

Baseline Assessment – Stream Attributes

Reach S-KL54 (Pipeline ROW)

Perennial

Spread I

Franklin County, Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	N/A – Perennial stream (not shadeable, slope >4%)
RBP Physical Characteristics Form	✓
Water Quality Data	✓
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	✓
Wolman Pebble Count	✓
RiverMorph Data Sheet	✓
USM Form (Virginia Only)	✓
Longitudinal Profile and Cross Sections	✓

Spread I Stream S-KL54 (Pipeline ROW) Franklin County



Photo Type: RB US VIEW

Location, Orientation, Photographer Initials: Downstream at ROW/LOD on right bank looking N upstream, DW



Photo Type: LB US VIEW

Location, Orientation, Photographer Initials: Downstream at ROW/LOD on left bank looking N upstream, DW

Spread I Stream S-KL54 (Pipeline ROW) Franklin County



Photo Type: DS COND

Location, Orientation, Photographer Initials: Downstream at ROW/LOD looking S downstream, DW



Photo Type: LB CL

Location, Orientation, Photographer Initials: On thalweg at pipe centerline looking W at right streambank, DW

Spread I Stream S-KL54 (Pipeline ROW) Franklin County



Photo Type: RB CL

Location, Orientation, Photographer Initials: On thalweg at pipe centerline looking E at left streambank, DW



Photo Type: US COND

Location, Orientation, Photographer Initials: Upstream at ROW/LOD looking N upstream, DW

Spread I Stream S-KL54 (Pipeline ROW) Franklin County



Photo Type: LB DS VIEW

Location, Orientation, Photographer Initials: Upstream at ROW/LOD on left bank looking S downstream, DW



Photo Type: RB DS VIEW

Location, Orientation, Photographer Initials: Upstream at ROW/LOD on right bank looking S downstream, DW

USACE FILE NO./ Project Name: (v2.1, Sept 2016)			Mountain Valley Pipeline			IMPACT COORDINATES: (in Decimal Degrees)			Lat.	37.059535			Lon.	-79.840624			WEATHER:			Sunny			DATE:			August 26, 2021																					
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)						S-KL54/377 ac						MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)						Comments:																													
STREAM IMPACT LENGTH:			76			FORM OF MITIGATION:			RESTORATION (Levels I-III)			MIT COORDINATES: (in Decimal Degrees)			Lat.				Lon.				PRECIPITATION PAST 48 HRS:			No			Mitigation Length:																		
Column No. 1- Impact Existing Condition (Debit)						Column No. 2- Mitigation Existing Condition - Baseline (Credit)						Column No. 3- Mitigation Projected at Five Years Post Completion (Credit)						Column No. 4- Mitigation Projected at Ten Years Post Completion (Credit)						Column No. 5- Mitigation Projected at Maturity (Credit)																							
Stream Classification:						Perennial						Stream Classification:						0						Stream Classification:						0																	
Percent Stream Channel Slope						2.27						Percent Stream Channel Slope						0						Percent Stream Channel Slope						0																	
HGM Score (attach data forms):						Average						HGM Score (attach data forms):						Average						HGM Score (attach data forms):						Average																	
Hydrology												Hydrology												Hydrology												Hydrology											
Biogeochemical Cycling						0						Biogeochemical Cycling						0						Biogeochemical Cycling						0						Biogeochemical Cycling						0					
Habitat												Habitat												Habitat												Habitat											
PART I - Physical, Chemical and Biological Indicators												PART I - Physical, Chemical and Biological Indicators												PART I - Physical, Chemical and Biological Indicators												PART I - Physical, Chemical and Biological Indicators											
Points Scale						Range						Points Scale						Range						Points Scale						Range						Points Scale						Range					
Phys. Ind. Score												Phys. Ind. Score												Phys. Ind. Score												Phys. Ind. Score											
PHYSICAL INDICATOR (Applies to all streams classifications)												PHYSICAL INDICATOR (Applies to all streams classifications)												PHYSICAL INDICATOR (Applies to all streams classifications)												PHYSICAL INDICATOR (Applies to all streams classifications)											
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						1. Epifaunal Substrate/Available Cover						0-20						1. Epifaunal Substrate/Available Cover						0-20						1. Epifaunal Substrate/Available Cover						0-20					
2. Embeddedness						0-20						2. Embeddedness						0-20						2. Embeddedness						0-20						2. Embeddedness						0-20					
3. Velocity Depth Regime						0-20						3. Velocity Depth Regime						0-20						3. Velocity Depth Regime						0-20						3. Velocity Depth Regime						0-20					
4. Sediment Deposition						0-20						4. Sediment Deposition						0-20						4. Sediment Deposition						0-20						4. Sediment Deposition						0-20					
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						6. Channel Alteration						0-20						6. Channel Alteration						0-20						6. Channel Alteration						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						7. Frequency of Riffles (or bends)						0-20					
8. Bank Stability (LB & RB)						0-20						8. Bank Stability (LB & RB)						0-20						8. Bank Stability (LB & RB)						0-20						8. Bank Stability (LB & RB)						0-20					
9. Vegetative Protection (LB & RB)						0-20						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						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						Total RBP Score						Poor						Total RBP Score						Poor						Total RBP Score						Poor					
Sub-Total						0.695						Sub-Total						0						Sub-Total						0						Sub-Total						0					
CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)												CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)												CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)												CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)											
WVDEP Water Quality Indicators (General)												WVDEP Water Quality Indicators (General)												WVDEP Water Quality Indicators (General)												WVDEP Water Quality Indicators (General)											
Specific Conductivity						0-90						Specific Conductivity						0-90						Specific Conductivity						0-90						Specific Conductivity						0-90					
pH						0-1						pH						0-1						pH						0-1						pH						0-1					
DO						0-10						DO						0-10						DO						0-10						DO						0-10					
Sub-Total						1						Sub-Total						0						Sub-Total						0						Sub-Total						0					
BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)												BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)												BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)												BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)											
WV Stream Condition Index (WVSCI)												WV Stream Condition Index (WVSCI)												WV Stream Condition Index (WVSCI)												WV Stream Condition Index (WVSCI)											
Good						0-100						Good						0-100						Good						0-100						Good						0-100					
Sub-Total						0.735						Sub-Total						0						Sub-Total						0						Sub-Total						0					
PART II - Index and Unit Score												PART II - Index and Unit Score												PART II - Index and Unit Score												PART II - Index and Unit Score											
Index						Linear Feet						Index						Linear Feet						Index						Linear Feet						Index						Linear Feet					
0.810						76						0						0						0						0						0						0					
Unit Score						61.56						Unit Score						0						Unit Score						0						Unit Score						0					

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME S-KL54	LOCATION Franklin County	
STATION # _____ RIVERMILE 268.6	STREAM CLASS Perennial	
LAT 37.059535 LONG -79.840624	RIVER BASIN Upper Roanoke	
STORET # _____	AGENCY VADEQ	
INVESTIGATORS JM, DW		
FORM COMPLETED BY JM	DATE 8/26/2021 TIME 0800	REASON FOR SURVEY Baseline Assessment

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☒ %cloud cover ☒ clear/sunny Past 24 hours ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☐ %cloud cover ☒ clear/sunny Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature 21 °C Other _____	
SITE LOCATION/MAP * Eroded Cliff * Silt Fence * CFS	Draw a map of the site and indicate the areas sampled (or attach a photograph) 	
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☒ Spring-fed ☐ Non-glacial montane ☐ Mixture of origins ☐ Swamp and bog ☐ Other _____ Stream Type ☒ Coldwater ☐ Warmwater Catchment Area _____ km²	

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☐ Forest ☐ Commercial ☒ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☐ Residential	Local Watershed NPS Pollution ☒ No evidence ☐ Some potential sources ☐ Obvious sources Local Watershed Erosion ☒ None ☐ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☐ Trees ☐ Shrubs ☒ Grasses ☒ Herbaceous Dominant species present _____	
INSTREAM FEATURES	Estimated Reach Length <u>18.2</u> m Estimated Stream Width <u>3</u> m Sampling Reach Area <u>46.6</u> m² Area in km² (m²x1000) _____ km² Estimated Stream Depth <u>0.154</u> m Surface Velocity (at thalweg) _____ m/sec Canopy Cover ☒ Partly open ☐ Partly shaded ☐ Shaded High Water Mark <u>1.5</u> m Proportion of Reach Represented by Stream Morphology Types Riffle <u>50</u> % Run _____ % Pool <u>50</u> % Channelized ☐ Yes ☒ No Dam Present ☐ Yes ☒ No	
LARGE WOODY DEBRIS	LWD <u>0</u> m ² Density of LWD _____ m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☒ Rooted emergent ☒ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☐ Attached Algae Dominant species present <u>Grass</u> Portion of the reach with aquatic vegetation _____ %	
WATER QUALITY	Temperature <u>20.6u/20.6d</u> °C Specific Conductance <u>51.5 u/51.4d</u> ms/cm Dissolved Oxygen <u>7.96 u/7.88d</u> mg/L pH <u>7.03u/7.04d</u> Turbidity _____ WQ Instrument Used <u>YSI</u> Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____	
SEDIMENT/SUBSTRATE	Odors ☒ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No	

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	
Boulder	> 256 mm (10")	20			
Cobble	64-256 mm (2.5"-10")	30			
Gravel	2-64 mm (0.1"-2.5")		Muck-Mud	black, very fine organic (FPOM)	
Sand	0.06-2mm (gritty)	50			
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)		Marl	grey, shell fragments	

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

STREAM NAME S-KL54		LOCATION Franklin County	
STATION # _____ RIVERMILE 268.6		STREAM CLASS Perennial	
LAT 37.059535 LONG -79.840624		RIVER BASIN Upper Roanoke	
STORET # _____		AGENCY VADEQ	
INVESTIGATORS JM, DW			
FORM COMPLETED BY JM		DATE 8/26/2021 TIME 0800 AM PM	REASON FOR SURVEY Baseline Assessment

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	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 <u>not</u> new fall and <u>not</u> transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
	SCORE 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime (usually slow-deep).
	SCORE 20	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 18	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 15	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 Parameter	Condition Category																				
	Optimal					Suboptimal					Marginal					Poor					
6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern.						Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.					Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.					Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.					
SCORE 9	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
7. Frequency of Riffles (or bends) Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.						Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.					Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.					Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.					
SCORE 18	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected. Note: determine left or right side by facing downstream.						Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.					Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.					Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.					
SCORE 7																					
SCORE 1	Left Bank	10	9			8	7	6			5	4	3			2	1	0			
	Right Bank	10	9			8	7	6			5	4	3			2	1	0			
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 5																					
SCORE 4	Left Bank	10	9			8	7	6			5	4	3			2	1	0			
	Right Bank	10	9			8	7	6			5	4	3			2	1	0			
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 3																					
SCORE 3	Left Bank	10	9			8	7	6			5	4	3			2	1	0			
	Right Bank	10	9			8	7	6			5	4	3			2	1	0			

Total Score 139

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME S-KL54		LOCATION Franklin County	
STATION # _____ RIVERMILE _____		STREAM CLASS Perennial	
LAT 37.059535 LONG -79.840624		RIVER BASIN Upper Roanoke	
STORET # _____		AGENCY _____	
INVESTIGATORS KB TC		LOT NUMBER _____	
FORM COMPLETED BY KB		DATE 9/9/2021 TIME 10:00 AM	REASON FOR SURVEY _____

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 4 _____ ☐ Snags _____ ☐ Vegetated Banks _____ ☐ Sand _____ ☐ Submerged Macrophytes _____ ☐ Other (_____) _____
GENERAL COMMENTS	4 kicks done in cobble riffle habitats.

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						

Sample ID Collection Date		S-KL54 09-09-2021
ORDER	GENUS/SPECIES	COUNT
Ephemeroptera	Acentrella sp.	3
Ephemeroptera	Baetis sp.	15
Ephemeroptera	Caenis sp.	8
Ephemeroptera	Isonychia sp.	2
Ephemeroptera	Maccaffertium sp.	10
Plecoptera	Leuctra sp.	4
Trichoptera	Cheumatopsyche sp.	25
Trichoptera	Chimarra sp.	11
Trichoptera	Hydropsyche sp.	4
Trichoptera	Hydroptilidae	1
Odonata	Calopterygidae	1
Coleoptera	Microcylloepus sp.	2
Coleoptera	Optioservus sp.	1
Coleoptera	Oulimnius sp.	4
Coleoptera	Psephenus sp.	8
Coleoptera	Stenelmis sp.	3
Megaloptera	Corydalus sp.	2
Diptera-Chironomidae	Chironomidae	1
Diptera-Chironomidae	Cladotanytarsus sp.	2
Diptera-Chironomidae	Corynoneura sp.	3
Diptera-Chironomidae	Cricotopus sp.	7
Diptera-Chironomidae	Microtendipes sp.	3
Diptera-Chironomidae	Parachaetocladius sp.	1
Diptera-Chironomidae	Parametrioctenus sp.	1
Diptera-Chironomidae	Paraphaenocladus sp.	2
Diptera-Chironomidae	Polypedilum sp.	22
Diptera-Chironomidae	Stempellinella sp.	1
Diptera-Chironomidae	Sublettea sp.	1
Diptera-Chironomidae	Tanytarsus sp.	5
Diptera-Chironomidae	Thienemanniella sp.	1
Diptera-Chironomidae	Thienemannimyia gr. sp.	8
Diptera	Anopheles sp.	1
Diptera	Antocha sp.	4
Diptera	Atrichopogon sp.	1
Diptera	Empididae	1
Diptera	Limonia sp.	1
Diptera	Simulium sp.	1
Annelida	Naididae	12
Bivalvia	Pisidium sp.	1
Gastropoda	Elimia sp.	14
Gastropoda	Ferrissia sp.	12
Gastropoda	Lymnaeidae	4
Acari	Atractides sp.	2
Acari	Lebertia sp.	3
Other Organisms	Nematoda	1
Other Organisms	Prostoma sp.	7
Other Organisms	Tetrastemmatidae	4
Other Organisms	Turbellaria	1
TOTAL		232

Sample ID Collection Date		S-KL54 09-09-2021
WVSCI Metric Values		
Total taxa		28
EPT taxa		8
% EPT		35.8
% Chironomidae		25.0
% 2 Dominant		37.5
HBI		5.22
WVSCI Metric Scores		
Total taxa		133.3
EPT taxa		61.5
% EPT		38.9
% Chironomidae		75.7
% 2 Dominant		97.7
HBI		67.3
WVSCI Total Score		73.5

WVSCI Thresholds

Unimpaired = > 68.00

Gray Zone = 60.61 to 68.00

Impaired = <60.61

WOLMAN PEBBLE COUNT FORM

County:	Franklin County	Stream ID:	S-KL54
Stream Name:	UNT to Maggodee Creek		
HUC Code:	03010101	Basin:	Upper Roanoke
Survey Date:	8/26/2021		
Surveyors:	JM, DW		
Type:	Representative		

PEBBLE COUNT								
Inches	PARTICLE	Millimeters		Particle Count	Total #	Item %	% Cum	
	Silt/Clay	< .062	S/C	▲▼	20	20.00	20.00	
	Very Fine	.062-.125	S A N D	▲▼	11	11.00	31.00	
	Fine	.125-.25		▲▼	0	0.00	31.00	
	Medium	.25-.5		▲▼	0	0.00	31.00	
	Coarse	.50-1.0		▲▼	0	0.00	31.00	
.04-.08	Very Coarse	1.0-2		▲▼	0	0.00	31.00	
.08 -.16	Very Fine	2 -4		G R A V E L	▲▼	0	0.00	31.00
.16 - .22	Fine	4 -5.7	▲▼		0	0.00	31.00	
.22 - .31	Fine	5.7 - 8	▲▼		4	4.00	35.00	
.31 - .44	Medium	8 -11.3	▲▼		7	7.00	42.00	
.44 - .63	Medium	11.3 - 16	▲▼		4	4.00	46.00	
.63 - .89	Coarse	16 -22.6	▲▼		3	3.00	49.00	
.89 - 1.26	Coarse	22.6 - 32	▲▼		2	2.00	51.00	
1.26 - 1.77	Vry Coarse	32 - 45	▲▼		4	4.00	55.00	
1.77 -2.5	Vry Coarse	45 - 64	▲▼		9	9.00	64.00	
2.5 - 3.5	Small	64 - 90	C O B B L E		▲▼	13	13.00	77.00
3.5 - 5.0	Small	90 - 128			▲▼	7	7.00	84.00
5.0 - 7.1	Large	128 - 180			▲▼	5	5.00	89.00
7.1 - 10.1	Large	180 - 256		▲▼	4	4.00	93.00	
10.1 - 14.3	Small	256 - 362	B O U L D E R	▲▼	3	3.00	96.00	
14.3 - 20	Small	362 - 512		▲▼	3	3.00	99.00	
20 - 40	Medium	512 - 1024		▲▼	1	1.00	100.00	
40 - 80	Large	1024 -2048		▲▼	0	0.00	100.00	
80 - 160	Vry Large	2048 -4096		▲▼	0	0.00	100.00	
	Bedrock		BDRK	▲▼	0	0.00	100.00	
				Totals:	100			
	Total Tally:							

RIVERMORPH PARTICLE SUMMARY

River Name: UNT to Maggodee Creek
 Reach Name: S-KL54
 Sample Name: Representative
 Survey Date: 08/26/2021

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	20	20.00	20.00
0.062 - 0.125	11	11.00	31.00
0.125 - 0.25	0	0.00	31.00
0.25 - 0.50	0	0.00	31.00
0.50 - 1.0	0	0.00	31.00
1.0 - 2.0	0	0.00	31.00
2.0 - 4.0	0	0.00	31.00
4.0 - 5.7	0	0.00	31.00
5.7 - 8.0	4	4.00	35.00
8.0 - 11.3	7	7.00	42.00
11.3 - 16.0	4	4.00	46.00
16.0 - 22.6	3	3.00	49.00
22.6 - 32.0	2	2.00	51.00
32 - 45	4	4.00	55.00
45 - 64	9	9.00	64.00
64 - 90	13	13.00	77.00
90 - 128	7	7.00	84.00
128 - 180	5	5.00	89.00
180 - 256	4	4.00	93.00
256 - 362	3	3.00	96.00
362 - 512	3	3.00	99.00
512 - 1024	1	1.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00
D16 (mm)	0.05		
D35 (mm)	8		
D50 (mm)	27.3		
D84 (mm)	128		
D95 (mm)	326.67		
D100 (mm)	1023.95		
Silt/Clay (%)	20		
Sand (%)	11		
Gravel (%)	33		
Cobble (%)	29		
Boulder (%)	7		
Bedrock (%)	0		

Total Particles = 100.

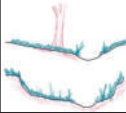
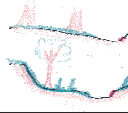
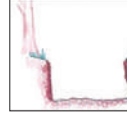
Stream Assessment Form (Form 1)

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 # / Data Point	Impact Length	Impact Factor
22865.06	Mountain Valley Pipeline (Mountain Valley Pipeline, LLC)	Franklin County	R3	03010101	8/27/2021	S-KL54	76	1
Name(s) of Evaluator(s)		Stream Name and Information					SAR Length	
JM, DW		UNT to Maggodee Creek					76	

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

Conditional Category						CI
Channel Condition	Optimal	Suboptimal	Marginal	Poor	Severe	
						
	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. AND/OR 60-80% 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.	
Scores	3	2.4	2	1.6	1	2.00

NOTES>>

Assessment is limited to areas within the temporary ROW

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>>
Riparian Buffers	Optimal	Suboptimal	Marginal	Poor		
	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.		
Scores	1.5	High 1.2 Low 1.1	High 0.85 Low 0.75	High 0.6 Low 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.

Right Bank		% Riparian Area>	25%	75%					100%
		Score >	0.75	0.5					
Left Bank		% Riparian Area>	30%	70%					100%
		Score >	0.75	0.5					
CI = (Sum % RA * Scores*0.01)/2									
		Rt Bank CI >	0.56						CI
		Lt Bank CI >	0.58						0.57

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

Conditional Category					NOTES>>
Instream Habitat/ Available Cover	Optimal	Suboptimal	Marginal	Poor	
	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.	
Scores	1.5	1.2	0.9	0.5	
Stream Gradient					CI
High / Low					1.50

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)	Franklin County	R3	03010101	8/27/2021	S-KL54	76	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	
			40 - 60% of reach is disrupted by any of the channel	60 - 80% of reach is disrupted by any of the channel	

Reach R3-R4

File: C:\Users\dan.weidenhof\Documents\Documents\VA Stream Sampling\0 QAQC SUBMITTALS\QAQC working 1st submittal\Ready for Submittal\Needs Benthics\S-KL54_20210926EF needs Benthics\S-KL54_USM_MVP_20210913JC.xlsx

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.	or the channel alterations listed in the parameter guidelines. If stream has been channelized, normal stable stream meander pattern has not recovered	or 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	1.30
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) >>							1.07
RCI= (Sum of all CI's)/5, except if stream is ephemeral RCI = (Riparian CI/2)							
COMPENSATION REQUIREMENT (CR) >>							81
CR = RCI X L _i X IF							

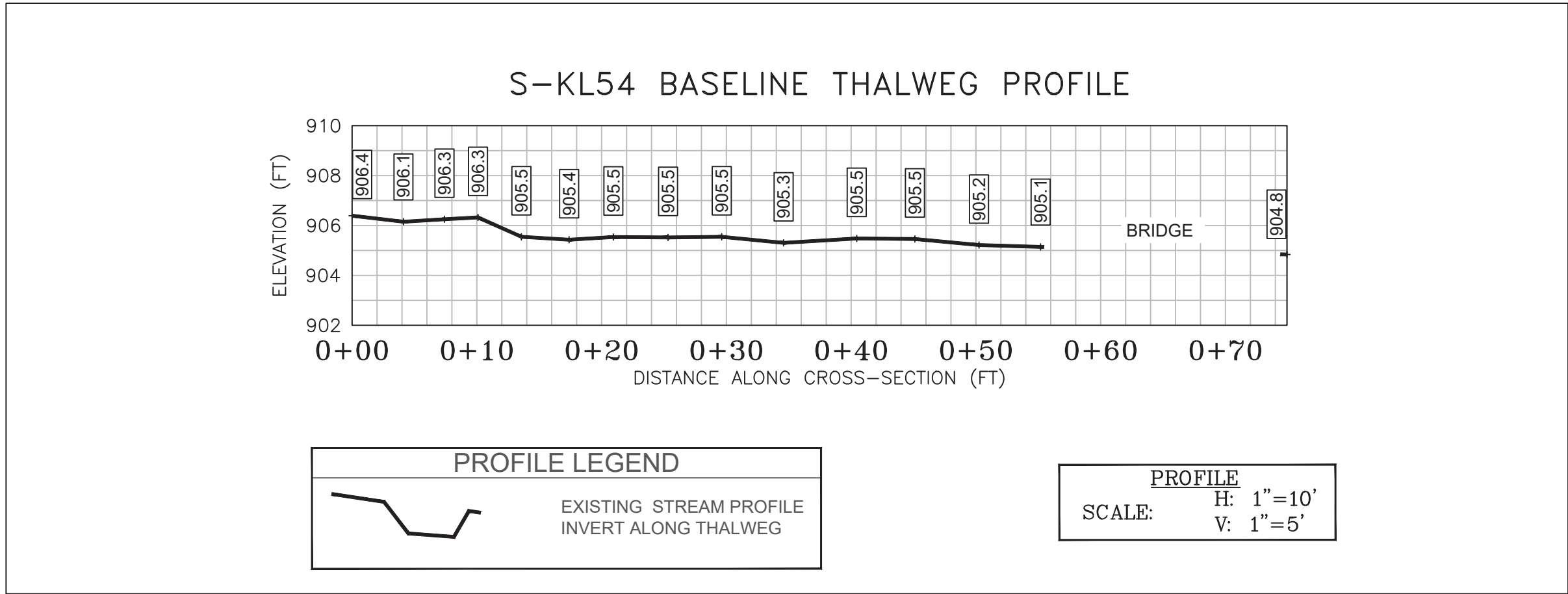
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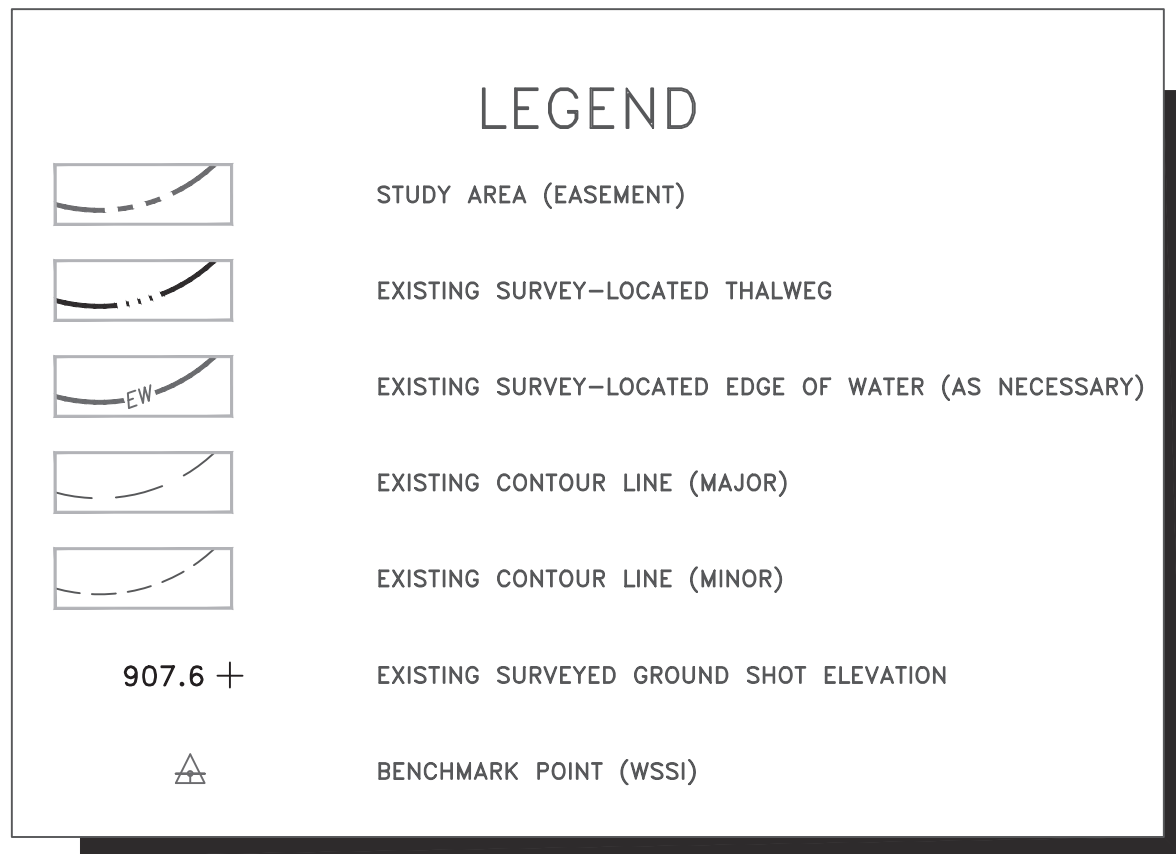
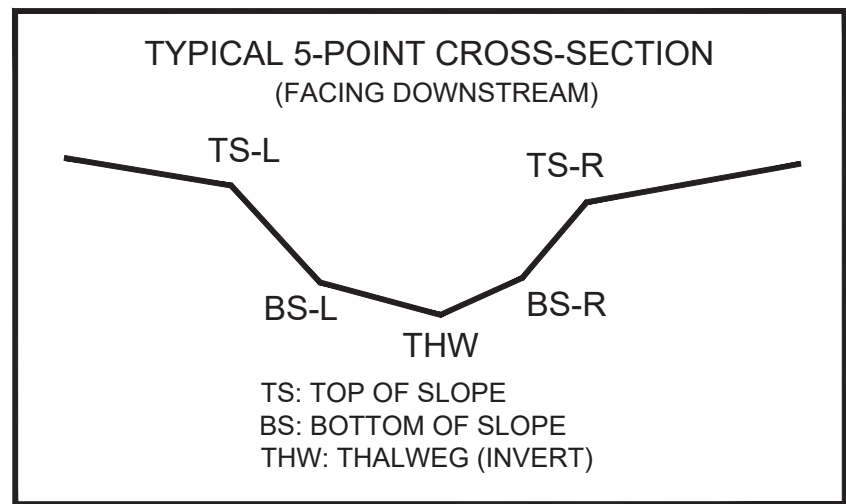
S-KL54
LB DS View - South
08.27.2021 08:02 AM
37.05958, -79.84072
3175 Booker T Washington Hwy, Rocky Mount, VA 24151, USA

DESCRIBE PROPOSED IMPACT:

PROVIDED UNDER SEPARATE COVER

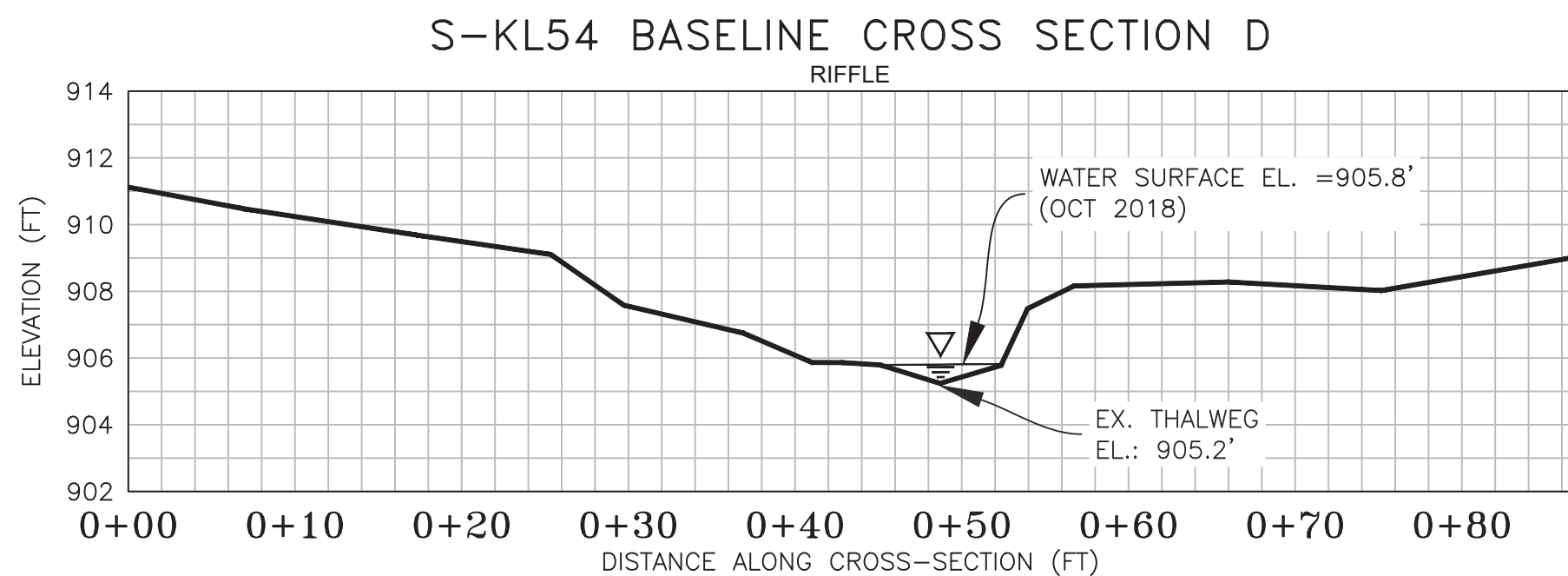
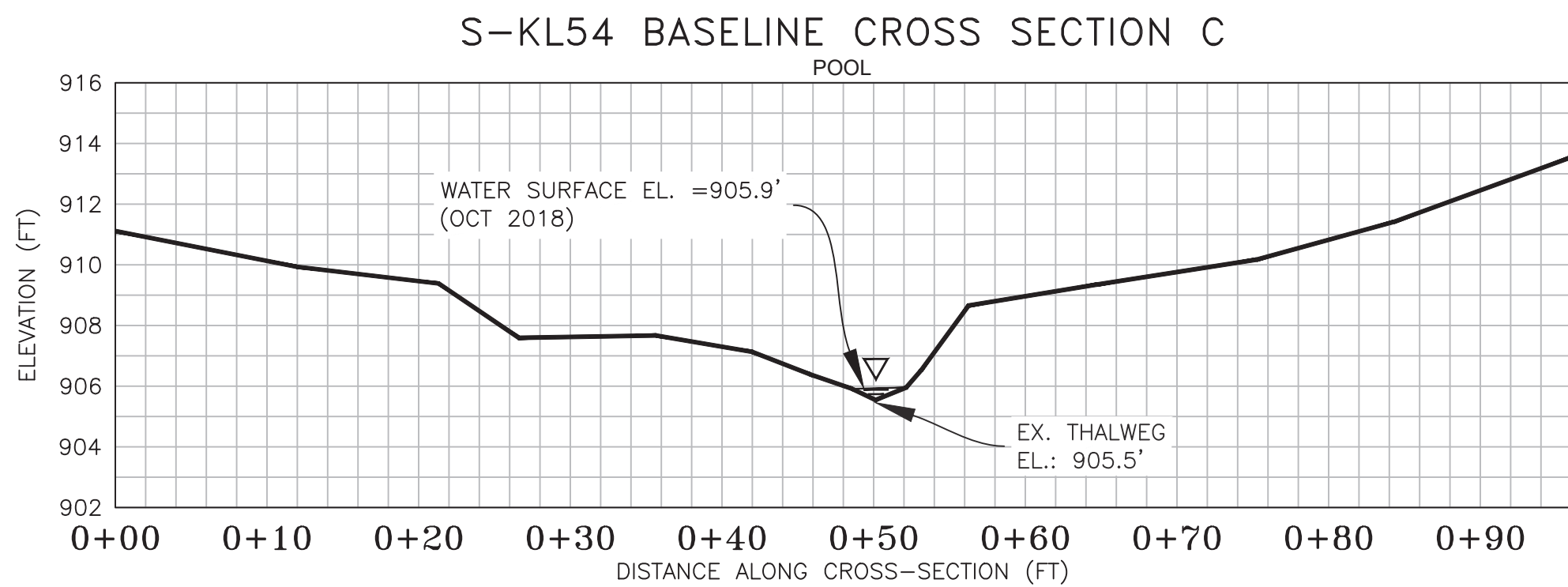
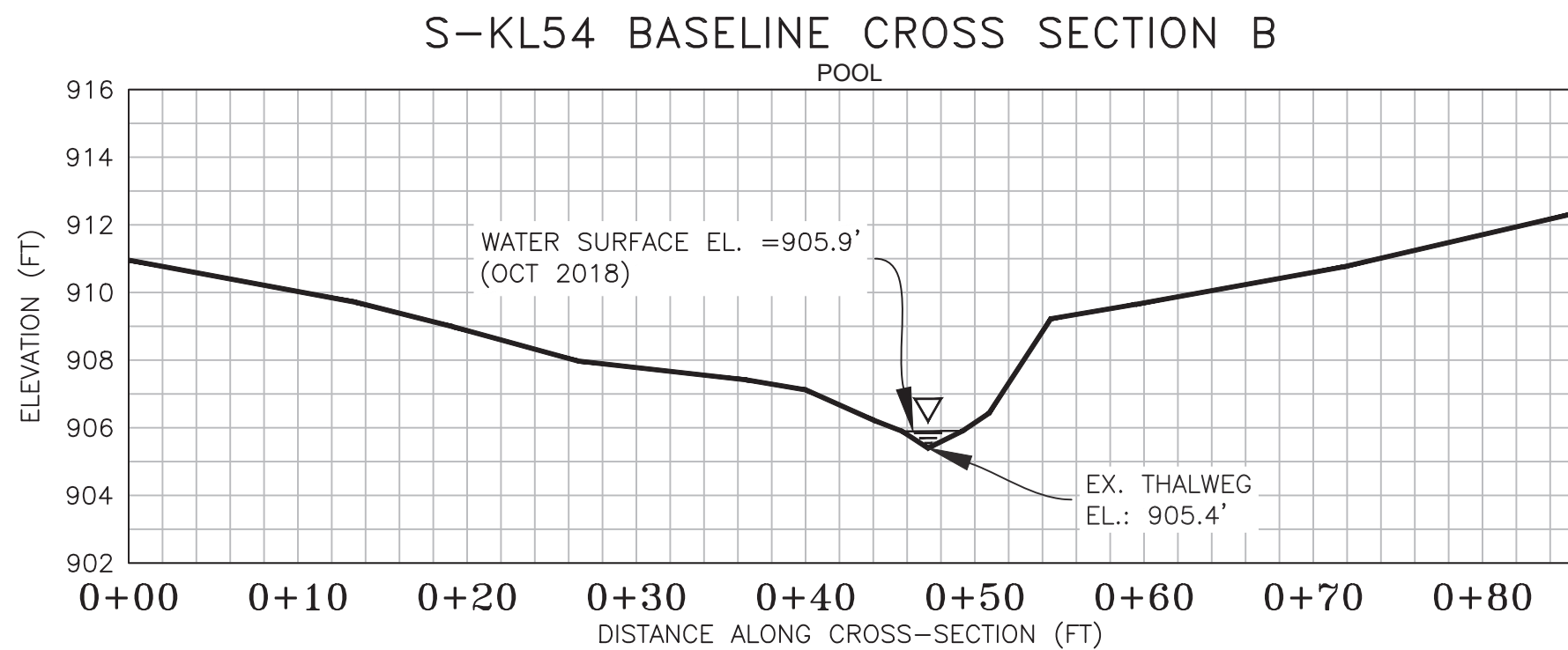
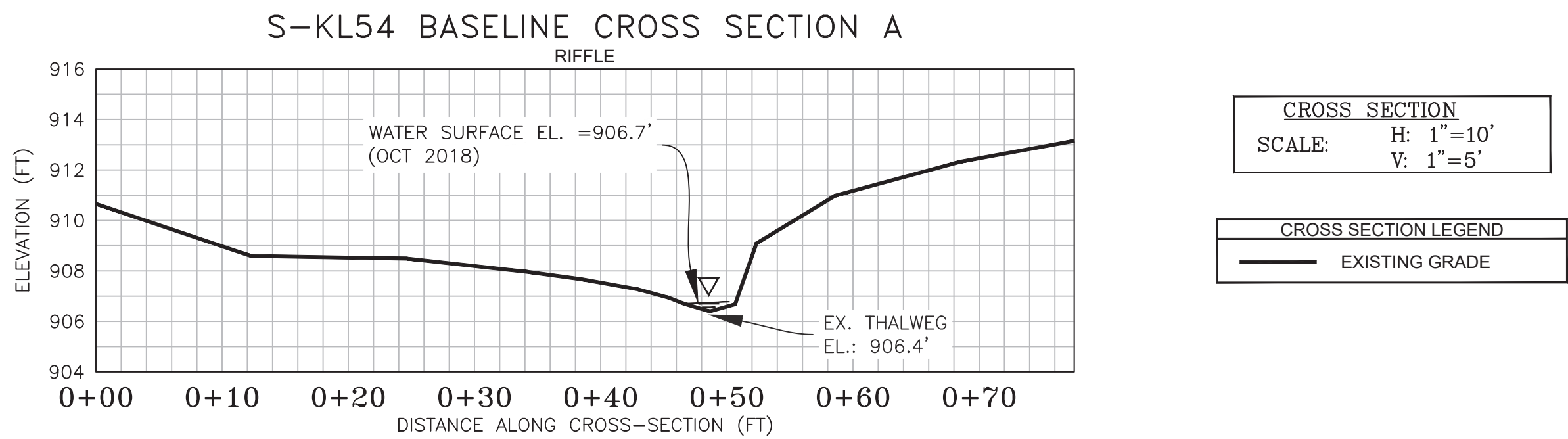


CL STAKEOUT POINTS: S-KL54 CROSS SECTION B (PIPE CL)						
		PRE-CROSSING			POST-CROSSING	
PT. LOC.	NORTHING	EASTING	ELEV	VERT. DIFF.	HORZ. DIFF.	
TS-L	13458328.50	1978597.05	907.12	----	----	
BS-L	13458326.11	1978593.83	906.22	----	----	
THW	13458324.31	1978591.19	905.40	----	----	
BS-R	13458322.11	1978588.33	906.43	----	----	
TS-R	13458320.23	1978585.18	909.22	----	----	

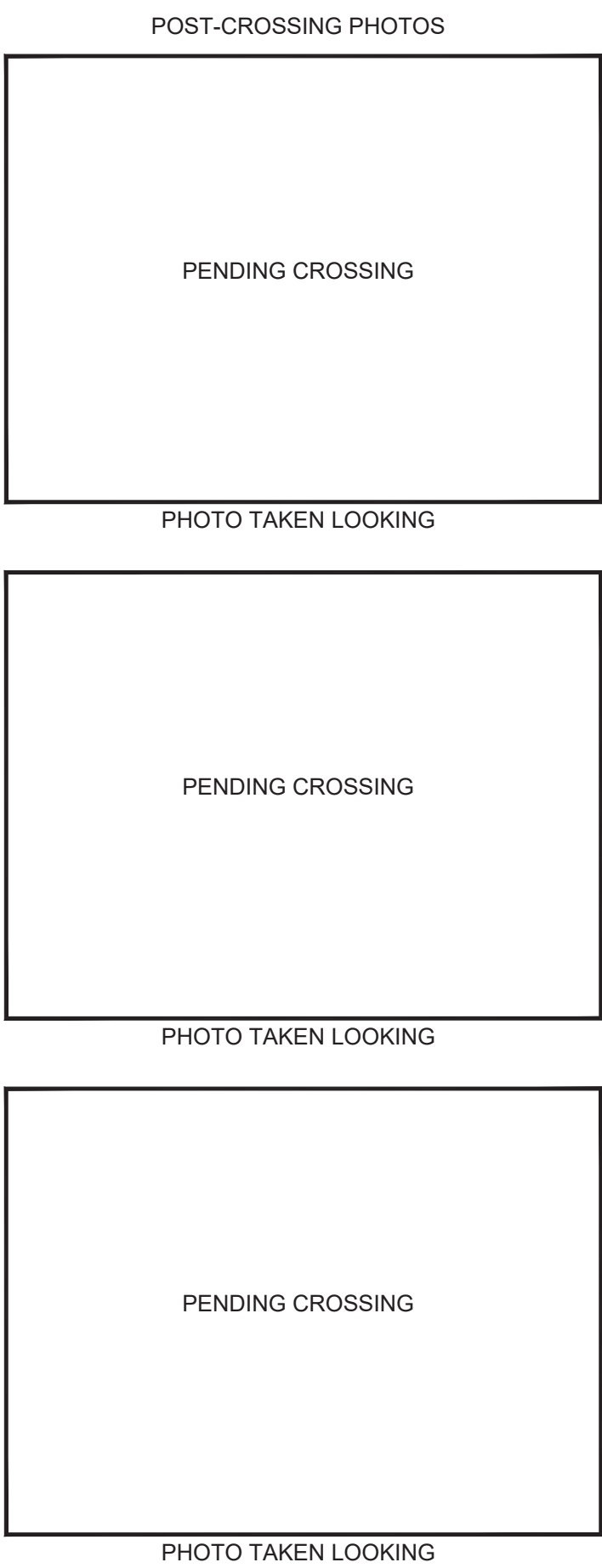


SURVEY NOTES:

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 October 2, 2018.
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).



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



Profile and Cross-Sections Baseline Survey

Prepared For: MVP

Crossing S-KL54 - UNT to Maggodee Creek (MP 268.5)

REVISIONS			
No.	Date	Description	App. By
DATE: October, 2021		SCALE: AS NOTED	

Horizontal Datum: NAD 1983 UTM Zone 17N

Vertical Datum: NAVD 88

Boundary and Topo Source: MVP

WSSI 2' C.I. Topo

Design	Draft	Approved
EJC	SIH	NAS

Sheet #

1 of 1

Computer File Name:
I:\Survey\22000\22000\2265\2265.dwg

22655_03 5'1 MP 246-273 Sheet.dwg