

## Baseline Assessment – Stream Attributes

**Reach S-F36b (2) (Pipeline ROW)**

**Perennial**

**Spread D**

**Webster County, West Virginia**

<b>Data</b>	<b>Included</b>
Photos	✓
SWVM Form	✓ Water quality from benthic sample
FCI Calculator and HGM Form	N/A – Perennial stream; slope <4%
RBP Physical Characteristics Form	✓
Water Quality Data	✓
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	✓ Benthic sample taken on 09/14/21
Wolman Pebble Count	✓
Reference Reach Software Pebble Count Data	✓
Longitudinal Profile and Cross Sections	✓

**Spread D      Stream S-F36b (2) (Pipeline ROW) Webster County**



Photo Type: DS, US View

Location, Orientation, Photographer Initials: Downstream Edge of ROW, Upstream View, CNJ

Lat: 38.417774 Long: -80.576635

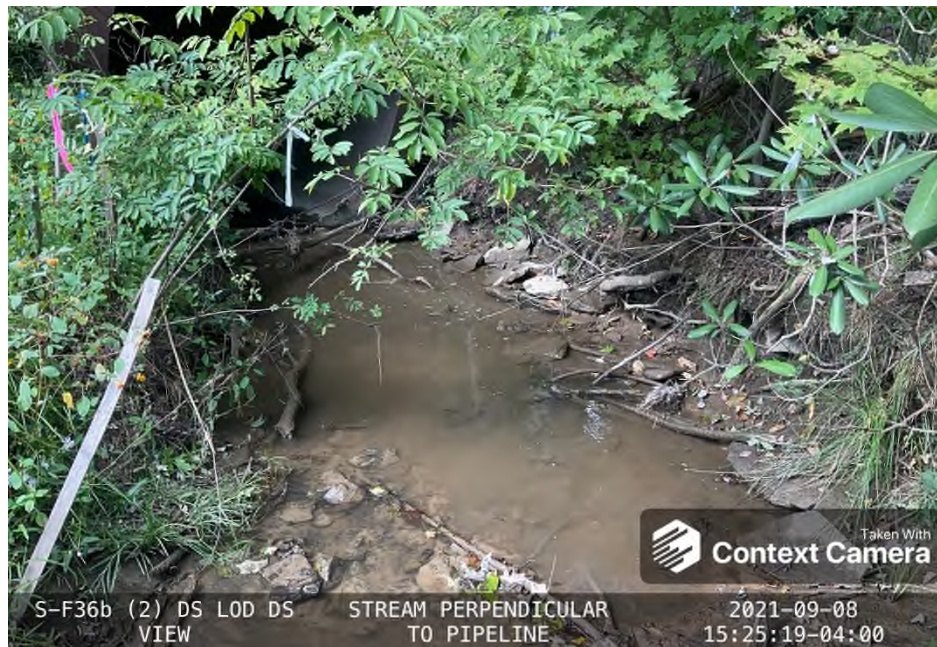


Photo Type: DS, DS View

Location, Orientation, Photographer Initials: Downstream Edge of ROW, Downstream View, CNJ

Lat: 38.417774 Long: -80.576635



**Spread D      Stream S-F36b (2) (Pipeline ROW) Webster County**

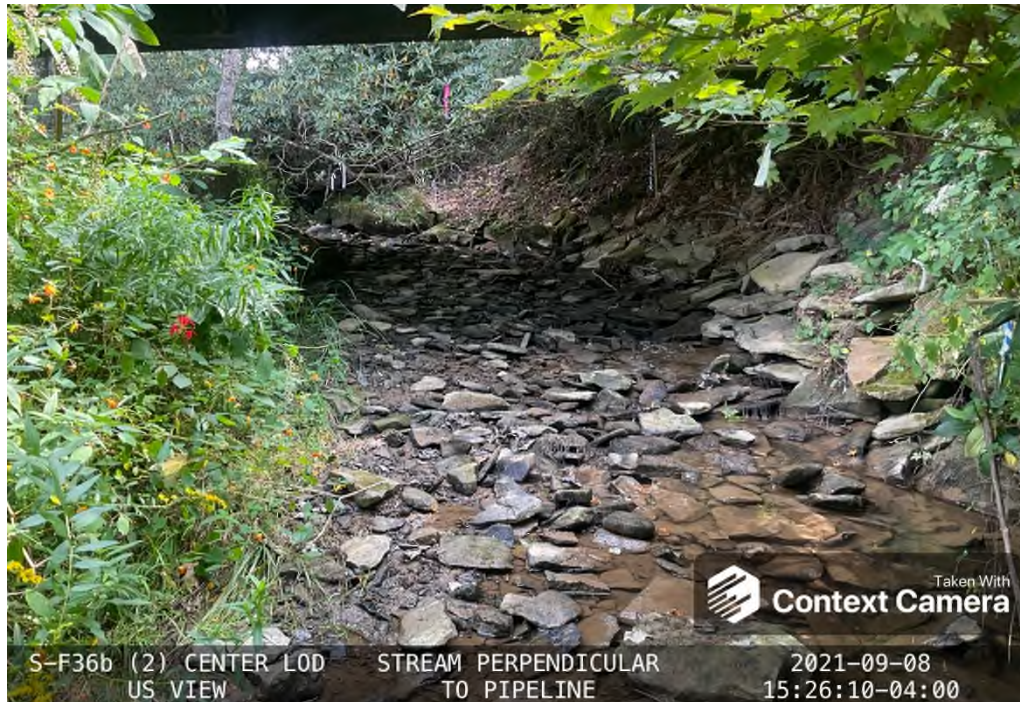


Photo Type: US View at Center  
Location, Orientation, Photographer Initials: Center ROW, Upstream View, CNJ  
Lat: 38.417774 Long: -80.576635



Photo Type: DS View at Center  
Location, Orientation, Photographer Initials: Center ROW, Downstream View, CNJ  
Lat: 38.417774 Long: -80.576635



**Spread D      Stream S-F36b (2) (Pipeline ROW) Webster County**



Photo Type: US, US View  
Location, Orientation, Photographer Initials: Upstream Edge of ROW, Upstream View, CNJ  
Lat: 38.417774 Long: -80.576635



Photo Type: US, DS View  
Location, Orientation, Photographer Initials: Upstream Edge of ROW, Downstream View, CNJ  
Lat: 38.417774 Long: -80.576635



**Spread D      Stream S-F36b (2) (Pipeline ROW) Webster County**



Photo Type: Riffle US View  
Location, Orientation, Photographer Initials: Downstream of Riffle, Upstream View, CNJ  
Lat: 38.417774 Long: -80.576635



Photo Type: Riffle, DS View  
Location, Orientation, Photographer Initials: Upstream of Riffle, Downstream View, CNJ  
Lat: 38.417774 Long: -80.576635



**Spread D      Stream S-F36b (2) (Pipeline ROW) Webster County**

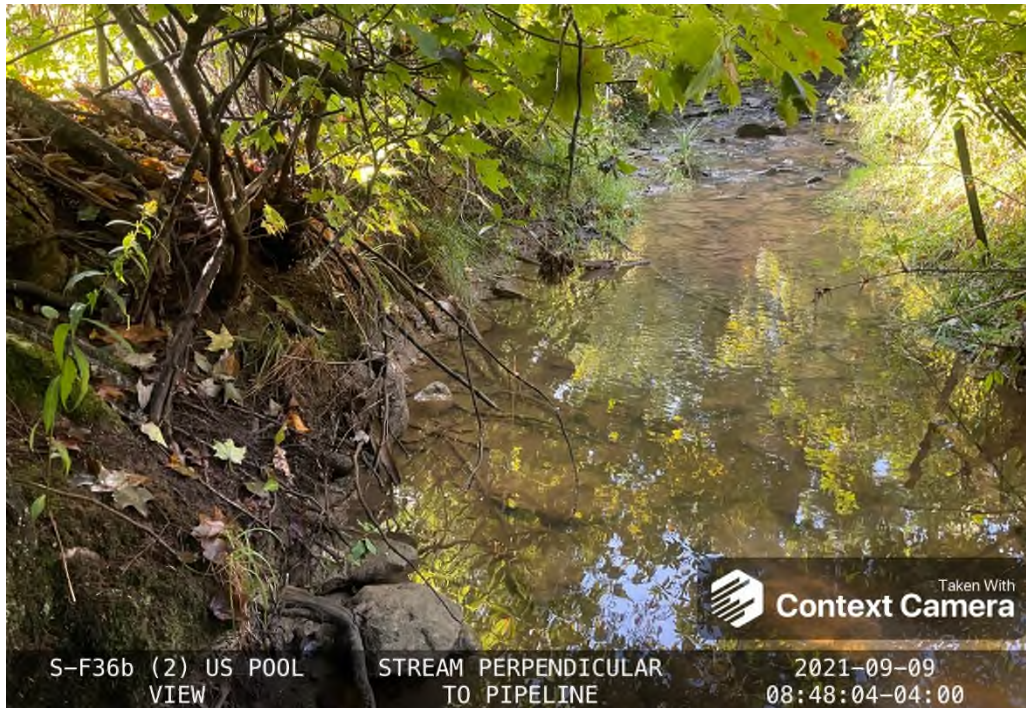


Photo Type: Pool, US View  
Location, Orientation, Photographer Initials: Downstream of Pool, Upstream View, CNJ  
Lat: 38.417774 Long: -80.576635

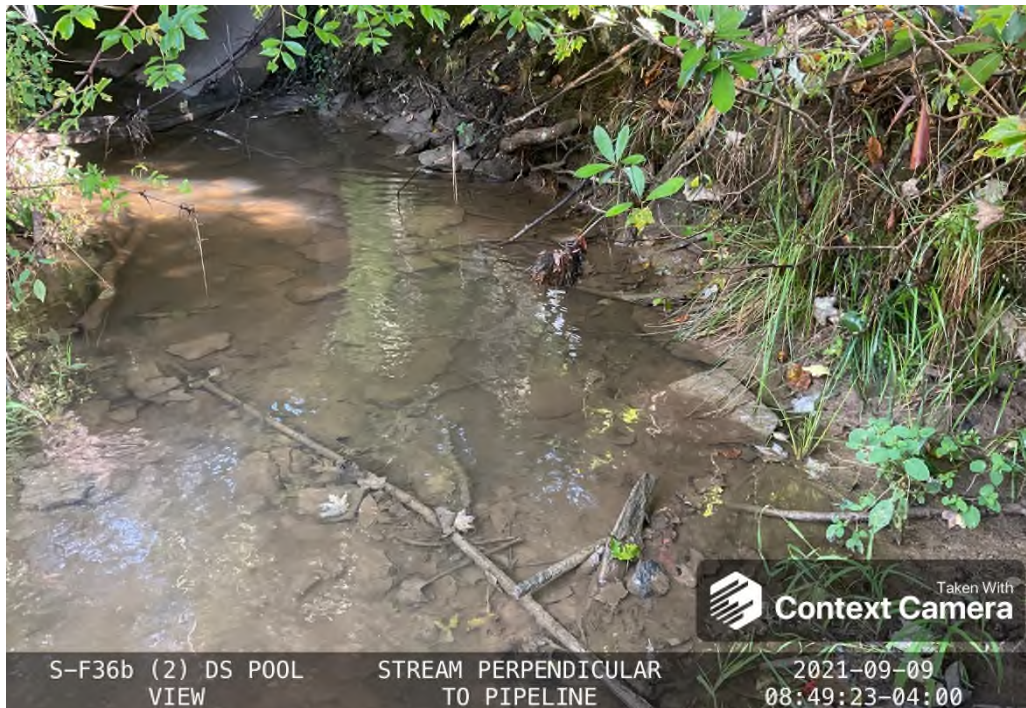
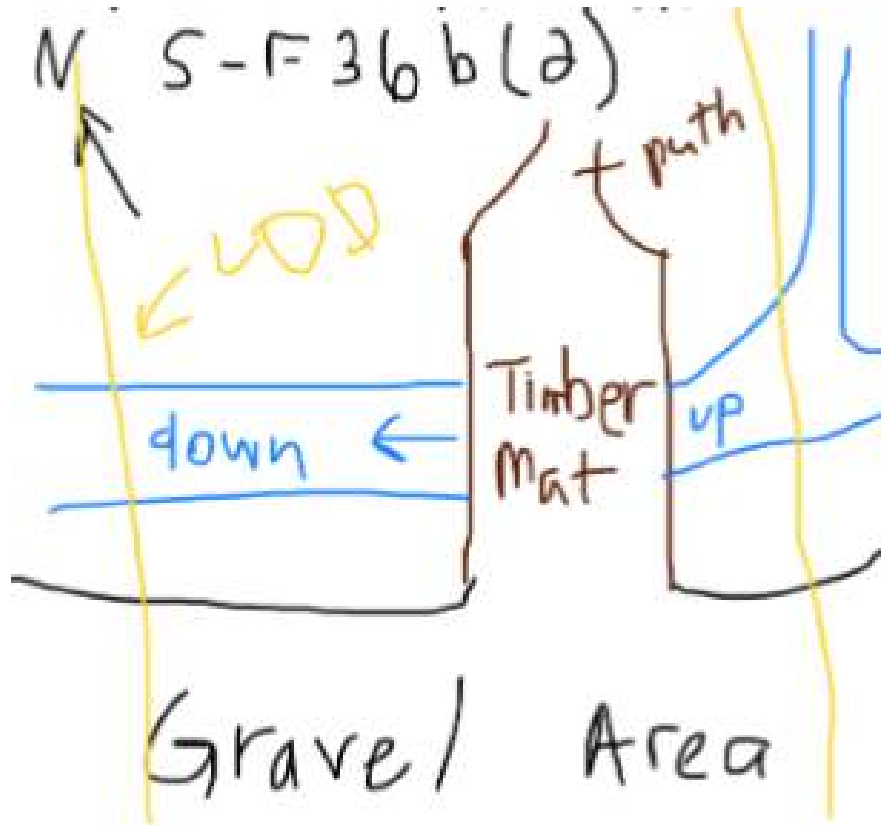


Photo Type: Pool, DS View  
Location, Orientation, Photographer Initials: Upstream of Pool, Downstream View, CNJ  
Lat: 38.417774 Long: -80.576635

USACE FILE NO./ Project Name: (v2.1, Sept 2015)			Mountain Valley Pipeline			IMPACT COORDINATES: (in Decimal Degrees)			Lat.	38.417774	Lon.	-80.576635	WEATHER:			Sunny	DATE:			9/14/2021									
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)						S-F36b (2)						MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)						Comments:											
STREAM IMPACT LENGTH:			78	FORM OF MITIGATION:		RESTORATION (Levels I-III)			MIT COORDINATES: (in Decimal Degrees)			Lat.		Lon.		PRECIPITATION PAST 48 HRS:			Mitigation Length:										
Column No. 1- Impact Existing Condition (Debit)						Column No. 2- Mitigation Existing Condition - Baseline (Credit)						Column No. 3- Mitigation Projected at Five Years Post Completion (Credit)						Column No. 4- Mitigation Projected at Ten Years Post Completion (Credit)						Column No. 5- Mitigation Projected at Maturity (Credit)					
Stream Classification:						Stream Classification:						Stream Classification:						Stream Classification:						Stream Classification:					
Percent Stream Channel Slope						Percent Stream Channel Slope						Percent Stream Channel Slope						Percent Stream Channel Slope						Percent Stream Channel Slope					
HGM Score (attach data forms):						HGM Score (attach data forms):						HGM Score (attach data forms):						HGM Score (attach data forms):						HGM Score (attach data forms):					
Average						Average						Average						Average						Average					
Hydrology						Hydrology						Hydrology						Hydrology						Hydrology					
Biogeochemical Cycling						Biogeochemical Cycling						Biogeochemical Cycling						Biogeochemical Cycling						Biogeochemical Cycling					
Habitat						Habitat						Habitat						Habitat						Habitat					
PART I - Physical, Chemical and Biological Indicators						PART I - Physical, Chemical and Biological Indicators						PART I - Physical, Chemical and Biological Indicators						PART I - Physical, Chemical and Biological Indicators						PART I - Physical, Chemical and Biological Indicators					
Points Score Range Site Score						Points Score Range Site Score						Points Score Range Site Score						Points Score Range Site Score						Points Score Range Site Score					
PHYSICAL INDICATOR (Applies to all streams classifications)						PHYSICAL INDICATOR (Applies to all streams classifications)						PHYSICAL INDICATOR (Applies to all streams classifications)						PHYSICAL INDICATOR (Applies to all streams classifications)						PHYSICAL INDICATOR (Applies to all streams classifications)					
USEPA RBP (High Gradient Data Sheet)						USEPA RBP (Low Gradient Data Sheet)						USEPA RBP (High Gradient Data Sheet)						USEPA RBP (High Gradient Data Sheet)						USEPA RBP (High Gradient Data Sheet)					
1. Epifaunal Substrate/Available Cover 0-20 12						1. Epifaunal Substrate/Available Cover 0-20						1. Epifaunal Substrate/Available Cover 0-20						1. Epifaunal Substrate/Available Cover 0-20						1. Epifaunal Substrate/Available Cover 0-20					
2. Embeddedness 0-20 13						2. Pool Substrate Characterization 0-20						2. Embeddedness 0-20						2. Embeddedness 0-20						2. Embeddedness 0-20					
3. Velocity Depth Regime 0-20 16						3. Pool Variability 0-20						3. Velocity Depth Regime 0-20						3. Velocity Depth Regime 0-20						3. Velocity Depth Regime 0-20					
4. Sediment Deposition 0-20 11						4. Sediment Deposition 0-20						4. Sediment Deposition 0-20						4. Sediment Deposition 0-20						4. Sediment Deposition 0-20					
5. Channel Flow Status 0-20 10						5. Channel Flow Status 0-20 0-1						5. Channel Flow Status 0-20 0-1						5. Channel Flow Status 0-20 0-1						5. Channel Flow Status 0-20 0-1					
6. Channel Alteration 0-20 13						6. Channel Alteration 0-20						6. Channel Alteration 0-20						6. Channel Alteration 0-20						6. Channel Alteration 0-20					
7. Frequency of Riffles (or bends) 0-20 18						7. Channel Sinuosity 0-20						7. Frequency of Riffles (or bends) 0-20						7. Frequency of Riffles (or bends) 0-20						7. Frequency of Riffles (or bends) 0-20					
8. Bank Stability (LB & RB) 0-20 14						8. Bank Stability (LB & RB) 0-20						8. Bank Stability (LB & RB) 0-20						8. Bank Stability (LB & RB) 0-20						8. Bank Stability (LB & RB) 0-20					
9. Vegetative Protection (LB & RB) 0-20 16						9. Vegetative Protection (LB & RB) 0-20						9. Vegetative Protection (LB & RB) 0-20						9. Vegetative Protection (LB & RB) 0-20						9. Vegetative Protection (LB & RB) 0-20					
10. Riparian Vegetative Zone Width (LB & RB) 0-20 12						10. Riparian Vegetative Zone Width (LB & RB) 0-20						10. Riparian Vegetative Zone Width (LB & RB) 0-20						10. Riparian Vegetative Zone Width (LB & RB) 0-20						10. Riparian Vegetative Zone Width (LB & RB) 0-20					
Total RBP Score Suboptimal 135						Total RBP Score Poor 0						Total RBP Score Poor 0						Total RBP Score Poor 0						Total RBP Score Poor 0					
Sub-Total 0.675						Sub-Total 0						Sub-Total 0						Sub-Total 0						Sub-Total 0					
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)						CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)						CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)						CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)						CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)					
WVDEP Water Quality Indicators (General)						WVDEP Water Quality Indicators (General)						WVDEP Water Quality Indicators (General)						WVDEP Water Quality Indicators (General)						WVDEP Water Quality Indicators (General)					
Specific Conductivity						Specific Conductivity						Specific Conductivity						Specific Conductivity						Specific Conductivity					
<=99 - 90 points 0-90 88						<=99 - 90 points 0-90						<=99 - 90 points 0-90						<=99 - 90 points 0-90						<=99 - 90 points 0-90					
pH						pH						pH						pH						pH					
6.0-8.0 = 80 points 0-80 7.4						6.0-8.0 = 80 points 0-80 0-1						6.0-8.0 = 80 points 0-80 0-1						6.0-8.0 = 80 points 0-80 0-1						6.0-8.0 = 80 points 0-80 0-1					
DO						DO						DO						DO						DO					
>5.0 = 30 points 10-30 7.9						>5.0 = 30 points 10-30						>5.0 = 30 points 10-30						>5.0 = 30 points 10-30						>5.0 = 30 points 10-30					
Sub-Total 1						Sub-Total 0						Sub-Total 0						Sub-Total 0						Sub-Total 0					
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)						BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)						BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)						BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)						BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)					
WV Stream Condition Index (WVSCI)						WV Stream Condition Index (WVSCI)						WV Stream Condition Index (WVSCI)						WV Stream Condition Index (WVSCI)						WV Stream Condition Index (WVSCI)					
Fair 0-100 0-1 44.3						Fair 0-100 0-1						Fair 0-100 0-1						Fair 0-100 0-1						Fair 0-100 0-1					
Sub-Total 0.343						Sub-Total 0						Sub-Total 0						Sub-Total 0						Sub-Total 0					
PART II - Index and Unit Score						PART II - Index and Unit Score						PART II - Index and Unit Score						PART II - Index and Unit Score						PART II - Index and Unit Score					
Index Linear Feet Unit Score						Index Linear Feet Unit Score						Index Linear Feet Unit Score						Index Linear Feet Unit Score						Index Linear Feet Unit Score					
0.673 78 52.468						0 0 0						0 0 0						0 0 0						0 0 0					

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME _____	LOCATION _____	
STATION # _____ RIVERMILE _____	STREAM CLASS _____	
LAT _____ LONG _____	RIVER BASIN _____	
STORET # _____	AGENCY _____	
INVESTIGATORS _____		
FORM COMPLETED BY _____	DATE _____ TIME _____	REASON FOR SURVEY _____

<b>WEATHER CONDITIONS</b>	<table style="width: 100%;"> <tr> <td style="width: 33%; vertical-align: top;"> <b>Now</b>             storm (heavy rain)            rain (steady rain)            showers (intermittent)            _____%            %cloud cover            clear/sunny         </td> <td style="width: 33%; vertical-align: top;"> <b>Past 24 hours</b>             _____%         </td> <td style="width: 33%; vertical-align: top;"> <b>Has there been a heavy rain in the last 7 days?</b>            Yes      No   <b>Air Temperature</b> _____ °C   <b>Other</b> _____         </td> </tr> </table>			<b>Now</b>  storm (heavy rain) rain (steady rain) showers (intermittent) _____% %cloud cover clear/sunny	<b>Past 24 hours</b>  _____%	<b>Has there been a heavy rain in the last 7 days?</b> Yes      No  <b>Air Temperature</b> _____ °C  <b>Other</b> _____
<b>Now</b>  storm (heavy rain) rain (steady rain) showers (intermittent) _____% %cloud cover clear/sunny	<b>Past 24 hours</b>  _____%	<b>Has there been a heavy rain in the last 7 days?</b> Yes      No  <b>Air Temperature</b> _____ °C  <b>Other</b> _____				
<b>SITE LOCATION/MAP</b>	<p><b>Draw a map of the site and indicate the areas sampled (or attach a photograph)</b></p> 					
<b>STREAM CHARACTERIZATION</b>	<table style="width: 100%;"> <tr> <td style="width: 50%;"> <b>Stream Subsystem</b>            Perennial      Intermittent      Tidal   <b>Stream Origin</b>            Glacial            Non-glacial montane            Swamp and bog         </td> <td style="width: 50%;"> <b>Stream Type</b>            Coldwater      Warmwater   <b>Catchment Area</b> _____ km<sup>2</sup>             Spring-fed            Mixture of origins            Other _____         </td> </tr> </table>			<b>Stream Subsystem</b> Perennial      Intermittent      Tidal  <b>Stream Origin</b> Glacial Non-glacial montane Swamp and bog	<b>Stream Type</b> Coldwater      Warmwater  <b>Catchment Area</b> _____ km <sup>2</sup>  Spring-fed Mixture of origins Other _____	
<b>Stream Subsystem</b> Perennial      Intermittent      Tidal  <b>Stream Origin</b> Glacial Non-glacial montane Swamp and bog	<b>Stream Type</b> Coldwater      Warmwater  <b>Catchment Area</b> _____ km <sup>2</sup>  Spring-fed Mixture of origins Other _____					



# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> Forest _____ Field/Pasture _____ Agricultural _____ Residential _____ Commercial _____ Industrial _____ Other _____	<b>Local Watershed NPS Pollution</b> No evidence <input type="checkbox"/> Some potential sources Obvious sources _____ <b>Local Watershed Erosion</b> None _____ Moderate _____ Heavy _____
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	<b>Indicate the dominant type and record the dominant species present</b> Trees _____ Shrubs _____ Grasses _____ Herbaceous _____ <b>Dominant species present</b> _____	
<b>INSTREAM FEATURES</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Estimated Reach Length</b> _____ m  <b>Estimated Stream Width</b> _____ m  <b>Sampling Reach Area</b> _____ m<sup>2</sup>  <b>Area in km<sup>2</sup> (m<sup>2</sup>x1000)</b> _____ km<sup>2</sup>  <b>Estimated Stream Depth</b> _____ m  <b>Surface Velocity (at thalweg)</b> _____ m/sec           </div> <div style="width: 50%;"> <b>Canopy Cover</b>            Partly open _____ Partly shaded _____ Shaded _____  <b>High Water Mark</b> _____ m  <b>Proportion of Reach Represented by Stream Morphology Types</b>            Riffle _____ % Run _____ %            Pool _____ %  <b>Channelized</b> Yes _____ No _____  <b>Dam Present</b> Yes _____ No _____           </div> </div>	
<b>LARGE WOODY DEBRIS</b>	<b>LWD</b> _____ m <sup>2</sup> <b>Density of LWD</b> _____ m <sup>2</sup> /km <sup>2</sup> (LWD/ reach area)	
<b>AQUATIC VEGETATION</b>	<b>Indicate the dominant type and record the dominant species present</b> Rooted emergent _____ Rooted submergent _____ Rooted floating _____ Free floating _____ Floating Algae _____ Attached Algae _____ <b>Dominant species present</b> _____ <b>Portion of the reach with aquatic vegetation</b> _____ %	
<b>WATER QUALITY (DS, US)</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Temperature</b> _____ °C  <b>Specific Conductance</b> _____  <b>Dissolved Oxygen</b> _____  <b>pH</b> _____  <b>Turbidity</b> _____  <b>WQ Instrument Used</b> _____           </div> <div style="width: 50%;"> <b>Water Odors</b>            Normal/None _____ Sewage _____            Petroleum _____ Chemical _____            Fishy _____ Other _____  <b>Water Surface Oils</b>            Slick _____ Sheen _____ Globs _____ Flecks _____            None _____ Other _____  <b>Turbidity (if not measured)</b>            Clear <input type="checkbox"/> Slightly turbid _____ Turbid _____            Opaque _____ Stained _____ Other _____           </div> </div>	
<b>SEDIMENT/ SUBSTRATE</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Odors</b>            Normal _____ Sewage _____ Petroleum _____            Chemical _____ Anaerobic _____ None _____            Other _____           </div> <div style="width: 50%;"> <b>Deposits</b>            Sludge _____ Sawdust _____ Paper fiber _____ Sand _____            Relict shells _____ Other _____  <b>Looking at stones which are not deeply embedded, are the undersides black in color?</b>            Yes _____ No _____           </div> </div>	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)		Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

# HABITAT ASSESSMENT FIELD DATA SHEET - HG - USE ON ALL STREAMS (FRONT)

STREAM NAME		LOCATION	
STATION # _____ RIVERMILE _____		STREAM CLASS	
LAT _____ LONG _____		RIVER BASIN	
STORET #		AGENCY	
INVESTIGATORS			
FORM COMPLETED BY		DATE _____ TIME _____ AM PM	REASON FOR SURVEY

Parameters to be evaluated in sampling reach	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
	<b>1. Epifaunal Substrate/ Available Cover</b>	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	<b>2. Embeddedness</b>	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	<b>3. Velocity/Depth Regime</b>	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime (usually slow-deep).
	<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	<b>4. Sediment Deposition</b>	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	<b>5. Channel Flow Status</b>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	<b>SCORE</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0



# HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Habitat Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
<b>6. Channel Alteration</b>	Channelization or dredging absent or minimal; stream with normal pattern.					Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
<b>SCORE</b>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
<b>7. Frequency of Riffles (or bends)</b>	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.					Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.					Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.					Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.					
<b>SCORE</b>	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
<b>8. Bank Stability (score each bank)</b>	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.					Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
Note: determine left or right side by facing downstream.																					
SCORE ____ (LB)	Left Bank	10		9		8	7		6		5	4		3		2	1		0		
SCORE ____ (RB)	Right Bank	10		9		8	7		6		5	4		3		2	1		0		
<b>9. Vegetative Protection (score each bank)</b>	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.					70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.					50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.					Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.					
SCORE ____ (LB)	Left Bank	10		9		8	7		6		5	4		3		2	1		0		
SCORE ____ (RB)	Right Bank	10		9		8	7		6		5	4		3		2	1		0		
<b>10. Riparian Vegetative Zone Width (score each bank riparian zone)</b>	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.					Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.					Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.					Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.					
SCORE ____ (LB)	Left Bank	10		9		8	7		6		5	4		3		2	1		0		
SCORE ____ (RB)	Right Bank	10		9		8	7		6		5	4		3		2	1		0		

Total Score \_\_\_\_\_

## BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME S-F36b (2)		LOCATION Webster County	
STATION # _____ RIVERMILE _____		STREAM CLASS Perennial	
LAT <u>38.417774</u> LONG <u>-80.576635</u>		RIVER BASIN	
STORET #		AGENCY WVDEP	
INVESTIGATORS PL SM		LOT NUMBER	
FORM COMPLETED BY <b>SM</b>		DATE <u>09-14-21</u> TIME <u>1000</u>	REASON FOR SURVEY Baseline Assessment

<b>HABITAT TYPES</b>	<b>Indicate the percentage of each habitat type present</b> <input checked="" type="checkbox"/> Cobble <u>70</u> % <input type="checkbox"/> Snags _____ % <input type="checkbox"/> Vegetated Banks _____ % <input type="checkbox"/> Sand _____ % <input type="checkbox"/> Submerged Macrophytes _____ % <input type="checkbox"/> Other ( _____ ) _____ %
<b>SAMPLE COLLECTION</b>	<b>Gear used</b> <input type="checkbox"/> D-frame <input checked="" type="checkbox"/> kick-net <input type="checkbox"/> Other _____  <b>How were the samples collected?</b> <input checked="" type="checkbox"/> wading <input type="checkbox"/> from bank <input type="checkbox"/> from boat  <b>Indicate the number of jabs/kicks taken in each habitat type.</b> <input checked="" type="checkbox"/> Cobble <u>4</u> <input type="checkbox"/> Snags _____ <input type="checkbox"/> Vegetated Banks _____ <input type="checkbox"/> Sand _____ <input type="checkbox"/> Submerged Macrophytes _____ <input type="checkbox"/> Other ( _____ ) _____
<b>GENERAL COMMENTS</b>	US: Temp: 17 C, SPC: 90.5 us/cm, DO: 8.0 mg/L, pH: 7.4 DS: Temp: 17 C, SPC: 88.0 us/cm, DO: 7.9 mg/L, pH: 7.4 Observed: Crayfish and Salamander

### QUALITATIVE LISTING OF AQUATIC BIOTA

**Indicate estimated abundance:** 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	<u>0</u>	1	2	3	4	Slimes	<u>0</u>	1	2	3	4
Filamentous Algae	<u>0</u>	1	2	3	4	Macroinvertebrates	<u>0</u>	1	2	3	4
Macrophytes	<u>0</u>	1	2	3	4	Fish	<u>0</u>	1	2	3	4

### FIELD OBSERVATIONS OF MACROBENTHOS

**Indicate estimated abundance:** 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						



<b>SITE ID:</b>	<b>S-F36b(2)</b>
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9/14/2021

Insects	Count	Tolerance	TV	Insects	Count	Tolerance	TV	Non-Insects	Count	Tolerance	TV		
Ephemeroptera				16	Odonata			2	Crustacea			0	
Ameletidae		2	0	Aeshnidae	2	3	6	Asellidae		7	0		
Baetidae		4	0	Calopterygidae		6	0	Cambaridae		5	0		
Beatiscidae		4	0	Coenagrionidae		7	0	Gammaridae		5	0		
Caenidae	1	5	5	Cordulegastridae		3	0	Palaemonidae		5	0		
Ephemerellidae	3	3	9	Gomphidae		5	0	Annelida			0		
Ephemeridae	1	5	5	Lestidae		7	0	Hirudinea		10	0		
Heptageniidae	11	3	33	Libellulidae		7	0	Nematoda		10	0		
Isonychiidae		3	0	Coleoptera			12	Nematomorpha		10	0		
Leptophlebiidae		4	0	Chrysomelidae		7	0	Oligochaeta		10	0		
Potamanthidae		5	0	Dryopidae		5	0	Turbellaria			0		
Siphonuridae		3	0	Dytiscidae		6	0	Turbellaria		7	0		
Tricorythidae		5	0	Elmidae	6	4	24	Bivalvia			0		
Plecoptera			0	Gyrinidae		5	0	Corbiculidae		6	0		
Capniidae		2	0	Haliplidae		7	0	Sphaeriidae		5	0		
Chloroperlidae		2	0	Hydrophilidae		7	0	Unionidae		4	0		
Leuctridae		2	0	Psephenidae	6	3	18	Gastropoda			0		
Nemouridae		2	0	Ptilodactylidae		5	0	Ancylidae		7	0		
Peltoperlidae		1	0	Hemiptera			2	Hydrobiidae		4	0		
Perlidae		1	0	Belostomatidae		8	0	Physidae		7	0		
Perlodidae		1	0	Corixidae		8	0	Planorbidae		5	0		
Pteronarcyidae		1	0	Gerridae	2	10	20	Pleuroceridae		5	0		
Taeniopterygidae		2	0	Hydrometridae		8	0	Viviparidae		5	0		
Trichoptera			13	Nepidae		8	0	Miscellaneous			2		
Brachycentridae		2	0	Notonectidae		8	0	Collembola	2	6	12		
Glossosomatidae		2	0	Megaloptera			0	Lepidoptera		5	0		
Helicopsychidae		3	0	Corydalidae		3	0	Neuroptera		5	0		
Hydropsychidae	12	5	60	Sialidae		6	0	Hydrachnidae		6	0		
Hydroptilidae		3	0	Diptera			80	Totals	Total number	127			
Lepidostomatidae		3	0	Athericidae		3	0		Total families	15			
Leptoceridae		3	0	Blephariceridae		2	0	Metric calculations					
Limnephilidae		4	0	Ceratopogonidae	1	8	8	WVSCI Metric Scores			Additional metrics		
Molannidae		3	0	Chironomidae	77	9	693				Ephemeroptera Taxa	4	
Philopotamidae		4	0	Culicidae		10	0	Total Taxa	15	68.2	Plecoptera Taxa	0	
Phryganeidae		4	0	Dixidae		6	0	EPT Taxa	6	46.2	Trichoptera Taxa	2	
Polycentropodidae	1	5	5	Empididae		7	0	% EPT Abundance	22.8	25.6	Long-lived Taxa	6	
Psychomiidae		4	0	Psychodidae		8	0	% Chironomidae	60.6	40.1	Odonata Taxa	1	
Rhyacophilidae		3	0	Ptychopteridae		8	0	Hilsenhoff Biotic Index (HBI)	7.17	38.4	Diptera Taxa	4	
Uenoidae		2	0	Simuliidae	1	7	7	% 2 Dominant Taxa	70.1	47.7	COET Taxa	9	
Total Tolerance Value			910	Stratiomyidae		10	0				% Sensitive	17.3	
West Virginia Stream Condition Index (WVSCI)				Syrphidae		10	0	WV Stream Condition Index			% Tolerant	63.8	
Gerritson, J., J. Burton, and M.T. Barbour. 2000. A stream condition index for West Virginia wadeable streams. Tetra Tech, Inc. Owing Mills, MD.				Tabanidae		7	0				44.3	% Clingers	21.3
				Tipulidae	1	5	5					% Net-spinners	10.2

Spreadsheet uses updated Best Standard Values [BSV] for each metric per WVSCI Addenda dated March 23, 2010

## WOLMAN PEBBLE COUNT FORM

County: Webster

Stream ID: S-F36b (2)

Stream Name: UNT to Birch River (2)

HUC Code:

Basin:

Survey Date: 9/8/2021

Surveyors: JD, CC, CJ

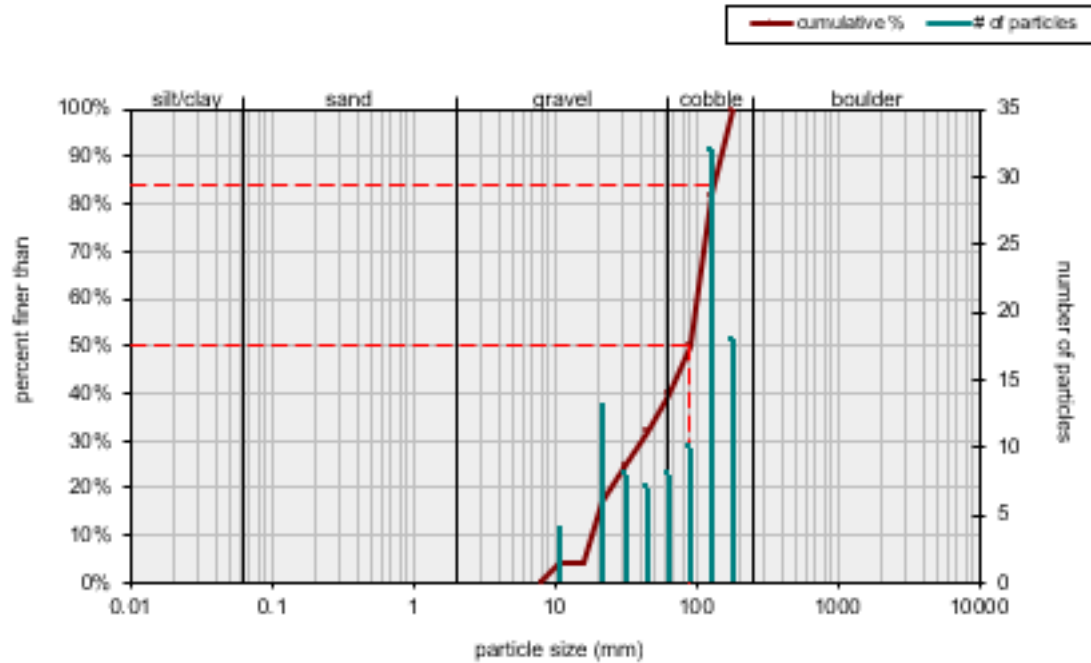
Reach 18.8m

Type: Bankfull Channel

PEBBLE COUNT							
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cum
	Silt/Clay	< .062	S/C	▲ ▼	0	0.00	0.00
	Very Fine	.062-.125	S A N D	▲ ▼	0	0.00	0.00
	Fine	.125-.25		▲ ▼	0	0.00	0.00
	Medium	.25-.5		▲ ▼	0	0.00	0.00
	Coarse	.50-1.0		▲ ▼	0	0.00	0.00
.04-.08	Very Coarse	1.0-2		▲ ▼	0	0.00	0.00
.08 -.16	Very Fine	2 -4		G R A V E L	▲ ▼	0	0.00
.16 - .22	Fine	4 -5.7	▲ ▼		0	0.00	0.00
.22 - .31	Fine	5.7 - 8	▲ ▼		0	0.00	0.00
.31 - .44	Medium	8 -11.3	▲ ▼		4	4.00	4.00
.44 - .63	Medium	11.3 - 16	▲ ▼		0	0.00	4.00
.63 - .89	Coarse	16 -22.6	▲ ▼		13	13.00	17.00
.89 - 1.26	Coarse	22.6 - 32	▲ ▼		8	8.00	25.00
1.26 - 1.77	Vry Coarse	32 - 45	▲ ▼		7	7.00	32.00
1.77 -2.5	Vry Coarse	45 - 64	C O B B L E	▲ ▼	8	8.00	40.00
2.5 - 3.5	Small	64 - 90		▲ ▼	10	10.00	50.00
3.5 - 5.0	Small	90 - 128		▲ ▼	32	32.00	82.00
5.0 - 7.1	Large	128 - 180		▲ ▼	18	18.00	100.00
7.1 - 10.1	Large	180 - 256		▲ ▼	0	0.00	100.00
10.1 - 14.3	Small	256 - 362	B O U L D E R	▲ ▼	0	0.00	100.00
14.3 - 20	Small	362 - 512		▲ ▼	0	0.00	100.00
20 - 40	Medium	512 - 1024		▲ ▼	0	0.00	100.00
40 - 80	Large	1024 -2048		▲ ▼	0	0.00	100.00
80 - 160	Vry Large	2048 -4096		▲ ▼	0	0.00	100.00
	Bedrock		BDRK	▲ ▼	0	0.00	100.00
				Totals:	100		
	Total Tally:						



# Bankfull Channel Pebble Count, S-F38b (2)



Size (mm)		Size Distribution		Type	
D16	21	mean	52.2	silt/clay	0%
D35	51	dispersion	2.9	sand	0%
D50	90	skewness	-0.27	gravel	40%
D65	110			cobble	60%
D84	130			boulder	0%
D95	160				

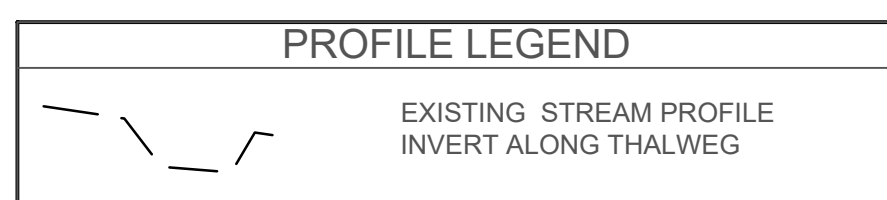
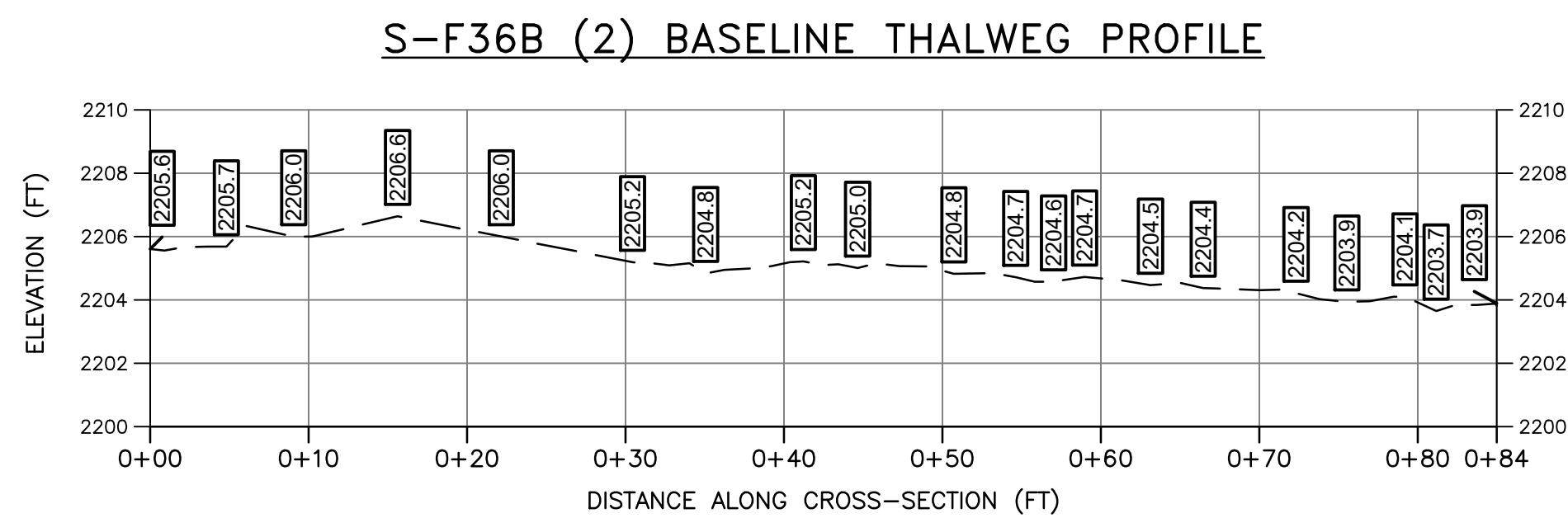
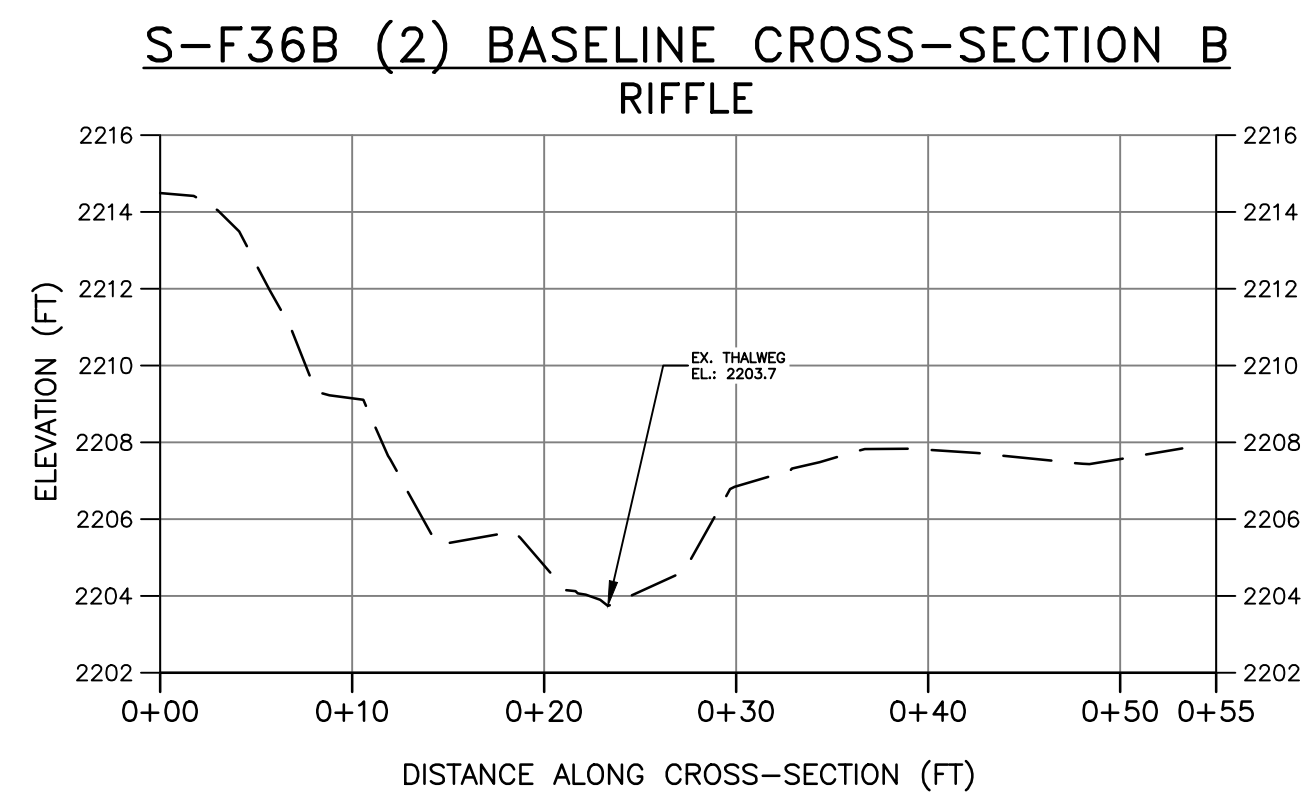
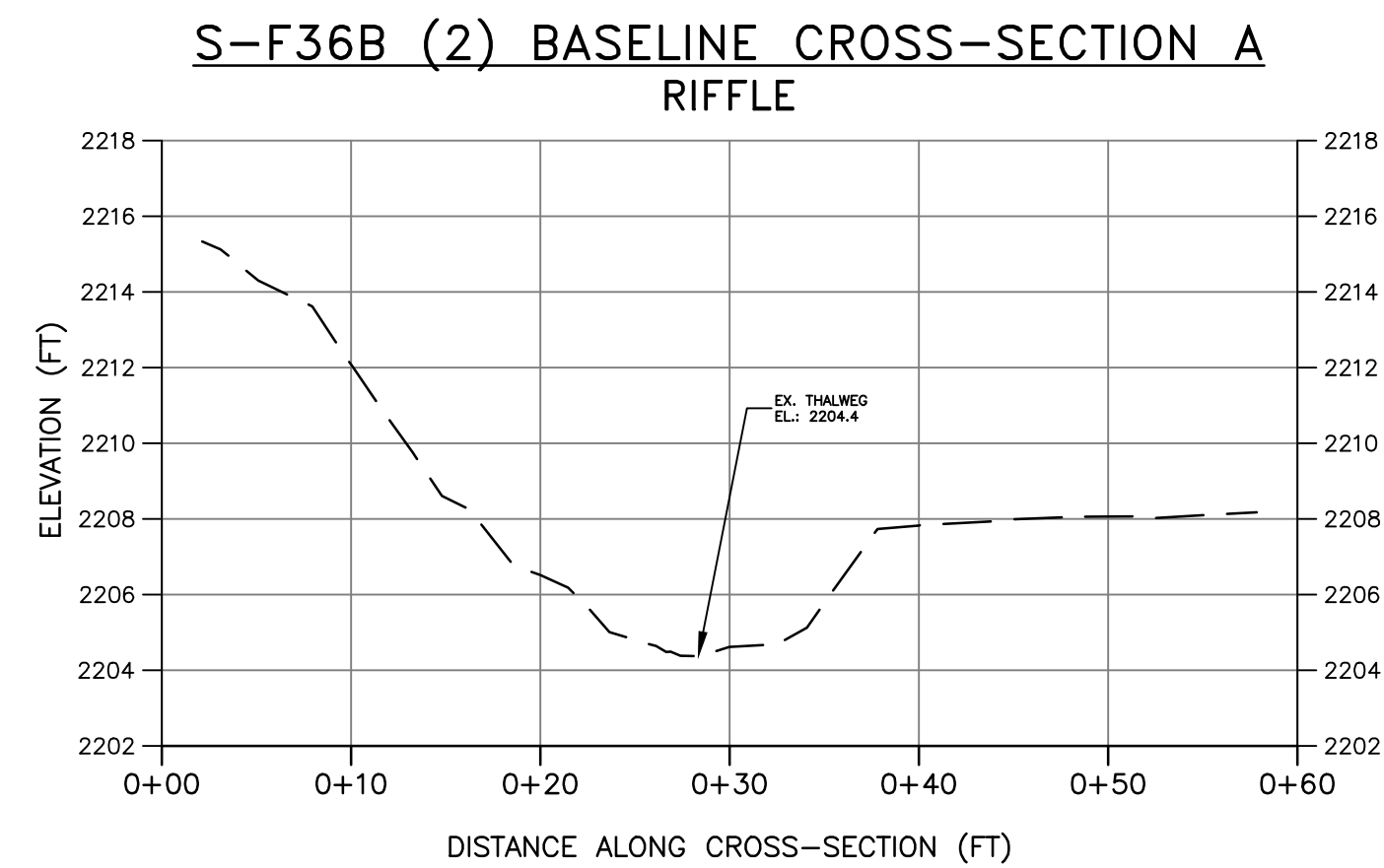


## LEGEND

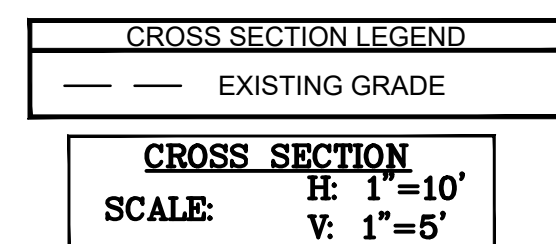
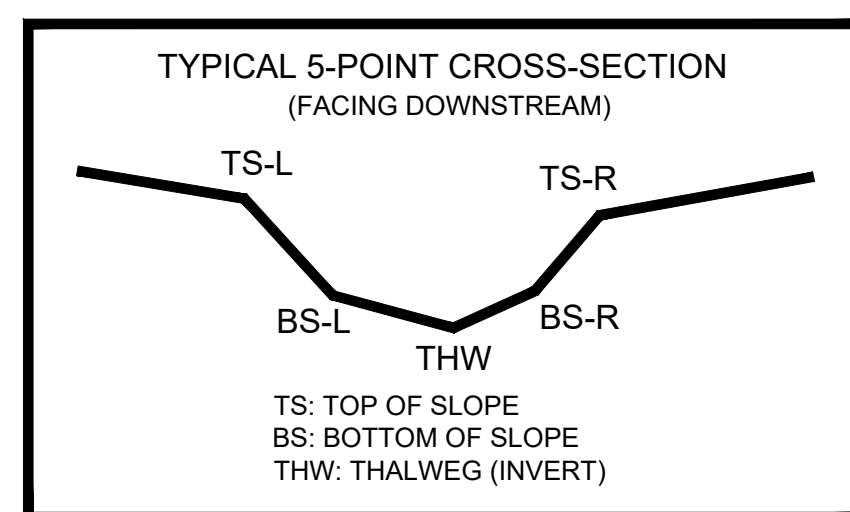
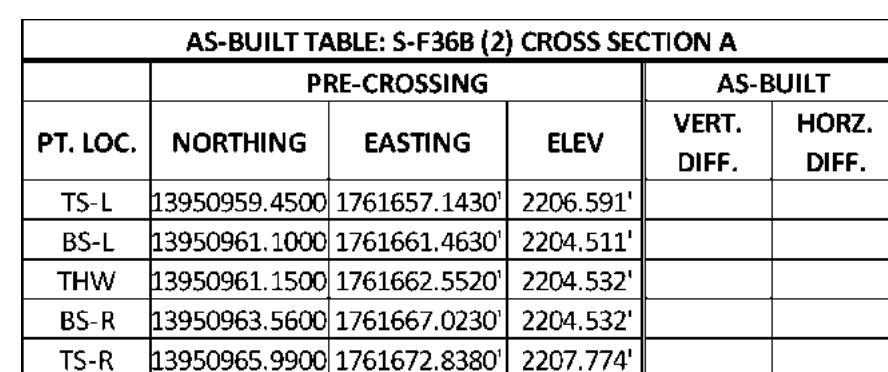
- |                  |   |
|------------------|---|
| — — — —          | STUDY AREA (EASEMENT)                   |
| — . — . —        | EXISTING SURVEY-LOCATED THALWEG         |
| <b>1176.87 +</b> | EXISTING SURVEYED GROUND SHOT ELEVATION |

SURVEY NOTES:

1. THIS MAP HAS BEEN ORIENTED TO NAD 1983 UTM ZONE 17N, AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), USING REAL TIME DGPS. FIELD LOCATIONS WERE COMPLETED ON SEPTEMBER 9, 2021.
2. EASEMENT LINES SHOWN ON PLAN VIEW WERE PROVIDED BY MOUNTAIN VALLEY PIPELINE.
3. SURVEY POINTS FOR CROSS SECTIONS AND THALWEG PROFILES COLLECTED IN 2021 HAVE BEEN USED IN COMBINATION WITH SURVEY POINTS COLLECTED PREVIOUSLY IN 2020 IN ORDER TO GENERATE THE PRE-CROSSING SURFACE SHOWN IN PLAN. DUE TO NATURAL EROSIONAL STREAM PROCESSES THAT CAN OCCUR OVER TIME, MINOR ADJUSTMENTS TO THE PROFILE ALIGNMENTS MAY HAVE BEEN REQUIRED IN ORDER TO GENERATE A CLEAN PRE-CROSSING SURFACE.
4. ALL SECTION VIEWS SHOWN LEFT TO RIGHT FACING DOWNSTREAM.
5. POST-CROSSING SURVEY INFORMATION SHOWN IN RED. DATA PENDING.
6. POST-CROSSING SURVEY POINTS FOR CROSS SECTIONS AND THALWEG ARE PROJECTED ONTO PRE-CROSSING SECTION AND PROFILE VIEWS FOR COMPARISON.



**PROFILE**  
SCALE: H: 1"=10'  
V: 1"=5'



NOTE: ALL SECTIONS VIEWS SHOWN LEFT TO RIGHT FACING DOWNSTREAM.

PRE-CROSSING PHOTOS



PHOTO TAKEN LOOKING DOWNSTREAM  
FROM UPSTREAM IMPACT LIMITS



PHOTO TAKEN LOOKING UPSTREAM FROM  
DOWNSTREAM IMPACT LIMITS

### POST-CROSSING PHOTOS

PENDING CROSSING

PHOTO TAKEN LOOKING DOWNSTREAM  
FROM UPSTREAM IMPACT LIMITS


PENDING CROSSING

PHOTO TAKEN LOOKING UPSTREAM FROM  
DOWNSTREAM IMPACT LIMITS

## PRE-CROSSING

CAD File No.  
 JZ  
 Drawn  
 GH  
 Checked  
 DW  
 Approved  
 NOTED  
 Scale:  
 SEPT. 2021  
 Date:  
 112IC07157  
 Project No.

**TETRA TECH, INC.**  
661 ANDERSEN DRIVE FOSTER PLAZA 7  
PITTSBURGH, PA 15220  
TEL: (412) 921-7090 FAX: (412) 921-4040  
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**TETRA TECH**  
www.tetrattech.com

OUNTAIN VALLEY PIPELINE, LLC  
O ENERGY DRIVE, 2ND FLOOR  
CANONSBURG, PA 15317

Profile and Cross-Sections  
Baseline Survey  
CROSSING S-F36B (2) - UNNAMED  
TRIBUTARY TO BIRCH RIVER (MP 104.89)  
WEBSTER COUNTY, WV

1  
Drawing No.

PRELIMINARY