Baseline Assessment – Stream Attributes

Reach S-PP1 (Pipeline ROW)
Intermittent
Spread G
Craig County, Virginia

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

Photo Type: DS VIEW
Location, Orientation, Photographer Initials: Downstream view of ROW south of CL and east of Stevers Gap Trail looking W, KB

Photo Type: DS VIEW
Location, Orientation, Photographer Initials: Downstream view of ROW north of CL and west of Stevers Gap Trail looking W, KB

Photo Type: US VIEW
Location, Orientation, Photographer Initials: Upstream view of ROW south of CL and east of Stevers Gap Trail looking E, KB

Photo Type: LB CL
Location, Orientation, Photographer Initials: Standing on LB looking at RB along pipe centerline looking NE, KB

Photo Type: RB CL
Location, Orientation, Photographer Initials: Standing on RB looking at LB along pipe centerline looking SW, KB

Photo Type: DS COND
Location, Orientation, Photographer Initials: Downstream conditions outside of ROW looking NW, KB

Stream Assessment Form (Form 1)

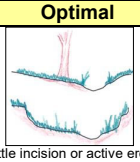
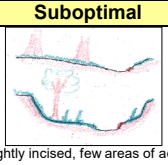
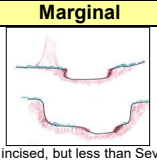
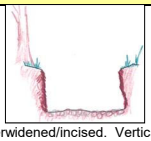
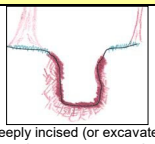
Unified Stream Methodology for use in Virginia

For use in wadeable channels classified as intermittent or perennial

Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR #	Impact Length	Impact Factor
22865.06	Mountain Valley Pipeline (Mountain Valley Pipeline, LLC)	Craig County	R4	05050002	9/22/21	S-PP1	86	1

Name(s) of Evaluator(s)	Stream Name and Information	SAR Length
SB/EL/ES	UNT to Sinking Creek	86

1. Channel Condition: Assess the cross-section of the stream and prevailing condition (erosion, aggradation)

	Conditional Category					
	Optimal	Suboptimal	Marginal	Poor	Severe	
Channel Condition	 Very little incision or active erosion; 80-100% stable banks. Vegetative surface protection or natural rock, prominent (80-100%). AND/OR Stable bankfull benches are present. Access to their original floodplain or fully developed wide bankfull benches. Mid channel bars and transverse bars few. Transient sediment deposition covers less than 10% of bottom.	 Slightly incised, few areas of active erosion or unprotected banks. Majority of banks are stable (60-80%). Vegetative protection or natural rock prominent (60-80%) AND/OR Depositional features contribute to stability. The bankfull and low flow channels are well defined. Stream likely has access to bankfull benches,or newly developed portions of the reach. Transient sediment covers 10-40% of the stream bottom.	 Often incised, but less than Severe or Poor. Banks more stable than Severe or Poor due to lower bank slopes. Erosion may be present on 40-60% of both banks. Vegetative protection on 40-60% of banks. Streambanks may be vertical or undercut. AND/OR 40-60% Sediment may be temporary / transient, contribute instability. Deposition that contribute to stability, may be forming/present. AND/OR V-shaped channels have vegetative protection on > 40% of the banks and depositional features which contribute to stability.	 Overwidened/incised. Vertically / laterally unstable. Likely to widen further. Majority of both banks are near vertical. Erosion present on 60-banks. Vegetative protection present on 20-40% of banks, and is insufficient to prevent erosion. the stream is covered by sediment. Sediment is temporary / transient in nature, and contributing to instability. AND/OR V-shaped channels have vegetative protection is present on > 40% of the banks and stable sediment deposition is absent.	 Deeply incised (or excavated), vertical/lateral instability. Severe incision, flow contained within the banks. Streambed below average majority of banks vertical/undercut. Vegetative protection present on less than 20% of banks, is not preventing erosion. Obvious bank sloughing present. Erosion/raw banks on 80-100%. AND/OR Aggrading channel. than 80% of stream bed is covered by deposition, contributing to instability. Multiple thread channels and/or subterranean flow.	CI
Scores	3	2.4	2	1.6	1	2.40
NOTES>>						

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. Wetlands located within the riparian 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% to 60% 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	
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>	80%	10%	10%				100%	
	Score >	0.5	0.6	0.75					
								CI= (Sum % RA * Scores*0.01)/2	
Left Bank	% Riparian Area>	50%	30%	10%	10%			100%	Rt Bank CI > 0.54
	Score >	0.6	0.5	1.2	0.85				Lt Bank CI > 0.66

CI: 0.60

3. INSTREAM HABITAT: Varied substrate sizes, water velocity and depths; woody and leafy debris; stable substrate; low embededness; shade; undercut banks; root mats; SAV; riffle/pool complexes, stable features.

	Conditional Category				NOTES>>	
	Optimal	Suboptimal	Marginal	Poor		
Instream Habitat/ Available Cover	Habitat elements are typically present in greater than 50% of the reach.	Stable habitat elements are typically present in 30-50% of the reach and are adequate for maintenance of populations.	Stable habitat elements are typically present in 10-30% of the reach and are adequate for maintenance of populations.	Habitat elements listed above are lacking or are unstable. Habitat elements are typically present in less than 10% of the reach.	Stream Gradient	CI
Scores	1.5	1.2	0.9	0.5	High	0.90

Stream Impact Assessment Form Page 2

Project #	Project Name (Applicant)	Locality	Cowardin Class.	HUC	Date	SAR #	Impact Length	Impact Factor
22865.06	Mountain Valley Pipeline (Mountain Valley Pipeline, LLC)	Craig County	R4	05050002	9/22/21	S-PP1	86	1

4. CHANNEL ALTERATION: Stream crossings, riprap, concrete, gabions, or concrete blocks, straightening of channel, channelization, embankments, spoil piles, constrictions, livestock

	Conditional Category						NOTES>>	
	Negligible	Minor		Moderate		Severe		
Channel Alteration	Channelization, dredging, alteration, or hardening absent. Stream has an unaltered pattern or has naturalized.	Less than 20% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	20-40% of the stream reach is disrupted by any of the channel alterations listed in the parameter guidelines.	40 - 60% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	60 - 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered.	Greater than 80% of reach is disrupted by any of the channel alterations listed in the parameter guidelines AND/OR 80% of banks shored with gabion, riprap, or cement.		CI
Scores	1.5	1.3	1.1	0.9	0.7	0.5		0.90

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) >>	**0.96**

RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)

COMPENSATION REQUIREMENT (CR) >>	**83**

CR = RCI X L_I X IF

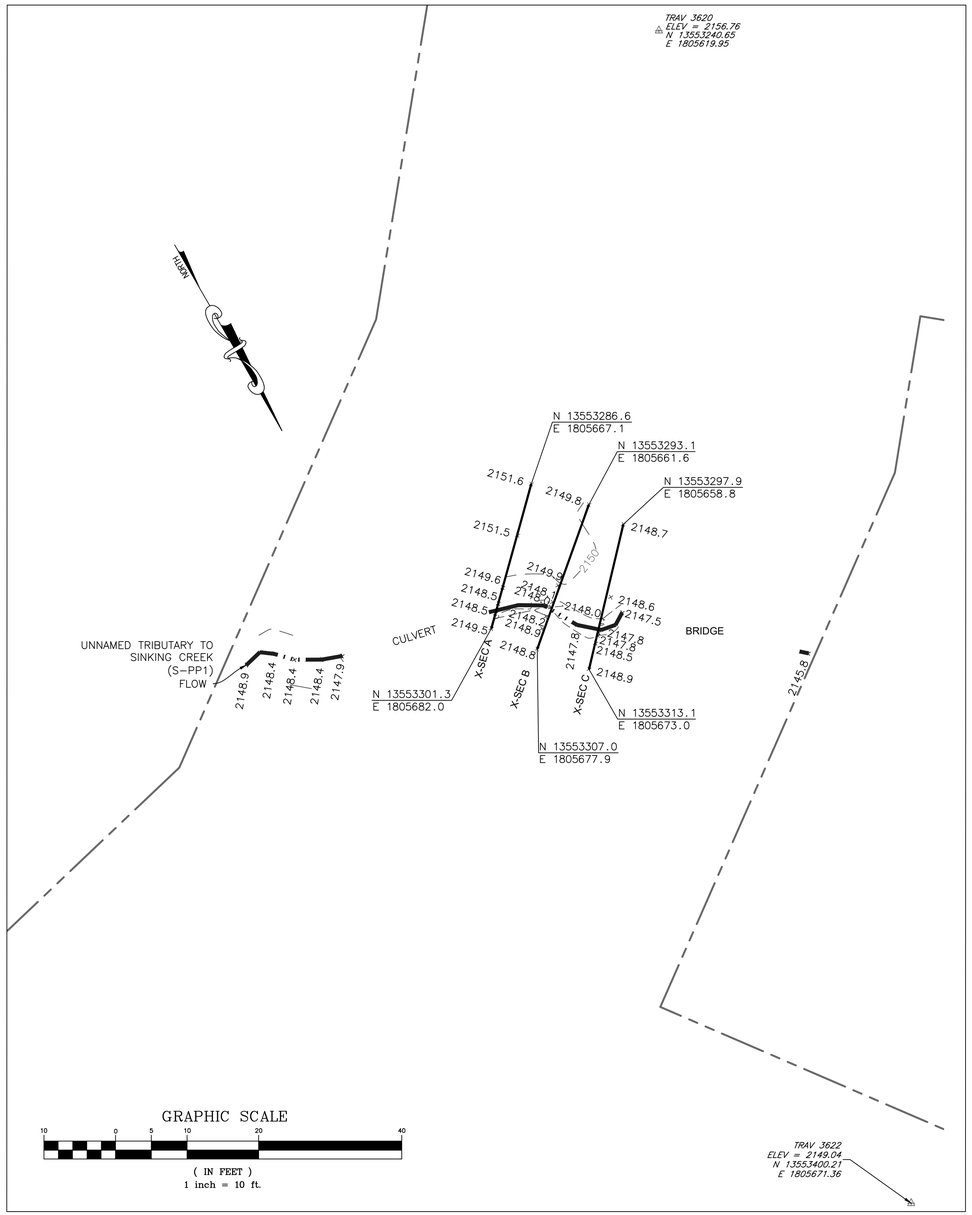
INSERT PHOTOS:

(WSSI Photo Location "L:\22000s\22800\22865.06\Admin\05-ENVR\Field Data\Spread G\Field Forms\S-PP1\Photos\S-PP1_DS COND US.JPG")

Looking upstream within the ROW. Assessment is limited to areas within the temporary ROW.

DESCRIBE PROPOSED IMPACT:

PROVIDED UNDER SEPARATE COVER



S-PP1 BASELINE THALWEG

PROFILE LEGEND

EXISTING STREAM PROFILE
INVERT ALONG THALWEG

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

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 March 20, 2019.

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.

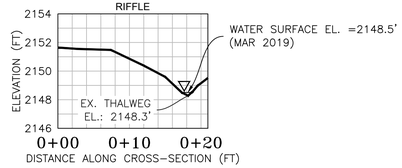
5. All section views shown are left to right facing downstream.

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

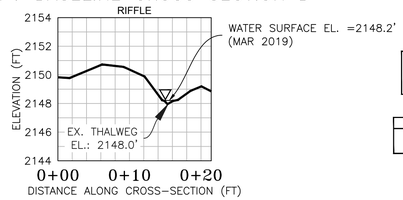
LEGEND

- STUDY AREA (EASEMENT)
- EXISTING SURVEY-LOCATED THALWEG
- EW — EXISTING SURVEY-LOCATED EDGE OF WATER (AS NECESSARY)
- EXISTING CONTOUR LINE (MAJOR)
- EXISTING CONTOUR LINE (MINOR)
- 2148.2 + EXISTING SURVEYED GROUND SHOT ELEVATION
- BENCHMARK POINT (WSSI)

S-PP1 BASELINE CROSS SECTION A



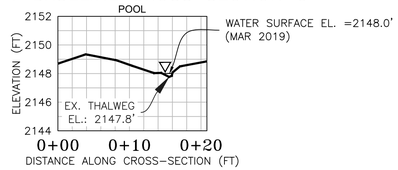
S-PP1 BASELINE CROSS SECTION B



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

CROSS SECTION LEGEND
EXISTING GRADE

S-PP1 BASELINE CROSS SECTION C



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

PRE-CROSSING PHOTOS

PHOTO TAKEN LOOKING DOWNSTREAM ON 03/20/2019

PHOTO TAKEN LOOKING UPSTREAM ON 03/20/2019

POST-CROSSING PHOTOS

PENDING CROSSING

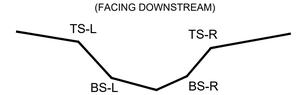
PHOTO TAKEN LOOKING

PENDING CROSSING

PHOTO TAKEN LOOKING

CL STAKEOUT POINTS: S-PP1 CROSS SECTION B (PIPE CL)					
	PRE-CROSSING			POST-CROSSING	
PT. LOC.	NORTHING	EASTING	ELEV	VERT. DIFF.	HORZ. DIFF.
TS-L	13553300.78	1805670.95	2149.89	----	----
BS-L	13553302.42	1805672.76	2148.11	----	----
THW	13553302.91	1805673.33	2147.96	----	----
BS-R	13553303.69	1805674.58	2148.25	----	----
TS-R	13553304.88	1805675.90	2148.88	----	----

TYPICAL 5-POINT CROSS-SECTION
(FACING DOWNSTREAM)



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

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5300 Wellington Branch Drive • Suite 100
Gainesville, Virginia 20155
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www.wetlands.com

Profile and Cross-Sections Baseline Survey

Prepared For: MVP

Crossing S-PP1 - UNT to Sinking Creek (MP 217.4)

Craig 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
PFS	JSF	NAS

Sheet #
1 of 1

Computer File Name:
L:\Survey\22686\22686\22665.03\Spread G Work Dwgs
22665_03 S-G MP 208-227 Sheets.dwg