



Pigg River Restoration at Power Dam

Year-2 Monitoring Report

As required by VDEQ Permit #15-1551 and USFWS Biological Opinion for the Pigg River Restoration at Power Dam Project.

Prepared for:

Friends of the Rivers of Virginia, Inc.
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WSSI #22906.01

DECEMBER 2018

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Introduction

Wetland Studies and Solutions, Inc. (WSSI) presents this monitoring report to the Friends of the Rivers of Virginia (FORVA), providing data related to Year-2 Monitoring efforts. The monitoring program has been designed to track changes to the river corridor and adjacent wetlands following the removal of the decommissioned Power Dam on the Pigg River in Rocky Mount, Virginia, and in accordance with the *Virginia Water Protection Permit Joint Permit Application #15-1551* (draft dated 6/30/2016). Monitoring activities were performed as outlined in the *Pigg River Restoration at Power Dam Monitoring RFP* (WSSI#1054, dated July 27, 2016, a.k.a. “RFP”). Results of annual monitoring required by the U.S. Fish and Wildlife Service in their biological opinion dated January 13, 2016 are hereby incorporated by reference.

Monitoring Year 2 field data was collected by WSSI staff during baseflow conditions on October 01 - 03, 2018. The rainfall this year was well above average, therefore baseflow water levels were higher than normal. A total of twelve (12) cross sections were surveyed. Cross-sections were established during November 2016 Post-Construction Monitoring and based on locations outlined in the RFP. Cross-sections, as located by GPS, are shown in **Exhibit 1**. Half of the cross-sections were established upstream and half below the relic dam structure. Spacing was adjusted to focus on areas around the dam where the greatest change was anticipated to occur. Cross-sections covered areas far enough upstream to be beyond backwater effects created by the dam and stretched downstream to the point where effects of the dam removal were anticipated to be largely diminished. Cross-section locations were also selected to correspond with previous monitoring efforts (Hitt et al., 2009; Bass, 2015).

Methods

The focus of Year-2 Monitoring efforts was to locate the twelve monitoring stations previously established and document current channel conditions. The results are compared with post-construction monitoring information to show channel evolution throughout the dam removal 5-year post-construction monitoring period. WSSI staff began by accessing upstream cross-sections by boat. Upstream access was gained through the Town of Rocky Mount’s sanitary sewer pumping station (entrance road located near the intersection of Power Dam Road and Scenic River Drive). Cross-sections 1-5 were accessed by boat. Cross-sections 6-12 were accessed via vehicle/foot travel through Town or private property – specifically public land or Town property for sections 6-8, via Hudson Farm Lane (private) for section 9-11, and through private land on Chestnut Hill Road just downstream of the Pigg River bridge for section 12.

At each cross-section, WSSI staff photo-documented local conditions through upstream, downstream and channel bank photos. All photo documentation adhered to VWP guidelines, noting: direction, photographer, date/time, vegetative cover (as applicable), and a brief description. Additional photos were taken to document conditions at locations where significant tributaries upstream of the dam join Pigg River. This information is included at the end of **Appendix A**.

In addition to photographs, WSSI staff surveyed cross-section geometry using a laser level and survey tape to record station/elevation information. During Year 2 monitoring, points

were surveyed at any break in slope, generally consistent with methodologies used in the *Sediment Capacity and Fate Modeling Report* (Bass, 2015) and Post-Construction Monitoring. Slight variations in cross section geometry are attributable to differences in individual sampling events and site-specific factors (i.e. normal survey error, vegetation, slack in the survey tape, etc.). At various cross sections water depth measurements were taken due to vegetation obstruction (especially for generation of the thalweg profile) and the water surface depth added to the edge of water elevation recorded during cross section survey. Though less exact, this method was necessary due to field conditions and allows relative comparison of overall bed level elevation changes. Major changes seen in cross sections are due to channel evolution and erosion following dam removal. Cross-section geometry for all sections is given in **Appendix B**, with sections showing Post-Construction and 2-year channel geometry overlaid.

Physical habitat parameters including particle size, embeddedness, woody debris, and thalweg depth measurements were recorded consistent with previous studies (Hitt et al., 2009). Observations regarding embeddedness are included with the section descriptions and photographs in **Appendix A**. The presence and quantification of large woody debris was documented by visual assessment for areas 150 feet upstream and downstream of the measured cross-section. Woody debris counts are also given in **Appendix A**.

Thalweg measurements were taken to document streambed elevation changes in the vicinity of the cross-section. Depth measurements were collected at 5-ft. intervals (generally) from the cross-section location in both the upstream and downstream direction for a distance of approximately 50 ft. (each direction). In some cases water depth measurement was taken due to vegetation obstruction and the depth measurement added to the elevation of the edge of water measurement taken during cross section survey. Incomplete thalweg survey information in prior year monitoring was due to similar issues with thick bank vegetation. Therefore, field procedures were modified in Year 2 to allow a more complete general picture of bed elevation changes in future monitoring events. (Note: The modified methodology neglects water surface slope.) Thalweg plots are given in **Appendix A**.

The method of data collection for bed material size varied depending on local conditions. The particle size distribution at all but one of monitored cross-sections was uniformly sandy, so no pebble count surveys were warranted. Bed material at the downstream-most cross section was coarser in nature and warranted formal sampling. A Wolman riffle pebble count was performed at this section and particle size distribution data is presented in **Appendix B**.

Wetland hydrology monitoring activities were conducted at forested wetland sites #2, #3, and #4, as outlined in the Joint Permit Application (two locations within Site #2 and one location each within Site #3 and #4). Locations are shown in **Exhibit 1**. Sampling consisted of photo documentation of site conditions and observations of hydrology and soil characteristics necessary for completion of the hydrology portion of the “Wetland Determination Data Form – Eastern Mountains and Piedmont Region” from the U.S. Army Corps of Engineers Regional Supplement, Version 2 (2012). A 12-18” deep test pit/auger hole was dug to document the presence or absence of a water table or saturation. Wetland soil indicators were photo documented when observed and are scheduled for more detailed assessment in future years, as required by permit. Field data forms are included in **Appendix C**.

Also included within this report are the results of the Year-2 (11/3/2017 – 11/5/2018) ground and surface water monitoring at Wetland Site #2, (location shown in **Exhibit 1**). Groundwater monitoring information and results can be found in **Appendix D** with corresponding local weather station data given in **Appendix E**.

Results and Conclusions

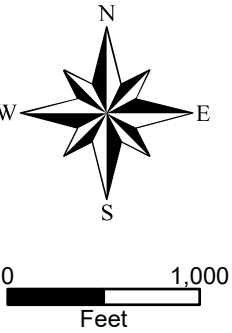
Year 2 monitoring cross section surveys indicate continued bed incision at Cross Section 1 (approximately 1-ft of drop in bed elevation since Year-1), likely driven by the frequency and intensity of storm events experienced throughout the year. Cross Section 2 had almost no change from the previous year, downcutting increased in Cross Sections 3-4 ranging from 2-ft to 3-ft at Section 4. Changes at Sections 5 and 6 were less dramatic since significant evolution occurred immediately following construction and these sections now approach the invert elevation of the dam remains. Upstream of the removed dam, there was a significant loss of bank vegetation and signs of consistent bank failure, again largely attributable to the frequency and intensity of high water events in 2018. Tension cracking and mass failure is visible at cross sections where steep banks still exist. Downstream of the removed dam the banks had sediment deposits, with these deposits becoming less pronounced with greater distance from the dam. End pins at various cross sections downstream of the dam saw deposition of approximately 0.1 ft, confirming sediment transport in overbank events since Year 1 monitoring.

Pebble count monitoring data shows a gradual transition to finer sediments at the downstream-most cross sections. Post-construction and Year 1 monitoring included a pebble count survey at cross section 11. A pebble count was not collected at Cross Section 11 during Year 2 monitoring due to the fact that bed conditions had transitioned to being sandy in nature. The D50 from pebble count data at Cross Section 12 also showed significant fining (from 42 mm in Year 1 to 24 mm in Year 2).

Soils at both Site 3 and 4 locations (adjacent to Cross Section 2 and Cross Section 4, respectively) were a uniform sandy loam texture with no water or saturation observed in test pits. Two sampling locations were established at Wetland Site 2 (river left, just upstream of the dam) and hydric soil indicators were seen in both locations. A high water table was seen at Site 2, Point 1 and Point 2. Water was present at approximately 3-4' due to consistent rainfall in the months preceding monitoring. Though generally found to be present, wetland vegetation survey is not within the scope of Year 2 monitoring.



Pigg River Restoration at
Power Dam-Monitoring
Permanent Monitoring Locations
Original Scale: 1"=1000'



- Survey Locations
- Cross Sections

Appendix A

Cross Section 1

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.990985	-79.864618
Right Bank	36.990712	-79.864937

Description: Cross Section 1 is located approximately 600 feet downstream of the existing sanitary pump station, accessible via Scenic River Road. Access was by boat from the upstream pumping station. Local conditions were noted as forested on the left bank and agricultural fields on the right bank. (*Note:* Left and right bank references will always be made facing downstream.) Bank slopes were steep, with minor vegetation and major bank scour visible along most of the slope. In contrast to previous monitoring events, the right bank show signs of significant failure and loss of vegetative cover. In addition, just downstream of the cross sections there was a large pile up of large woody debris.

The instrument setup for this cross section was at the left bank pin (Height of Instrument, HI = 4.95 ft.). The cross section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy) nature of bed sediments. An isolated pocket of gravel (~5 ft wide, with less than 2-in pebbles) was observed in the middle of the stream adjacent to some woody debris.



Photo 1-1

Location, Orientation: XS 1, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/1/18, 9:07 AM

Taken by: *See note below

Description: View looking upstream from the middle of Cross Section 1

Woody Debris: 15

*Note: All Post-construction photographs taken by M. Hutchins, unless otherwise noted.



Photo 1-2

Location, Orientation: XS 1, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 10:34 AM

Description: View looking downstream from the middle of Cross Section 1
Woody Debris: >100



Photo 1-3

Location, Orientation: XS 1, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 9:12 AM

Description: View looking left from the middle of Cross Section 1
Vegetation: 30% herbaceous cover, few trees at top of bank



Photo 1-4

Location, Orientation: XS 1, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 9:13 AM

Description: View looking right from the middle of Cross Section 1

Vegetation: 10% herbaceous cover, no trees



Photo 1-5

Location, Orientation: XS 1, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 9:08 AM

Description: View looking downstream at Cross Section 1 from an upstream position



Photo 1-6

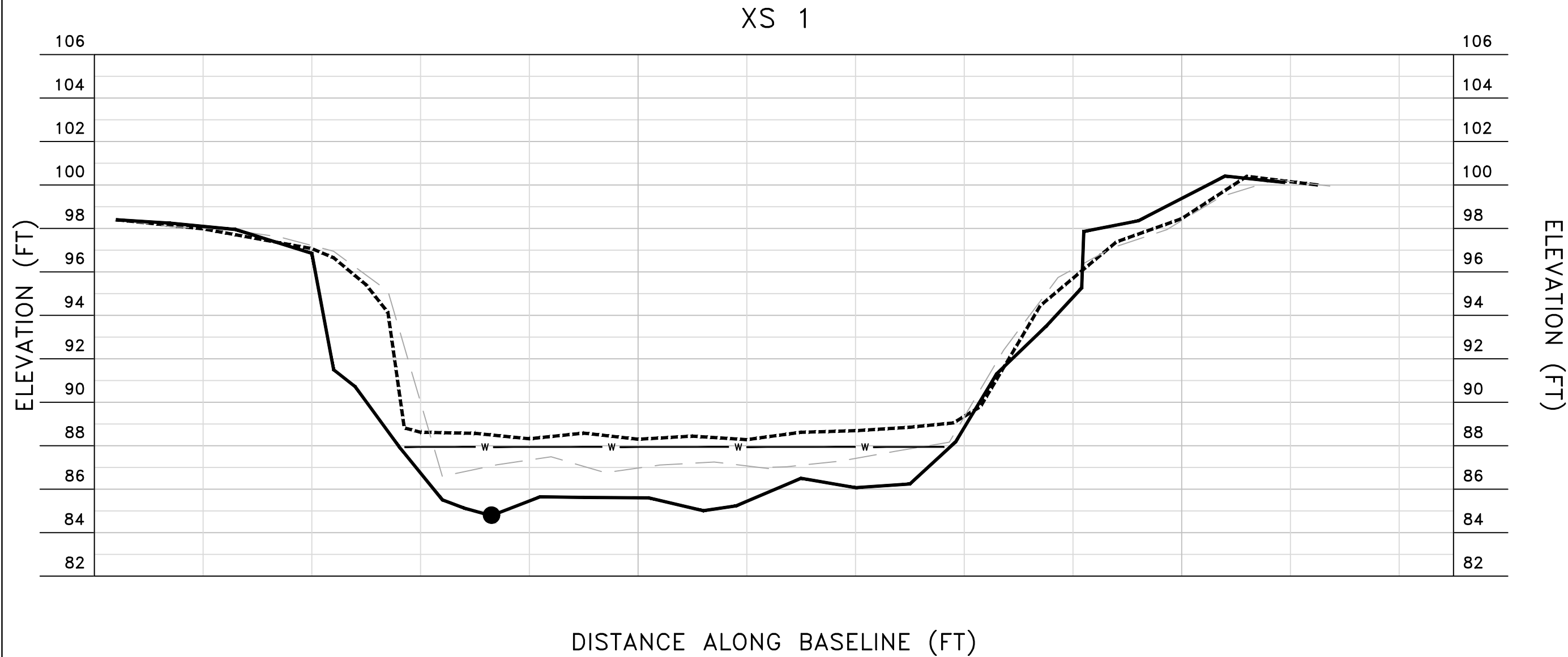
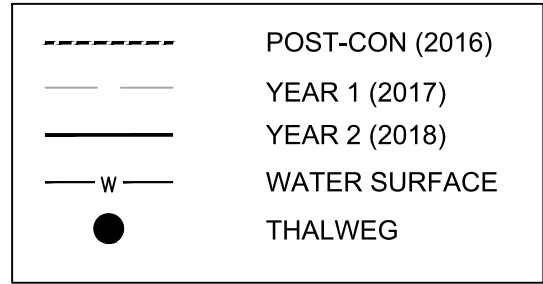
Location, Orientation: XS 1, Downstream looking up

Permit Number: JPA #15-1551


Wetland Data Sheet Reference: n/a

10/01/18, 9:07 AM

Description: View looking upstream at Cross Section 1 from a downstream position



PROFILE SCALE:
HORIZ: 1"=10'
VERT: 1"=5'
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Rocky Mount, Virginia

Year 2 - XS 1
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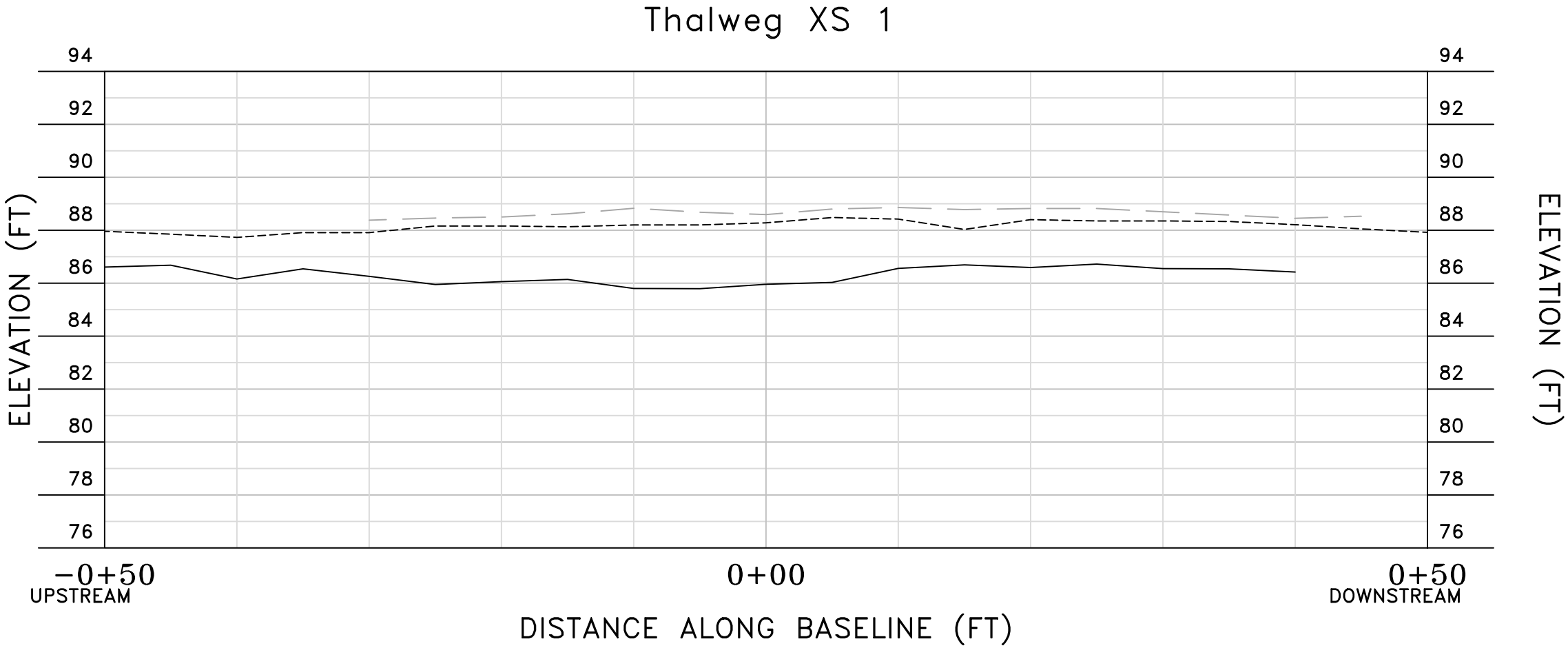
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-----	POST-CON (2016)
-----	YEAR 1 (2017)
-----	YEAR 2 (2018)



PROFILE SCALE:
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VERT: 1"=5'
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Rocky Mount, Virginia

Year 2 - Thalweg Profile XS 1
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Cross Section 2

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.984705	-79.864096
Right Bank	36.984655	-79.864333

Description: Cross Section 2 is located approximately 2,400 feet downstream (south) of Cross Section 1 and 1,200 feet downstream of the power line crossing. Access was by boat from the upstream pumping station. Local conditions were noted as forested on both banks. The right bank slope was almost vertical with two different shelves with some herbaceous cover and woody debris. The left bank was formed by a sandy deposit (bar) and woody debris with little vegetation.

The instrument setup for this cross section was at the right bank pin station zero measured from left bank (HI = 1.65 ft.). The cross section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy) nature of bed sediments.

This cross section was located adjacent to the overbank wetland area (left bank) identified in permit documents and previous reports as Wetland Site #4. Wetland hydrology data forms are given in Appendix C.



Photo 2-1

Location, Orientation: XS 2, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 10:48 AM

Description: View looking upstream from the center of Cross Section 2

Woody Debris: 10



Photo 2-2

Location, Orientation: XS 2, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 10:48 AM

Description: View looking downstream from the middle of Cross Section 2

Woody Debris: 10



Photo 2-3

Location, Orientation: XS 2, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 12:40 PM

Description: View looking left from the middle of Cross Section 2

Vegetation: 40% herbaceous cover, few trees, woody debris



Photo 2-4

Location, Orientation: XS 2, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 12:48 PM

Description: View looking right from the middle of Cross Section 2

Vegetation: 20% herbaceous cover, few trees, woody debris



Photo 2-5

Location, Orientation: XS 2, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 12:49 PM

Description: View looking downstream at Cross Section 2 from an upstream position



Photo 2-6

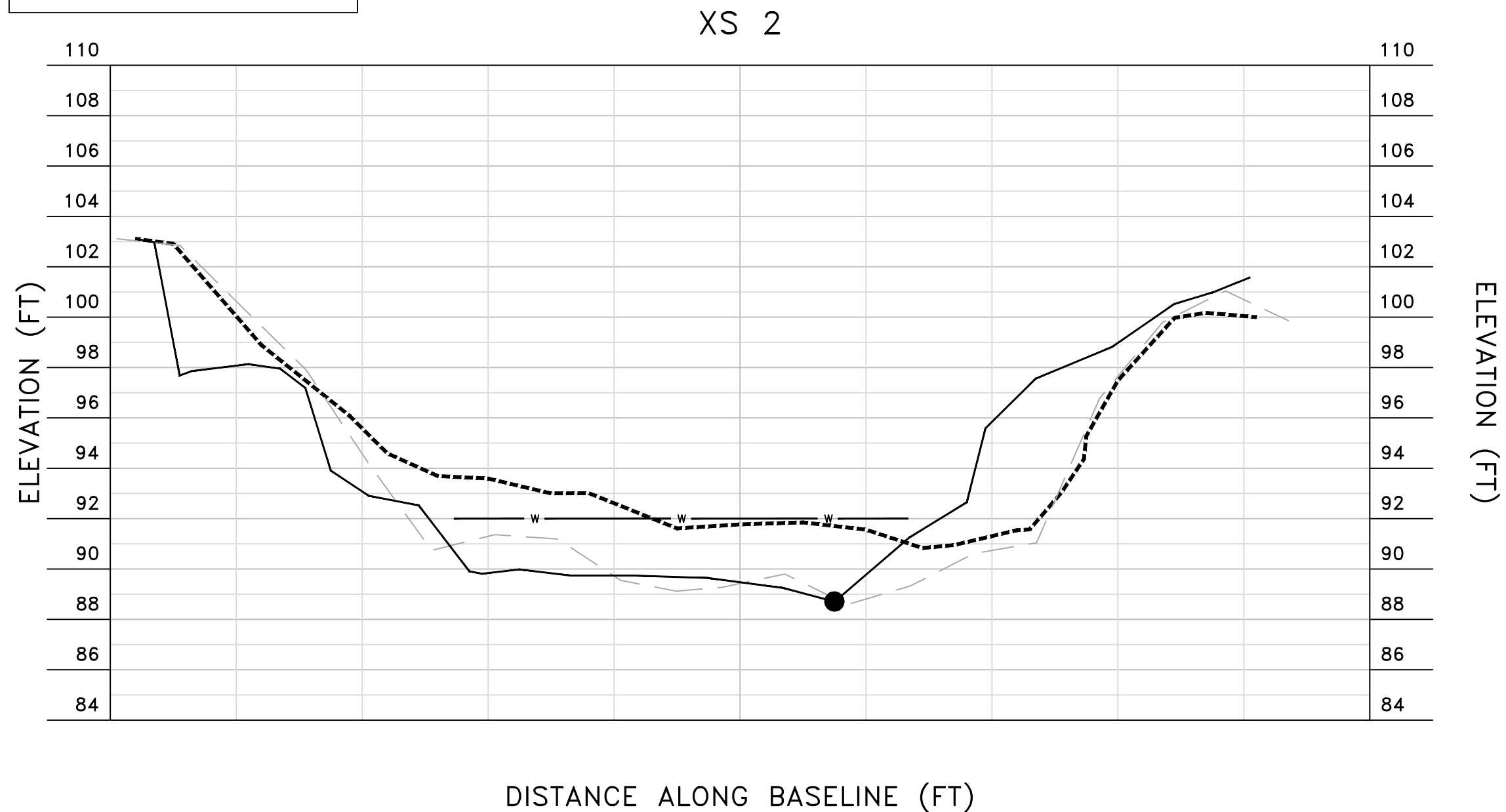
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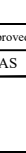
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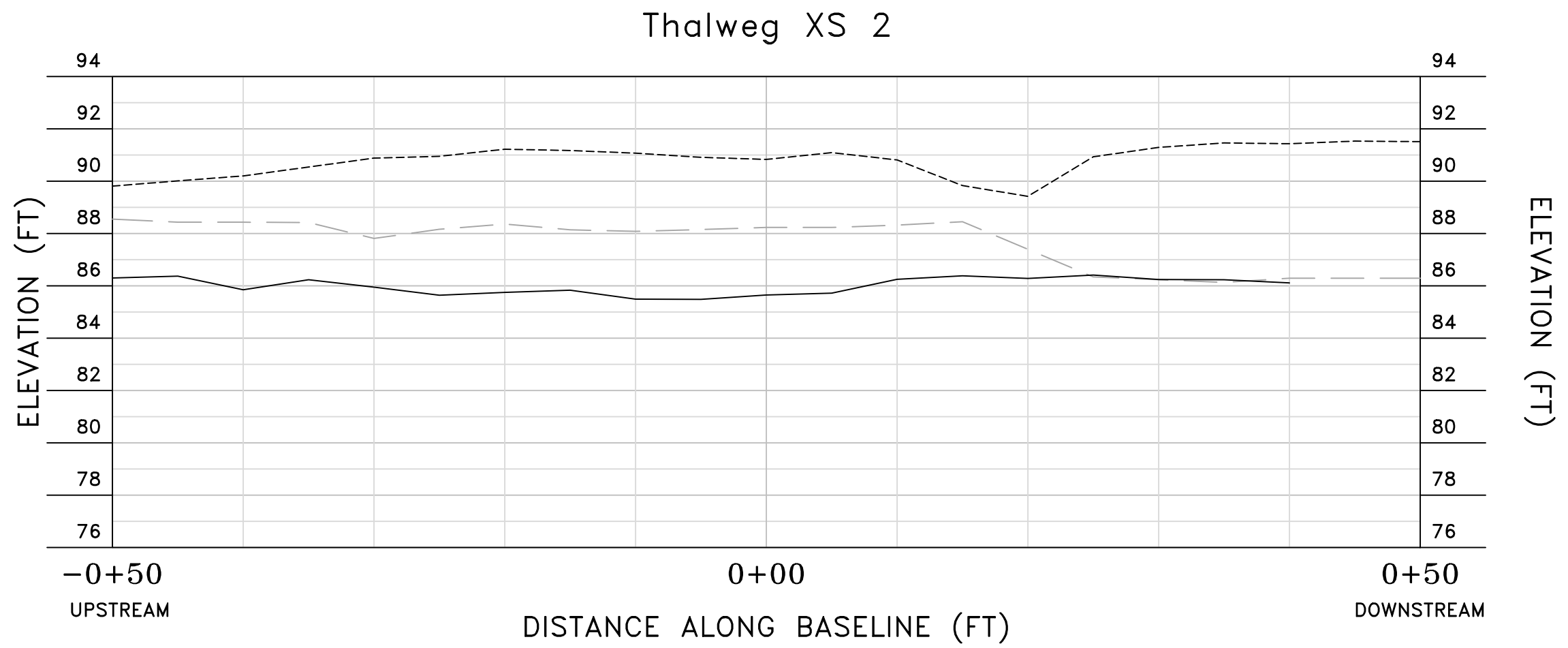
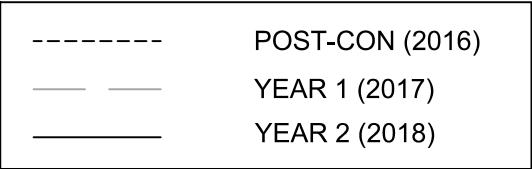
Wetland Data Sheet Reference: n/a

10/01/18, 10:49 AM

Description: View looking upstream at Cross Section 2 from a downstream position



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VERT: 1"=5'
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Pigg River Dam Removal Restoration - Monitoring
Rocky Mount, Virginia

Year 2 - Thalweg Profile XS 2

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Cross Section 3

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.980573	-79.855954
Right Bank	36.980669	-79.855792

Description: Cross Section 3 was located approximately 2,600 feet downstream of Cross Section 2, 500 feet southeast of the south end of Scenic River Road, and just downstream of a large meander bend. Access was by boat from the upstream pumping station. Local conditions were noted as forested on both banks. The left bank was composed of 10% vegetative cover and exposed root structures creating a steep vertical upper bank with the lower left bank primarily composed of sediment deposits. The right bank was also steeply sloped and composed of fine-grained sediment deposits towards the toe. Herbaceous cover was 10% on upper-half before it drops off, the lower half is mostly sediment deposits.

The instrument setup for this cross section was at the left bank (HI = 1.68 ft.). The cross section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy) nature of bed sediments.



Photo 3-1

Location, Orientation: XS 3, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 2:11 PM

Description: View looking upstream from the center of Cross Section 3

Woody Debris: 3



Photo 3-2

Location, Orientation: XS 3, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 2:11 PM

Description: View looking downstream from the middle of Cross Section 3

Woody Debris: 50



Photo 3-3

Location, Orientation: XS 3, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 2:11 PM

Description: View looking left from the middle of Cross Section 3

Vegetation: 10% herbaceous plants, few trees on top of bank



Photo 3-4

Location, Orientation: XS 3, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 2:11 PM

Description: View looking right from the middle of Cross Section 3

Vegetation: 10% herbaceous cover, a few trees at top of bank, and woody debris



Photo 3-5

Location, Orientation: XS 3, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 2:12 PM

Description: View looking downstream at Cross Section 3 from an upstream position



Photo 3-6

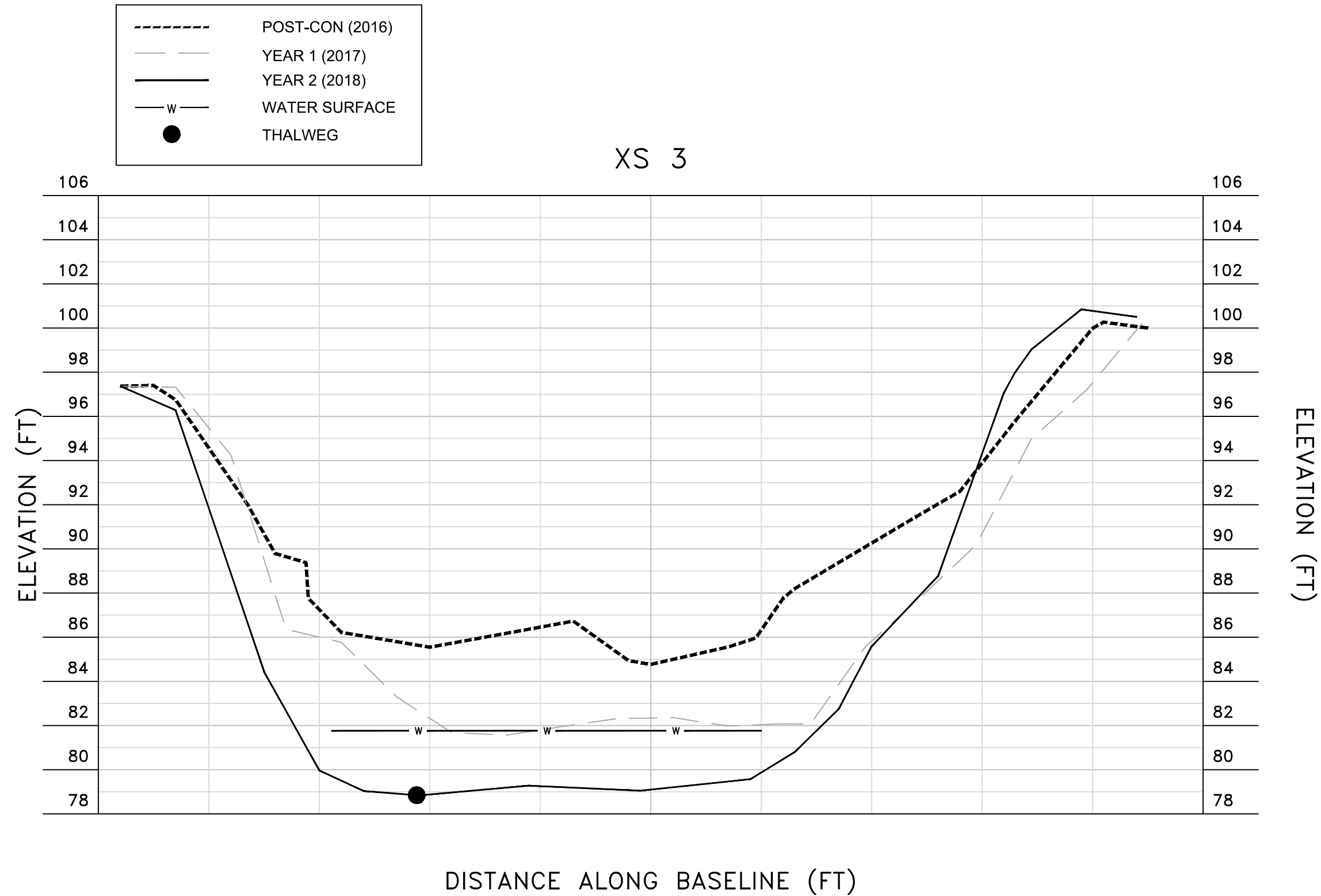
Location, Orientation: XS 3, Downstream looking up

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 2:13 PM

Description: View looking upstream at Cross Section 3 from a downstream position



PROFILE SCALE:

HORIZ: 1"=10'

VERT: 1"=5'

(ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)

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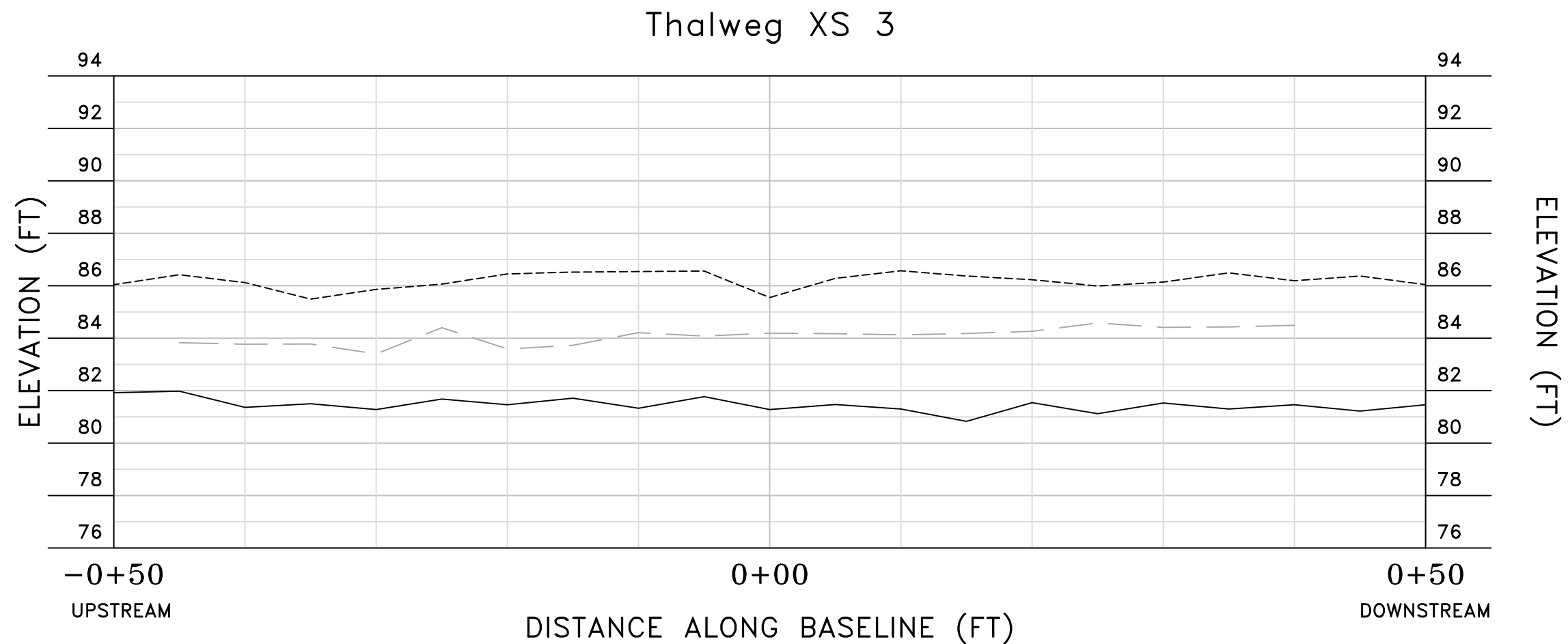
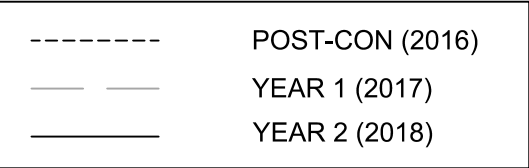
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VERT: 1"=5'
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Cross Section 4

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.985663	-79.856937
Right Bank	36.985403	-79.856873
Thalweg	36.985530	-79.856930

Description: Cross Section 4 is located approximately 1,600 feet downstream of Cross Section 3, east of Scenic River Road, south of the power line easement, and west of Power Dam Road in a short, straight, run between two sharp meander pools. Access was by boat from the upstream pumping station. The cross section can be characterized by significant bank failure. The right upper bank face was vertical, approximately 10-ft high, and showed signs of periodic mass failure (Photo 4-4). The lower right bank was a steady slope composed of fine sand and silt. The left upper bank had shrubs, the lower left bank was a steep drop to the water showing signs of bank failure. The right bank pin was moved back 5 ft because the erosion had reached the position of the pin (the pin was moved after measurements were taken).

The instrument setup for this cross section was at the left bank (HI = 2.98 ft.). The cross section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy/silty) nature of bed sediments.

This cross section was located adjacent to the overbank wetland area (right bank) identified in permit documents and previous reports as Wetland Site #3. Wetland hydrology data forms are given in Appendix C.



Photo 4-1

Location, Orientation: XS 4, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 3:32 PM

Description: View looking upstream from the center of Cross Section 4

Woody Debris: 3



Photo 4-2

Location, Orientation: XS 4, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 3:32 PM

Description: View looking downstream from the middle of Cross Section 4

Woody Debris: 50



Photo 4-3

Location, Orientation: XS 4, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 3:32 PM

Description: View looking left from the middle of Cross Section 4

Vegetation: 40% herbaceous cover with some shrubs on the top of the bank



Photo 4-4

Location, Orientation: XS 4, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 3:32 PM

Description: View looking right from the middle of Cross Section 4

Vegetation: 5% herbaceous cover, small shrubs and a few trees at top of bank



Photo 4-5

Location, Orientation: XS 4, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 3:33 PM

Description: View looking downstream at Cross Section 4 from an upstream position



Photo 4-6

Location, Orientation: XS 4, Downstream looking up

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 3:33 PM

Description: View looking upstream at Cross Section 4 from a downstream position

Cross Section 5

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank	36.991448	-79.857178
Right Bank		

Description: Cross Section 5 is located approximately 2,000 feet downstream of Cross Section 4; approximately 800 feet downstream (north) of the power line easement. Access was by boat from the upstream pumping station. The cross section is experiencing significant bank failure with the channel defined by a wide, deep cross section with a down cutting bed. The right bank is flanked by a wide steep mudflat about 5 ft. tall. The upper right bank has herbaceous vegetation with a few trees at the top of the bank. The left bank drops off from a few trees on the top and slopes steeply down to the waters edge with no vegetation.

The instrument setup for this cross section was at the right bank (HI = 2.33 ft.). The cross section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy) nature of bed sediments.

This cross section was located adjacent to a narrow band of wetlands (as previously delineated) located on the left bank – the upstream end of the area identified in permit documents and previous reports as Wetland Site #2. Wetland hydrology data forms are given in Appendix C.



Photo 5-1

Location, Orientation: XS 5, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 6:01 PM

Description: View looking upstream from the center of Cross Section 5

Woody Debris: 1



Photo 5-2

Location, Orientation: XS 5, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 06:01 PM

Description: View looking downstream from the middle of Cross Section 5

Woody Debris: 2



Photo 5-3

Location, Orientation: XS 5, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 6:01 PM

Description: View looking left from the middle of Cross Section 5

Vegetation: 2% herbaceous cover



Photo 5-4

Location, Orientation: XS 5, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 6:01 PM

Description: View looking right from the middle of Cross Section 5

Vegetation: 25% herbaceous cover (mainly upper bank)



Photo 5-5

Location, Orientation: XS 5, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/01/18, 6:01 PM

Description: View looking downstream at Cross Section 5 from an upstream position



Photo 5-6

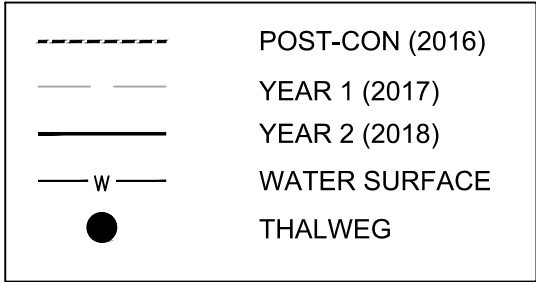
Location, Orientation: XS 5, Downstream looking up

Permit Number: JPA #15-1551

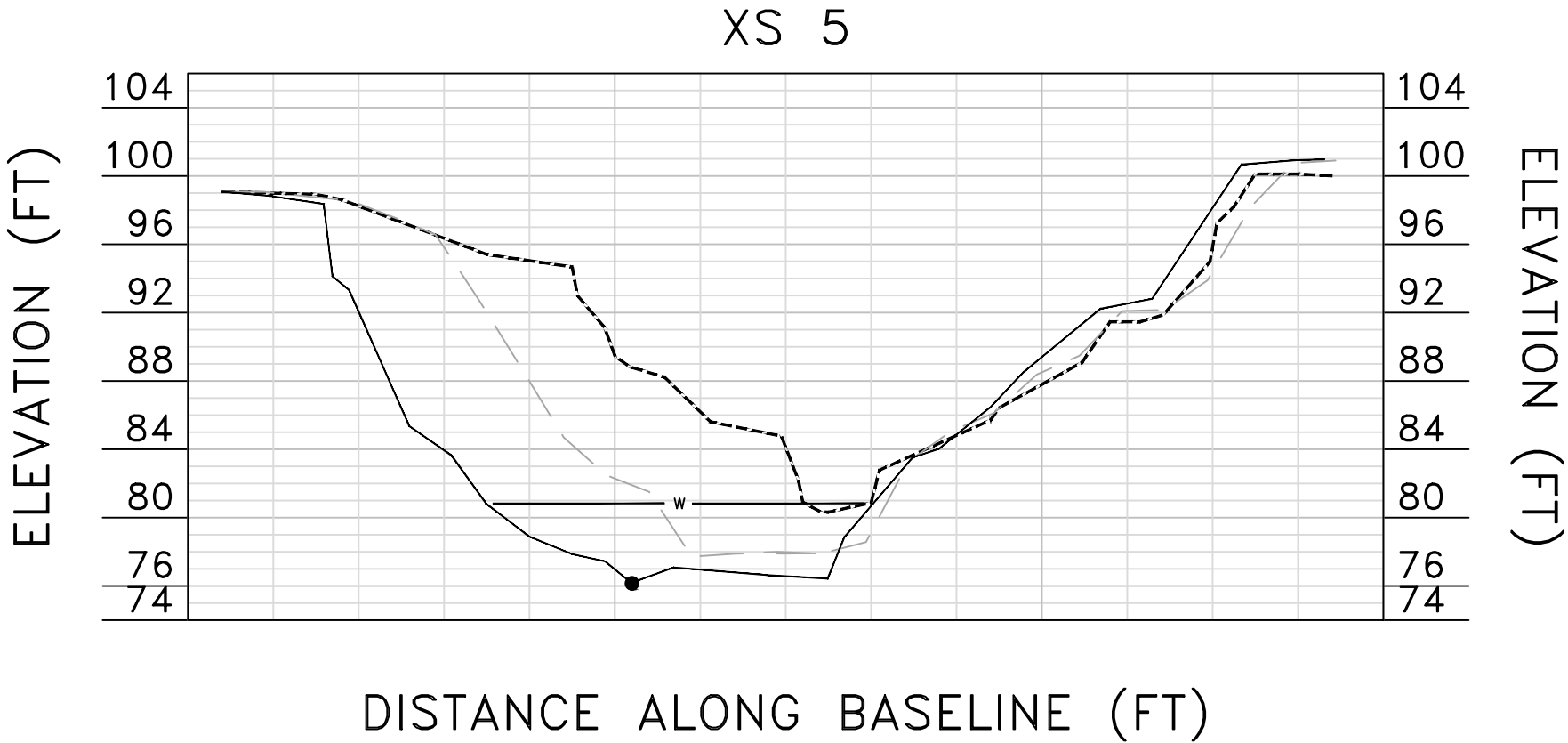
Wetland Data Sheet Reference: n/a

10/01/18, 06:02 PM

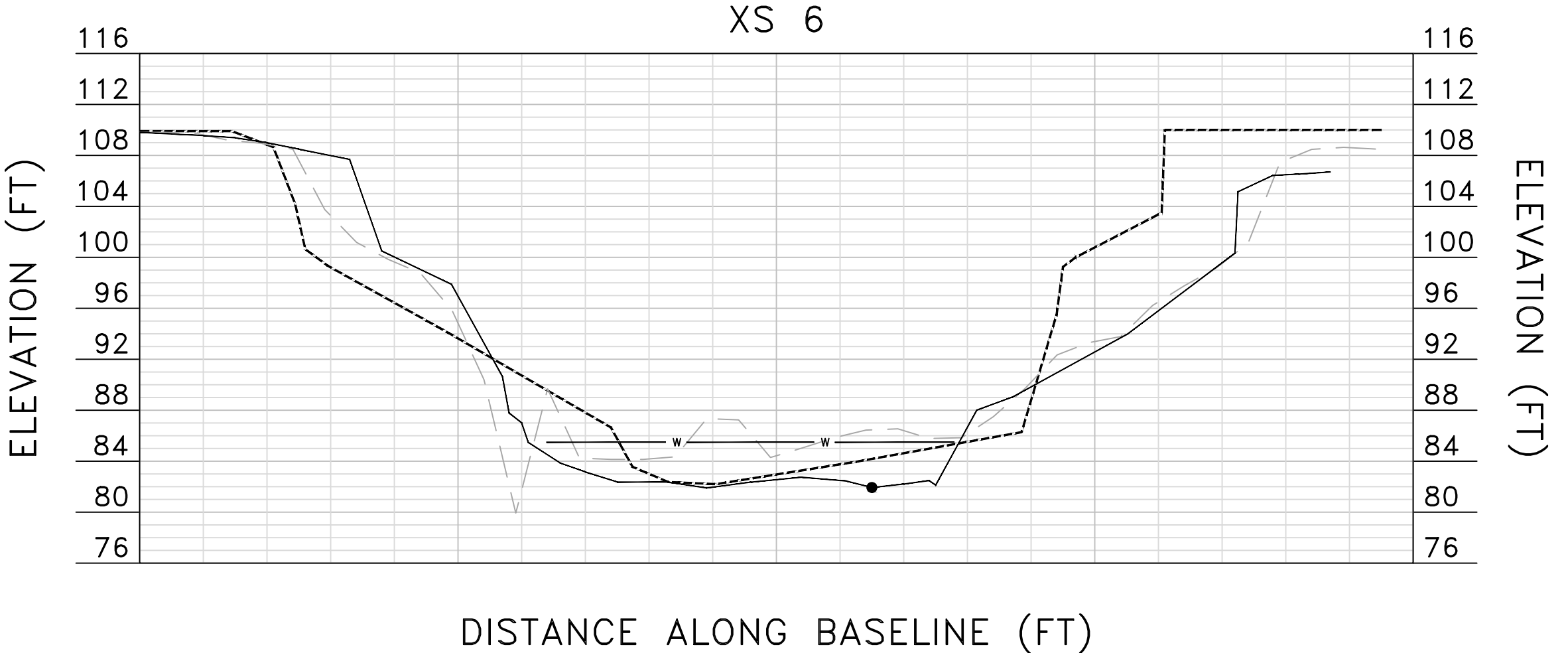
Description: View looking upstream at Cross Section 5 from a downstream position



PROFILE SCALE:
HORIZ: 1"=20'
VERT: 1"=10'



PROFILE SCALE:
HORIZ: 1"=20'
VERT: 1"=10'



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Pigg River Dam Removal Restoration - Monitoring
Rocky Mount, Virginia

Year 2 - XS 5 & 6

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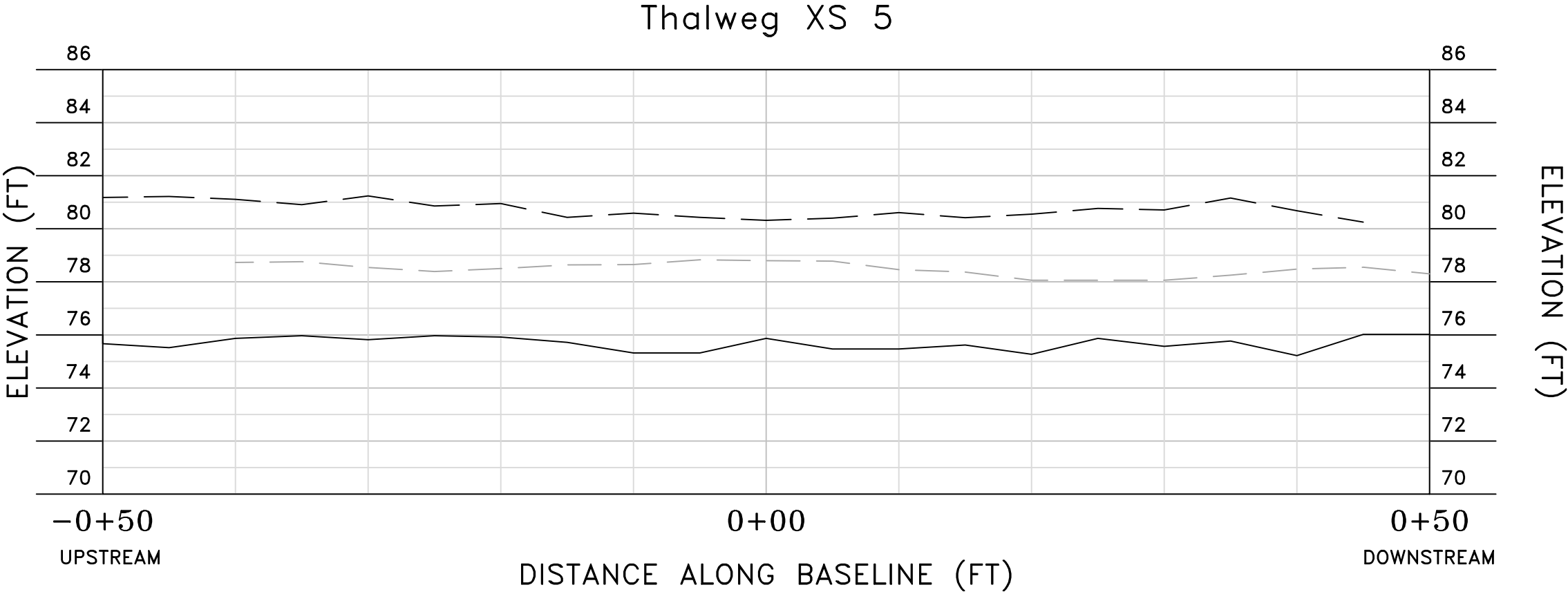
REVISIONS			DATE: OCT 2018	SCALE: AS NOTED
No.	Date	Description		

Boundary and Topo Source:
WSSI and Orange Digital Data


Design	Draft	Approved
NAS	NAS	NAS

Sheet #
5 of 11

Computer File Name:
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PROFILE SCALE:
HORIZ: 1"=10'
VERT: 1"=5'
(ELEV. RELATIVE TO ASSUMED XS END PIN AT 100.)



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Rocky Mount, Virginia

Year 2 - Thalweg Profile XS 5
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REVISIONS			Rev. App. By	
No.	Date	Description	By	
DATE: OCT 2018			SCALE: AS NOTED	

Boundary and Topo Source:
WSSI and Orange Digital Data

Design	Draft	Approved
NAS	NAS	NAS

Sheet #
5 of 12

Computer File Name:
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Cross Section 6

<i>Location</i>	<i>Latitude</i>	<i>Longitude</i>
Left Bank		
Right Bank	36.995027	-79.859314

Description: Cross Section 6 is located approximately 300 feet upstream of the Power Dam structure. Access was by foot via the trail paralleling Power Dam Road. The cross section is bounded on both banks by forested conditions. During and following dam removal, flows cut through the deep sediment deposits behind the dam. At the time of Post-Construction monitoring, thalweg elevation at this section appeared to have already approached the elevation at the location of the dam breach. Thus, section depth did not significantly change between Post-Construction Year-2 surveys. This section was approximately 25-ft. deep and characterized by a wide channel cross section with widening of the channel apparent from previously confined cross sections (XS 4, 5, 6). The right bank had a vertical upper bank with evidence of previous bank failures apparent. Midway down the right bank a large shelf was established with moderate herbaceous vegetation with major scouring occurring at the lower right bank. The upper left bank showed evidence of mass failure with steep vertical faces covered with herbaceous vegetation. The mid- to lower left bank was composed of bare soil and woody debris.

The instrument setup for this cross section was at the right bank (HI = 2.60 ft.). The cross section plot and thalweg profile are shown below. No pebble count was taken at this location due the uniform fine-grained (sandy) nature of bed sediments.

This cross section was located adjacent to a wider area of wetlands (as previously delineated) located on the left bank – the lower end of the area identified in permit documents and previous reports as Wetland Site #2. Wetland hydrology data forms are given in Appendix C.



Photo 6-1

Location, Orientation: XS 6, Looking Upstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/18, 11:11 AM

Description: View looking upstream from the center of Cross Section 6
Woody Debris: 5



Photo 6-2

Location, Orientation: XS 6, Looking Downstream

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/18, 11:11 AM

Description: View looking downstream from the middle of Cross Section 6

Woody Debris: 6



Photo 6-3

Location, Orientation: XS 6, Left Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/18, 11:11 AM

Description: View looking left from the middle of Cross Section 6

Vegetation: 75% herbaceous cover, large trees and shrubs at top of bank



Photo 6-4

Location, Orientation: XS 6, Right Bank

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/18, 11:11 AM

Description: View looking right from the middle of Cross Section 6

Vegetation: 75% herbaceous cover, large trees and shrubs at top of bank



Photo 6-5

Location, Orientation: XS 6, Upstream looking down

Permit Number: JPA #15-1551

Wetland Data Sheet Reference: n/a

10/02/18, 11:12 AM

Description: View looking downstream at Cross Section 6 from an upstream position



Photo 6-6

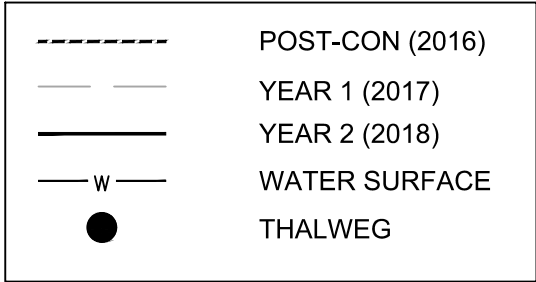
Location, Orientation: XS 6, Downstream looking up

Permit Number: JPA #15-1551

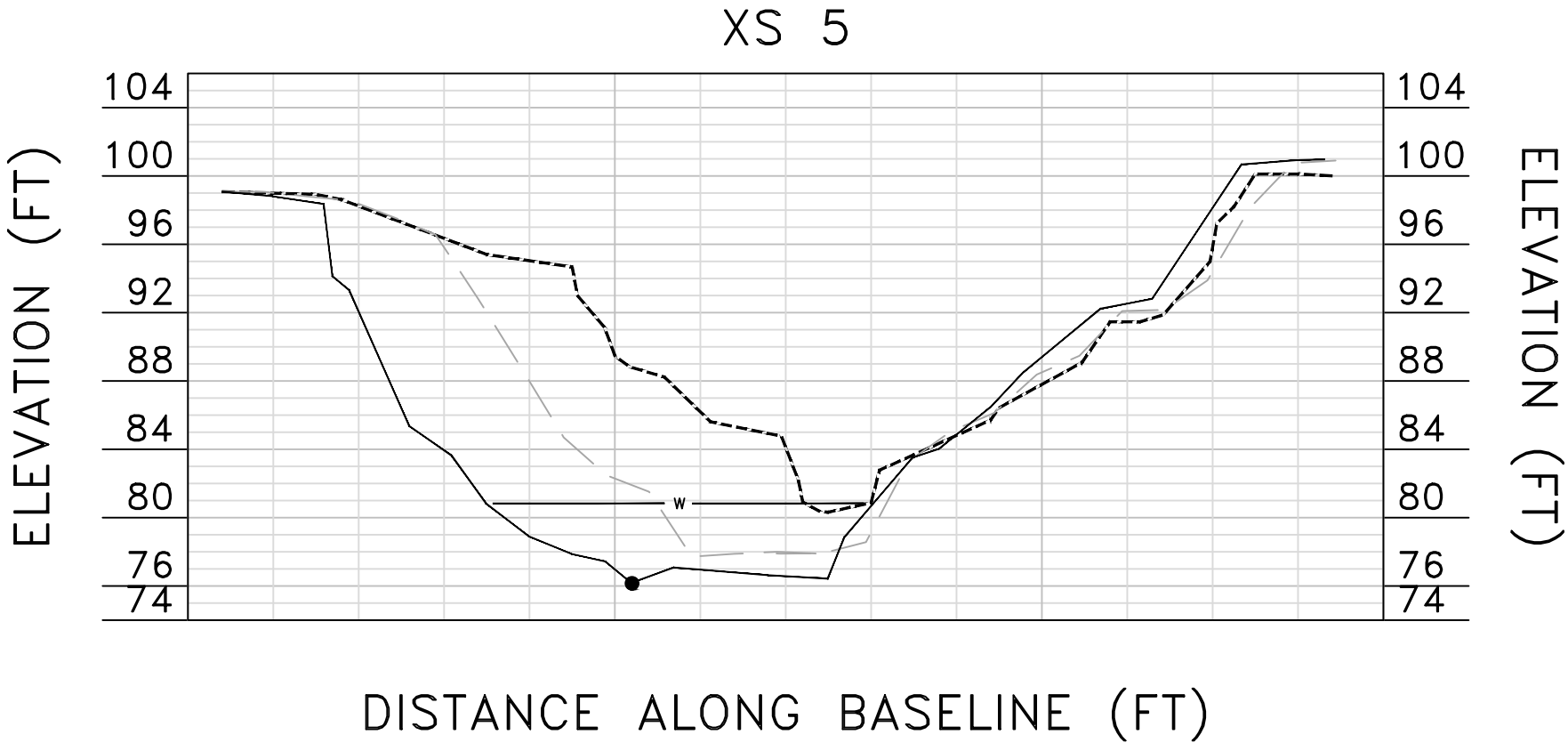
Wetland Data Sheet Reference: n/a

10/02/18, 11:13 AM

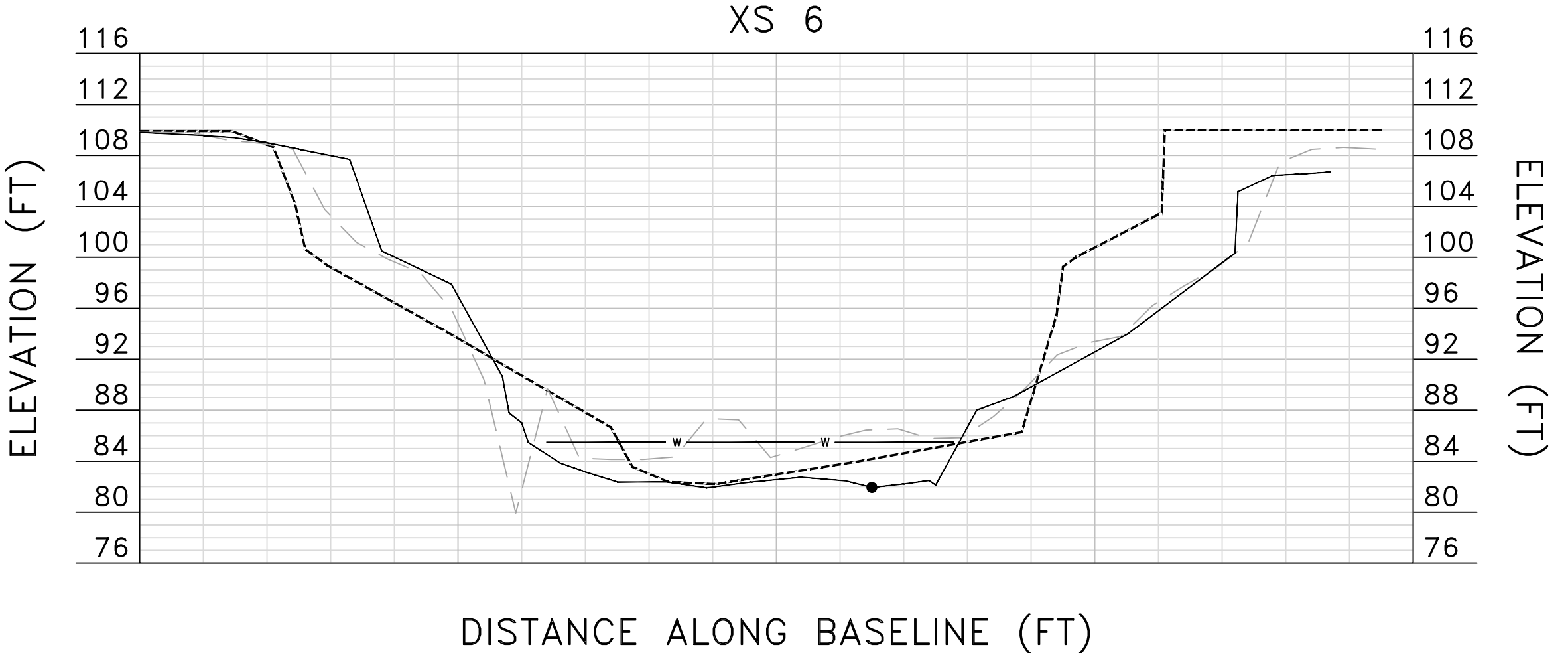
Description: View looking upstream at Cross Section 6 from a downstream position



PROFILE SCALE:
HORIZ: 1"=20'
VERT: 1"=10'



PROFILE SCALE:
HORIZ: 1"=20'
VERT: 1"=10'



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Year 2 - XS 5 & 6

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