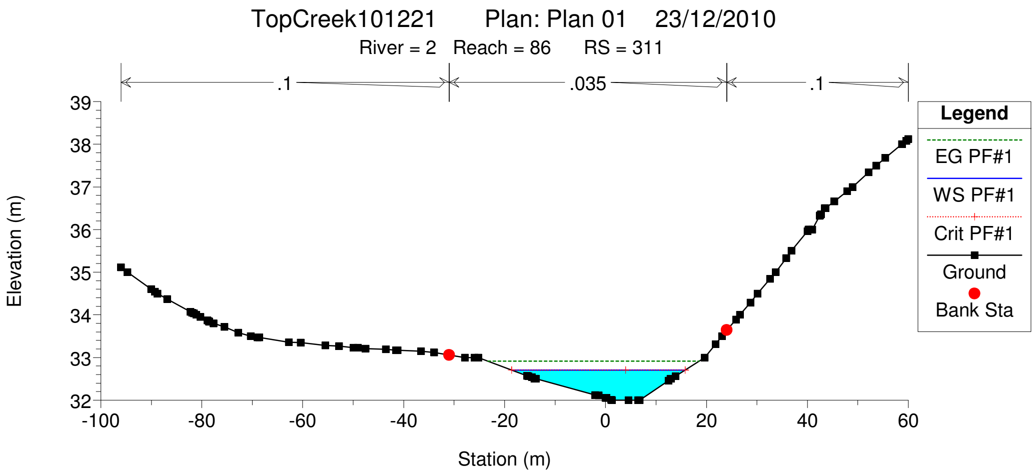
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 371
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 311
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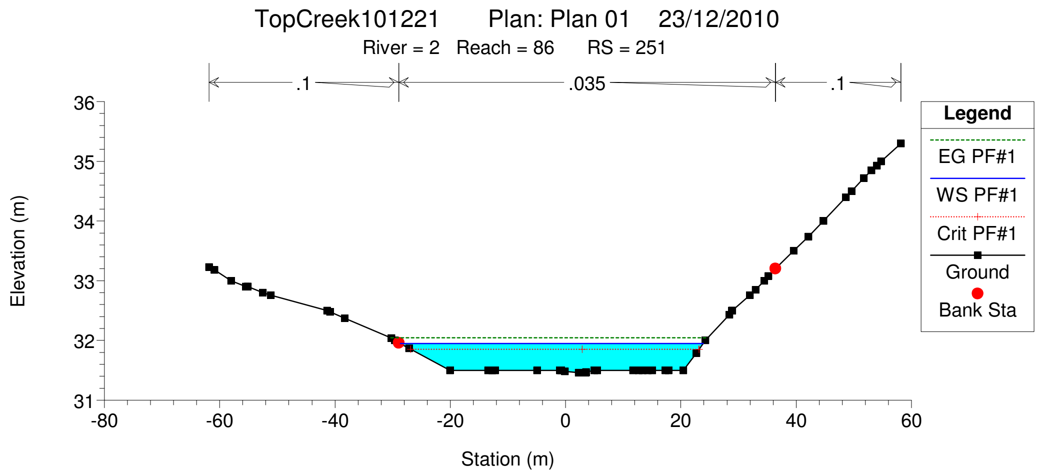
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 251
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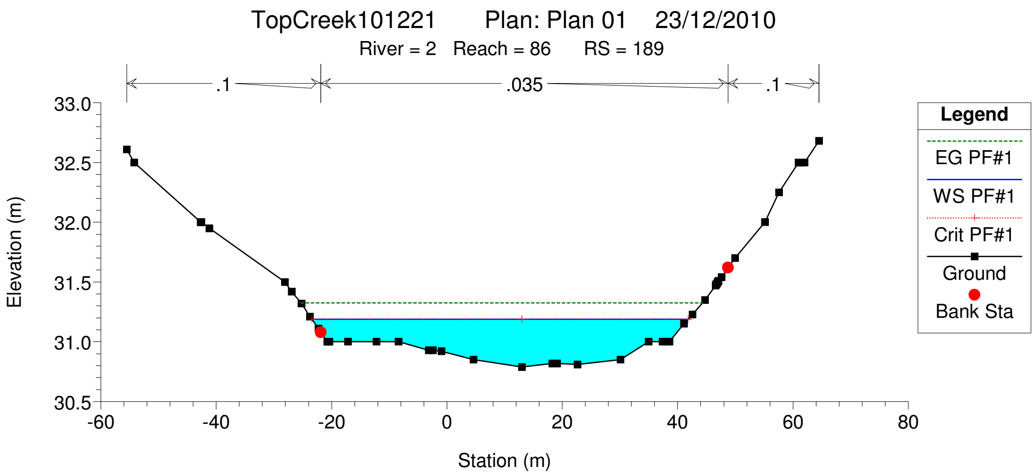
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 189
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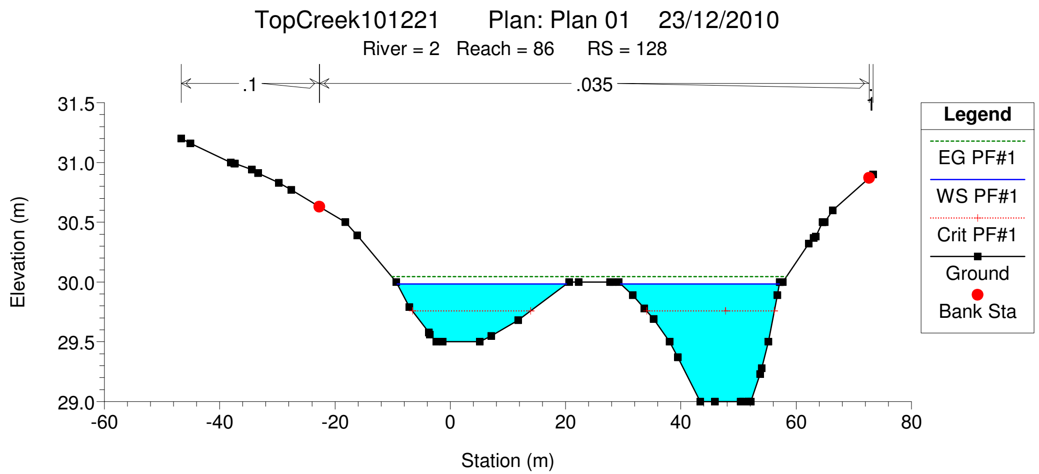
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 128
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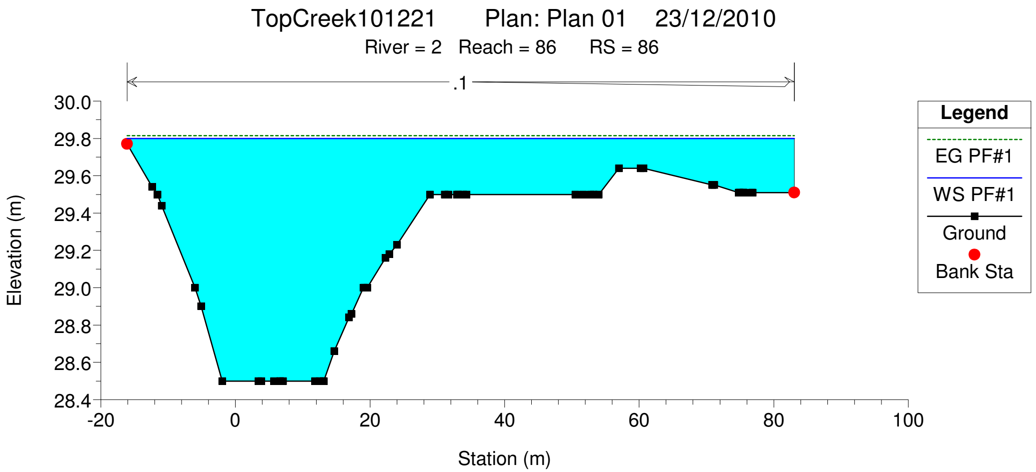
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


TopCreek101221 Plan: Plan 01 23/12/2010
River = 2 Reach = 86 RS = 86
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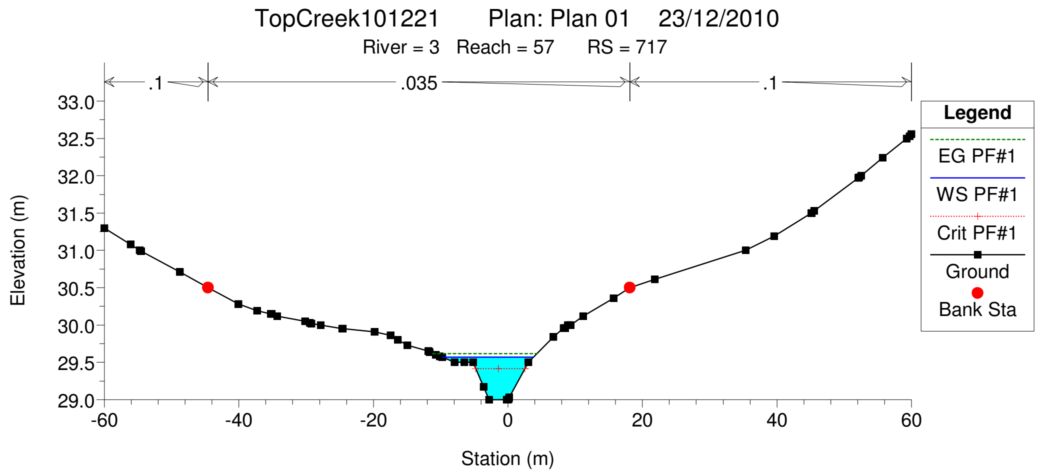
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 717
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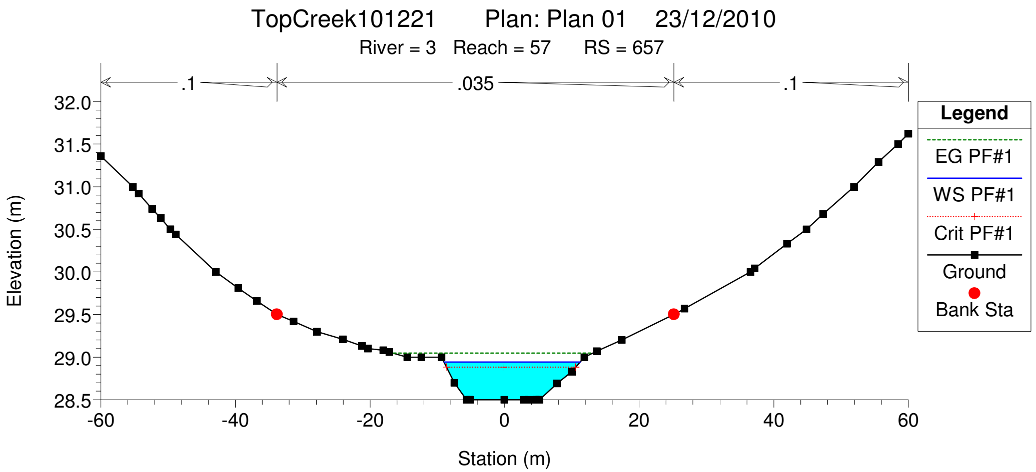
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 657
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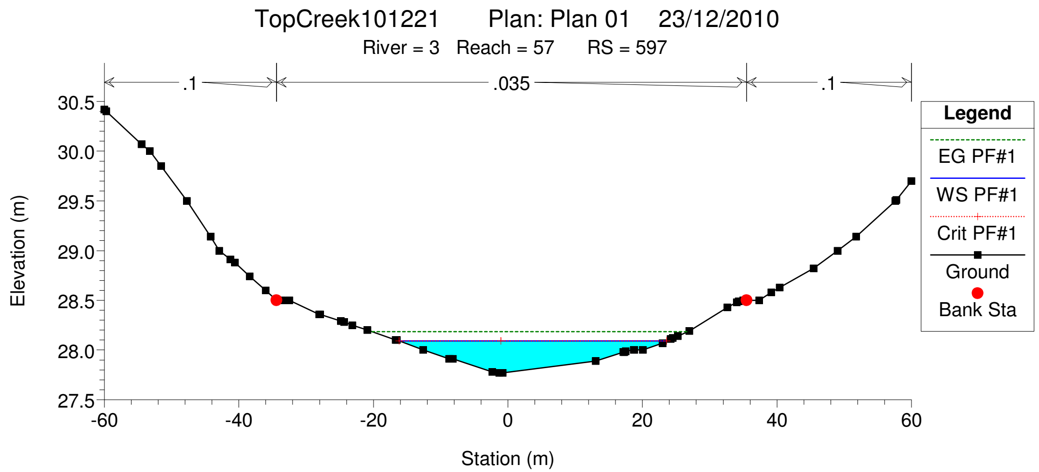
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 597
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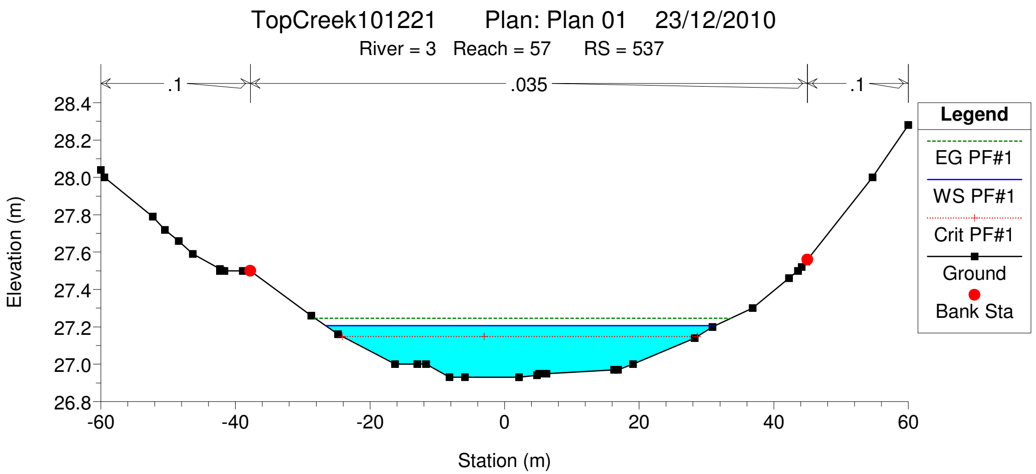
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 537
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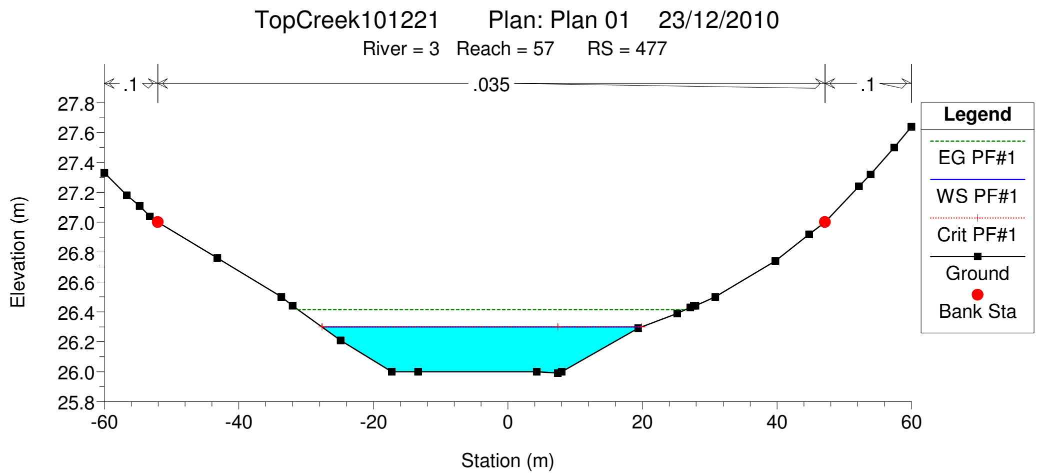
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 477
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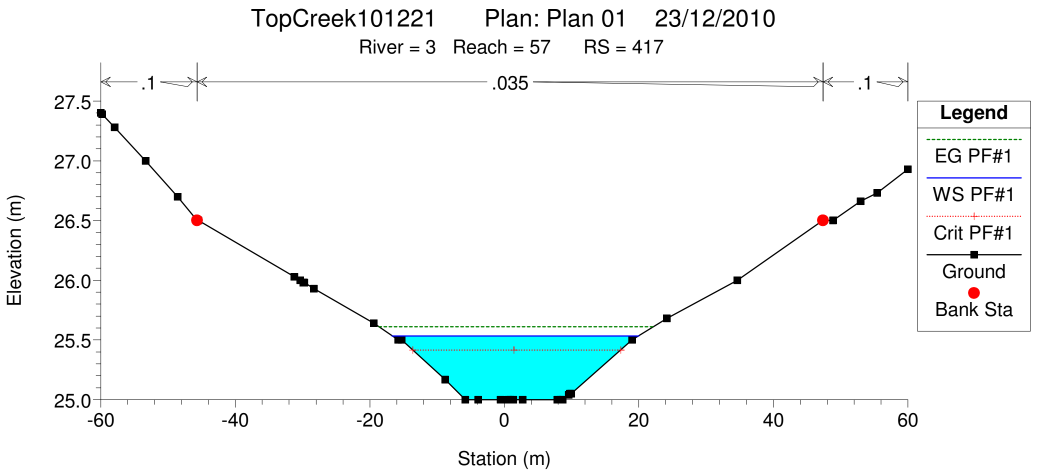
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 417
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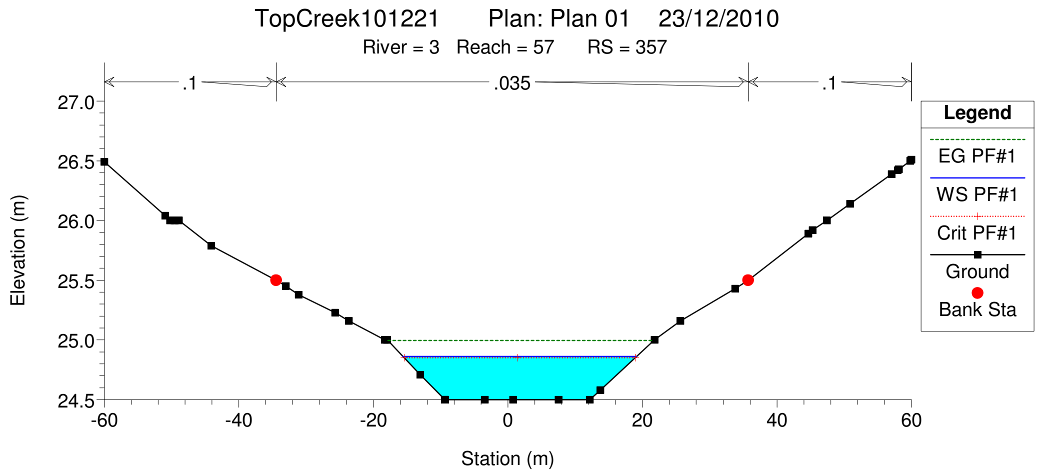
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 357
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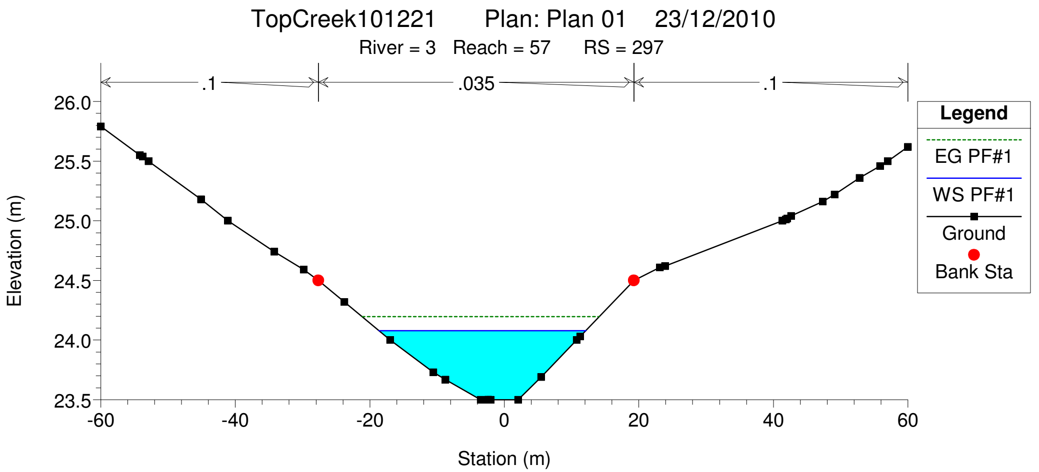
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 297
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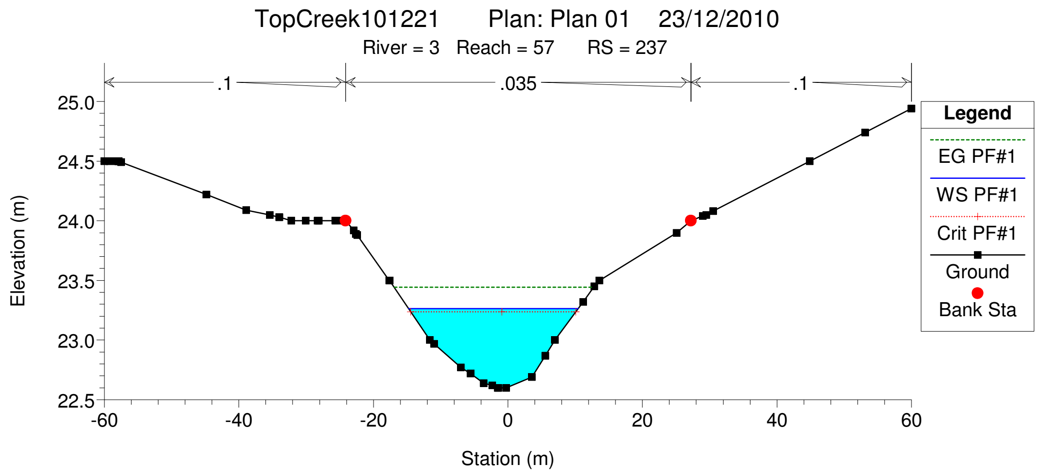
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 237
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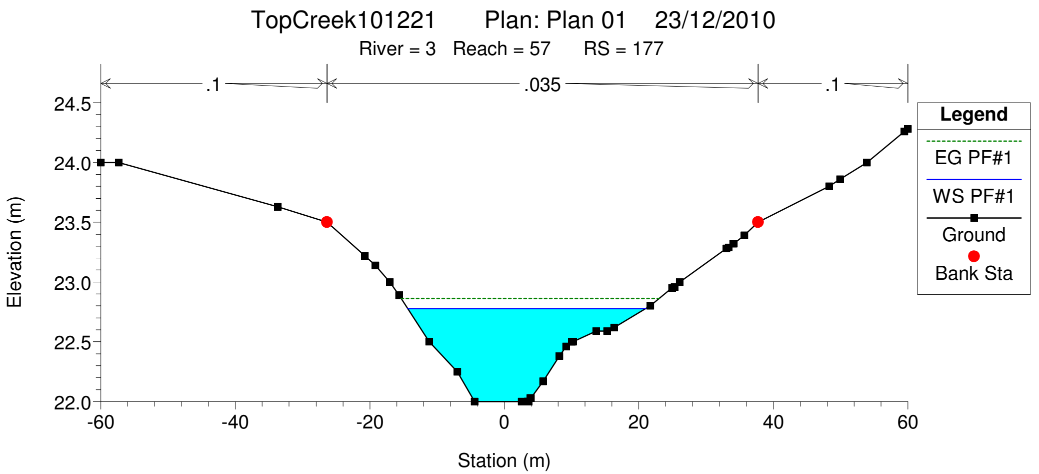
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 177
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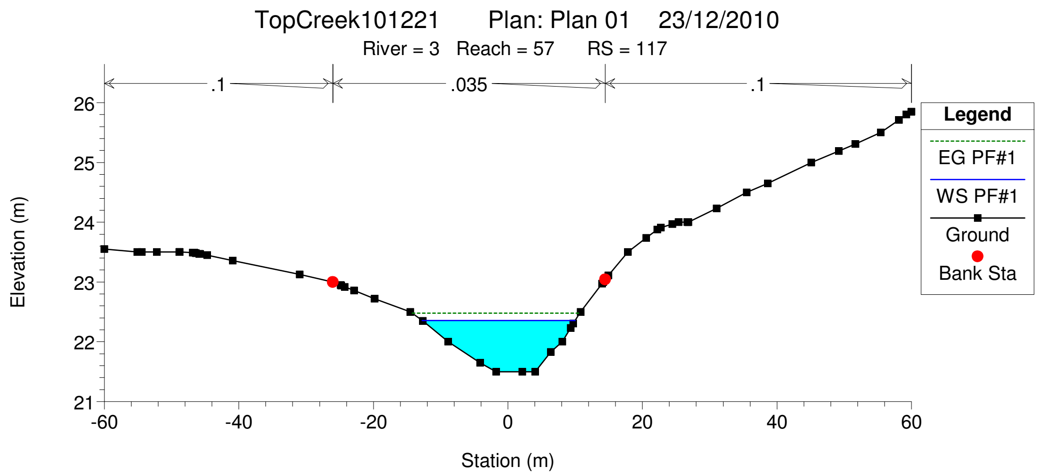
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 117
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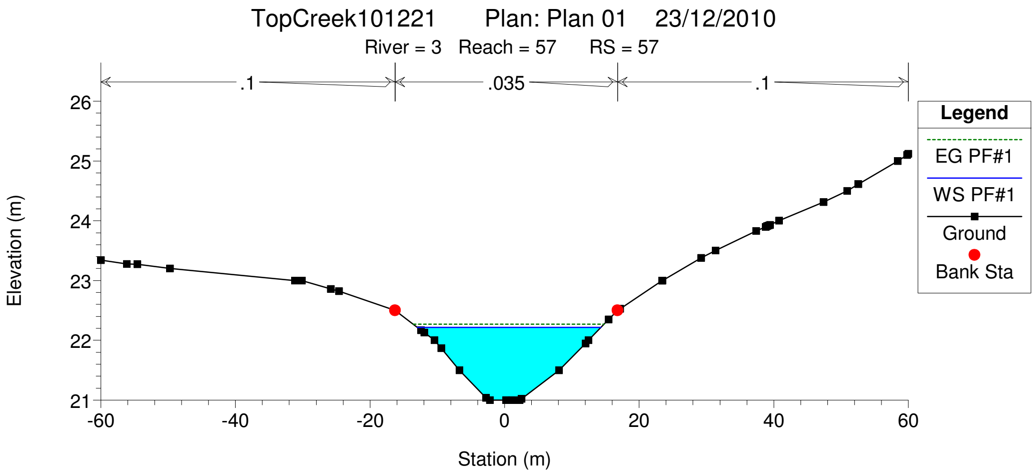
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta



TopCreek101221 Plan: Plan 01 23/12/2010
River = 3 Reach = 57 RS = 57
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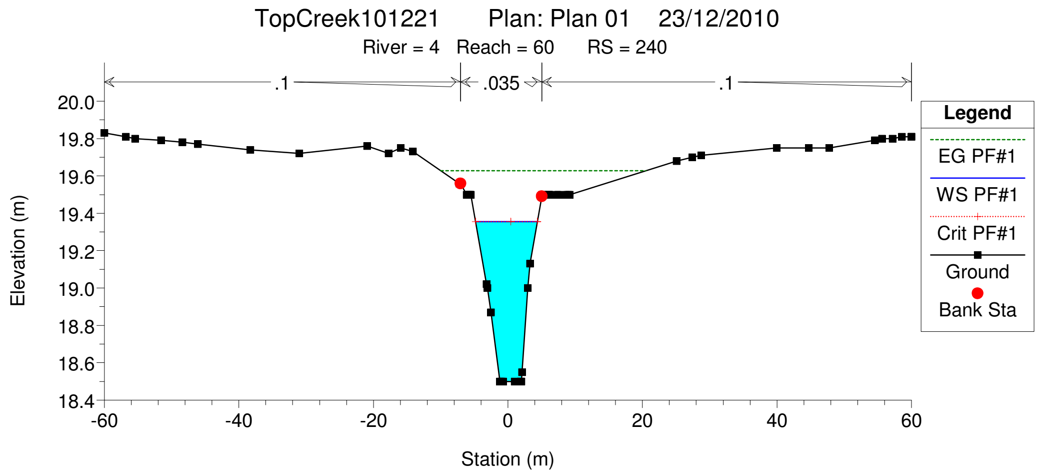
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta



TopCreek101221 Plan: Plan 01 23/12/2010
River = 4 Reach = 60 RS = 240
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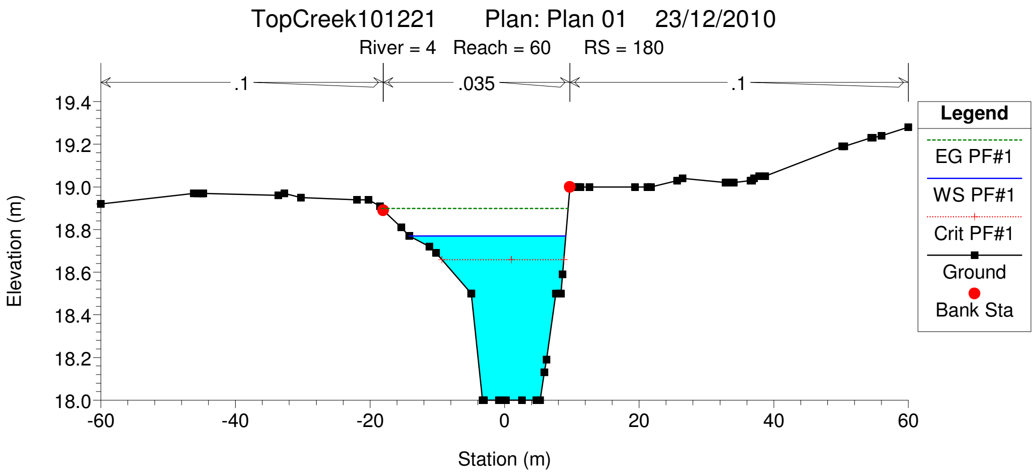
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta



TopCreek101221 Plan: Plan 01 23/12/2010
River = 4 Reach = 60 RS = 180
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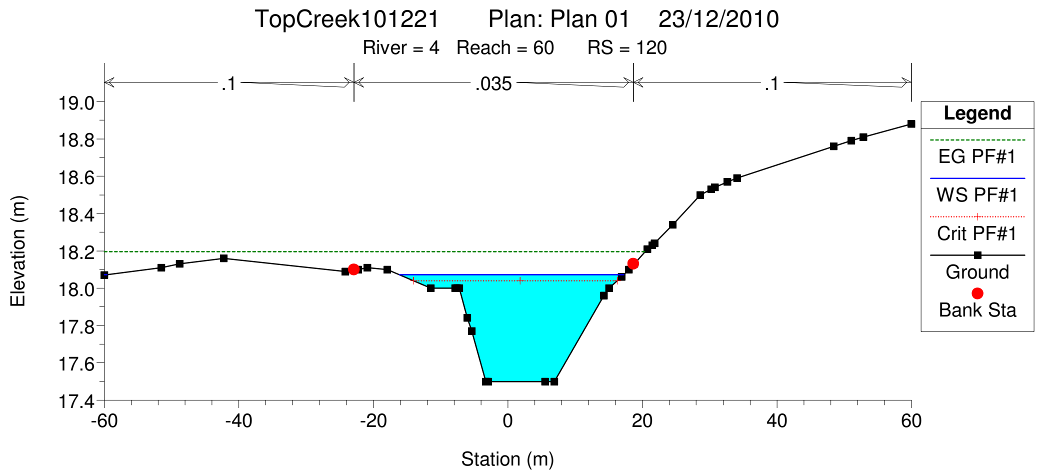
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta



TopCreek101221 Plan: Plan 01 23/12/2010
River = 4 Reach = 60 RS = 120
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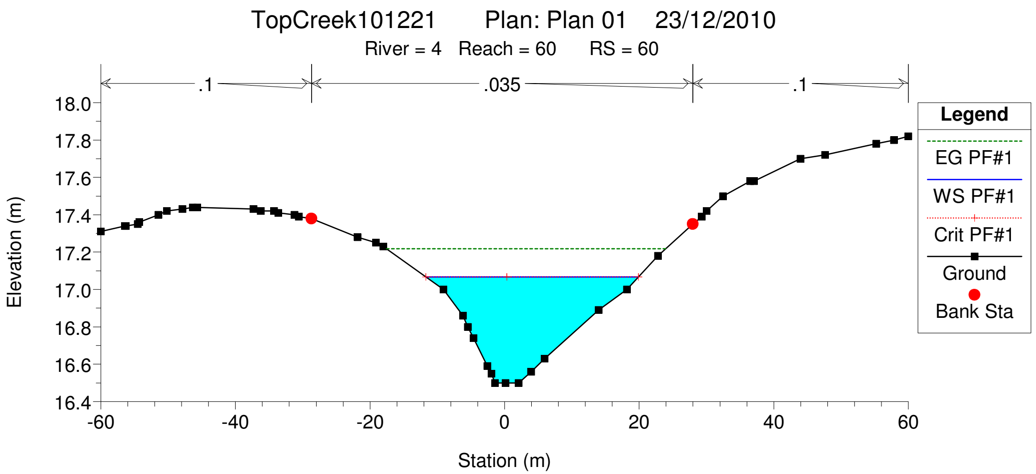
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta



TopCreek101221 Plan: Plan 01 23/12/2010
River = 4 Reach = 60 RS = 60
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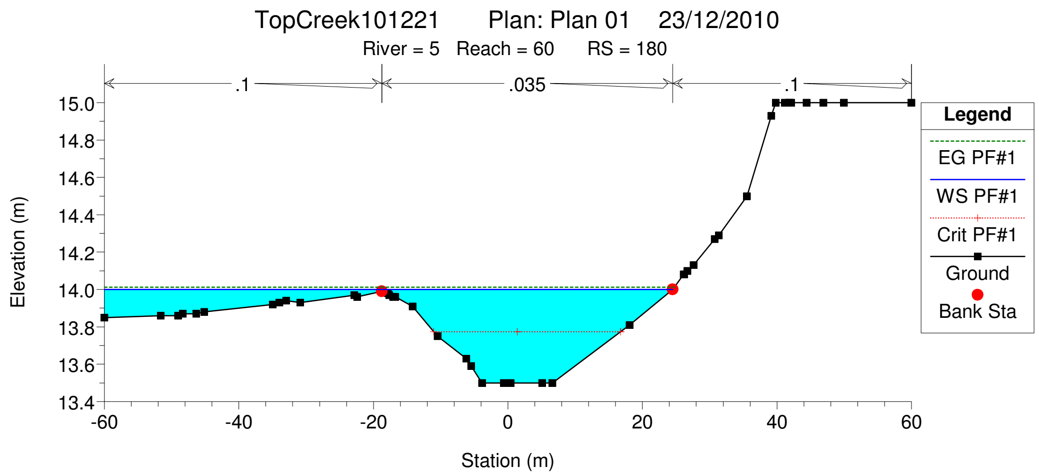
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta



TopCreek101221 Plan: Plan 01 23/12/2010
River = 5 Reach = 60 RS = 180
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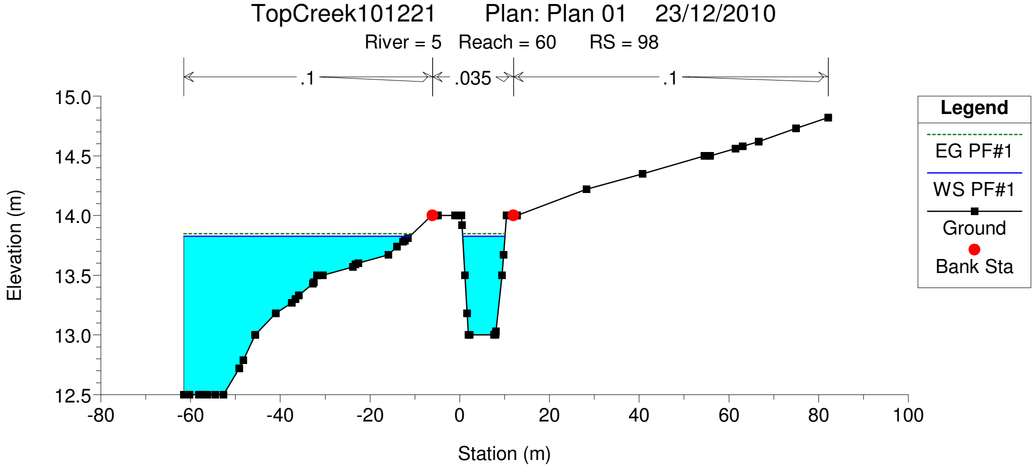
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 5 Reach = 60 RS = 98
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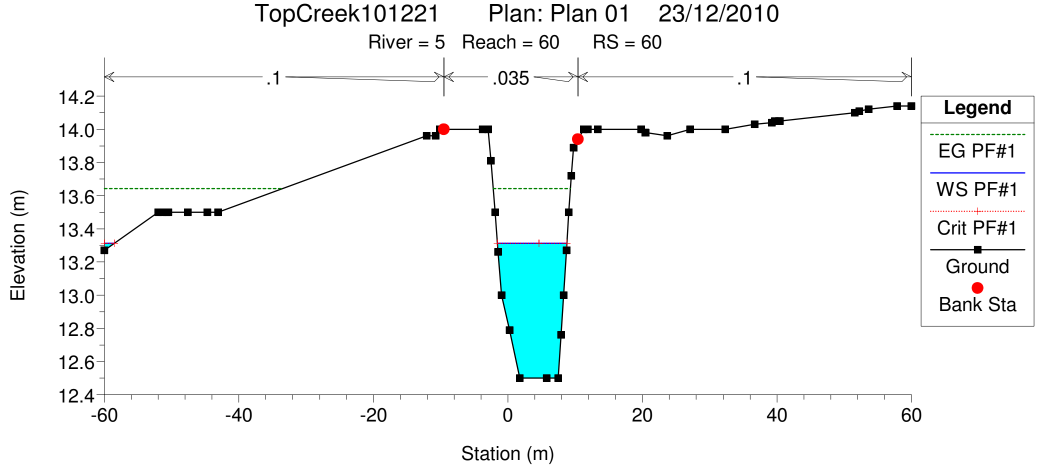
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 5 Reach = 60 RS = 60
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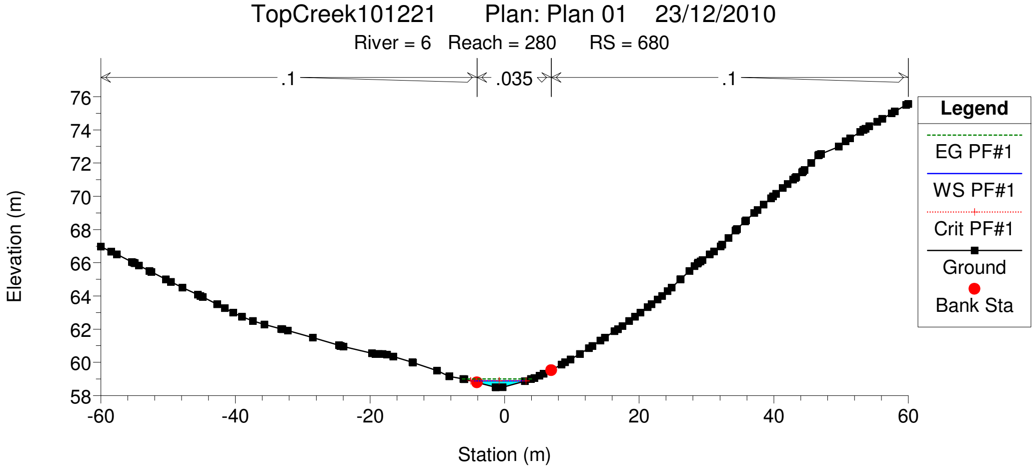
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 280 RS = 680
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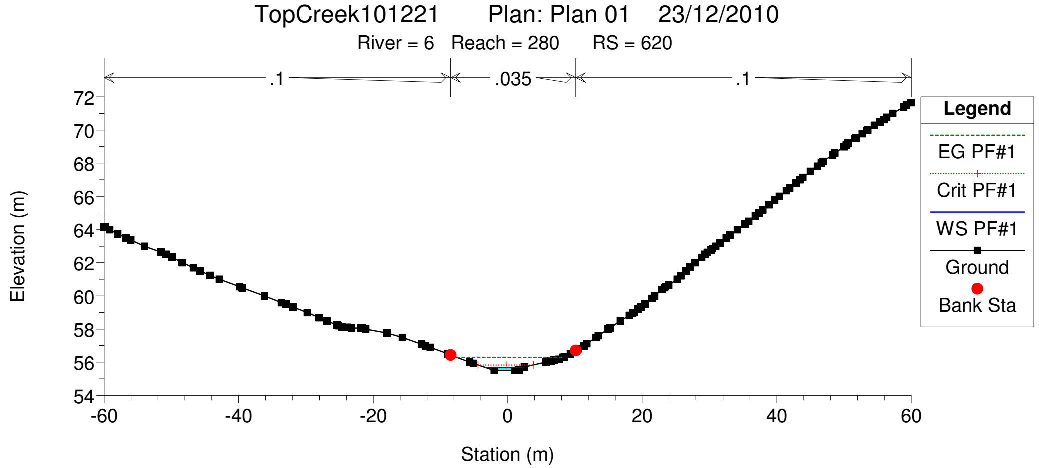
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 280 RS = 620
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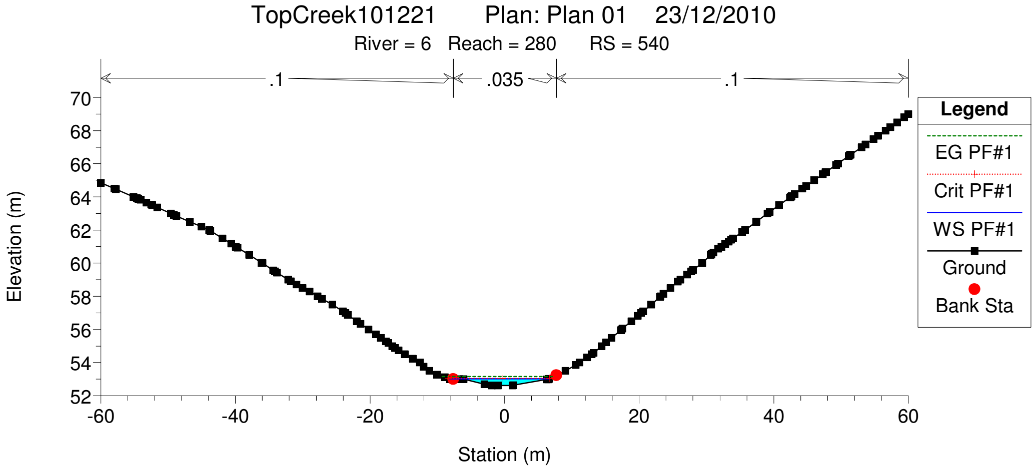
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 280 RS = 540
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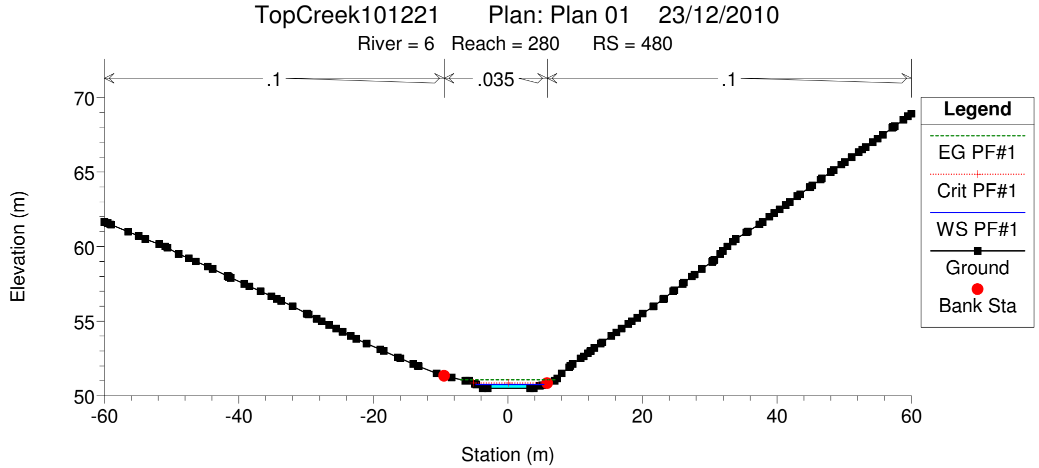
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 280 RS = 480
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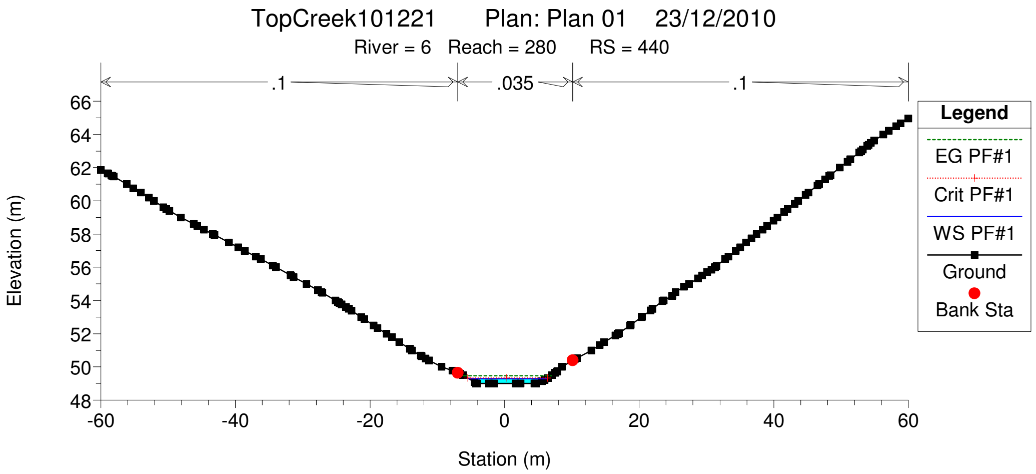
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 280 RS = 440
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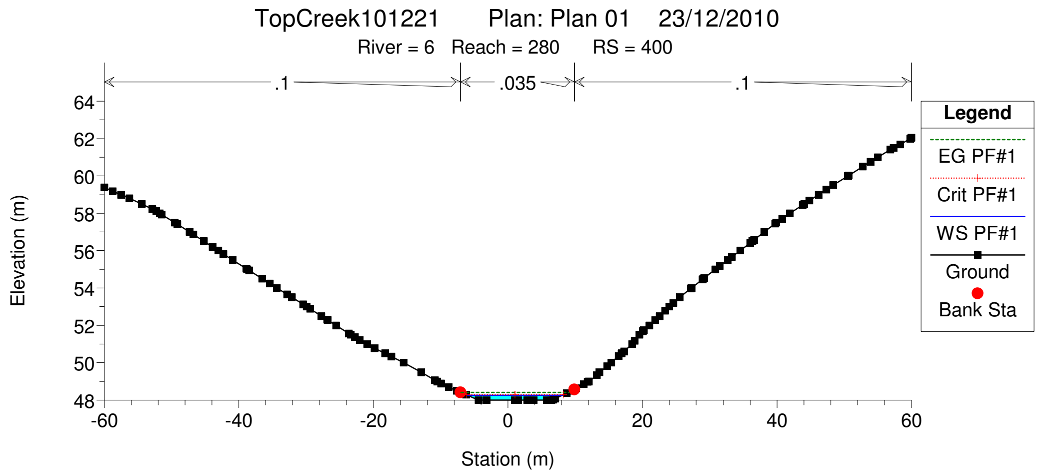
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 280 RS = 400
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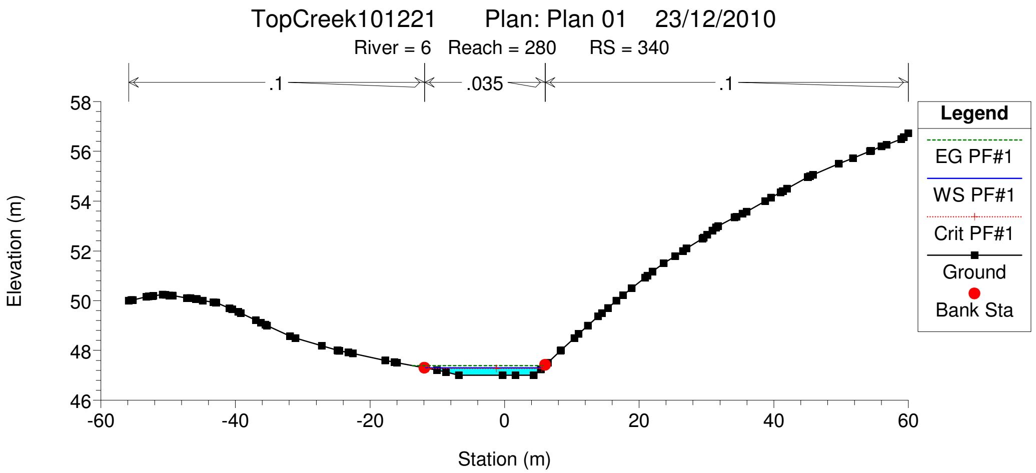
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 280 RS = 340
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Station (m)
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EG PF#1
WS PF#1
Crit PF#1
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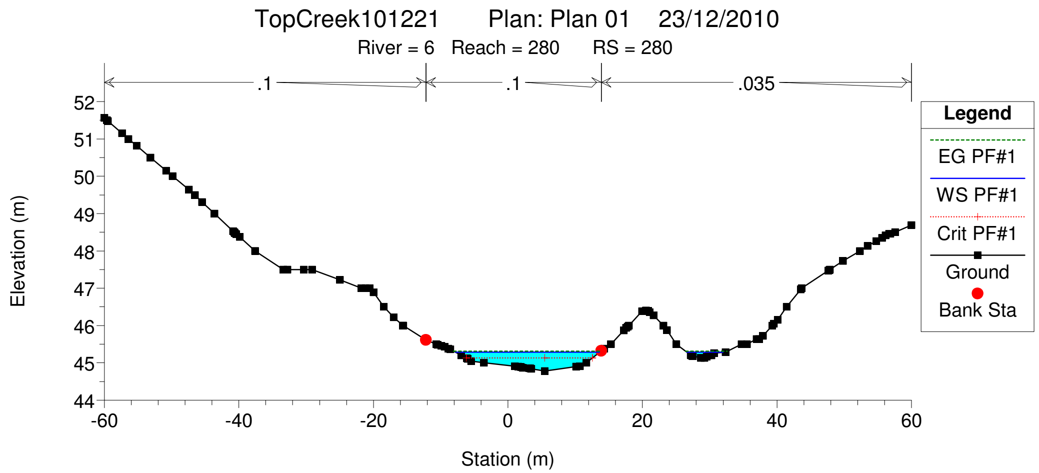
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 280 RS = 280
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Station (m)
Legend
EG PF#1
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Crit PF#1
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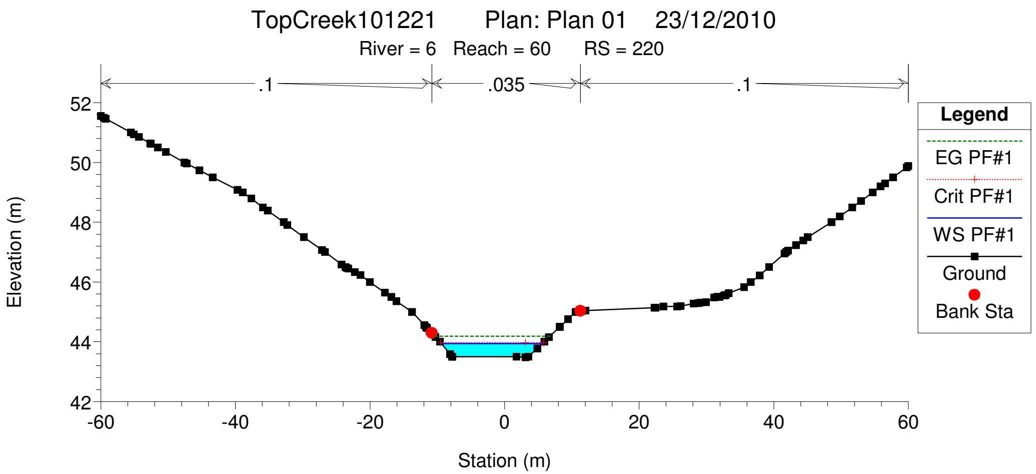
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 60 RS = 220
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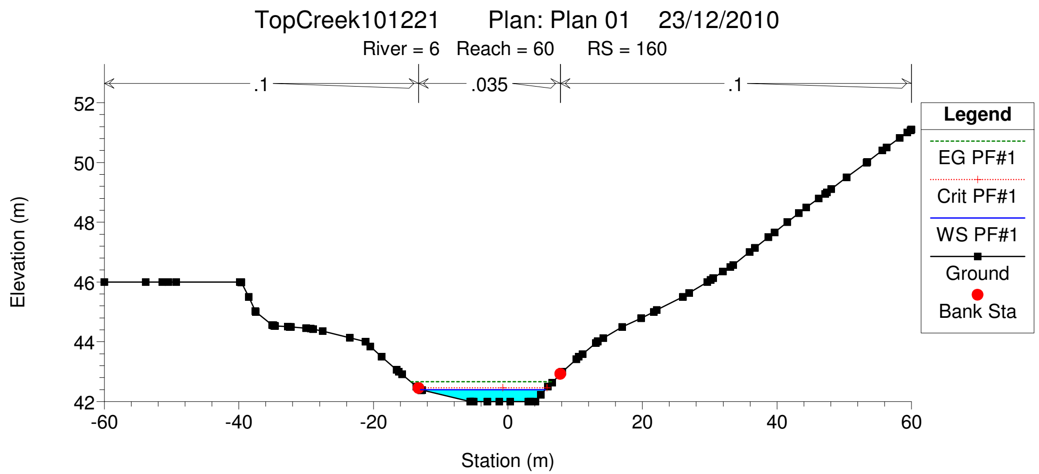
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 60 RS = 160
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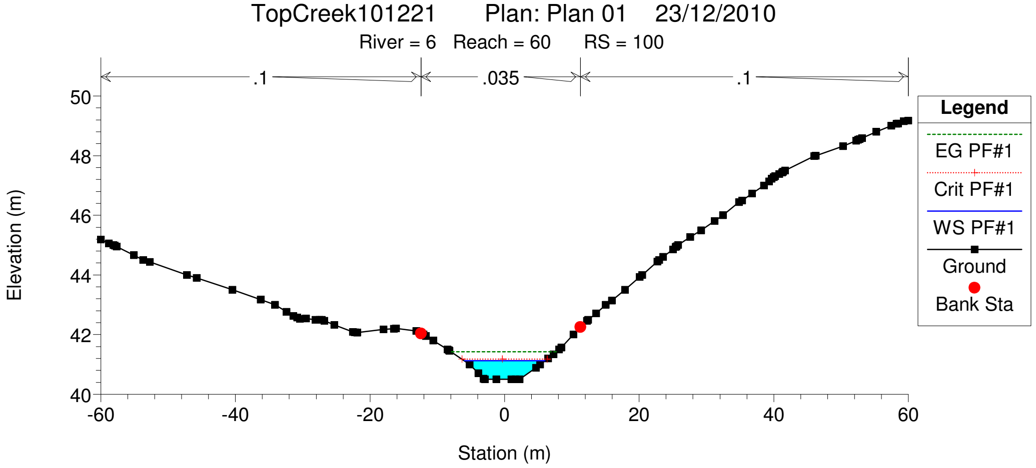
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 60 RS = 100
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Station (m)
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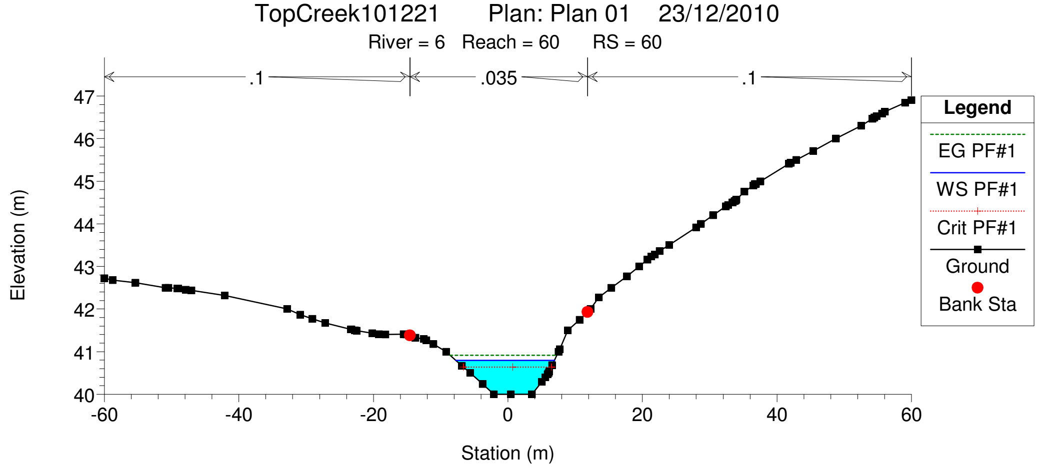
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 6 Reach = 60 RS = 60
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Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
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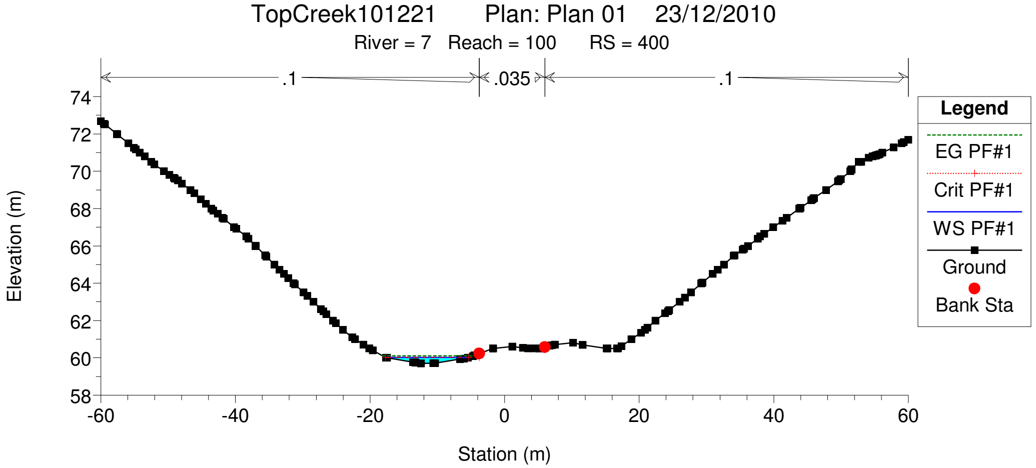
TopCreek101221 Plan: Plan 01 23/12/2010
River = 7 Reach = 100 RS = 400
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Station (m)
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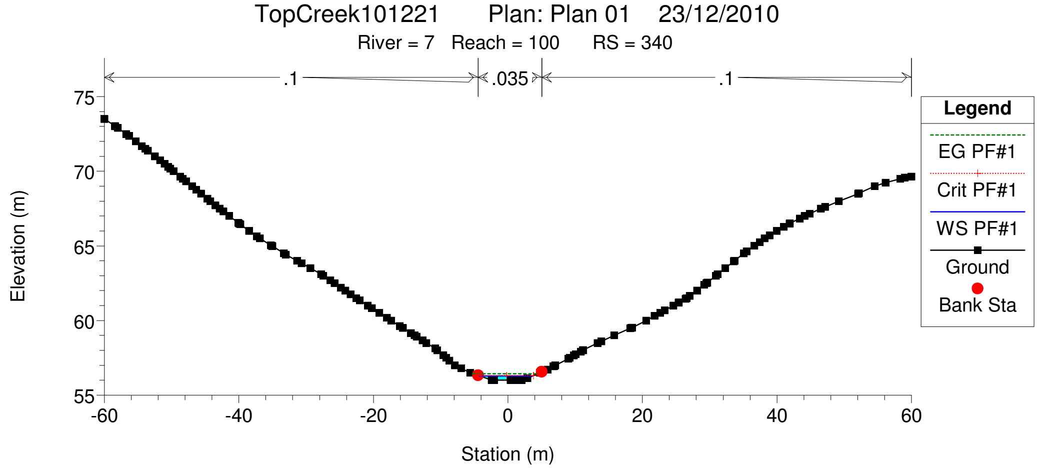
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 7 Reach = 100 RS = 340
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Elevation (m)
Station (m)
Legend
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Crit PF#1
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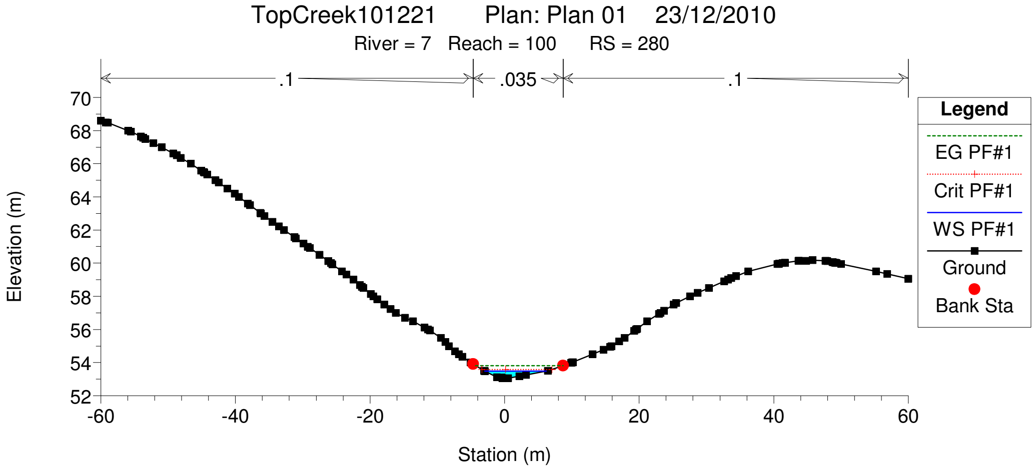
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 7 Reach = 100 RS = 280
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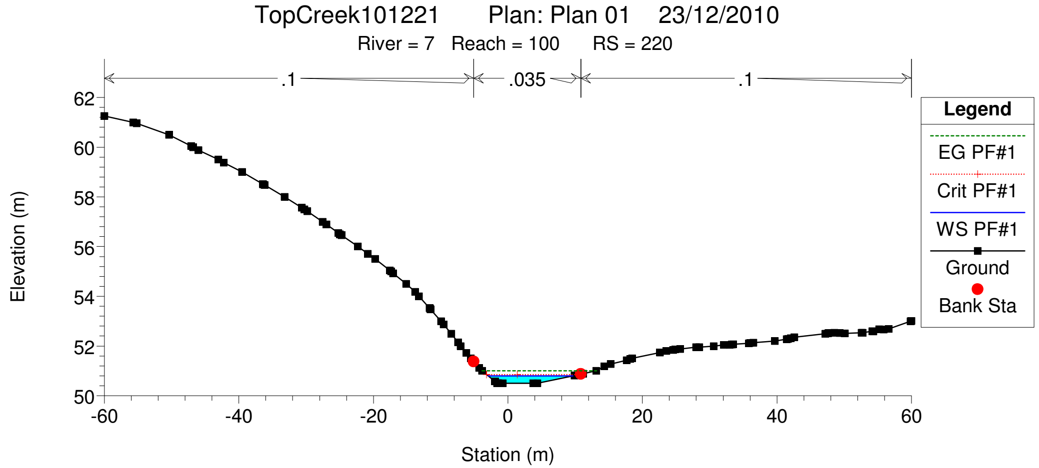
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 7 Reach = 100 RS = 220
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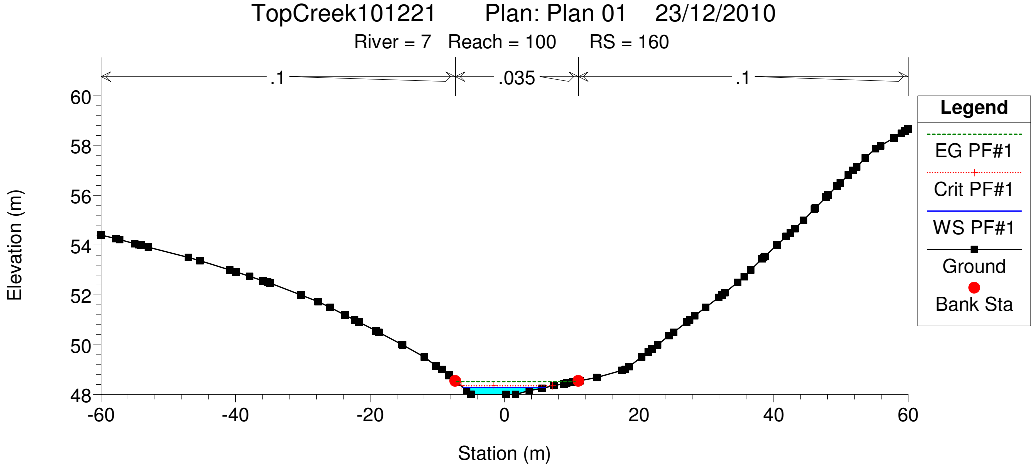
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta


TopCreek101221 Plan: Plan 01 23/12/2010
River = 7 Reach = 100 RS = 160
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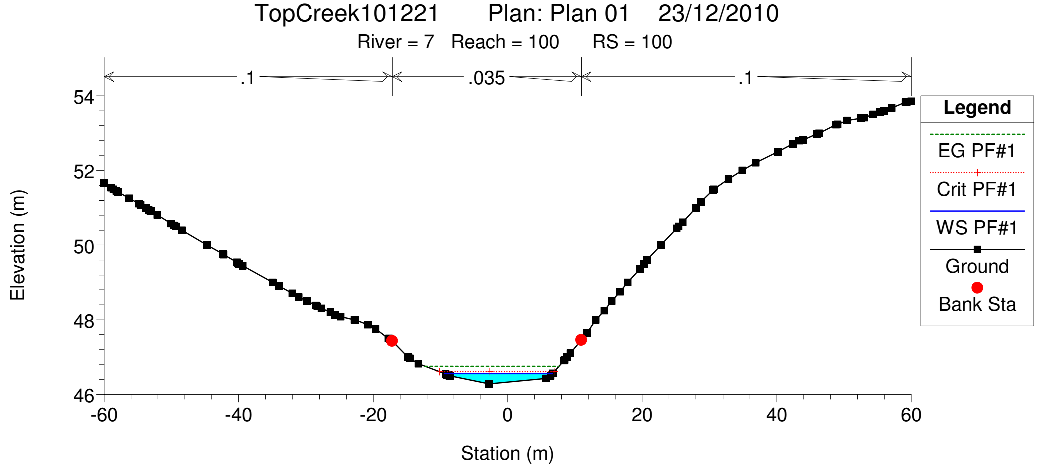
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)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River = 7 Reach = 100 RS = 100
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Legend
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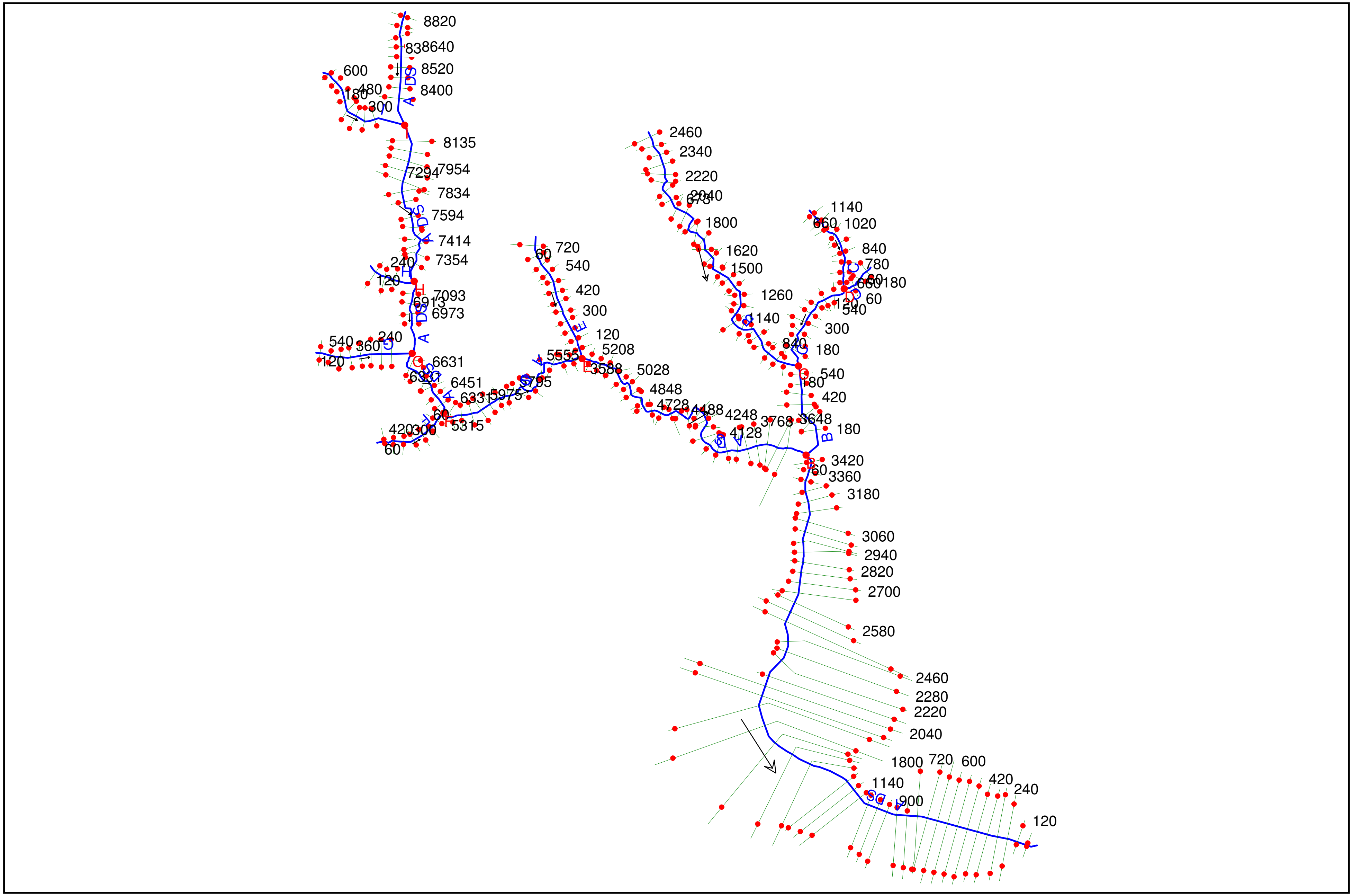
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)



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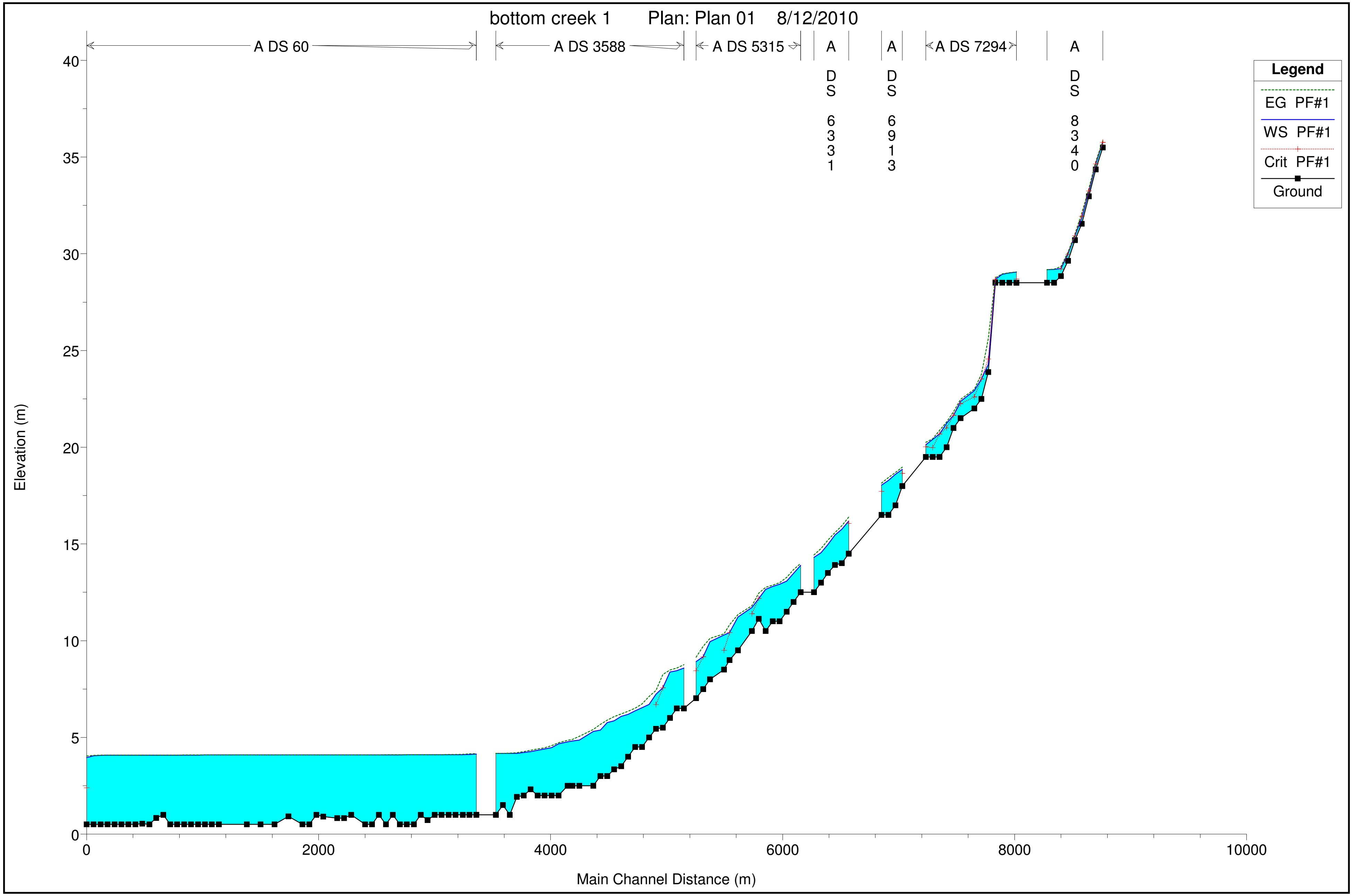
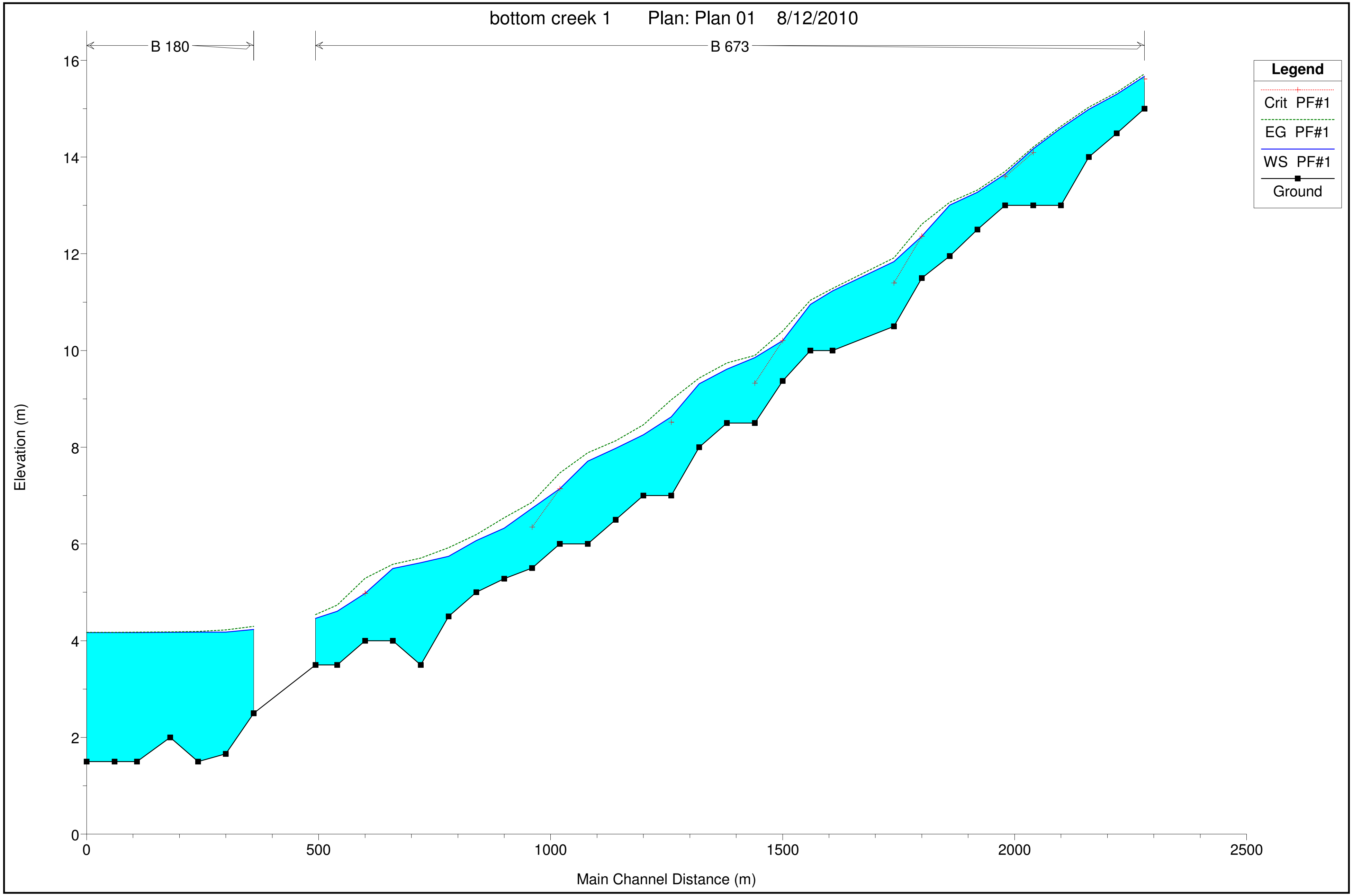
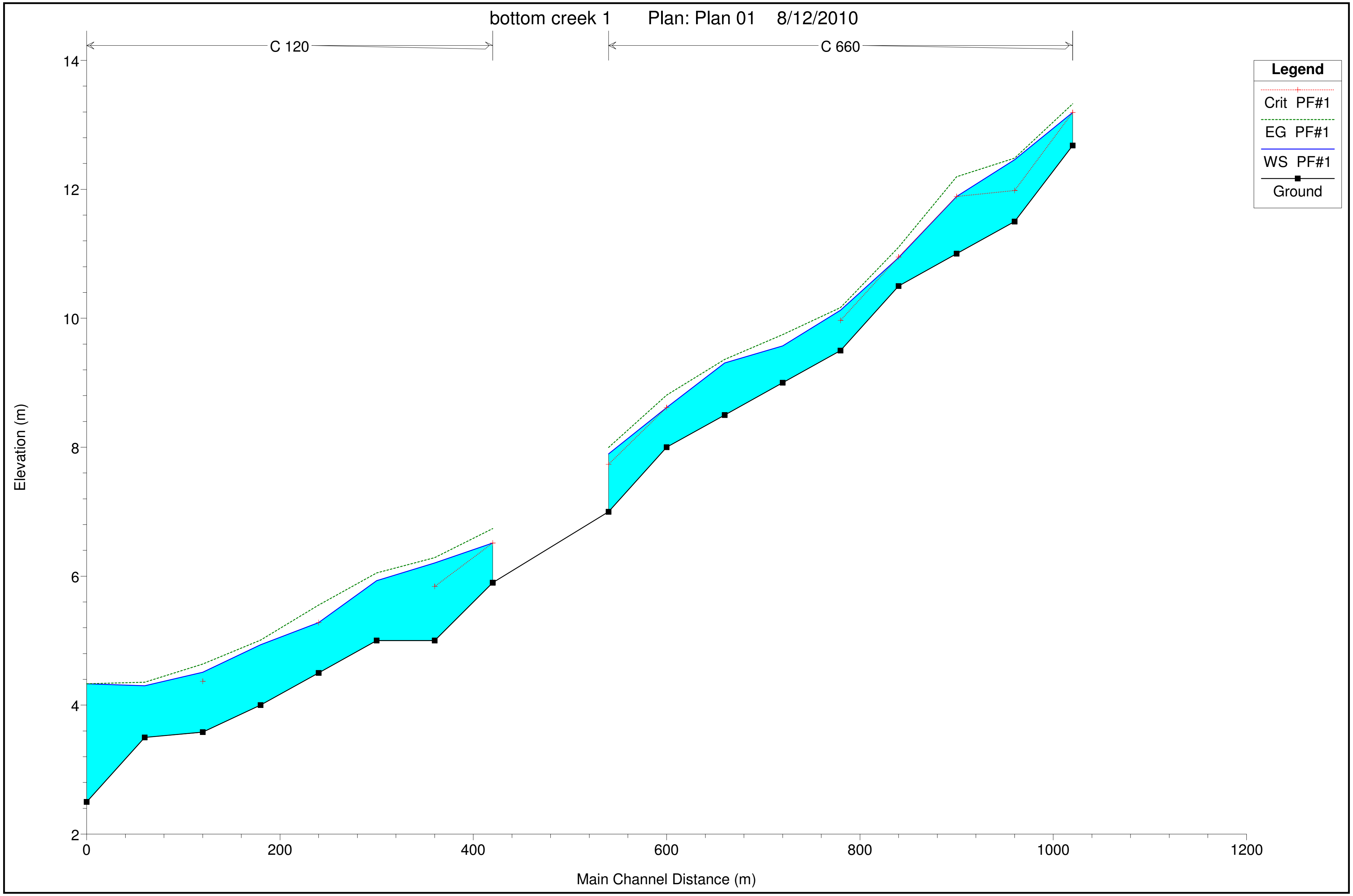
300
840
180
540
180
420
180
3420
60
3360
3180
3060
2940
2820
2700
2580
2460
2280
2220
2040
1800
720
600
420
240
1140
900
120



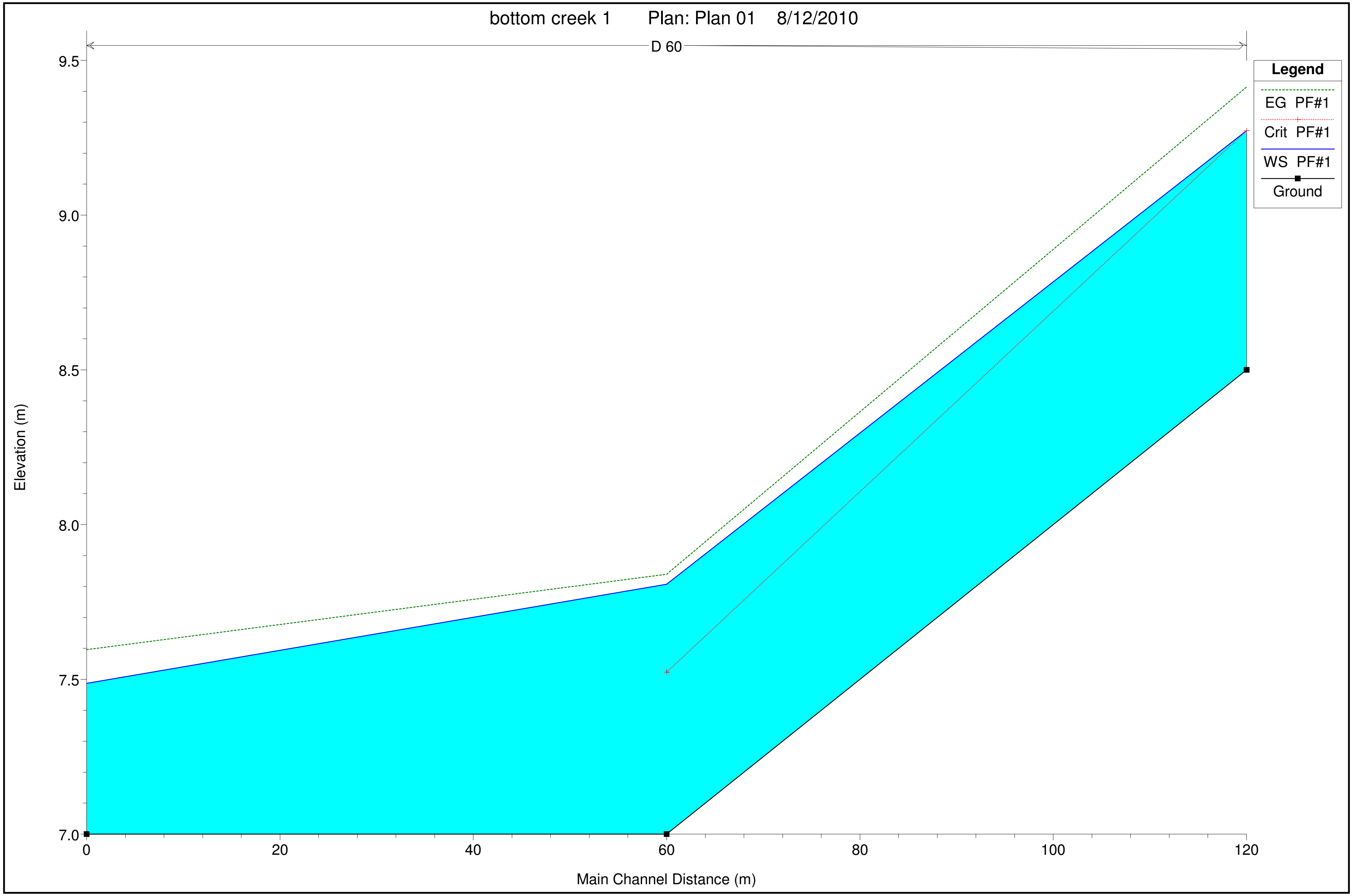
bottom creek 1 Plan: Plan 01 8/12/2010
A DS 60
A DS 3588
A DS 5315
A DS 6331
A DS 6913
A DS 7294
A DS 8340
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Elevation (m)
Main Channel Distance (m)
0
5
10
15
20
25
30
35
40
0
2000
4000
6000
8000
10000

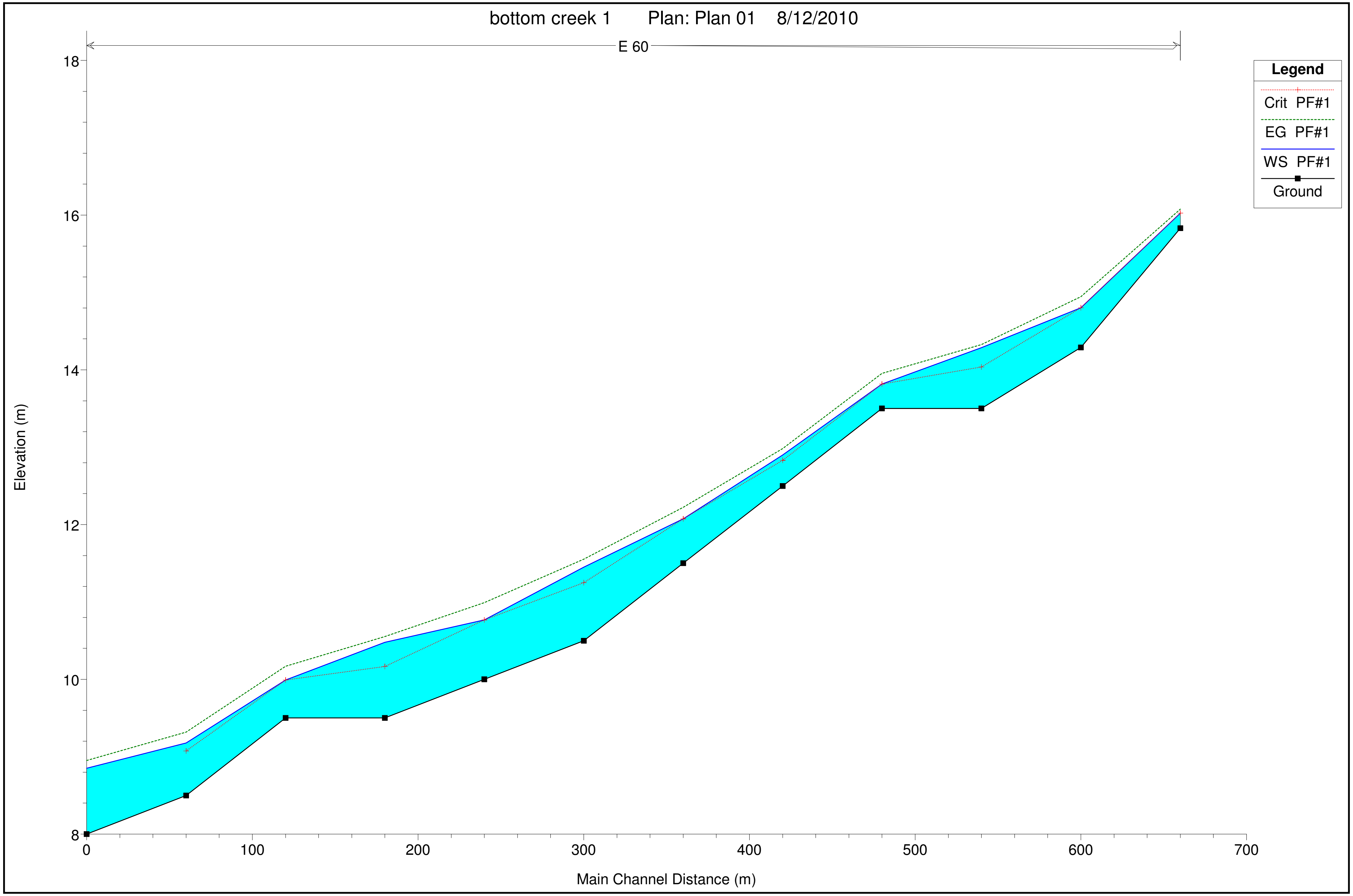


bottom creek 1 Plan: Plan 01 8/12/2010
B 180
B 673
Legend
Crit PF#1
EG PF#1
WS PF#1
Ground
Elevation (m)
Main Channel Distance (m)
0
2
4
6
8
10
12
14
16
0
500
1000
1500
2000
2500

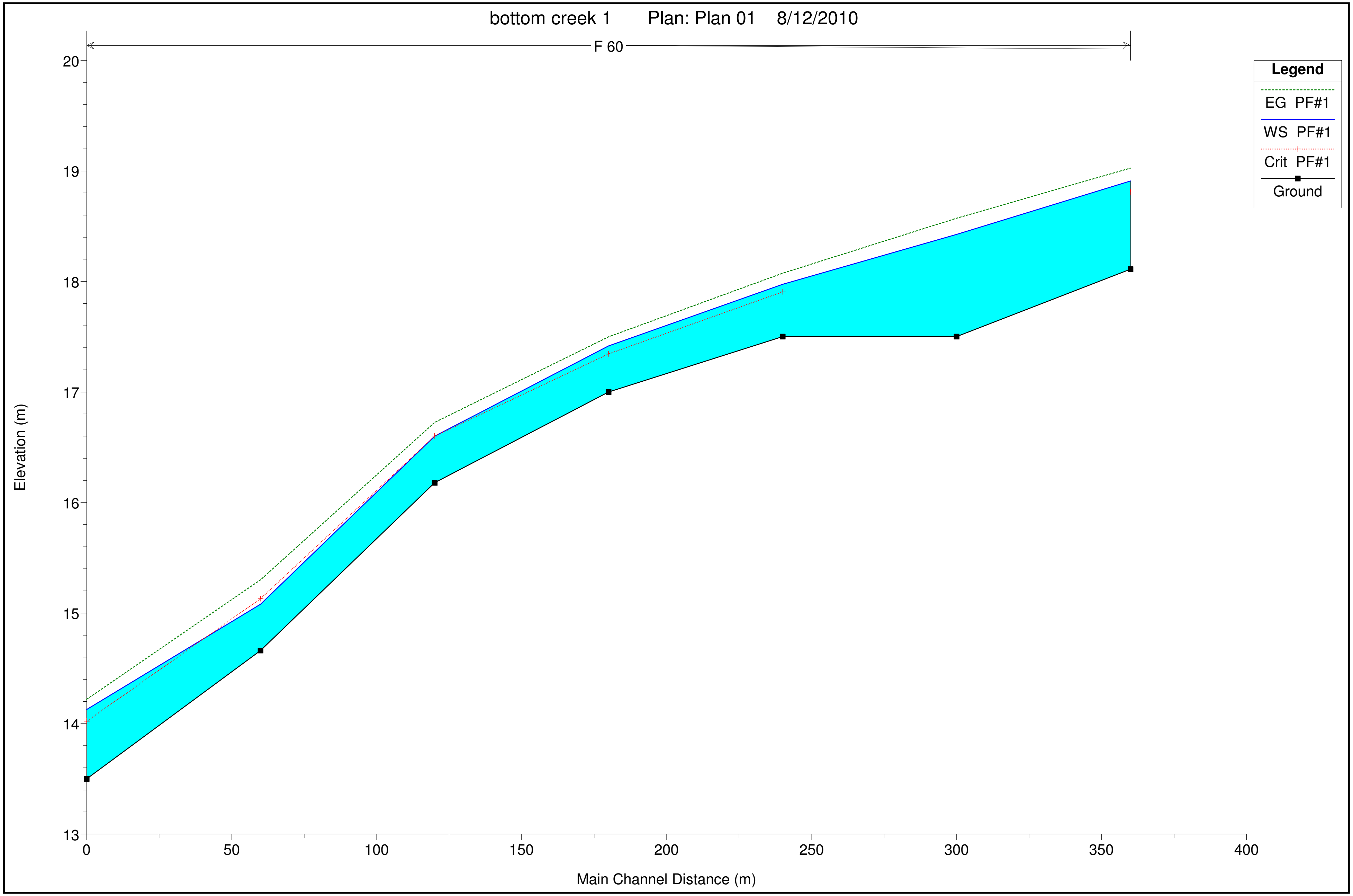


bottom creek 1 Plan: Plan 01 8/12/2010
C 120
C 660
Legend
Crit PF#1
EG PF#1
WS PF#1
Ground
Elevation (m)
Main Channel Distance (m)
14
12
10
8
6
4
2
0
200
400
600
800
1000
1200

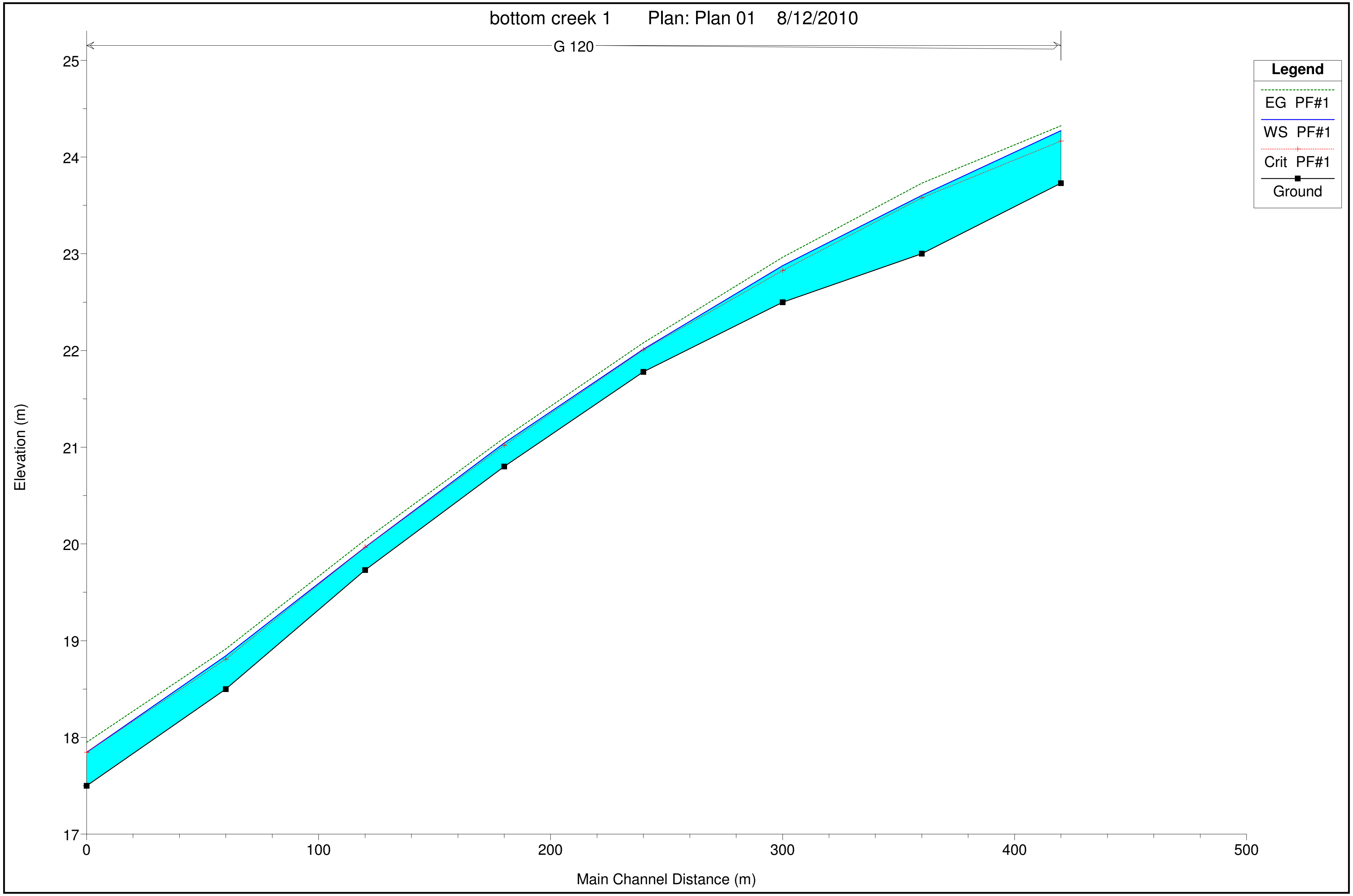

bottom creek 1 Plan: Plan 01 8/12/2010
D 60
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Elevation (m)
9.5
9.0
8.5
8.0
7.5
7.0
0
20
40
60
80
100
120
Main Channel Distance (m)



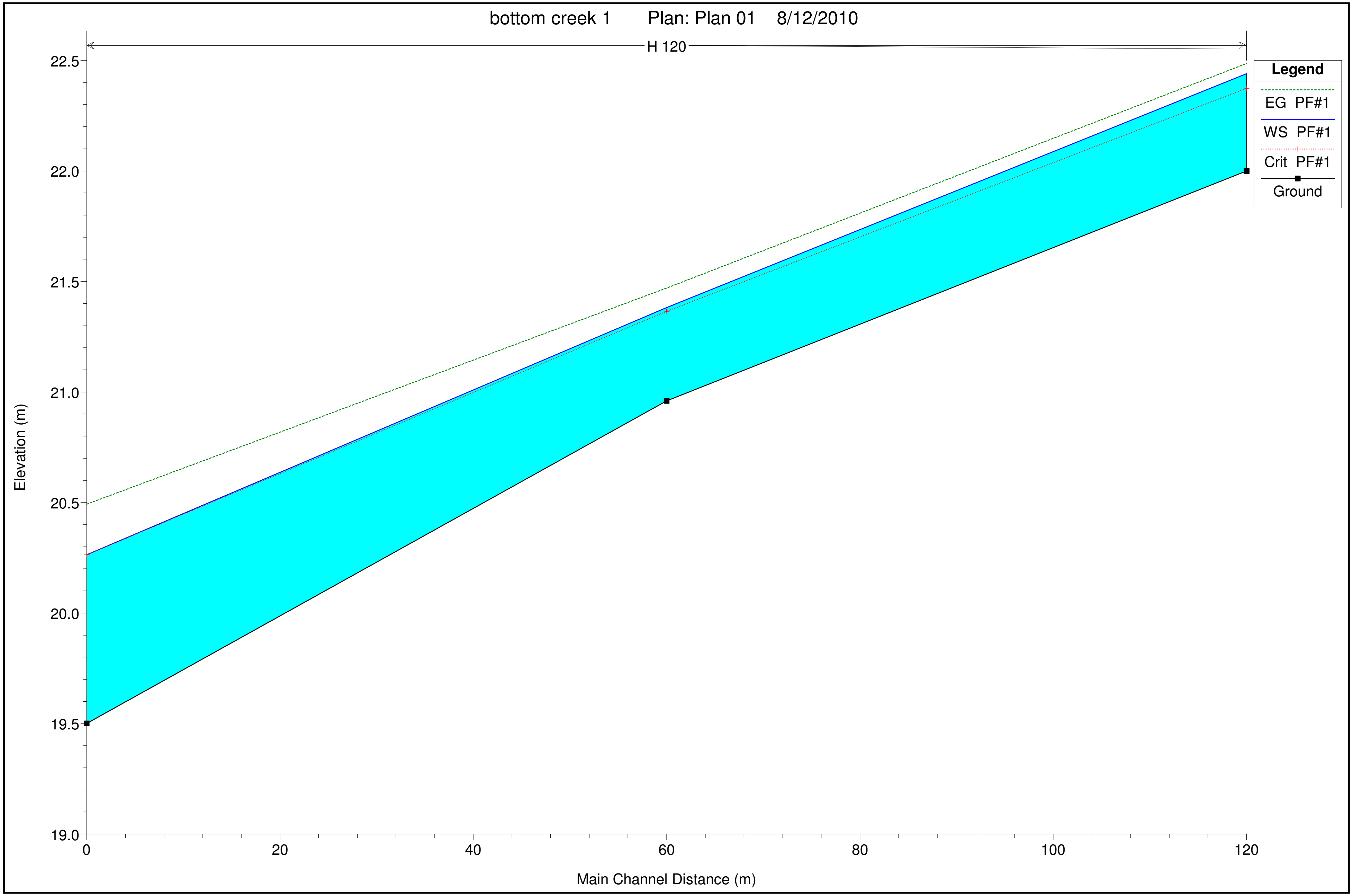
bottom creek 1 Plan: Plan 01 8/12/2010
E 60
Legend
Crit PF#1
EG PF#1
WS PF#1
Ground
Elevation (m)
Main Channel Distance (m)
8
10
12
14
16
18
0
100
200
300
400
500
600
700



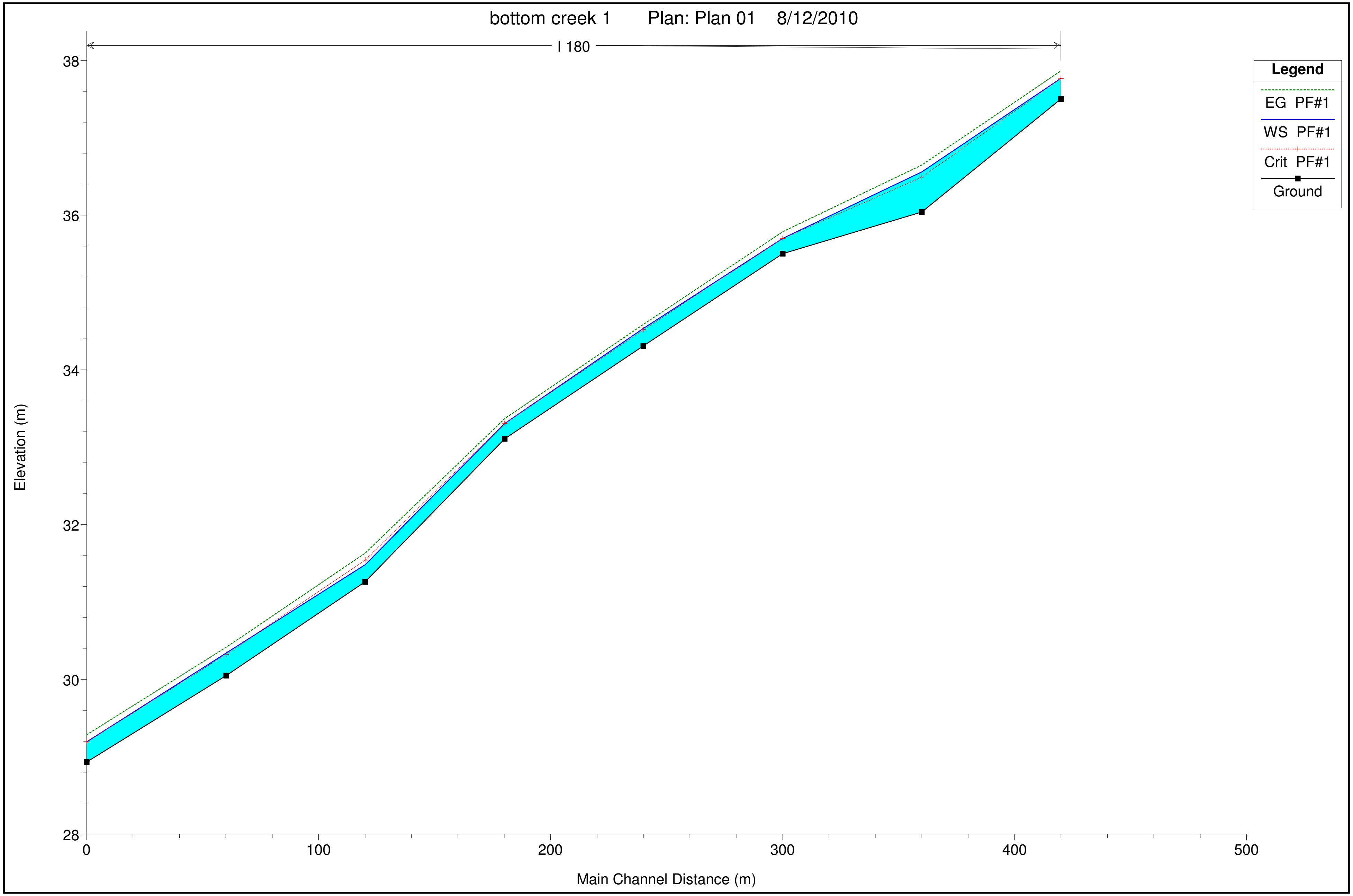
bottom creek 1 Plan: Plan 01 8/12/2010
F 60
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Elevation (m)
Main Channel Distance (m)
13
14
15
16
17
18
19
20
0
50
100
150
200
250
300
350
400



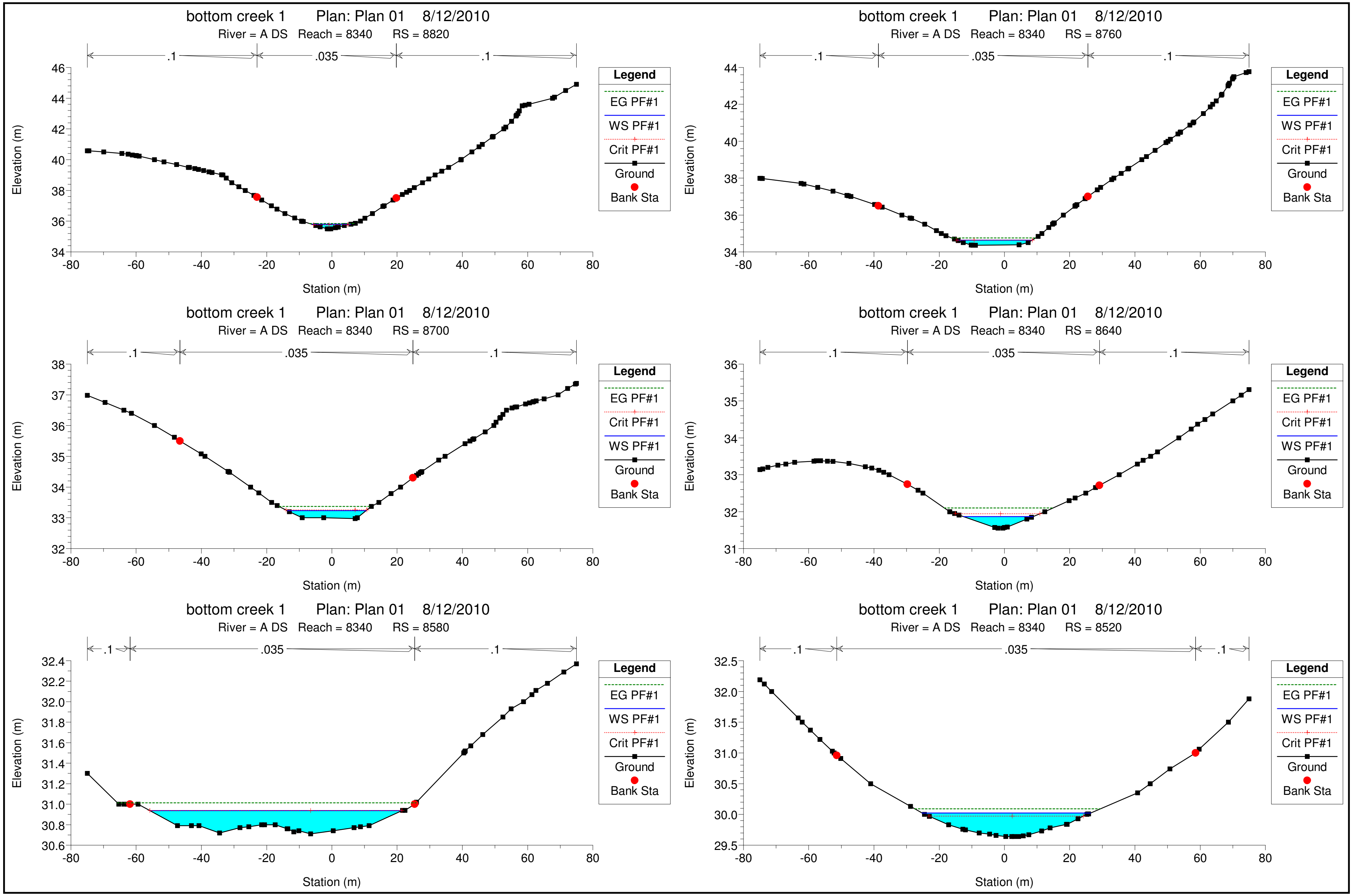
bottom creek 1 Plan: Plan 01 8/12/2010
G 120
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Elevation (m)
25
24
23
22
21
20
19
18
17
0
100
200
300
400
500
Main Channel Distance (m)



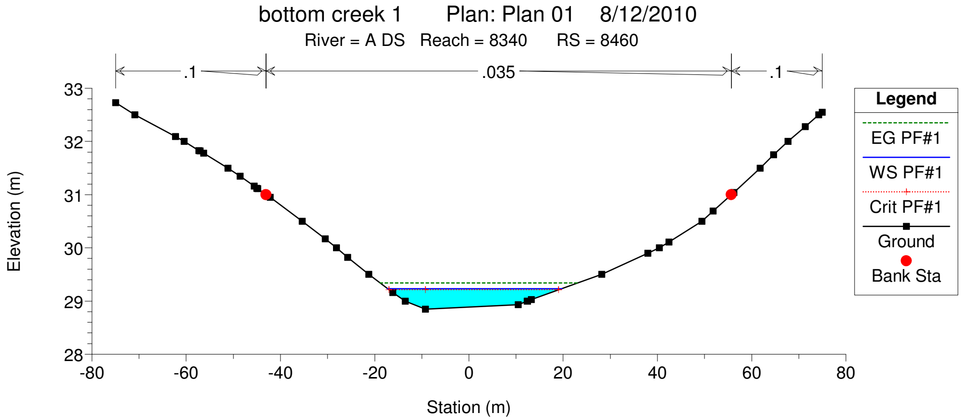
bottom creek 1 Plan: Plan 01 8/12/2010
H 120
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Elevation (m)
22.5
22.0
21.5
21.0
20.5
20.0
19.5
19.0
0
20
40
60
80
100
120
Main Channel Distance (m)

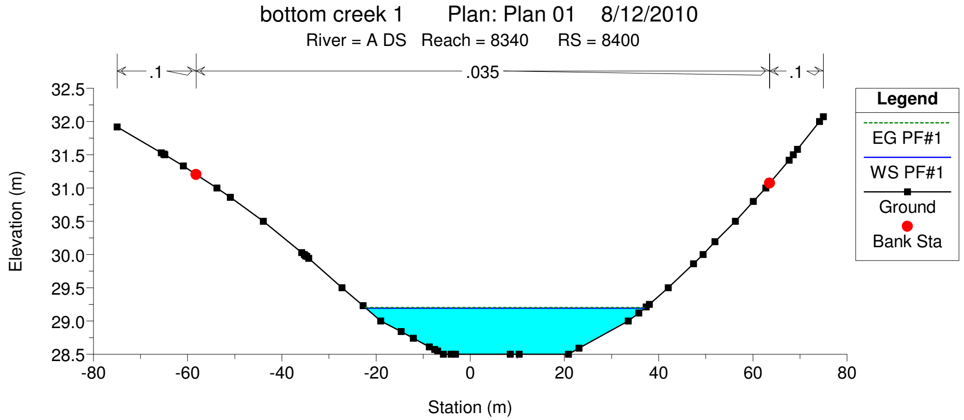


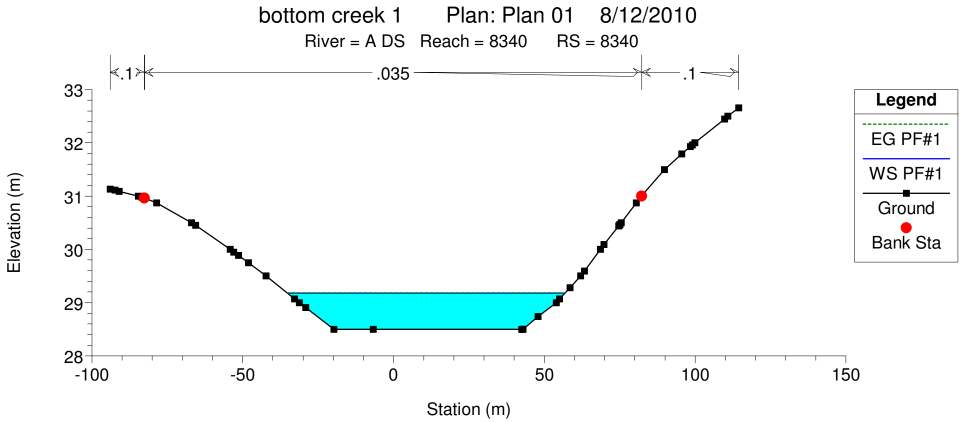
bottom creek 1 Plan: Plan 01 8/12/2010
I 180
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Elevation (m)
28
30
32
34
36
38
0
100
200
300
400
500
Main Channel Distance (m)

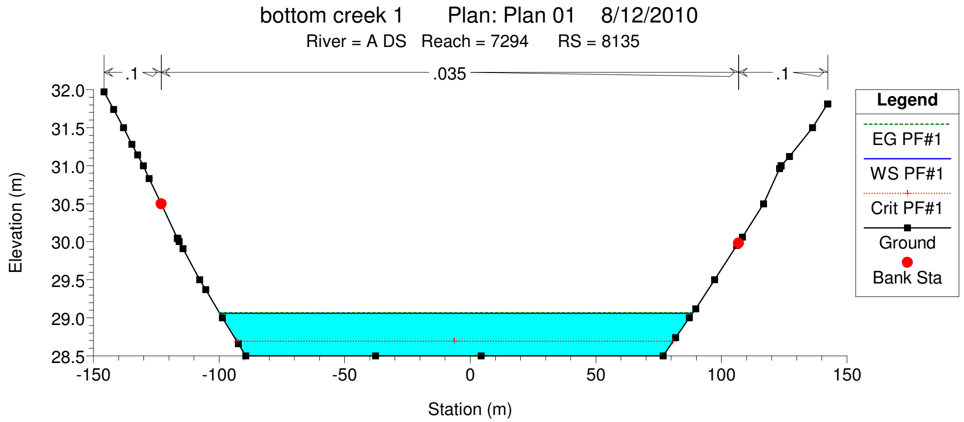


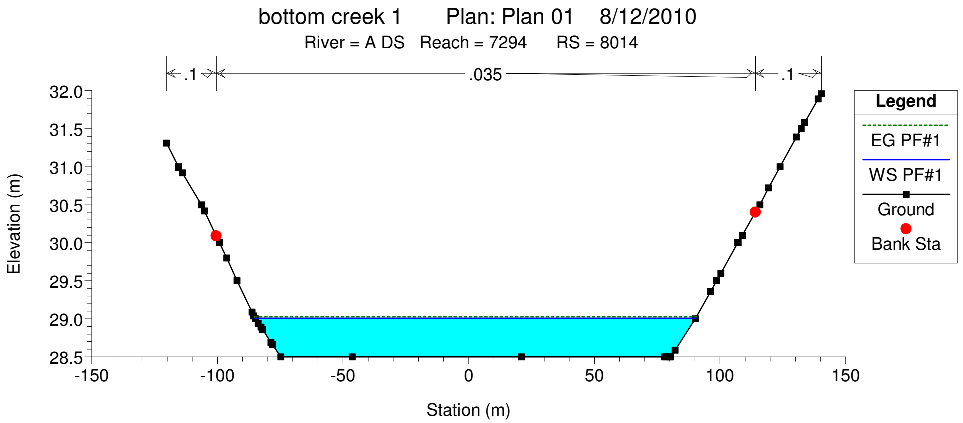
bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 8340 RS = 8820
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 8340 RS = 8760
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 8340 RS = 8700
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 8340 RS = 8640
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 8340 RS = 8580
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 8340 RS = 8520
.1 .035 .1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

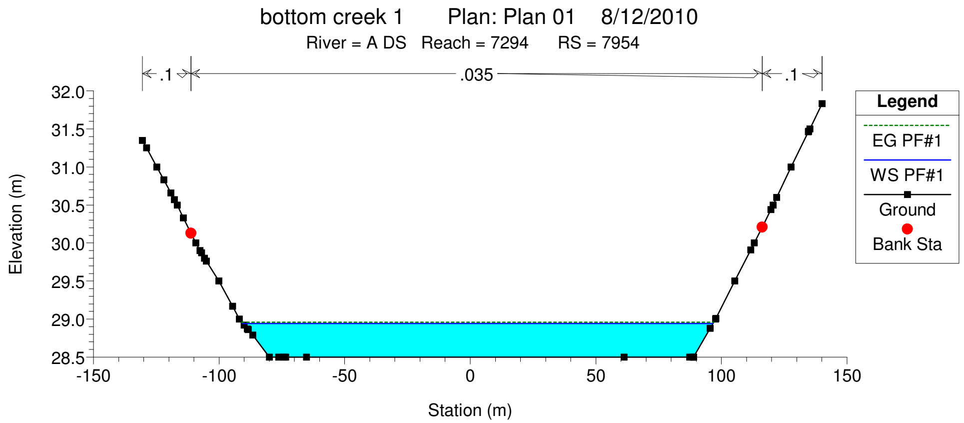

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 8340 RS = 8460
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

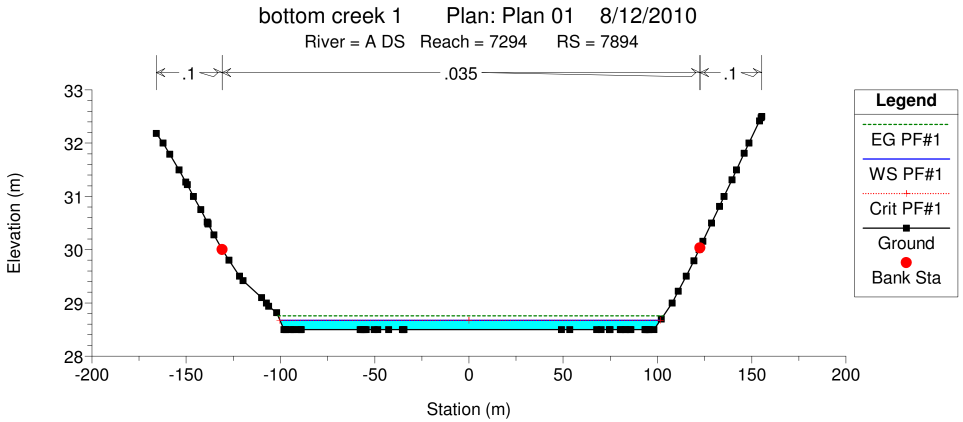

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 8340 RS = 8400
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

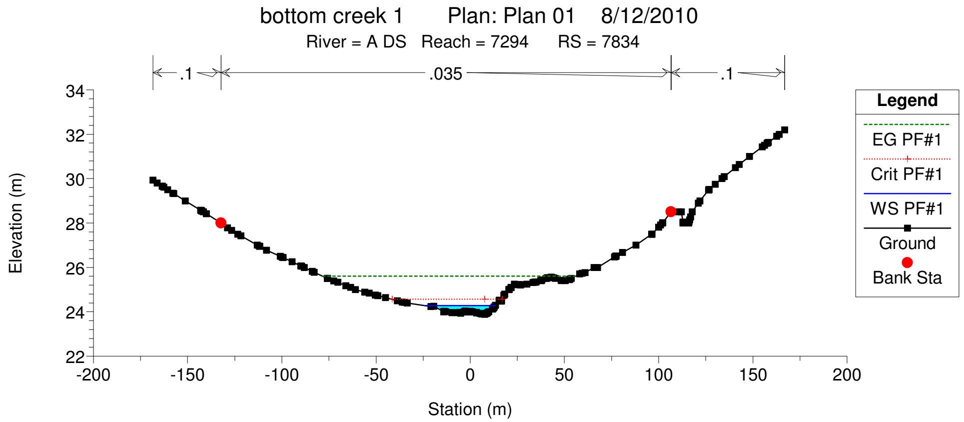

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 8340 RS = 8340
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

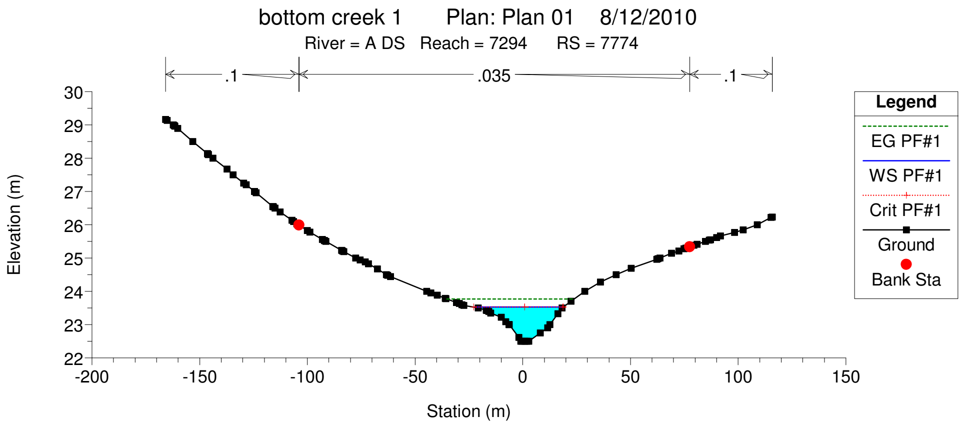

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 8135
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

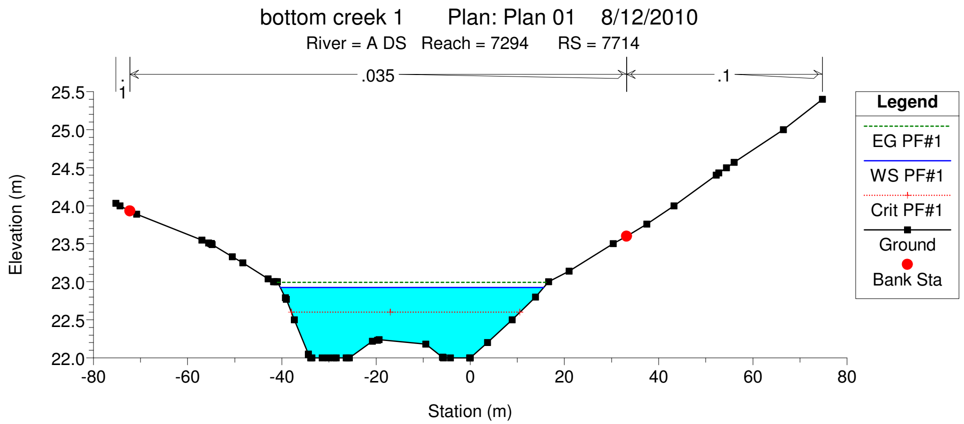

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 8014
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

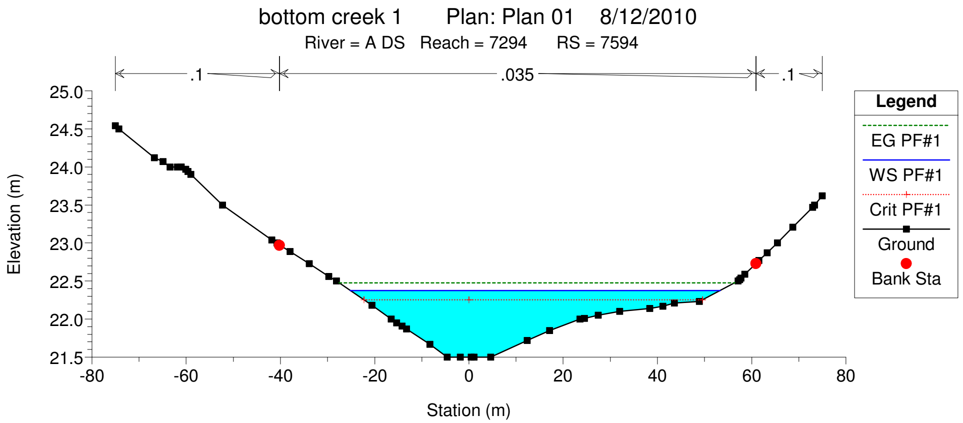

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7954
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

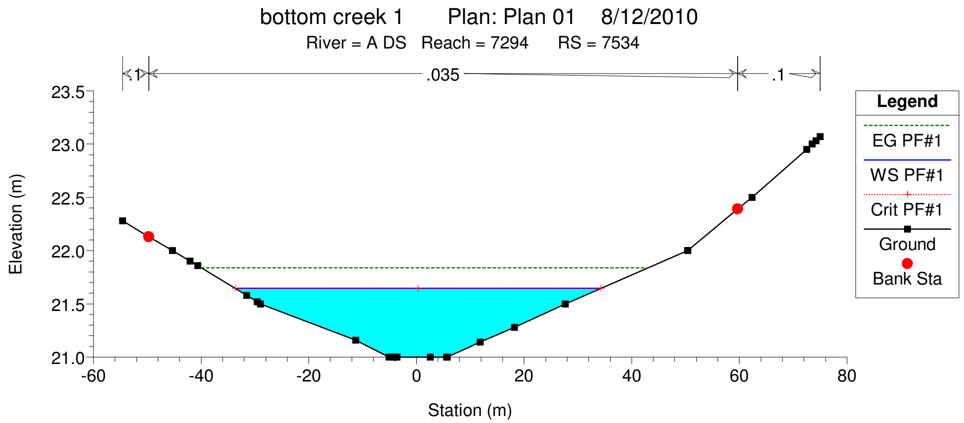

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7894
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

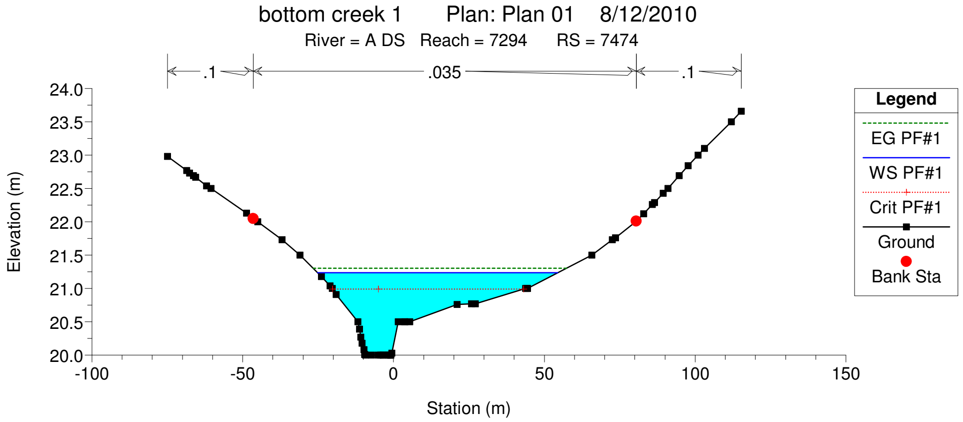

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7834
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

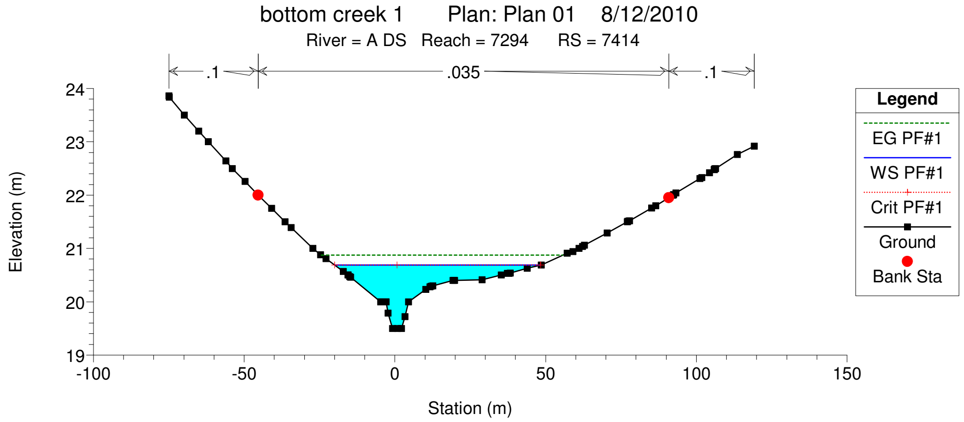

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7774
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

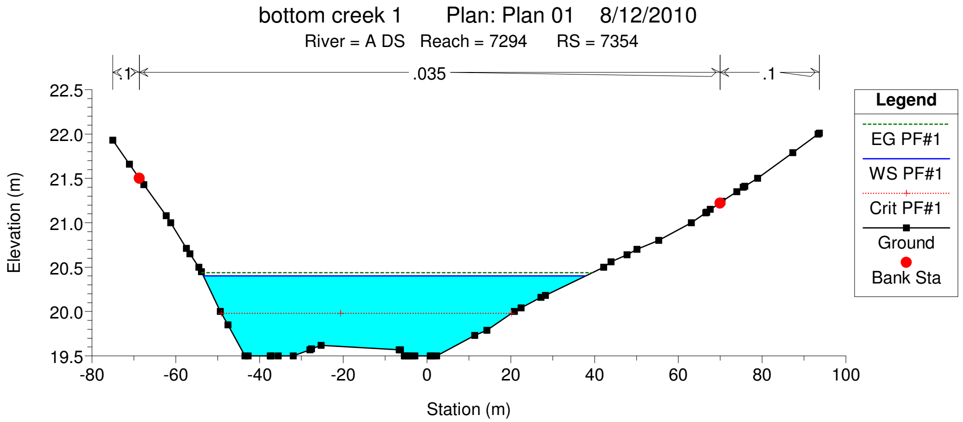

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7714
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

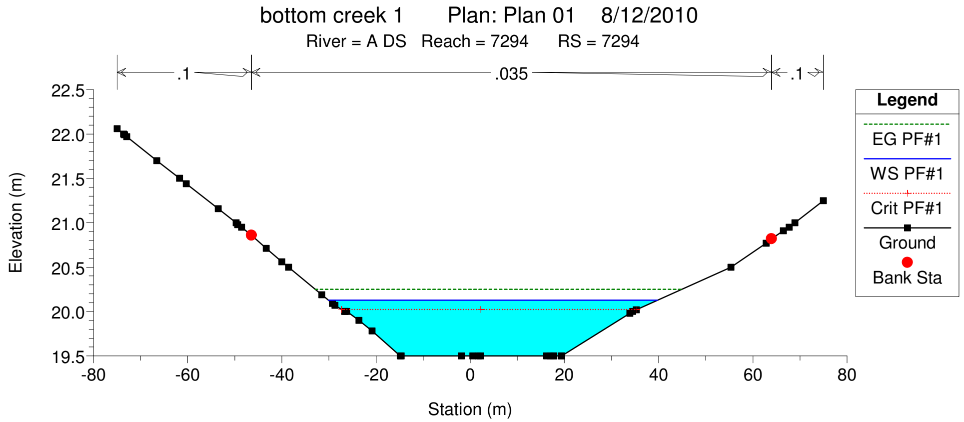

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7594
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

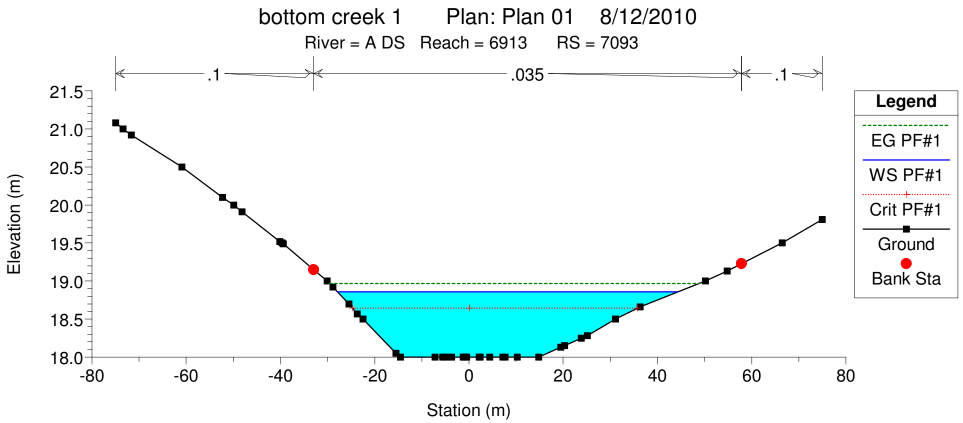

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7534
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

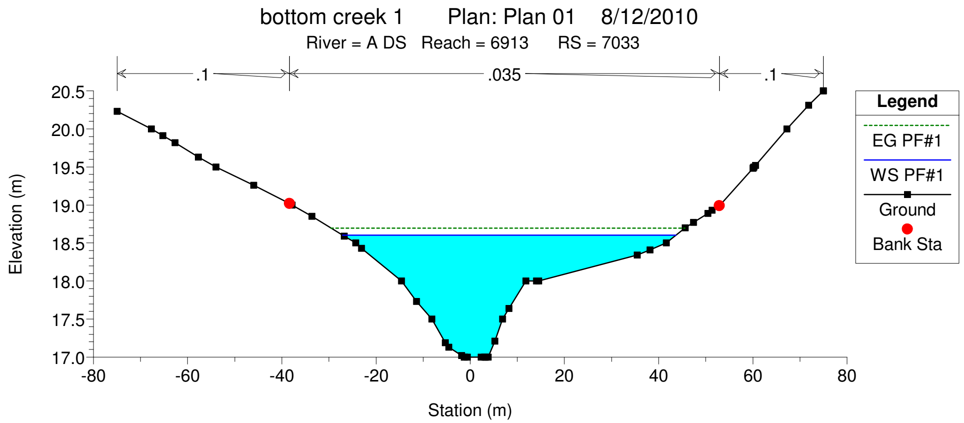

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7474
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

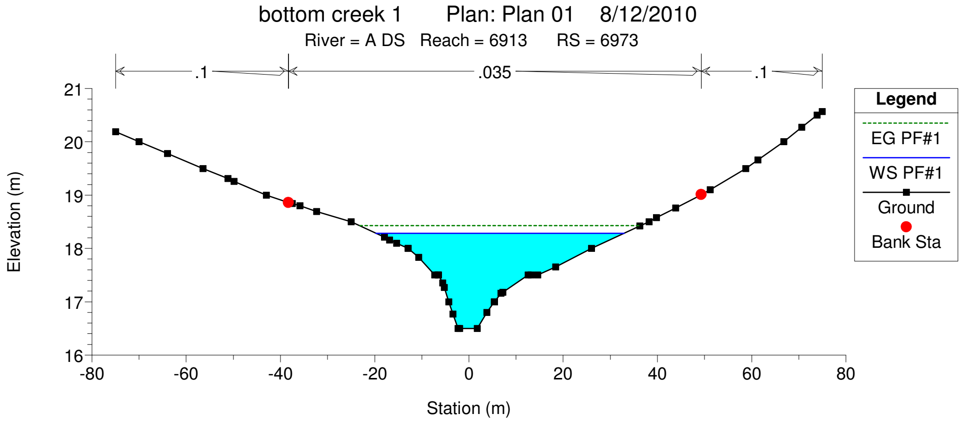

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7414
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

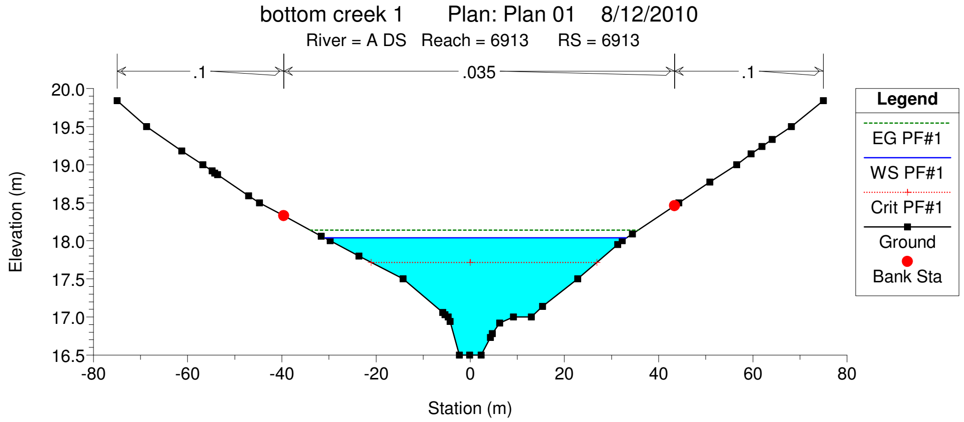

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7354
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

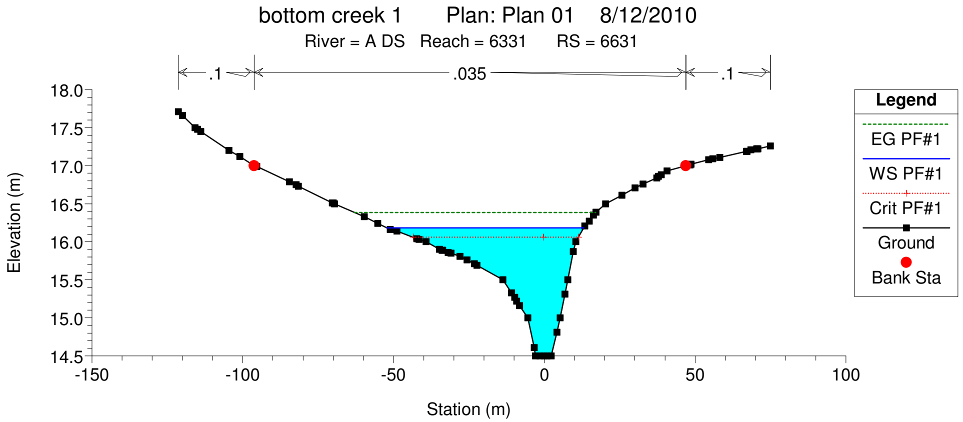

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 7294 RS = 7294
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

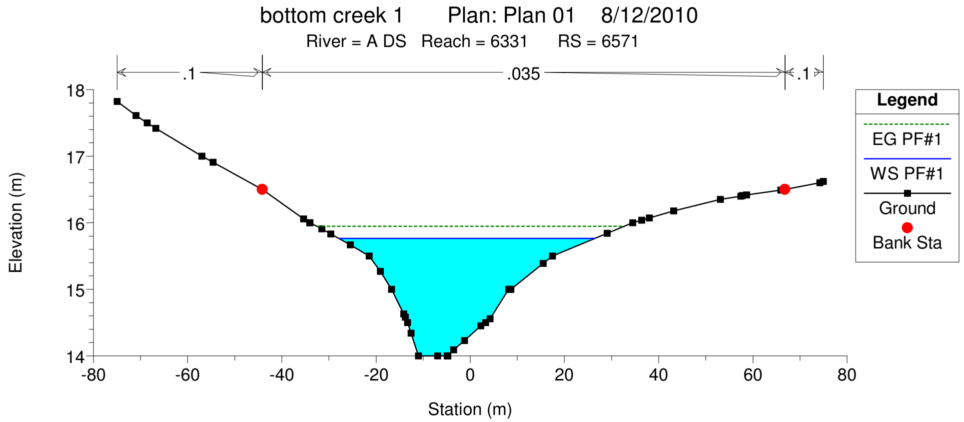

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6913 RS = 7093
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

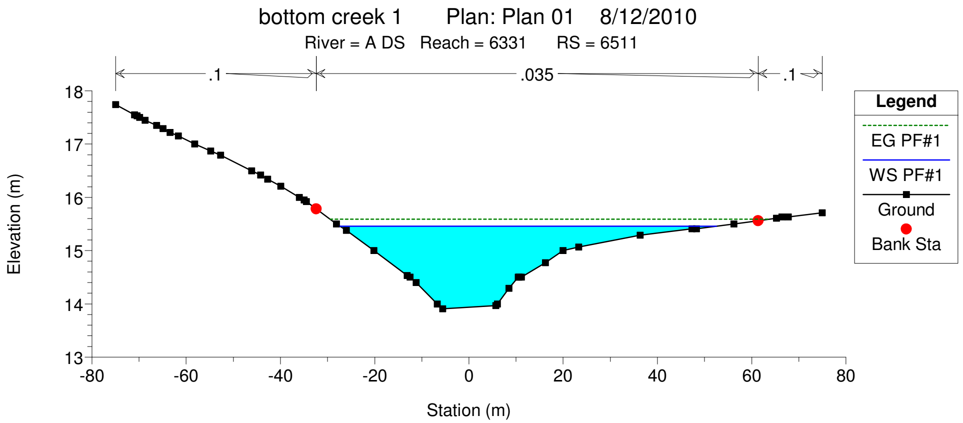

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6913 RS = 7033
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

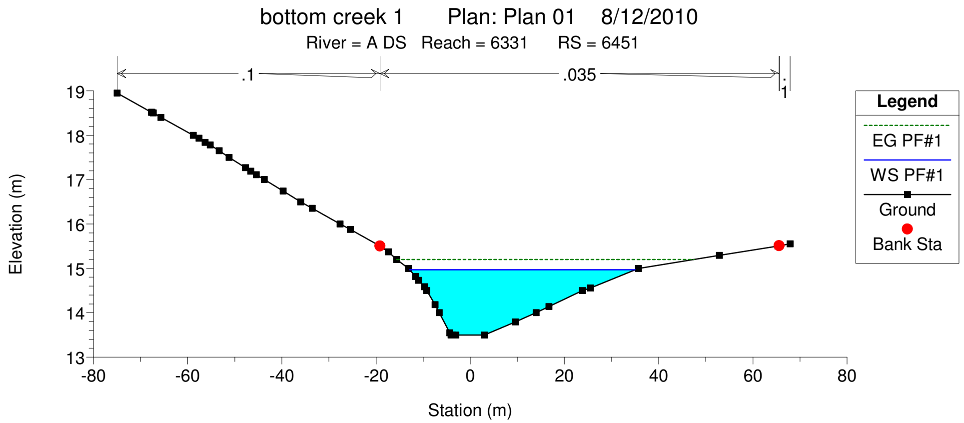

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6913 RS = 6973
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

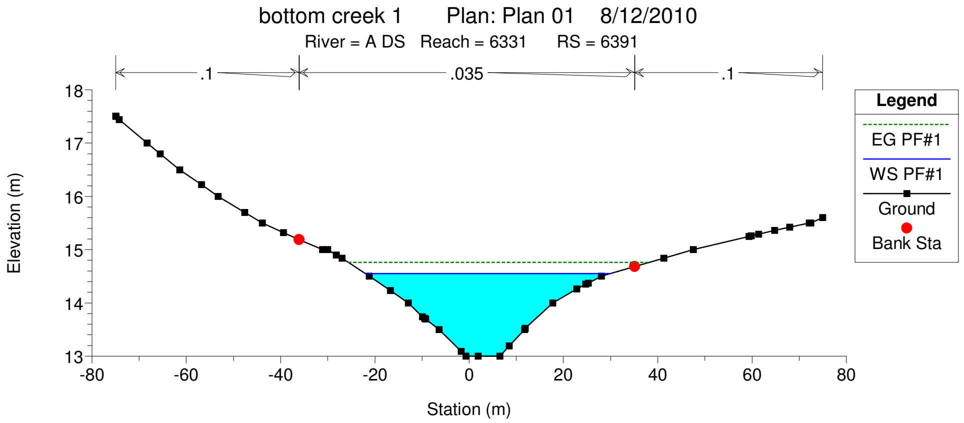

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6913 RS = 6913
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

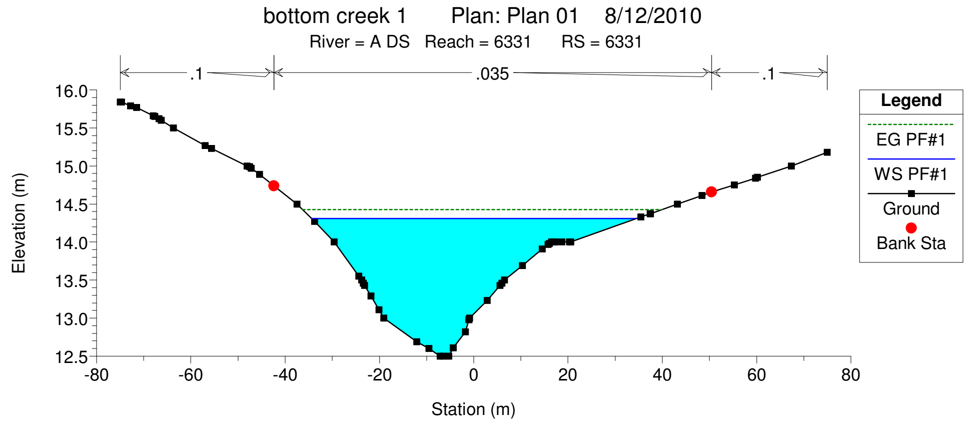

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6331 RS = 6631
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

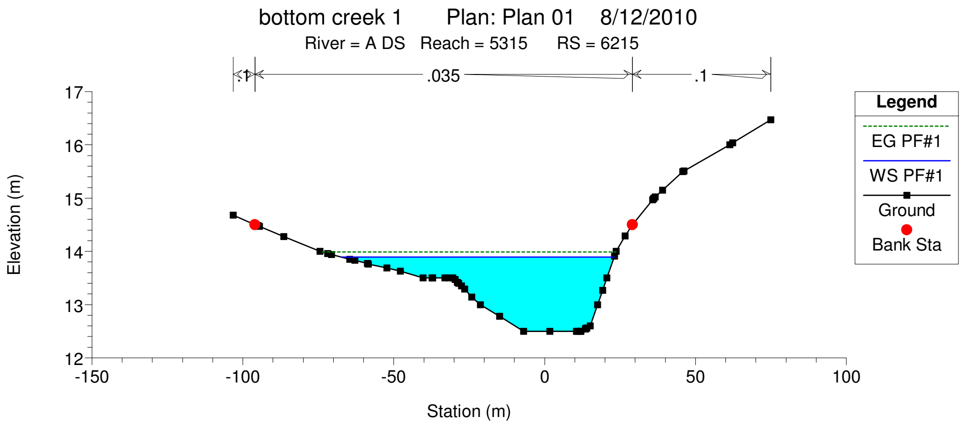

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6331 RS = 6571
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

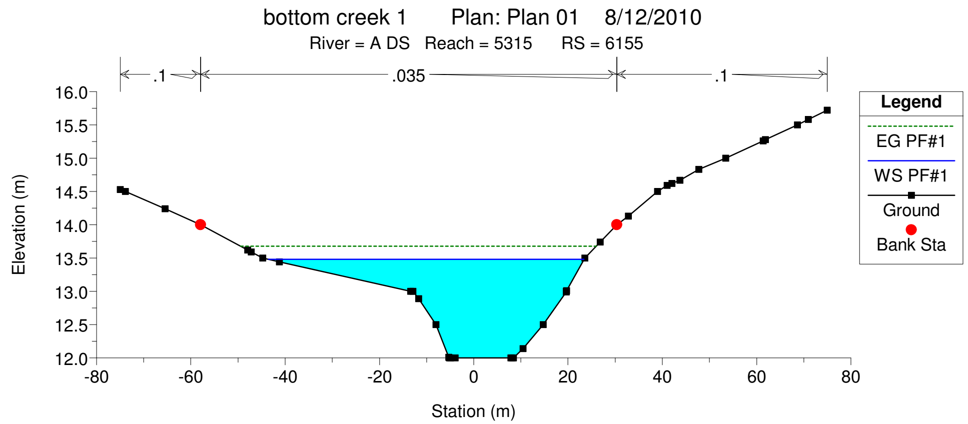

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6331 RS = 6511
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

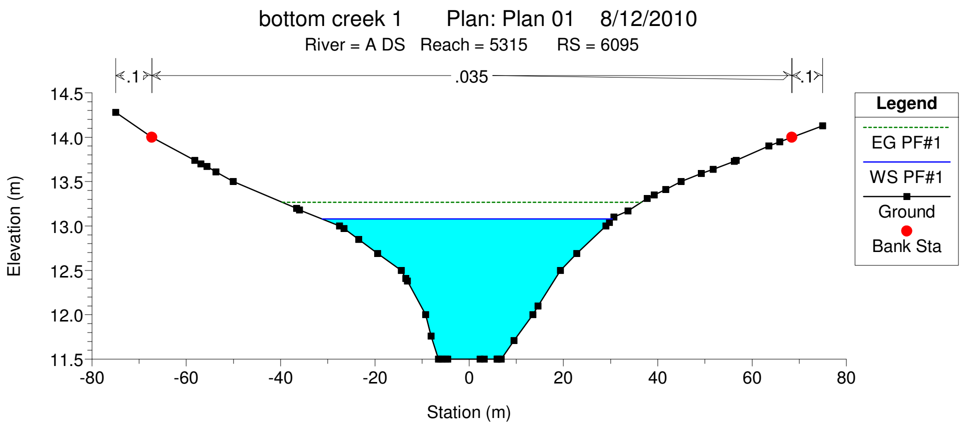

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6331 RS = 6451
.1
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

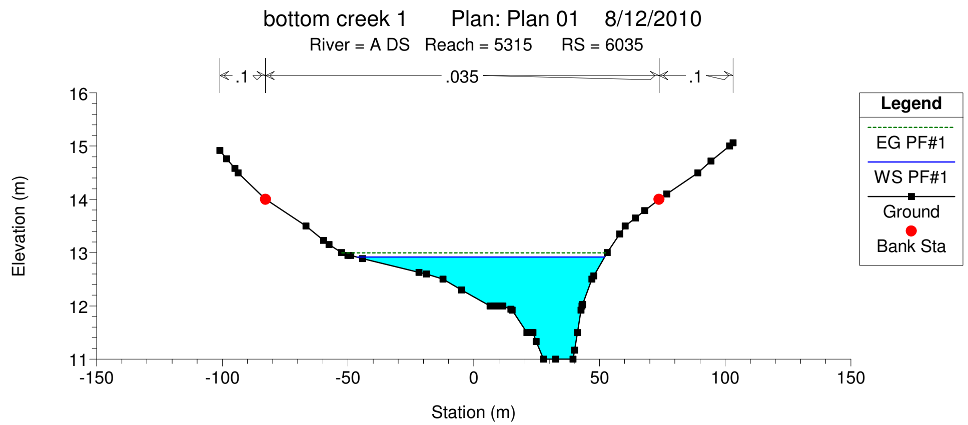

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6331 RS = 6391
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

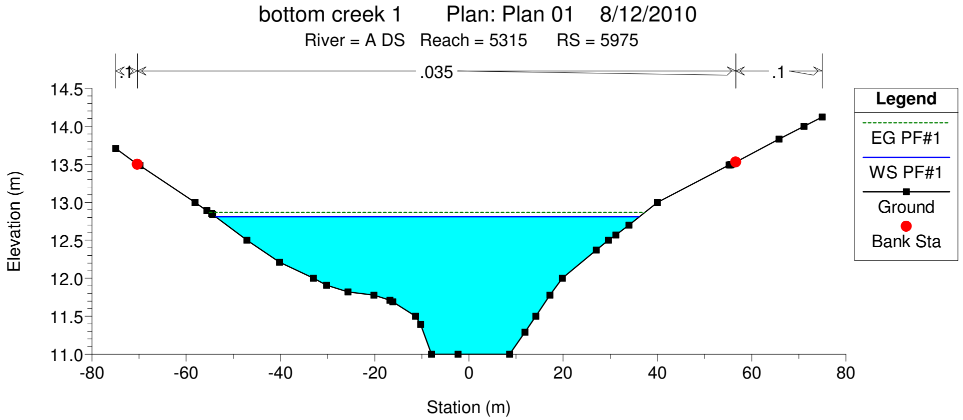

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 6331 RS = 6331
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 6215
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 6155
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 6095
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 6035
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5975
.1
.035
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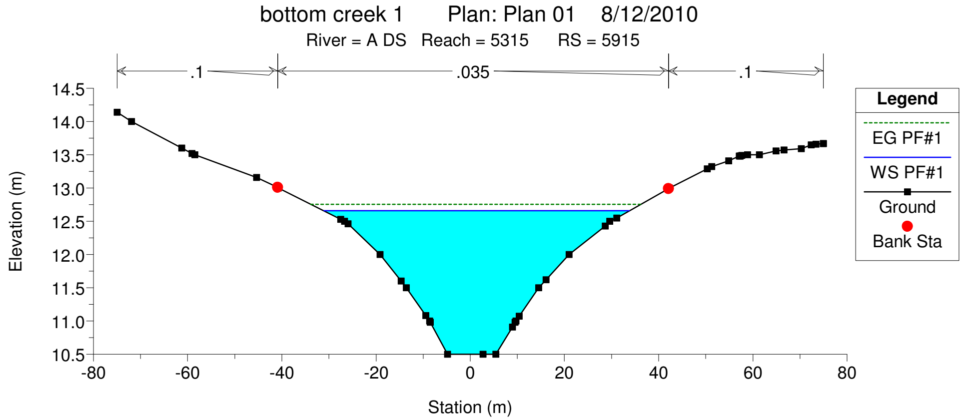
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5915
.1
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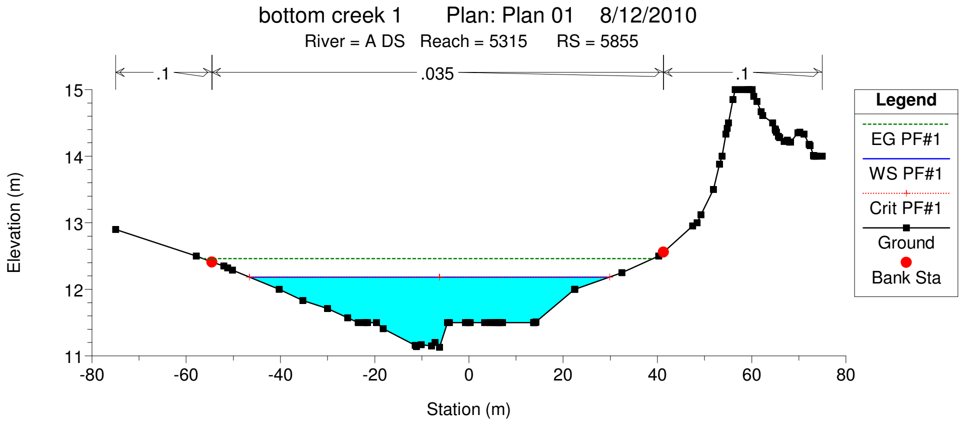
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5855
.1
.035
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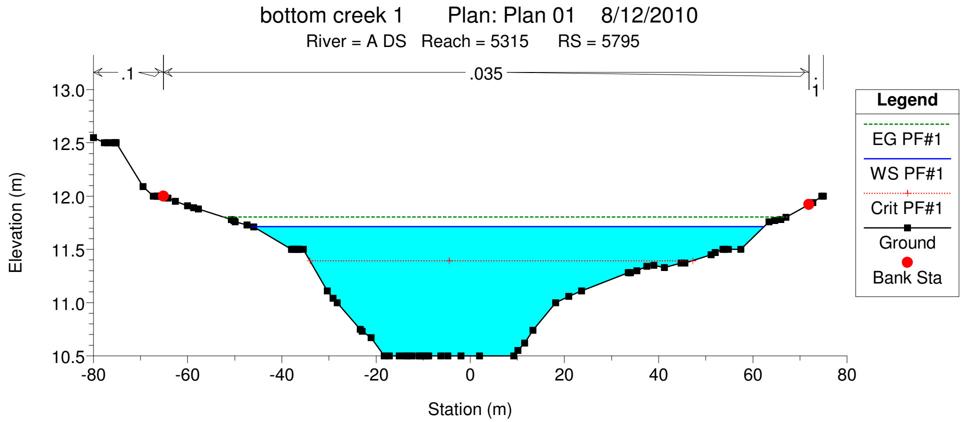
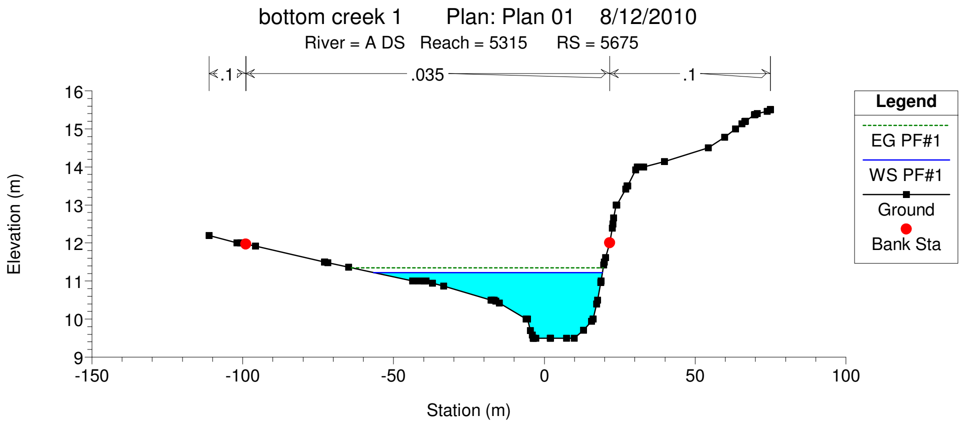
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5795
.1
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5675
.1
.035
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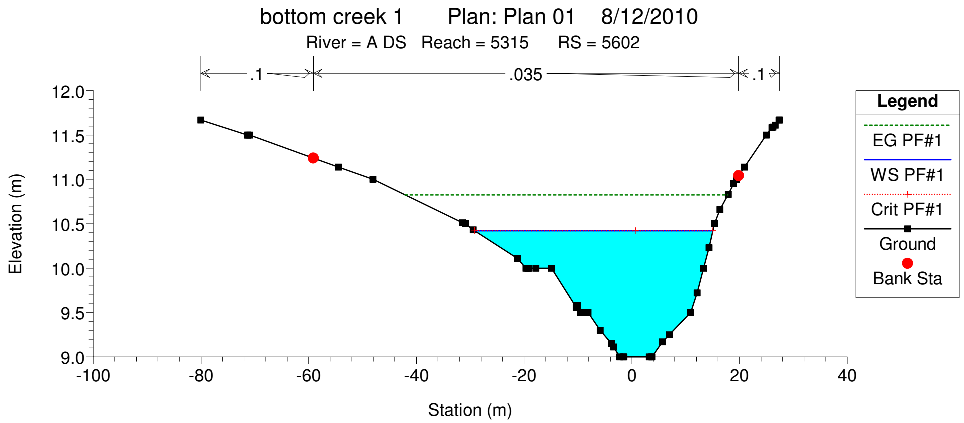
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5602
.1
.035
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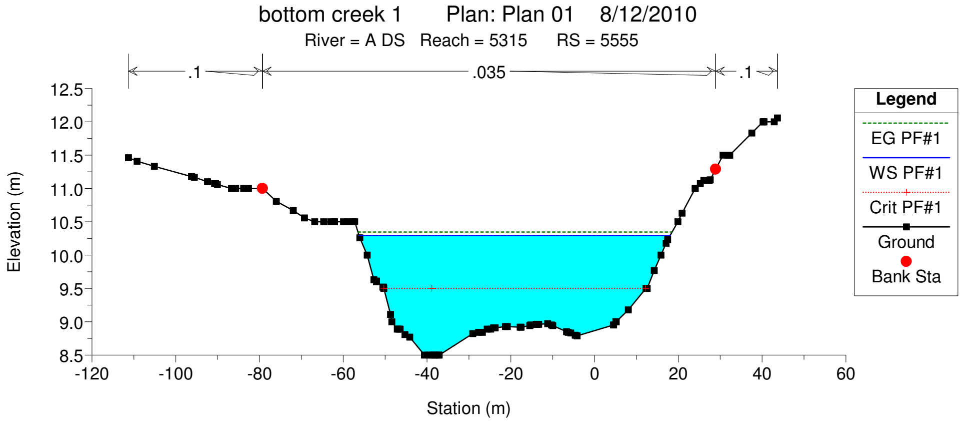
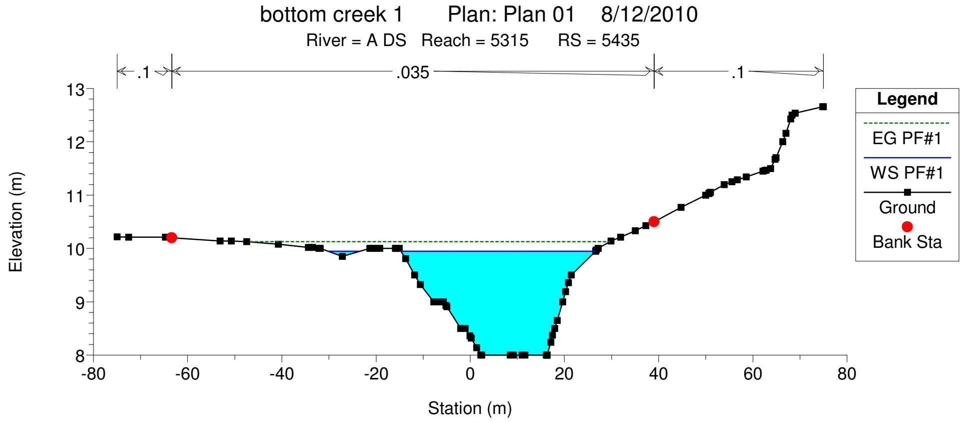
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5555
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5435
.1
.035
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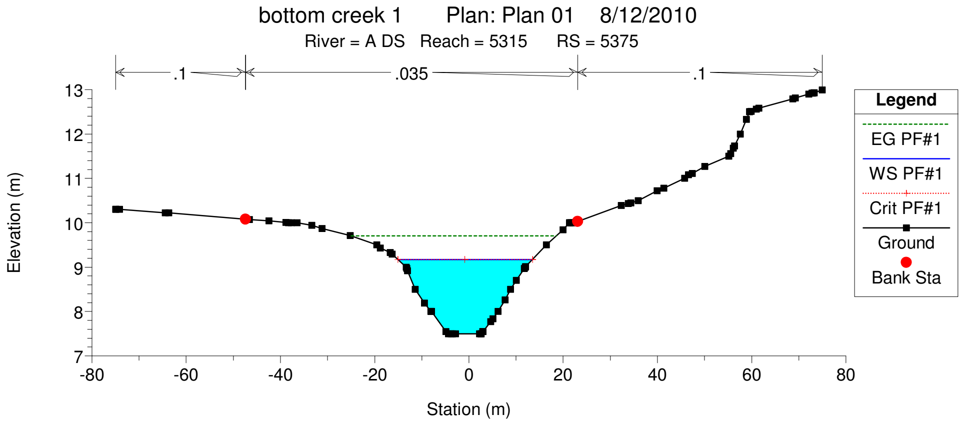
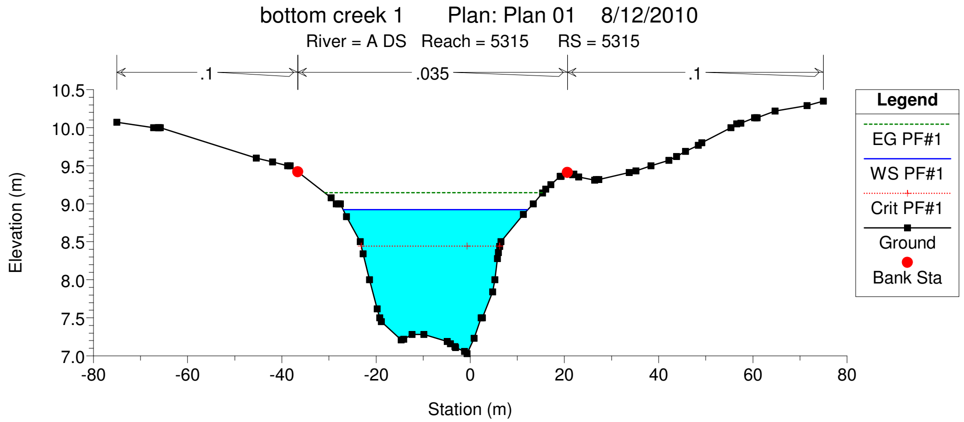
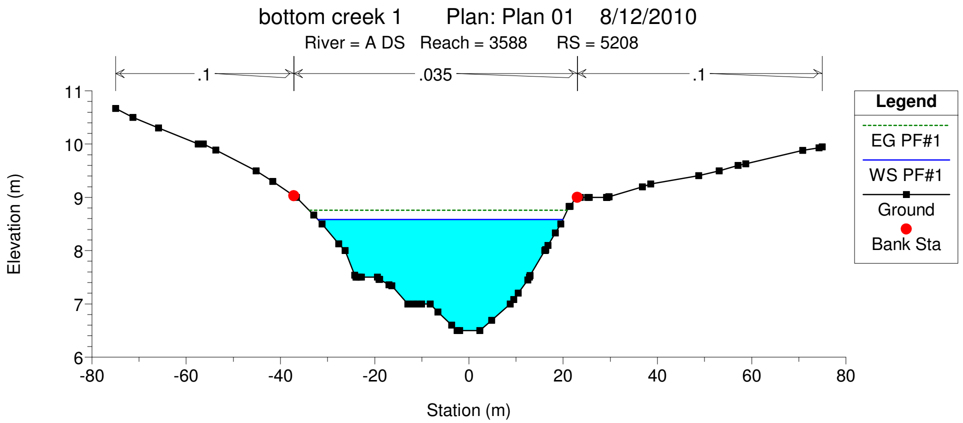
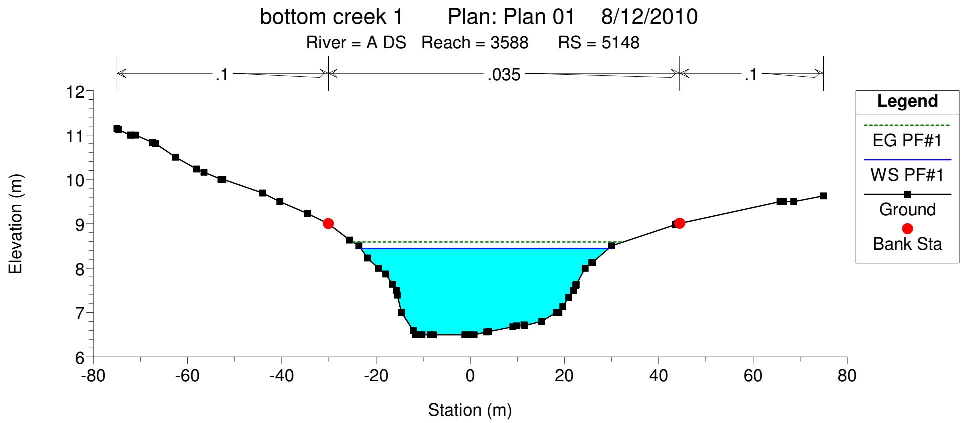
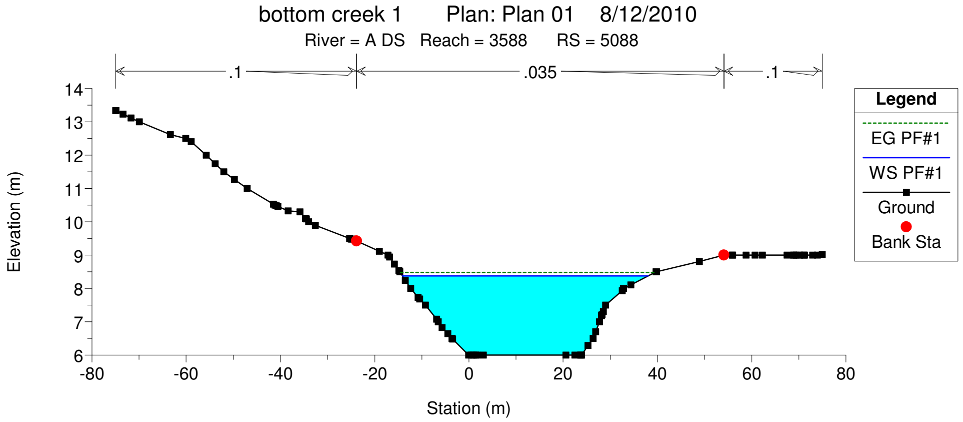
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

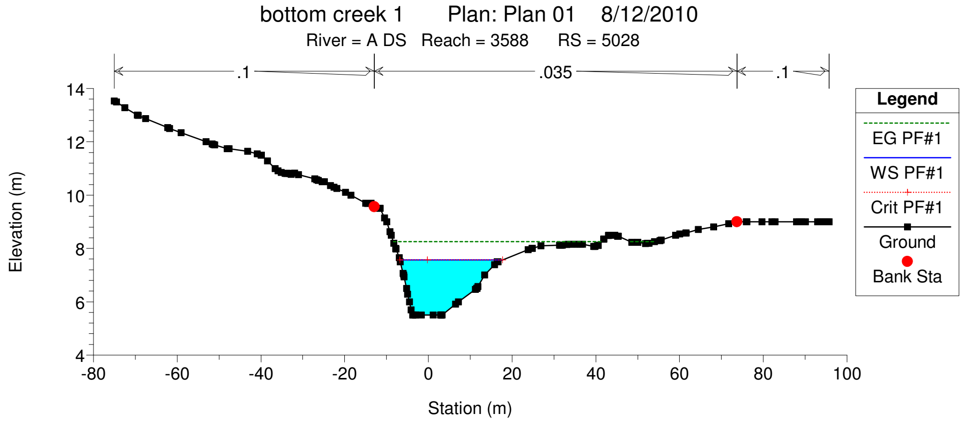

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5375
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

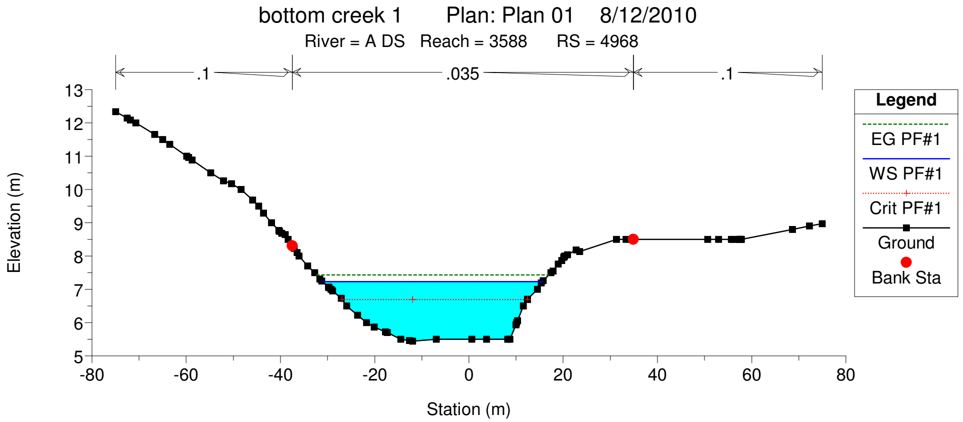

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 5315 RS = 5315
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

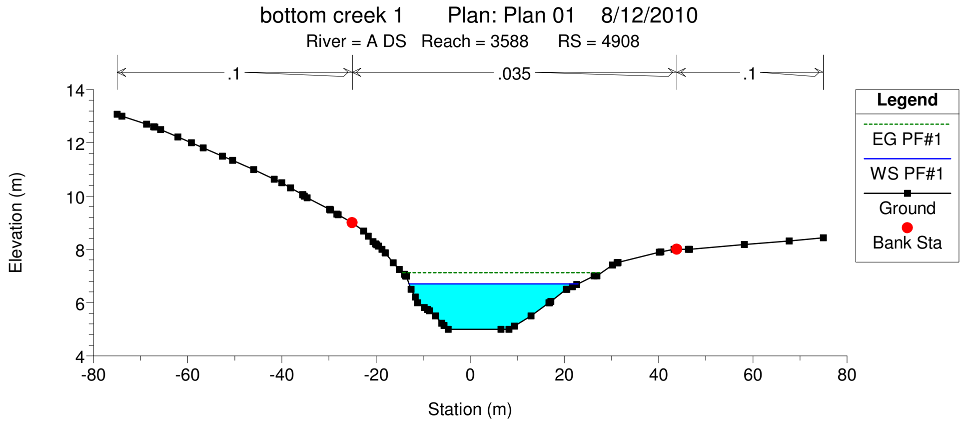

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 5208
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

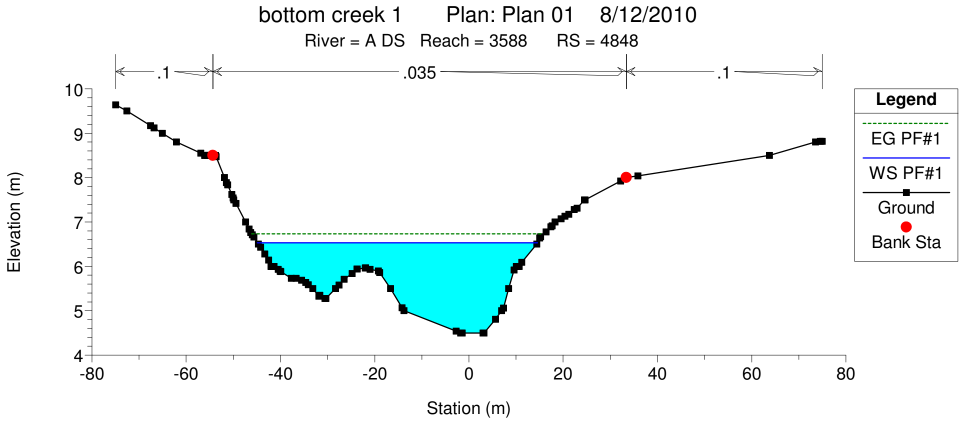

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 5148
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

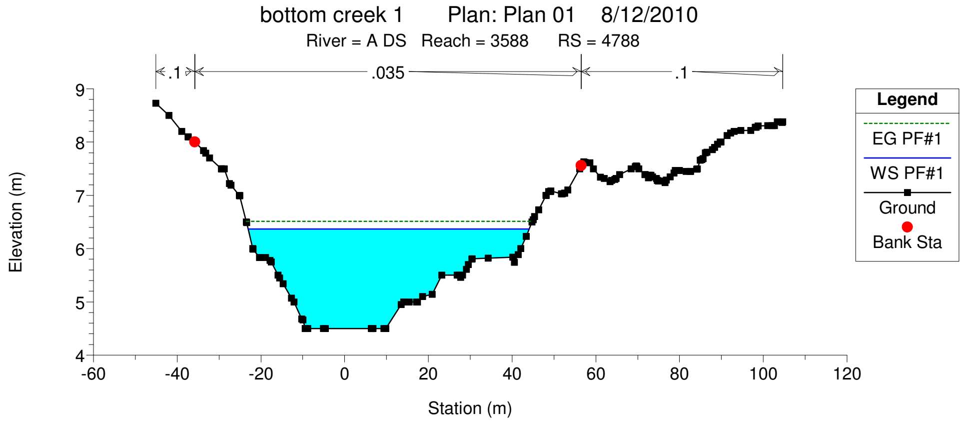

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 5088
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

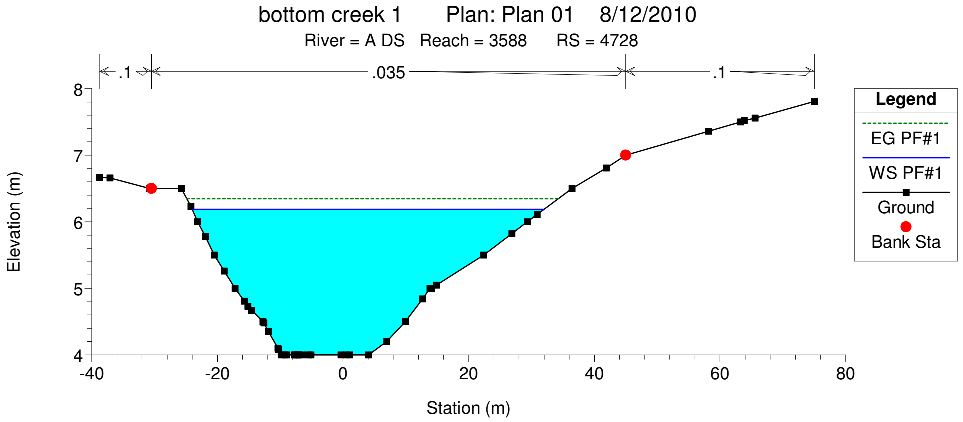

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 5028
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

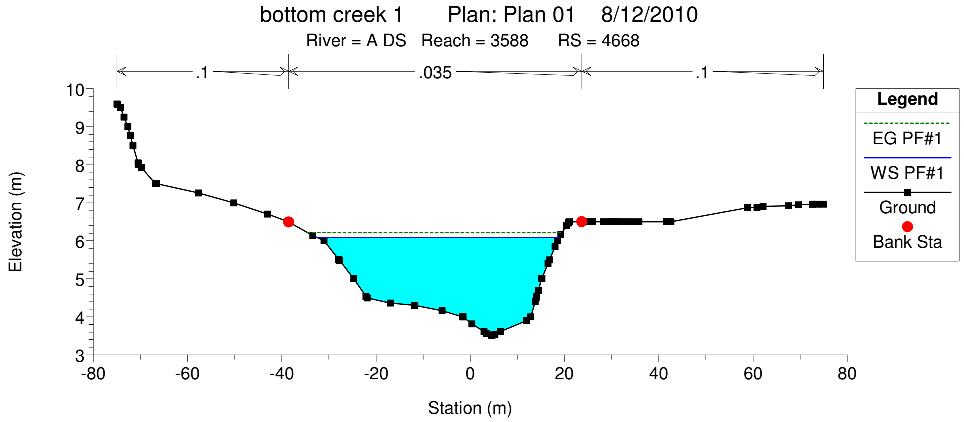

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4968
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

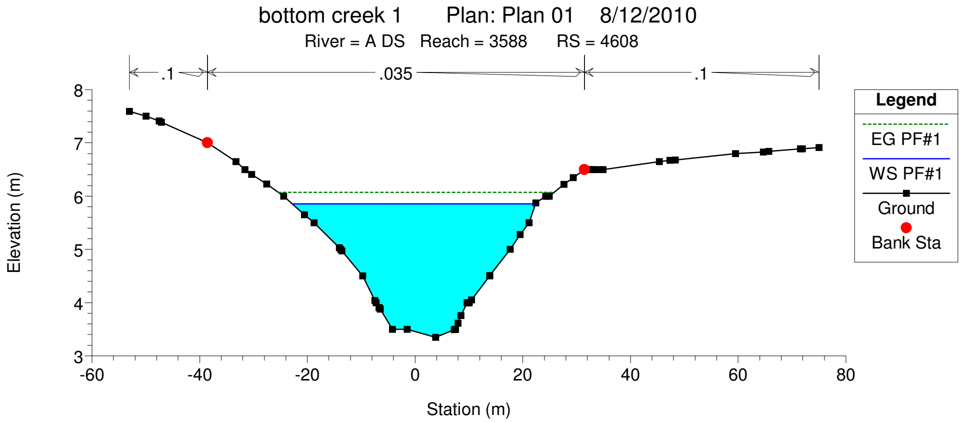

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4908
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

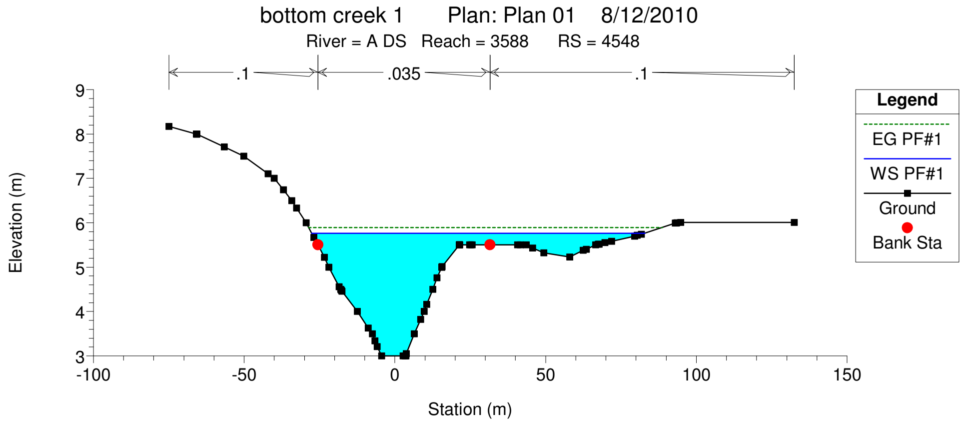

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4848
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

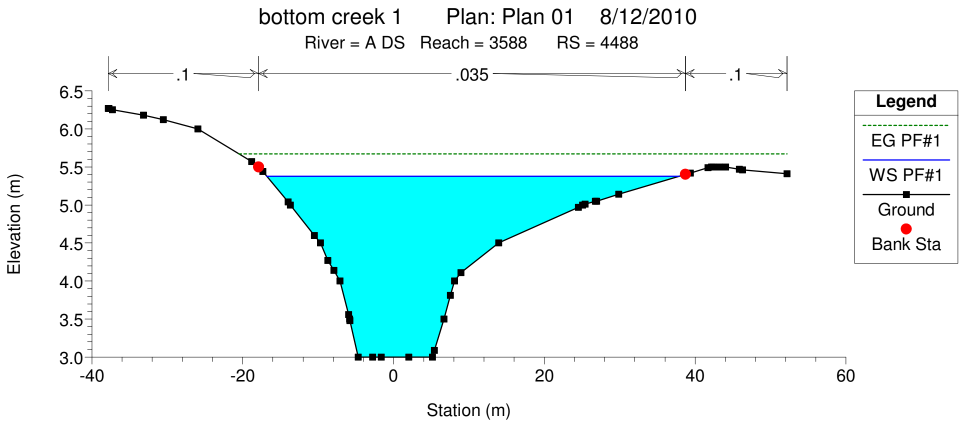

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4788
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

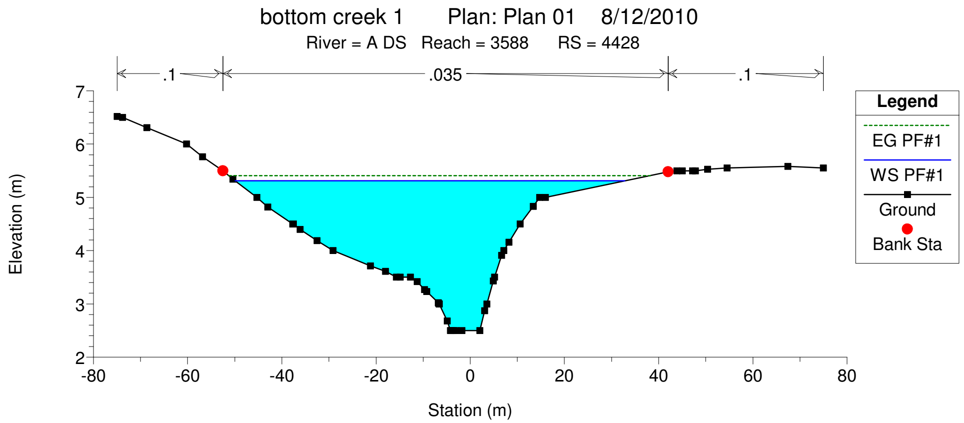

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4728
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

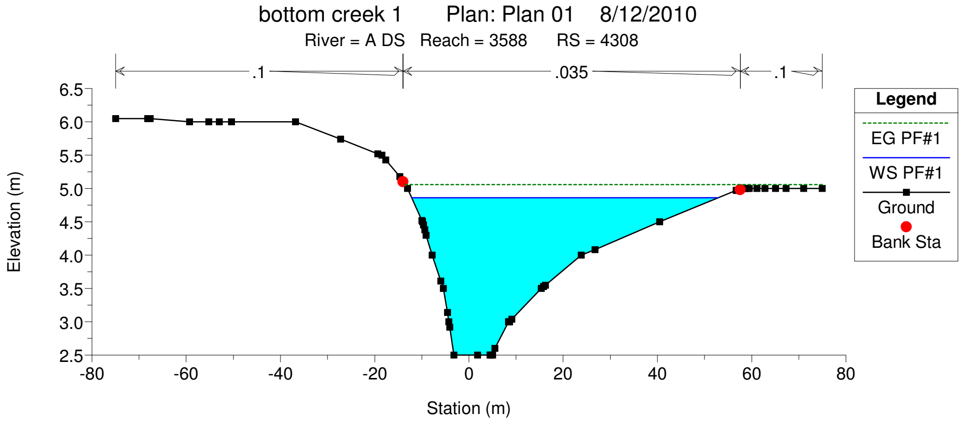

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4668
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

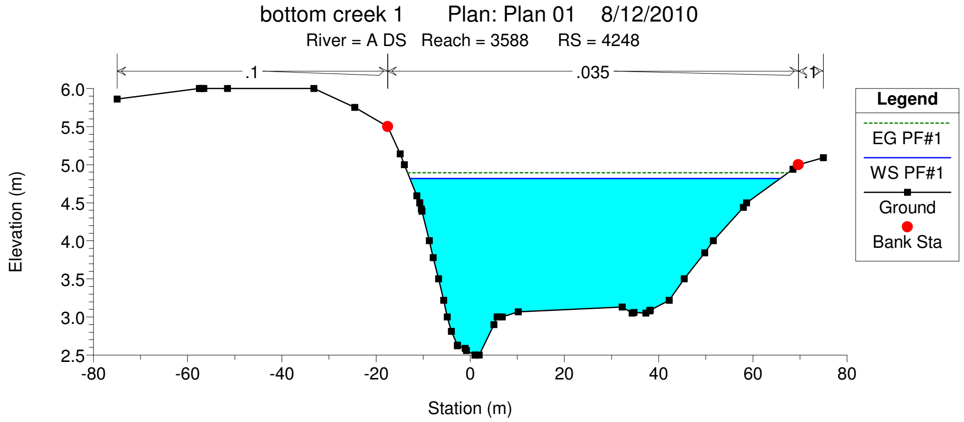

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4608
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

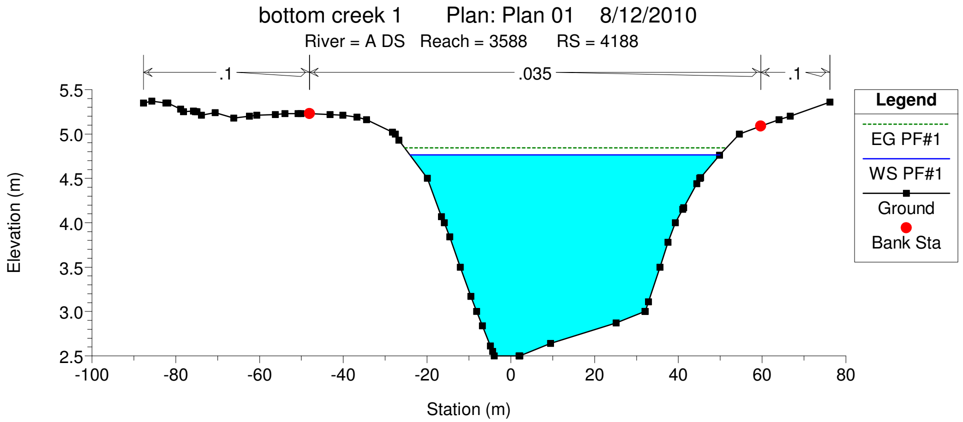

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4548
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

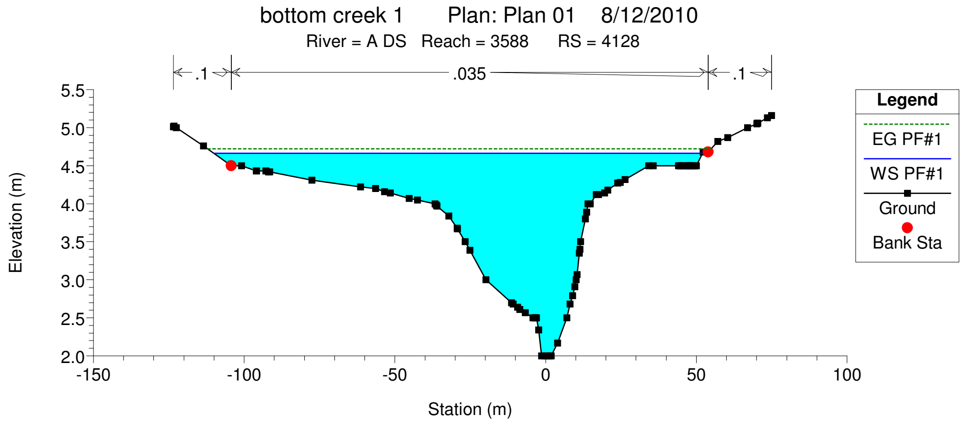

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4488
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

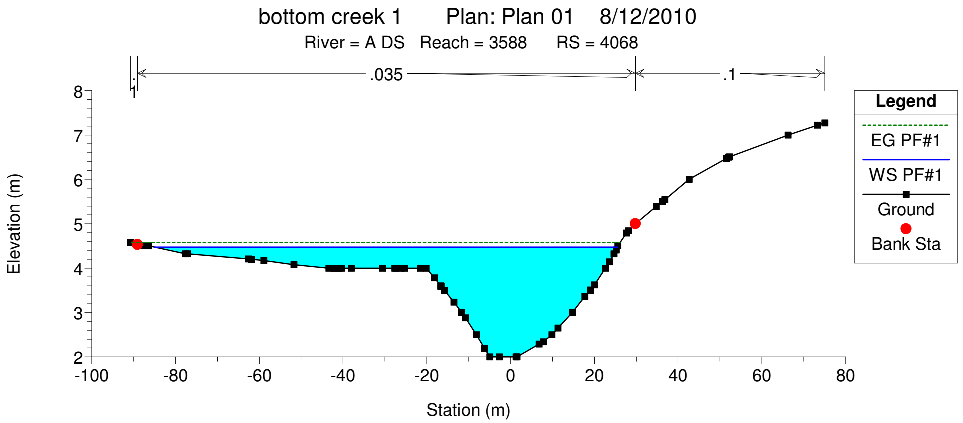

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4428
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

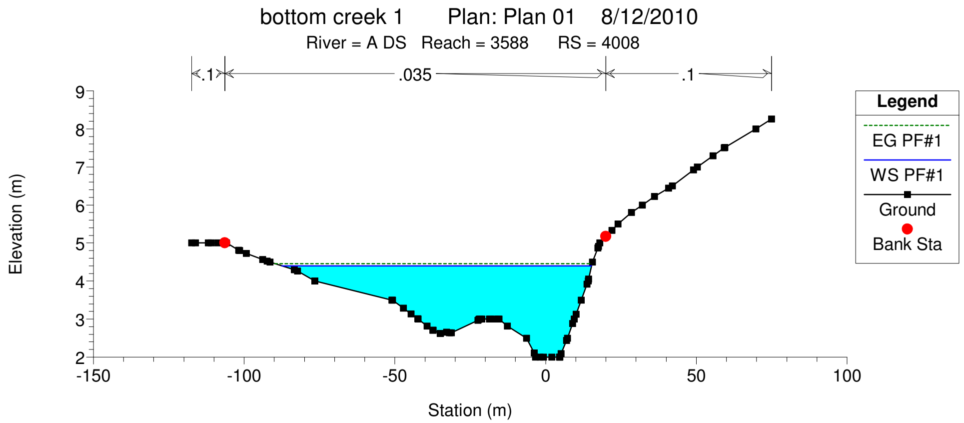

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4308
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

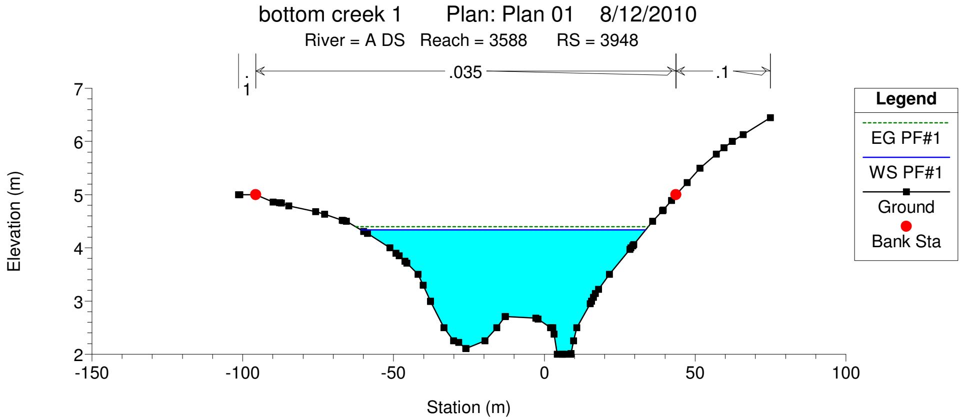

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4248
.1
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

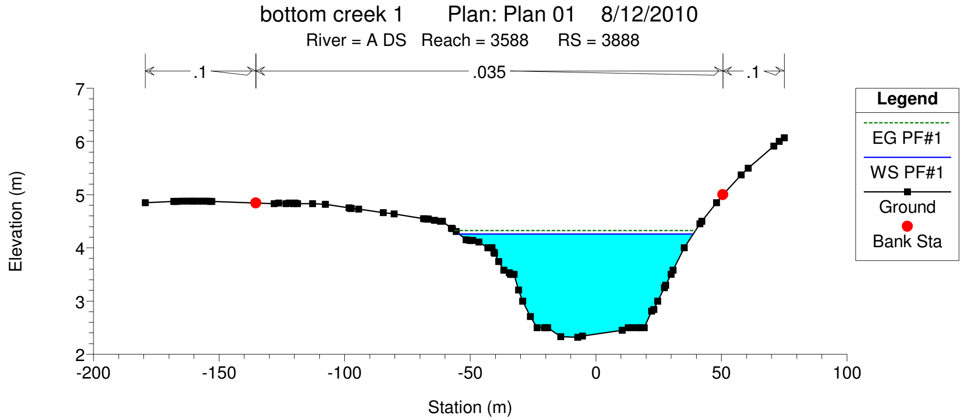

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4188
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

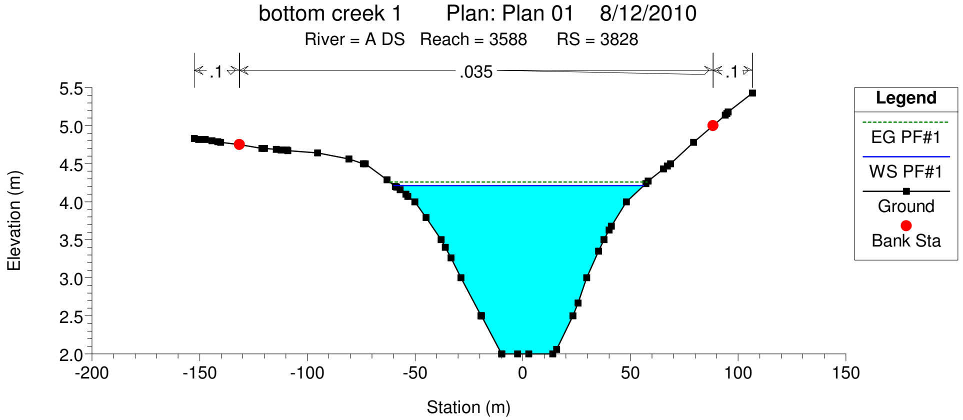

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4128
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

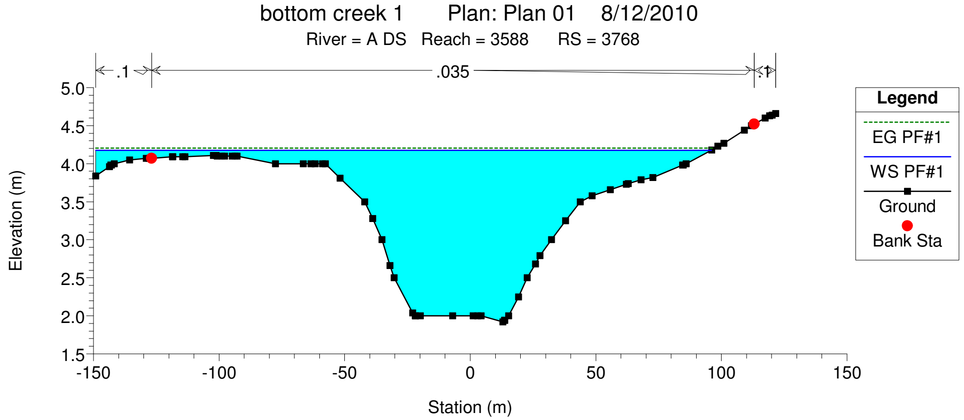

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4068
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

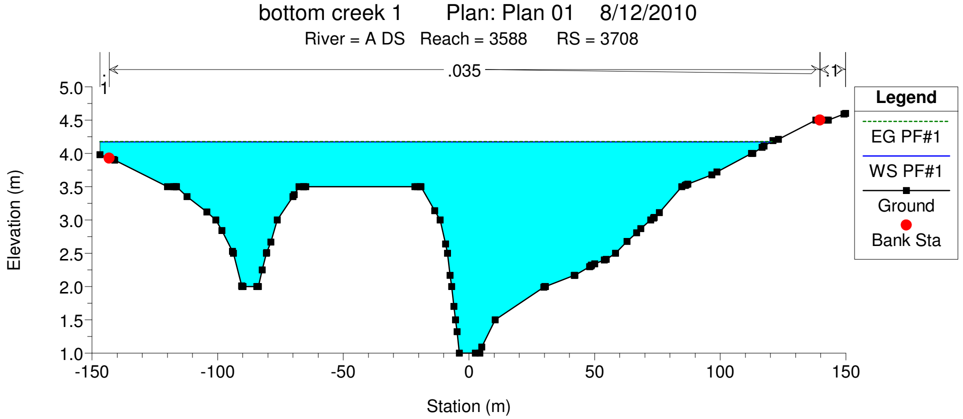

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 4008
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

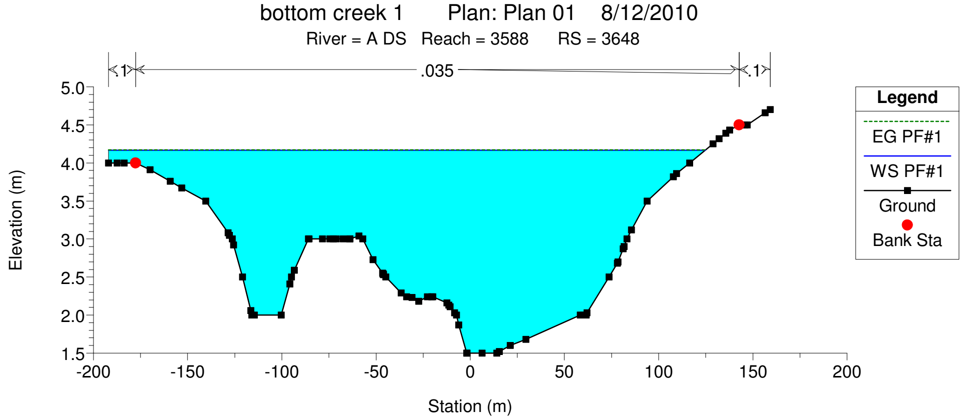

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 3948
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

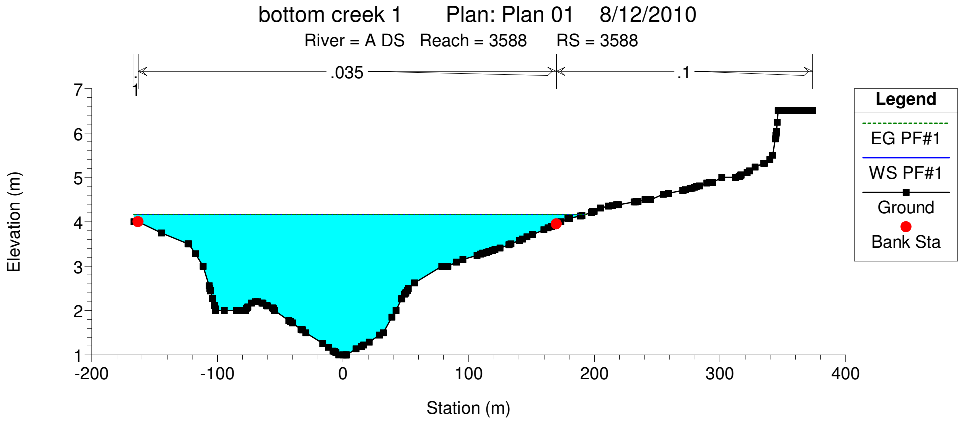

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 3888
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

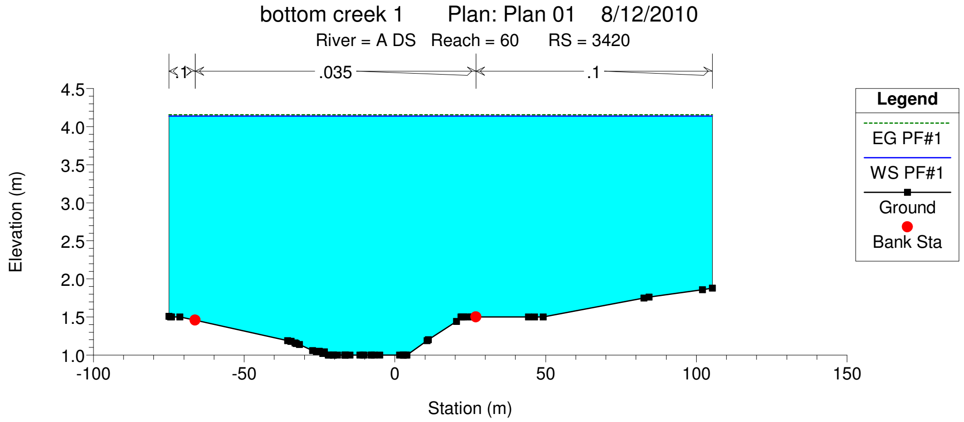

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 3828
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

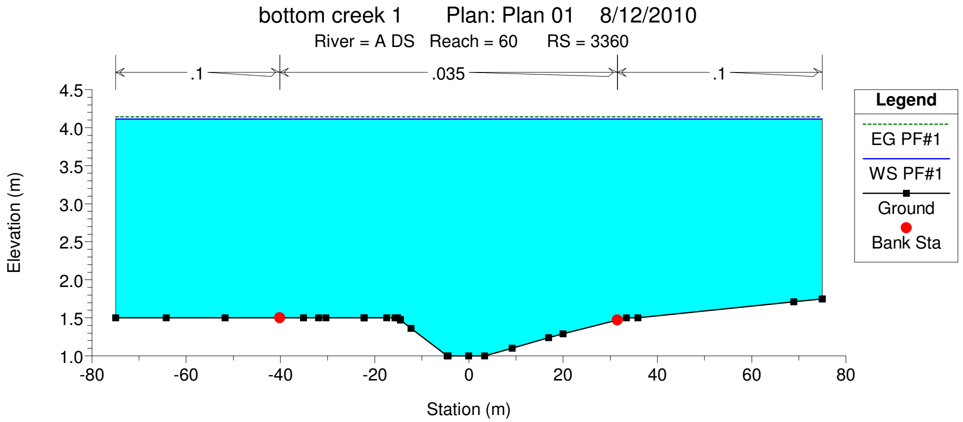

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 3768
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

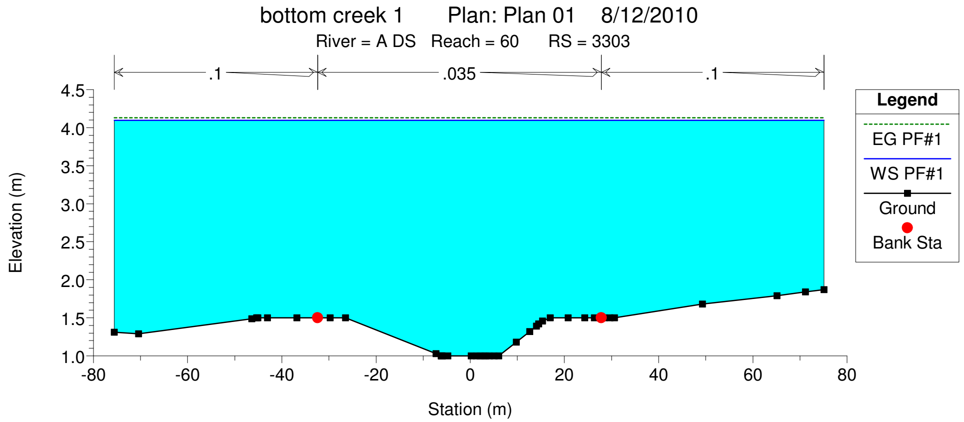

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 3708
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

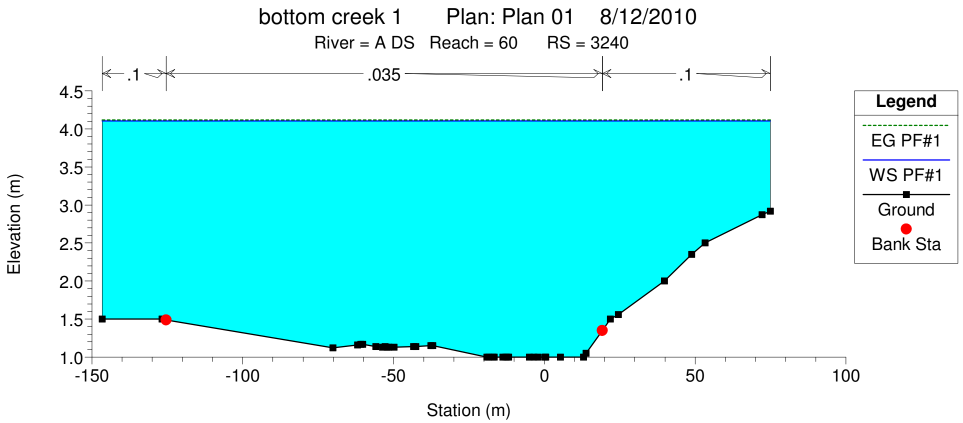

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 3648
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

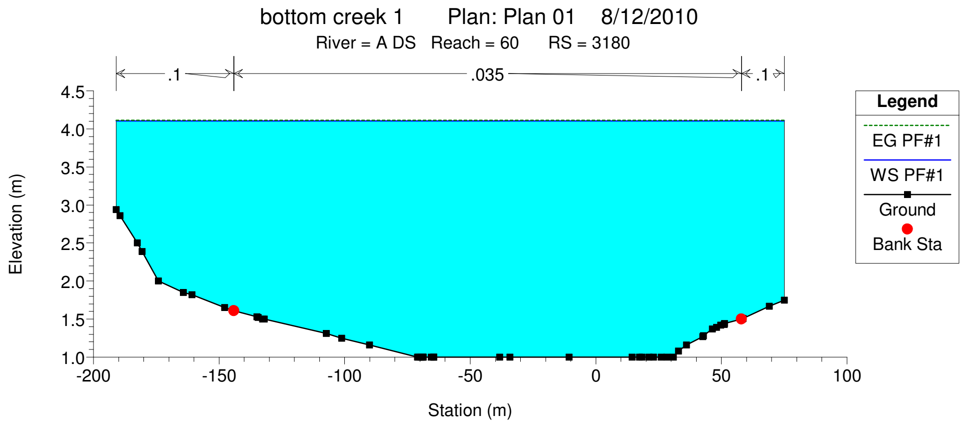

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 3588 RS = 3588
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

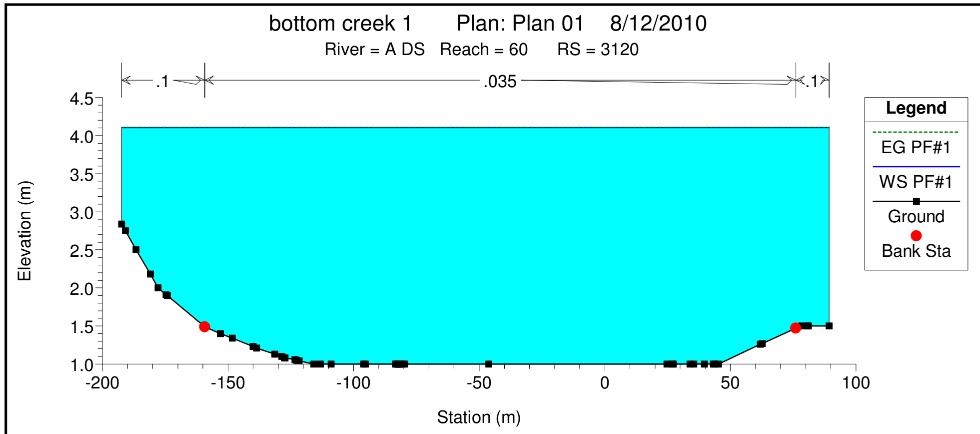

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 3420
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

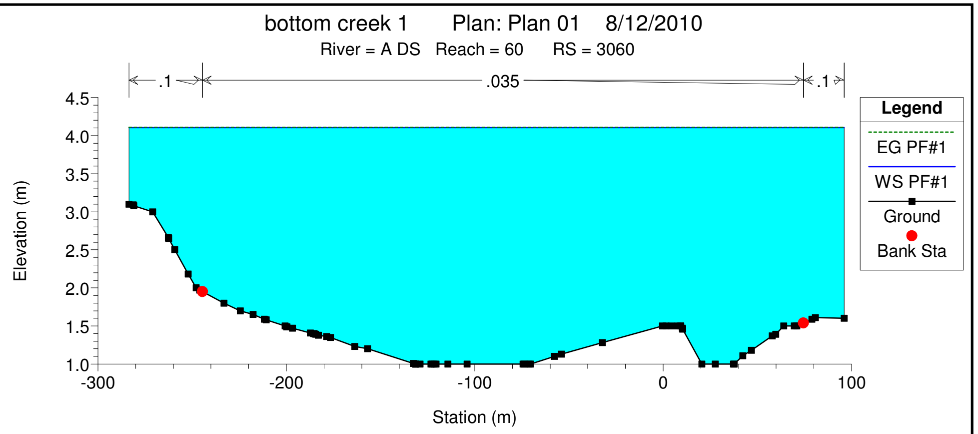

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 3360
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

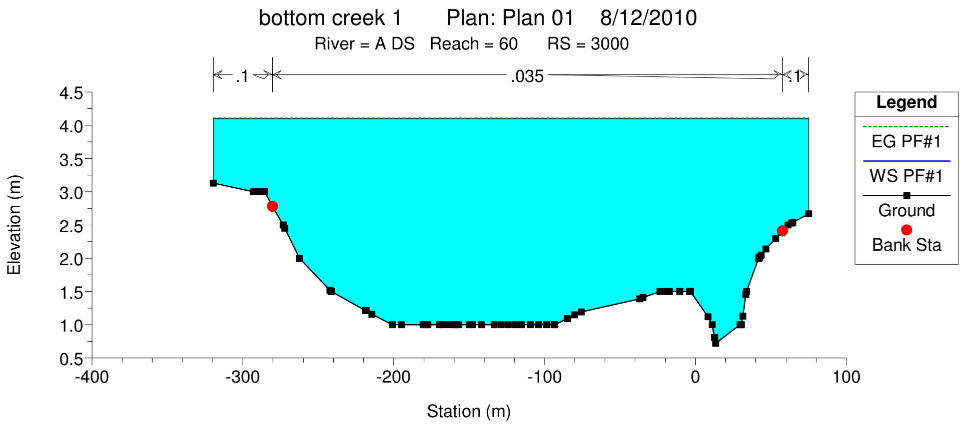

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 3303
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 3240
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 3180
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 3120
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 3060
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 3000
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.035
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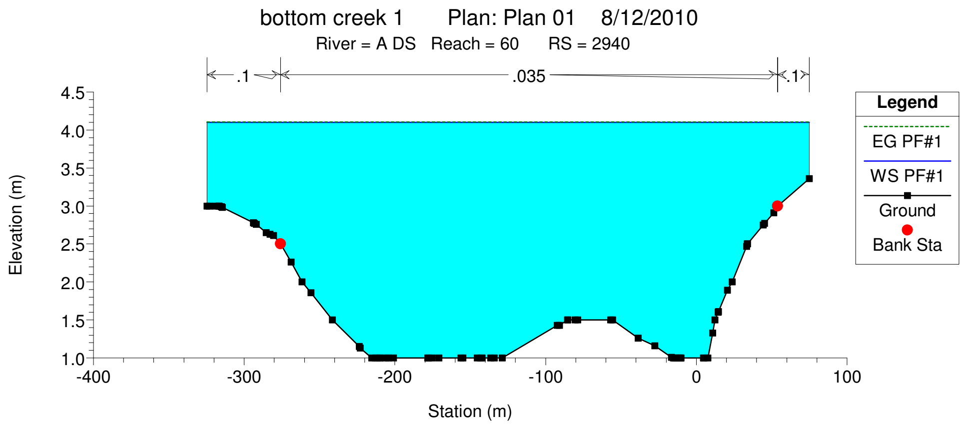
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2940
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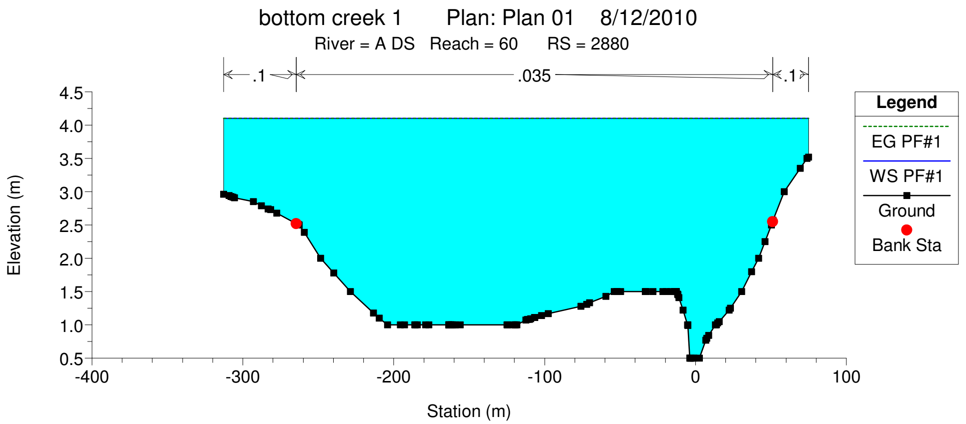
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2880
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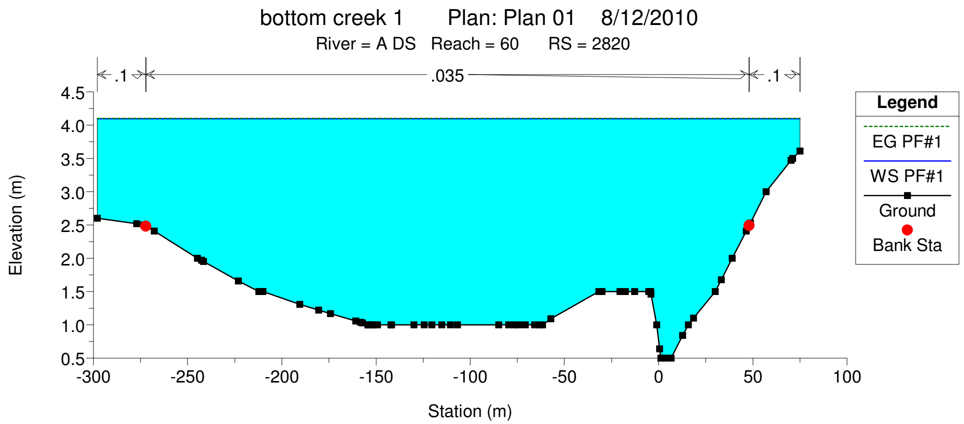
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2820
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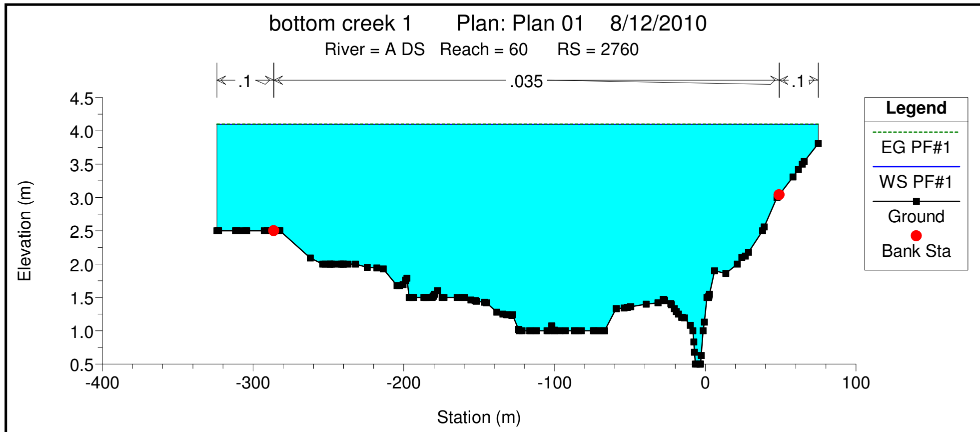
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2760
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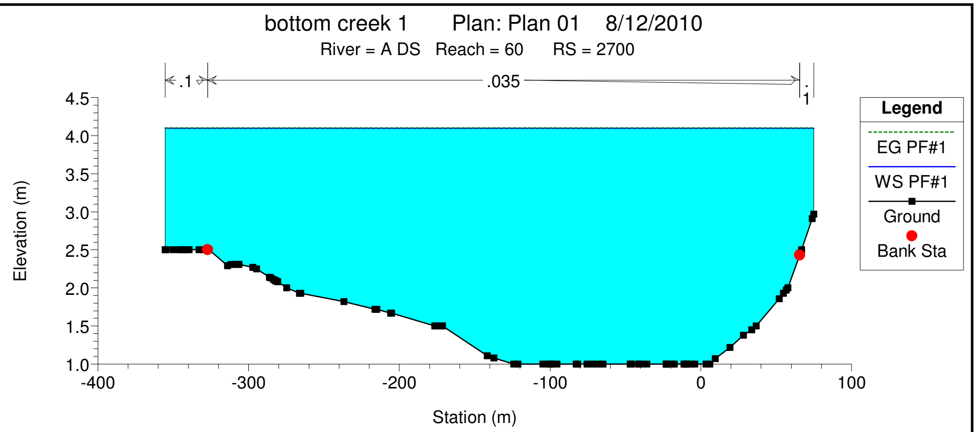
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2700
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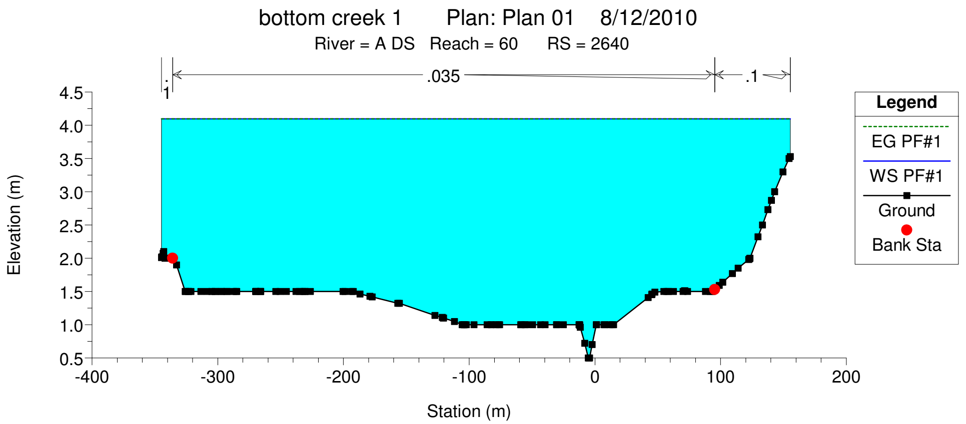
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2640
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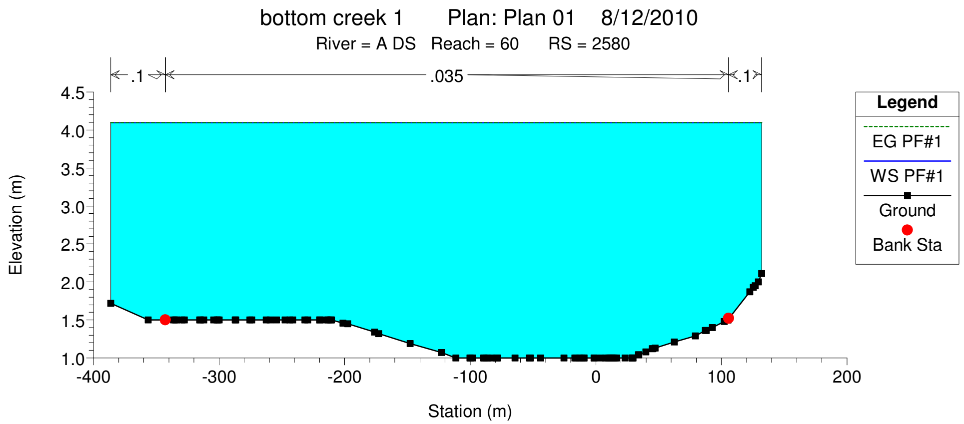
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2580
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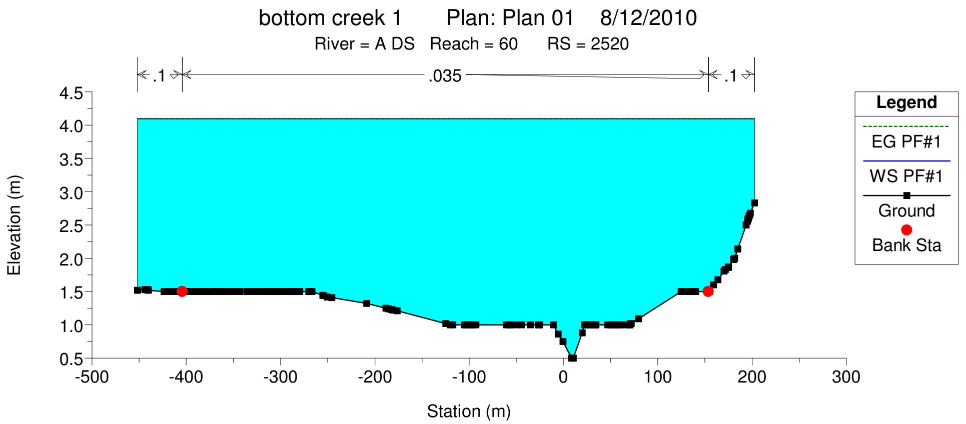
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2520
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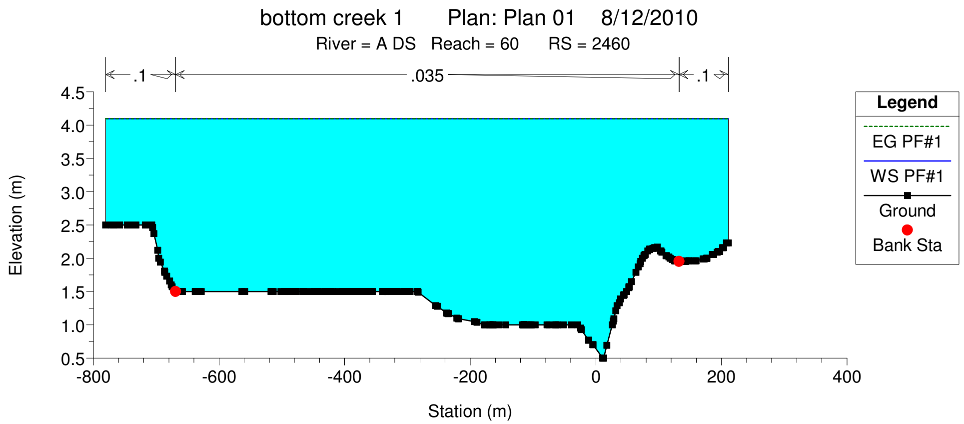
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2460
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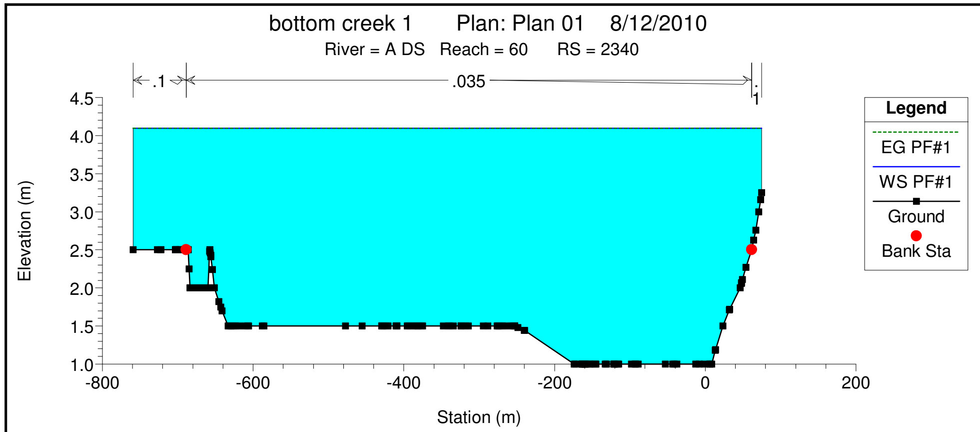
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2340
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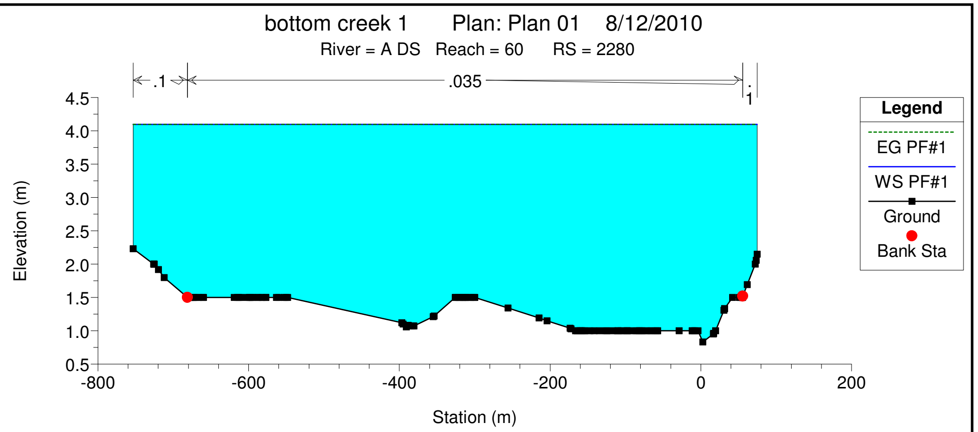
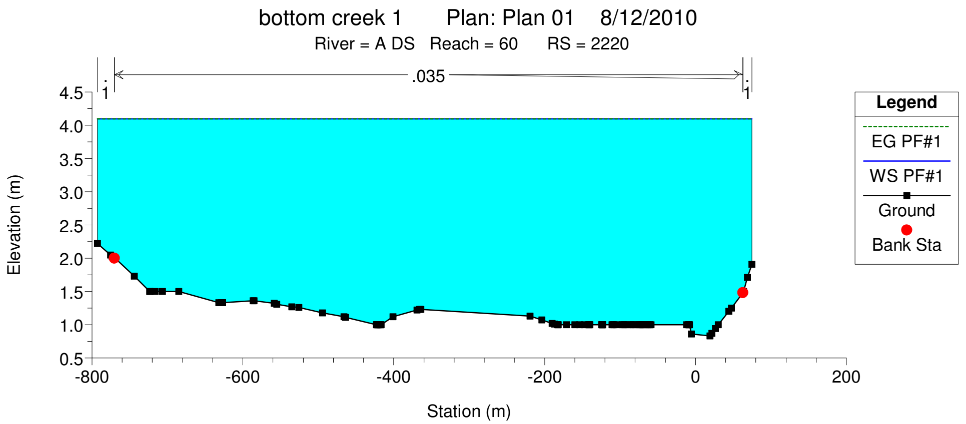
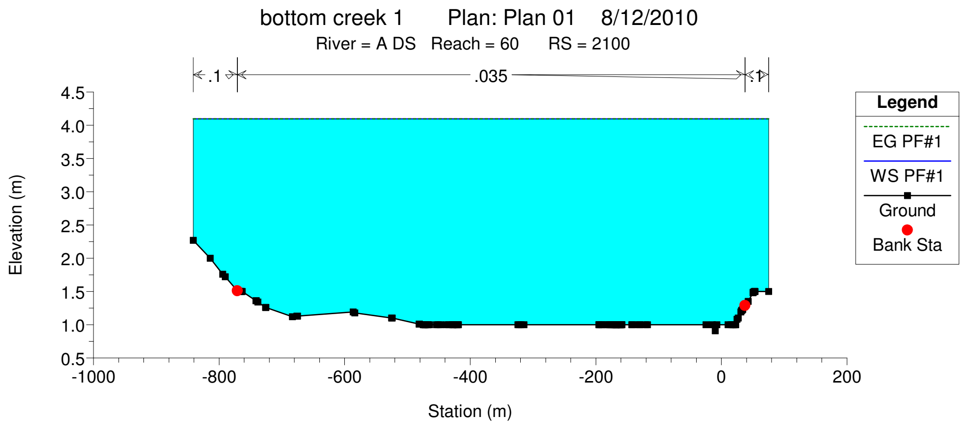
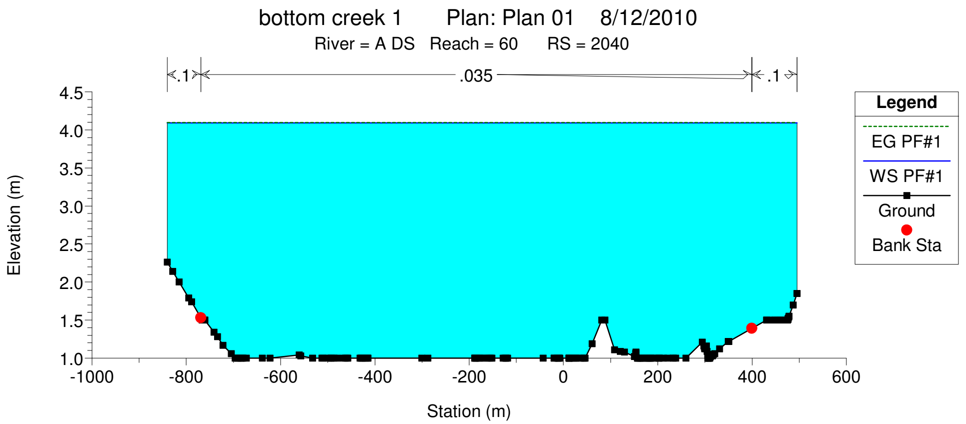
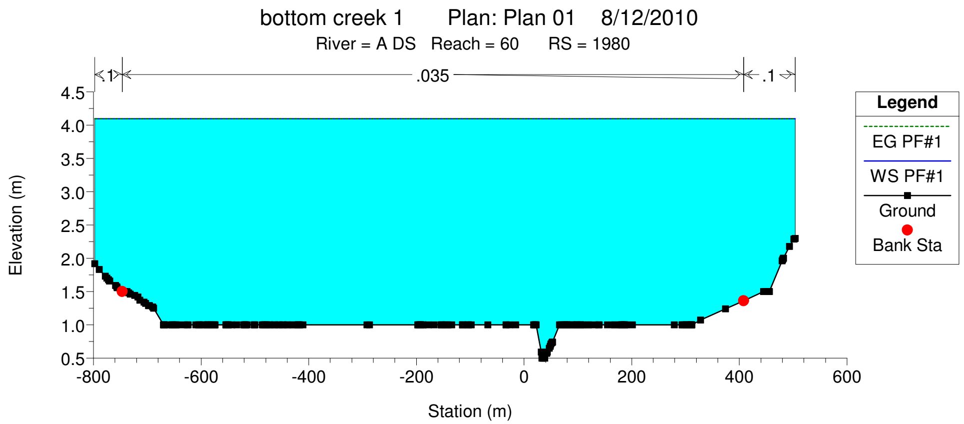
.035
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

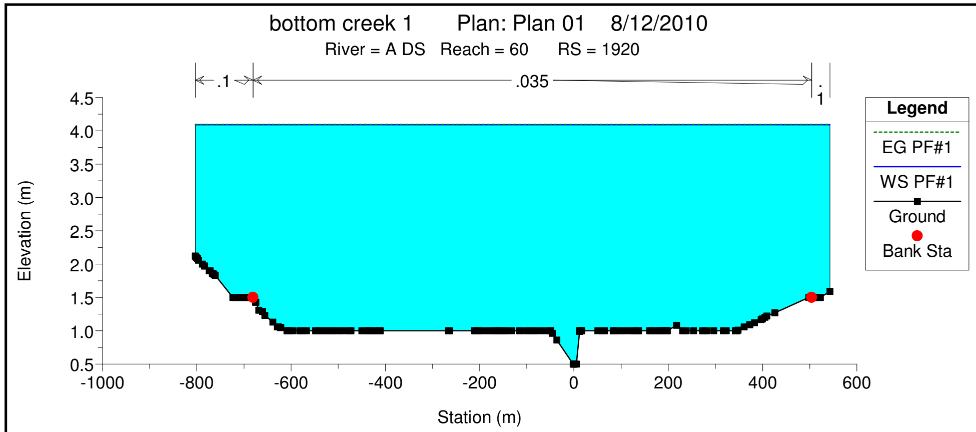

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2280
.1
.035
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

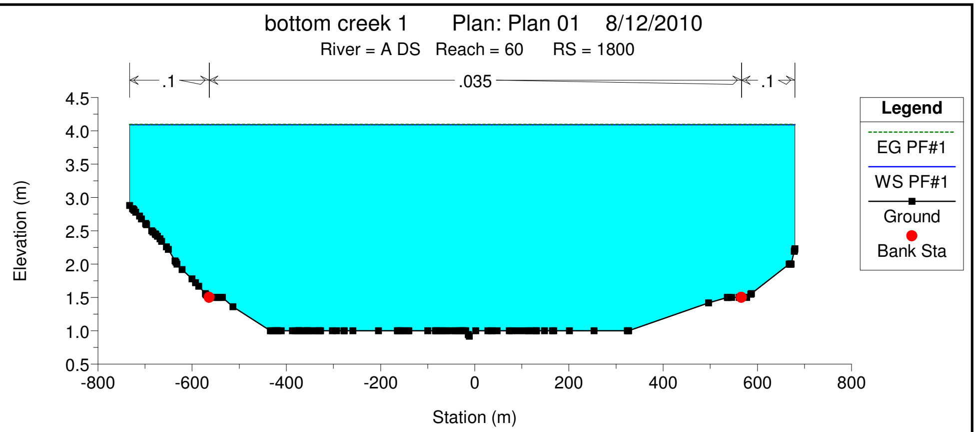

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2220
.035
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

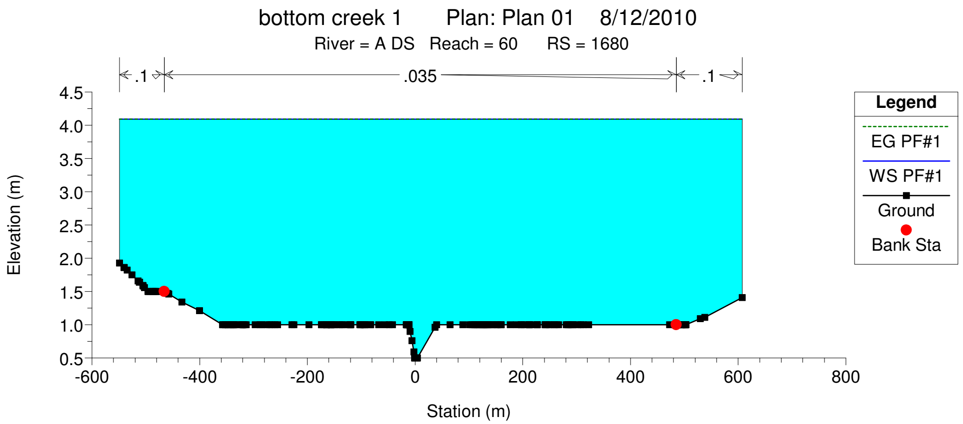

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2100
.1
.035
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

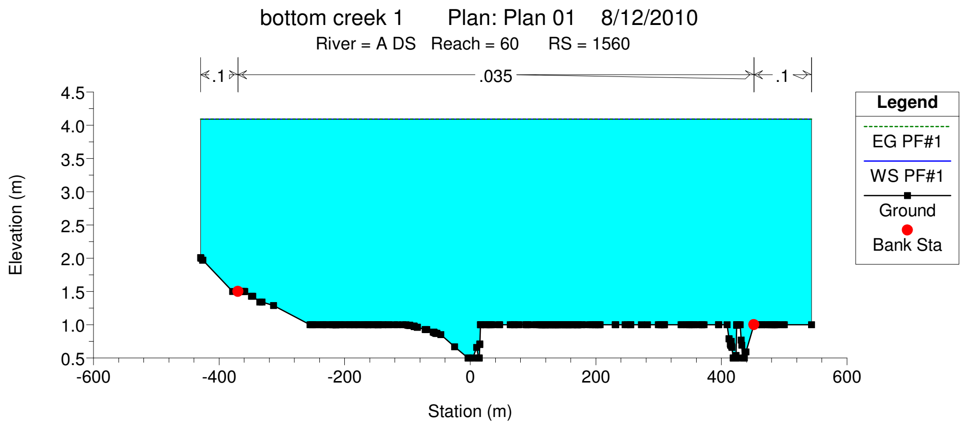

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 2040
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

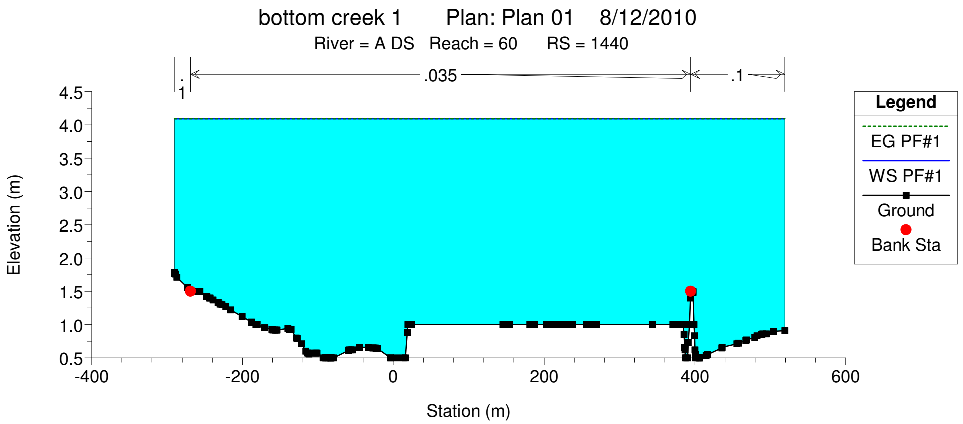

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1980
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

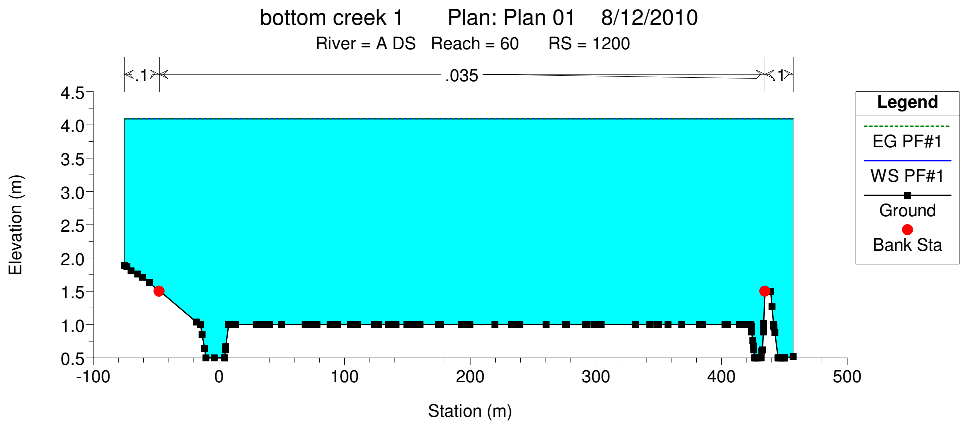

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1920
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

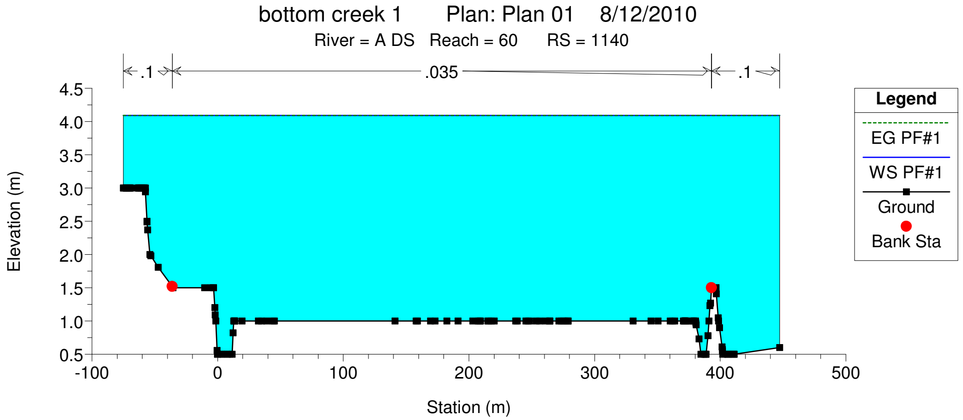

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1800
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

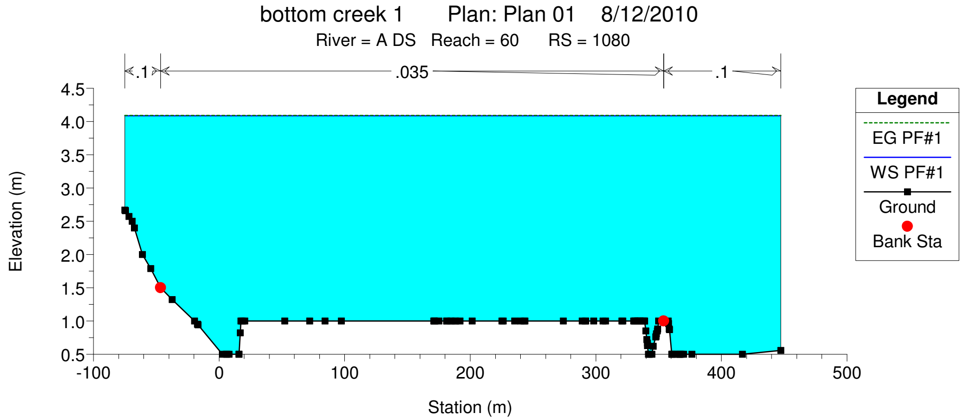

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1680
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

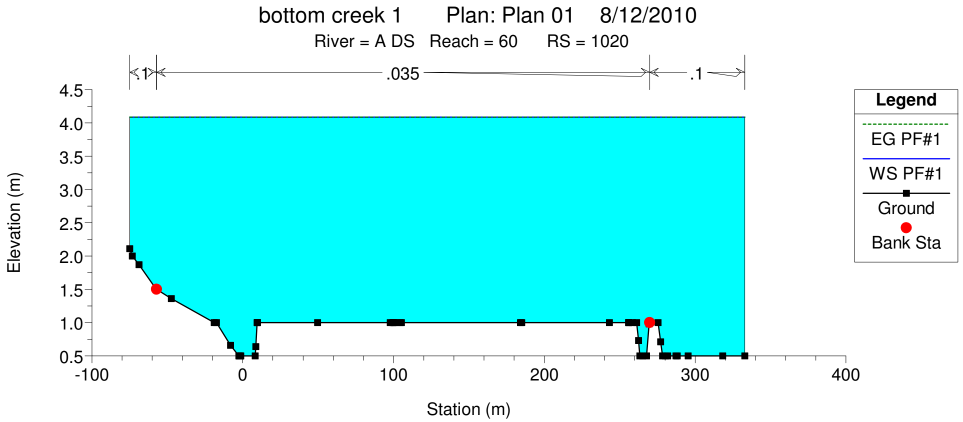

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1560
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

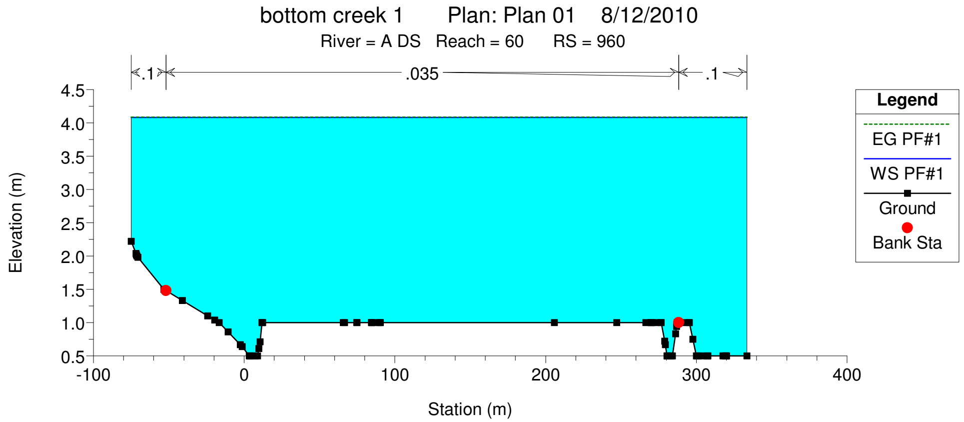

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1440
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

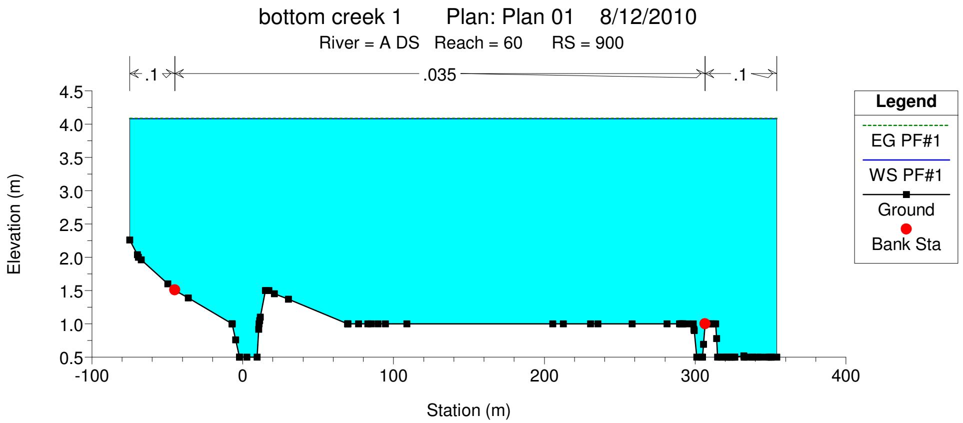

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1200
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

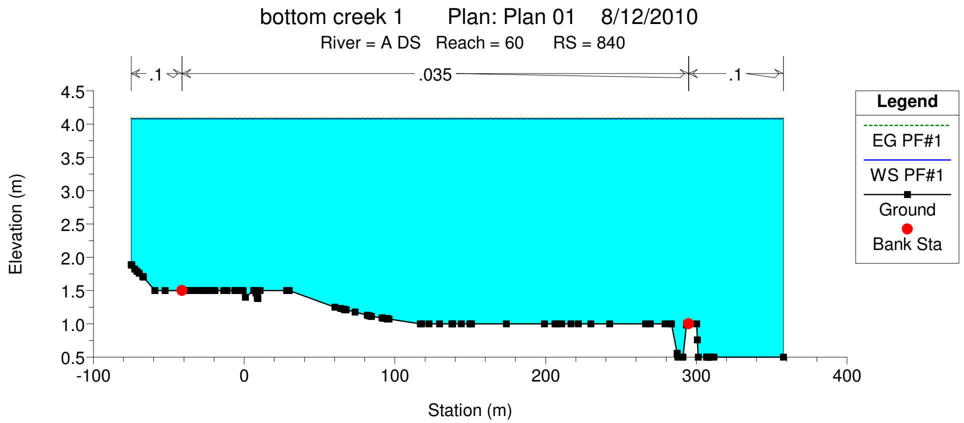

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1140
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

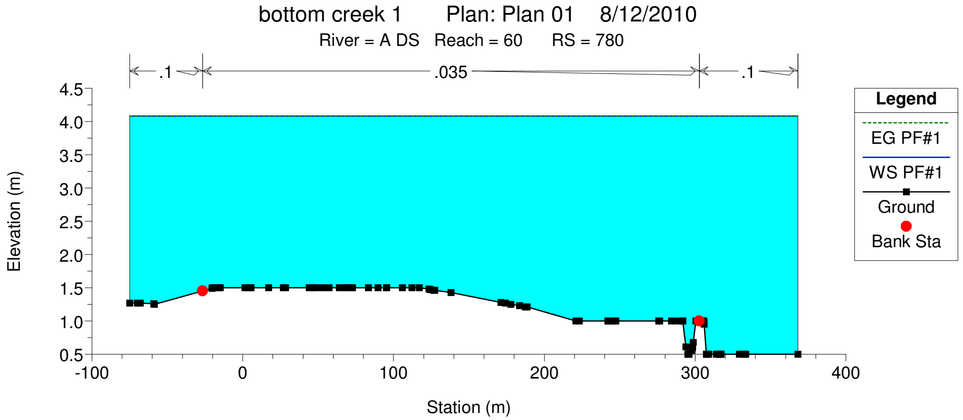

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1080
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

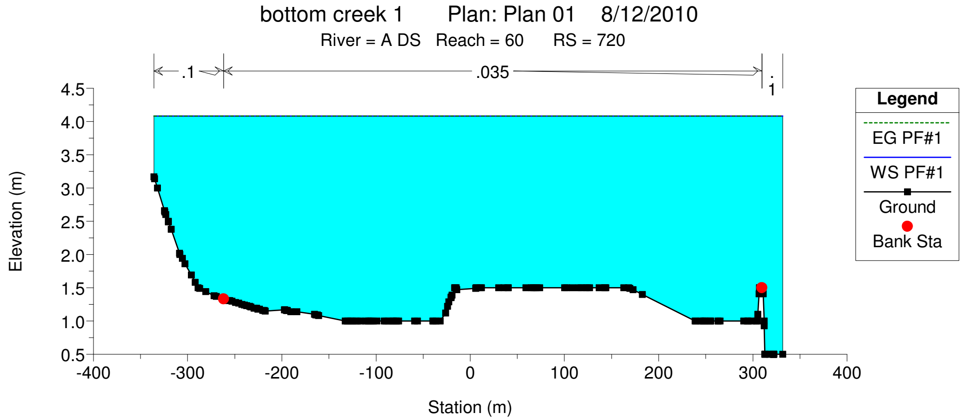

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 1020
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

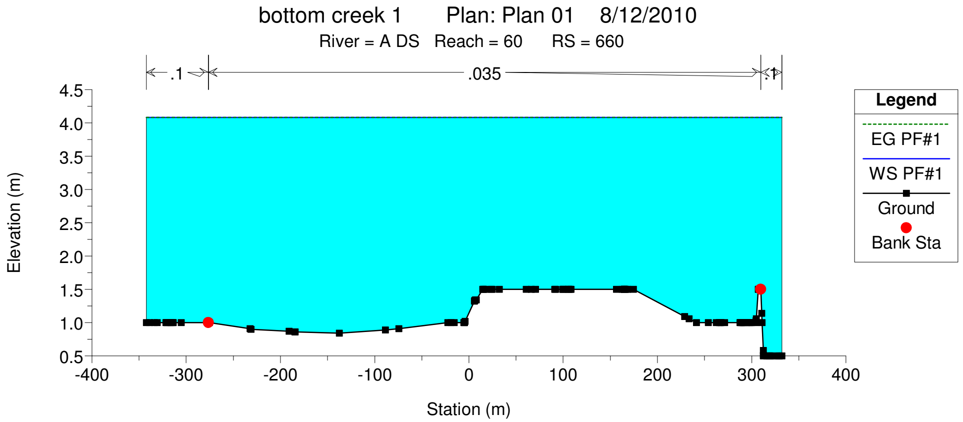

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 960
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

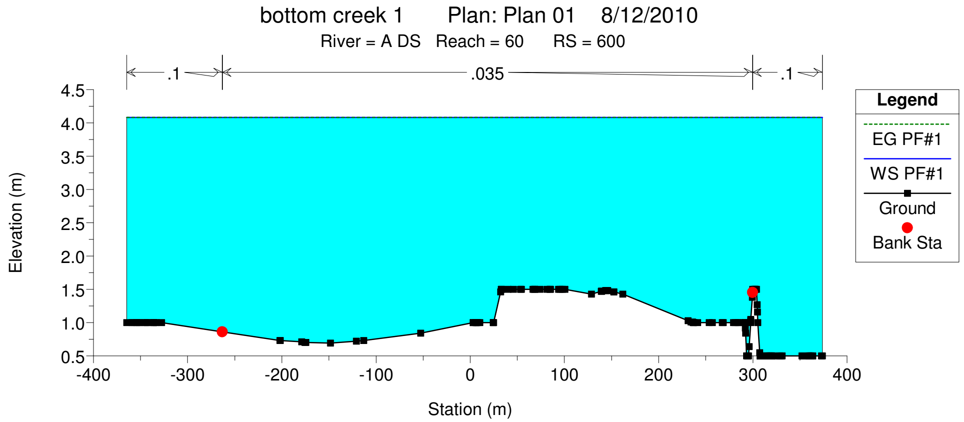

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 900
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

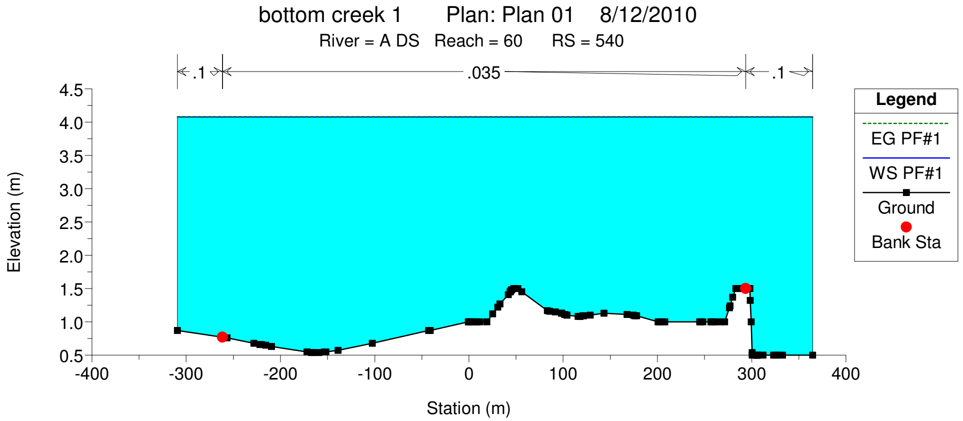

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 840
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

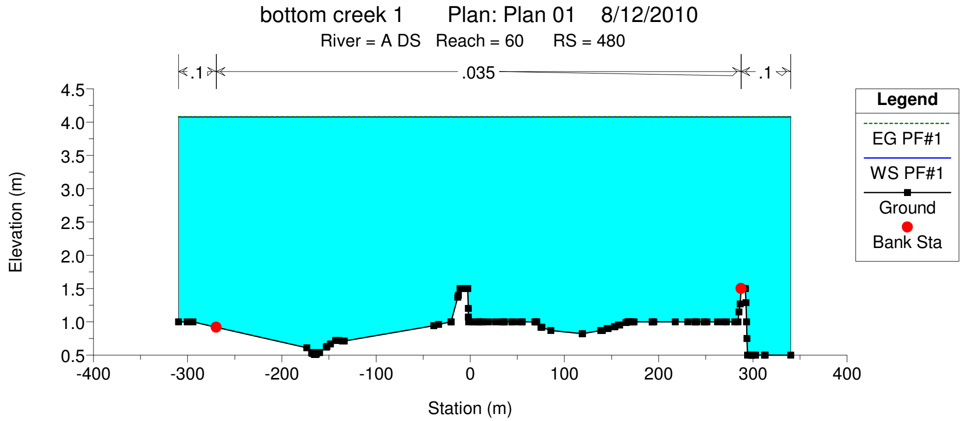

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 780
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

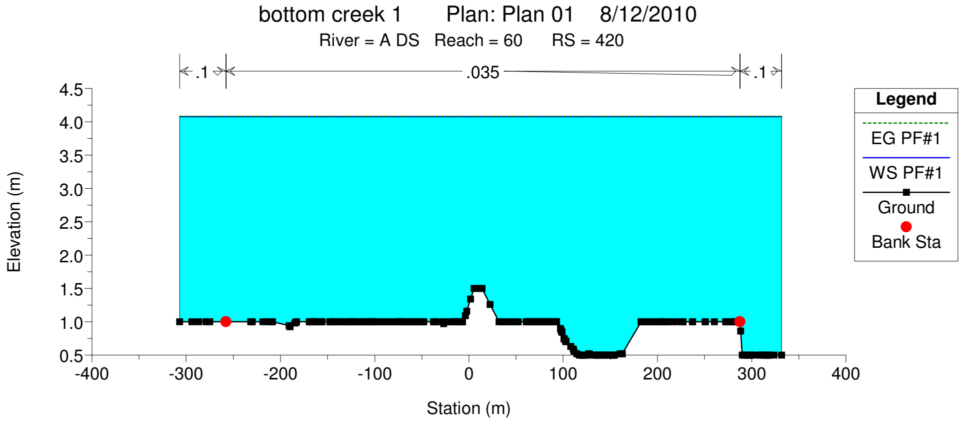

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 720
.1
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

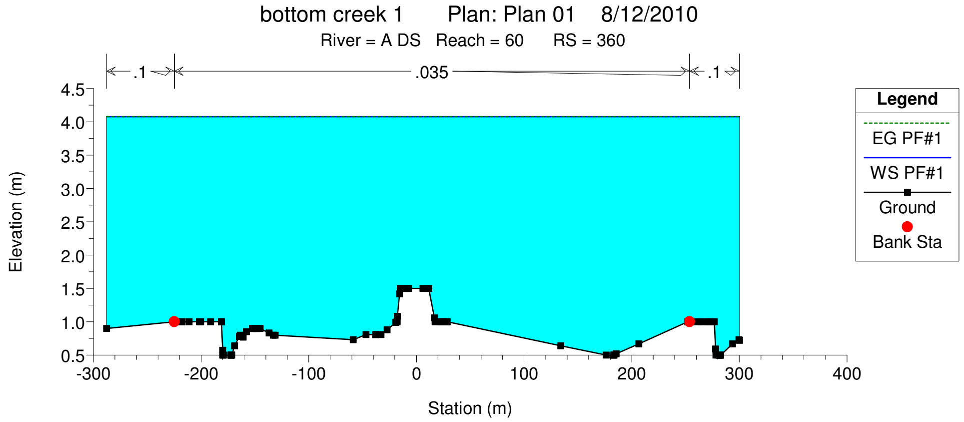

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 660
.1
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

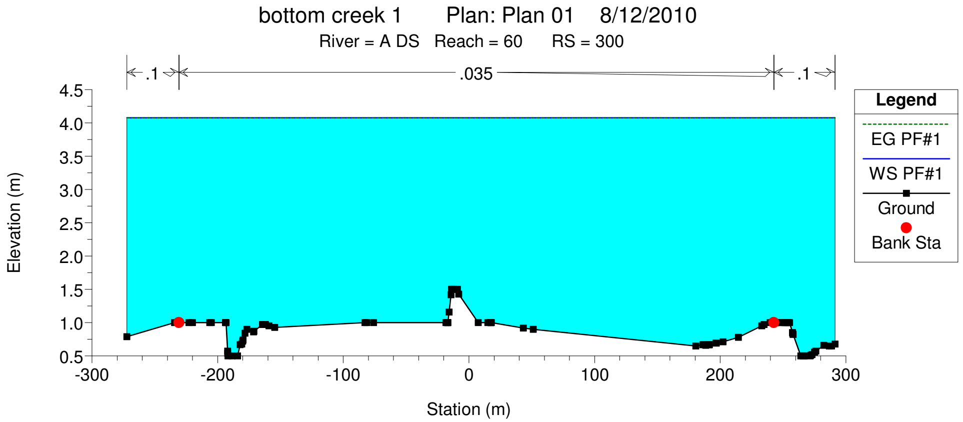

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 600
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

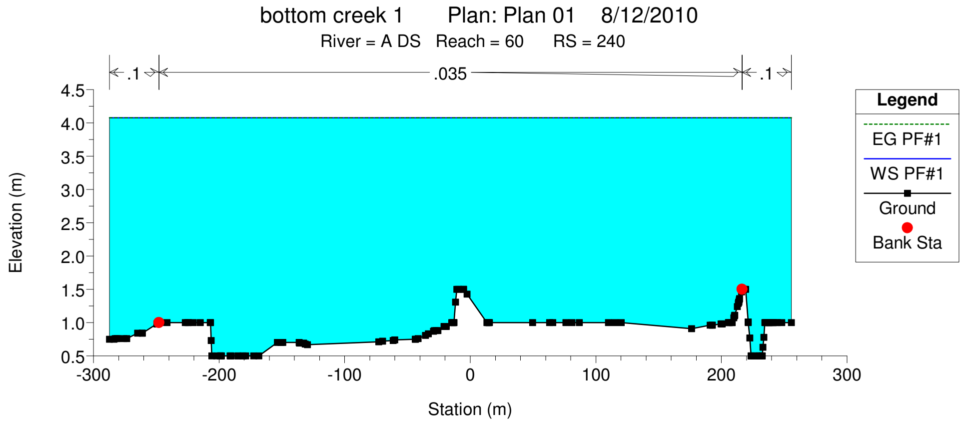

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 540
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

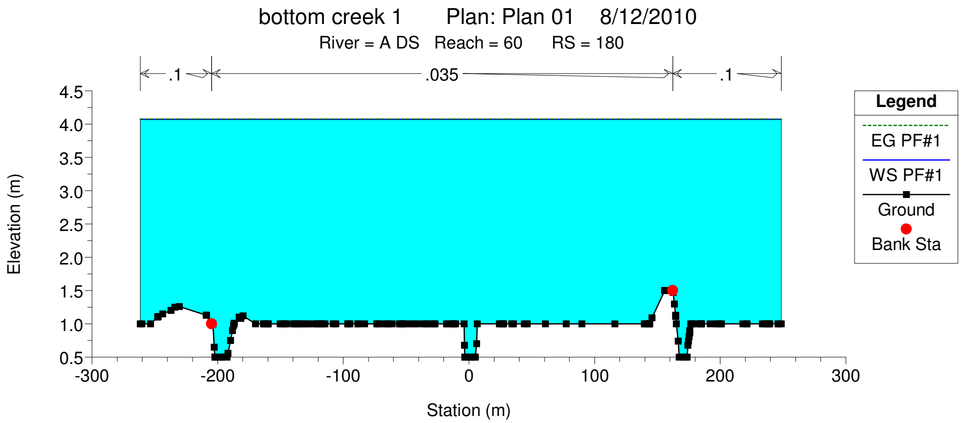

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 480
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

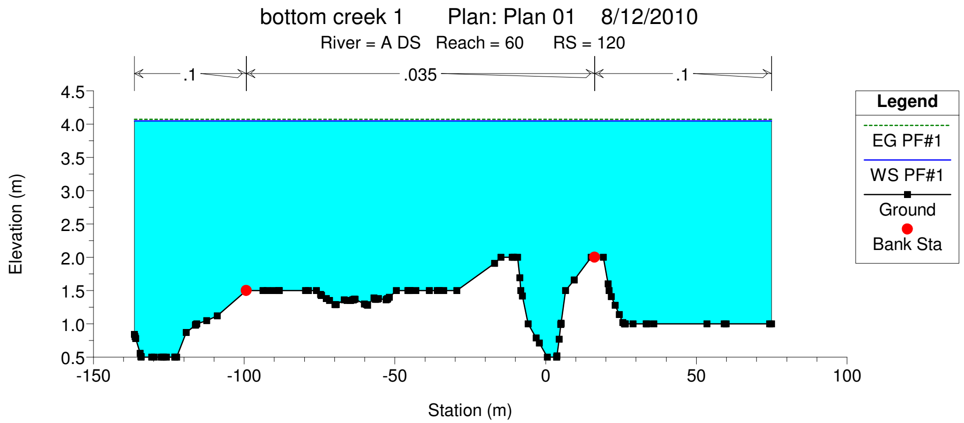

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 420
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

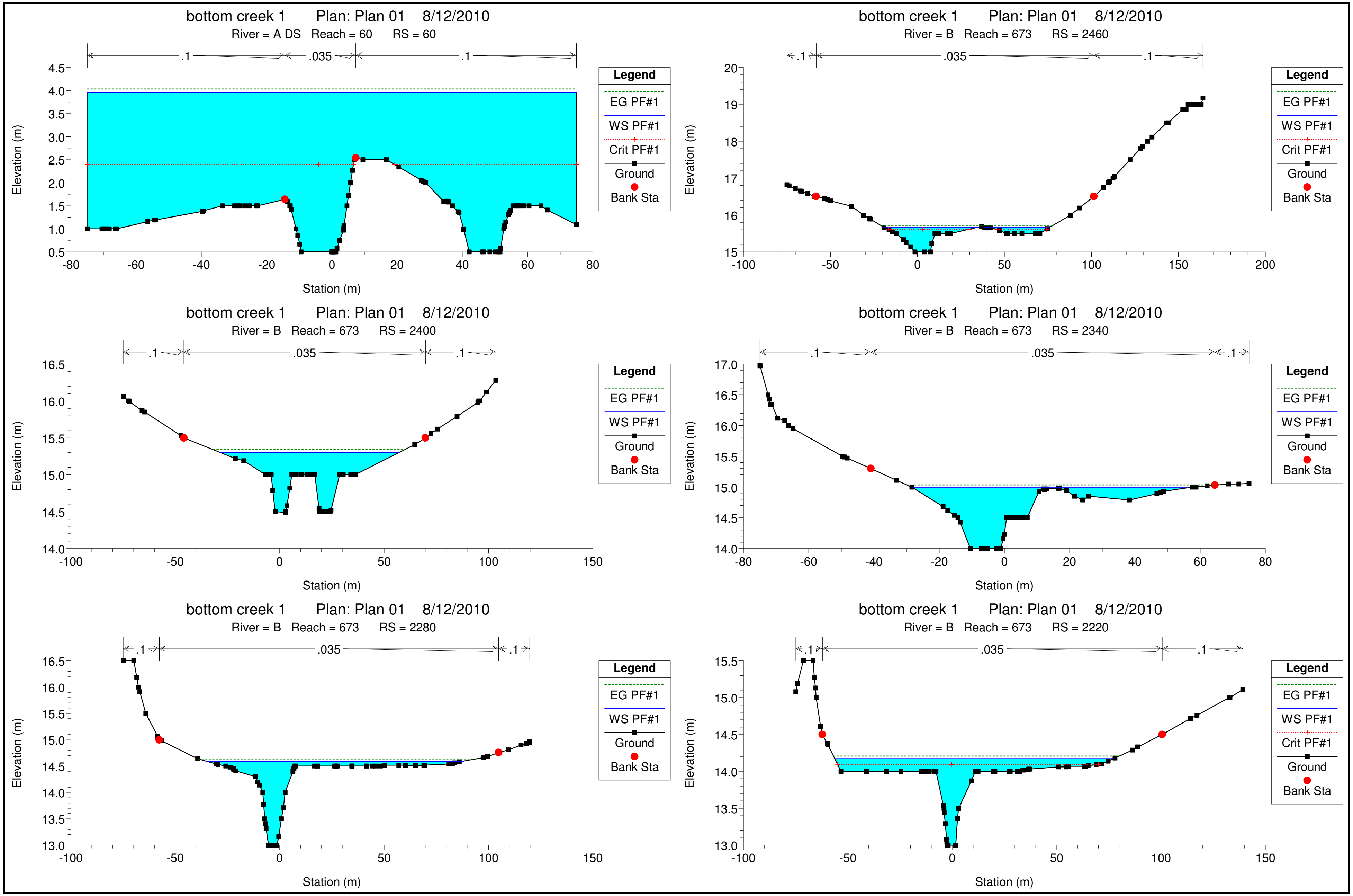

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 360
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

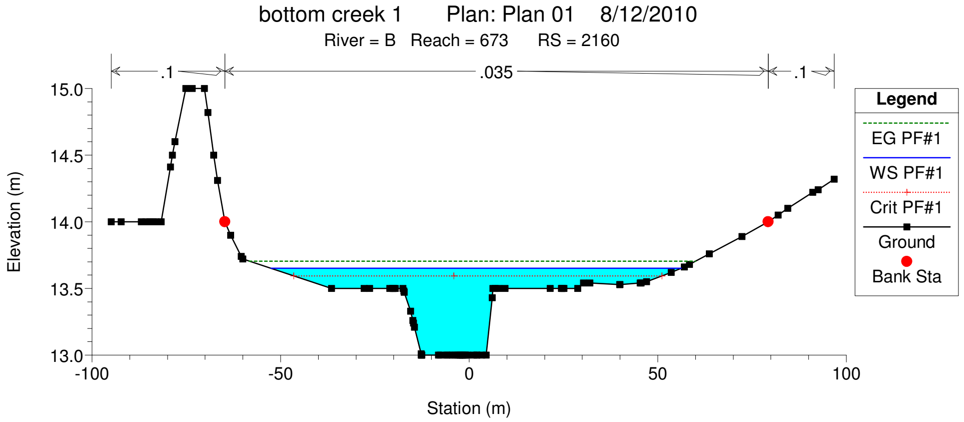

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 300
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

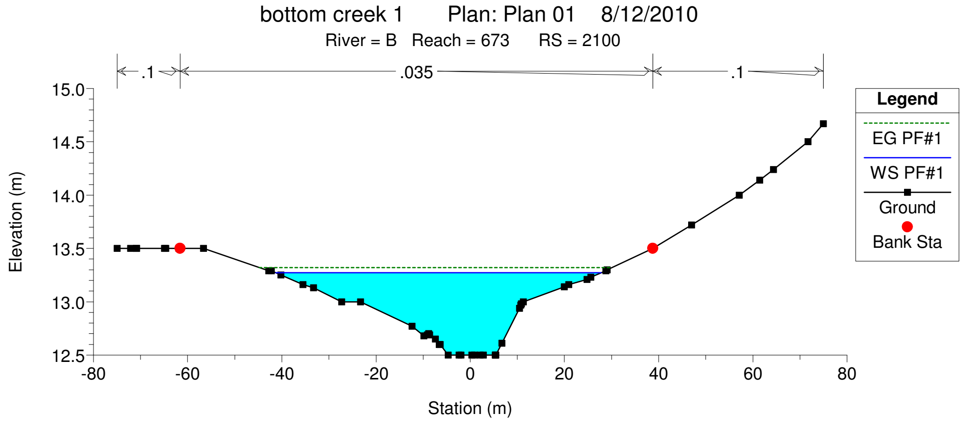

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 240
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

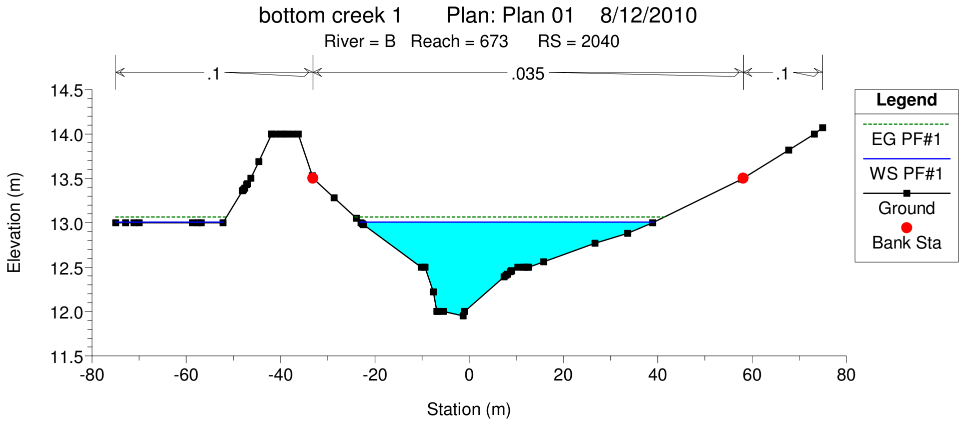

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 180
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

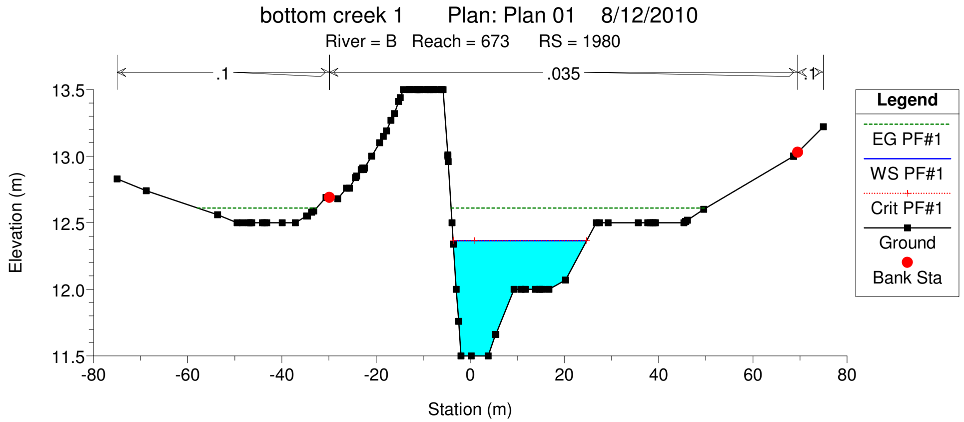

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 120
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

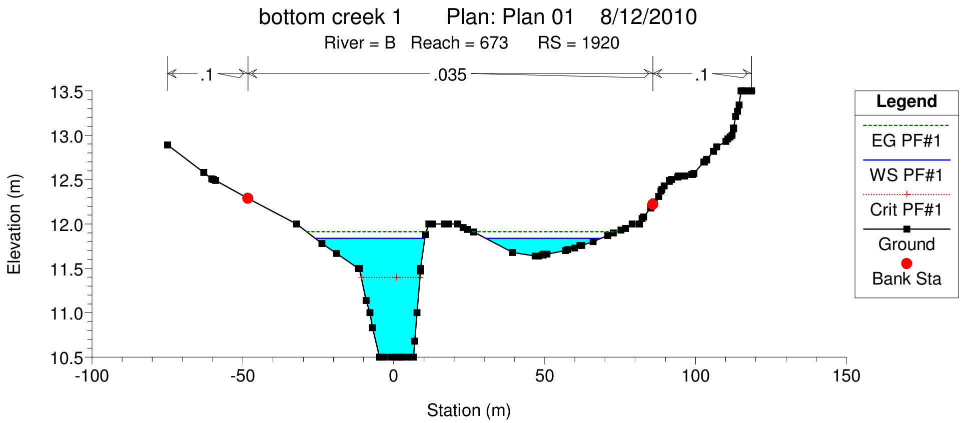

bottom creek 1 Plan: Plan 01 8/12/2010
River = A DS Reach = 60 RS = 60
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 2460
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 2400
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 2340
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 2280
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 2220
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
.1
.035

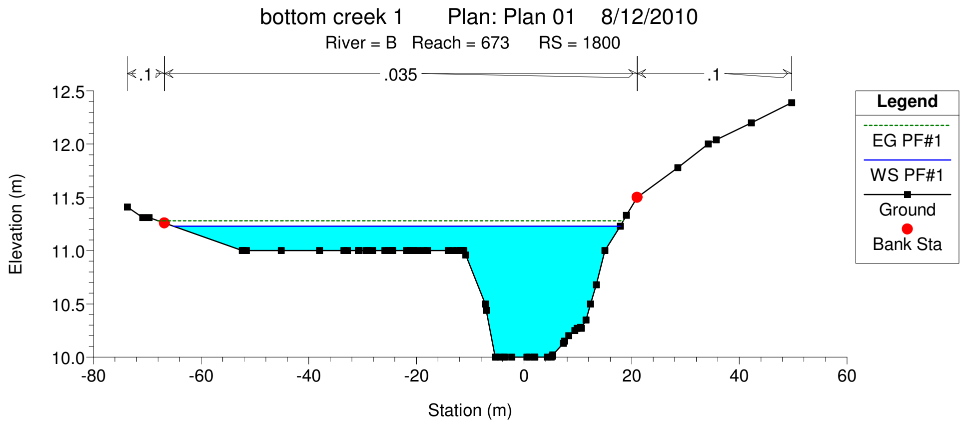

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 2160
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

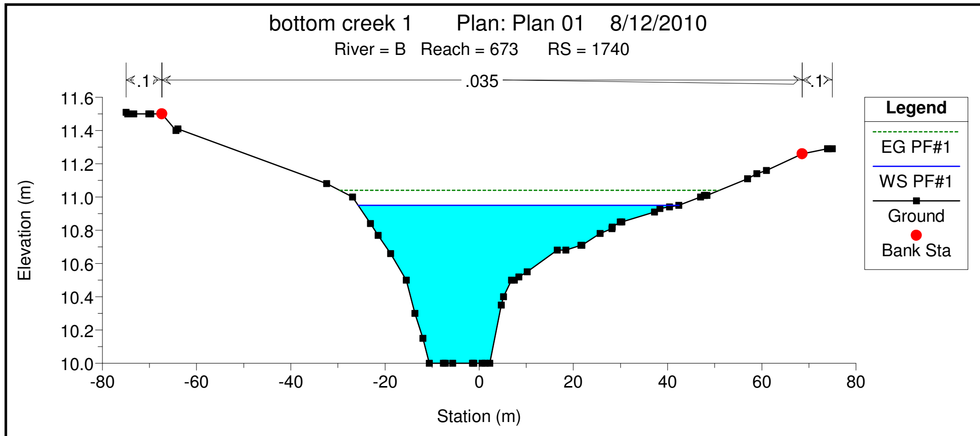

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 2100
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

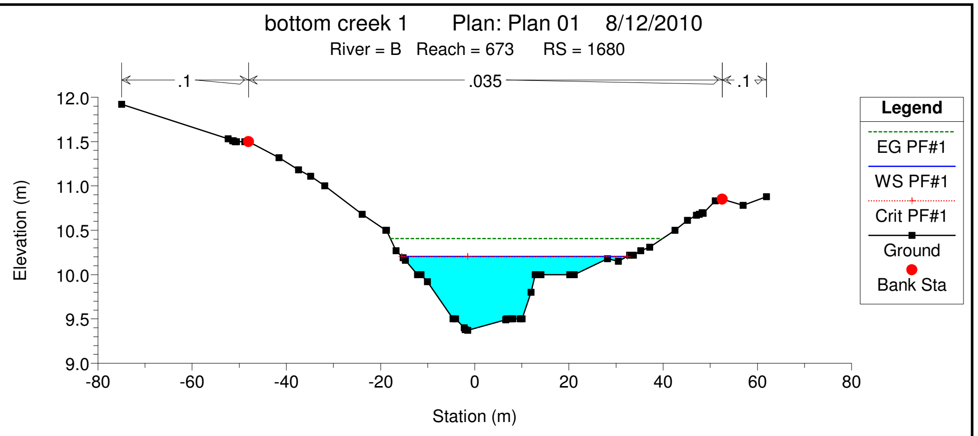

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 2040
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

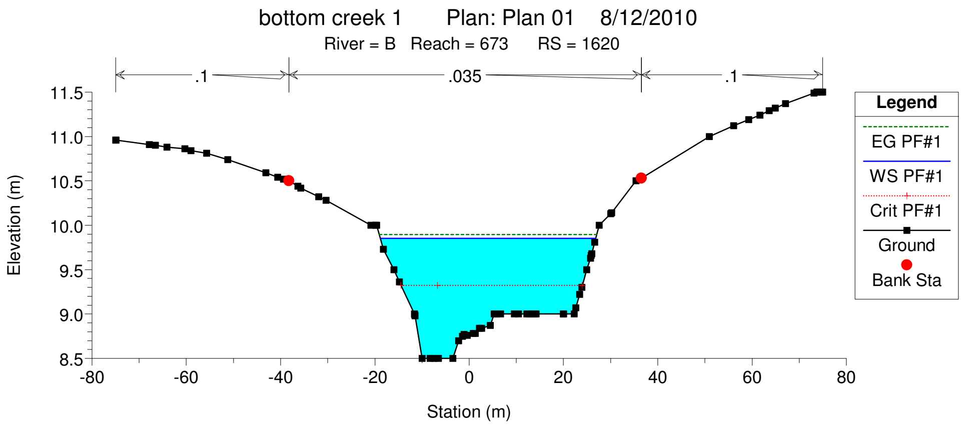

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1980
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

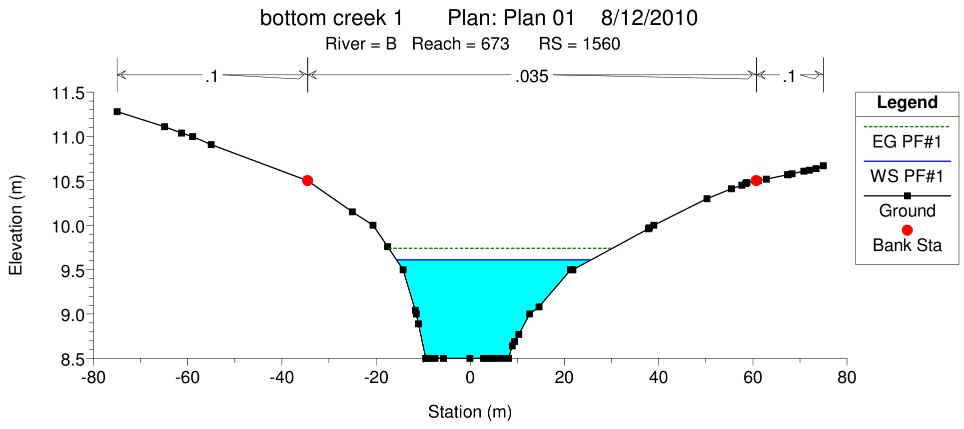

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1920
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

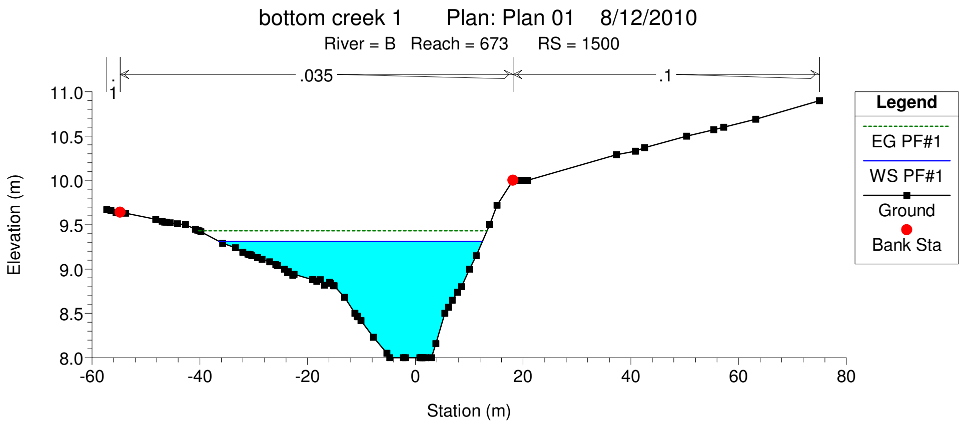

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1800
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

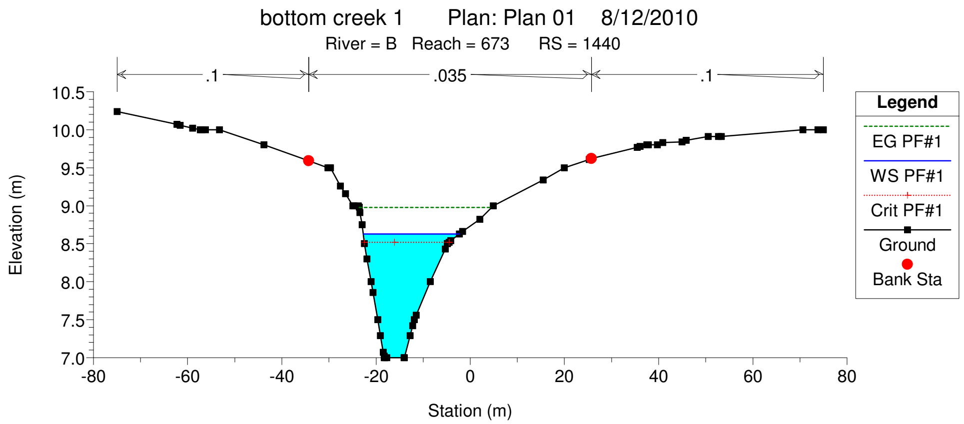

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1740
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

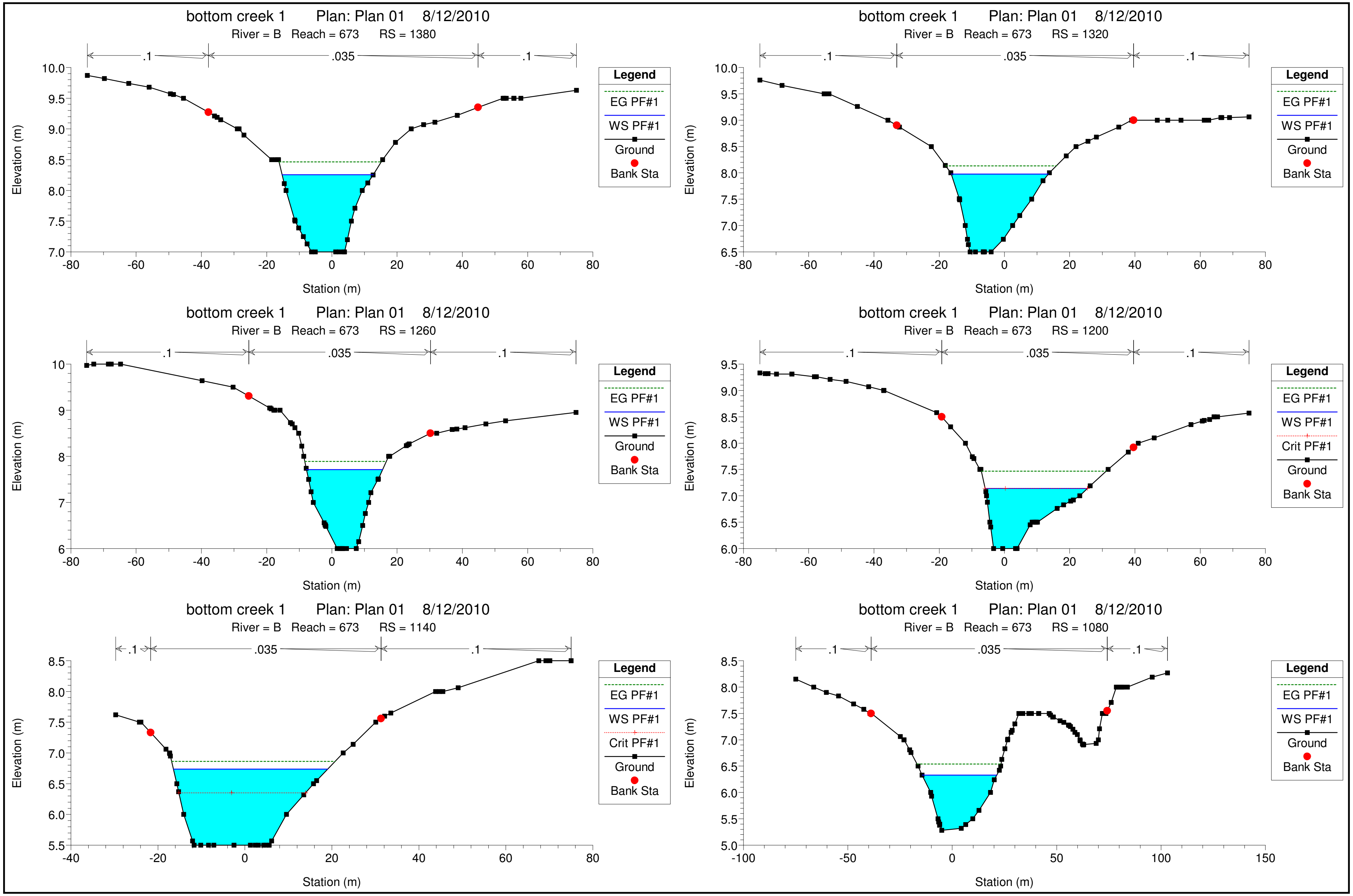

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1680
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1620
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

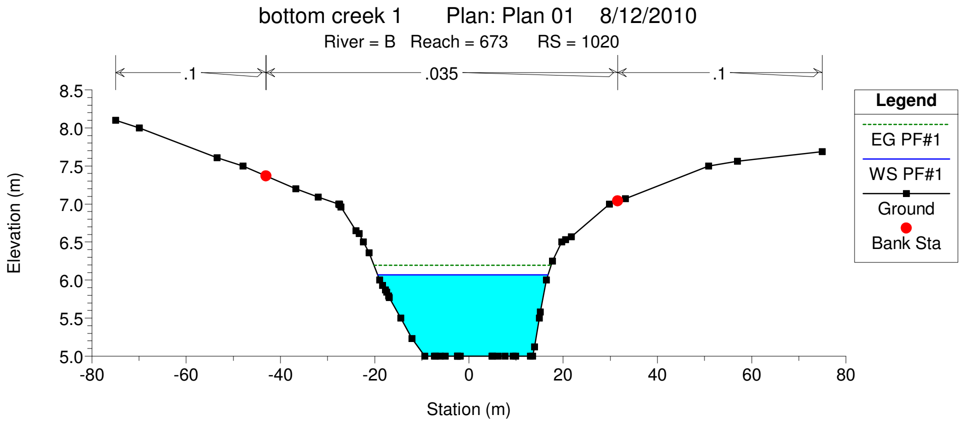

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1560
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

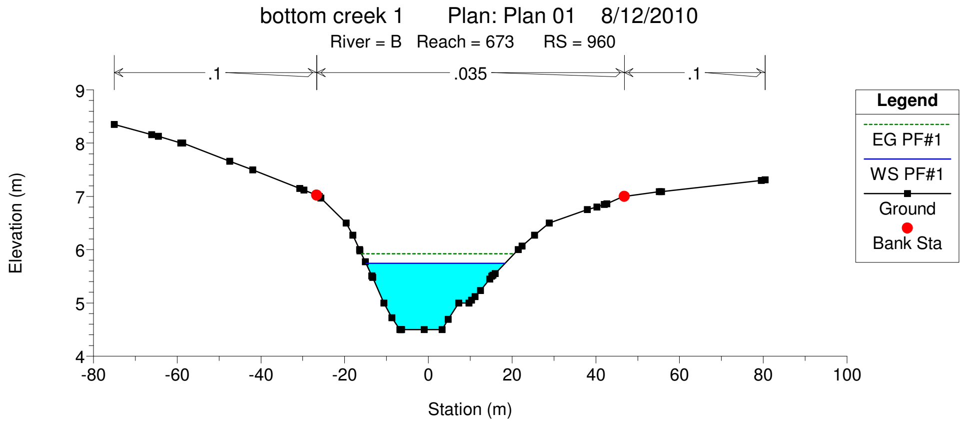

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1500
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

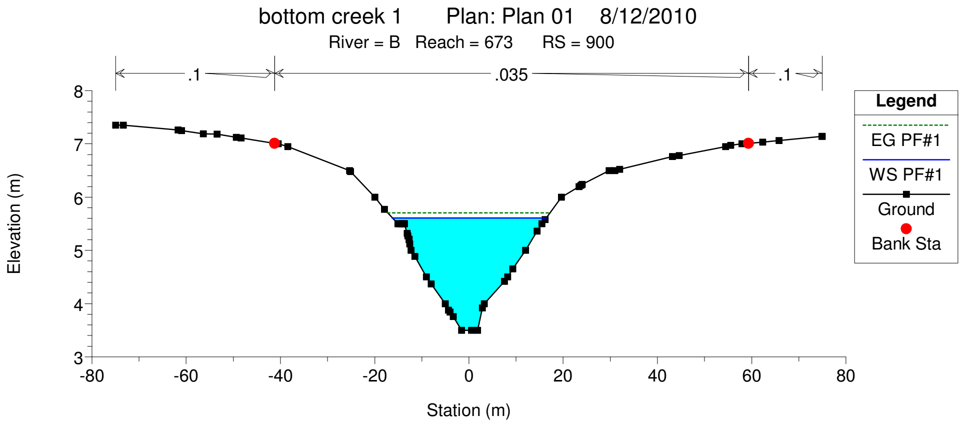

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1440
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

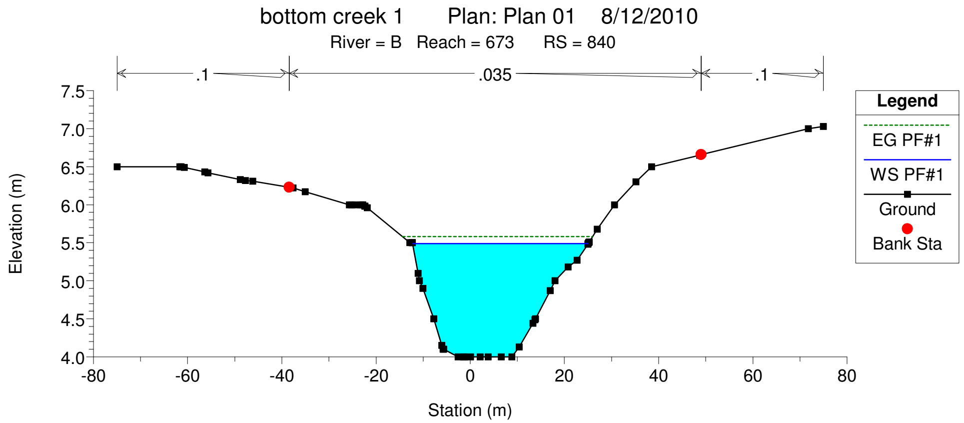


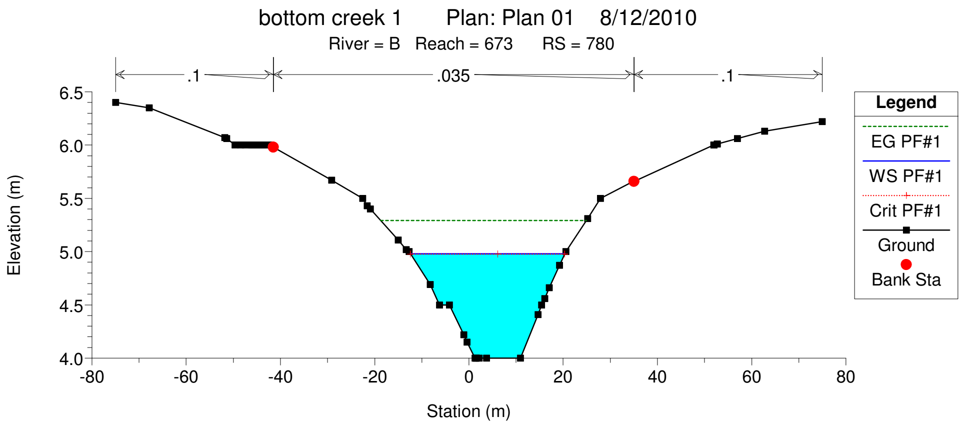
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1380
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1320
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1260
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1200
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1140
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1080
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

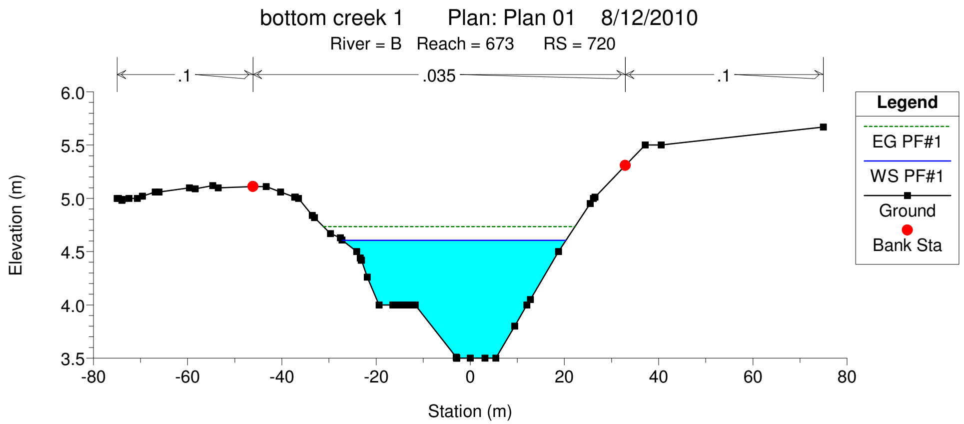

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 1020
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
-80
-60
-40
-20
0
20
40
60
80

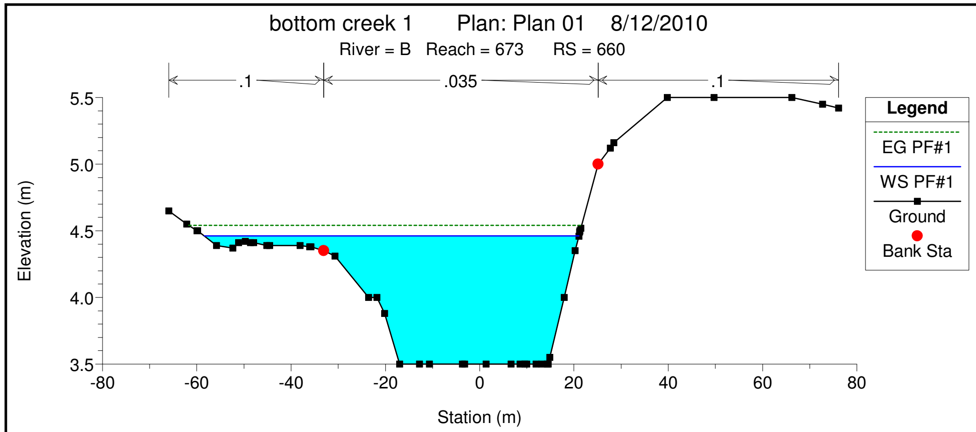

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 960
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
9
8
7
6
5
4
-80
-60
-40
-20
0
20
40
60
80
100

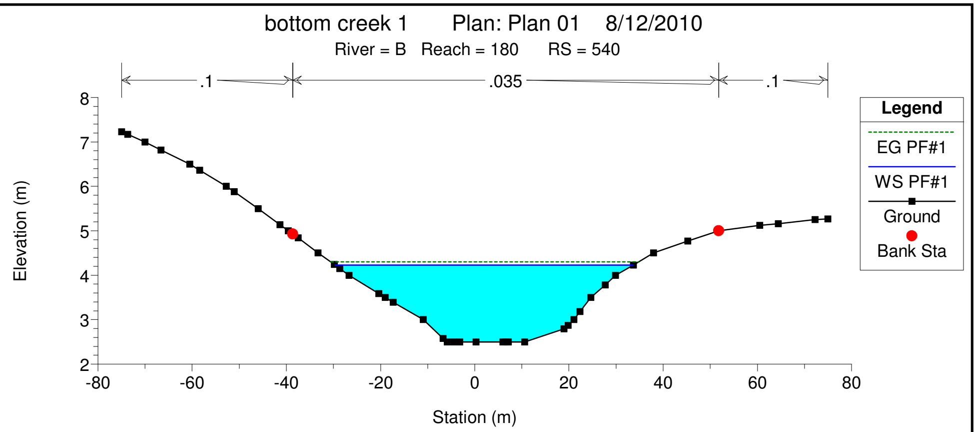

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 900
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
8
7
6
5
4
3
-80
-60
-40
-20
0
20
40
60
80

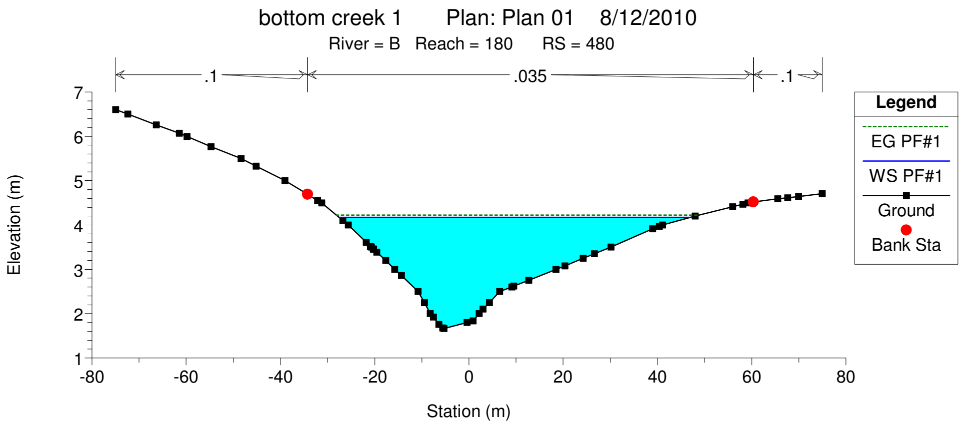

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 840
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
-80
-60
-40
-20
0
20
40
60
80

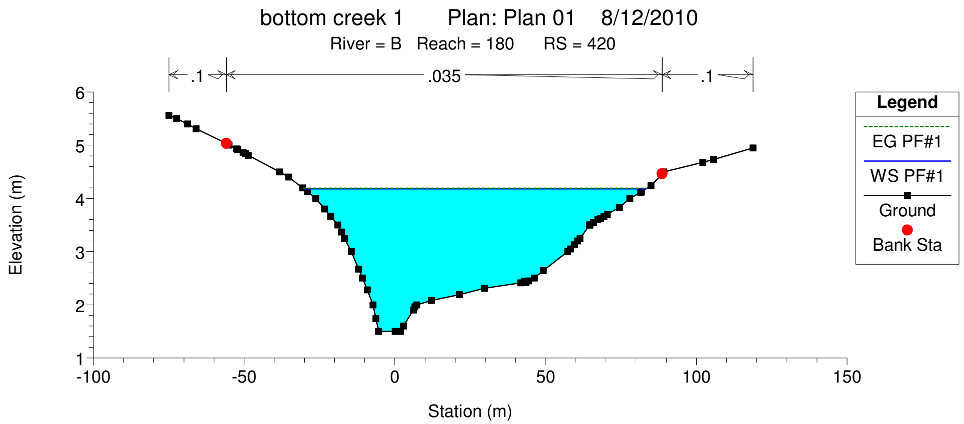

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 780
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
6.5
6.0
5.5
5.0
4.5
4.0
-80
-60
-40
-20
0
20
40
60
80

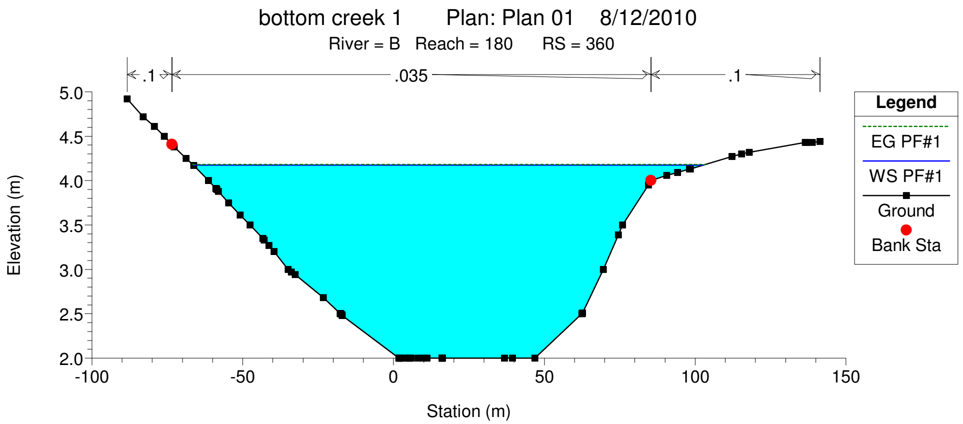

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 720
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
6.0
5.5
5.0
4.5
4.0
3.5
-80
-60
-40
-20
0
20
40
60
80

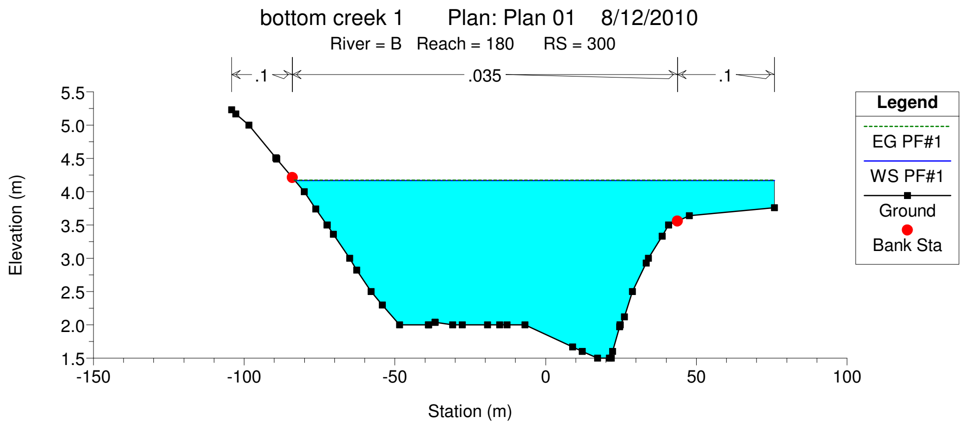

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 673 RS = 660
.1
.035
.1
Elevation (m)
Station (m)
5.5
5.0
4.5
4.0
3.5
-80
-60
-40
-20
0
20
40
60
80
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

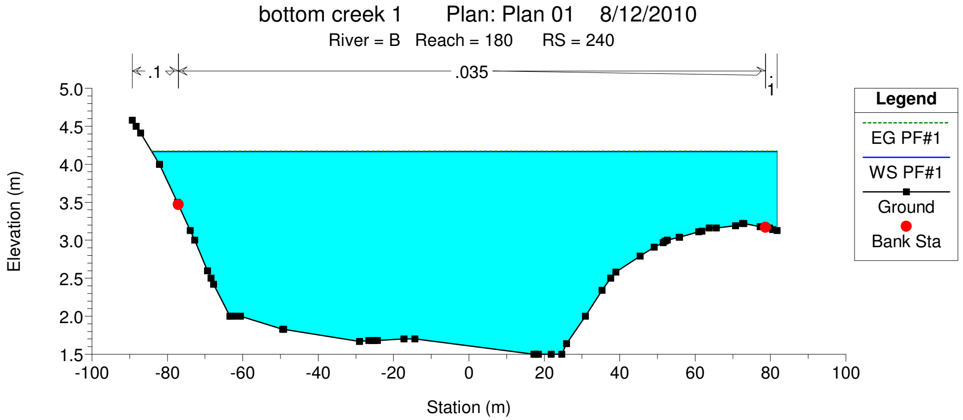

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 180 RS = 540
.1
.035
.1
Elevation (m)
Station (m)
8
7
6
5
4
3
2
-80
-60
-40
-20
0
20
40
60
80
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

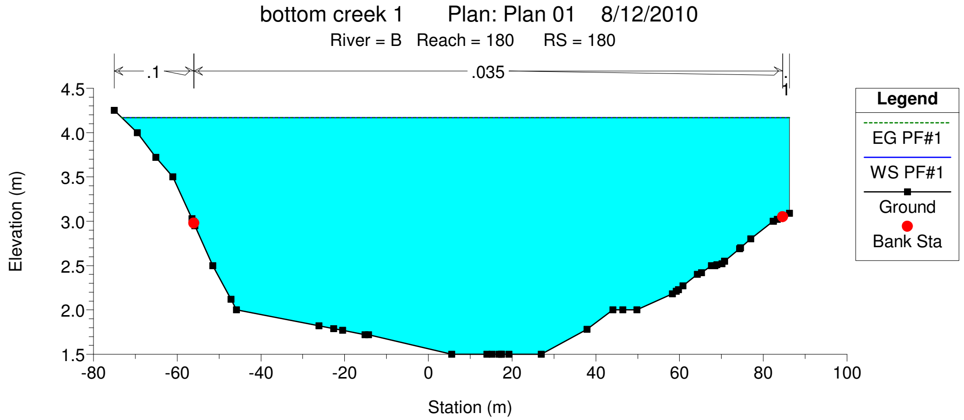

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 180 RS = 480
.1
.035
.1
Elevation (m)
Station (m)
7
6
5
4
3
2
1
-80
-60
-40
-20
0
20
40
60
80
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

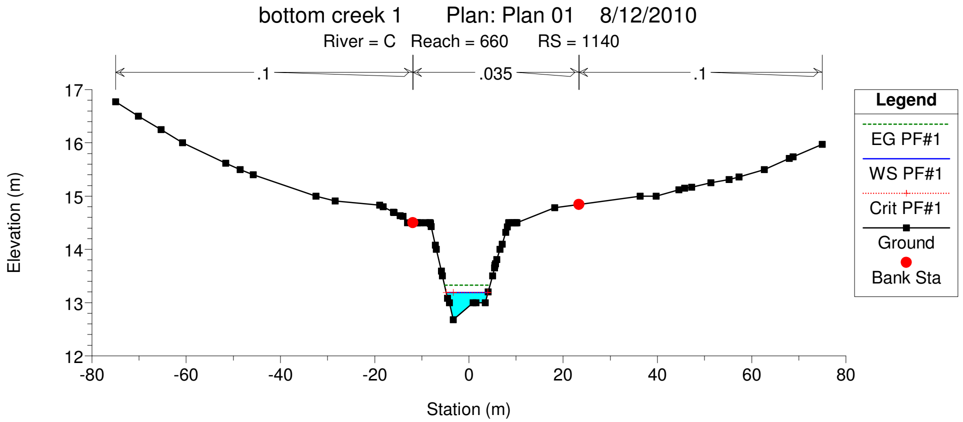

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 180 RS = 420
.1
.035
.1
Elevation (m)
Station (m)
6
5
4
3
2
1
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

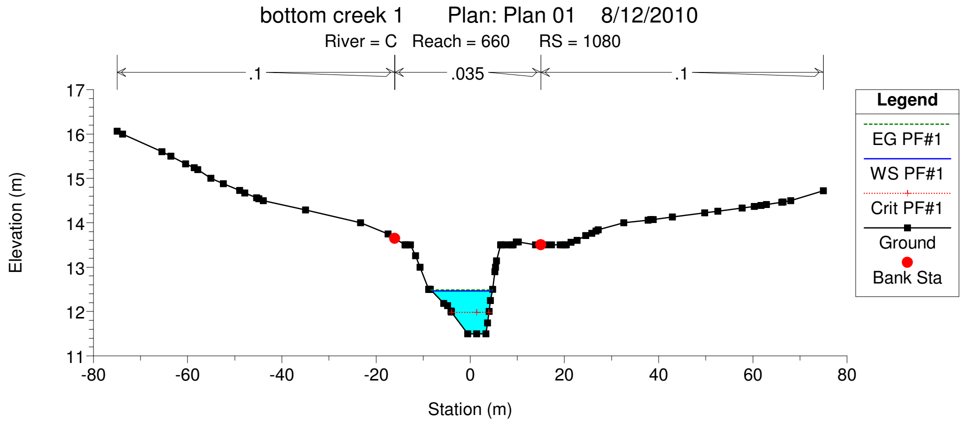

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 180 RS = 360
.1
.035
.1
Elevation (m)
Station (m)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
-100
-50
0
50
100
150
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

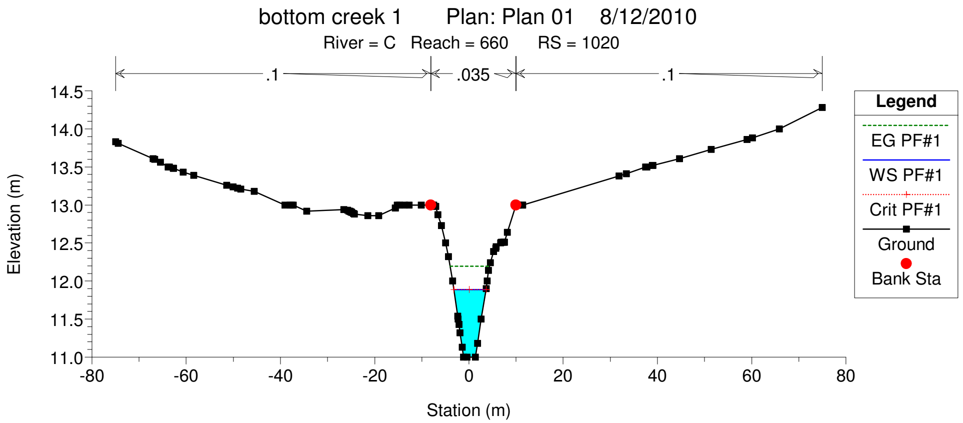

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 180 RS = 300
.1
.035
.1
Elevation (m)
Station (m)
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
-150
-100
-50
0
50
100
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

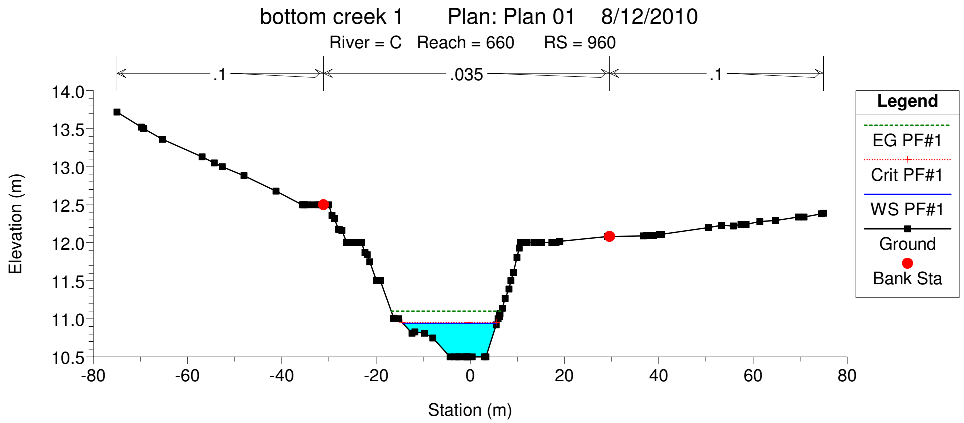

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 180 RS = 240
.1
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

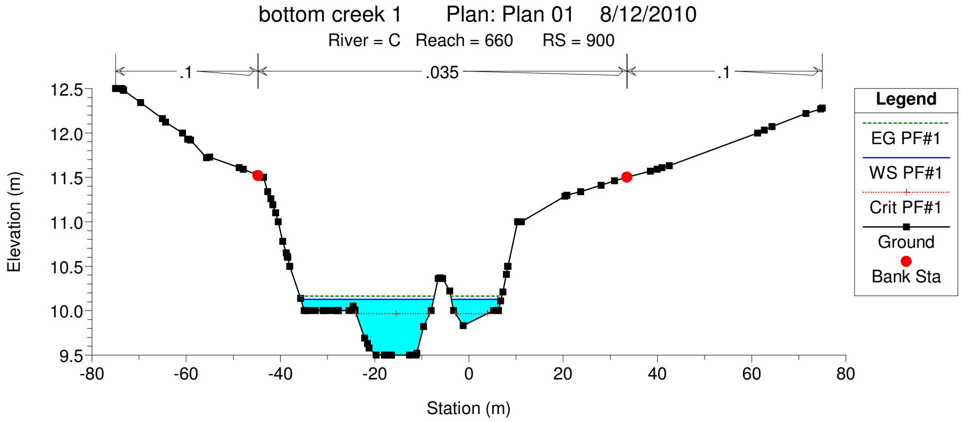

bottom creek 1 Plan: Plan 01 8/12/2010
River = B Reach = 180 RS = 180
.1
.035
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

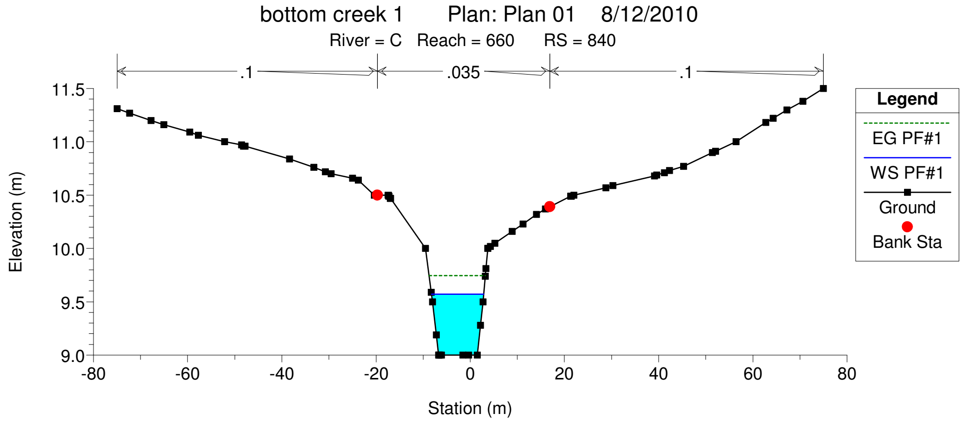

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 660 RS = 1140
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

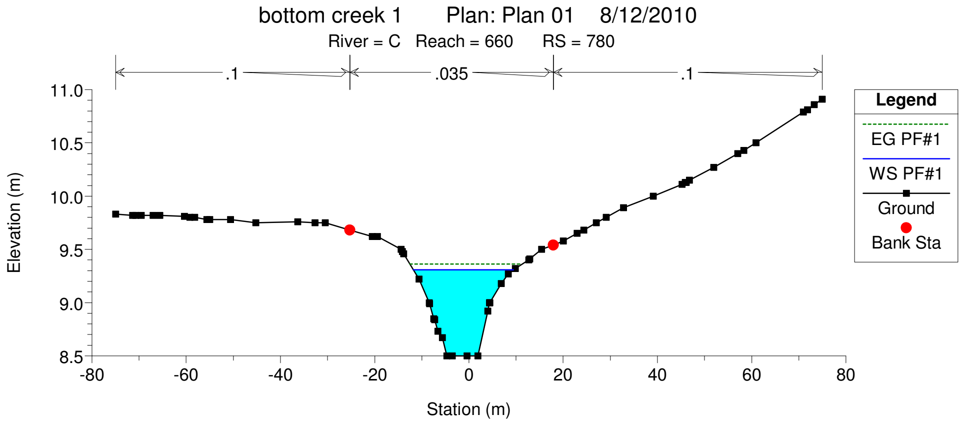

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 660 RS = 1080
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

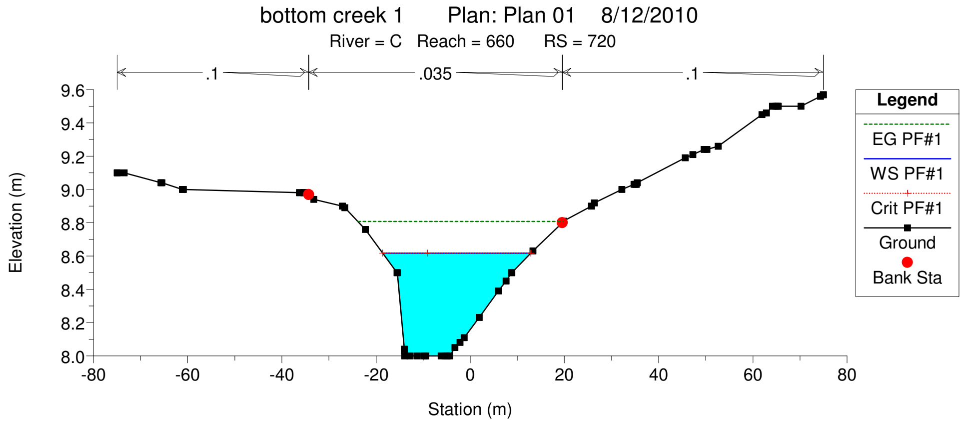

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 660 RS = 1020
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

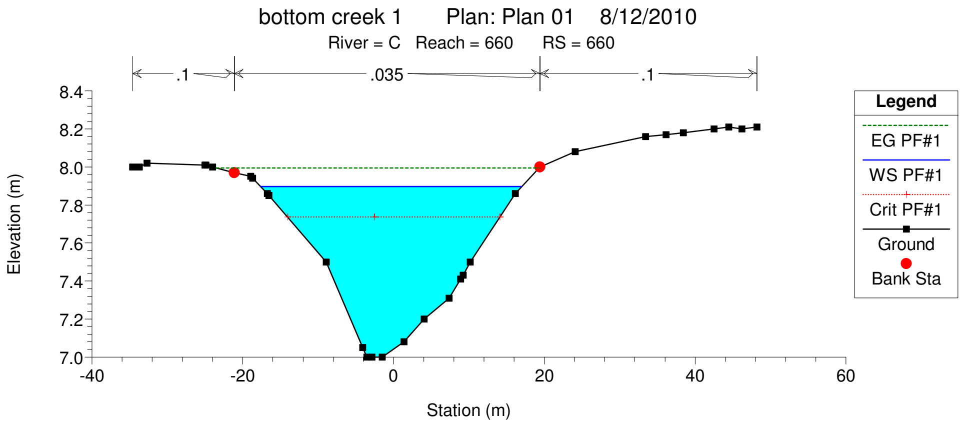

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 660 RS = 960
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

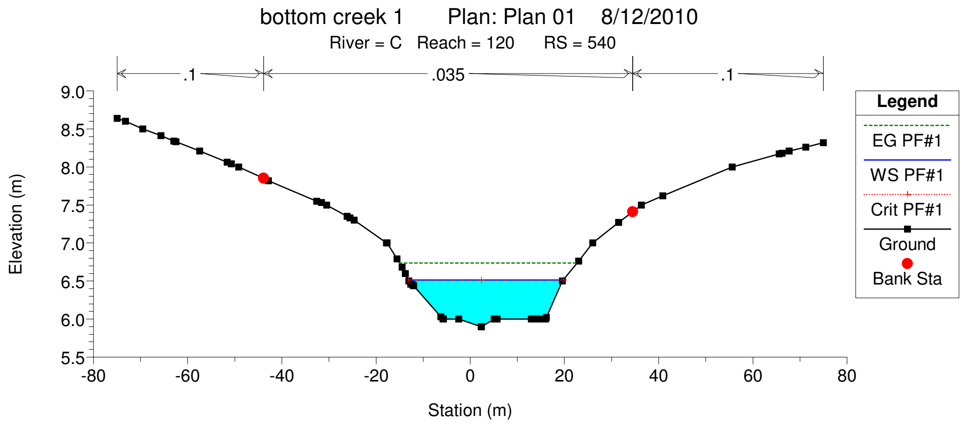

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 660 RS = 900
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

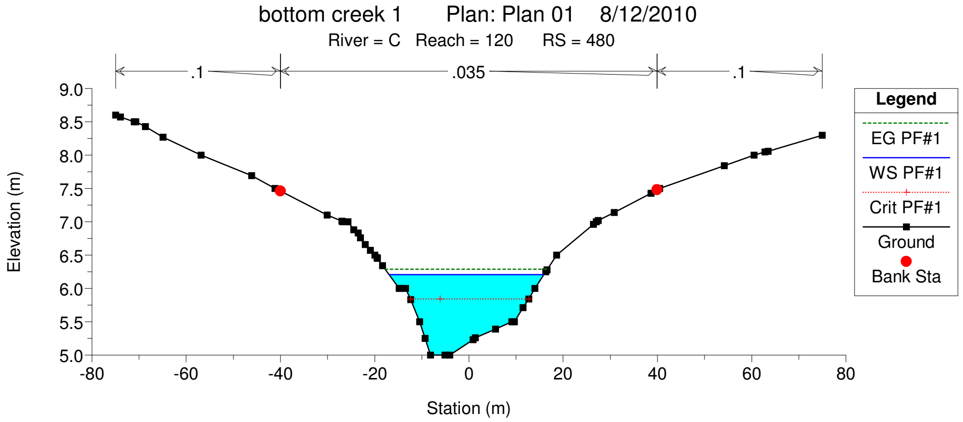

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 660 RS = 840
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

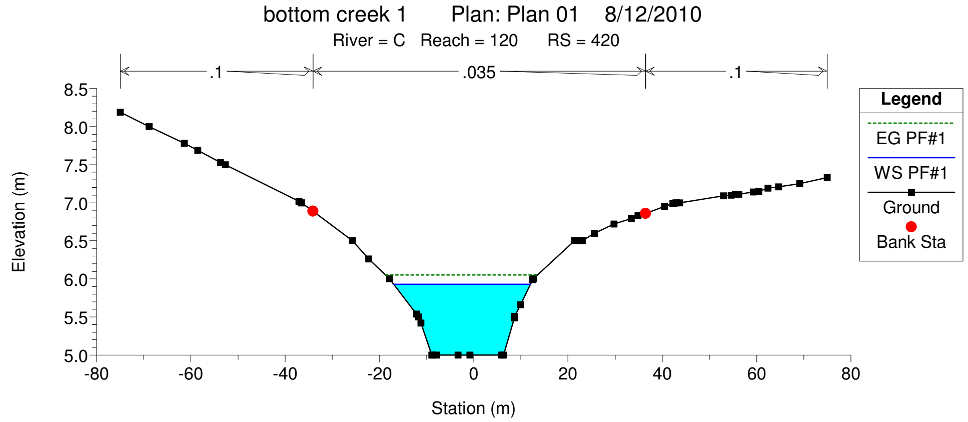

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 660 RS = 780
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

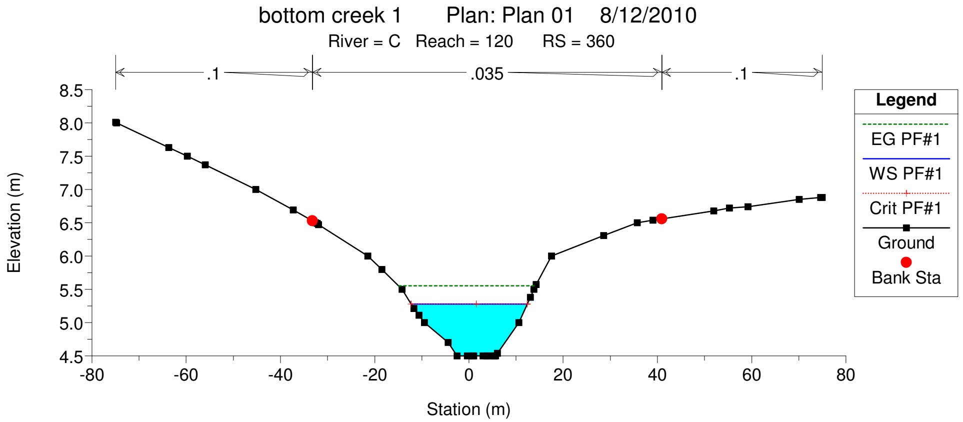

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 660 RS = 720
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

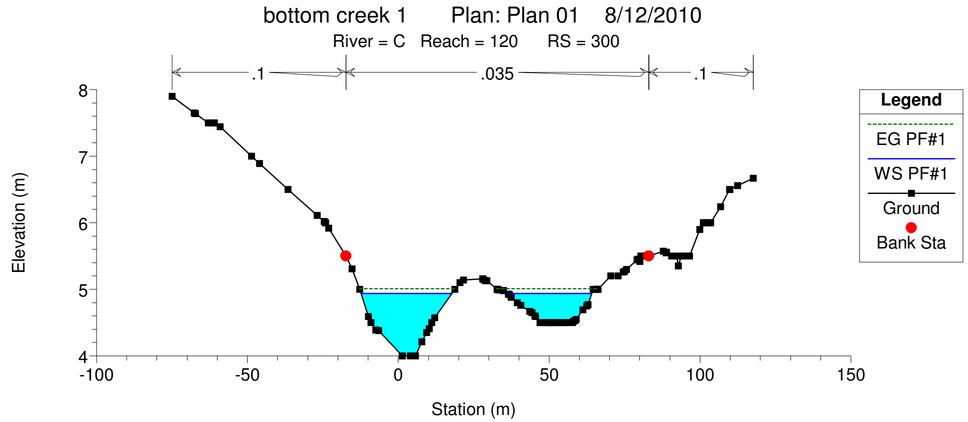

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 660 RS = 660
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

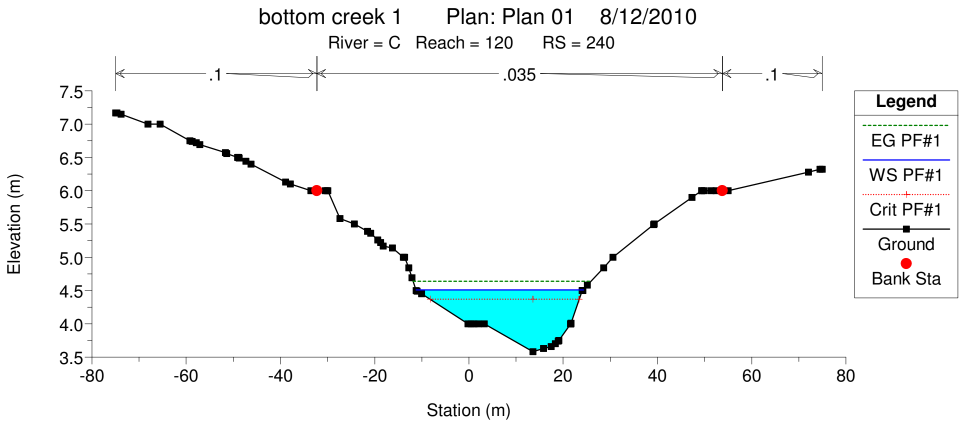

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 120 RS = 540
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

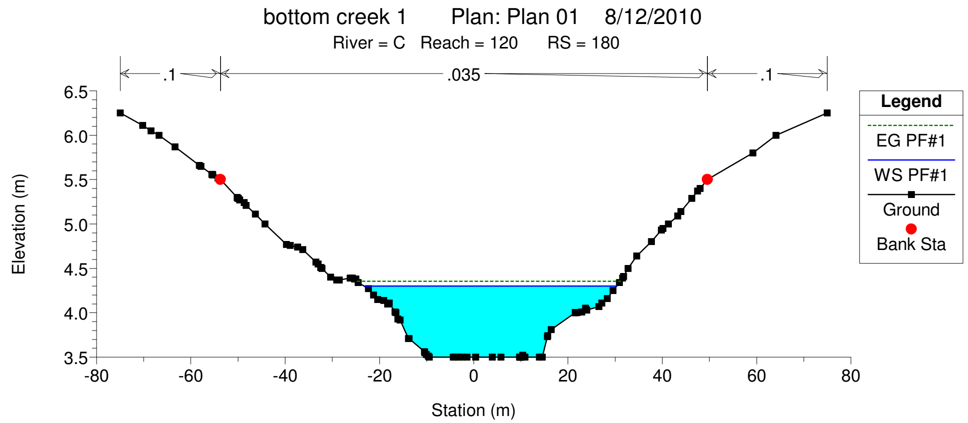

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 120 RS = 480
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

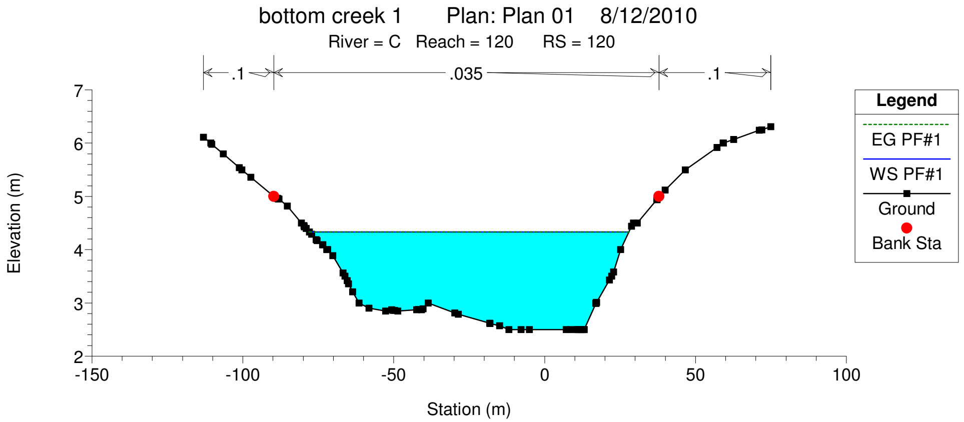

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 120 RS = 420
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

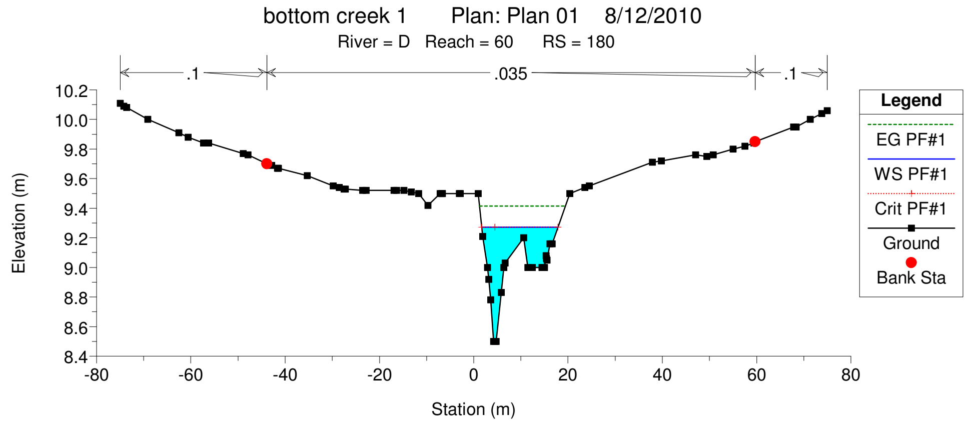

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 120 RS = 360
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

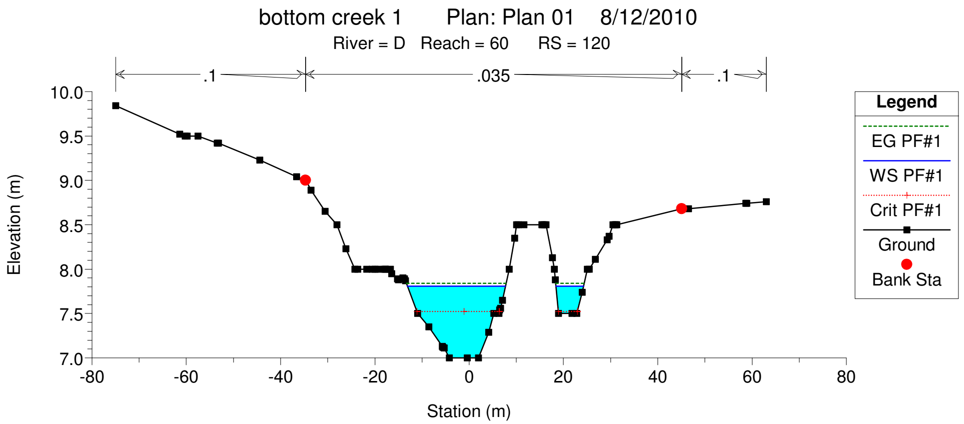

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 120 RS = 300
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

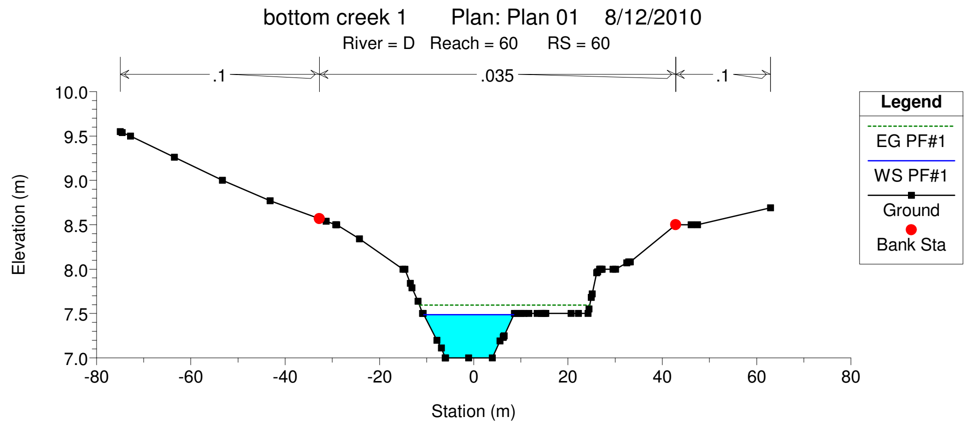

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 120 RS = 240
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

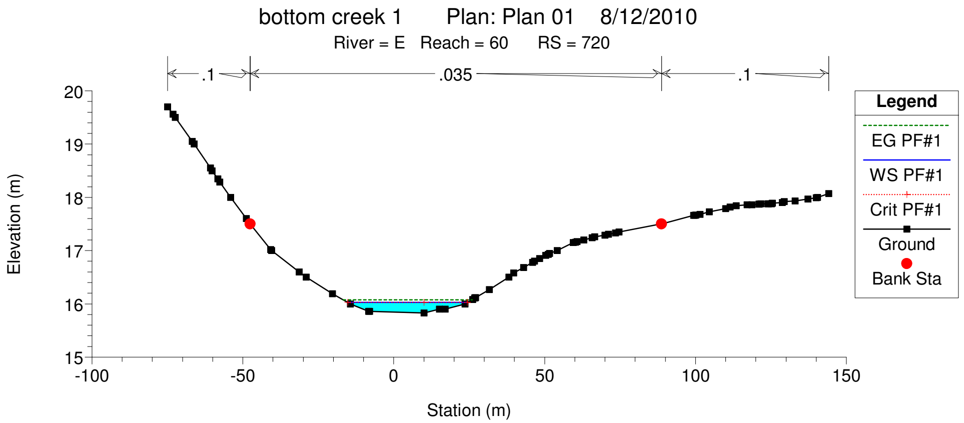

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 120 RS = 180
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

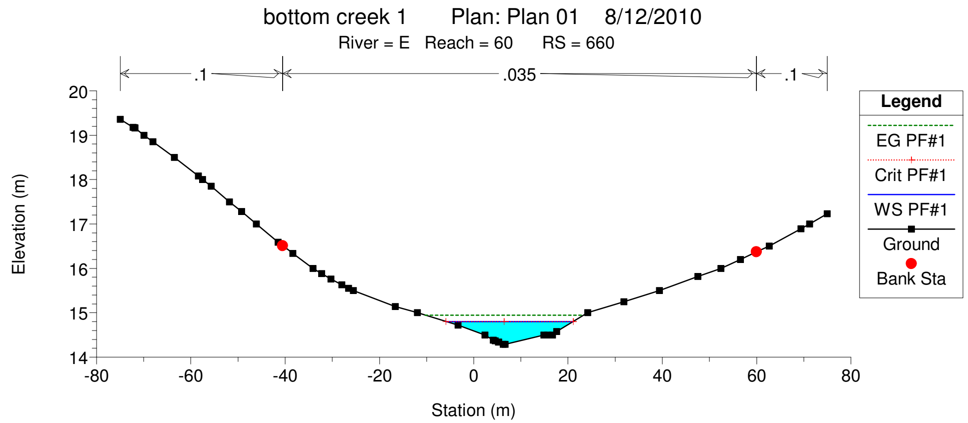

bottom creek 1 Plan: Plan 01 8/12/2010
River = C Reach = 120 RS = 120
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

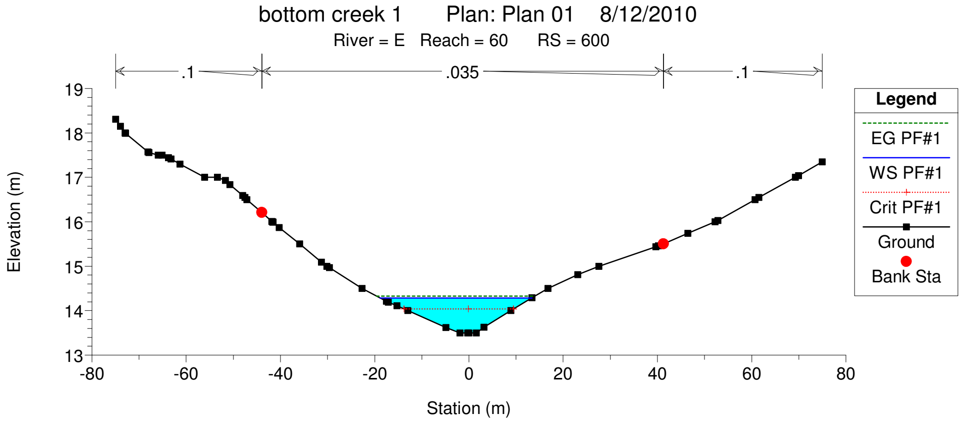

bottom creek 1 Plan: Plan 01 8/12/2010
River = D Reach = 60 RS = 180
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

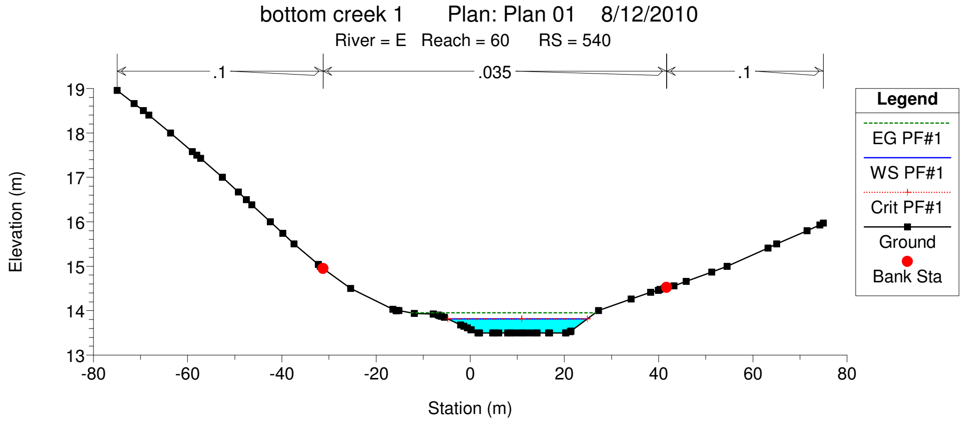

bottom creek 1 Plan: Plan 01 8/12/2010
River = D Reach = 60 RS = 120
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

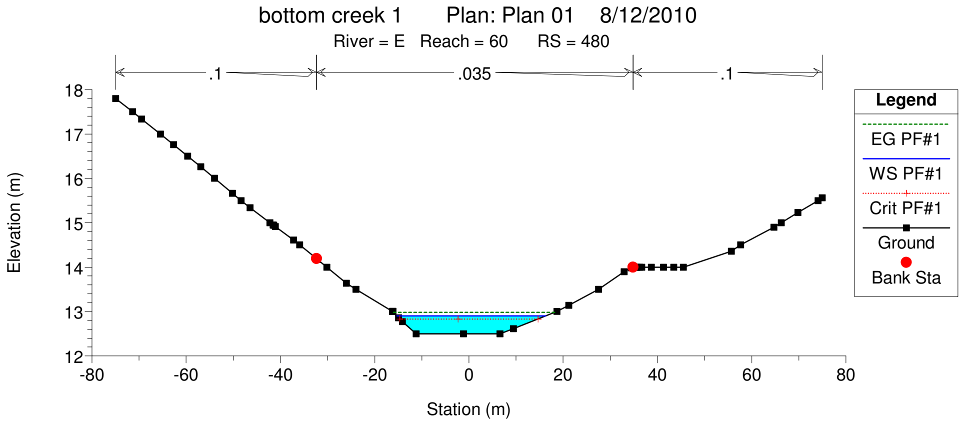

bottom creek 1 Plan: Plan 01 8/12/2010
River = D Reach = 60 RS = 60
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

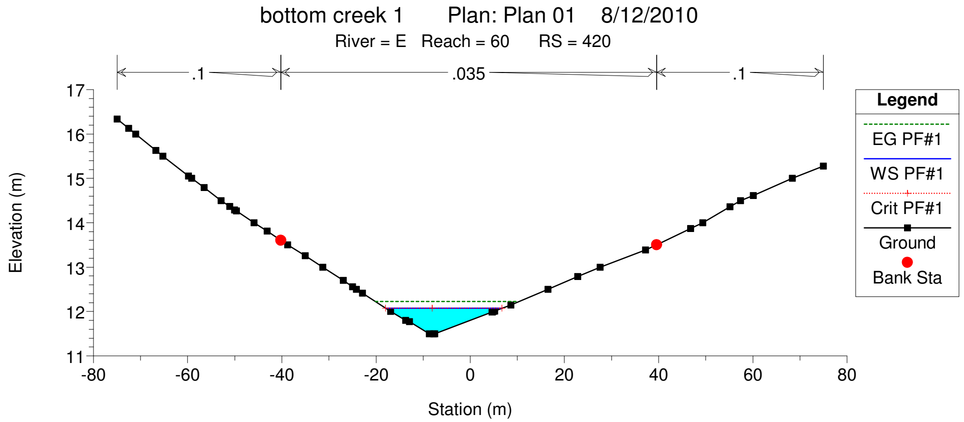

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 720
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

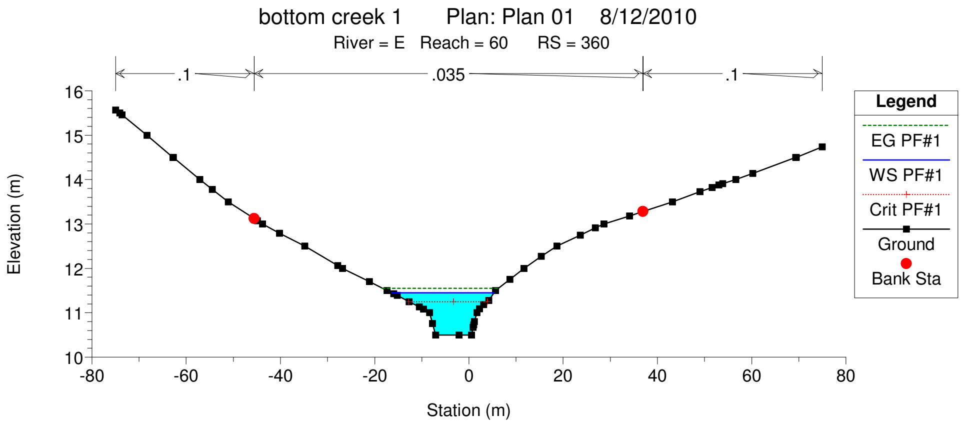

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 660
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

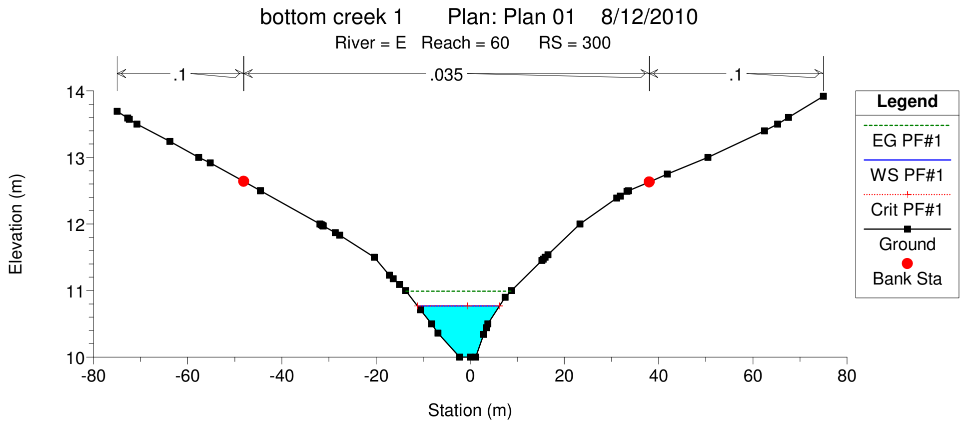

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 600
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

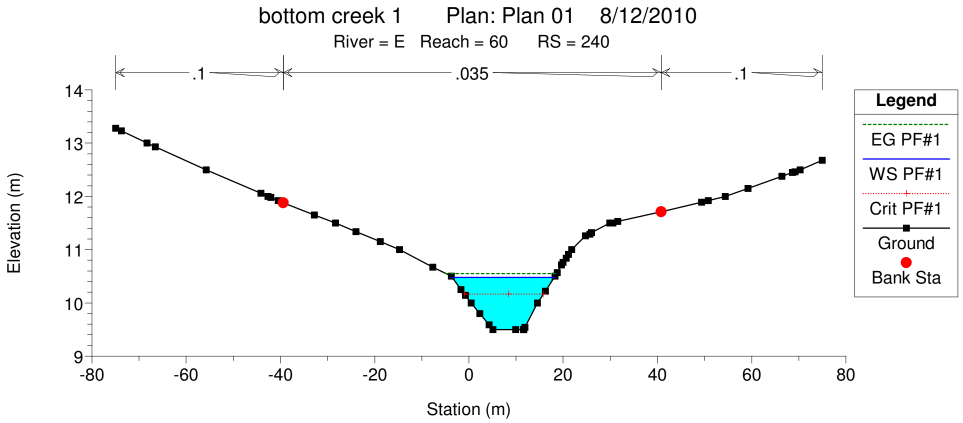

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 540
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

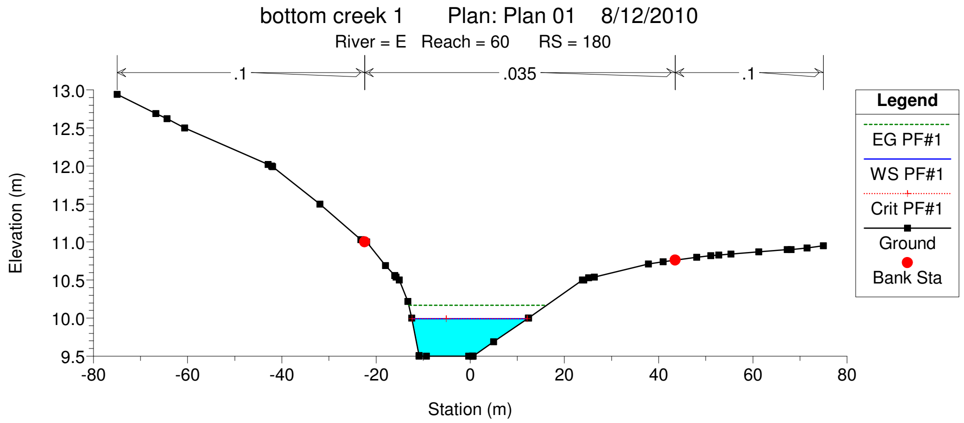

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 480
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

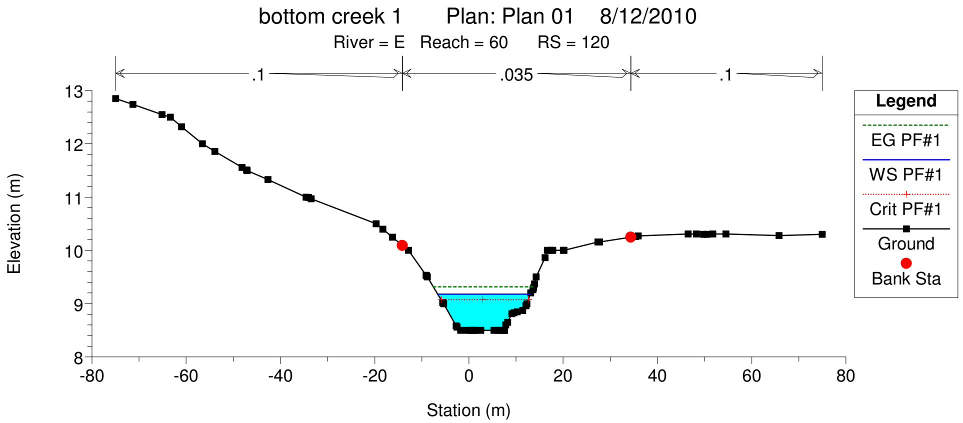

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 420
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

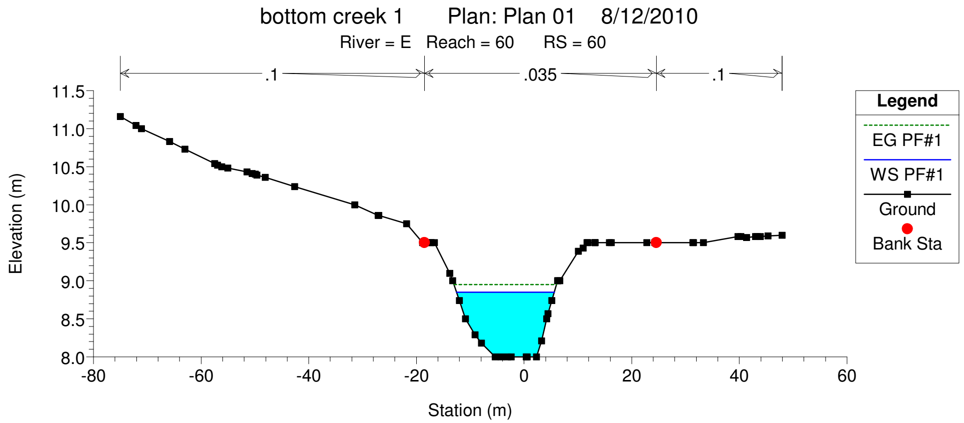

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 360
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

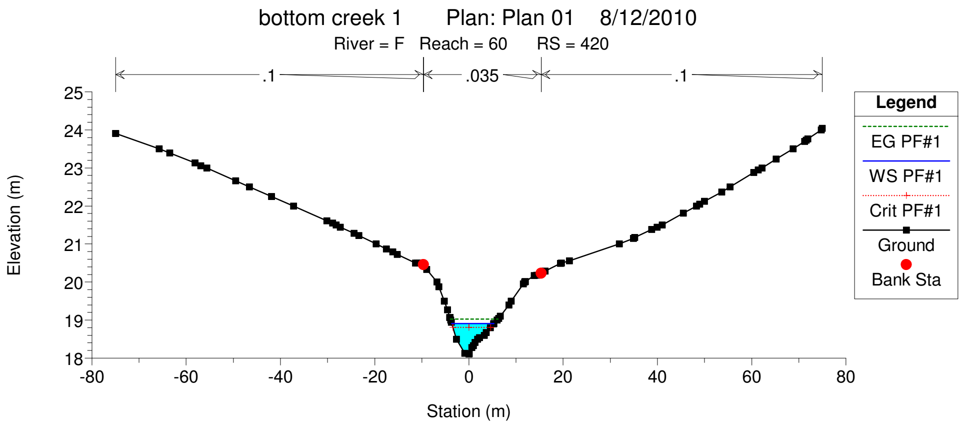

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 300
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

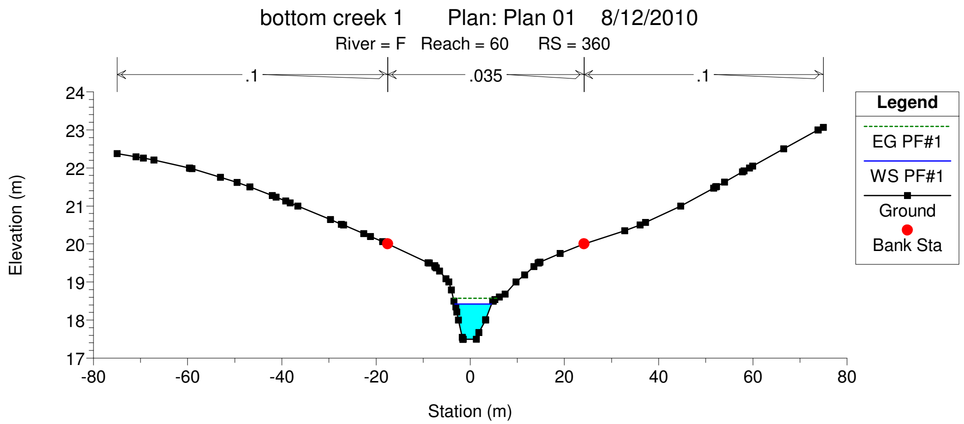

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 240
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

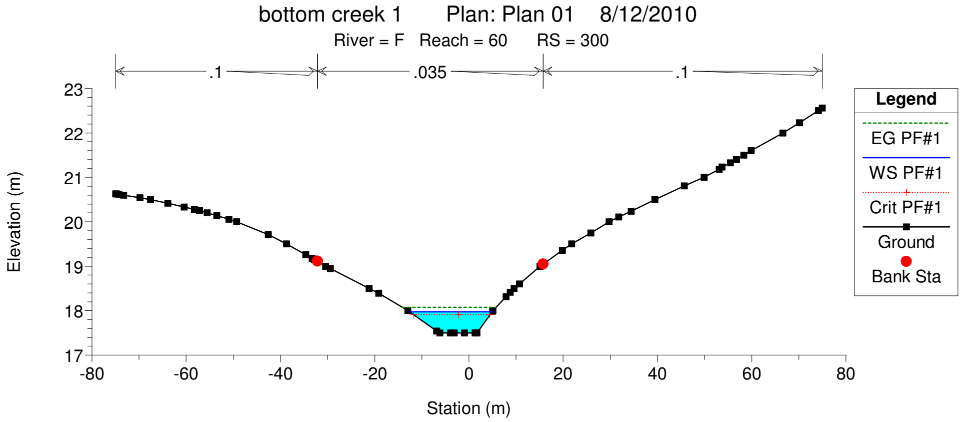

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 180
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

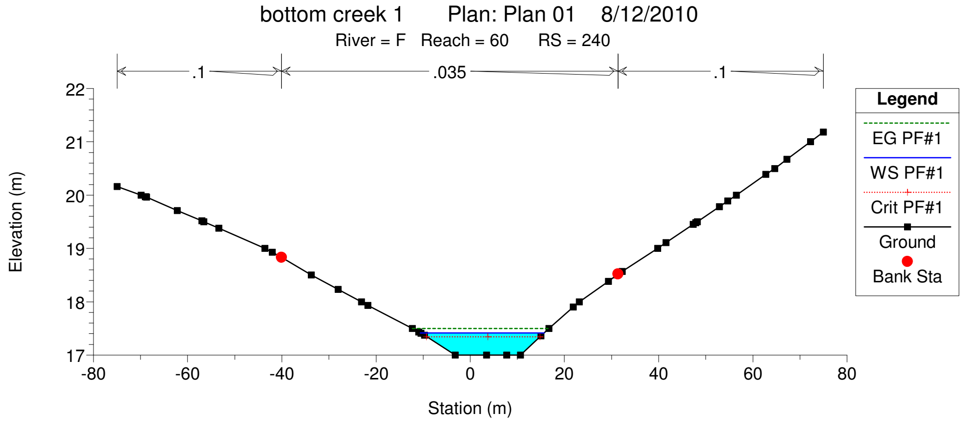

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 120
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

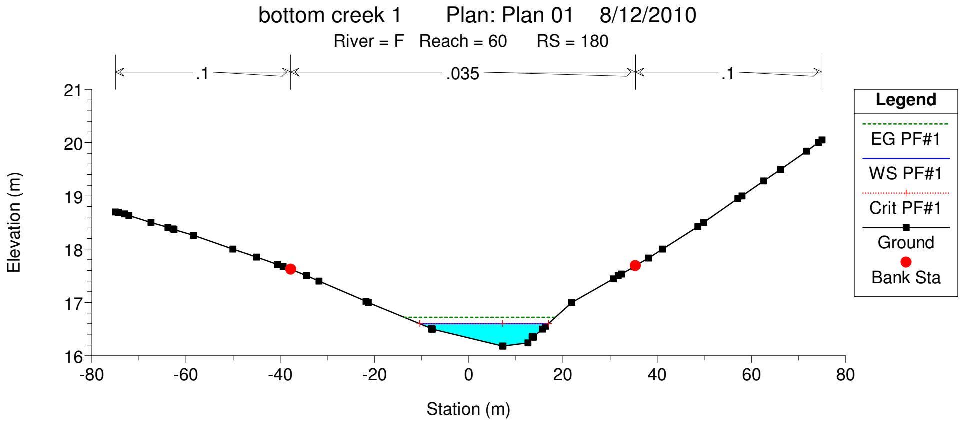

bottom creek 1 Plan: Plan 01 8/12/2010
River = E Reach = 60 RS = 60
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

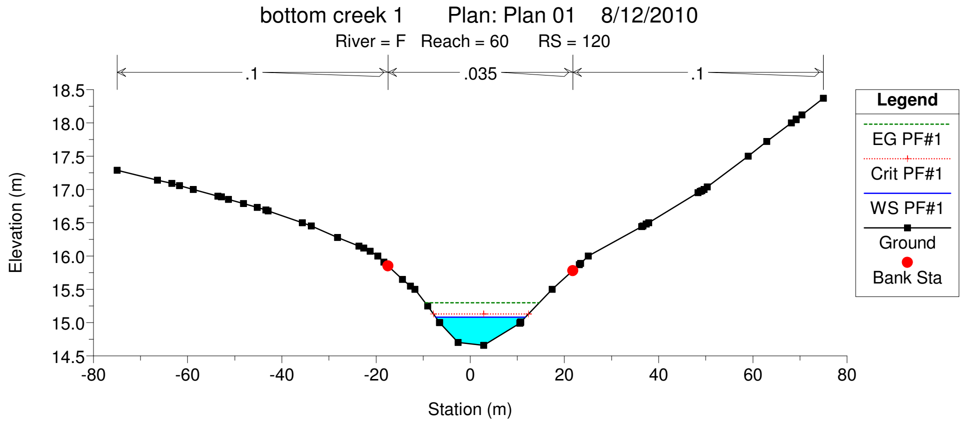

bottom creek 1 Plan: Plan 01 8/12/2010
River = F Reach = 60 RS = 420
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

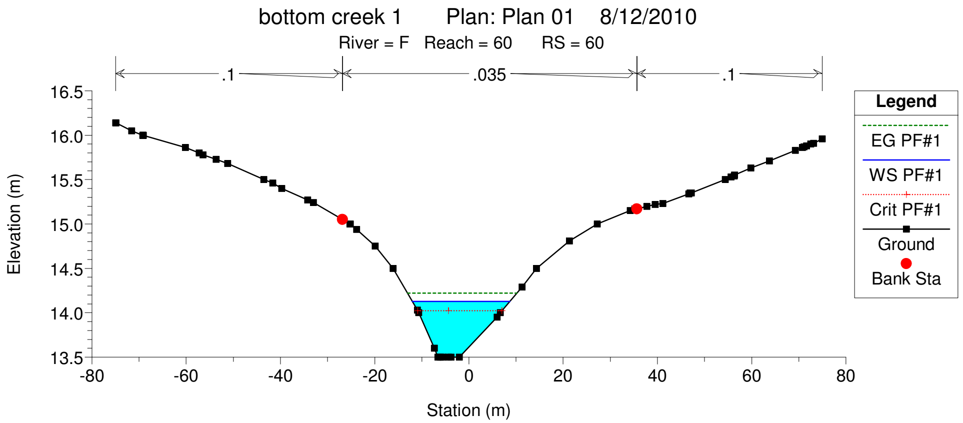

bottom creek 1 Plan: Plan 01 8/12/2010
River = F Reach = 60 RS = 360
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

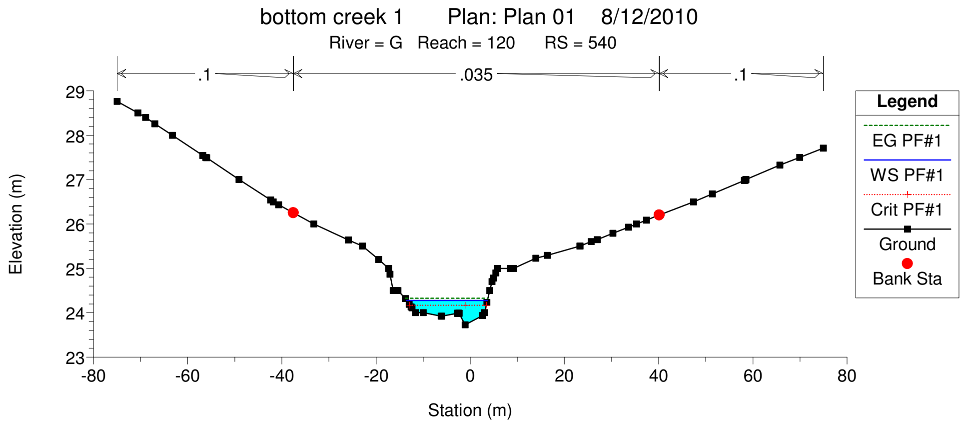

bottom creek 1 Plan: Plan 01 8/12/2010
River = F Reach = 60 RS = 300
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

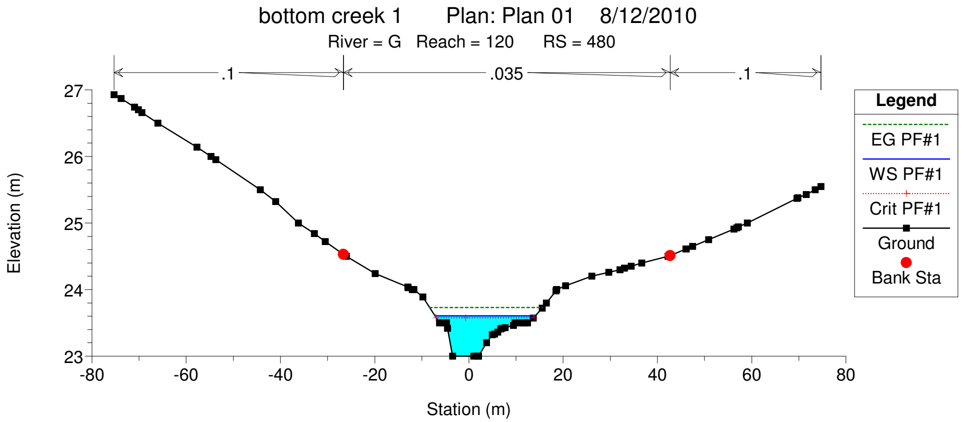

bottom creek 1 Plan: Plan 01 8/12/2010
River = F Reach = 60 RS = 240
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

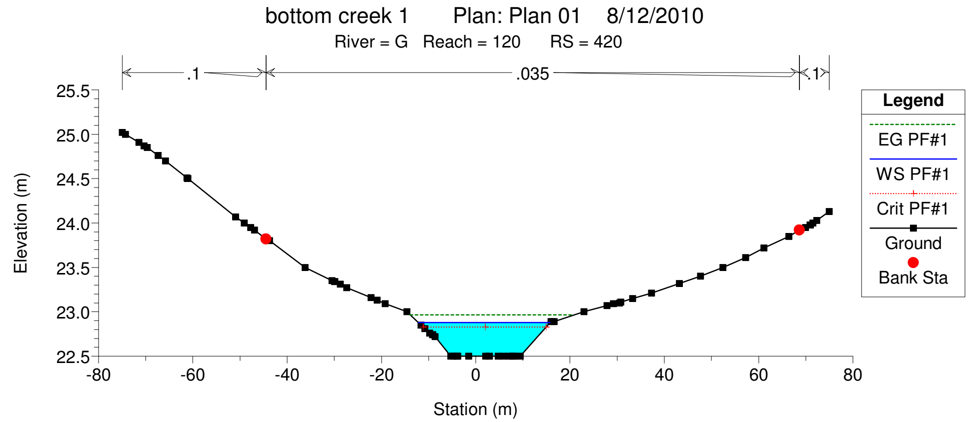

bottom creek 1 Plan: Plan 01 8/12/2010
River = F Reach = 60 RS = 180
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

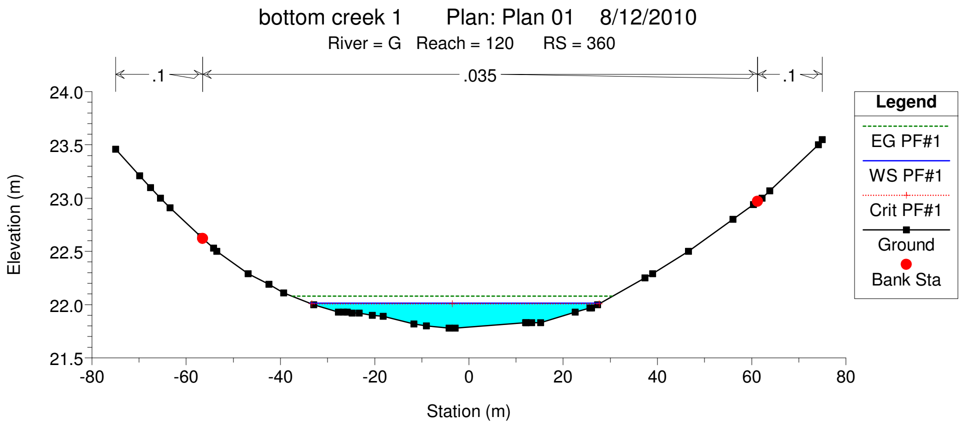

bottom creek 1 Plan: Plan 01 8/12/2010
River = F Reach = 60 RS = 120
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

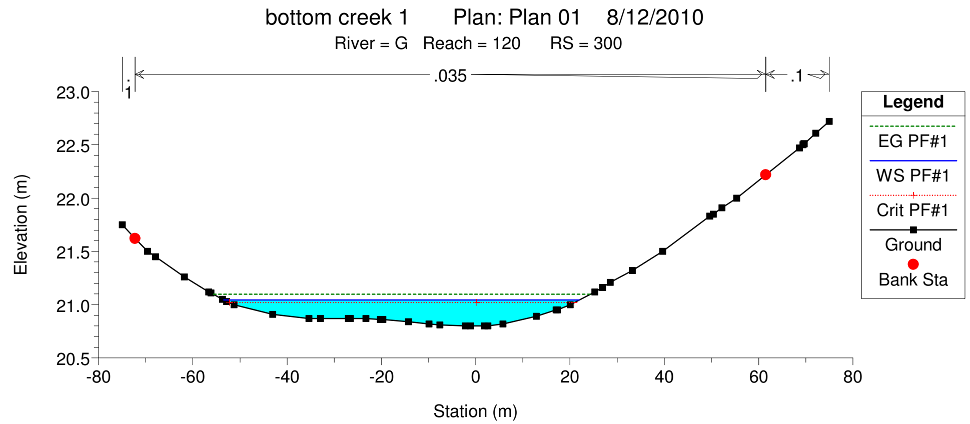

bottom creek 1 Plan: Plan 01 8/12/2010
River = F Reach = 60 RS = 60
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

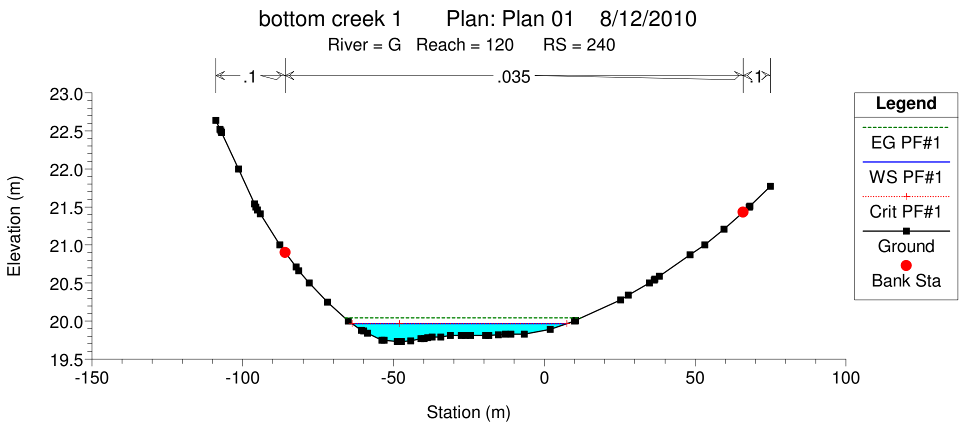

bottom creek 1 Plan: Plan 01 8/12/2010
River = G Reach = 120 RS = 540
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

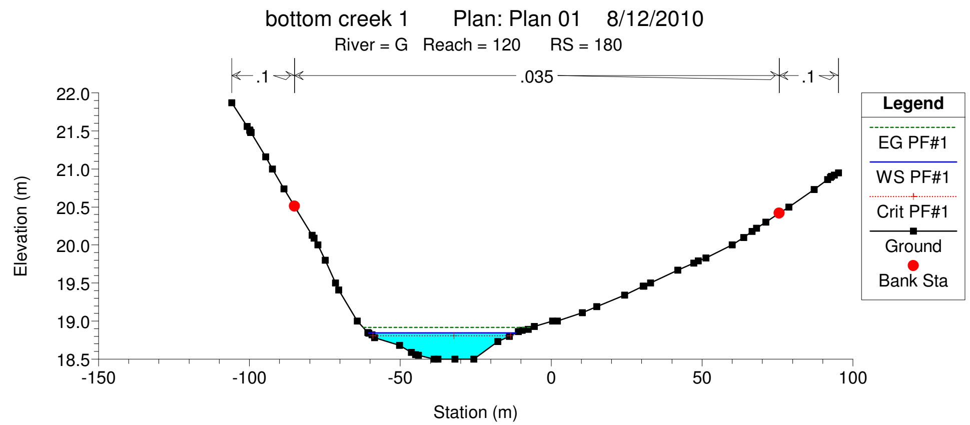

bottom creek 1 Plan: Plan 01 8/12/2010
River = G Reach = 120 RS = 480
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

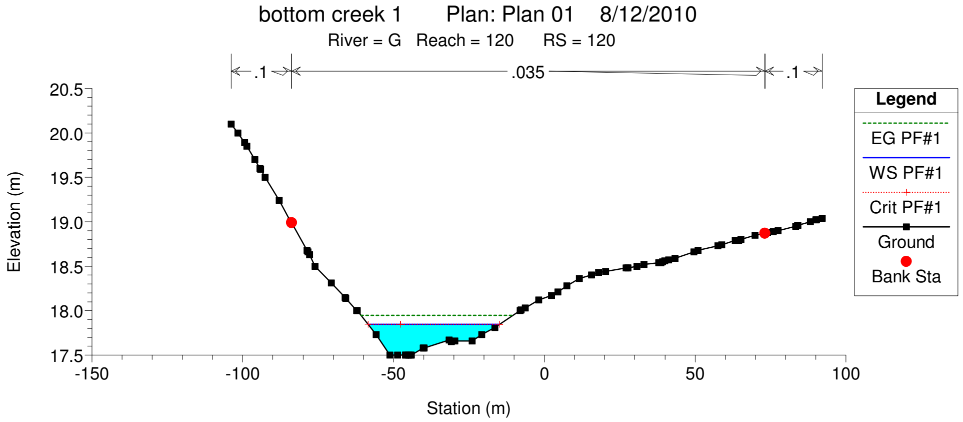

bottom creek 1 Plan: Plan 01 8/12/2010
River = G Reach = 120 RS = 420
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

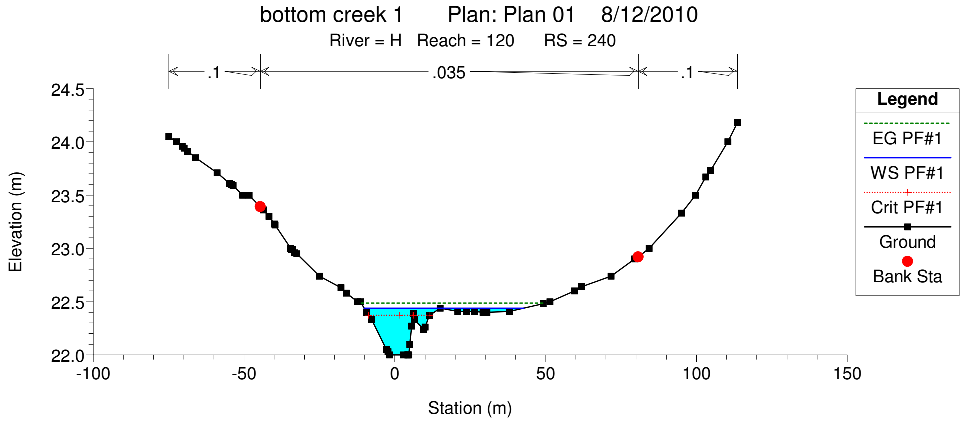

bottom creek 1 Plan: Plan 01 8/12/2010
River = G Reach = 120 RS = 360
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

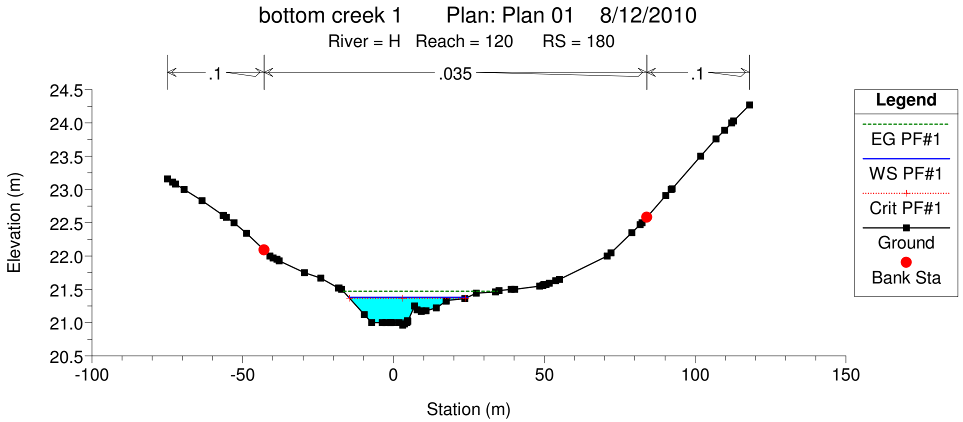

bottom creek 1 Plan: Plan 01 8/12/2010
River = G Reach = 120 RS = 300
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

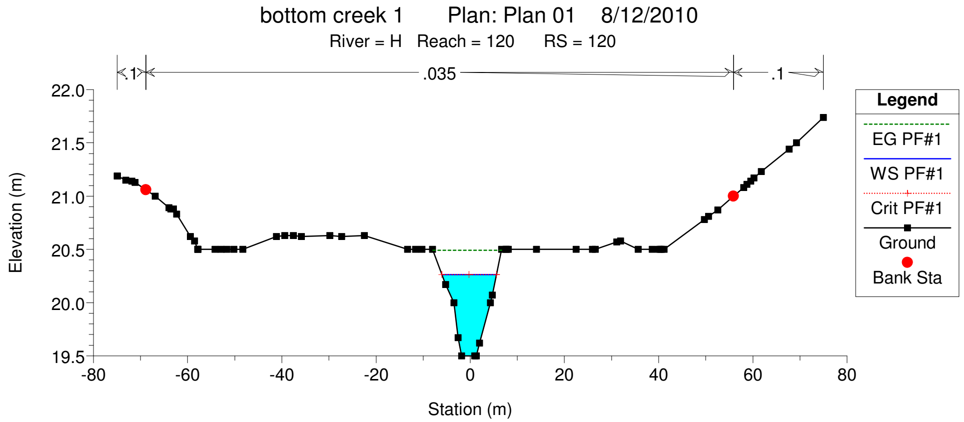

bottom creek 1 Plan: Plan 01 8/12/2010
River = G Reach = 120 RS = 240
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

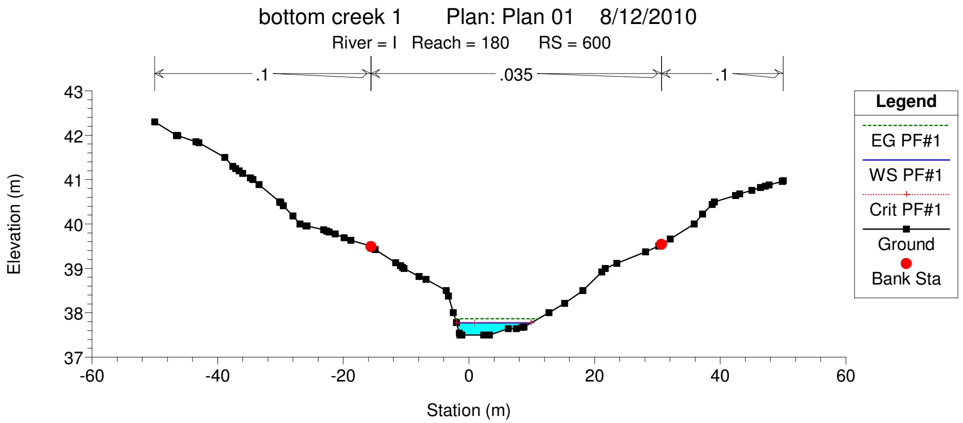

bottom creek 1 Plan: Plan 01 8/12/2010
River = G Reach = 120 RS = 180
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

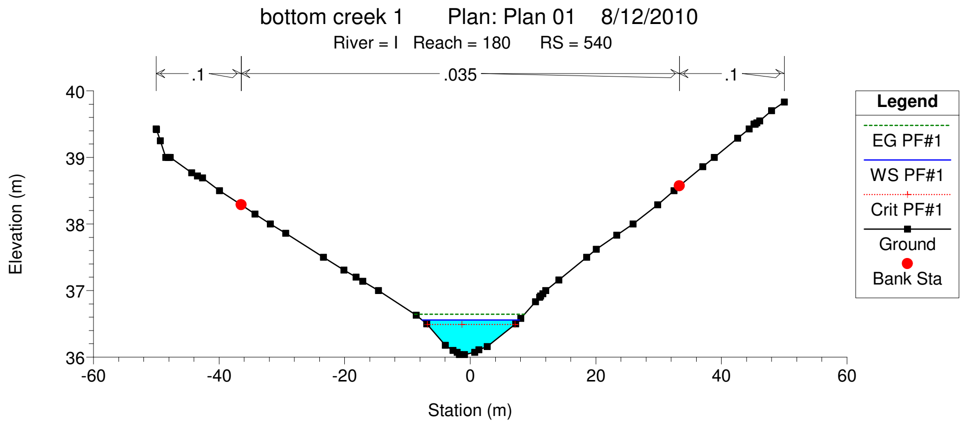

bottom creek 1 Plan: Plan 01 8/12/2010
River = G Reach = 120 RS = 120
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

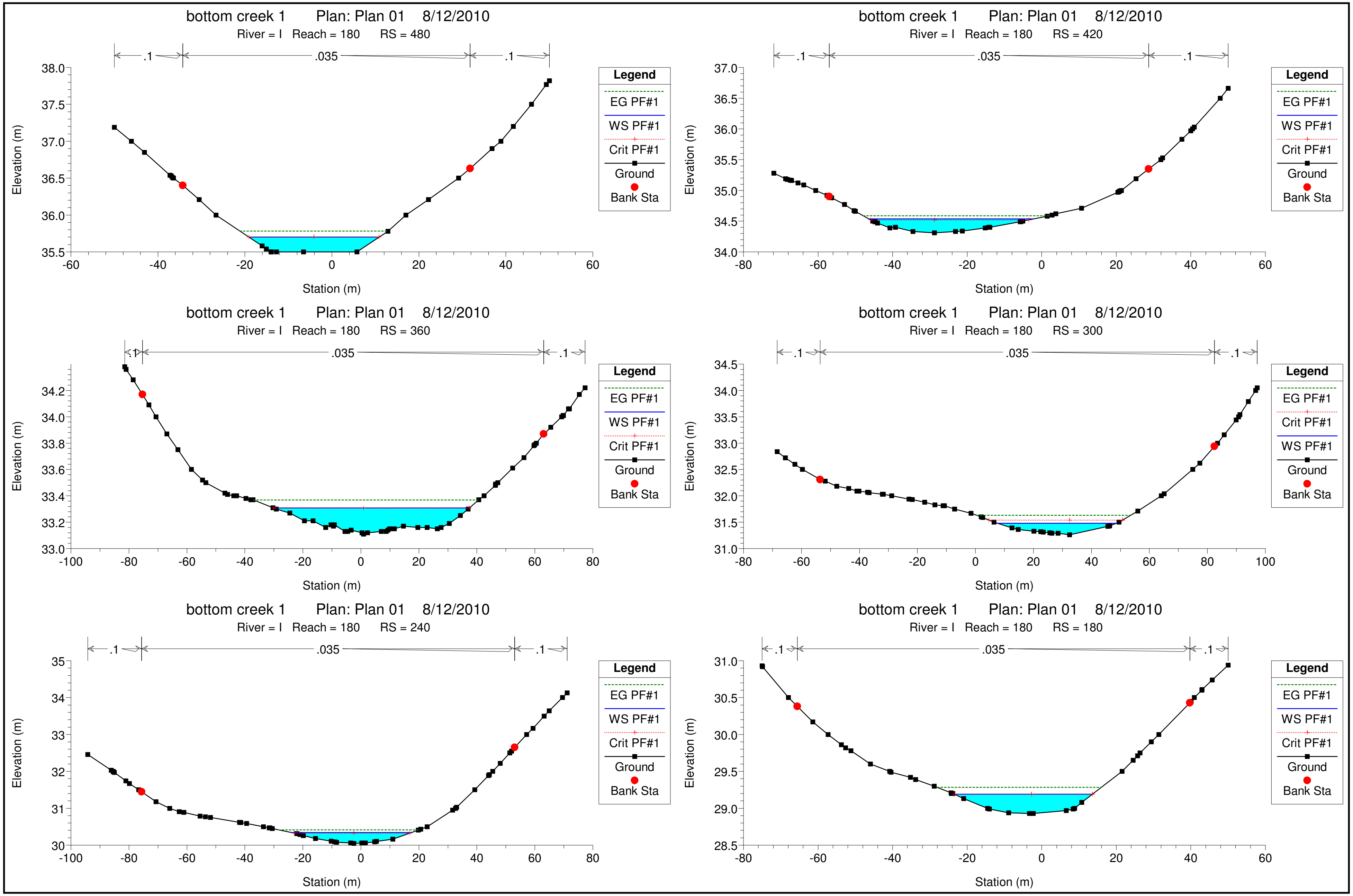

bottom creek 1 Plan: Plan 01 8/12/2010
River = H Reach = 120 RS = 240
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = H Reach = 120 RS = 180
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

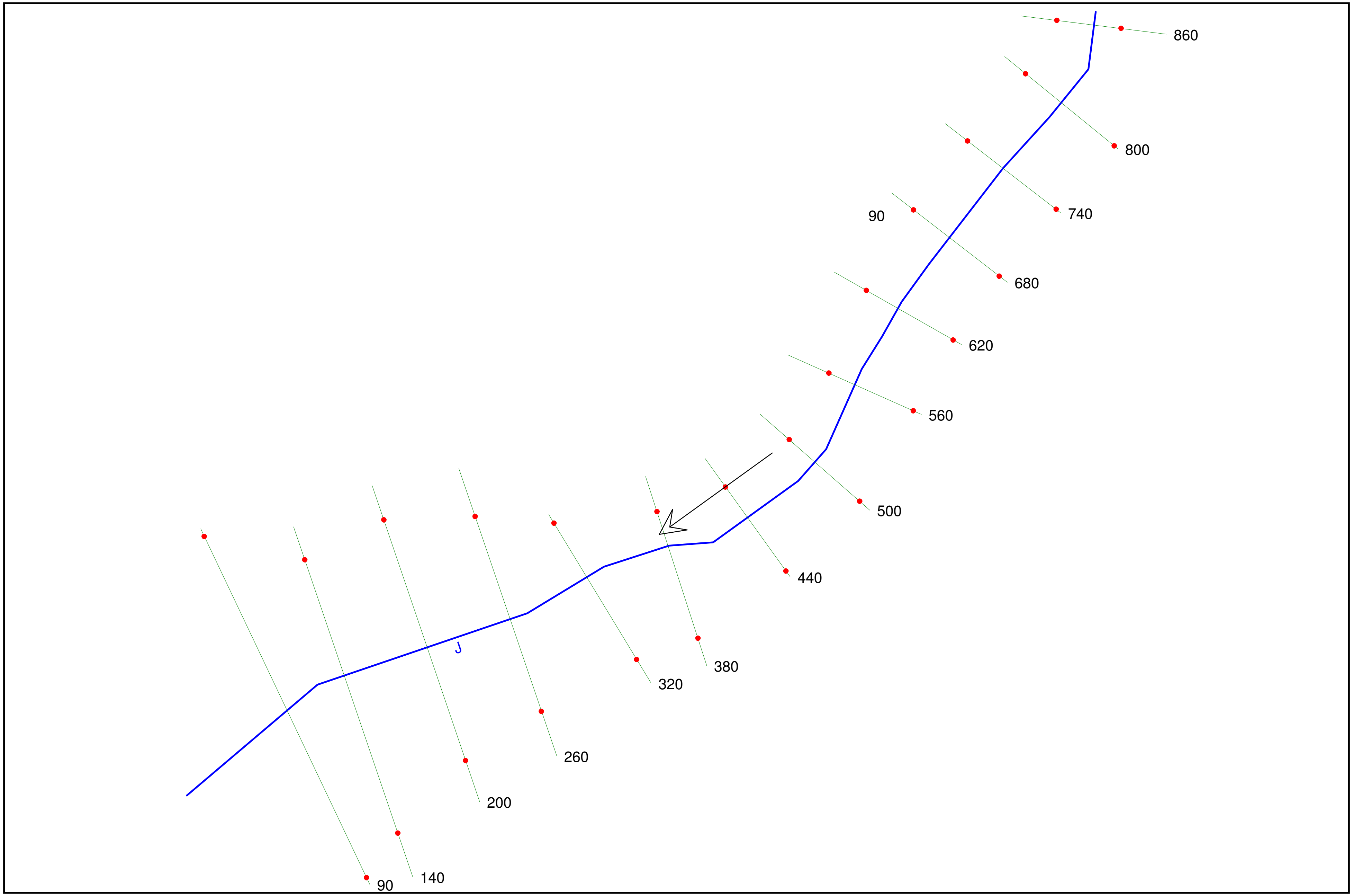

bottom creek 1 Plan: Plan 01 8/12/2010
River = H Reach = 120 RS = 120
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


bottom creek 1 Plan: Plan 01 8/12/2010
River = I Reach = 180 RS = 600
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

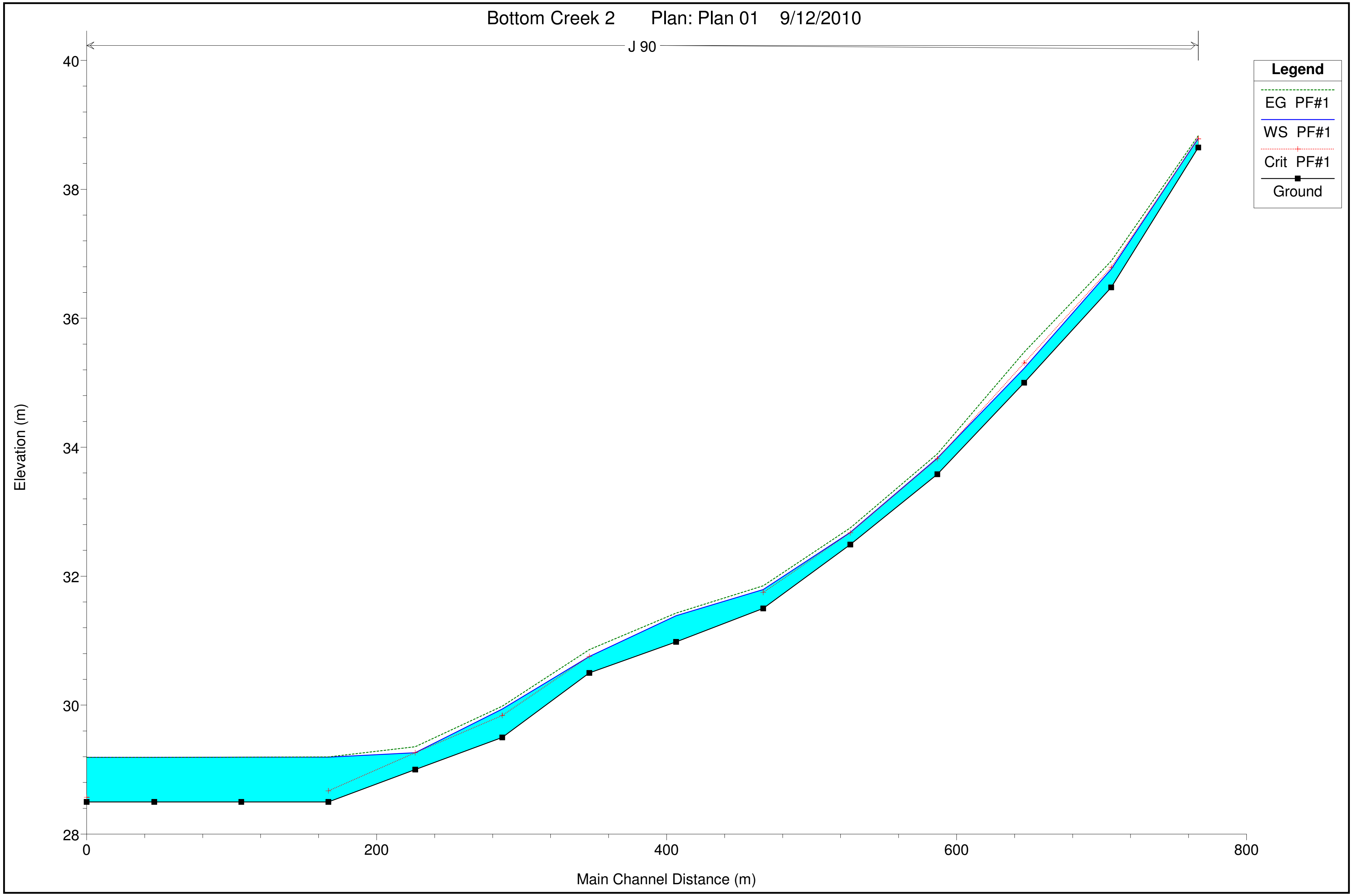

bottom creek 1 Plan: Plan 01 8/12/2010
River = I Reach = 180 RS = 540
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta



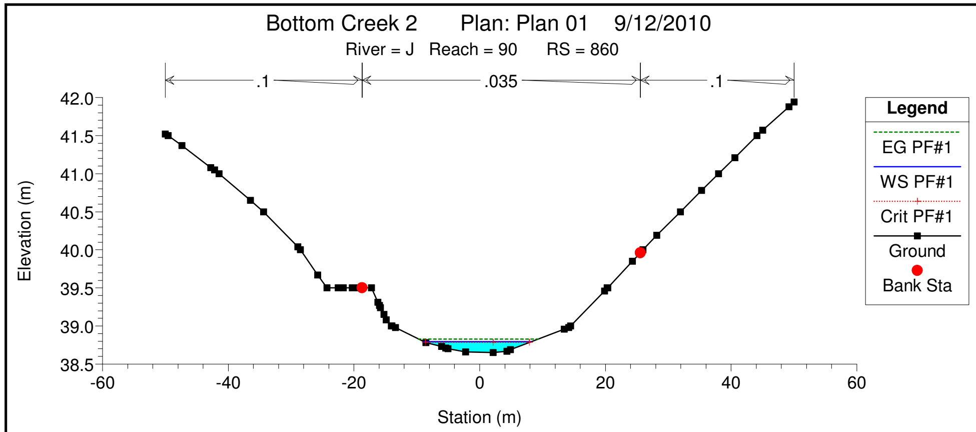
bottom creek 1 Plan: Plan 01 8/12/2010
River = I Reach = 180 RS = 480
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
bottom creek 1 Plan: Plan 01 8/12/2010
River = I Reach = 180 RS = 420
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
bottom creek 1 Plan: Plan 01 8/12/2010
River = I Reach = 180 RS = 360
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
bottom creek 1 Plan: Plan 01 8/12/2010
River = I Reach = 180 RS = 300
.1
.035
.1
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
bottom creek 1 Plan: Plan 01 8/12/2010
River = I Reach = 180 RS = 240
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)
bottom creek 1 Plan: Plan 01 8/12/2010
River = I Reach = 180 RS = 180
.1
.035
.1
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

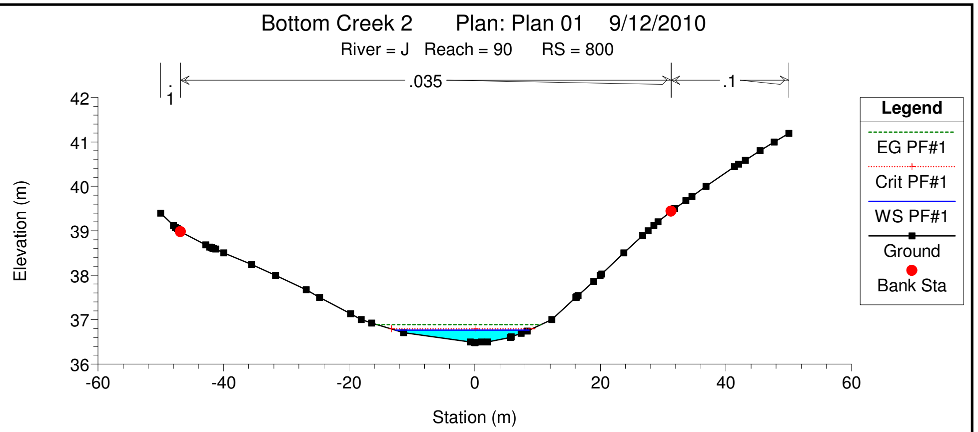


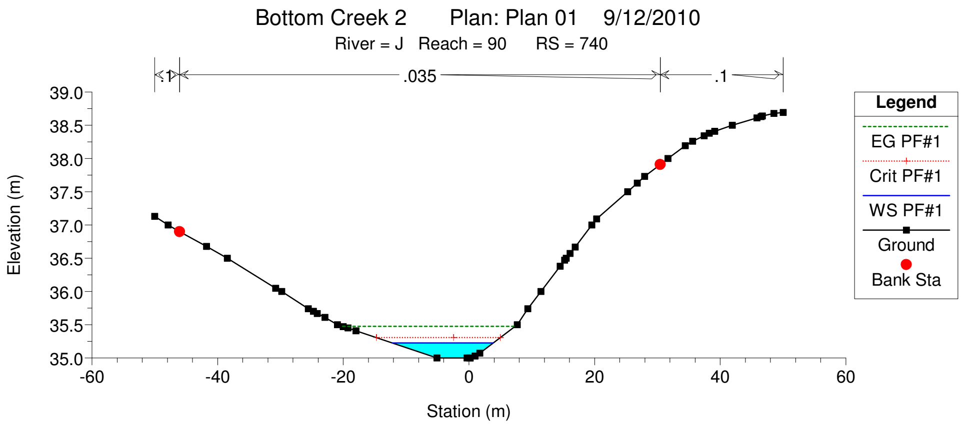
860
800
740
90
680
620
560
500
440
J
380
320
260
200
140
90

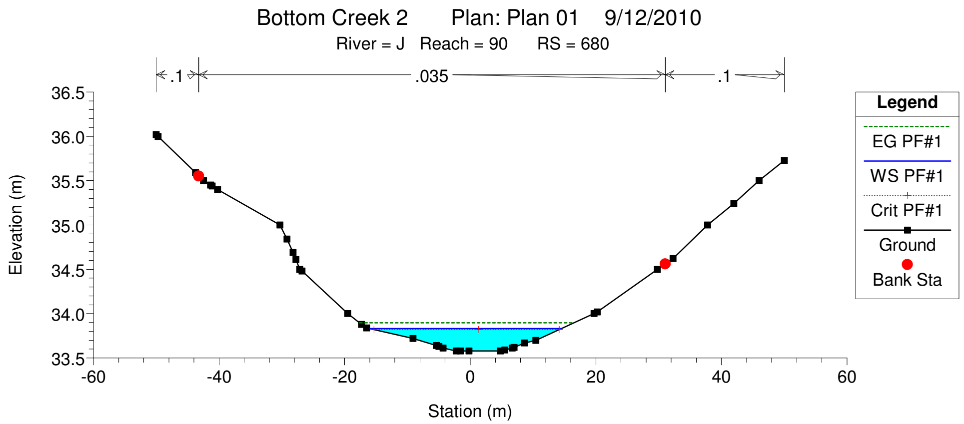


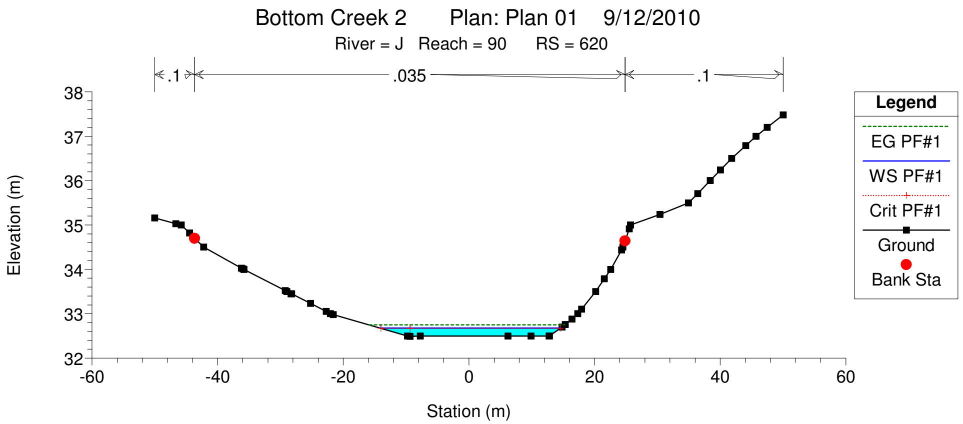
Bottom Creek 2 Plan: Plan 01 9/12/2010
J 90
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Elevation (m)
Main Channel Distance (m)
40
38
36
34
32
30
28
0
200
400
600
800

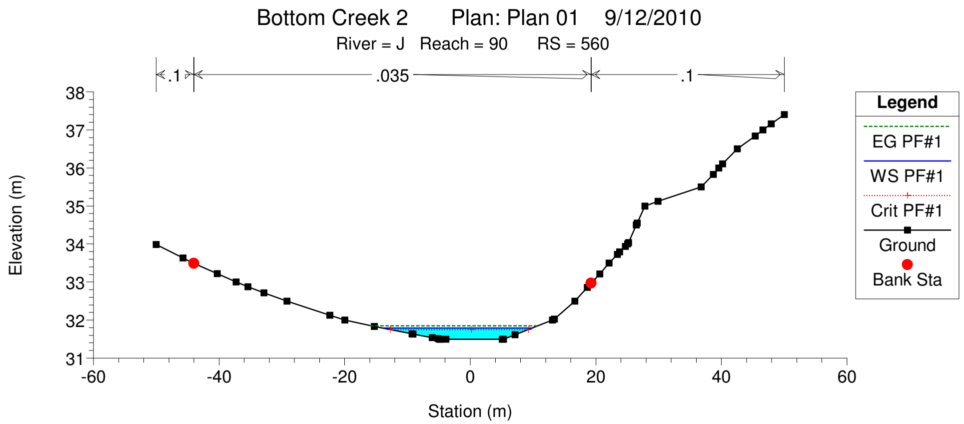

Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 860
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

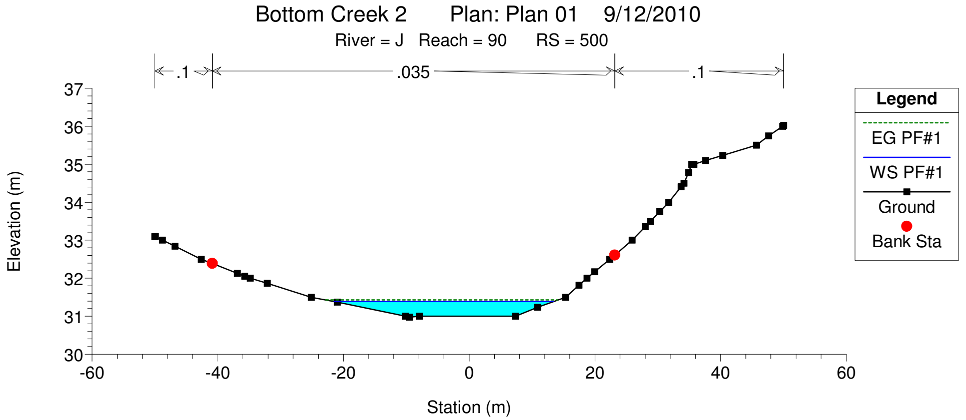

Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 800
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

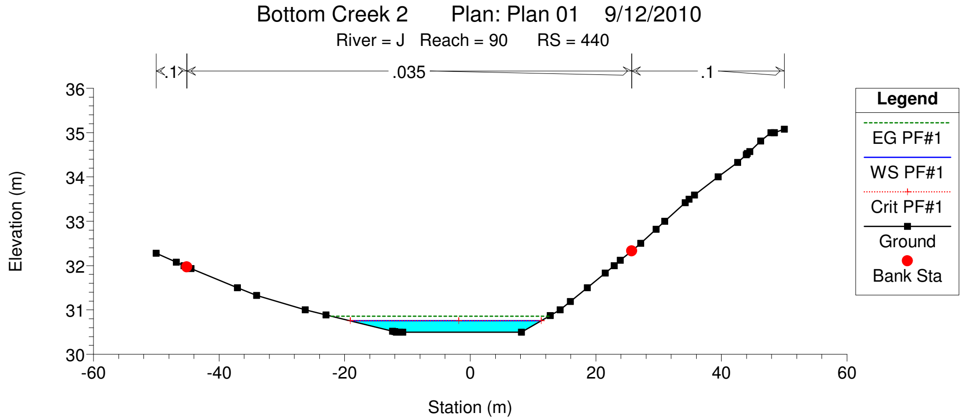

Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 740
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
Crit PF#1
WS PF#1
Ground
Bank Sta

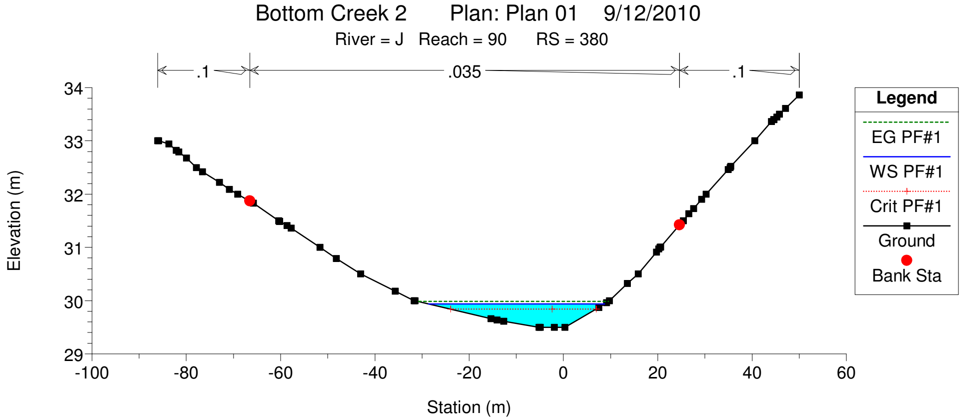

Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 680
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

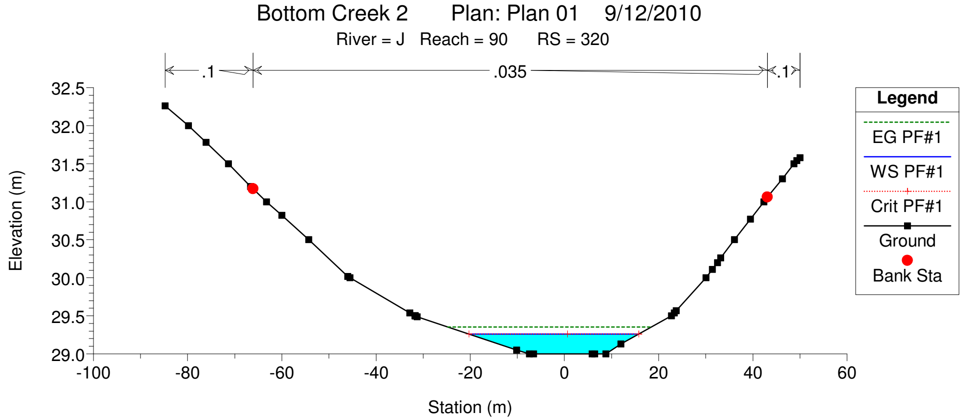

Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 620
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

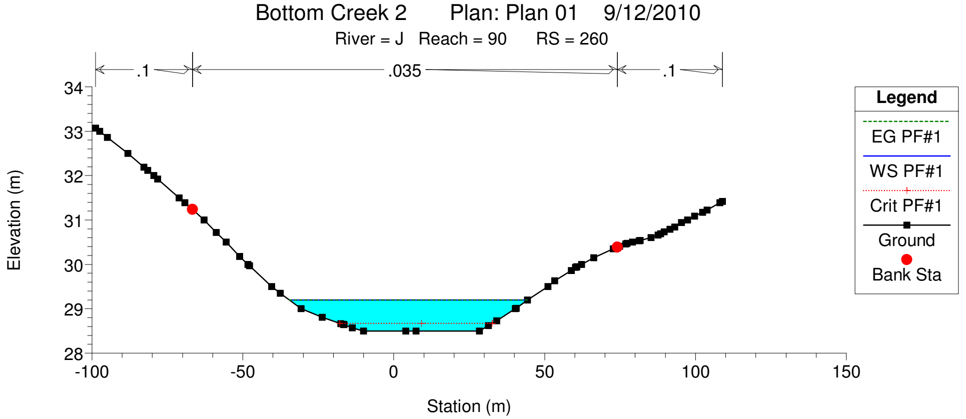

Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 560
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

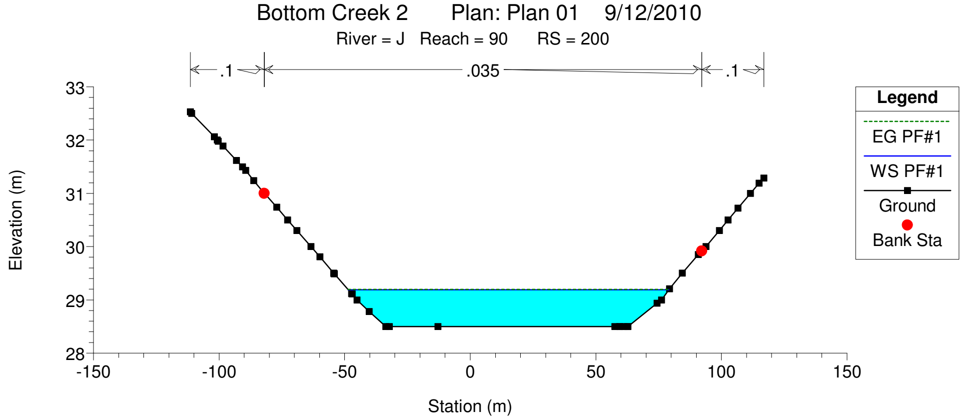

Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 500
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta

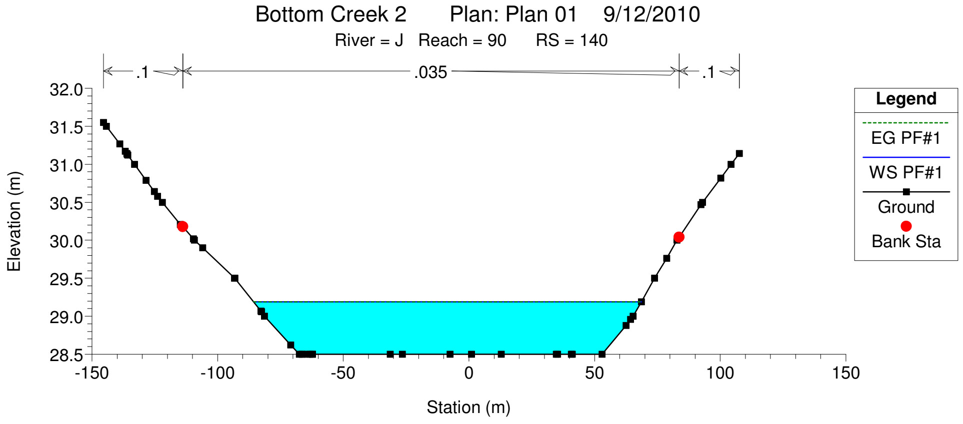

Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 440
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 380
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta

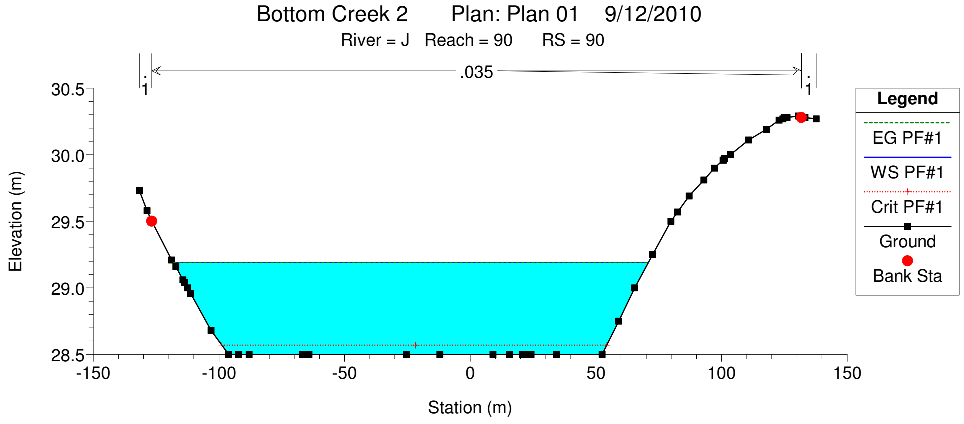

Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 320
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 260
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta


Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 200
.1
.035
.1
Elevation (m)
Station (m)
Legend
EG PF#1
WS PF#1
Ground
Bank Sta



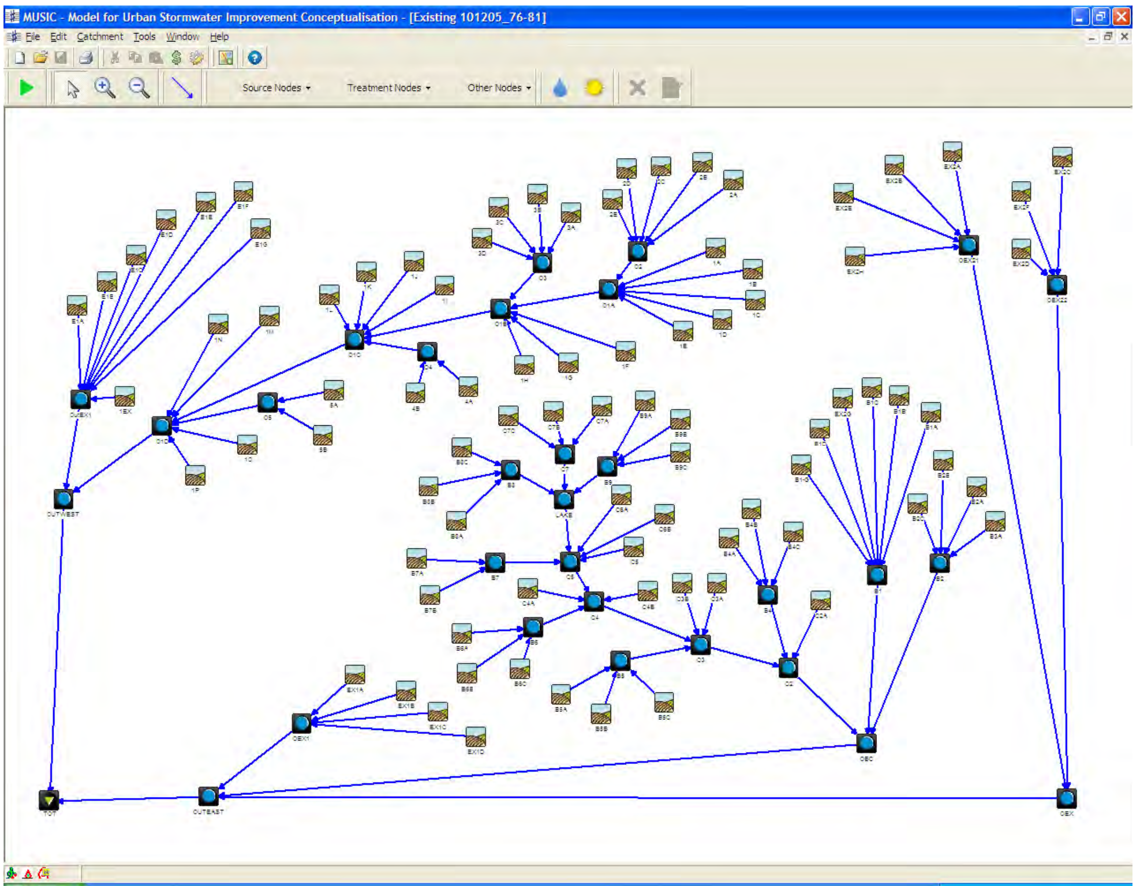
Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 140
.1
.035
.1
Legend
EG PF#1
WS PF#1
Ground
Bank Sta
Elevation (m)
Station (m)



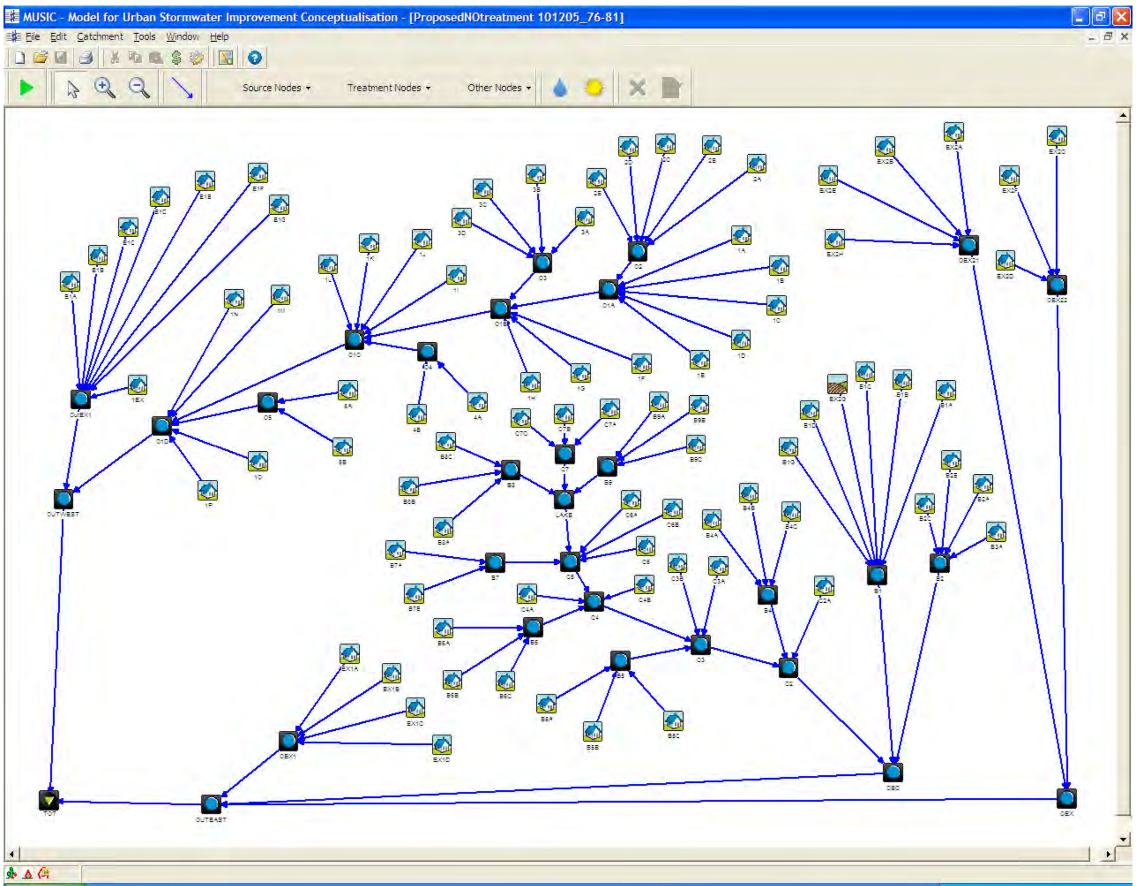
Bottom Creek 2 Plan: Plan 01 9/12/2010
River = J Reach = 90 RS = 90
.035
Legend
EG PF#1
WS PF#1
Crit PF#1
Ground
Bank Sta
Elevation (m)
Station (m)

Appendix 4 MUSIC Model Layout

EXISTING SCENARIO



POST-DEVELOPMENT SCENARIO – NO TREATMENT



POST-DEVELOPMENT SCENARIO – WITH TREATMENT