Baseline Assessment – Stream Attributes

Reach S-B39a/B46 (2) (Pipeline ROW) Ephemeral Spread C Webster County, West Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	✓
RBP Physical Characteristics Form	✓
Water Quality Data	N/A – No flow
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	N/A – No flow
Wolman Pebble Count	✓
Reference Reach Software Pebble Count Data	✓
Longitudinal Profile and Cross Sections	✓

Spread C Stream S-B39a/B46 (2) (Pipeline ROW) Webster County



Photo Type: DS, US View Location, Orientation, Photographer Initials: Downstream Edge of ROW, Upstream View, HC/VM Lat: 38.493227 Long: -80.560529



Photo Type: DS, DS View
Location, Orientation, Photographer Initials: Downstream Edge of ROW, Downstream View, HC/VM
Lat: 38.493227 Long: -80.560529

Spread C Stream S-B39a/B46 (2) (Pipeline ROW) Webster County



Photo Type: US View at Center Location, Orientation, Photographer Initials: Center ROW, Upstream View, HC/VM Lat: 38.493227 Long: -80.560529



Photo Type: DS View at Center Location, Orientation, Photographer Initials: ROW Center, Downstream View, HC/VM Lat: 38.493227 Long: -80.560529

Spread C Stream S-B39a/B46 (2) (Pipeline ROW) Webster County



Photo Type: US, US View
Location, Orientation, Photographer Initials: Upstream Edge of ROW, Upstream View, HC/VM
Lat: 38.493227 Long: -80.560529



Photo Type: US, DS View Location, Orientation, Photographer Initials: Upstream Edge of ROW, Downstream View, HC/VM Lat: 38.493227 Long: -80.560529

(in Decimal Degrees)	09/11/21
MPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershold size (screegy), unaffered or impairments) MITIGATION STREAM CLASS/SITE ID AND SITE DESCRIPTION: (pestershold size (screegy), unaffered or impairments)	Comments:
STREAM IMPACT LENGTH: 11 FORM OF MITIGATION: RESTORATION (Levels I-III) MIT COORDINATES: (In Decimal Degrees) MIT COORDINATES: 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: Ephemeral Stream Classification: Stream Classification: 0 Stream Classification: 0	Stream Classification: 0
Percent Stream Channel Slope 5.3 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):
Average Average Average Average	Average
Hydrology 0.51 Hydrology Hydrology Hydrology Hydrology	Hydrology
Biogeochemical Cycling 0.2 0.2666667 Biogeochemical Cycling 0 Biogeochemical Cycling 0 Biogeochemical Cycling 0 Biogeochemical Cycling 0	Biogeochemical Cycling 0
Habitat 0.09 Habitat Habitat Habitat 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	Habitat PART I - Physical, Chemical and Biological Indicators
Notice Rep Sixten Notice Rep Sixten Notice Rep Sixten	Point Scrie Rage She Score
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)
1. Epifaunal Substrate/Available Cover 0.20 0 1. Epifaunal Substrate/Available Cover 0.20	Epifaunal Substrate/Available Cover 0-20
2. Embeddedness 0.20 2 2. Embeddedness 0.20 2. Embeddedness 0.20	2. Embeddedness 0-20
3. Velocity/ Depth Regime 0-20	3. Velocity/ Depth Regime 0-20
4. Sediment Deposition 0.20 1 4. Sediment Deposition 0.20 5. Channel Flow Status 0.20 5. Channel Flow Status 0.20 6. S. Chan	4. Sediment Deposition 0-20 5. Channel Flow Status 0-20
01 01 01	
6. Channel Alteration 0.20 1 6. Channel Alteration 0.20 6. Channel Alteration 0.20 6. Channel Alteration 0.20 7. Frequency of Rifles (or bands) 0.20 7. Frequency of Rifles (or bands) 0.20 7. Channel Alteration	6. Channel Alteration 0-20 7. Frequency of Riffles (or bends) 0-20
	8. Bank Stability (LB & RB) 0-20
Scholari Station Color C	9. Vegetative Protection (LB & RB) 0-20
10. Riparian Vegetative Zone Width (LB & RB) 0,20 10. Riparian Vegetative Zone Width (LB & RB) 0	10. Riparian Vegetative Zone Width (LB & RB) 0-20
Total RBP Score	Total RBP Score Poor 0
Sub-Total 0.4666667 Sub-Total 0 Sub-Total 0 Sub-Total 0	Sub-Total 0
CHEMICAL INDICATOR (Applies to Intermittent and Personnial Streams) CHEMICAL INDICATOR (Applies to Intermittent and Personnial Streams) CHEMICAL INDICATOR (Applies to Intermittent and Personnial 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)
Specific Conductivity Specific Conductivity Specific Conductivity	Specific Conductivity
100-199 - 85 points 0-90 0-90 0-90	0-90
pH pH pH	pH
040 01 550 01 550 01	5-90 0-1
5.6-5.9 = 45 points	
DO DO 1030	10-30
Sub-Total Sub-Total Sub-Total O Sub-Total O	Sub-Total 0
BOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)	BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)
WW Stream Condition Index (WVSCI) WV Stream Condition Index (WVSCI) WW Stream Condition Index (WVSCI) WW Stream Condition Index (WVSCI) WW Stream Condition Index (WVSCI)	WV Stream Condition Index (WVSCI)
0 Sub-Total 0 Sub-Total 0 Sub-Total	Sub-Total 0
V	Sup-Total U
PART II - Index and Unit Score PART II - Index and Unit Score PART II - Index and Unit Score	PART II - Index and Unit Score
TAX I TIME AND COLOR	THE HIGH AND ONE OCCUP
Index Linear Feet Unit Score Index Linear Feet Unit Score Index Linear Feet Unit Score	Index Linear Feet Unit Score
0.450 11 4.95 0 0 0 0 0 0 0 0 0 0	0 0 0

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: MVP-stream assessment Location: Webster, Spread C

Sampling Date: 9/11/21 **Project Site** Before Project

Subclass for this SAR:

Ephemeral Stream

SAR number: S-B39a/B46b (2) Uppermost stratum present at this SAR: Shrub/Herb Strata

Functional Results Summary: Enter Results in Section A of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.51
Biogeochemical Cycling	0.20
Habitat	0.09

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.	1.00	0.10
V _{SUBSTRATE}	Median stream channel substrate particle size.	0.08	0.04
V _{BERO}	Total percent of eroded stream channel bank.	0.00	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.	64.71	1.00
V _{SRICH}	Riparian vegetation species richness.	0.00	0.00
V _{DETRITUS}	Average percent cover of leaves, sticks, etc.	8.63	0.11
V _{HERB}	Average percent cover of herbaceous vegetation.	81.88	1.00
V _{WLUSE}	Weighted Average of Runoff Score for Catchment.	1.00	1.00

			High-G		Headwa [.] Data She				а		
	Team:	HC VM		i ieiu i	Jala Sile	et and C			M Northing:	38.493227	
Pro			m Assessm	ent			L	.ongitude/U	TM Easting:	-80.560529)
	Location:	Webster, S	pread C					San	npling Date:	9/11/21	
SA	AR Number:	B39a/B46b	Reach	Length (ft):	17	Stream Ty	/pe: Ephe	emeral Stream	n		•
	Top Strata:	Sh	rub/Herb St	rata	(determine	d from perce	ent calculate	ed in V _{CCANO}	_{PY})		
Site	and Timing:	Project Site	•			~	Before Proje	ct			_
		1-4 in strea									
1	V _{CCANOPY}	equidistant 20%, enter	ercent cover points alono at least one measureme	the stream value betw	. Measure een 0 and 1	only if tree/s	apling cove	r is at least			Not Used, <20%
	0	0	0	0	0	0	0	0	0	0	
2	V_{EMBED}	along the s surface and to the follow	mbeddednes tream. Sele d area surro wing table. I bed is comp	ect a particle unding the p f the bed is	from the be particle that i an artificial s	ed. Before n is covered b surface, or c	noving it, de by fine sedim composed of	termine the ent, and en	percentage ter the ratin	of the g according	1.0
		Embedded Minshall 19	ness rating to	for gravel, c	obble and b	oulder partic	cles (rescale	d from Platt	ts, Megahan	, and	
		Rating	Rating Des							,	
		5 4			covered, sur					()	-
		3	26 to 50 pe	rcent of sur	face covere	d, surrounde	ed, or buried	by fine sed	liment		
		2			face covered covered, su					al surface)	
	List the rati		point below			ouriueu, U	. Duricu by I	o scanner	(or artificia		-
	1	1	1	1	1	1	1	1	1	1	
	1	1	1	1	1	1	1	1	1	1	
	1	1	1	1	1	1	1	1	1	1	
	1	1	1	1	1	1	1	1	1	1	
3	V _{SUBSTRATE}		eam channe tream; use t						hly equidista	ant points	0.08 in
	Enter partic	cle size in in	ches to the	nearest 0.1	inch at each	point below	(bedrock s	hould be co	unted as 99	in, asphalt	
			and or finer			0.00	0.00	0.00	0.00	0.00	1
	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
4	0.08	0.08	0.08 ent of eroded	0.08	0.08	0.08	0.08	0.08	0.08	0.08	
4	V _{BERO}		al percentag	e will be cal		oth banks a		otal erosion			0 %
Sample 5			he entire ri								
J	V_{LWD}	stream rea	down wood ch. Enter th et of stream	e number fr	om the entir llated.	e 50'-wide b		thin the cha			0.0
6	V_{TDBH}		oh of trees (r cm) in diam				g cover is a	t least 20%)). Trees are	at least 4	Not Used
		,	n measurem below:) within the				
			Left Side			^		Right Side			Į
	0					0					
											1
]
											1
											1
7	V _{SNAG}		snags (at le stream, and					Enter numb	er of snags	on each	0.0
			Left Side:		0		Right Side:		0		
8	V _{SSD}		saplings an	d shrubs (w	oody stems		es dbh) per	100 feet of	stream (me		
			r is <20%). of stream wil	l be calculat	ed.	gs and shrul				the amount	64.7
			Left Side:		0		Right Side:		1		

9	V _{SRICH}		the tallest st	tratum. Che					strata. Spe	CUCS	0.00
				nd the subi	ndex will be	calculated f	rom these d		0 (1 0)		
_	Acor rubru		p 1 = 1.0	Magnalia t	rinotolo		Ailanthua		2 (-1.0)	Lonicoro io	nonino
	Acer rubrui			Magnolia ti	•		Ailanthus a			Lonicera ja	
	Acer sacch			Nyssa sylv			Albizia julib			Lonicera ta	
	Aesculus fl			-	n arboreum		Alliaria peti	olata		Lotus corni	
	Asimina tril			Prunus sei			Alternanthe			Lythrum sa	
	Betula alleg			Quercus a		_	philoxeroide			Microstegiur	
	Betula lenta	а		Quercus co	occinea		Aster tatari			Paulownia	tomentosa
	Carya alba			Quercus in	nbricaria		Cerastium	fontanum		Polygonum	cuspidatum
	Carya glab	ra		Quercus p	rinus		Coronilla va	aria		Pueraria m	ontana
	Carya oval	is		Quercus ru	ıbra		Elaeagnus u	mbellata		Rosa multi	flora
	Carya ovat	'a		Quercus ve	elutina		Lespedeza	bicolor		Sorghum h	alepense
	Cornus flor	rida		Sassafras	albidum		Lespedeza	cuneata		Verbena bi	asiliensis
	Fagus grar	ndifolia		Tilia americ	cana		Ligustrum ol	otusifolium			
	Fraxinus a	mericana		Tsuga can	adensis		Ligustrum s	sinense			
	Liriodendron	tulipifera		Ulmus ame	ericana						
	Magnolia a	cuminata									
		0	Species in	Group 1				0	Species in	Group 2	
Camal	e Variables	40 44	4 laa-4 0	aubolata (40" × 40" a	- d v d\	la tha ulaau	/b ff		OF foot from	
	e variables The four sul					,	•		one within	25 feet fron	ı eacn
10	V _{DETRITUS}				sticks, or oth				<4" diamete	er and <36"	
		long are inc	lude. Enter	the percen	t cover of th	e detrital lay	er at each s	ubplot.			8.63 %
			Left	Side			Right	Side]	
		10	8	9	7	10	7	10	8		
- 4.4	M	A				4-4: (+000() D		
11	V_{HERB}				aceous vege oh and 36" ta						
		vegetation	percentages		n 200% are a						82 %
		each subpl		0:1			Diala	0:1		7	
		00		Side	0.5	100		Side	GE.		
Sampl	e Variable 1	90 2 within the	65	75	85 he stream.	100	100	75	65		
Sampl	e Variable 1	2 within the	65 e entire cato	75 chment of t					65		1.00
		2 within the	65 e entire cato exerage of F	75 chment of t	he stream.	ned:			65 Runoff	% in	Running
		2 within the	65 e entire cato exerage of F	75 chment of t	he stream.	ned:				% in Catch- ment	
	V _{WLUSE}	2 within the	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff Score	Catch- ment	Running Percent (not >100)
	V _{WLUSE}	2 within the	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff	Catch-	Running Percent
	V _{WLUSE}	2 within the	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff Score	Catch- ment	Running Percent (not >100)
	V _{WLUSE}	2 within the	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff Score	Catch- ment	Running Percent (not >100)
	V _{WLUSE}	2 within the	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff Score	Catch- ment	Running Percent (not >100)
	V _{WLUSE}	2 within the	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff Score	Catch- ment	Running Percent (not >100)
	V _{WLUSE}	2 within the	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff Score	Catch- ment	Running Percent (not >100)
	V _{WLUSE}	2 within the	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff Score	Catch- ment	Running Percent (not >100)
	V _{WLUSE}	2 within the	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff Score	Catch- ment	Running Percent (not >100)
	V _{WLUSE}	2 within the Weighted A	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:			Runoff Score	Catch- ment	Running Percent (not >100)
	Forest and n	2 within the Weighted A	e entire cate verage of F	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100		Runoff Score	Catch- ment	Running Percent (not >100)
12	Forest and m	2 within the Weighted A	e entire cate verage of F Land	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
12	Forest and m	2 within the Weighted A hative range (:	e entire cate verage of F Land -75% ground	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
12	Forest and m	2 within the Weighted A	e entire cate verage of F Land	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
12	Forest and m	2 within the Weighted A mative range (: 2a/B46b (2) Value Not Used,	e entire cate verage of F Land -75% ground	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
12	Forest and m S-B39 Variable Vcanopy Vembed	2 within the Weighted A mative range (: 2a/B46b (2) Value Not Used, <20%	e entire cate verage of F Land 75% ground	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
12	S-B39 /ariable Vacanopy Values Val	2 within the Weighted A a/B46b (2) Value Not Used, <20% 1.0 0.08 in	verage of F Land VSI Not Used 0.10 0.04	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
V V	S-B39 Variable Vacanopy Vembed Vsubstrate Vbero	2 within the Weighted A Market A M	e entire cate verage of F Land 75% ground VSI Not Used 0.10	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
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V	S-B39 /ariable Vcanopy Vsubstrate Vbero VLWD VTDBH	2 within the Weighted A hative range (: 2a/B46b (2) Value Not Used, <20% 1.0 0.08 in 0 % 0.0 Not Used	VSI Not Used 0.00 Not Used	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
V V	S-B39 Variable Variable	2 within the Weighted A autive range (: au/B46b (2) Value Not Used, <20% 1.0 0.08 in 0 % 0.0 Not Used 0.0	VSI Not Used 0.10 Not Used 0.10	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
V V	S-B39 /ariable Vcanopy Vsubstrate Vbero VLWD VTDBH	2 within the Weighted A hative range (: 2a/B46b (2) Value Not Used, <20% 1.0 0.08 in 0 % 0.0 Not Used	VSI Not Used 0.00 Not Used	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
12	S-B39 Variable Variable	2 within the Weighted A autive range (: au/B46b (2) Value Not Used, <20% 1.0 0.08 in 0 % 0.0 Not Used 0.0	VSI Not Used 0.10 Not Used 0.10	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
V V	S-B39 Variable Vcanopy Vambed Vsubstrate Vbero Vtub Vtub Vsubstrate Vsero Vtub Vsubstrate	2 within the Weighted A Pa/B46b (2) Value Not Used, <20% 1.0 0.08 in 0 % 0.0 Not Used 0.0 64.7	VSI Not Used 0.10 0.00 Not Used 0.10 1.00	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
12 V	S-B39 Variable Vcanopy Vambed Vsubstrate Vbero Vtob Vsubstrate	2 within the Weighted A Ma/B46b (2) Value Not Used, <20% 1.0 0.08 in 0 % 0.0 Not Used 0.0 64.7 0.00 8.6 %	VSI Not Used 0.10 0.00 Not Used 0.10 0.00 0.01	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)
V V	S-B39 Variable Vcanopy Vambed Vsubstrate Vbero Vtub Vtub Vsubstrate Vsero Vtub Vsubstrate	2 within the Weighted A Ma/B46b (2) Value Not Used, <20% 1.0 0.08 in 0 % 0.0 Not Used 0.0 64.7 0.00	VSI Not Used 0.10 0.00 Not Used 0.10 0.00	75 chment of t Runoff Score Use (Choose	he stream.	ned:	100	75 * * * * * * * * * * * * * * * * * * *	Runoff Score	Catch- ment	Running Percent (not >100)

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%	storm (heavy rain) rain (steady rain) showers (intermittent) %cloud cover clear/sunny	Past 24 hours	Has there been a heavy rain in the last 7 days? Yes No Air Temperature0 C Other
SITE LOCATION/MAP	Draw a map	•	ne areas sam	s-B39a2/B46
STREAM CHARACTERIZATION	Stream Sub Perennial Stream Ori Glacial Non-glaci Swamp an	gin Spring-fe Al montane Mixture	ed of origins	Stream Type Coldwater Warmwater Catchment Areakm²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

	WATERSHED FEATURES Predominant Surrou Forest Field/Pasture Agricultural Residential			nduse ercial rial	Obvious sources	No evidence Some potential sources Obvious sources Local Watershed Erosion		
RIPARIA VEGETA (18 meter	TION	Indicate the dominant type and record the dominant species present Trees Shrubs Grasses Herbaceous Dominant species present						
INSTREA FEATURI		Estimat Samplin Area in Estimat	km² (m²x1000) ed Stream Depth Velocity	m m² km² m	Canopy Cover Partly open Part High Water Mark Proportion of Reach R Morphology Types Riffle % Pool	epresented by Stream Run% No		
LARGE V DEBRIS	VOODY		of LWD	m ² /km ² (LWD/	reach area)			
AQUATIO VEGETA		Roote Floati Domin a	ed emergent Fing Algae A	Rooted submerge Attached Algae		Ü		
WATER ((DS, US)	QUALITY	Specific Dissolve pH Turbidi	rature0 C Conductance ed Oxygen ty strument Used	_	Water Odors Normal/None Sewage Petroleum Fishy Water Surface Oils Slick Sheen None Other Turbidity (if not measu Clear □ Slightly tu Opaque Stained	Chemical Other Globs Flecks		
SEDIMEN SUBSTRA		Odors Normal Sewage Petroleum Sludge Chemical Anaerobic None Relict shell Other Oils Absent Slight Moderate Profuse Yes				Othereh are not deeply embedded,		
INC	ORGANIC SUBS		COMPONENTS 00%)		ORGANIC SUBSTRATE C			
Substrate Type	Diamete	er	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area		
Bedrock	-			Detritus	sticks, wood, coarse plant materials (CPOM)			
Boulder	> 256 mm (10")				materials (CI OWI)			
Cobble	64-256 mm (2.5	"-10")		Muck-Mud	black, very fine organic (FPOM)			

Gravel

2-64 mm (0.1"-2.5")

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
Para	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	onks % Sand %		

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	

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: Webster Stream ID: S-B39a/B46 (2)

Stream Name: UNT to Amos Run (2)

HUC Code: Basin:

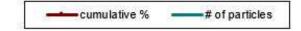
Survey Date: 9/11/2021 Surveyors: VM, HC

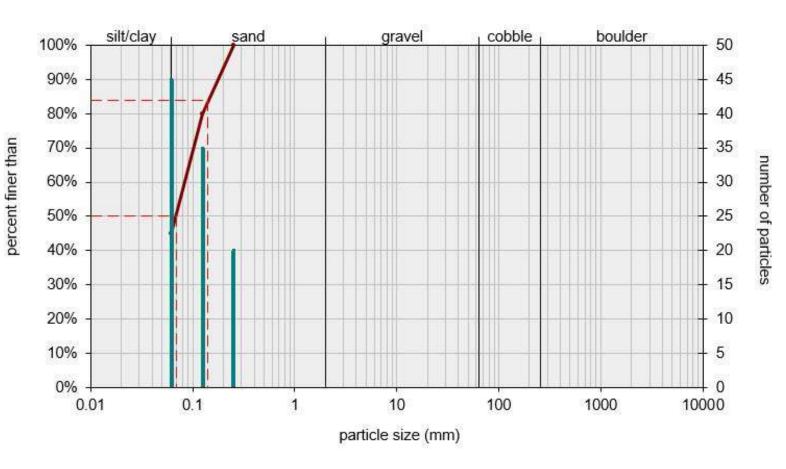
Surveyors: VM, HC Impact Reach: 5.2 m

Type: Bankfull Channel

			BLE COUNT				
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cur
	Silt/Clay	< .062	S/C	A	45	45.00	45.00
	Very Fine	.062125		A	35	35.00	80.00
	Fine	.12525	1	A	20	20.00	100.0
	Medium	.255	SAND	A	0	0.00	100.0
	Coarse	.50-1.0	1	A	0	0.00	100.0
.0408	Very Coarse	1.0-2	1	A	0	0.00	100.0
.0816	Very Fine	2 -4		A	0	0.00	100.0
.1622	Fine	4 -5.7	1	<u> </u>	0	0.00	100.0
.2231	Fine	5.7 - 8	1	A	0	0.00	100.0
.3144	Medium	8 -11.3	1	A	0	0.00	100.0
.4463	Medium	11.3 - 16	GRAVEL	<u> </u>	0	0.00	100.0
.6389	Coarse	16 -22.6	1	<u> </u>	0	0.00	100.0
.89 - 1.26	Coarse	22.6 - 32	1	<u> </u>	0	0.00	100.0
1.26 - 1.77	Vry Coarse	32 - 45	1	<u> </u>	0	0.00	100.0
1.77 -2.5	Vry Coarse	45 - 64	1	<u> </u>	0	0.00	100.0
2.5 - 3.5	Small	64 - 90		<u> </u>	0	0.00	100.0
3.5 - 5.0	Small	90 - 128	1	<u> </u>	0	0.00	100.0
5.0 - 7.1	Large	128 - 180	COBBLE	<u>^</u>	0	0.00	100.0
7.1 - 10.1	Large	180 - 256	1	<u> </u>	0	0.00	100.0
10.1 - 14.3	Small	256 - 362		<u> </u>	0	0.00	100.0
14.3 - 20	Small	362 - 512	1	<u> </u>	0	0.00	100.0
20 - 40	Medium	512 - 1024	BOULDER	<u> </u>	0	0.00	100.0
40 - 80	Large	1024 -2048	1	<u> </u>	0	0.00	100.0
80 - 160	Vry Large	2048 -4096	1	<u> </u>	0	0.00	100.0
	Bedrock		BDRK		0	0.00	100.0
				Totals:	100		
	Total Tally:		DDKK	▼		0.00	

Bankfull Channel Pebble Count, S-B39a/B46 (2), UNT to Amos Run (2)

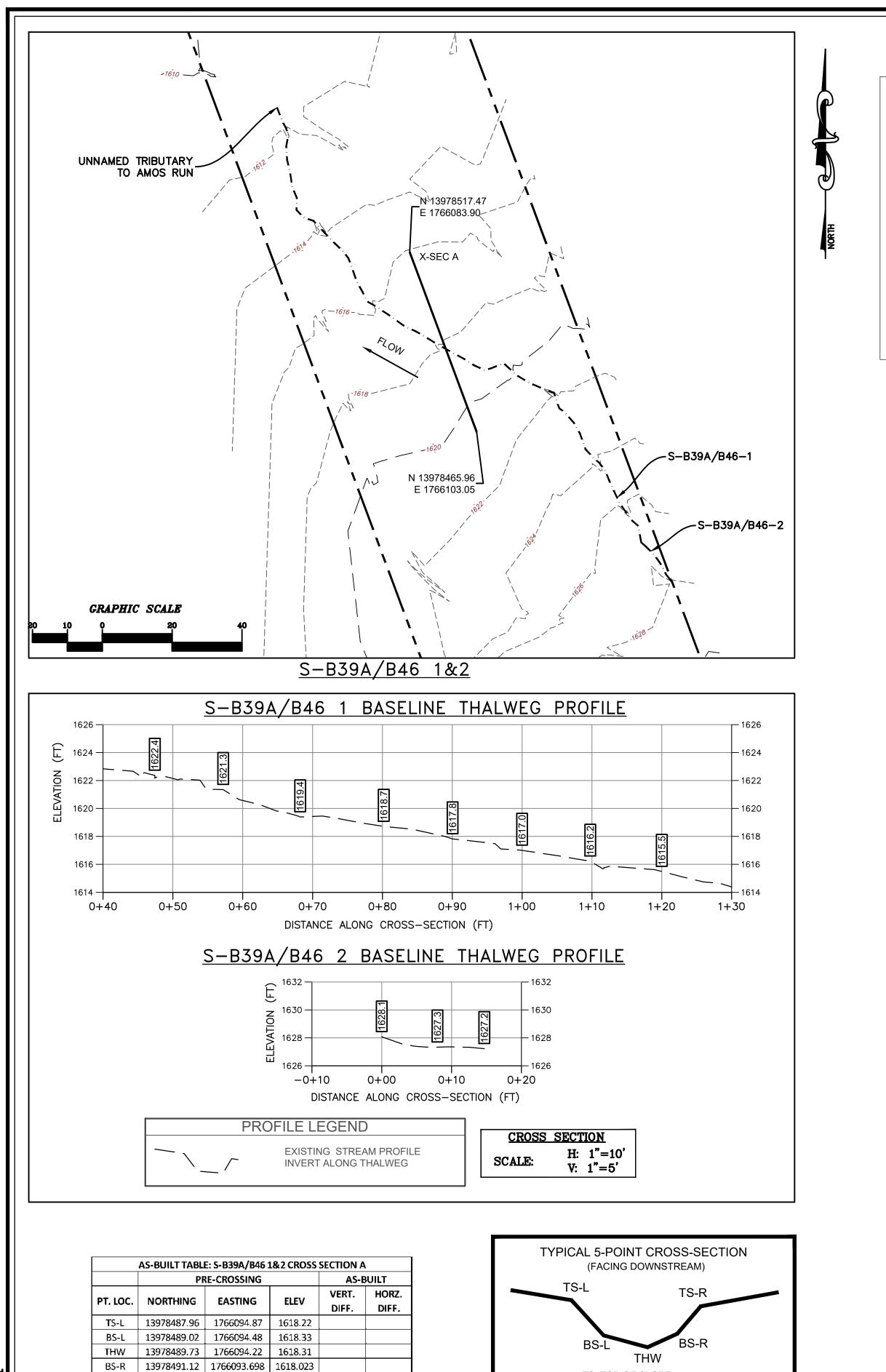




Size (mm)					
D16	0.062				
D35	0.062				
D50	0.069				
D65	0.093				
D84	0.14				
D95	0.21				

Size Distr	ibution
mean	0.1
dispersion	1.6
skewness	0.22

T	ype
silt/clay	45%
sand	55%
gravel	0%
cobble	0%
boulder	0%

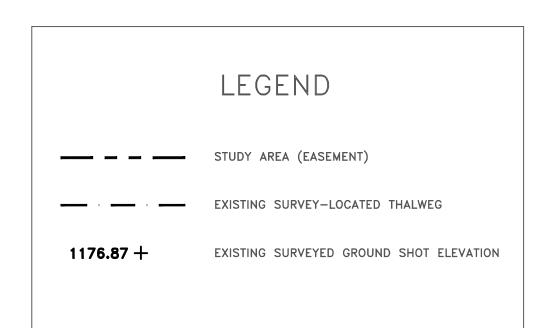


TS-R 13978492.02 1766093.365 1618.002

TS: TOP OF SLOPE

BS: BOTTOM OF SLOPE

THW: THALWEG (INVERT)



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 SEPTEMBER 11, 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 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.
- 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.

CROSS SECTION LEGEND

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

— EXISTING GRADE

CROSS SECTION

S-B39A/B46 1&2 BASELINE CROSS-SECTION A PIPELINE 1628 -1628 - 1626 1624 -1624 -1622 - 1620 - 1618 1616 — EX. THALWEG EL.: 1618.2 0+30 DISTANCE ALONG CROSS-SECTION (FT)

NOTE: ALL SECTIONS 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 FROM UPSTREAM IMPACT LIMITS

> > PENDING CROSSING

PHOTO TAKEN LOOKING UPSTREAM FROM DOWNSTREAM IMPACT LIMITS

PRE-CROSSING

CAD File No.

DRAWING