Baseline Assessment – Stream Attributes

Reach S-F2 (Timber Mat Crossing) Ephemeral Spread I Pittsylvania County, Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	✓
RBP Physical Characteristics Form	✓
Water Quality Data	✓
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	N/A –lack of habitat
Wolman Pebble Count	✓
RiverMorph Data Sheet	✓
USM Form (Virginia Only)	✓
Longitudinal Profile and Cross Sections	✓

Spread I Stream S-F2 (Timber Mat Crossing) Pittsylvania County

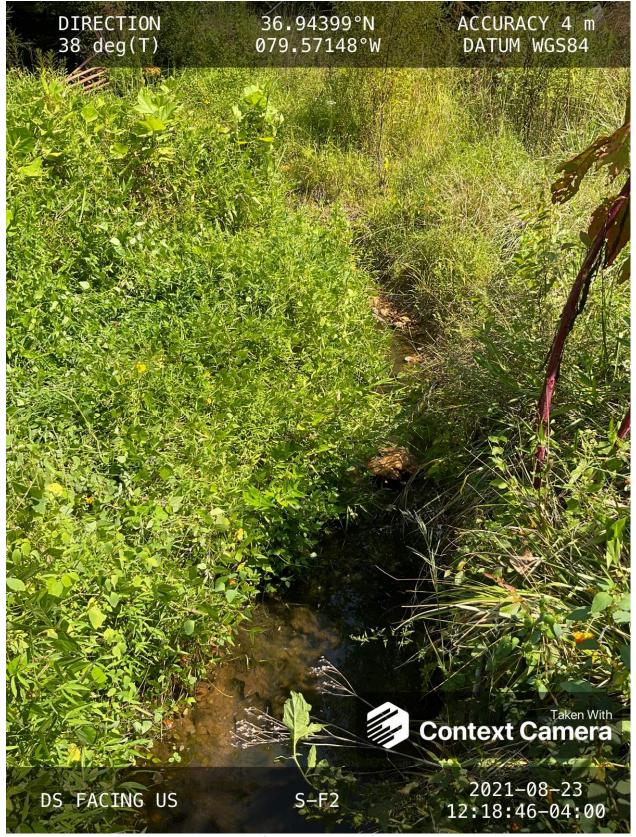
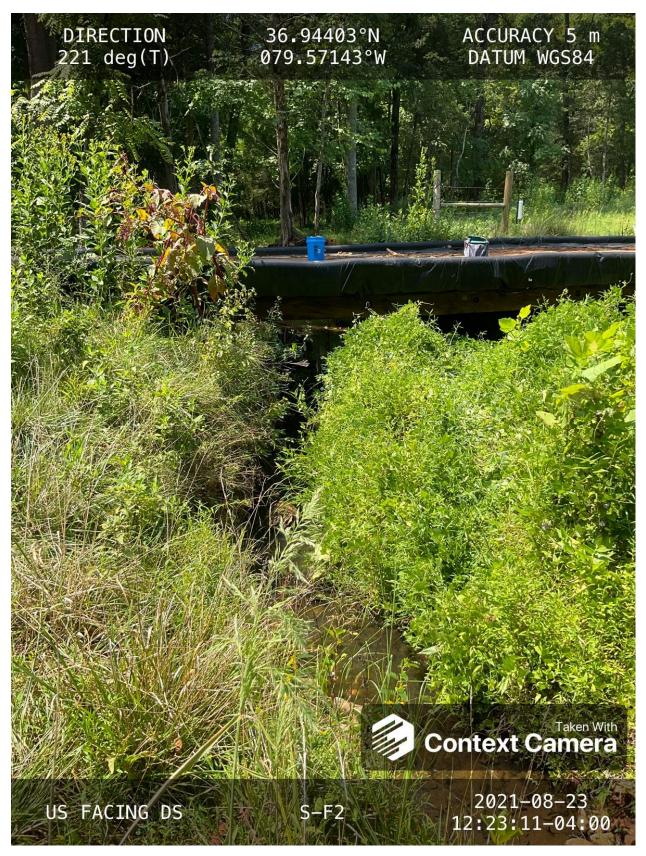


Photo Type: DS VIEW

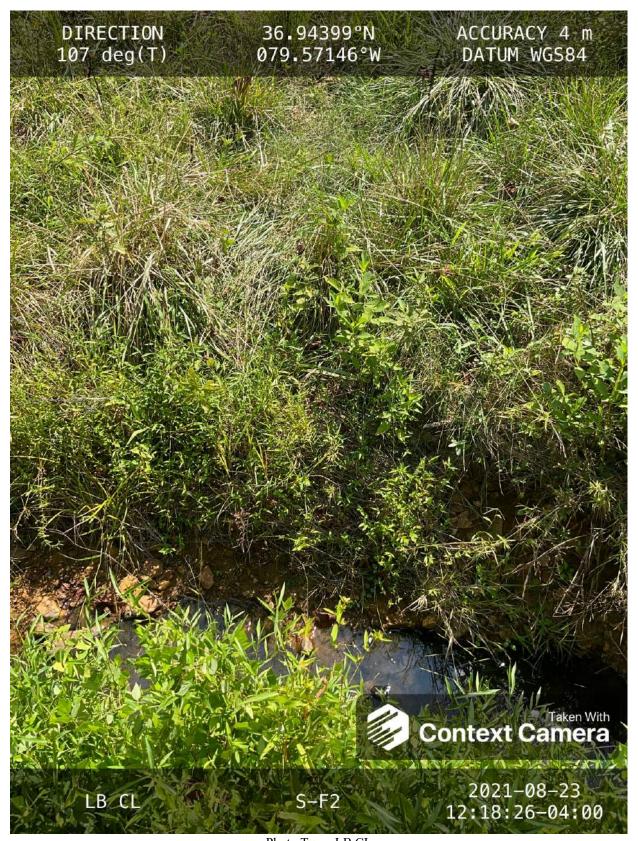
Location, Orientation, Photographer Initials: Downstream view of ROW looking NE, DW/JM

Spread I Stream S-F2 (Timber Mat Crossing) Pittsylvania County



 $\label{eq:PhotoType: US VIEW} Photo Type: US VIEW \\ Location, Orientation, Photographer Initials: Upstream view of ROW looking SW, DW/JM$

Spread I Stream S-F2 (Timber Mat Crossing) Pittsylvania County



 $\label{eq:PhotoType:LBCL} Photo \ Type: LB\ CL \\ Location, Orientation, Photographer Initials: Standing on LB looking at RB looking NW, DW/JM$

Spread I Stream S-F2 (Timber Mat Crossing) Pittsylvania County

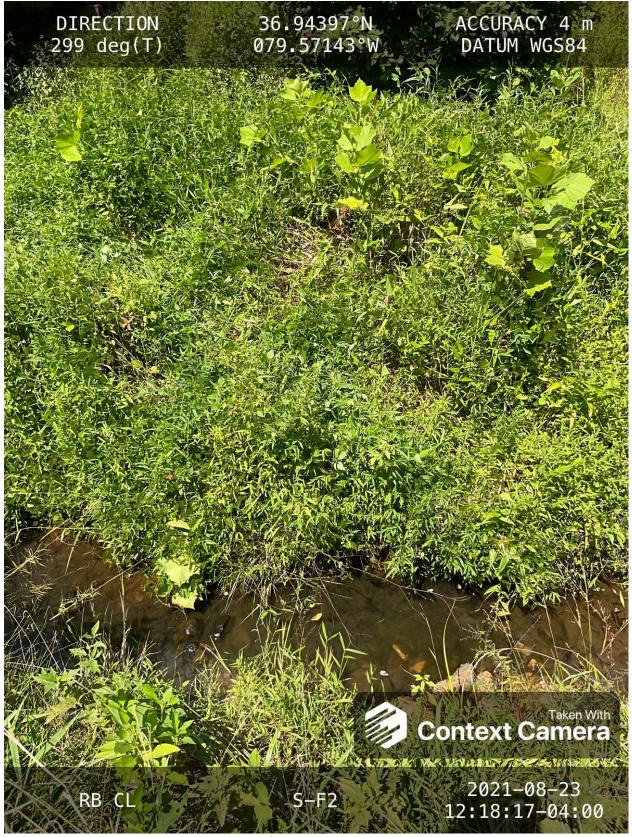


Photo Type: RB CL

Location, Orientation, Photographer Initials: Standing on RB looking at LB looking SE, DW/JM

Spread I Stream S-F2 (Timber Mat Crossing) Pittsylvania County

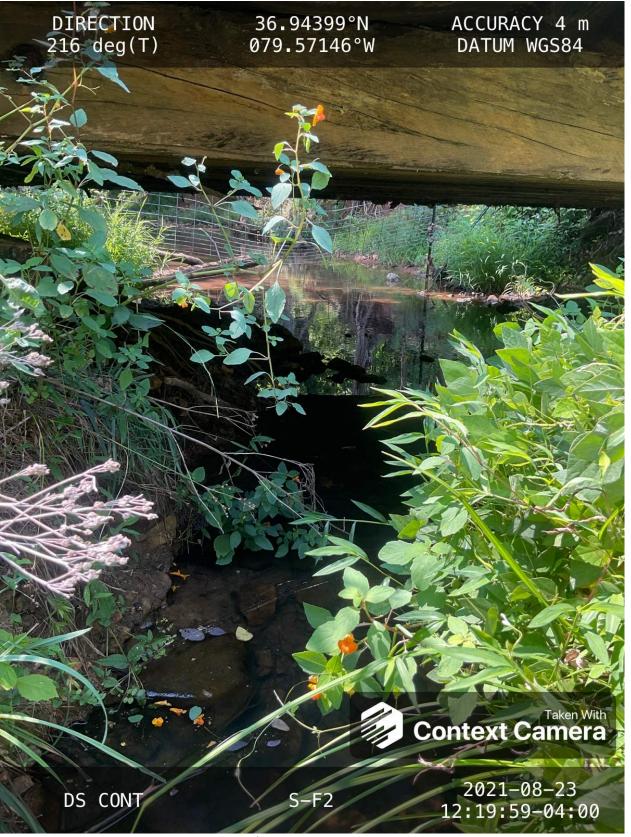


Photo Type: DS COND

Location, Orientation, Photographer Initials: Downstream conditions outside of ROW looking SW, DW/JM

USACE FILE NO./ Project Name: (v2.1, Sept 2015)		Mo	ountain Va	alley Pipeline		COORDINATES: imal Degrees)	Lat.	36.944049	Lon.	-79.571442	WEATHER:	5	Sunny	DATE:	August 23, 20	2021
IMPACT STREAM/SITE ID (watershed size {acreage}				S-F2 / 9	2.54 ac			MITIGATION STREAM CLASS./ (watershed size {acreage						Comments:		
OTDEAM IMPACT LENGTH	00		\		MIT OC	ODDINATEO.	1 -4				DDECIDITATION DAOT 40 LIDO.			Mid-nadian Langda		
STREAM IMPACT LENGTH:	20	FORM C MITIGATION		RESTORATION (Levels I-III)		OORDINATES: imal Degrees)	Lat.		Lon.		PRECIPITATION PAST 48 HRS:			Mitigation Length:		
Column No. 1- Impact Existing	g Condition (Del	bit)		Column No. 2- Mitigation Existing Co	ondition - Base	line (Credit)		Column No. 3- Mitigation Pro Post Completion		'ears	Column No. 4- Mitigation Proj Post Completion		s	Column No. 5- Mitigation Projected	d at Maturity (Credit	t)
Stream Classification:	Ephe	meral		Stream Classification:				Stream Classification:		0	Stream Classification:	0		Stream Classification:	0	
Percent Stream Channel SI	lope	4.79		Percent Stream Channel Slo	ре			Percent Stream Channel SI	ope	0	Percent Stream Channel S	lope	0	Percent Stream Channel Slo	ope	0
HGM Score (attach d	lata forms):			HGM Score (attach d	ata forms):			HGM Score (attach	data forms):		HGM Score (attach d	ata forms):		HGM Score (attach da	ta forms):	
		Average				Average				Average			Average		A	Average
Hydrology	0.61		II-	Hydrology			ll .	Hydrology			Hydrology			Hydrology		
Biogeochemical Cycling	0.49	0.48666667	li-	Biogeochemical Cycling		0		Biogeochemical Cycling		0	Biogeochemical Cycling		0	Biogeochemical Cycling		0
Habitat	0.36	vators		Habitat PART I - Physical, Chemical and	Piological Indi	icators		Habitat PART I - Physical, Chemical ar	d Riological Ind	icators	Habitat PART I - Physical, Chemical and	Riological Indicat	ore	Habitat	Riological Indicators	
PART I - Physical, Chemical and		ators		PART 1 - Physical, Chemical and		icators		PART I - Physical, Chemical ar			PART 1 - Physical, Chemical and			PART I - Physical, Chemical and E		
	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	s classifications)			PHYSICAL INDICATOR (Applies to all streams c	lassifications)			PHYSICAL INDICATOR (Applies to all streams	classifications)		PHYSICAL INDICATOR (Applies to all stream	s classifications)		PHYSICAL INDICATOR (Applies to all streams of	classifications)	
USEPA RBP (High Gradient Data Sheet)		0		USEPA RBP (Low Gradient Data Sheet)	0.00			USEPA RBP (High Gradient Data Sheet)			USEPA RBP (High Gradient Data Sheet) 1. Epifaunal Substrate/Available Cover			USEPA RBP (High Gradient Data Sheet)		
Epifaunal Substrate/Available Cover Embeddedness	0-20	10	-	Epifaunal Substrate/Available Cover Pool Substrate Characterization	0-20 0-20			Epifaunal Substrate/Available Cover Embeddedness	0-20		Epitaunal Substrate/Available Cover Embeddedness	0-20		Epifaunal Substrate/Available Cover Embeddedness	0-20	
3. Velocity/ Depth Regime	0-20	0	 	3. Pool Variability	0-20			Velocity/ Depth Regime	0-20		3. Velocity/ Depth Regime	0-20		Velocity/ Depth Regime	0-20	
Velocity Depth Regime Sediment Deposition	0-20	13		4. Sediment Deposition	0-20			Velocity Depth Regime Sediment Deposition	0-20		4. Sediment Deposition	0-20		4. Sediment Deposition	0-20	
5. Channel Flow Status	0-20	1		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	15		6. Channel Alteration	0-1			6. Channel Alteration	0-20		6. Channel Alteration	0-20 0-1		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		B. 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	10		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	78	II-	Total RBP Score	Poor	0		Total RBP Score	Poor	0	Total RBP Score	Poor	0	Total RBP Score	Poor	0
Sub-Total CHEMICAL INDICATOR (Applies to Intermitter	nt and Parannial Str	0.65	ll l	Sub-Total CHEMICAL INDICATOR (Applies to Intermittent a	and Parannial Stra	O O		Sub-Total CHEMICAL INDICATOR (Applies to Intermitter	t and Parannial Str	O O	Sub-Total CHEMICAL INDICATOR (Applies to Intermitte	nt and Parannial Stree	0	Sub-Total CHEMICAL INDICATOR (Applies to Intermittent	and Parannial Straams	0
WVDEP Water Quality Indicators (General		eams)		WVDEP Water Quality Indicators (General)		ans)		WVDEP Water Quality Indicators (General		earrs)	WVDEP Water Quality Indicators (Genera		arris)	WVDEP Water Quality Indicators (General)		
Specific Conductivity	11)			Specific Conductivity		0		Specific Conductivity			Specific Conductivity			Specific Conductivity		
	0-90	117		•	0-90			•	0-90			0-90		•	0-90	
100-199 - 85 points	0-30	117	ļ.		0-30				0-50			0-30			<u> </u>	
рН	0-1		1	OH .	0-1	ll ll		рН	0-1		рн	0-1		рн	0-1	
6.0-8.0 = 80 points	0-80	7.15			5-90				5-90			5-90			5-90	
DO		10		00		0		DO			DO			DO		
	10-30	3.04			10-30				10-30			10-30			10-30	
<5.0 = 10 points Sub-Total		0.875		Sub-Total		0		Sub-Total		0	Sub-Total		0	Sub-Total		0
BIOLOGICAL INDICATOR (Applies to Intermit	ttent and Perennial S		l	BIOLOGICAL INDICATOR (Applies to Intermitter	nt and Perennial S	treams)		BIOLOGICAL INDICATOR (Applies to Interm	ittent and Perenn	al Streams)	BIOLOGICAL INDICATOR (Applies to Interr	mittent and Perennia	l Streams)	BIOLOGICAL INDICATOR (Applies to Intermit	ttent and Perennial St	reams)
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)		
_	0-100 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 U	Init Score		П	PART II - Index and U	Init Score]	PART II - Index and	Unit Score		PART II - Index and U	Init Score		PART II - Index and Un	nit Score	
TAKT II TIIIUGA AIIU C	J.III 30016			i Att ii - iiidex alid t	30016			i Act II - Illuex allu	J 00016		TAKT II - IIIUGA AIIU C	00010		Act in a midex and on	00010	
Index	Linear Feet	Unit Score		Index	Linear Feet	Unit Score		Index	Linear Feet	Unit Score	Index	Linear Feet	Unit Score	Index	Linear Feet Un	nit Score
0.625	00	12 4046667		0	0			•					0			

			High-C			ter Strea		Appalachia	3		
	Team:	JM, DW						Latitude/UT	M Northing:	36.944049	
Pr	oject Name:	Mountain V	alley Pipelir	ne				Longitude/U	ΓM Easting:	-79.571442	2
	Location:	Pittsylvania	1					San	npling Date:	8/23/2021	
S	AR Number:	S-F2	Reach	Length (ft):	30	Stream Ty	/pe: E	phemeral Stream	l		•
	Top Strata:	Sh	rub/Herb Sti	rata	(determine	d from perce	ent calcul	ated in V _{CCANO}	_{PY})		
Site	and Timing:	Project Site				•	Before Pr	oject			•
ampl	e Variables										
1	V _{CCANOPY}	equidistant	points along at least one	g the stream value betw	n. Measure reen 0 and 1		sapling co	Measure at not bover is at least ta choice.)			Not Used, <20%
	5			nto ait oaton p							1
											1
2	V _{EMBED}	along the s surface and according t rating score	tream. Seled area surro to the following of the following	ect a particle unding the p ing table. If a bed is com	from the becarticle that the bed is a posed of be	ed. Before r is covered b an artificial s edrock, use a	noving it, by fine se urface, o a rating s		percentage nter the ratir fine sedime	e of the ng ents, use a	3.1
		Embeddedi Minshall 19	•	for gravel, c	obble and b	oulder parti	cles (resc	caled from Plat	ts, Megahaı	n, and	Measure at least
		Rating	Rating Des		101/070 d	rounded -	المارة والما	, fine as di	/or b = d	l ₂ \	30 points
		5 4						y fine sedimen ed by fine sedi	•	K)	1
		3						ied by fine sea			1
		2	51 to 75 pe	rcent of sur	face covere	d, surrounde	ed, or bur	ied by fine sec	liment]
		1			covered, su	ırrounded, o	r buried b	by fine sedime	nt (or artifici	al surface)]
		ngs at each									,
	3	4	3	2	3	3	3	3	3	4	
3	Enter partic	along the s	tream; use t ches to the	he same po nearest 0.1	ints and par inch at each	ticles as us n point belov	ed in V _{EM}	er than 30 roug BED· ck should be co			2.60 in
	3.70	2.70	2.50	2.00	1.90	1.30	2.90	3.30	2.70	1.80	1
	0.70	2.10	2.00	2.00	1.00	1.00	2.00	0.00	2 0	1.00	
4	V_{BERO}	-						er of feet of er eroded, total e			13 %
		may be up						,			13 70
			Left Bank:	2	ft		Right Bar	nk: 2	ft		
	. Variables	F.O. within t								ah hank)	
5	V _{LWD}	Number of	down woody	y stems (at I	east 4 inche	es in diamete	er and 36	channel (25 for inches in length within the character)	th) per 100	feet of	0.0
		per 100 fee	et of stream	will be calcu		f dave	a also i	201	n		
6	\/	Avorose di	h of trace /	moodure and		f downed wo	-	ns: s at least 20%) Troop are	at locat 4	
O	V_{TDBH}	inches (10 List the dbh	cm) in diam n measurem	eter. Enter	tree DBHs i	n inches.		he buffer on ea		e at least 4	Not Used
		the stream	Left Side					Right Side			1
	0		Lon Olde			0		ragin olue			1
	0					J					1
											ł
											ł
											l
											l
											1
											ł
											ł
7	Veri	Number of	snage (at la	act //" dhh a	nd 36" tall\	ner 100 foot	of etroer	m. Enter numb	er of space	on each	
'	V_{SNAG}					per 100 lee et will be cal		n. Enternum	or or snags	On Caul	0.0
		5.40 of tile	za sam, and	amount	. poi 100 ide	DO Gai	J.,				
			Left Side:	(0		Right Sic	de:	0		
8	V_{SSD}					up to 4 inch	es dbh) p	er 100 feet of			
						gs and shru	bs on eac	ch side of the s	tream, and	the amount	10.0
		per 100 ft o		l be calculat			D:L: 0:	da.	1		
			Left Side:		2		Right Sic	ie:	1		

9	V _{SRICH}	Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data.						0.00			
	Group 1 = 1.0					calculated	from these a		2 (-1.0)		
	Acer rubrui		<u> </u>	Magnolia tr	ripetala		Ailanthus ai	•	<u> </u>	Lonicera ja	ponica
	Acer sacch	narum		Nyssa sylv	•		Albizia julibi	rissin		Lonicera ta	
	Aesculus fl	'ava		Oxydendrum			Alliaria petio			Lotus corni	culatus
	Asimina tril	oba		Prunus ser	otina		Alternanthe	ra		Lythrum sa	licaria
	Betula alleg	haniensis		Quercus al	lba		philoxeroides		7	Microstegium	n vimineum
	Betula lenta	а		Quercus co	occinea		Aster tatario	cus		Paulownia :	tomentosa
	Carya alba			Quercus in	nbricaria		Cerastium fontanum			Polygonum c	uspidatum
	Carya glab	ra		Quercus pi	rinus		Coronilla va	nria		Pueraria m	ontana
	Carya oval	is		Quercus ru	ıbra		Elaeagnus ur	nbellata		Rosa multif	lora
	Carya ovat	'a		Quercus velutina			Lespedeza	bicolor		Sorghum h	alepense
	Cornus flor	rida		Sassafras	albidum		Lespedeza	cuneata		Verbena br	asiliensis
	Fagus grar	ndifolia		Tilia amerio	cana		Ligustrum ob	tusifolium			
	Fraxinus ai	mericana		Tsuga cana	adensis		Ligustrum s	inense			
V	Liriodendron	tulipifera		Ulmus ame	ericana						
	Magnolia a	cuminata									i
		1	Species in	Group 1				1	Species in	Group 2	
				<u> </u>					•	•	
-						-	in the ripar		zone within	25 feet from	n each
Dank.	V _{DETRITUS}						nch side of to material. Wo		<4" diamete	er and <36"	
	DETRITUS	• .				•	yer at each s	•			10.00 %
			Left	Side			Right	Side			
					20	0					
11	V _{HERB}	Average pe	rcentage co	over of herb	aceous vede	etation (mea	asure only if	tree cover i	s <20%) D	o not	
''	V HERB	include woo	ody stems a	t least 4" db	h and 36" ta	II. Because	there may b	e several la	ayers of gro	und cover	90 %
		vegetation each subple		s up through	n 200% are a	accepted. E	Enter the per	cent cover	of ground ve	egetation at	90 70
		each subpli		Side			Right	Side]	
					80	100					
Sample	e Variable 1	2 within the	e entire cate	chment of t							
Sample 12	e Variable 1										0.75
					he stream.						0.75
			Average of F	Runoff Score	he stream.	ed:			Runoff	% in Catch	Running
			Average of F	Runoff Score	he stream.	ed:			Runoff Score	% in Catch- ment	
	V _{WLUSE}		Average of F Land	Runoff Score	he stream.	ed:		•			Running Percent
	V _{WLUSE} Forest and n	Weighted A	Land 50% ground	Runoff Score Use (Choos	he stream.	ed:		▼	Score	ment	Running Percent (not >100)
	VwLUSE Forest and n Forest and n	Weighted A	Land 50% ground 75% ground	Runoff Score Use (Choos cover)	he stream.	ed:			0.5 1	ment 27.34 58.9	Running Percent (not >100) 27.34 86.24
	Forest and n Forest and n Impervious a	Weighted Anative range (active range (> areas (parking)	Land 50% ground 75% ground lots, roofs, di	Use (Choos cover) cover)	he stream. e for watersh	ed:		~	0.5 1 0	ment 27.34 58.9 5.12	Running Percent (not >100) 27.34 86.24 91.36
	Forest and n Forest and n Impervious a	Weighted A	Land 50% ground 75% ground lots, roofs, di	Use (Choos cover) cover)	he stream. e for watersh	ed:		*	0.5 1	ment 27.34 58.9	Running Percent (not >100) 27.34 86.24
	Forest and n Forest and n Impervious a	Weighted Anative range (active range (> areas (parking)	Land 50% ground 75% ground lots, roofs, di	Use (Choos cover) cover)	he stream. e for watersh	ed:		~	0.5 1 0	ment 27.34 58.9 5.12	Running Percent (not >100) 27.34 86.24 91.36
	Forest and n Forest and n Impervious a	Weighted Anative range (active range (> areas (parking)	Land 50% ground 75% ground lots, roofs, di	Use (Choos cover) cover)	he stream. e for watersh	ed:		*	0.5 1 0	ment 27.34 58.9 5.12	Running Percent (not >100) 27.34 86.24 91.36
	Forest and n Forest and n Impervious a	Weighted Anative range (active range (> areas (parking)	Land 50% ground 75% ground lots, roofs, di	Use (Choos cover) cover)	he stream. e for watersh	ed:		* * *	0.5 1 0	ment 27.34 58.9 5.12	Running Percent (not >100) 27.34 86.24 91.36
	Forest and n Forest and n Impervious a	Weighted Anative range (active range (> areas (parking)	Land 50% ground 75% ground lots, roofs, di	Use (Choos cover) cover)	he stream. e for watersh	ed:		• • • • • • • • • • • • • • • • • • •	0.5 1 0	ment 27.34 58.9 5.12	Running Percent (not >100) 27.34 86.24 91.36
	Forest and n Forest and n Impervious a Open space	Weighted Anative range (active range (> areas (parking)	Land 50% ground 75% ground lots, roofs, di	Use (Choos cover) cover)	he stream. e for watersh	ed:	Not	~ ~ ~ ~	0.5 1 0	ment 27.34 58.9 5.12	Running Percent (not >100) 27.34 86.24 91.36
12	Forest and n Forest and n Impervious a Open space	Weighted Anative range (native range (> areas (parking (pasture, lawn)) S-F2	Land 50% ground 75% ground lots, roofs, di	Cover) cover) riveways, etc)	the stream. The for waterships of the stream of the stream. The for waterships of the stream of the	ed: o List)	Not bleted using	• • • • • • • • • • • • • • • • • • •	0.5 1 0 0.3	ment 27.34 58.9 5.12 8.64	Running Percent (not >100) 27.34 86.24 91.36 100
12 V	Forest and n Forest and n Impervious a Open space	weighted Anative range (Land 50% ground 75% ground lots, roofs, di	Cover) Cover)	the stream. The for waterships of the stream of the stream. The for waterships of the stream of the stream. The for waterships of the stream of the strea	was compat satellite	oleted using imagery and	es:	0.5 1 0 0.3 National Lapplementar	ment 27.34 58.9 5.12 8.64 and Cover I y datasets.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
12 V	Forest and n Forest and n Impervious a Open space	weighted Anative range (native range (> areas (parking (pasture, lawn)) S-F2 Value Not Used, <20%	Land 50% ground 75% ground lots, roofs, di s, parks, etc.) VSI Not Used	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
12 V	Forest and n Forest and n Impervious a Open space	weighted Anative range (active range (> areas (parking) (pasture, lawn) S-F2 Value Not Used,	Land 50% ground 75% ground lots, roofs, di	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
12 V V V V V V V E	Forest and n Forest and n Impervious a Open space	weighted Anative range (native range (> areas (parking (pasture, lawn)) S-F2 Value Not Used, <20%	Land 50% ground 75% ground lots, roofs, di s, parks, etc.) VSI Not Used	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
12 V V V V V V V V V V V V V V V V V V V	Forest and n Forest and n Impervious a Open space ariable CANOPY MBED	weighted Anative range (native range (> areas (parking (pasture, lawn)) S-F2 Value Not Used, <20% 3.1	Land 50% ground 75% ground lots, roofs, di s, parks, etc.) VSI Not Used 0.86	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
V	Forest and n Forest and n Impervious a Open space ariable CANOPY MBED UBSTRATE ERO	weighted A native range (< native range (> nat	VSI Not Used 0.86 1.00	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
V	Forest and n Forest and n Impervious a Open space ariable CANOPY MBED UBSTRATE ERO WD	weighted A native range (< native range (> nat	VSI Not Used 0.86 1.00 1.00 0.00	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
V	Forest and n Forest and n Impervious a Open space ariable CANOPY MBED UBSTRATE ERO WD	weighted Anative range (native range (native range (> areas (parking) (pasture, lawn) S-F2 Value Not Used, <20%	VSI Not Used 0.86 1.00 1.00 Not Used	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
V	Forest and n Forest and n Impervious a Open space ariable CANOPY MBED UBSTRATE ERO WD	weighted A native range (< native range (> nat	VSI Not Used 0.86 1.00 1.00 0.00	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
V	Forest and n Forest and n Impervious a Open space ariable CANOPY MBED UBSTRATE ERO WD DBH NAG	weighted Anative range (native range (native range (> areas (parking) (pasture, lawn) S-F2 Value Not Used, <20% 3.1 2.60 in 13 % 0.0 Not Used	VSI Not Used 0.86 1.00 1.00 Not Used	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
V	Forest and n Forest and n Impervious a Open space ariable CANOPY MBED UBSTRATE ERO WD DBH NAG	weighted Anative range (native range (native range (> areas (parking) (pasture, lawn) S-F2 Value Not Used, <20% 3.1 2.60 in 13 % 0.0 Not Used 0.0 Not Used 0.0	VSI Not Used 0.86 1.00 1.00 Not Used 0.10	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
V	Forest and n Forest and n Impervious a Open space ariable CANOPY MBED UBSTRATE ERO WD DBH NAG SD	weighted Anative range (active range (areas (parking) (pasture, lawn) S-F2 Value Not Used, <20% 3.1 2.60 in 13 % 0.0 Not Used 0.0 10.0	VSI Not Used 0.86 1.00 1.00 Not Used 0.10 0.15	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database
V	Forest and n Forest and n Impervious a Open space ariable CANOPY MBED UBSTRATE ERO WD DBH NAG SD RICH	weighted Anative range (active range (areas (parking) (pasture, lawn) S-F2 Value Not Used, <20% 3.1 2.60 in 13 % 0.0 Not Used 0.0 10.0 0.00	VSI Not Used 0.86 1.00 0.00 Not Used 0.15 0.00	Cover) Cover) Cover) Covers Cover (Size and Cover) Land Cover (NLCD), from Watershe	er Analysis rom Landsad boundarie	was compat satellite les are bas	oleted using imagery and led off of fiel	es: the 2019 d other suid delineat	O.5 1 0 0.3 National Lapplementared stream	ment 27.34 58.9 5.12 8.64 and Cover I y datasets. impacts.	Running Percent (not >100) 27.34 86.24 91.36 100 Database

Ver. 10-20-17

FCI Calculator for the High-Gradient Headwater Streams in Appalachia

To ensure accurate calculations, the <u>UPPERMOST STRATUM</u> of the plant community is determined based on the calculated value for V_{CCANOPY} (≥20% cover is required for tree/sapling strata). Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells. For information on determining how to split a project into SARs, see Chapter 5 of the Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia (Environmental Laboratory U.S. Army Corps of Engineers 2017).

Project Name: Mountain Valley Pipeline

Location: Pittsylvania **Sampling Date:** 8/23/2021

Project Site Before Project

Subclass for this SAR:

Ephemeral Stream

Uppermost stratum present at this SAR: SAR number: S-F2

Shrub/Herb Strata

Functional Results Summary:

Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.61
Biogeochemical Cycling	0.49
Habitat	0.36

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
V _{CCANOPY}	Percent canpoy over channel.	Not Used, <20%	Not Used
V_{EMBED}	Average embeddedness of channel.	3.10	0.86
V _{SUBSTRATE}	Median stream channel substrate particle size.	2.60	1.00
V_{BERO}	Total percent of eroded stream channel bank.	13.33	1.00
V_{LWD}	Number of down woody stems per 100 feet of stream.	0.00	0.00
V_{TDBH}	Average dbh of trees.	Not Used	Not Used
V _{SNAG}	Number of snags per 100 feet of stream.	0.00	0.10
V _{SSD}	Number of saplings and shrubs per 100 feet of stream.	10.00	0.15
V _{SRICH}	Riparian vegetation species richness.	0.00	0.00
V _{DETRITUS}	Average percent cover of leaves, sticks, etc.	10.00	0.12
V _{HERB}	Average percent cover of herbaceous vegetation.	90.00	1.00
V _{WLUSE}	Weighted Average of Runoff Score for Catchment.	0.75	0.79

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME	LOCATION	
STATION # RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN	
STORET#	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE	REASON FOR SURVEY

WEATHER CONDITIONS	Now Past 24 hours Yes No 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 O C Other
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph)
	LUD MAT
STREAM CHARACTERIZATION	Stream Subsystem Perennial Intermittent Tidal Stream Type Coldwater Warmwater Stream Origin Glacial Spring-fed Non-glacial montane Mixture of origins Swamp and bog Other

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERS FEATURI		Fores Field Agric	Pasture Industri	ercial	No evidence Son Obvious sources Local Watershed Erosi None Moderate	ne potential sources
RIPARIA VEGETA (18 meter	ΓΙΟΝ	Trees	e the dominant type and S ant species present	hrubs		rbaceous
INSTREA FEATURI			ted Reach Length		Canopy Cover Partly open Part	ly shaded Shaded
				m	High Water Mark	m
					Proportion of Reach Re	epresented by Stream
			km² (m²x1000) ted Stream Depth	km²	Morphology Types Riffle Pool %	Run%
			Velocity		Channelized Yes	No
		(111 11111			Dam Present Yes	No
LARGE V DEBRIS	VOODY		m² of LWDn	n ² /km ² (LWD /	reach area)	
AQUATIO VEGETA		Indicate Roote Floati Domina	e the dominant type and demergent R ng Algae A	l record the do ooted submerge ttached Algae	minant species present nt Rooted floating	C
		Portion	of the reach with aqua	tic vegetation _	%	
WATER (QUALITY	Specific	rature0 C Conductance	-	Water Odors Normal/None Sewage Petroleum Fishy	Chemical Other
		рН	ed Oxygen		Water Surface Oils Slick Sheen None Other	Globs Flecks
			strument Used		Turbidity (if not measu Clear ☐ Slightly tur Opaque Stained	r ed) rbid Turbid Other
SEDIMEN SUBSTRA		Odors Norm Chem		Petroleum None	Deposits Sludge Sawdust Relict shells	Paper fiber Sand Other
		Oils Abser		te Profu	are the undersides blac	h are not deeply embedded, k in color?
INC	ORGANIC SUBS		COMPONENTS (00%)		ORGANIC SUBSTRATE C (does not necessarily add	
Substrate Type	Diamete	er	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock				Detritus	sticks, wood, coarse plant	
Boulder	> 256 mm (10")				materials (CPOM)	
Cobble	64-256 mm (2.5	"-10")		Muck-Mud	black, very fine organic	

Gravel

Sand

Silt

Clay

2-64 mm (0.1"-2.5")

0.06-2mm (gritty)

< 0.004 mm (slick)

0.004-0.06 mm

grey, shell fragments

Marl

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

STREAM NAME	LOCATION	
STATION # RIVERMILE	STREAM CLASS	
LAT LONG	RIVER BASIN	
STORET#	AGENCY	
INVESTIGATORS		
FORM COMPLETED BY	DATE AM PM	REASON FOR SURVEY

	Habitat		Condition	ı Category	
	Parameter	Optimal	Suboptimal	Marginal	Poor
	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	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
n sampling reach	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.
ted in	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Parameters to be evaluated in sampling reach	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).
ıram	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
Pa	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	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	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)

	Habitat		Condition	n Category			
	Parameter	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 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
oling reach	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.		
samp	SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0		
Parameters to be evaluated broader than sampling reach	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.		
e eva	SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0		
to be	SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0		
Parameters	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 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0		
	SCORE (RB)	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 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0		
ĺ	SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0		

Total	Caare	
i otai	Score	

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME		LOCATION				
STATION #	RIVERMILE	STREAM CLASS				
LAT	LONG	RIVER BASIN				
STORET#		AGENCY				
INVESTIGATORS			LOT NUMBER			
FORM COMPLETED	ВҮ	DATE REASON FOR SURVEY TIME				
HABITAT TYPES	Indicate the percentage of	each habitat type present				

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
	Cobble Snags Vegetated Banks Sand Submerged Macrophytes Other ()
GENERAL COMMENTS	

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: Pittsylvania Stream ID: S-F2

Stream Name: UNT to Rocky Creek

HUC Code: 03010101 Basin: Upper Roanoke

Survey Date: 8/23/2021 Surveyors: JM DW Type: Representative

	•		LE COUNT	1			r
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cun
	Silt/Clay	< .062	S/C	A		0.00	0.00
	Very Fine	.062125		*		0.00	0.00
	Fine	.12525	1	A		0.00	0.00
	Medium	.255	SAND	A		0.00	0.00
	Coarse	.50-1.0	1	A		0.00	0.00
.0408	Very Coarse	1.0-2	1	A		0.00	0.00
.0816	Very Fine	2 -4		A		0.00	0.00
.1622	Fine	4 -5.7	1	A		0.00	0.00
.2231	Fine	5.7 - 8	1			0.00	0.00
.3144	Medium	8 -11.3	1	<u> </u>	2	2.00	2.00
.4463	Medium	11.3 - 16	GRAVEL	<u> </u>	5	5.00	7.00
.6389	Coarse	16 -22.6			6	6.00	13.00
.89 - 1.26	Coarse	22.6 - 32		A	8	8.00	21.00
1.26 - 1.77	Vry Coarse	32 - 45		<u> </u>	8	8.00	29.00
1.77 -2.5	Vry Coarse	45 - 64	1	<u> </u>	22	22.00	51.00
2.5 - 3.5	Small	64 - 90		A	30	30.00	81.00
3.5 - 5.0	Small	90 - 128	1	<u> </u>	13	13.00	94.00
5.0 - 7.1	Large	128 - 180	COBBLE	<u> </u>	3	3.00	97.00
7.1 - 10.1	Large	180 - 256	1		1	1.00	98.00
10.1 - 14.3	Small	256 - 362		<u> </u>	2	2.00	100.00
14.3 - 20	Small	362 - 512	1	<u> </u>		0.00	100.00
20 - 40	Medium	512 - 1024	BOULDER	<u> </u>		0.00	100.00
40 - 80	Large	1024 -2048	1	A		0.00	100.00
80 - 160	Vry Large	2048 -4096	1	A		0.00	100.00
	Bedrock		BDRK	^		0.00	100.00
				Totals:	100		
	Total Tally:		•			•	

RIVERMORPH PARTICLE SUMMARY

River Name: UNT to Rocky Creek Reach Name: S-F2 Sample Name: Representative 08/23/2021

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062 0.062 - 0.125 0.125 - 0.25 0.25 - 0.50 0.50 - 1.0 1.0 - 2.0 2.0 - 4.0 4.0 - 5.7 5.7 - 8.0 8.0 - 11.3 11.3 - 16.0 16.0 - 22.6 22.6 - 32.0 32 - 45 45 - 64 64 - 90 90 - 128 128 - 180 180 - 256 256 - 362 362 - 512 512 - 1024 1024 - 2048 Bedrock	0 0 0 0 0 0 0 0 0 0 0 0 2 5 6 8 8 22 30 13 3 1 2 0 0 0	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 2.00 5.00 6.00 8.00 8.00 22.00 30.00 13.00 3.00 1.00 2.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 2.00 7.00 13.00 21.00 29.00 51.00 81.00 94.00 97.00 98.00 100.00 100.00 100.00 100.00
D16 (mm) D35 (mm) D50 (mm) D84 (mm) D95 (mm) D100 (mm) Silt/Clay (%) Sand (%) Gravel (%) Cobble (%) Boulder (%) Bedrock (%)	26.13 50.18 63.14 98.77 145.33 361.99 0 0 51 47 2		

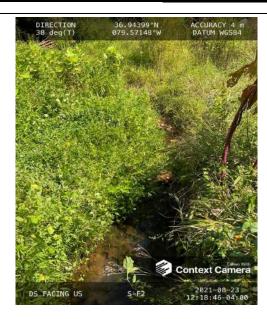
Total Particles = 100.

Ephemeral Stream Assessment Form (Form 1a) Unified Stream Methodology for use in Virginia For use in ephemeral streams Cowardin **Impact** Project # **Project Name** Locality HUC Date SAR# Class Length Factor Mountain Valley Pipeline (Mountain 22865.06 03010101 R6 8/23/21 S-F2 Pittslyvania 20 1 Valley Pipeline, LLC) Name(s) of Evaluator(s) Stream Name and Information SAR Length UNT to Rocky Creek JM, DW 201 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 Marginal Low Marginal: Non-maintained, dense herbaceous vegetation, riparian areas lacking shrub and High Poor: awns, mowed ligh Suboptima High Marginal: Non-maintained dense herbaceou vegetation with either a shrub Low Suboptimal: Riparian areas with tree stratum (dbh > Riparian areas with tree stratum (dbh > 3 inches) present, with 30% to 60% tree and maintained areas, nurseries no-till cropland; Low Poor: Impervious surfaces, mine spoil lands, Tree stratum (dbh > 3 inches) present, with > 60% tree canopy cover and an non-maintained understory. Wetlands 3 inches) present, with >30% tree actively grazed Riparian tree stratum, hay pasture, sparsely vegetated non-maintained area, enuded surface: to 60% tree canopy cover and containing both herbaceous and shrub layers or a non-maintained understory. canopy cover and a maintained layer or a tree layer (dbh > 3 roduction, ponds open water. If Buffers row crops, active feed lots, trails, o other comparable conditions. understory. Recen cutover (dense vegetation). inches) present with <30% tree canopy cover. present, tree stratum (dbh >3 inches) present, with <30% tree recently seeded and stabilized, or other comparable canopy cover with maintained High Low High Low High Low Condition 1.5 1.2 1.1 0.85 0.75 0.6 0.5 Scores Delineate riparian areas along each stream bank into Condition Categories and Condition Scores using the descriptors Ensure the sums Determine square footage for each by measuring or estimating length and width. Calculators are provided for you of % Riparian Enter the % Riparian Area and Score for each riparian category in the blocks below 100% 100% 6 Riparian Area> Right Bank 0.75 CI= (Sum % RA * Scores*0.01)/2 % Riparian Area> 50% 50% 100% Rt Bank CI > 0.75 CI Left Bank Lt Bank CI > 0.68 0.72 Score > 0.75 0.6 REACH CONDITION INDEX and STREAM CONDITION UNITS FOR THIS REACH THE REACH CONDITION INDEX (RCI) >> 0.36 NOTE: The CIs and RCI should be rounded to 2 decimal places. The CR should be rounded to a whole number RCI= (Riparian CI)/2

COMPENSATION REQUIREMENT (CR) >>

CR = RCI X LF X IF

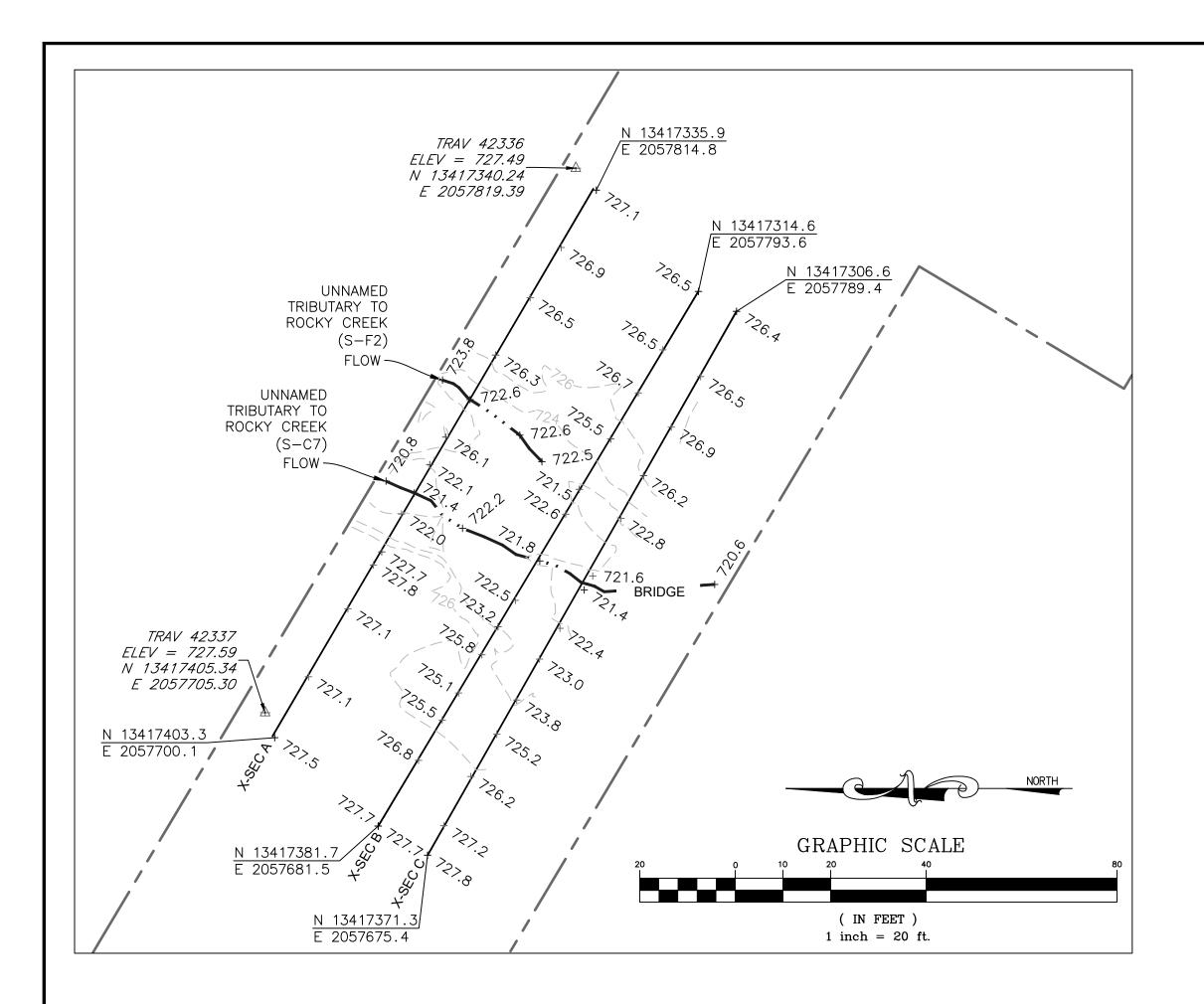
INSERT PHOTOS:

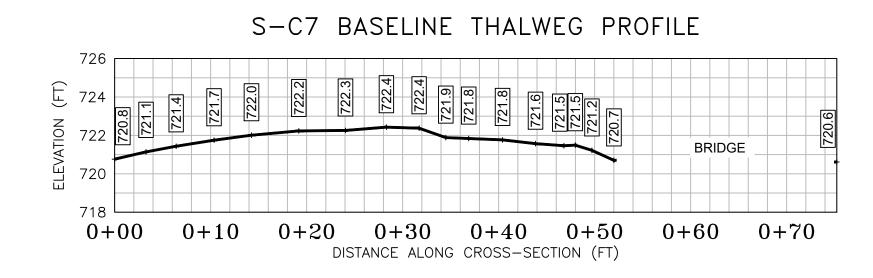


CAPTION. Assessment is limited to areas within the temporary ROW

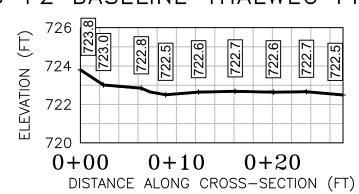
DESCRIBE PROPOSED IMPACT:

PROVIDED UNDER SEPARATE COVER

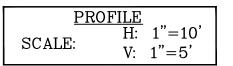


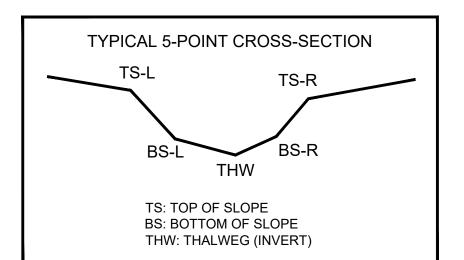


S-F2 BASELINE THALWEG PROFILE







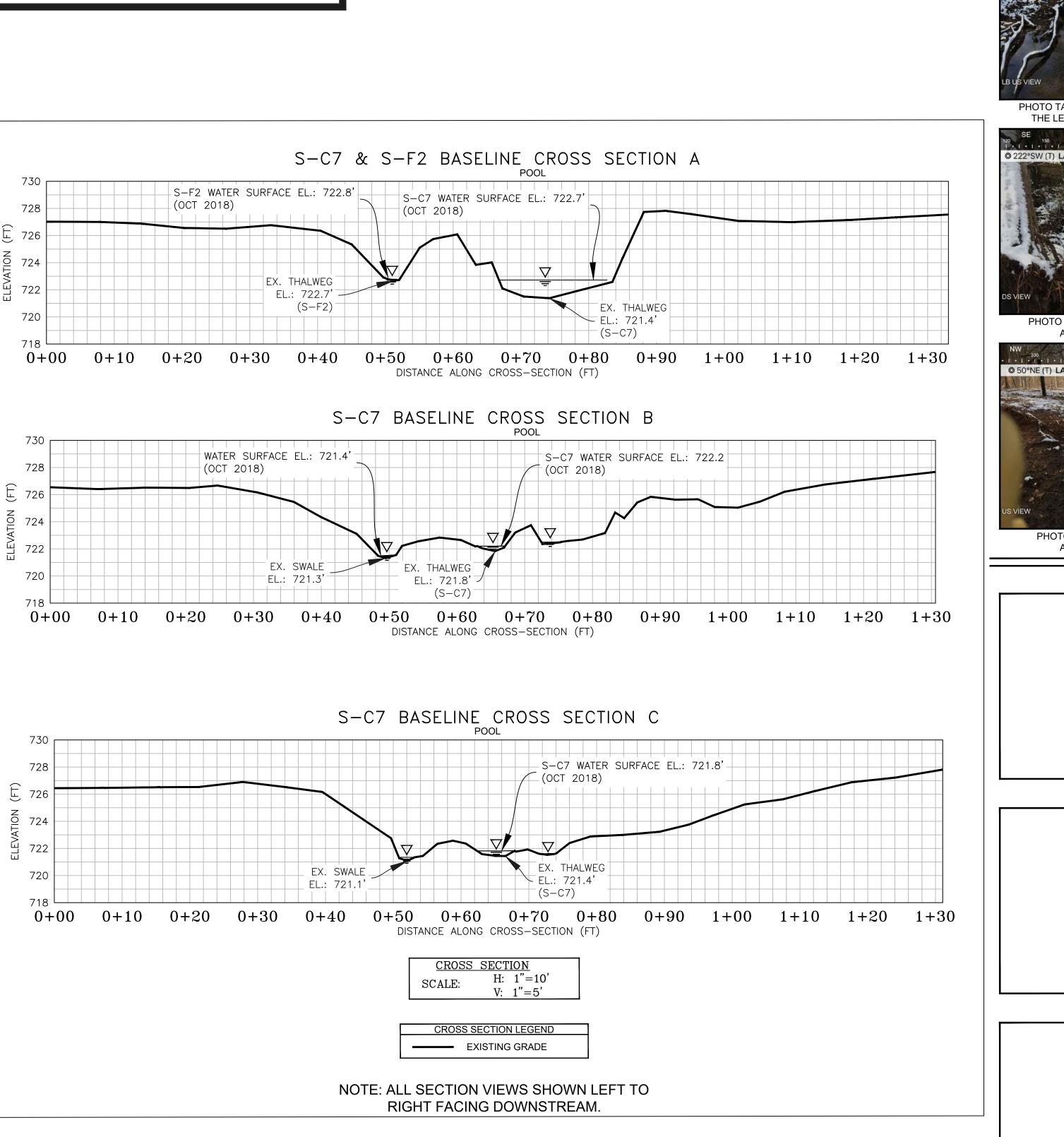


CL STAKEOUT POINTS: S-C7 CROSS SECTION B (PIPE CL)							
	PR	PRE-CROSSING					
PT. LOC.	NORTHING	EASTING	ELEV	VERT.	HORZ.		
PI. LOC.	NORTHING	IVORTHING LASTING ELEV		DIFF.	DIFF.		
⊤S-L	13417358.89	2057719.15	725.43				
BS-L	13417356.55	2057723.32	723.16				
THW	13417348.30	2057737.24	721.84				
BS-R	13417339.51	2057752.11	721.48				
T\$-R	13417332.94	2057762.66	725.46				

LEGEND STUDY AREA (EASEMENT) EXISTING SURVEY-LOCATED THALWEG EXISTING SURVEY-LOCATED EDGE OF WATER (AS NECESSARY) EXISTING CONTOUR LINE (MAJOR) EXISTING CONTOUR LINE (MINOR) 726.2 +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 real time DGPS. Field locations were completed on October 28 & 29, 2018.
- 2. Monumentation, including traverse stations and fly points, shown on this drawing should be used to orient any future boundary, topographic, or location
- 3. Easement lines shown on plan view were provided by Mountain Valley Pipeline (MVP).
- 4. WSSI Contour Interval = 2.0'. Interpolated from cross-section and thalweg points without additional breakline shots.
- 5. All section views shown left to right facing downstream.
- 6. Cross section B shot at location of pipe centerline (based on field stakes).





ALONG RIGHT BANK OF S-C7 ON 03/13/2018



PHOTO TAKEN LOOKING UPSTREAM ALONG THE LEFT BANK OF S-C7 ON 03/13/2018



PHOTO TAKEN LOOKING DOWNSTREAM



PHOTO TAKEN LOOKING UPSTREAM

ALONG S-F2 ON 03/13/2018 POST-CROSSING PHOTOS PENDING CROSSING

DHOTO T/	/ KENI I	OOKII	<u></u>

PHOTO TAKEN LOOKING PENDING CROSSING Horizontal Datum: NAD 1983 UTM ZONE 1

PHOTO TAKEN LOOKING

WSSI 2' C.I. Topo PENDING CROSSING EJC NAS PFS

> Sheet # 1 of 1

Approved

Vertical Datum: NAVD 88

Boundary and Topo Source:

286.8)

PHOTO TAKEN LOOKING

Computer File Name: L:\Survey\22000s\22800\22865.03\Spread I Work Dwgs 2865_03 S-I MP 279-291 Sheets.dwg