Baseline Assessment – Stream Attributes

Reach S-H23 (Pipeline ROW)
Ephemeral
Spread I
Franklin County, Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	N/A – Slope less than 4%
RBP Physical Characteristics Form	✓
Water Quality Data	N/A – No flow
RBP Habitat Form*	✓
RBP Benthic Form	✓
Benthic Identification Sheet	N/A – No flow
Wolman Pebble Count	✓
RiverMorph Data Sheet	✓
USM Form (Virginia Only)	✓
Longitudinal Profile and Cross Sections	✓

*Modified RBP – no flow

Photo Type: US VIEW
Location, Orientation, Photographer Initials: Downstream at ROW/LOC looking NE upstream, VM

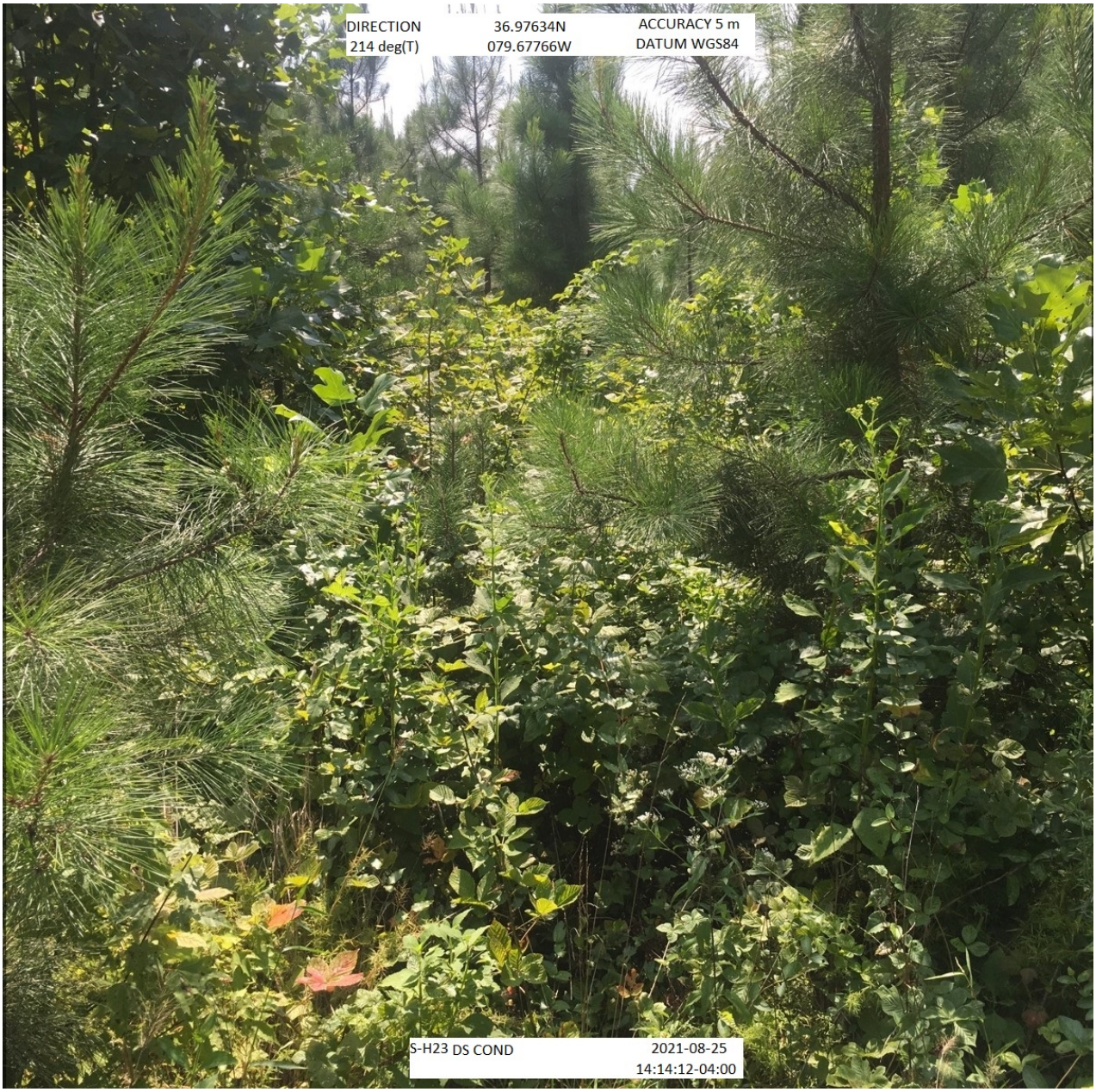


Photo Type: DS COND DS
Location, Orientation, Photographer Initials: Downstream at ROW/LOC looking SW downstream, VM

Photo Type: LB CL

Location, Orientation, Photographer Initials: On thalweg at pipe centerline looking SE at left streambank, VM

Photo Type: RB CL
Location, Orientation, Photographer Initials: On thalweg at pipe centerline looking NW at right streambank, VM

Photo Type: US COND
Location, Orientation, Photographer Initials: Upstream at ROW/LOC looking NE upstream, VM

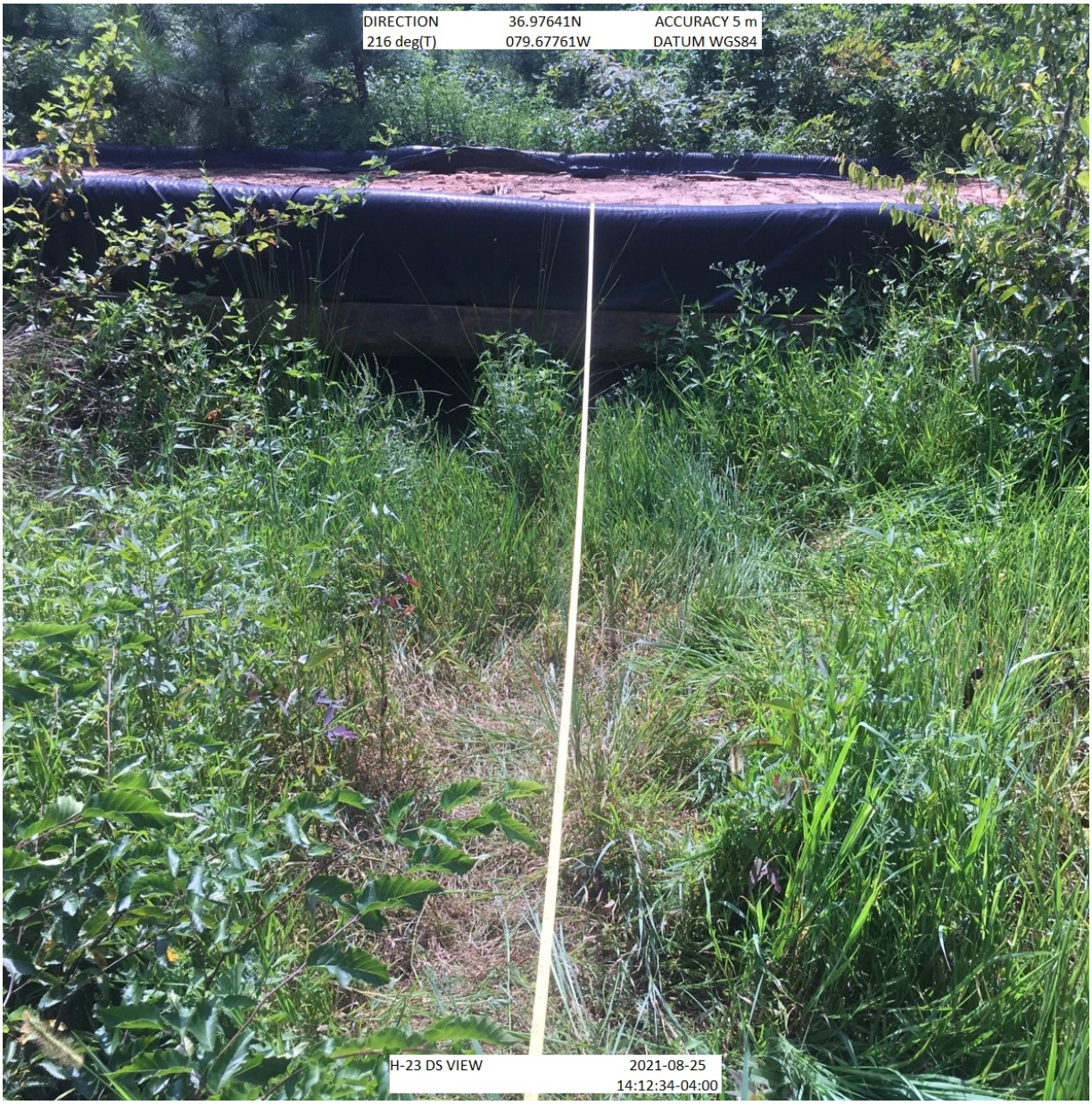


Photo Type: DS VIEW
Location, Orientation, Photographer Initials: Upstream at ROW/LOC looking SW downstream, VM

West Virginia Stream and Wetland Valuation Metric (SWVM)
Version 2.1, September 2017

USACE FILE NO./ Project Name: (v2.1, Sept 2015)	Mountain Valley Pipeline	IMPACT COORDINATES: (in Decimal Degrees)	Lat.	36.976421	Lon.	-79.677525	WEATHER:	Sunny	DATE:	8/25/2021
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size {acreage}, unaltered or impairments)	S-H23 / 9.68 ac	MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size {acreage}, unaltered or impairments)							Comments:	
STREAM IMPACT LENGTH:	92	FORM OF MITIGATION:	RESTORATION (Levels I-III)	MIT COORDINATES: (in Decimal Degrees)	Lat.		Lon.		PRECIPITATION PAST 48 HRS:	No	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:	Ephemeral			Stream Classification:				Stream Classification:	0			Stream Classification:	0			Stream Classification:	0		
Percent Stream Channel Slope	2.78			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):			
		Average				Average				Average				Average				Average	
Hydrology				Hydrology				Hydrology				Hydrology				Hydrology			
Biogeochemical Cycling		0		Biogeochemical Cycling		0		Biogeochemical Cycling		0		Biogeochemical Cycling		0		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**			
	Points Scale	Range	Site Score		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)			
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		0	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		15	2. Pool Substrate Characterization	0-20			2. Embeddedness	0-20			2. Embeddedness	0-20			2. Embeddedness	0-20		
3. Velocity/ Depth Regime	0-20		0	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		19	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	0-1	0	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		10	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		0	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		18	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		14	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		14	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		90	Total RBP Score	Poor		0	Total RBP Score	Poor		0	Total RBP Score	Poor		0	Total RBP Score	Poor		0
Sub-Total			0.75	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**			
100-199 - 85 points	0-90				0-90				0-90				0-90				0-90		
pH				**pH**				**pH**				**pH**				**pH**			
5.6-5.9 = 45 points	0-80	0-1			5-90	0-1			5-90	0-1			5-90	0-1			5-90	0-1	
DO				**DO**				**DO**				**DO**				**DO**			
	10-30				10-30				10-30				10-30				10-30		
Sub-Total				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)**			
0	0-100	0-1			0-100	0-1			0-100	0-1			0-100	0-1			0-100	0-1	
Sub-Total			0	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
0.775	92	71.3	0	0	0	0	0	0	0	0	0	0	0	0

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-H23	LOCATION Franklin County, Spread I	
STATION # _____ RIVERMILE 280.2	STREAM CLASS Ephemeral	
LAT 36.976421` LONG -79.677525	RIVER BASIN Upper Roanoke	
STORET #	AGENCY VADEQ	
INVESTIGATORS AJ, VM		
FORM COMPLETED BY AJ, VM	DATE 8-25-21 TIME 1400	REASON FOR SURVEY Baseline Assessment

WEATHER CONDITIONS

Now

100 %

- ☐ storm (heavy rain)
- ☐ rain (steady rain)
- ☐ showers (intermittent)
- ☐ %cloud cover
- ☑ clear/sunny

Past 24 hours

- ☐
- ☐
- ☐
- ☐
- ☑ ____%

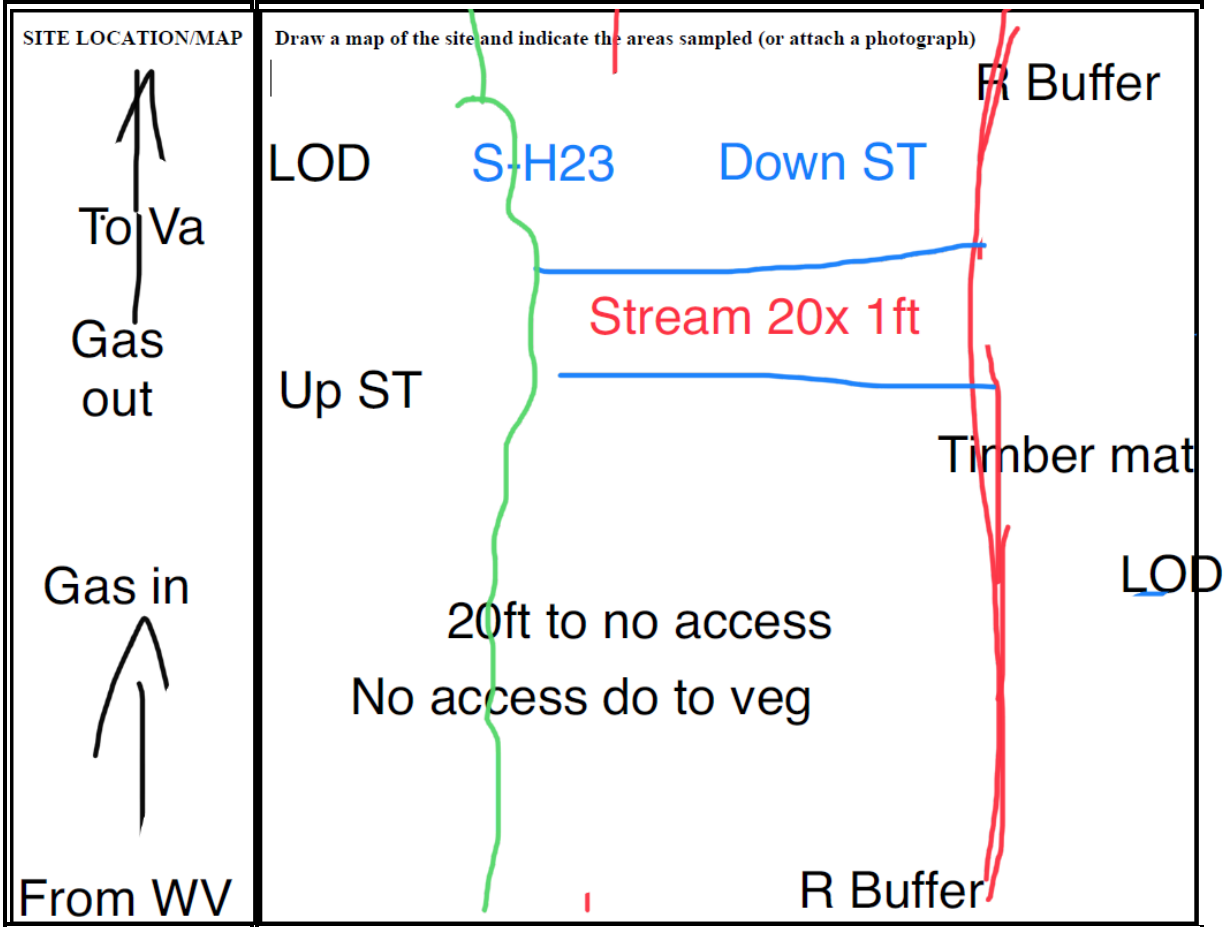
Has there been a heavy rain in the last 7 days? ☐ Yes ☑ No

Air Temperature 24 ^{0} C

Other _____

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
☐ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☑ Warmwater

Stream Origin
- ☐ Glacial
- ☐ Non-glacial montane
- ☐ Swamp and bog
- ☐ Spring-fed
- ☑ Mixture of origins
- ☐ Other_____

Catchment Area 0.04 km^2

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☑ Forest ☐ Commercial
☑ Field/Pasture ☐ Industrial
☐ Agricultural ☐ Other _____
☐ Residential

Local Watershed NPS Pollution
☑ No evidence ☐ Some potential sources
☐ Obvious sources

Local Watershed Erosion
☑ None ☐ Moderate ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☑ Trees ☑ Shrubs ☑ Grasses ☑ Herbaceous

Dominant species present Sycamore, American beech, rose, jewel weed, canary grass, smartweed, false nettle, willows daisies,

INSTREAM FEATURES

Estimated Reach Length 6.1 m

Estimated Stream Width 0.3 m

Sampling Reach Area 1.83 m^2

Area in km^2 (m^2x1000) _____ km^2

Estimated Stream Depth 0 m

Surface Velocity (at thalweg) NA m/sec

Canopy Cover
☐ Partly open ☐ Partly shaded ☐ Shaded

High Water Mark 0.3 m

Proportion of Reach Represented by Stream Morphology Types
Riffle NA % Run NA %
Pool NA %

Channelized ☐ Yes ☑ No

Dam Present ☐ Yes ☑ No

LARGE WOODY DEBRIS

LWD 0 m^2

Density of LWD _____ m^2/km^2 **(LWD/ reach area)**

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating
☐ Floating Algae ☐ Attached Algae

Dominant species present None

Portion of the reach with aquatic vegetation NA %

WATER QUALITY

Not enough water to sample

Temperature NA ^{0} C

Specific Conductance NA

Dissolved Oxygen NA

pH NA

Turbidity _____

WQ Instrument Used NA

Water Odors
☑ Normal/None ☐ Sewage
☐ Petroleum ☐ Chemical
☐ Fishy ☐ Other _____

Water Surface Oils
☐ Slick ☐ Sheen ☐ Globs Flecks
☑ None ☐ Other _____

Turbidity (if not measured)
☐ Clear ☐ Slightly turbid ☐ Turbid
☐ Opaque ☐ Stained ☐ Other _____

SEDIMENT/ SUBSTRATE

Odors
☑ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
☐ Other _____

Oils
☑ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand
☐ Relict shells ☐ Other _____

Looking at stones which are not deeply embedded, are the undersides black in color?
☐ Yes ☑ No

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)	0
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")				
Sand	0.06-2mm (gritty)	0	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	40			
Clay	< 0.004 mm (slick)	60			

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

STREAM NAME S-H23	LOCATION Franklin County, Spread I	
STATION #_____ RIVERMILE 280.2	STREAM CLASS Ephemeral	
LAT 36.976421 LONG -79.677525	RIVER BASIN Upper Roanoke	
STORET #	AGENCY VADEQ	
INVESTIGATORS AJ, VM		
FORM COMPLETED BY AJ, VM	DATE 8-25-21 TIME 0830 AM PM	REASON FOR SURVEY Baseline Assessment

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated in sampling reach	**1. Epifaunal Substrate/ Available Cover**	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 not new fall and not 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.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Embeddedness	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.
	SCORE 15	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Velocity/Depth Regime	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).
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	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.
	SCORE 19	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	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.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

NOTE: Modified RBP

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

	Habitat Parameter	Condition Category			
		Optimal	**Suboptimal**	**Marginal**	**Poor**
Parameters to be evaluated broader than sampling reach	**6. Channel Alteration**	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.
	SCORE 10	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	7. Frequency of Riffles (or bends)	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.
	SCORE 0	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	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.
	SCORE 9	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	SCORE 9	Right Bank 10 9	8 7 6	5 4 3	2 1 0
	9. Vegetative Protection (score each bank)	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 7	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	SCORE 7	Right Bank 10 9	8 7 6	5 4 3	2 1 0
	10. Riparian Vegetative Zone Width (score each bank riparian zone)	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 7	Left Bank 10 9	8 7 6	5 4 3	2 1 0
	SCORE 7	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 90

NOTE: Modified RBP

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME S-H23	LOCATION Franklin County, Spread I	
STATION # _____ RIVERMILE 280.2	STREAM CLASS Ephemeral	
LAT 36.976421 LONG -79.677525	RIVER BASIN Upper Roanoke	
STORET #	AGENCY VADEQ	
INVESTIGATORS AJ, VM		LOT NUMBER
FORM COMPLETED BY AJ, VM	DATE 8-25-21 TIME 1400	REASON FOR SURVEY Baseline Assessment

HABITAT TYPES	**Indicate the percentage of each habitat type present** ☐ Cobble_____% ☐ Snags_____% ☐ Vegetated Banks_____% ☐ Sand_____% ☐ Submerged Macrophytes_____% ☐ Other ( )_____%
SAMPLE COLLECTION	**Gear used** ☐ D-frame ☐ kick-net ☐ Other _____ **How were the samples collected?** ☐ wading ☐ from bank ☐ from boat **Indicate the number of jabs/kicks taken in each habitat type.** ☐ Cobble_____ ☐ Snags_____ ☐ Vegetated Banks_____ ☐ Sand_____ ☐ Submerged Macrophytes_____ ☐ Other ( )_____
GENERAL COMMENTS	No flow, cannot sample for benthics as this reach.

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						

WOLMAN PEBBLE COUNT FORM

County: Franklin County
Stream Name: UNT to
HUC Code: 03010101
Survey Date: 8/25/2021
Surveyors: AJ, VM
Type: Representative

Stream ID: S-H23
Basin: Upper Roanoke

PEBBLE COUNT							
Inches	PARTICLE	Millimeters		Particle Count	**Total #**	**Item %**	**% Cum**
	Silt/Clay	< .062	S/C		100	100.00	100.00
	Very Fine	.062-.125	SAND			0.00	100.00
	Fine	.125-.25				0.00	100.00
	Medium	.25-.5				0.00	100.00
	Coarse	.50-1.0				0.00	100.00
.04-.08	Very Coarse	1.0-2				0.00	100.00
.08 -.16	Very Fine	2 -4	GRAVEL			0.00	100.00
.16 - .22	Fine	4 -5.7				0.00	100.00
.22 - .31	Fine	5.7 - 8				0.00	100.00
.31 - .44	Medium	8 -11.3				0.00	100.00
.44 - .63	Medium	11.3 - 16				0.00	100.00
.63 - .89	Coarse	16 -22.6				0.00	100.00
.89 - 1.26	Coarse	22.6 - 32				0.00	100.00
1.26 - 1.77	Vry Coarse	32 - 45				0.00	100.00
1.77 -2.5	Vry Coarse	45 - 64				0.00	100.00
2.5 - 3.5	Small	64 - 90	COBBLE			0.00	100.00
3.5 - 5.0	Small	90 - 128				0.00	100.00
5.0 - 7.1	Large	128 - 180				0.00	100.00
7.1 - 10.1	Large	180 - 256				0.00	100.00
10.1 - 14.3	Small	256 - 362	BOULDER			0.00	100.00
14.3 - 20	Small	362 - 512				0.00	100.00
20 - 40	Medium	512 - 1024				0.00	100.00
40 - 80	Large	1024 -2048				0.00	100.00
80 - 160	Vry Large	2048 -4096				0.00	100.00
	Bedrock		BDRK			0.00	100.00
				Totals:	100		
	Total Tally:						

RIVERMORPH PARTICLE SUMMARY

River Name: UNT to Turkey Creek
Reach Name: S-H23
Sample Name: Representative
Survey Date: 08/25/2021

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	100	100.00	100.00
0.062 - 0.125	0	0.00	100.00
0.125 - 0.25	0	0.00	100.00
0.25 - 0.50	0	0.00	100.00
0.50 - 1.0	0	0.00	100.00
1.0 - 2.0	0	0.00	100.00
2.0 - 4.0	0	0.00	100.00
4.0 - 5.7	0	0.00	100.00
5.7 - 8.0	0	0.00	100.00
8.0 - 11.3	0	0.00	100.00
11.3 - 16.0	0	0.00	100.00
16.0 - 22.6	0	0.00	100.00
22.6 - 32.0	0	0.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.01
D35 (mm)	0.02
D50 (mm)	0.03
D84 (mm)	0.05
D95 (mm)	0.06
D100 (mm)	0.06
Silt/Clay (%)	100
Sand (%)	0
Gravel (%)	0
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

Total Particles = 100.

Ephemeral Stream Assessment Form (Form 1a)

Unified Stream Methodology for use in Virginia

For use in ephemeral streams

Project #	Project Name	Locality	Cowardin Class.	HUC	Date	SAR #	Impact Length	Impact Factor
22865.06	Mountain Valley Pipeline (Mountain Valley Pipeline, LLC)	ranklin Coun	R6	03010101	8-25-2021	S-H23	92	1

Name(s) of Evaluator(s)	Stream Name and Information	SAR Length
AJ, VM	Spread I; Franklin County, UNT to Turkey Creek	92

2. RIPARIAN BUFFERS: Assess both bank's 100 foot riparian areas along the entire SAR. (rough measurements of length & width may be acceptable)

Conditional Category								NOTES>>
	Optimal	Suboptimal		Marginal		Poor		
Riparian Buffers	Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands areas.	**High Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory.	**Low Suboptimal:** Riparian areas with tree stratum (dbh > 3 inches) present, with >30% tree canopy cover and a maintained understory. Recent cutover (dense vegetation).	**High Marginal:** Non-maintained, dense herbaceous vegetation with either a shrub layer or a tree layer (dbh > 3 inches) present, with <30% tree canopy cover.	**Low Marginal:** Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and tree stratum, hay production, ponds, open water. If present, tree stratum (dbh >3 inches) present, with <30% tree canopy cover with maintained understory.	**High Poor:** Lawns, mowed, and maintained areas, nurseries; no-till cropland; actively grazed pasture, sparsely vegetated non-maintained area, recently seeded and stabilized, or other comparable condition.	**Low Poor:** Impervious surfaces, mine spoil lands, denuded surfaces, row crops, active feed lots, trails, or other comparable conditions.	
		High	Low	High	Low	High	Low	
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

1. Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
2. Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
3. Enter the % Riparian Area and Score for each riparian category in the blocks below.

Ensure the sums of % Riparian Blocks equal 100

Right Bank	% Riparian Area>	100%						100%			
	Score >	0.85									
									CI= (Sum % RA * Scores*0.01)/2		
Left Bank	% Riparian Area>	100%						100%	Rt Bank CI >	0.85	CI
	Score >	0.85							Lt Bank CI >	0.85	0.85

REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH

NOTE: **The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number.**

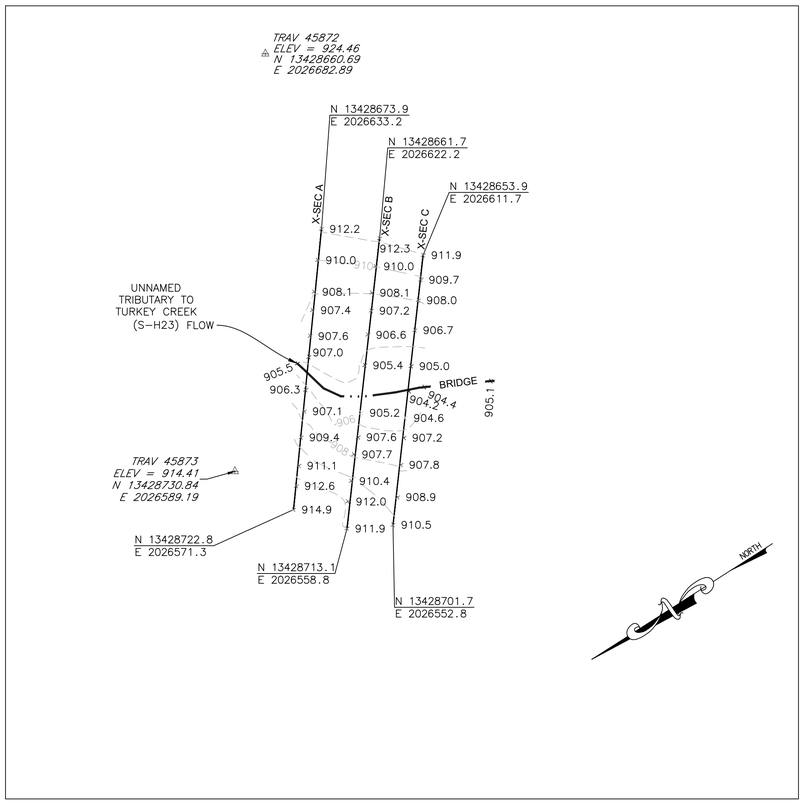
THE REACH CONDITION INDEX (RCI) >>	**0.43**
RCI= (Riparian CI)/2	
COMPENSATION REQUIREMENT (CR) >>	**40**
CR = RCI X LF X IF	

INSERT PHOTOS:

CAPTION. Assessment is limited to areas within the temporary ROW.

DESCRIBE PROPOSED IMPACT:

PROVIDED UNDER SEPARATE COVER

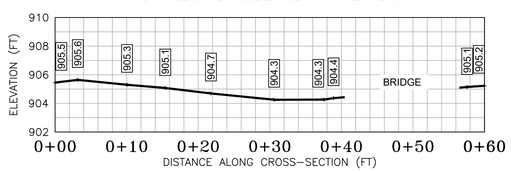


GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

S-H23 BASELINE THALWEG

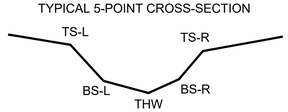


PROFILE LEGEND

EXISTING STREAM PROFILE
INVERT ALONG THALWEG

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

TYPICAL 5-POINT CROSS-SECTION



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

CL STAKEOUT POINTS: S-H23 CROSS SECTION B (PIPE CL)					
	PRE-CROSSING			POST-CROSSING	
PT. LOC.	NORTHING	EASTING	ELEV	VERT. DIFF.	HORZ. DIFF.
TS-L	13428684.29	2026594.58	905.37	----	----
BS-L	13428686.97	2026591.47	904.91	----	----
THW	13428689.40	2026587.85	904.68	----	----
BS-R	13428692.22	2026583.89	905.17	----	----
TS-R	13428696.65	2026578.65	907.58	----	----

LEGEND

- STUDY AREA (EASEMENT)
- EXISTING SURVEY-LOCATED THALWEG
- EW — EXISTING SURVEY-LOCATED EDGE OF WATER (AS NECESSARY)
- EXISTING CONTOUR LINE (MAJOR)
- EXISTING CONTOUR LINE (MINOR)
- 906.7 + EXISTING SURVEYED GROUND SHOT ELEVATION
- BENCHMARK POINT (WSSI)

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 a Real Time Network (RTN) GPS. Field locations were completed on December 4, 2018.

2. Monumentation, including traverse stations and fly points, shown on this drawing should be used to orient any future boundary, topographic, or location survey.

3. Easement lines shown on plan view were provided by Mountain Valley Pipeline (MVP).

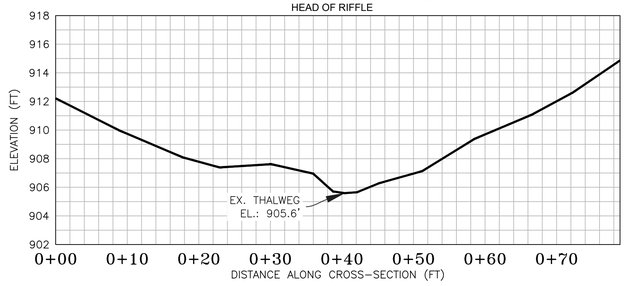
4. WSSI Contour Interval = 2.0'. Contours within the channel were interpolated using stream channel breaklines (i.e. top of slopes, toe of slopes, thalweg) and cross-sectional points. Contours outside the channel were interpolated using cross-sectional spot shots.

5. All section views shown are left to right facing downstream.

6. Cross-section B shot at location of pipe centerline (based on best professional judgement).

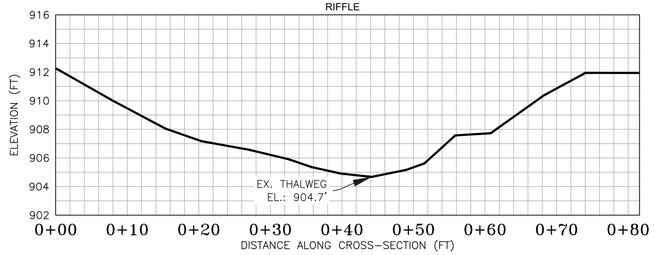
S-H23 BASELINE CROSS SECTION A

HEAD OF RIFFLE



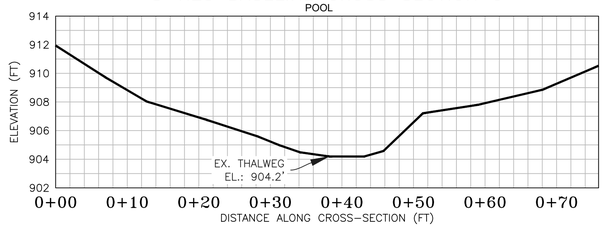
S-H23 BASELINE CROSS SECTION B

RIFFLE



S-H23 BASELINE CROSS SECTION C

POOL



CROSS SECTION
SCALE: H: 1"=10'
V: 1"=5'

CROSS SECTION LEGEND
EXISTING GRADE

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

PRE-CROSSING PHOTOS

PHOTO TAKEN LOOKING DOWNSTREAM ON 04/04/2018

PHOTO TAKEN LOOKING UPSTREAM ON 04/04/2018

PHOTO TAKEN LOOKING TOWARDS RIGHT BANK AT THE PROPOSED PIPE CENTERLINE ON 04/04/2018

PHOTO TAKEN LOOKING TOWARDS LEFT BANK AT THE PROPOSED PIPE CENTERLINE ON 04/04/2018

POST-CROSSING PHOTOS

PENDING CROSSING

PHOTO TAKEN LOOKING

PENDING CROSSING

PHOTO TAKEN LOOKING

PENDING CROSSING

PHOTO TAKEN LOOKING

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Profile and Cross-Sections Baseline Survey

Prepared For: MVP

Crossing S-H23 - UNT to Turkey Creek (MP 279.9)

Franklin County, Virginia

REVISIONS

No.	Date	Description	Rev. By	App. By

SCALE: AS NOTED

DATE: September, 2021

Horizontal Datum: NAD 1983 UTM ZONE 17N

Vertical Datum: NAVD 88

Boundary and Topo Source:
MVP
WSSI 2' C.I. Topo

Design	Draft	Approved
EJC	SIH	PFS

Sheet #
1 of 1

Computer File Name:
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