

## Baseline Assessment – Stream Attributes

### Reach S-L26(2) (Pipeline ROW) Perennial Spread E Greenbrier County, West Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	N/A – Perennial stream (not shadeable, slope >4%)
RBP Physical Characteristics Form	✓
Water Quality Data	✓
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	N/A – Low flow
Wolman Pebble Count	✓
Reference Reach Software Pebble Count Data	✓
Longitudinal Profile and Cross Sections	✓



37.9819° N, -80.755213° W



Photo Type: US Reach, US View

Location, Orientation, Photographer Initials: Upstream Reach, Upstream View, AAK/SM

37.9819° N, -80.755213° W



Photo Type: US Reach, DS View

Location, Orientation, Photographer Initials: Upstream Reach, Downstream View, AAK/SM





Photo Type: Mid-Reach, US View

Location, Orientation, Photographer Initials: Mid-Reach, Upstream View, AAK/SM



Photo Type: Mid-Reach, DS View

Location, Orientation, Photographer Initials: Mid-Reach, Downstream View, AAK/SM



37.9819° N, -80.755213° W



Photo Type: DS Reach, US View

Location, Orientation, Photographer Initials: Downstream Reach, Upstream View, AAK/SM

37.9819° N, -80.755213° W



Photo Type: DS Reach, DS View

Location, Orientation, Photographer Initials: Downstream Reach, Downstream View, AAK/SM

*"Q:\Charleston\2021 Projects\21-0244- MVP- STREAM AND WETLAND CONDITIONS ASSESSMENT AND SURVEY PLAN\002 - Pre-Crossing Monitoring\Spread E\S-L26(2)"*

USCE FILE NO./ Project Name: (v2.1, Sept 2015)				Mountain Valley Pipeline				IMPACT COORDINATES: (in Decimal Degrees)				Lat.	37.980598				Lon.	-80.754872				WEATHER:				20% Cloud cover, Clear/Sunny 75 °F				DATE:				9/8/2021																									
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)										S-L26(2) UNT to Meadow River (2)										MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)																				Comments:																			
STREAM IMPACT LENGTH:				166				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:				Perennial						Stream Classification:										Stream Classification:				0						Stream Classification:				0						Stream Classification:				0															
Percent Stream Channel Slope				2.56						Percent Stream Channel Slope										Percent Stream Channel Slope				0						Percent Stream Channel Slope				0						Percent Stream Channel Slope				0															
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):										HGM Score (attach data forms):									
Average										Average										Average										Average										Average										Average									
Hydrology										Hydrology										Hydrology										Hydrology										Hydrology																			
Biogeochemical Cycling				0						Biogeochemical Cycling										Biogeochemical Cycling				0						Biogeochemical Cycling										Biogeochemical Cycling				0															
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										PART I - Physical, Chemical and Biological Indicators									
				Points Scale		Range		Site Score						Points Scale		Range		Site Score						Points Scale		Range		Site Score						Points Scale		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)										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)										USEPA RBP (High Gradient Data Sheet)									
1. Epifaunal Substrate/Available Cover				0-20				4		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				2		2. Embeddedness				0-20						2. Embeddedness				0-20						2. Embeddedness				0-20																									
3. Velocity/ Depth Regime				0-20				7		3. Velocity/ Depth Regime				0-20						3. Velocity/ Depth Regime				0-20						3. Velocity/ Depth Regime				0-20																									
4. Sediment Deposition				0-20				4		4. Sediment Deposition				0-20						4. Sediment Deposition				0-20						4. Sediment Deposition				0-20																									
5. Channel Flow Status				0-20				12		5. Channel Flow Status				0-20						5. Channel Flow Status				0-20						5. Channel Flow Status				0-20																									
6. Channel Alteration				0-20				13		6. Channel Alteration				0-20						6. Channel Alteration				0-20						6. Channel Alteration				0-20																									
7. Frequency of Riffles (or bends)				0-20				4		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				18		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				18		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				10		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				Marginal				92		Total RBP Score				Poor				0		Total RBP Score				Poor				0		Total RBP Score				Poor				0																					



STREAM NAMES-L26(2)		LOCATION UNT to Meadow River Spread E	
STATION # _____ RIVERMILE _____		STREAM CLASS Perennial <input type="checkbox"/>	
LAT _____ LONG _____		COUNTY Greenbrier <input type="checkbox"/>	
STORET # _____		AGENCY _____	
INVESTIGATORS AK/SM			
FORM COMPLETED BY <b>AK</b>		DATE 9-8-2021 TIME 1210	REASON FOR SURVEY Preliminary Assessment

*Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1* A-5

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

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input checked="" type="checkbox"/> Forest <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input type="checkbox"/> Residential	<b>Local Watershed NPS Pollution</b> <input type="checkbox"/> No evidence <input checked="" type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources <b>Local Watershed Erosion</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	<b>Indicate the dominant type and record the dominant species present</b> <input type="checkbox"/> Trees <input checked="" type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous Dominant species present <u>Willow, joepyee weed, jewelweed</u>	
<b>INSTREAM FEATURES</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">           Estimated Reach Length <u>50</u> ft <small>m</small>            Estimated Stream Width <u>0.6</u> ft <small>m</small>            Sampling Reach Area <u>30</u> ft<sup>2</sup> <small>m<sup>2</sup></small>            Area in km<sup>2</sup> (m<sup>2</sup>x1000) _____ km<sup>2</sup>            Estimated Stream Depth <u>0.01</u> ft <small>m</small>            Surface Velocity <u>0.12</u> ft/sec <small>m/sec</small>            Stream Dry <input type="checkbox"/> </div> <div style="width: 45%;"> <b>Canopy Cover</b>  <input type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded            High Water Mark <u>0.4</u> ft <small>m</small>  <b>Proportion of Reach Represented by Stream Morphology Types</b>            Riffle <u>20</u> % Run <u>80</u> %            Pool <u>0</u> %            Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No            Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No         </div> </div>	
<b>LARGE WOODY DEBRIS</b>	LWD <u>0</u> m <sup>2</sup> Density of LWD _____ 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> <input type="checkbox"/> Rooted emergent <input checked="" type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input checked="" type="checkbox"/> Attached Algae Dominant species present _____ Portion of the reach with aquatic vegetation <u>50</u> %	
<b>WATER QUALITY</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;">           Temperature <u>16.6</u> °C            Specific Conductance <u>0.002</u> us/cm            Dissolved Oxygen <u>7.88</u> mg/L            pH <u>6.45</u> su            Turbidity <u>12.10</u> ntu            WQ Instrument Used <u>YSI</u> </div> <div style="width: 45%;"> <b>Water Odors</b>  <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage  <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical  <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____  <b>Water Surface Oils</b>  <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globs <input type="checkbox"/> Flecks  <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____  <b>Turbidity (if not measured)</b>  <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid  <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____         </div> </div>	
<b>SEDIMENT/SUBSTRATE</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Odors</b>  <input type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum  <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input checked="" type="checkbox"/> None  <input type="checkbox"/> Other _____  <b>Oils</b>  <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse         </div> <div style="width: 45%;"> <b>Deposits</b>  <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand  <input type="checkbox"/> Relict shells <input checked="" type="checkbox"/> Other <u>Silt</u>  <b>Looking at stones which are not deeply embedded, are the undersides black in color?</b>  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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		0	Detritus	sticks, wood, coarse plant materials (CPOM)	30
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	2	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	98			
Clay	< 0.004 mm (slick)	0			

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

STREAM NAMES-L26(2)		LOCATION	
STATION # _____ RIVERMILE _____		STREAM CLASS Perennial <input type="checkbox"/>	
LAT _____ LONG _____		COUNTY Greenbrier <input type="checkbox"/>	
STORET # _____		AGENCY _____	
INVESTIGATORS _____			
FORM COMPLETED BY AK		DATE 9-8-2021 TIME 1210 AM PM	REASON FOR SURVEY Preliminary Assessment

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>1. Epifaunal Substrate/ Available Cover</b>  <input type="checkbox"/> N/A  <b>SCORE 4</b> <input type="checkbox"/>	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).  20 19 18 17 16	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).  15 14 13 12 11	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.  10 9 8 7 6	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.  5 4 3 2 1 0
<b>2. Embeddedness</b>  <b>SCORE 2</b> <input type="checkbox"/>	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.  20 19 18 17 16	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.  15 14 13 12 11	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.  10 9 8 7 6	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.  5 4 3 2 1 0
<b>3. Velocity/Depth Regime</b>  <input type="checkbox"/> N/A  <b>SCORE 7</b> <input type="checkbox"/>	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.)  20 19 18 17 16	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).  15 14 13 12 11	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).  10 9 8 7 6	Dominated by 1 velocity/depth regime (usually slow-deep).  5 4 3 2 1 0
<b>4. Sediment Deposition</b>  <b>SCORE 4</b> <input type="checkbox"/>	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.  20 19 18 17 16	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.  15 14 13 12 11	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.  10 9 8 7 6	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.  5 4 3 2 1 0
<b>5. Channel Flow Status</b> <input type="checkbox"/> N/A  <b>SCORE 12</b> <input type="checkbox"/>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.  20 19 18 17 16	Water fills >75% of the available channel; or <25% of channel substrate is exposed.  15 14 13 12 11	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.  10 9 8 7 6	Very little water in channel and mostly present as standing pools.  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>  SCORE 13	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.
	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>  <input type="checkbox"/> N/A  SCORE 4	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.
	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>  Note: determine left or right side by facing downstream. SCORE 9 SCORE 9	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.
Left Bank	10 9	8 7 6	5 4 3	2 1 0
Right Bank	10 9	8 7 6	5 4 3	2 1 0
<b>9. Vegetative Protection (score each bank)</b>  SCORE 9 SCORE 9	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.
Left Bank	10 9	8 7 6	5 4 3	2 1 0
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>  SCORE 1 SCORE 9	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.
Left Bank	10 9	8 7 6	5 4 3	2 1 0
Right Bank	10 9	8 7 6	5 4 3	2 1 0

Total Score 92

## BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAMES-L26(2)		LOCATION	
STATION # _____ RIVERMILE _____		STREAM CLASS Perennial <span style="float: right;">▼</span>	
LAT _____ LONG _____		COUNTY Greenbrier <span style="float: right;">▼</span>	
STORET # _____		AGENCY _____	
INVESTIGATORS _____		LOT NUMBER _____	
FORM COMPLETED BY <b>AK</b>		DATE <u>9-8-2021</u> TIME <u>12:10</u>	REASON FOR SURVEY Preliminary Assessment

<b>HABITAT TYPES</b>	<b>Indicate the percentage of each habitat type present</b> <input type="checkbox"/> Cobble _____% <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 type="checkbox"/> kick-net <input type="checkbox"/> Other _____  <b>How were the samples collected?</b> <input 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 type="checkbox"/> Cobble _____ <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>	No benthics collected due to lack of substrate *limited flow

### QUALITATIVE LISTING OF AQUATIC BIOTA

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

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	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						



SITE ID: S-L26(2) UNT to Meadow River Spread E  
 DATE: 8 September 2021  
 COLLECTOR(S): SM

Wolman Pebble Count (Reach Wide)

.062	.062	.062	.062	.062	.062	.062	.062	.062	.062
.062	.062	.062	.062	.062	.062	.062	.062	.062	.062
.062	.062	.062	.062	.062	.062	.062	.062	.062	.062
.062	.062	.062	.062	.062	.062	.062	.062	.062	.062
.062	.062	.062	.062	.062	.062	.062	.062	.062	.062
.062	.062	.062	.062	.062	.062	.062	.062	.062	.062
.062	.062	.062	.062	.062	.062	.062	.062	.062	.062
.062	.062	.062	.062	.062	.062	.062	.062	.062	.062
.062	.062	.062	.062	.062	.062	.062	.062	.062	.062
.062	.062	.062	.062	.062	.062	.062	.062	.062	.062

NOTES:

Riffle Pebble Count

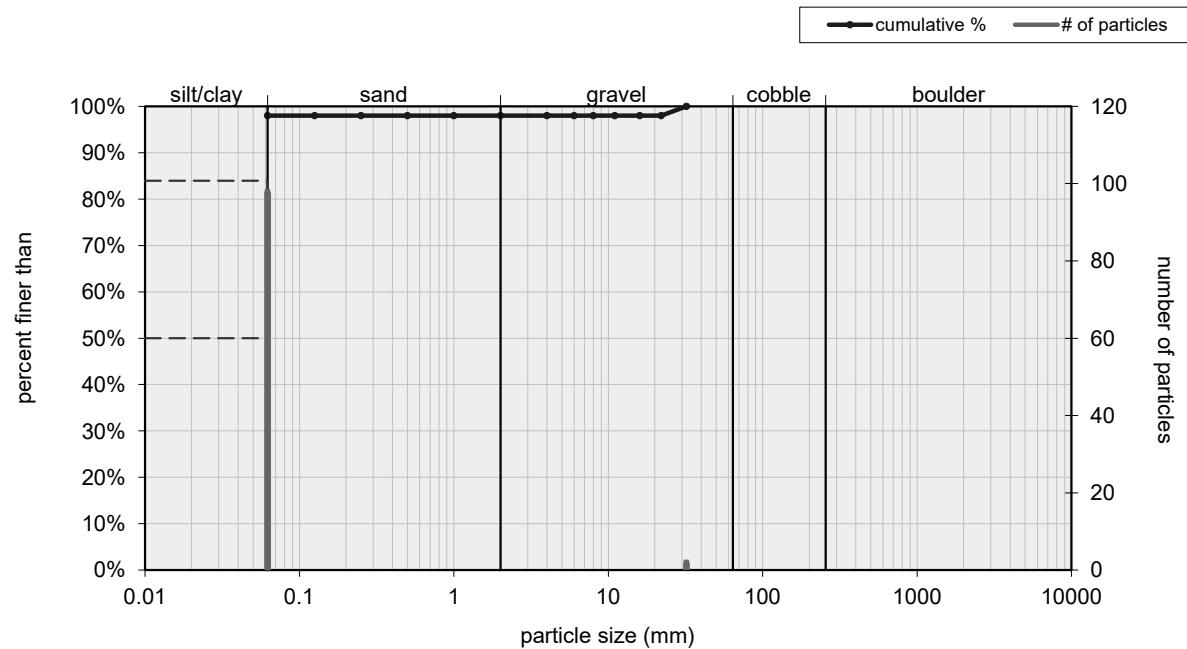

NOTES:


NOTES:

Inches	Millimeters	
	Slit Clay	< .005
	Very Fine	.005 - .025
	Fine	.025 - .063
	Medium	.063 - .125
	Coarse	.125 - .250
1/8 - 1/4	Very Coarse	.250 - .500
1/4 - 1/2	Very Fine	.500 - 1.0
1/2 - 1	Fine	1.0 - 2.0
1 - 2	Fine	2.0 - 5.0
2 - 4	Medium	5.0 - 10.0
4 - 8	Medium	10.0 - 20.0
8 - 16	Coarse	20.0 - 40.0
16 - 32	Coarse	40.0 - 80.0
32 - 64	Very Coarse	80.0 - 160.0
64 - 128	Very Coarse	160.0 - 320.0
128 - 256	Small	320.0 - 640.0
256 - 512	Small	640.0 - 1280.0
512 - 1024	Large	1280.0 - 2560.0
1024 - 2048	Large	2560.0 - 5120.0
2048 - 4096	Large	5120.0 - 10240.0
4096 - 8192	Large	10240.0 - 20480.0
8192 - 16384	Large	20480.0 - 40960.0
16384 - 32768	Large	40960.0 - 81920.0
32768 - 65536	Large	81920.0 - 163840.0
65536 - 131072	Large	163840.0 - 327680.0
131072 - 262144	Large	327680.0 - 655360.0
262144 - 524288	Large	655360.0 - 1310720.0
524288 - 1048576	Large	1310720.0 - 2621440.0
1048576 - 2097152	Large	2621440.0 - 5242880.0
2097152 - 4194304	Large	5242880.0 - 10485760.0
4194304 - 8388608	Large	10485760.0 - 20971520.0
8388608 - 16777216	Large	20971520.0 - 41943040.0
16777216 - 33554432	Large	41943040.0 - 83886080.0
33554432 - 67108864	Large	83886080.0 - 167772160.0
67108864 - 134217728	Large	167772160.0 - 335544320.0
134217728 - 268435456	Large	335544320.0 - 671088640.0
268435456 - 536870912	Large	671088640.0 - 1342177280.0
536870912 - 1073741824	Large	1342177280.0 - 2684354560.0
1073741824 - 2147483648	Large	2684354560.0 - 5368709120.0
2147483648 - 4294967296	Large	5368709120.0 - 10737418240.0
4294967296 - 8589934592	Large	10737418240.0 - 21474836480.0
8589934592 - 17179869184	Large	21474836480.0 - 42949672960.0
17179869184 - 34359738368	Large	42949672960.0 - 85899345920.0
34359738368 - 68719476736	Large	85899345920.0 - 171798691840.0
68719476736 - 137438953472	Large	171798691840.0 - 343597383680.0
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549755813888 - 1099511627776	Large	1374389534720.0 - 2748779069440.0
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8796093022208 - 17592186044416	Large	21990232555520.0 - 43980465111040.0
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70368744177664 - 140737488355328	Large	175921860444160.0 - 351843720888320.0
140737488355328 - 281474976710656	Large	351843720888320.0 - 703687441776640.0
281474976710656 - 562949953421312	Large	703687441776640.0 - 1407374883553280.0
562949953421312 - 1125899906842624	Large	1407374883553280.0 - 2814749767106560.0
1125899906842624 - 2251799813685248	Large	2814749767106560.0 - 5629499534213120.0
2251799813685248 - 4503599627370496	Large	5629499534213120.0 - 11258999068426240.0
4503599627370496 - 9007199254740992	Large	11258999068426240.0 - 22517998136852480.0
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1267650600228229401496703205376 - 2535301200456458802993406410752	Large	3169126500570573503741758013440.0 - 6338253001141147007483516026880.0
2535301200456458802993406410752 - 5070602400912917605986812821504	Large	6338253001141147007483516026880.0 - 12676506002282294014967032053760.0
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10141204801825835211973625643008 - 20282409603651670423947251286016	Large	25353012004564588029934064107520.0 - 5070602400912917605986812

Bankfull Channel		
Material	Size Range (mm)	Count
silt/clay	0 - 0.062	98
very fine sand	0.062 - 0.125	
fine sand	0.125 - 0.25	
medium sand	0.25 - 0.5	
coarse sand	0.5 - 1	
very coarse sand	1 - 2	
very fine gravel	2 - 4	
fine gravel	4 - 6	
fine gravel	6 - 8	
medium gravel	8 - 11	
medium gravel	11 - 16	
coarse gravel	16 - 22	
coarse gravel	22 - 32	2
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
total particle count:		100
bedrock -----		
clay hardpan -----		
detritus/wood -----		
artificial -----		
total count:		100
Note:		

Bankfull Channel Pebble Count, UNT to Meadow River (2) (S-L26(2))



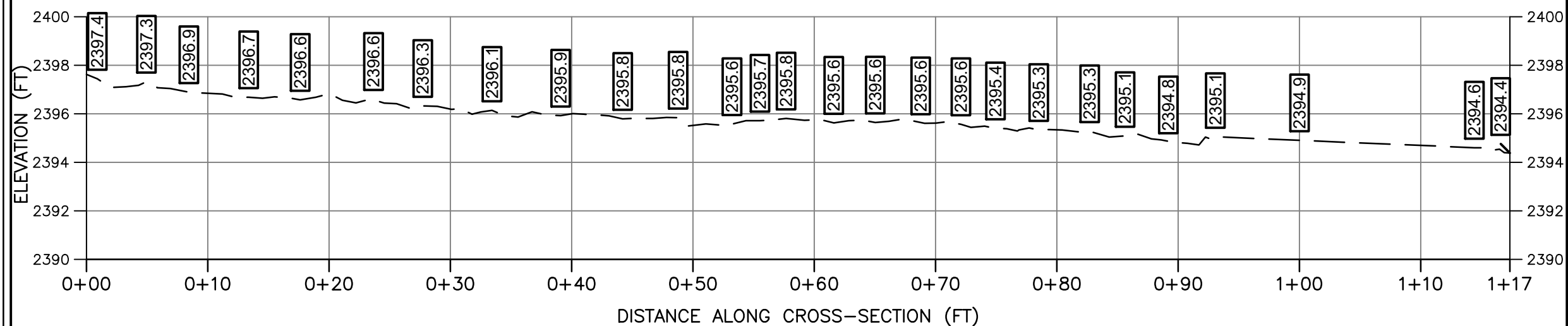
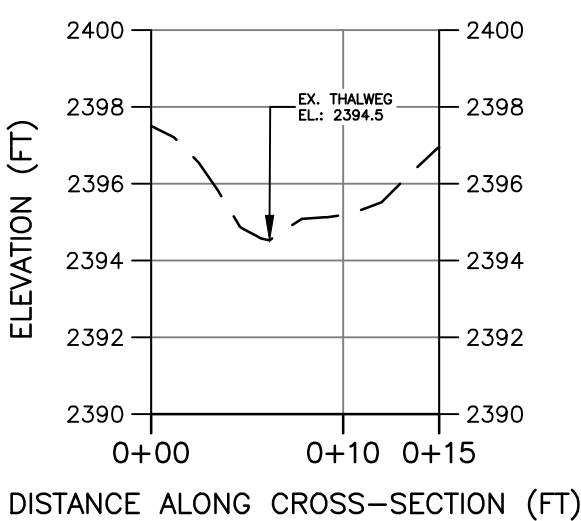
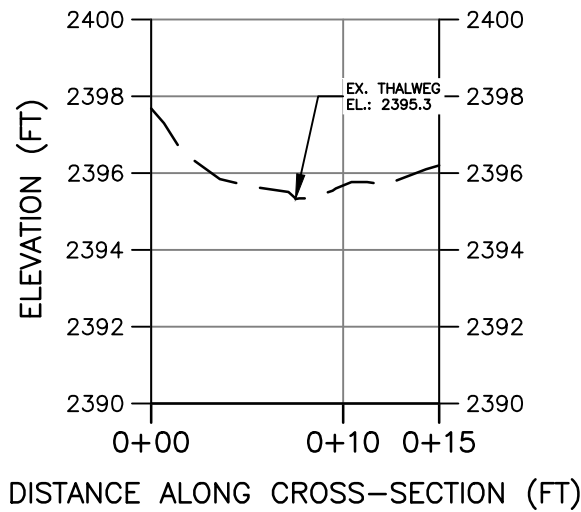
Size (mm)		Size Distribution		Type	
D16	0.062	mean	0.1	silt/clay	98%
D35	0.062	dispersion	1.0	sand	0%
D50	0.062	skewness	---	gravel	2%
D65	0.062			cobble	0%
D84	0.062			boulder	0%
D95	0.062				





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

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 15, 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.



**TYPICAL 5-POINT CROSS-SECTION**  
(FACING DOWNSTREAM)

TS-L TS-R

BS-L THW BS-R

TS: TOP OF SLOPE  
BS: BOTTOM OF SLOPE  
THW: THALWEG (INVERT)

AS-BUILT TABLE: S-L26 (2) CROSS SECTION A					
PRE-CROSSING			AS-BUILT		
PT. LOC.	NORTHING	EASTING	ELEV	VERT. DIFF.	HORZ. DIFF.
TS-L	13791635.3440	1711024.3870	2397.300'		
BS-L	13791637.5320	1711026.2610	2395.842'		
THW	13791640.6330	1711028.7510	2395.337'		
BS-R	13791642.1900	1711030.0000	2395.535'		
TS-R	13791645.8470	1711033.1180	2396.098'		


CROSS SECTION LEGEND
 EXISTING GRADE



PHOTO TAKEN LOOKING DOWNSTREAM  
FROM UPSTREAM IMPACT LIMITS



PHOTO TAKEN LOOKING UPSTREAM FROM  
DOWNSTREAM IMPACT LIMITS

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

**TETRA TECH**



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

le PROFILE AND CROSS-SECTIONS  
BASELINE SURVEY  
CROSSING S-L26 (2) - UNNAMED  
TO MEADOW RIVER (MP 144.18)  
GREENBRIER COUNTY, WV

1  
Drawing No.

# PRELIMINARY

File X:\CADD\Pittsburg\EST\7157 - MP\Crossing Permits\West Virginia WSSB Crossings\Crossings\GN - Completed\Completed\2021-09-15 - 3-129-2 STINEAM TOPO MP 144.18\9-129 - MP 144.18 - 22x34.dwg  
Date/Time: Oct 06, 2021 - 8:23am