

# Baseline Assessment – Stream Attributes

*Revisit*

*\*Additional information was collected on 1/11/2022.*

## Reach S-MN11-Upstream (NE Upstream) (Temporary Access Road) Ephemeral Spread G Giles County, Virginia

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



Photo Type: DS VIEW

Location, Orientation, Photographer Initials: Upstream at LOD looking SW downstream, KB



Photo Type: US VIEW

Location, Orientation, Photographer Initials: Downstream at LOD looking NE upstream, KB





Photo Type: CL ACCESS 1

Location, Orientation, Photographer Initials: Standing in Access Road looking SE, KB



Photo Type: CL ACCESS 2

Location, Orientation, Photographer Initials: Standing in Access Road looking NW, KB

L:\22000s\22800\22865.06\Admin\05-ENVR\Field Data\Spread G\Field Forms\S-MN11 Upstream 15\1\_QAQC\Photo Document\_S-MN11 Upstream.docx





Photo Type: DS VIEW  
Location, Orientation, Photographer Initials: Downstream view of LOC looking S/SW, KB



Photo Type: US VIEW  
Location, Orientation, Photographer Initials: Upstream view of LOC looking E/NE, KB





Photo Type: CL ACCESS 1  
Location, Orientation, Photographer Initials: Standing in Access Road looking SE, KB



Photo Type: CL ACCESS 2



Location, Orientation, Photographer Initials: Standing in Access Road looking W/NW, KB



Photo Type: DS COND

Location, Orientation, Photographer Initials: Downstream conditions outside of LOC looking S/SW, KB

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USACE FILE NO/ Project Name: <small>(V2.1, Sept 2015)</small>		Mountain Valley Pipeline		IMPACT COORDINATES: (in Decimal Degrees)		Lat.	37.332191	Lon.	-80.559979	WEATHER:		Sunny		DATE:		January 11, 2022			
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: <small>(watershed size (acreage), unaltered or impairments)</small>				S-MN11 NE Upstream (0.02 acre)				MITIGATION STREAM CLASS/SITE ID AND SITE DESCRIPTION: <small>(watershed size (acreage), unaltered or impairments)</small>				Comments:							
STREAM IMPACT LENGTH:		15		FORM OF MITIGATION:		RESTORATION (Levels I-III)		MIT COORDINATES: (in Decimal Degrees)		Lat.		Lon.		PRECIPITATION PAST 48 HRS:		0.29"		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:			
Ephemeral								0				0				0			
Percent Stream Channel Slope				Percent Stream Channel Slope				Percent Stream Channel Slope				Percent Stream Channel Slope				Percent Stream Channel Slope			
22.4								0				0				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			
0				0				0				0				0			
Hydrology				Hydrology				Hydrology				Hydrology				Hydrology			
Biogeochemical Cycling				Biogeochemical Cycling				Biogeochemical Cycling				Biogeochemical Cycling				Biogeochemical Cycling			
0				0				0				0				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			
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 (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				1. Epifaunal Substrate/Available Cover				1. Epifaunal Substrate/Available Cover				1. Epifaunal Substrate/Available Cover				1. Epifaunal Substrate/Available Cover			
0-20				0-20				0-20				0-20				0-20			
0				0				0				0				0			
2. Embeddedness				2. Embeddedness				2. Embeddedness				2. Embeddedness				2. Embeddedness			
0-20				0-20				0-20				0-20				0-20			
10				10				10				10				10			
3. Velocity/Depth Regime				3. Velocity/Depth Regime				3. Velocity/Depth Regime				3. Velocity/Depth Regime				3. Velocity/Depth Regime			
0-20				0-20				0-20				0-20				0-20			
5				5				5				5				5			
4. Sediment Deposition				4. Sediment Deposition				4. Sediment Deposition				4. Sediment Deposition				4. Sediment Deposition			
0-20				0-20				0-20				0-20				0-20			
0				0				0				0				0			
5. Channel Flow Status				5. Channel Flow Status				5. Channel Flow Status				5. Channel Flow Status				5. Channel Flow Status			
0-20				0-20				0-20				0-20				0-20			
0-1				0-1				0-1				0-1				0-1			
0				0				0				0				0			
6. Channel Alteration				6. Channel Alteration				6. Channel Alteration				6. Channel Alteration				6. Channel Alteration			
0-20				0-20				0-20				0-20				0-20			
11				11				11				11				11			
7. Frequency of Riffles (or bends)				7. Frequency of Riffles (or bends)				7. Frequency of Riffles (or bends)				7. Frequency of Riffles (or bends)				7. Frequency of Riffles (or bends)			
0-20				0-20				0-20				0-20				0-20			
0				0				0				0				0			
8. Bank Stability (LB & RB)				8. Bank Stability (LB & RB)				8. Bank Stability (LB & RB)				8. Bank Stability (LB & RB)				8. Bank Stability (LB & RB)			
0-20				0-20				0-20				0-20				0-20			
20				20				20				20				20			
9. Vegetative Protection (LB & RB)				9. Vegetative Protection (LB & RB)				9. Vegetative Protection (LB & RB)				9. Vegetative Protection (LB & RB)				9. Vegetative Protection (LB & RB)			
0-20				0-20				0-20				0-20				0-20			
16				16				16				16				16			
10. Riparian Vegetative Zone Width (LB & RB)				10. Riparian Vegetative Zone Width (LB & RB)				10. Riparian Vegetative Zone Width (LB & RB)				10. Riparian Vegetative Zone Width (LB & RB)				10. Riparian Vegetative Zone Width (LB & RB)			
0-20				0-20				0-20				0-20				0-20			
10				10				10				10				10			
Total RBP Score				Total RBP Score				Total RBP Score				Total RBP Score				Total RBP Score			
Suboptimal				Poor				Poor				Poor				Poor			
72				0				0				0				0			
Sub-Total				Sub-Total				Sub-Total				Sub-Total				Sub-Total			
0.6				0				0				0				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			
pH				pH				pH				pH				pH			
5.6-5.9 = 45 points				0-80				0-80				0-80				0-80			
DO				DO				DO				DO				DO			
10-30				10-30				10-30				10-30				10-30			
Sub-Total				Sub-Total				Sub-Total				Sub-Total				Sub-Total			
0				0				0				0				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				0-100				0-100				0-100			
0-1				0-100				0-100				0-100				0-100			
0				0				0				0				0			
Sub-Total				Sub-Total				Sub-Total				Sub-Total				Sub-Total			
0				0				0				0				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				Index				Index				Index				Index			
Linear Feet				Linear Feet				Linear Feet				Linear Feet				Linear Feet			
Unit Score				Unit Score				Unit Score				Unit Score				Unit Score			
0.700				15				10.5				0				0			
0				0				0				0				0			

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

STREAM NAME S-MN11 NE Upstream	LOCATION Giles County	
STATION # AR-242.01 RIVERMILE _____	STREAM CLASS Ephemeral	
LAT 37.332869 LONG -80.559168	RIVER BASIN Middle New	
STORET # _____	AGENCY VADEQ	
INVESTIGATORS KB AB		
FORM COMPLETED BY <b>KB</b>	DATE 1/11/22 TIME 1:00 PM	REASON FOR SURVEY Baseline Assessment

<b>WEATHER CONDITIONS</b>	<p><b>Now</b></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <input type="checkbox"/> storm (heavy rain)  <input type="checkbox"/> rain (steady rain)  <input type="checkbox"/> showers (intermittent)  <input type="checkbox"/> %cloud cover _____  <input checked="" type="checkbox"/> clear/sunny         </div> <div style="width: 45%;"> <p><b>Past 24 hours</b></p> <input type="checkbox"/> storm (heavy rain)  <input type="checkbox"/> rain (steady rain)  <input type="checkbox"/> showers (intermittent)  <input type="checkbox"/> %cloud cover _____  <input checked="" type="checkbox"/> clear/sunny         </div> </div> <p>Has there been a heavy rain in the last 7 days?  <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Air Temperature <u>-3.9</u> °C</p> <p>Other _____</p>	
<b>SITE LOCATION/MAP</b>	<p>Draw a map of the site and indicate the areas sampled (or attach a photograph)</p>	
<b>STREAM CHARACTERIZATION</b>	<p><b>Stream Subsystem</b>  <input type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal</p> <p><b>Stream Origin</b>  <input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed  <input type="checkbox"/> Non-glacial montane <input checked="" type="checkbox"/> Mixture of origins  <input type="checkbox"/> Swamp and bog <input type="checkbox"/> Other _____</p> <p><b>Stream Type</b>  <input type="checkbox"/> Coldwater <input checked="" type="checkbox"/> Warmwater</p> <p><b>Catchment Area</b> 0.09 km<sup>2</sup></p>	



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

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input checked="" type="checkbox"/> Forest <input 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 type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources <b>Local Watershed Erosion</b> <input 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 checked="" type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous <b>Dominant species present</b> <u>Quercus alba</u>	
<b>INSTREAM FEATURES</b>	<b>Estimated Reach Length</b> <u>4.5</u> m <b>Estimated Stream Width</b> <u>0.5</u> m <b>Sampling Reach Area</b> <u>3.75</u> 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> <u>0</u> m <b>Surface Velocity (at thalweg)</b> <u>N/A</u> m/sec	<b>Canopy Cover</b> <input type="checkbox"/> Partly open <input checked="" type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded <b>High Water Mark</b> _____ m <b>Proportion of Reach Represented by Stream Morphology Types</b> Riffle _____%      Run <u>100</u> % Pool _____% <b>Channelized</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <b>Dam Present</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>LARGE WOODY DEBRIS</b>	<b>LWD</b> <u>0</u> m <sup>2</sup> <b>Density of LWD</b> <u>0</u> 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 type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae <b>Dominant species present</b> <u>N/A</u> <b>Portion of the reach with aquatic vegetation</b> <u>0</u> %	
<b>WATER QUALITY</b>	<b>Temperature</b> <u>N/A</u> °C <b>Specific Conductance</b> <u>N/A</u> <b>Dissolved Oxygen</b> <u>N/A</u> <b>pH</b> <u>N/A</u> <b>Turbidity</b> <u>N/A</u> <b>WQ Instrument Used</b> <u>N/A</u>	<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      Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____ <b>Turbidity (if not measured)</b> <input type="checkbox"/> Clear <input type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____
<b>SEDIMENT/SUBSTRATE</b>	<b>Odors</b> <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input 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	<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 type="checkbox"/> Other _____ <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

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)	75
Boulder	> 256 mm (10")	5			
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)	30	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	30			
Clay	< 0.004 mm (slick)	25			

Note: Low flow conditions, thus water quality parameters were not assessed.

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

STREAM NAME S-MN11 NE Upstream	LOCATION Giles County	
STATION # <u>AR-242.01</u> RIVERMILE _____	STREAM CLASS Ephemeral	
LAT <u>37.332869</u> LONG <u>-80.559168</u>	RIVER BASIN Middle New	
STORET # _____	AGENCY VADEQ	
INVESTIGATORS KB AB		
FORM COMPLETED BY KB	DATE <u>1/11/22</u> TIME <u>1:00 PM</u> AM PM	REASON FOR SURVEY Baseline Assessment

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	<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 0</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 10</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 0</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 5</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 0</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Notes: Culvert outfall above stream reach. Stream reach covered by TMB within LOD. Visual observations made from within ROW. Low flow conditions were observed.



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

Habitat Parameter	Condition Category																			
	Optimal					Suboptimal					Marginal					Poor				
<b>6. Channel Alteration</b>  SCORE 11	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
<b>7. Frequency of Riffles (or bends)</b>  SCORE 0	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
<b>8. Bank Stability (score each bank)</b>  Note: determine left or right side by facing downstream. SCORE 10 SCORE 10	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 8 SCORE 8	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 5 SCORE 5	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** 72

Notes: Culvert outfall above stream reach. Stream reach covered by TMB within LOD. Visual observations made from within ROW. Low flow conditions were observed.

## BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME S-MN11 NE Upstream		LOCATION Giles County	
STATION # <u>AR-242.01</u> RIVERMILE _____		STREAM CLASS Ephemeral	
LAT <u>37.332869</u> LONG <u>-80.559168</u>		RIVER BASIN Middle New	
STORET # _____		AGENCY VADEQ	
INVESTIGATORS KB AB			LOT NUMBER _____
FORM COMPLETED BY <b>KB</b>		DATE <u>1/11/22</u> TIME <u>1:00 PM</u>	REASON FOR SURVEY Baseline 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>	Note: Not collected due to low flow conditions and inadequate riffle habitat.

### 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						





RIVERMORPH PARTICLE SUMMARY

-----  
 River Name: UNT to Sinking Creek S-  
 Reach Name: MN11 NE Upstream  
 Sample Name: Representative Bankfull  
 Survey Date: 01/11/2022  
 -----

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	27	27.00	27.00
0.062 - 0.125	17	17.00	44.00
0.125 - 0.25	20	20.00	64.00
0.25 - 0.50	18	18.00	82.00
0.50 - 1.0	5	5.00	87.00
1.0 - 2.0	7	7.00	94.00
2.0 - 4.0	0	0.00	94.00
4.0 - 5.7	0	0.00	94.00
5.7 - 8.0	0	0.00	94.00
8.0 - 11.3	0	0.00	94.00
11.3 - 16.0	0	0.00	94.00
16.0 - 22.6	0	0.00	94.00
22.6 - 32.0	0	0.00	94.00
32 - 45	0	0.00	94.00
45 - 64	0	0.00	94.00
64 - 90	0	0.00	94.00
90 - 128	0	0.00	94.00
128 - 180	0	0.00	94.00
180 - 256	0	0.00	94.00
256 - 362	4	4.00	98.00
362 - 512	2	2.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00
D16 (mm)	0.04		
D35 (mm)	0.09		
D50 (mm)	0.16		
D84 (mm)	0.7		
D95 (mm)	282.5		
D100 (mm)	511.99		
Silt/Clay (%)	27		
Sand (%)	67		
Gravel (%)	0		
Cobble (%)	0		
Boulder (%)	6		
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)	Giles County	R6	05050002	8/18/21	S-MN11-Upstream (Upstream NE)	15	1
Name(s) of Evaluator(s)		Stream Name and Information					SAR Length	
KB/TC		UNT to Sinking Creek					15	

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 a 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
Condition Scores	1.5	1.2	1.1	0.85	0.75	0.6	0.5	

- Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors.
- Determine square footage for each by measuring or estimating length and width. Calculators are provided for you below.
- 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>	90%	10%					100%
	Score >	0.5	0.75					
Left Bank	% Riparian Area>	90%	10%					100%
	Score >	0.5	0.75					

CI= (Sum % RA \* Scores\*0.01)/2

Rt Bank CI >	0.53	CI
Lt Bank CI >	0.53	0.53

## 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) >> 0.27

RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >> 4

CR = RCI X LF X IF

### INSERT PHOTOS:

(WSSI Photo Location "L:\22000s\22800\22865.06\Admin\05-ENVR\Field Data\Spread G\Field Forms\S-MN11 Upstream 15\Photos\S-MN11 Upstream 15\_2021-08-18\_12-42-47.jpg")



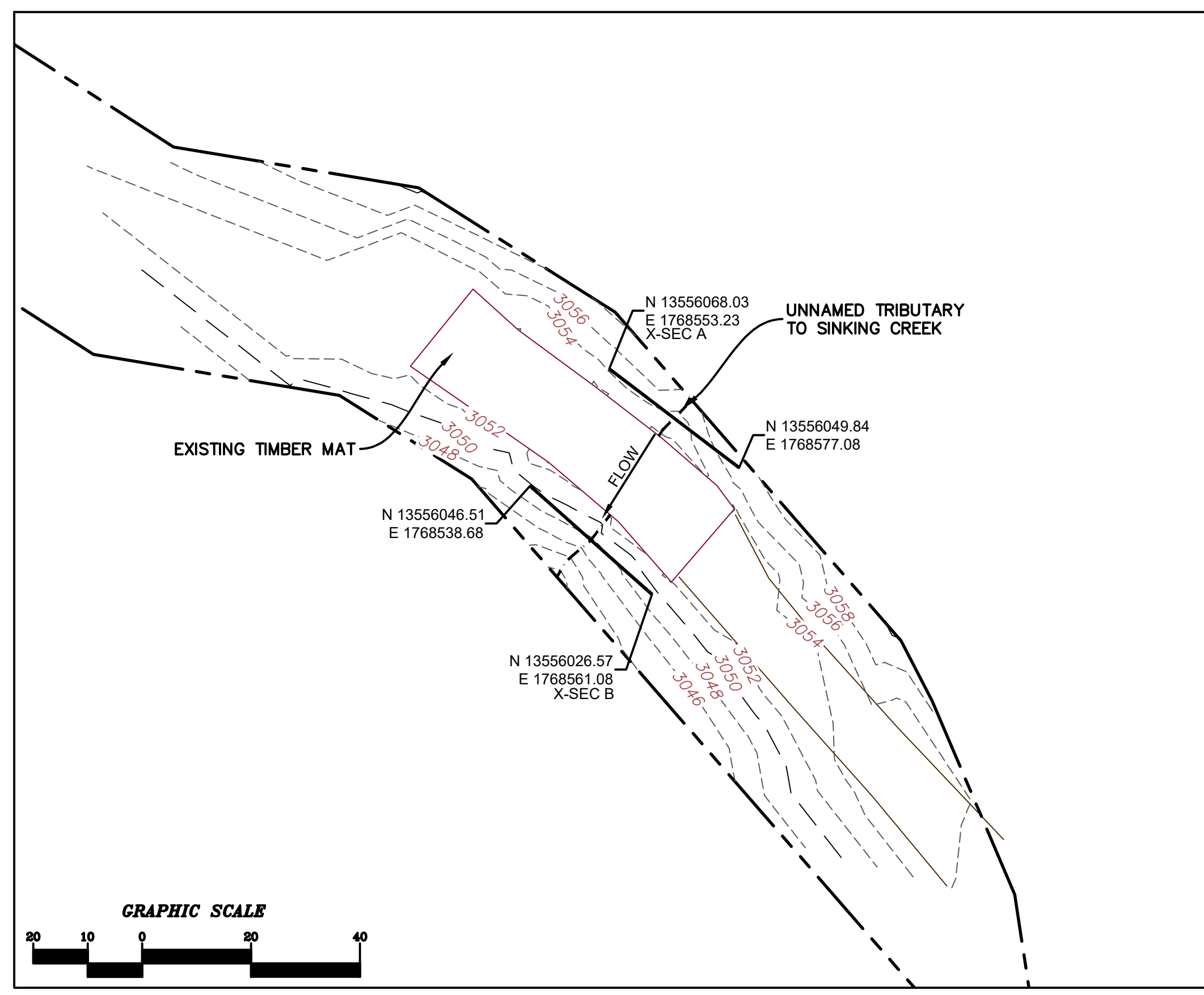
Standing in Access Road looking SE. Assessment is limited to areas within the temporary ROW.

**DESCRIBE PROPOSED IMPACT:**

<p><b>PROVIDED UNDER SEPARATE COVER</b></p>
---



No.	Date	Eng.	Revision



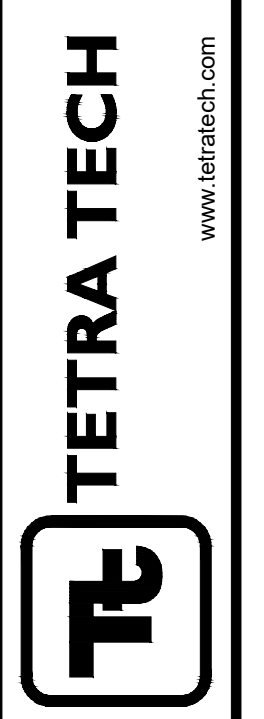
### LEGEND

- STUDY AREA (EASEMENT)
- EXISTING SURVEY-LOCATED THALWEG
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

- SURVEY NOTES:**
- 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 OCTOBER 15, 2021.
  - EASEMENT LINES SHOWN ON PLAN VIEW WERE PROVIDED BY MOUNTAIN VALLEY PIPELINE.
  - 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.
  - ALL SECTION VIEWS SHOWN LEFT TO RIGHT FACING DOWNSTREAM.

CAD File No.  
JZ  
Drawn  
GH  
Checked  
DW  
Approved  
NOTED  
Scale:  
SEPT. 2021  
Date:  
1121C07157  
Project No.

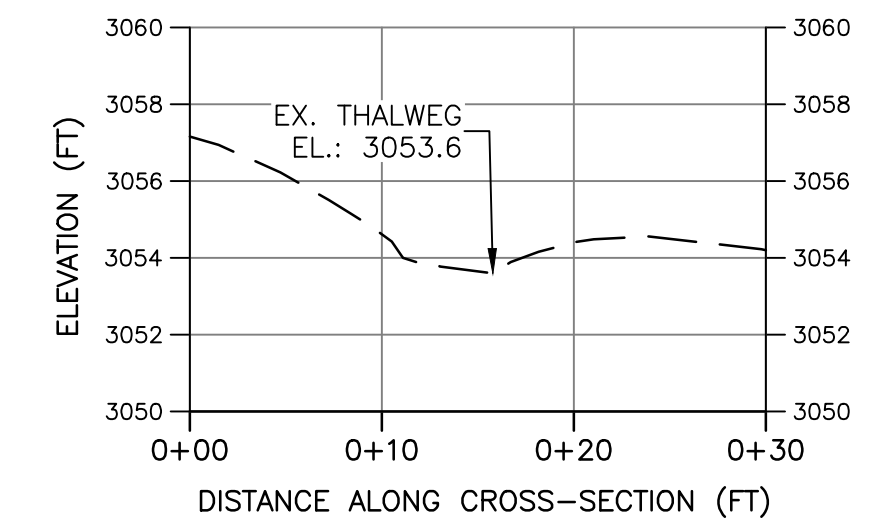
TETRA TECH, INC.  
681 ANDERSEN DRIVE FOSTER PLAZA 7  
PITTSBURGH, PA 15220  
TEL: (412) 921-7000 FAX: (412) 921-4040  
E-Mail Address: WWW.TETRA TECH.COM



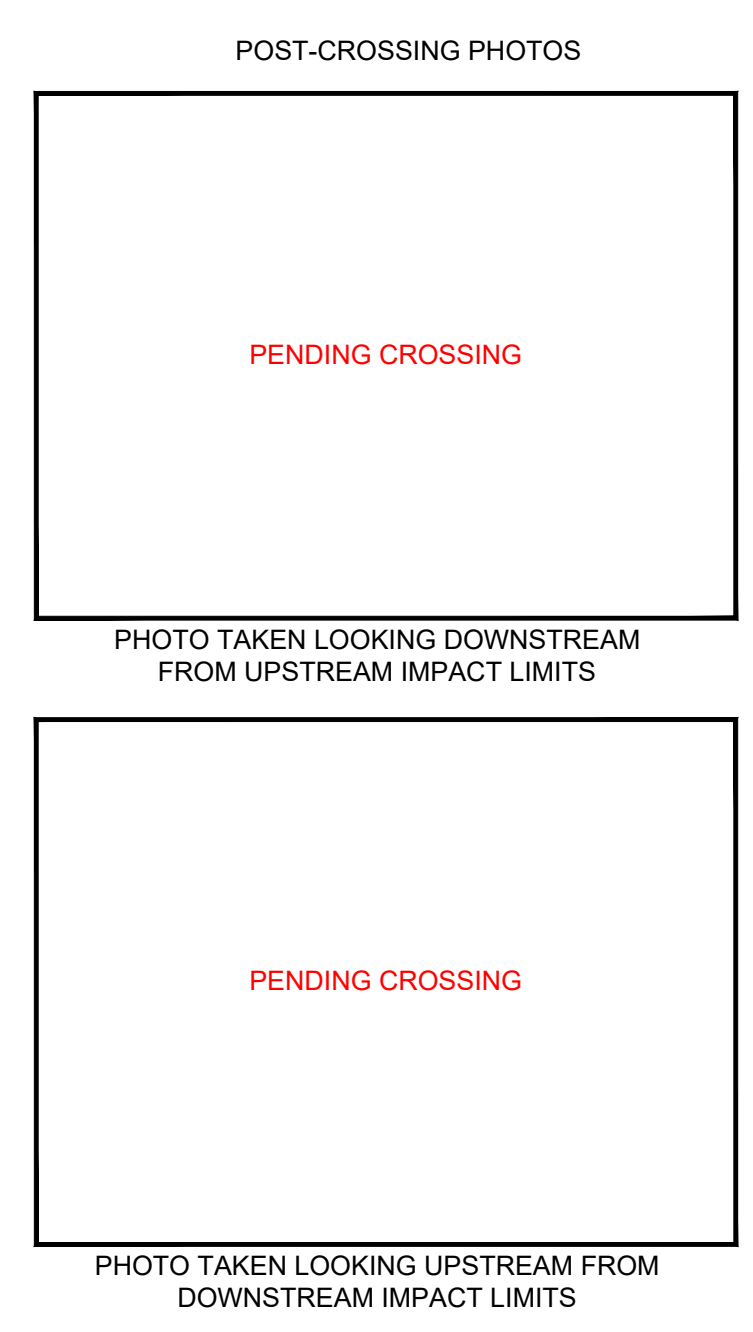
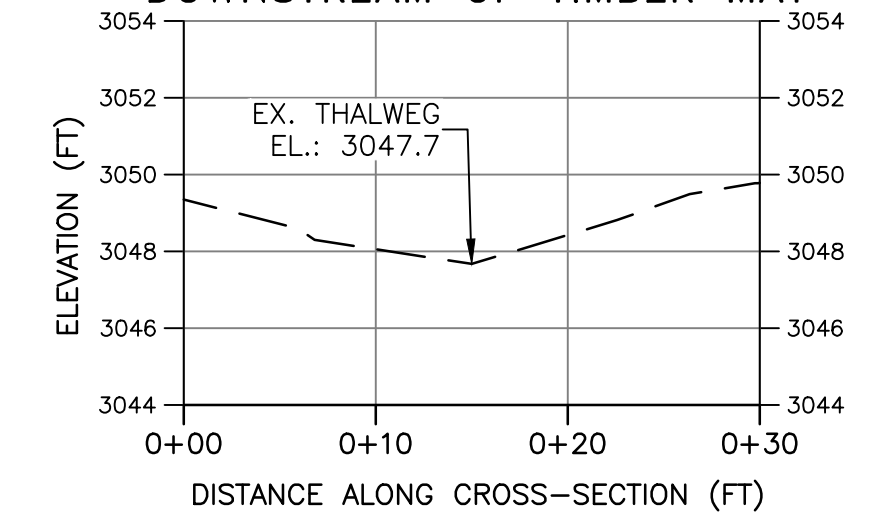
Client:  
MOUNTAIN VALLEY PIPELINE, LLC  
2200 ENERGY DRIVE, 2ND FLOOR  
CANONSBURG, PA 15317

Title: PROFILE AND CROSS-SECTIONS  
BASELINE SURVEY  
CROSSING S-MN11 NORTH - UNNAMED TRIB.  
TO SINKING CREEK (MP 208.00)  
GILES COUNTY, VA

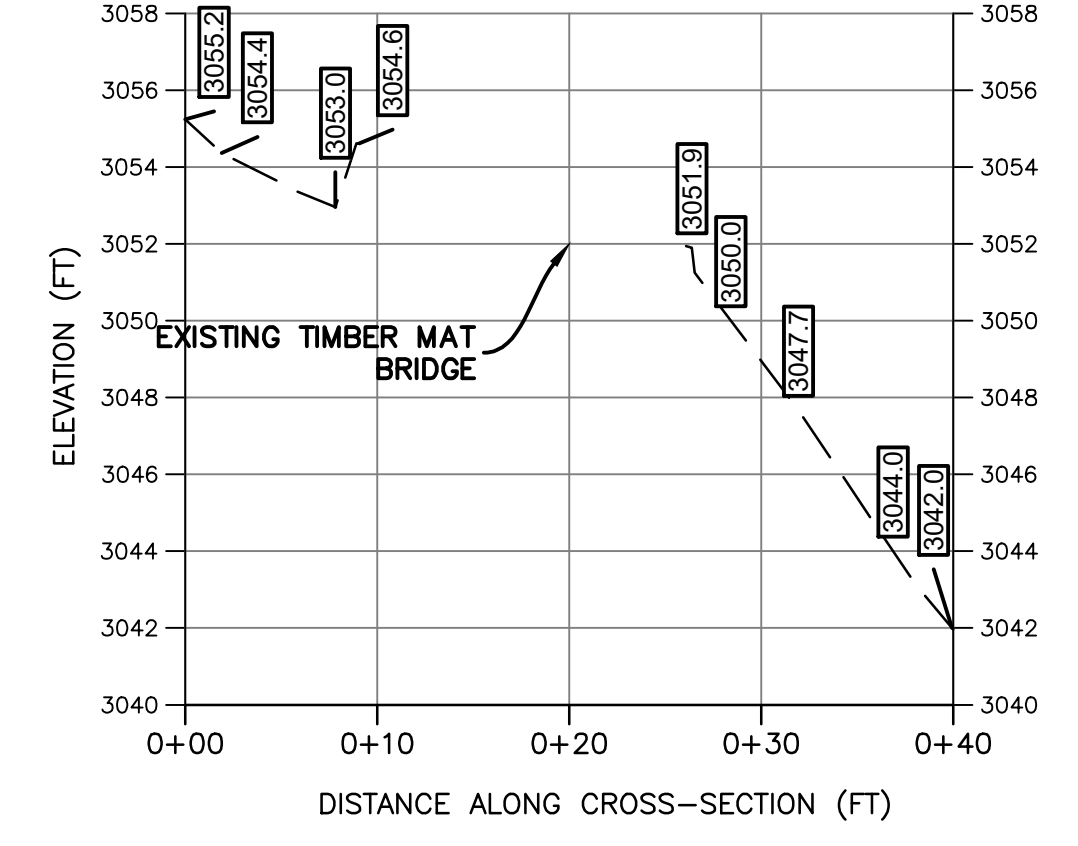
**S-MN11 NORTH BASELINE CROSS-SECTION A  
UPSTREAM OF TIMBER MAT**



**S-MN11 NORTH BASELINE CROSS-SECTION B  
DOWNSTREAM OF TIMBER MAT**



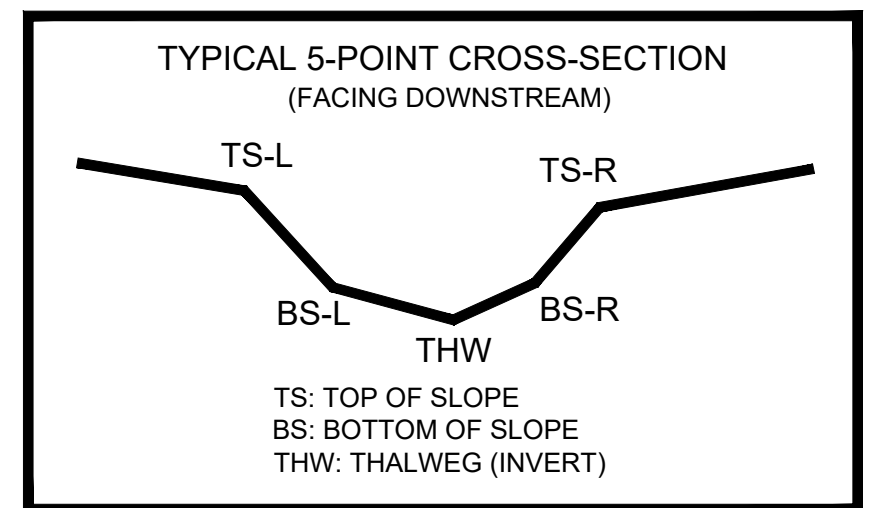
**S-MN11 NORTH BASELINE THALWEG PROFILE**



**PROFILE LEGEND**

EXISTING STREAM PROFILE  
 INVERT ALONG THALWEG

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



CL STAKEOUT POINTS: S-MN11 N. CROSS SECTION B (DOWNSTREAM)

PT. LOC.	PRE-CROSSING			POST-CROSSING	
	NORTHING	EASTING	ELEV	VERT. DIFF.	HORZ. DIFF.
TS-L	13556028.3800'	1768565.8970'	3052.265'		
BS-L	-	-	-		
THW	13556040.8500'	1768553.1490'	3051.247'		
BS-R	-	-	-		
TS-R	13556044.4100'	1768546.6600'	3051.193'		

**CROSS SECTION LEGEND**

EXISTING GRADE

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

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

File: I:\CADD\Projects\2107 - MP Crossing Permit\Map\_Vegline\_1888\_Crossing\Crossing\_Vegline\_Map\_S-MN11\_NORTH\_STREAM.dwg, MP 208 - 2208.dwg  
 Plot Date: 09/21/2021 11:53am  
 Plot Scale: 1"=100'