Baseline Assessment – Stream Attributes

Reach S-CV19 (Pipeline ROW)
Perennial
Spread F
Monroe County, West Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	N/A – Perennial stream (not shadeable)
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	✓

*No suitable habitat for benthic sample.

37.500284º N, -80.691498º W

Photo Type: US Riffle XCS, US View
Location, Orientation, Photographer Initials: Upstream Riffle Cross Section, Upstream View, AK/TA/SM

37.500284º N, -80.691498º W

Photo Type: US Riffle XCS, DS View
Location, Orientation, Photographer Initials: Upstream Riffle Cross Section, Downstream View, AK/TA/SM

Photo Type: CP, US View
Location, Orientation, Photographer Initials: Center ROW, Upstream View, AK/TA/SM

Photo Type: CP, DS View
Location, Orientation, Photographer Initials: Center ROW, Downstream View, AK/TA/SM

Photo Type: DS Pool XCS, US View
Location, Orientation, Photographer Initials: Downstream Pool Cross Section, Upstream View, AK/TA/SM

Photo Type: DS Pool XCS, DS View
Location, Orientation, Photographer Initials: Downstream Pool Cross Section, Downstream View, AK/TA/SM

"Q:\Charleston\2021 Projects\21-0244- MVP- STREAM AND WETLAND CONDITIONS ASSESSMENT AND SURVEY PLAN\002 - Pre-Crossing Monitoring\Spread F\S-CV19"

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.	37.500284	Lon.	-80.691498	WEATHER:	Clear/Sunny 70 °F	DATE:	9/3/21
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size {acreage}, unaltered or impairments)	S-CV19 Hans Creek	MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size {acreage}, unaltered or impairments)							Comments:	
STREAM IMPACT LENGTH:	77	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	3.9			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	17	1. Epifaunal Substrate/Available Cover	0-20	0-1		1. Epifaunal Substrate/Available Cover	0-20	0-1		1. Epifaunal Substrate/Available Cover	0-20	0-1		1. Epifaunal Substrate/Available Cover	0-20	0-1	
2. Embeddedness	0-20		16	2. Pool Substrate Characterization	0-20			2. Embeddedness	0-20			2. Embeddedness	0-20			2. Embeddedness	0-20		
3. Velocity/ Depth Regime	0-20		10	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		13	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		16	5. Channel Flow Status	0-20			5. Channel Flow Status	0-20			5. Channel Flow Status	0-20			5. Channel Flow Status	0-20		
6. Channel Alteration	0-20		20	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		9	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		17	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		18	9. Vegetative Protection (LB & RB)	0-20			9. Vegetative Protection (LB & RB)	0-20			9. Vegetative Protection (LB & RB)	0-20			9. Vegetative Protection (LB & RB)	0-20		
10. Riparian Vegetative Zone Width (LB & RB)	0-20		12	10. Riparian Vegetative Zone Width (LB & RB)	0-20			10. Riparian Vegetative Zone Width (LB & RB)	0-20			10. Riparian Vegetative Zone Width (LB & RB)	0-20			10. Riparian Vegetative Zone Width (LB & RB)	0-20		
Total RBP Score	Suboptimal		148	Total RBP Score	Poor		0	Total RBP Score	Poor		0	Total RBP Score	Poor		0	Total RBP Score	Poor		0
Sub-Total			0.74	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			
300-399 - 70 points	0-90	0-1	331.8		0-90	0-1			0-90	0-1			0-90	0-1			0-90	0-1	
pH				pH				pH				pH				pH			
6.0-8.0 = 80 points	0-80		7.95		5-90				5-90				5-90				5-90		
DO				DO				DO				DO				DO			
>5.0 = 30 points	10-30		7.79		10-30				10-30				10-30				10-30		
Sub-Total			0.9	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
0.820	77	63.14	0	0	0	0	0	0	0	0	0	0	0	0

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-CV19	LOCATION Hans Creek / Spread F	
STATION # _____ RIVERMILE _____	STREAM CLASS Perennial	
LAT 37.500284 LONG -80.691498	COUNTY Monroe	
STORET #	AGENCY Potesta/Edge	
INVESTIGATORS ABR/TA/SM		
FORM COMPLETED BY A. Kincaid	DATE 09/03/2021 TIME 1030	REASON FOR SURVEY Preliminary Assessment

WEATHER CONDITIONS

Now: ____% — ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☐ %cloud cover ☑ clear/sunny

Past 24 hours: ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☐ %cloud cover ☑ clear/sunny ____%

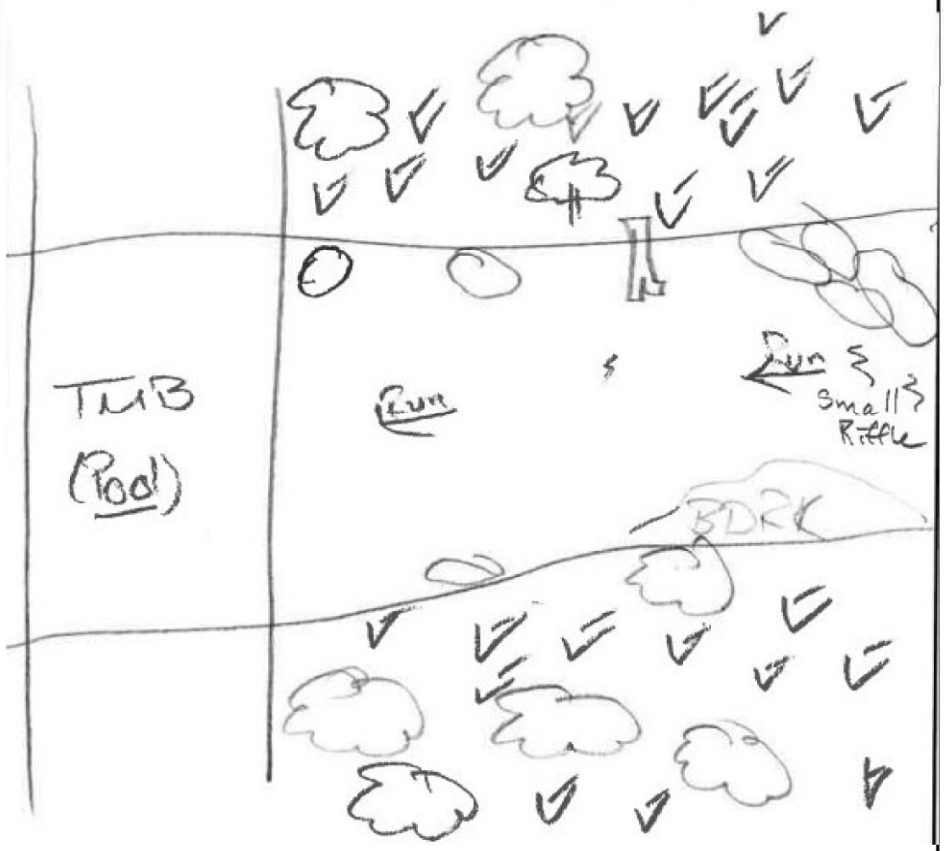
Has there been a heavy rain in the last 7 days? ☑ Yes ☐ No

Air Temperature 70 F ° 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 _____ km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- [x] Forest
- [ ] Field/Pasture
- [ ] Agricultural
- [ ] Residential
- [ ] Commercial
- [ ] Industrial
- [x] Other: located in Pipeline ROW

Local Watershed NPS Pollution
- [ ] No evidence
- [x] Some potential sources
- [ ] Obvious sources

Local Watershed Erosion
- [x] None
- [ ] Moderate
- [ ] Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- [ ] Trees
- [ ] Shrubs
- [x] Grasses
- [ ] Herbaceous

Dominant species present _____

INSTREAM FEATURES

Estimated Reach Length 75 ft m

Estimated Stream Width 25 ft m

Sampling Reach Area 1875 ft^2 m^2

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

Estimated Stream Depth 3.0 ft m

Surface Velocity (at thalweg) 0 m/sec

Stream Dry [ ]

Canopy Cover
- [x] Partly open
- [ ] Partly shaded
- [ ] Shaded

High Water Mark _____ m

Proportion of Reach Represented by Stream Morphology Types

Riffle 10 % Run 40 % Pool 50 %

Channelized
- [ ] Yes
- [x] No

Dam Present
- [ ] Yes
- [x] No

LARGE WOODY DEBRIS

LWD 0 m^2

Density of LWD 0 m^2/km^2 **(LWD/ reach area)** N/A

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- [ ] Rooted emergent
- [ ] Rooted submergent
- [ ] Rooted floating
- [ ] Free floating
- [ ] Floating Algae
- [x] Attached Algae

Dominant species present _____

Portion of the reach with aquatic vegetation 25 %

WATER QUALITY

Temperature 16.7 °C

Specific Conductance 331.8 us/cm

Dissolved Oxygen 7.79 mg/L

pH 7.95 su

Turbidity 6.80 ntu

WQ Instrument Used YSI/Turbidity Meter

Water Odors
- [x] Normal/None
- [ ] Sewage
- [ ] Petroleum
- [ ] Chemical
- [ ] Fishy
- [ ] Other: _____

Water Surface Oils
- [ ] Slick
- [ ] Sheen
- [ ] Globs
- [ ] Flecks
- [x] None
- [ ] Other: _____

Turbidity (if not measured)
- [ ] Clear
- [x] Slightly turbid
- [ ] Turbid
- [ ] Opaque
- [ ] Stained
- [ ] Other: _____

SEDIMENT/ SUBSTRATE

Odors
- [x] Normal
- [ ] Sewage
- [ ] Petroleum
- [ ] Chemical
- [ ] Anaerobic
- [ ] None
- [ ] Other: _____

Oils
- [x] Absent
- [ ] Slight
- [ ] Moderate
- [ ] Profuse

Deposits
- [ ] Sludge
- [ ] Sawdust
- [ ] Paper fiber
- [ ] Sand
- [ ] Relict shells
- [x] Other: silt

Looking at stones which are not deeply embedded, are the undersides black in color?
- [ ] Yes
- [x] 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		65	Detritus	sticks, wood, coarse plant materials (CPOM)	10
Boulder	> 256 mm (10")	10			
Cobble	64-256 mm (2.5"-10")	10	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	10			
Sand	0.06-2mm (gritty)	0	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)	0			

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

STREAM NAME S-CV19	LOCATION	
STATION # _____ RIVERMILE _____	STREAM CLASS Perennial	
LAT 37.500284 LONG -80.691498	COUNTY Monroe	
STORET #	AGENCY Potesta/Edge	
INVESTIGATORS ABR/TA/SM		
FORM COMPLETED BY A. Kincaid	DATE 09/03/2021 TIME 1030 AM PM	REASON FOR SURVEY Preliminary Assessment

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover ☐ N/A	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 17	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 16	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 ☐ N/A	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 10	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 13	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 ☐ N/A	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 16	20 19 18 17 **16**	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

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

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
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 20	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) ☐ N/A	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 9	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 8	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 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
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 6	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 6	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 148

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME S-CV19	LOCATION	
STATION #_____ RIVERMILE_____	STREAM CLASS Perennial	
LAT 37.500284 LONG -80.691498	COUNTY Monroe	
STORET #	AGENCY Potesta/Edge	
INVESTIGATORS ABR/TA/SM		LOT NUMBER
FORM COMPLETED BY A. Kincaid	DATE 09/03/2021 TIME 1030	REASON FOR SURVEY Preliminary 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 benthics/ no 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						

SITE ID: JCV-19 HansCreek Spread F

DATE: 3 September 2021

COLLECTOR(S): Allyson

Temp	D/O	Cond	PH
16.7°	8.79	3.333	7.97
16.7	7.79	331.8	7.95

Wolman Pebble Count (Reach Wide)

620	762	404	298	152	721	BDRK	442	272	228
490	224	46	157	158	BDRK	BDRK	BDRK	346	562
112	118	156	BDRK	BDRK	BDRK	BDRK	18	BDRK	.71
BDRK	441	97	BDRK	BDRK	BDRK	216	BDRK	BDRK	BDRK
371	177	368	BDRK	BDRK	11	BDRK	BDRK	BDRK	.68
482	120	BDRK	BDRK	BDRK	BDRK	BDRK	BDRK	BDRK	.89
971	175	53	BDRK	BDRK	72	BDRK	751	BDRK	BDRK
31	BDRK	BDRK	BDRK	BDRK	BDRK	BDRK	181	BDRK	BDRK
BDRK	BDRK	BDRK	BDRK	176	BDRK	BDRK	99	BDRK	BDRK
BDRK	BDRK	1392	134	BDRK	138	572	81	179	BDRK

NOTES:

Riffle Pebble Count

NOTES:

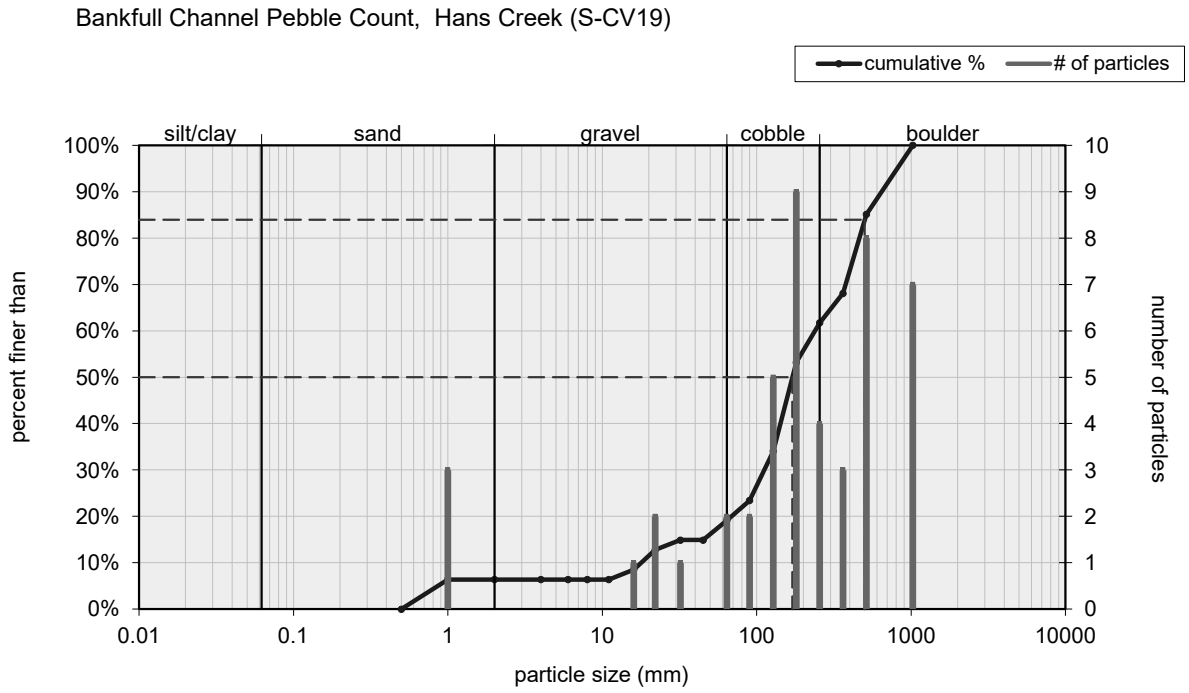
NOTES:

Inches	PARTICLE	Millimeters	S/C
	Silt / Clay	< .062	
	Very Fine	.062 - .125	SAND
	Fine	.125 - .25	
	Medium	.25 - .50	
	Coarse	.50 - 1.0	
.04 - .08	Very Coarse	1.0 - 2	
.08 - .16	Very Fine	2 - 4	GRAVEL
.16 - .22	Fine	4 - 5.7	
.22 - .31	Fine	5.7 - 8	
.31 - .44	Medium	8 - 11.3	
.44 - .63	Medium	11.3 - 16	
.63 - .89	Coarse	16 - 22.6	
.89 - 1.3	Coarse	22.6 - 32	
1.3 - 1.8	Very Coarse	32 - 45	
1.8 - 2.5	Very Coarse	45 - 64	
2.5 - 3.5	Small	64 - 90	COBBLE
3.5 - 5.0	Small	90 - 128	
5.0 - 7.1	Large	128 - 180	
7.1 - 10.1	Large	180 - 256	
10.1 - 14.3	Small	256 - 362	BOULDER
14.3 - 20	Small	362 - 512	
20 - 40	Medium	512 - 1024	
40 - 80	Large-Vry Large	1024 - 2048	
	Bedrock		BDRK

Bankfull Channel

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	
very fine sand	0.062 - 0.125	
fine sand	0.125 - 0.25	
medium sand	0.25 - 0.5	
coarse sand	0.5 - 1	**3**
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	**1**
coarse gravel	16 - 22	**2**
coarse gravel	22 - 32	**1**
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	**2**
small cobble	64 - 90	**2**
medium cobble	90 - 128	**5**
large cobble	128 - 180	**9**
very large cobble	180 - 256	**4**
small boulder	256 - 362	**3**
small boulder	362 - 512	**8**
medium boulder	512 - 1024	**7**
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
total particle count:		47
bedrock ----------		**53**
clay hardpan ----------		
detritus/wood ----------		
artificial ----------		
total count:		100

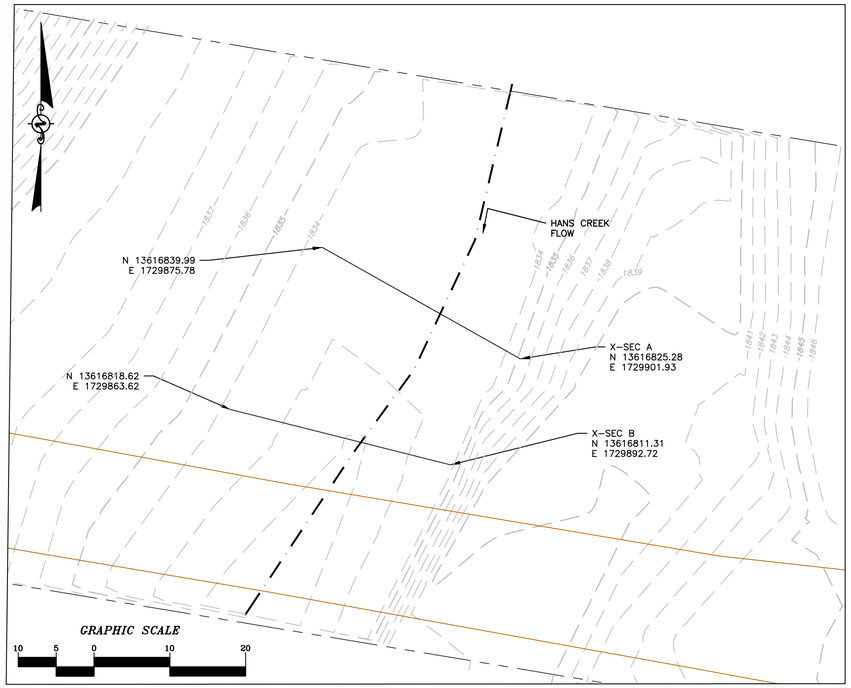
Note:



Size (mm)	
D16	49
D35	130
D50	170
D65	310
D84	500
D95	810

Size Distribution	
mean	156.5
dispersion	3.2
skewness	-0.04

Type			
silt/clay	0%	bedrock	53%
sand	3%		
gravel	6%		
cobble	20%		
boulder	18%		



S-CV19

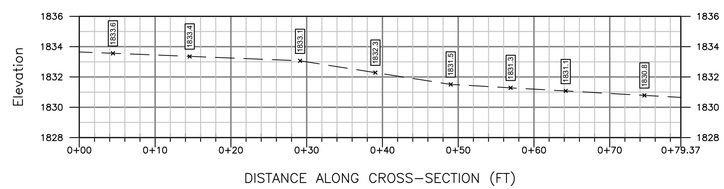
LEGEND

- STUDY AREA (EASEMENT)
- EXISTING SURVEY-LOCATED THALWEG
- 1176.87 + EXISTING SURVEYED GROUND SHOT ELEVATION

SURVEY NOTES:

1. THIS MAP HAS BEEN ORIENTED TO NAD 1983 UTM ZONE 17N, AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), USING REAL TIME DGPS. FIELD LOCATIONS WERE COMPLETED ON 8-19-2021.
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 AND COLLECTED PREVIOUSLY IN 2020 IN ORDER TO GENERATE THE PRE-CROSSING SURFACE SHOWN IN PLAN. DUE TO NATURAL EROSIONAL STREAM PROCESSES THAT 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.

S-CV19 BASELINE THALWEG PROFILE

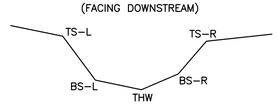


PROFILE LEGEND	
EXISTING STREAM PROFILE INVERT ALONG THALWEG	

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

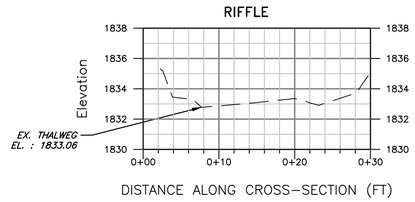
AS-BUILT TABLE: S-CV-19 CROSS SECTION A					
	PRE-CROSSING			AS-BUILT	
PT. LOC.	NORTHING	EASTING	ELEV.	VERT. DIFF.	HORZ. DIFF.
TS-L	13616826.12	1729899.50	1835.21		
BS-L	13616826.37	1729898.20	1833.45		
THW	13616832.12	1729889.12	1833.06		
BS-R	13616838.73	1729877.34	1833.71		
TS-R	13616839.81	1729876.05	1834.86		

TYPICAL 5-POINT CROSS-SECTION
(FACING DOWNSTREAM)

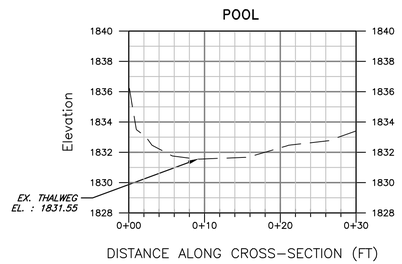


TS: TOP OF SLOPE
BS: BOTTOM OF SLOPE
THW: THALWEG (INVERT)

S-CV19 BASELINE CROSS-SECTION A



S-CV19 BASELINE CROSS-SECTION B



CROSS SECTION LEGEND	
EXISTING GRADE	

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

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

PRE-CROSSING PHOTOS

PHOTO TAKEN LOOKING DOWNSTREAM FROM UPSTREAM IMPACT LIMITS

PHOTO TAKEN LOOKING UPSTREAM FROM DOWNSTREAM IMPACT LIMITS

POST-CROSSING PHOTOS

PENDING CROSSING

PHOTO TAKEN LOOKING DOWNSTREAM UPSTREAM FROM IMPACT LIMITS

PENDING CROSSING

PHOTO TAKEN LOOKING UPSTREAM FROM UPSTREAM IMPACT LIMITS

PRE-CROSSING

DATE ISSUED 9/27/2021

S-CV19
CAD File No.
MBS
Drawn
CHH
Checked
BB/JLY
Approved
NOTED
Scale:
SEPT. 2021
Date:
21-0244-005
Project No.

POTESTA & ASSOCIATES, INC.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
7012 MacCorkle Avenue SE, Charleston, WV 25304
TEL: (304) 342-1400 FAX: (304) 343-9031
E-Mail Address: potesta@potesta.com

POTESTA

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

Title:
PROFILE AND CROSS-SECTIONS
BASELINE SURVEY
CROSSING S-CV19 - HANS CREEK
(MP 187.59)
MONROE COUNTY, WV

1
Drawing No.

File: S:\CAD-Proj-WV\2021\21-0244-WV\21-0244-S-CV19.dwg
Plot Date: 24 Sep 2021 - 2:39pm
Plotted By: MBSonkoff