

Baseline Assessment – Stream Attributes

Reach S-I40 (Pipeline ROW) Intermittent Spread D Nicholas County, West Virginia

Data	Included
Photos	✓
SWVM Form	✓
FCI Calculator and HGM Form	N/A – Intermittent Stream (<4% slope)
RBP Physical Characteristics Form	✓
Water Quality Data	✓
RBP Habitat Form	✓
RBP Benthic Form	✓
Benthic Identification Sheet	N/A –Low flow
Wolman Pebble Count	✓
Reference Reach Software Pebble Count Data	✓
Longitudinal Profile and Cross Sections	✓

38.187582° N, -80.723025° W



Photo Type: US View at DS Edge of LOD

Location, Orientation, Photographer Initials: Downstream Edge of Limits of Disturbance, Upstream View, TF

38.187582° N, -80.723025° W



Photo Type: DS View at DS Edge of LOD

Location, Orientation, Photographer Initials: Downstream Edge of Limits of Disturbance, Downstream View, TF

38.187582° N, -80.723025° W



Photo Type: US View at Center LOD

Location, Orientation, Photographer Initials: Center of Limits of Disturbance, Upstream View, TF

38.187582° N, -80.723025° W



Photo Type: DS View at Center LOD

Location, Orientation, Photographer Initials: Center of Limits of Disturbance, Downstream View, TF



Photo Type: US View at US Edge of LOD

Location, Orientation, Photographer Initials: Upstream Edge of Limits of Disturbance, Upstream View, TF



Photo Type: DS View at US Edge of LOD

Location, Orientation, Photographer Initials: Upstream Edge of Limits of Disturbance, Downstream View, TF

38.187582° N, -80.723025° W



Photo Type: C LOD, N

Location, Orientation, Photographer Initials: Center of Limits of Disturbance, Facing North, TF

38.187582° N, -80.723025° W



Photo Type: C LOD, S

Location, Orientation, Photographer Initials: Center of Limits of Disturbance, Facing South, TF

"Q:\Charleston\2021 Projects\21-0244- MVP- STREAM AND WETLAND CONDITIONS ASSESSMENT AND SURVEY PLAN\002 - Pre-Crossing Monitoring\Spread D\S-I40"

USACE FILE NO./ Project Name:
(v2.1, Sept 2015)

Mountain Valley Pipeline

IMPACT COORDINATES:
(in Decimal Degrees)

Lat.

38.187582

Lon.

-80.723025

WEATHER:

DATE:

8/19/21

IMPACT STREAM/SITE ID AND SITE DESCRIPTION:
(watershed size (acreage), unaltered or impairments)

UNT to Hominy Creek (S-I40)

MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION:
(watershed size (acreage), unaltered or impairments)

Comments:

STREAM IMPACT LENGTH:

82

FORM OF MITIGATION:

RESTORATION (Levels I-III)

MIT COORDINATES:
(in Decimal Degrees)

Lat.

Lon.

PRECIPITATION PAST 48 HRS:

Mitigation Length:

Column No. 1- Impact Existing Condition (Debit)

Stream Classification:

Intermittent

Percent Stream Channel Slope

0.01

HGM Score (attach data forms):

Average

Hydrology

Biogeochemical Cycling

0

Habitat

PART I - Physical, Chemical and Biological Indicators

Points Scale

Range

Site Score

PHYSICAL INDICATOR (Applies to all streams classifications)

USEPA RBP (High Gradient Data Sheet)

1. Epifaunal Substrate/Available Cover

0-20

8

2. Embeddedness

0-20

4

3. Velocity/ Depth Regime

0-20

6

4. Sediment Deposition

0-20

4

5. Channel Flow Status

0-20

14

6. Channel Alteration

0-20

18

7. Frequency of Riffles (or bends)

0-20

5

8. Bank Stability (LB & RB)

0-20

16

9. Vegetative Protection (LB & RB)

0-20

12

10. Riparian Vegetative Zone Width (LB & RB)

0-20

8

Total RBP Score

Marginal

95

Sub-Total

0.475

CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WVDEP Water Quality Indicators (General)

Specific Conductivity

<=99 - 90 points

0-90

28.2

pH

5.6-5.9 = 45 points

0-80

5.66

DO

>5.0 = 30 points

10-30

7.4

Sub-Total

0.825

BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WV Stream Condition Index (WVSCI)

0

0-100

0-1

Sub-Total

0

PART II - Index and Unit Score

Index

Linear Feet

Unit Score

0.650

82

53.3

Column No. 2- Mitigation Existing Condition - Baseline (Credit)

Stream Classification:

Percent Stream Channel Slope

HGM Score (attach data forms):

Average

Hydrology

Biogeochemical Cycling

0

Habitat

PART I - Physical, Chemical and Biological Indicators

Points Scale

Range

Site Score

PHYSICAL INDICATOR (Applies to all streams classifications)

USEPA RBP (Low Gradient Data Sheet)

1. Epifaunal Substrate/Available Cover

0-20

2. Pool Substrate Characterization

0-20

3. Pool Variability

0-20

4. Sediment Deposition

0-20

5. Channel Flow Status

0-20

6. Channel Alteration

0-20

7. Channel Sinuosity

0-20

8. Bank Stability (LB & RB)

0-20

9. Vegetative Protection (LB & RB)

0-20

10. Riparian Vegetative Zone Width (LB & RB)

0-20

Total RBP Score

Poor

0

Sub-Total

0

CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WVDEP Water Quality Indicators (General)

Specific Conductivity

0-90

pH

5-90

DO

10-30

Sub-Total

0

BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WV Stream Condition Index (WVSCI)

0-100

0-1

Sub-Total

0

PART II - Index and Unit Score

Index

Linear Feet

Unit Score

0

0

0

Column No. 3- Mitigation Projected at Five Years Post Completion (Credit)

Stream Classification:

0

Percent Stream Channel Slope

0

HGM Score (attach data forms):

Average

Hydrology

Biogeochemical Cycling

0

Habitat

PART I - Physical, Chemical and Biological Indicators

Points Scale

Range

Site Score

PHYSICAL INDICATOR (Applies to all streams classifications)

USEPA RBP (High Gradient Data Sheet)

1. Epifaunal Substrate/Available Cover

0-20

2. Embeddedness

0-20

3. Velocity/ Depth Regime

0-20

4. Sediment Deposition

0-20

5. Channel Flow Status

0-20

6. Channel Alteration

0-20

7. Frequency of Riffles (or bends)

0-20

8. Bank Stability (LB & RB)

0-20

9. Vegetative Protection (LB & RB)

0-20

10. Riparian Vegetative Zone Width (LB & RB)

0-20

Total RBP Score

Poor

0

Sub-Total

0

CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WVDEP Water Quality Indicators (General)

Specific Conductivity

0-90

pH

5-90

DO

10-30

Sub-Total

0

BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WV Stream Condition Index (WVSCI)

0-100

0-1

Sub-Total

0

PART II - Index and Unit Score

Index

Linear Feet

Unit Score

0

0

0

Column No. 4- Mitigation Projected at Ten Years Post Completion (Credit)

Stream Classification:

0

Percent Stream Channel Slope

0

HGM Score (attach data forms):

Average

Hydrology

Biogeochemical Cycling

0

Habitat

PART I - Physical, Chemical and Biological Indicators

Points Scale

Range

Site Score

PHYSICAL INDICATOR (Applies to all streams classifications)

USEPA RBP (High Gradient Data Sheet)

1. Epifaunal Substrate/Available Cover

0-20

2. Embeddedness

0-20

3. Velocity/ Depth Regime

0-20

4. Sediment Deposition

0-20

5. Channel Flow Status

0-20

6. Channel Alteration

0-20

7. Frequency of Riffles (or bends)

0-20

8. Bank Stability (LB & RB)

0-20

9. Vegetative Protection (LB & RB)

0-20

10. Riparian Vegetative Zone Width (LB & RB)

0-20

Total RBP Score

Poor

0

Sub-Total

0

CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WVDEP Water Quality Indicators (General)

Specific Conductivity

0-90

pH

5-90

DO

10-30

Sub-Total

0

BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WV Stream Condition Index (WVSCI)

0-100

0-1

Sub-Total

0

PART II - Index and Unit Score

Index

Linear Feet

Unit Score

0

0

0

Column No. 5- Mitigation Projected at Maturity (Credit)

Stream Classification:

0

Percent Stream Channel Slope

0

HGM Score (attach data forms):

Average

Hydrology

Biogeochemical Cycling

0

Habitat

PART I - Physical, Chemical and Biological Indicators

Points Scale

Range

Site Score

PHYSICAL INDICATOR (Applies to all streams classifications)

USEPA RBP (High Gradient Data Sheet)

1. Epifaunal Substrate/Available Cover

0-20

2. Embeddedness

0-20

3. Velocity/ Depth Regime

0-20

4. Sediment Deposition

0-20

5. Channel Flow Status

0-20

6. Channel Alteration

0-20

7. Frequency of Riffles (or bends)

0-20

8. Bank Stability (LB & RB)

0-20

9. Vegetative Protection (LB & RB)

0-20

10. Riparian Vegetative Zone Width (LB & RB)

0-20

Total RBP Score

Poor

0

Sub-Total

0

CHEMICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WVDEP Water Quality Indicators (General)

Specific Conductivity

0-90

pH

5-90

DO

10-30

Sub-Total

0

BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)

WV Stream Condition Index (WVSCI)

0-100

0-1

Sub-Total

0

PART II - Index and Unit Score

Index

Linear Feet

Unit Score

0

0

0

STREAM NAME	UNT to Hominy Creek	LOCATION	S-140, Spread D
STATION #	RIVERMILE	STREAM CLASS	Intermittent
LAT 38.187582	LONG -80.723025	COUNTY	Nicholas
STORET #	AGENCY Potesta		
INVESTIGATOR STF/ CH			
FORM COMPLETED BY	TF	DATE	8-18-21
		TIME	1511
		REASON FOR SURVEY	Preliminary Assessment

Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 1 A-5

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input checked="" type="checkbox"/> Other <u>Surface Mine</u> <input type="checkbox"/> Residential	Local Watershed NPS Pollution <input type="checkbox"/> No evidence <input type="checkbox"/> Some potential sources <input checked="" type="checkbox"/> Obvious sources Local Watershed Erosion <input type="checkbox"/> None <input checked="" type="checkbox"/> Moderate <input type="checkbox"/> Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input checked="" type="checkbox"/> Herbaceous Dominant species present <u>herbaceous - sedges - forbs</u>	
INSTREAM FEATURES	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Estimated Reach Length <u>75 ft</u> m Estimated Stream Width <u>2.5 ft</u> m Sampling Reach Area <u>187.5 ft²</u> m² Area in km² (m²x1000) _____ km² Estimated Stream Depth <u>0.2 ft</u> m Surface Velocity (at thalweg) _____ m/sec Stream Dry <input type="checkbox"/> </div> <div style="width: 45%;"> Canopy Cover <input checked="" type="checkbox"/> Partly open <input type="checkbox"/> Partly shaded <input type="checkbox"/> Shaded High Water Mark <u>4.5 ft</u> m Proportion of Reach Represented by Stream Morphology Types Riffle <u>15</u> % Run <u>5</u> % Pool <u>80</u> % Channelized <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Dam Present <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No </div> </div>	
LARGE WOODY DEBRIS	LWD <u>3</u> m ² Density of LWD _____ m ² /km ² (LWD/ reach area)	
AQUATIC VEGETATION <div style="text-align: center; font-size: 1.5em;">None</div>	Indicate the dominant type and record the dominant species present <input type="checkbox"/> Rooted emergent <input type="checkbox"/> Rooted submergent <input type="checkbox"/> Rooted floating <input type="checkbox"/> Free floating <input type="checkbox"/> Floating Algae <input type="checkbox"/> Attached Algae Dominant species present _____ Portion of the reach with aquatic vegetation _____ %	
WATER QUALITY	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Temperature <u>18.8</u> °C Specific Conductance <u>28.2</u> us/cm Dissolved Oxygen <u>7.4</u> mg/L pH <u>5.66</u> SU Turbidity <u>10.37</u> NTU WQ Instrument Used <u>YSI</u> </div> <div style="width: 45%;"> Water Odors <input checked="" type="checkbox"/> Normal/None <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Fishy <input type="checkbox"/> Other _____ Water Surface Oils <input type="checkbox"/> Slick <input type="checkbox"/> Sheen <input type="checkbox"/> Globs <input type="checkbox"/> Flecks <input checked="" type="checkbox"/> None <input type="checkbox"/> Other _____ Turbidity (if not measured) <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Slightly turbid <input type="checkbox"/> Turbid <input type="checkbox"/> Opaque <input type="checkbox"/> Stained <input type="checkbox"/> Other _____ </div> </div>	
SEDIMENT/SUBSTRATE	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> Odors <input checked="" type="checkbox"/> Normal <input type="checkbox"/> Sewage <input type="checkbox"/> Petroleum <input type="checkbox"/> Chemical <input type="checkbox"/> Anaerobic <input type="checkbox"/> None <input type="checkbox"/> Other _____ Oils <input checked="" type="checkbox"/> Absent <input type="checkbox"/> Slight <input type="checkbox"/> Moderate <input type="checkbox"/> Profuse </div> <div style="width: 45%;"> Deposits <input type="checkbox"/> Sludge <input type="checkbox"/> Sawdust <input type="checkbox"/> Paper fiber <input type="checkbox"/> Sand <input type="checkbox"/> Relict shells <input type="checkbox"/> Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No </div> </div>	

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		0	Detritus	sticks, wood, coarse plant materials (CPOM)	0
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	0	Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	0			
Sand	0.06-2mm (gritty)	70	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	30			
Clay	< 0.004 mm (slick)	0			

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

STREAM NAME UNT to Hominy Creek		LOCATION S-I40	
STATION # _____ RIVERMILE _____		STREAM CLASS Intermittent <input checked="" type="checkbox"/>	
LAT 38.187582 LONG -80.723025		COUNTY Nicholas <input checked="" type="checkbox"/>	
STORET # _____		AGENCY Potesta	
INVESTIGATOR STF/ CH _____			
FORM COMPLETED BY TF		DATE 8-19-21 TIME 1511 AM PM	REASON FOR SURVEY Preliminary Assessment

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover <input type="checkbox"/> N/A SCORE 8 <input checked="" type="checkbox"/>	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). 20 19 18 17 16	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). 15 14 13 12 11	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed. 10 9 8 7 6	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking. 5 4 3 2 1 0
2. Embeddedness SCORE 4 <input checked="" type="checkbox"/>	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. 20 19 18 17 16	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment. 15 14 13 12 11	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment. 10 9 8 7 6	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. 5 4 3 2 1 0
3. Velocity/Depth Regime <input type="checkbox"/> N/A SCORE 6 <input checked="" type="checkbox"/>	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.) 20 19 18 17 16	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). 15 14 13 12 11	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low). 10 9 8 7 6	Dominated by 1 velocity/depth regime (usually slow-deep). 5 4 3 2 1 0
4. Sediment Deposition SCORE 4 <input checked="" type="checkbox"/>	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. 20 19 18 17 16	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. 15 14 13 12 11	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. 10 9 8 7 6	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. 5 4 3 2 1 0
5. Channel Flow Status <input type="checkbox"/> N/A SCORE 14 <input checked="" type="checkbox"/>	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. 20 19 18 17 16	Water fills >75% of the available channel; or <25% of channel substrate is exposed. 15 14 13 12 11	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. 10 9 8 7 6	Very little water in channel and mostly present as standing pools. 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 SCORE <u>18</u>	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.
	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) <input type="checkbox"/> N/A SCORE <u>5</u>	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.
	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. SCORE <u>8</u> SCORE <u>8</u>	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.
	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) SCORE <u>6</u> SCORE <u>6</u>	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.
	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) SCORE <u>4</u> SCORE <u>4</u>	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.
	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 95

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME <u>UNT to Hominy Creek</u>		LOCATION <u>S-140</u>
STATION # <u> </u> RIVERMILE <u> </u>	STREAM CLASS <u>Intermittent</u> ▼	
LAT <u>38.167582</u> LONG <u>-89.723025</u>	COUNTY <u>Nicholas</u> ▼	
STORET # <u> </u>	AGENCY <u>Potesta</u>	
INVESTIGATOR <u>STF/ CH</u>		LOT NUMBER <u> </u>
FORM COMPLETED BY TF	DATE <u>8-16-21</u> TIME <u>1511</u>	REASON FOR SURVEY <u>Preliminary Assessment</u>

HABITAT TYPES	Indicate the percentage of each habitat type present <input type="checkbox"/> Cobble <u> </u> % <input type="checkbox"/> Snags <u> </u> % <input type="checkbox"/> Vegetated Banks <u> </u> % <input type="checkbox"/> Sand <u> </u> % <input type="checkbox"/> Submerged Macrophytes <u> </u> % <input type="checkbox"/> Other (<u> </u>) <u> </u> %
SAMPLE COLLECTION	Gear used <input type="checkbox"/> D-frame <input type="checkbox"/> kick-net <input type="checkbox"/> Other <u> </u> How were the samples collected? <input type="checkbox"/> wading <input type="checkbox"/> from bank <input type="checkbox"/> from boat Indicate the number of jabs/kicks taken in each habitat type. <input type="checkbox"/> Cobble <u> </u> <input type="checkbox"/> Snags <u> </u> <input type="checkbox"/> Vegetated Banks <u> </u> <input type="checkbox"/> Sand <u> </u> <input type="checkbox"/> Submerged Macrophytes <u> </u> <input type="checkbox"/> Other (<u> </u>) <u> </u>
GENERAL COMMENTS	No benthics collected due to lack of riffles and substrate

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	1	2	3	4	Slimes	0	1	2	3	4
Filamentous Algae	0	1	2	3	4	Macroinvertebrates	0	1	2	3	4
Macrophytes	0	1	2	3	4	Fish	0	1	2	3	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

SITE ID: S-240

DATE: 2/19/21

COLLECTOR(S): TF CH/TA

Wolman Pebble Count (Reach Wide)										NOTES:
SI	SI	SI	MS	MS	SI	FSA	FSA	5	FSA	SI - silt FSA - Fine sand SA - Sand CSA - coarse sand MS - med sand
FSA	SI	FSA	SI	MS	FSA	FSA	SI	12	FSA	
FSA	SI	FSA	FSA	FSA	FSA	4	SI	MS	FSA	
FSA	FSA	FSA	SI	SI	MS	8	SI	MS	SI	
FSA	FSA	FSA	SI	SI	MS	SI	SI	MS	SI	
FSA	FSA	FSA	SI	SI	MS	SI	SI	MS	FSA	
SI	FSA	FSA	SI	SI	FSA	MS	SI	9	SI	
SI	FSA	FSA	SI	SI	SI	SI	SI	FSA	SI	
SI	FSA	FSA	SI	SI	SI	SI	SI	SI	FSA	
SI	FSA	SI	SI	SI	SI	SI	SI	SI	9	

Riffle Pebble Count										NOTES:

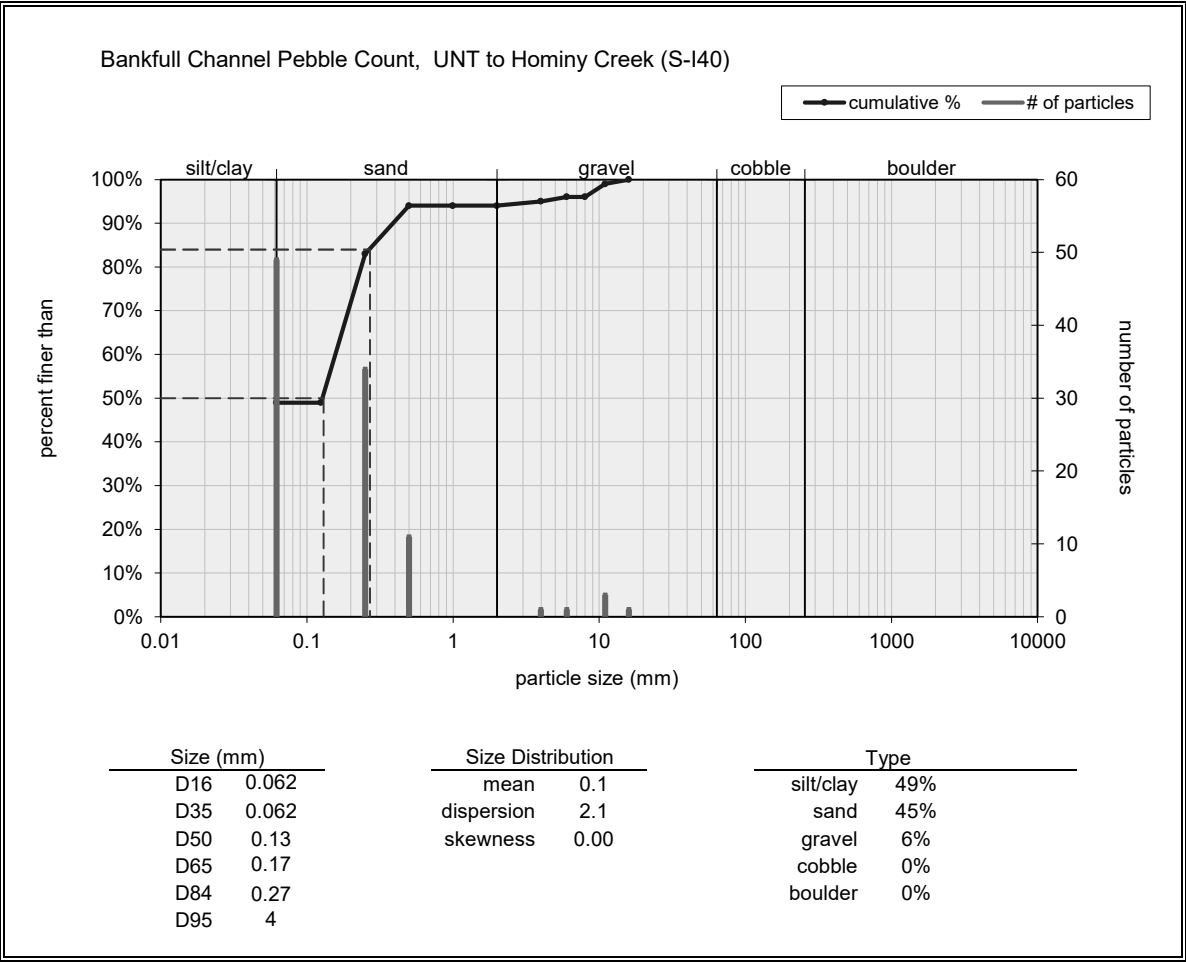
										NOTES:

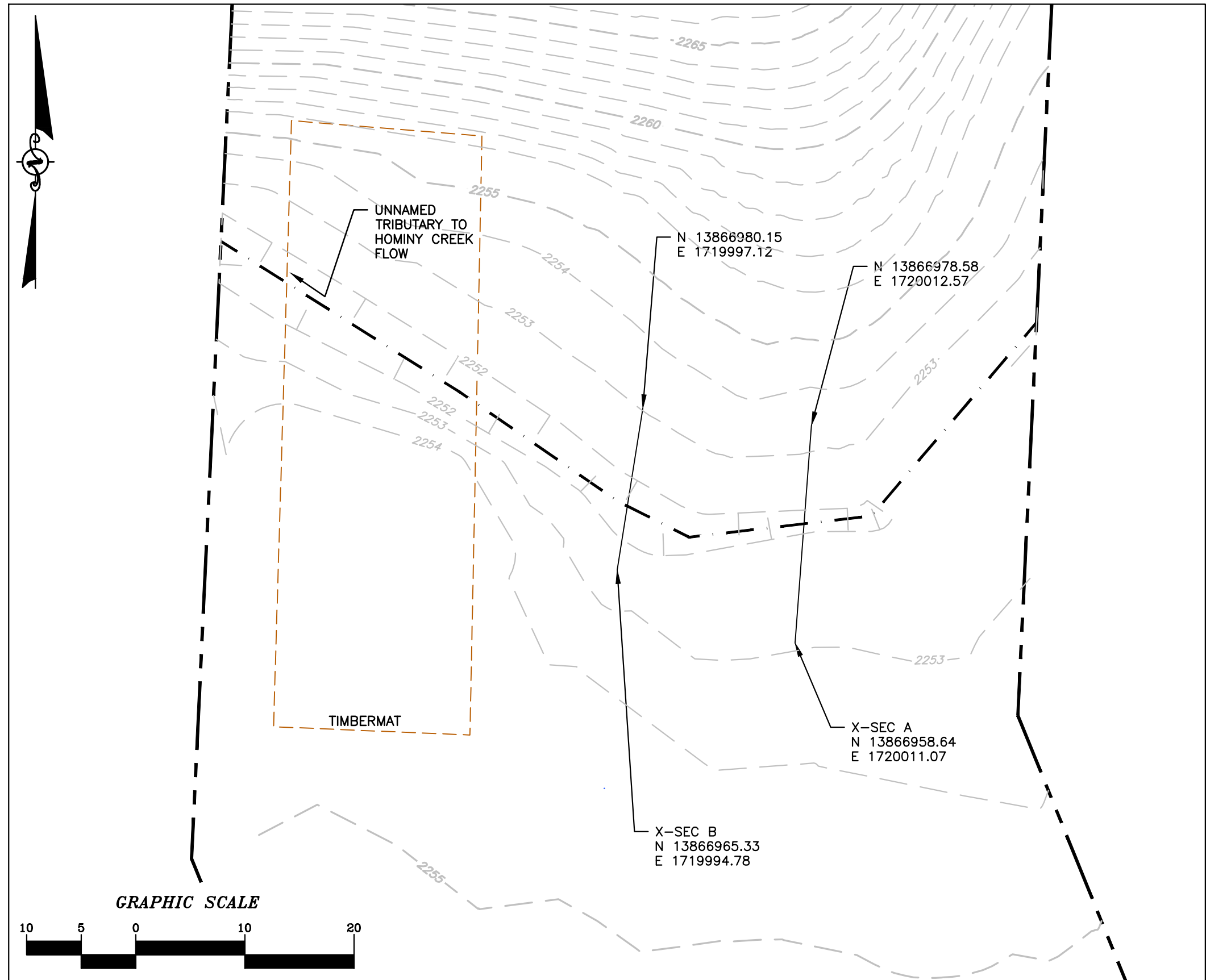
Inches	PARTICLE	Millimeters	S/C
	Silt / Clay	< .062	SAND
	Very Fine	.062 - .125	
	Fine	.125 - .25	
	Medium	.25 - .50	
	Coarse	.50 - 1.0	GRAVEL
.04 - .08	Very Coarse	1.0 - 2	
.08 - .16	Very Fine	2 - 4	
.16 - .22	Fine	4 - 5.7	
.22 - .31	Fine	5.7 - 8	COBBLE
.31 - .44	Medium	8 - 11.3	
.44 - .63	Medium	11.3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

Bankfull Channel

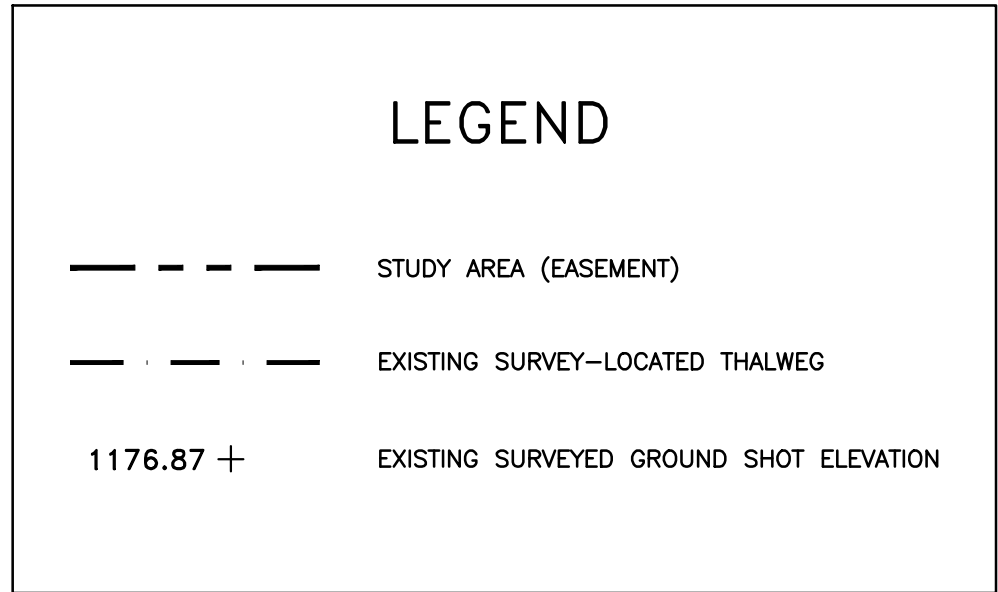
Material	Size Range (mm)	Count
silt/clay	0 - 0.062	49
very fine sand	0.062 - 0.125	
fine sand	0.125 - 0.25	34
medium sand	0.25 - 0.5	11
coarse sand	0.5 - 1	
very coarse sand	1 - 2	
very fine gravel	2 - 4	1
fine gravel	4 - 6	1
fine gravel	6 - 8	
medium gravel	8 - 11	3
medium gravel	11 - 16	1
coarse gravel	16 - 22	
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
total particle count:		100
bedrock		
clay hardpan		
detritus/wood		
artificial		
total count:		100

Note:





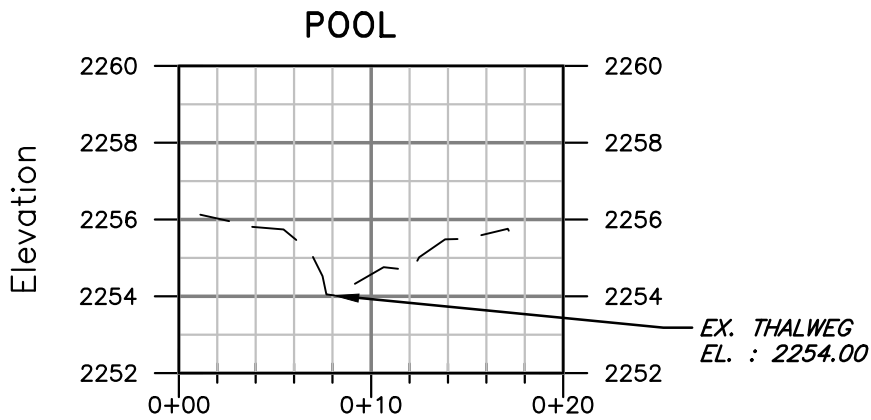
S-140



SURVEY NOTES:

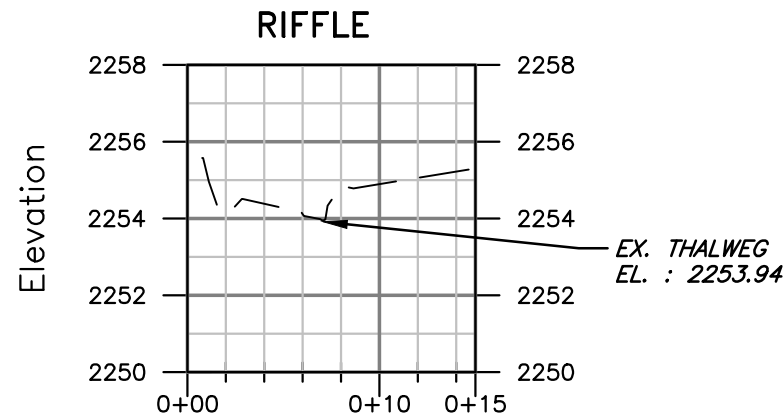
- THIS MAP HAS BEEN ORIENTED TO NAD 1983 UTM ZONE 17N, AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), USING REAL TIME DGPS. FIELD LOCATIONS WERE COMPLETED ON 8-19-2021.
- EASEMENT LINES SHOWN ON PLAN VIEW WERE PROVIDED BY MOUNTAIN VALLEY PIPELINE.
- SURVEY POINTS FOR CROSS SECTIONS AND THALWEG PROFILES COLLECTED IN 2021 HAVE BEEN USED IN COMBINATION WITH SURVEY POINTS AND COLLECTED PREVIOUSLY IN 2020 IN ORDER TO GENERATE THE PRE-CROSSING SURFACE SHOWN IN PLAN. DUE TO NATURAL EROSIONAL STREAM PROCESSES THAT OCCUR OVER TIME, MINOR ADJUSTMENTS TO THE PROFILE ALIGNMENTS MAY HAVE BEEN REQUIRED IN ORDER TO GENERATE A CLEAN PRE-CROSSING SURFACE.
- ALL SECTION VIEWS SHOWN LEFT TO RIGHT FACING DOWNSTREAM.
- POST-CROSSING SURVEY INFORMATION SHOWN IN RED. DATA PENDING.
- POST-CROSSING SURVEY POINTS FOR CROSS SECTIONS AND THALWEG ARE PROJECTED ONTO PRE-CROSSING SECTION AND PROFILE VIEWS FOR COMPARISON.

S-140 BASELINE CROSS-SECTION A



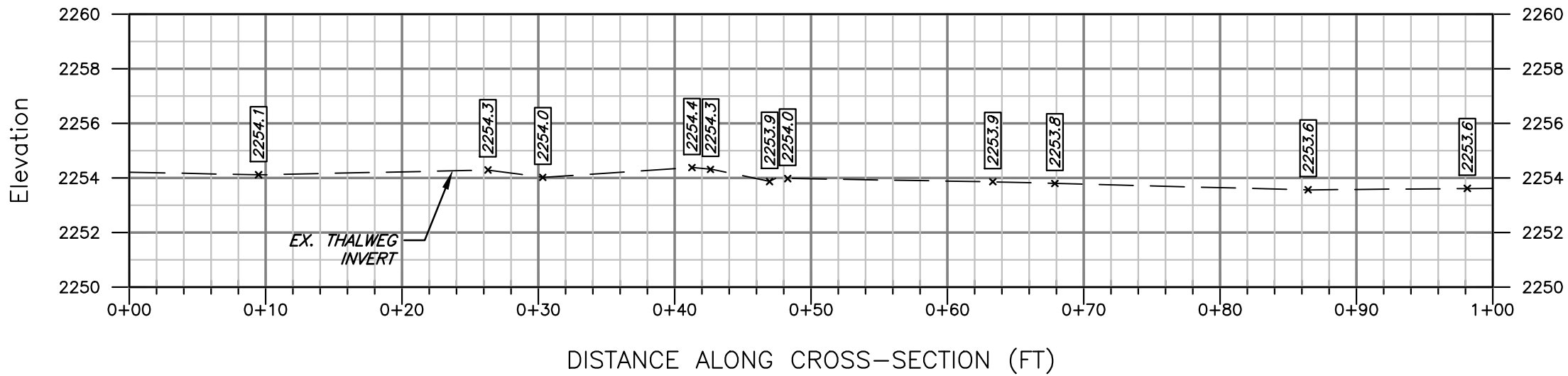
DISTANCE ALONG CROSS-SECTION (FT)

S-140 BASELINE CROSS-SECTION B



DISTANCE ALONG CROSS-SECTION (FT)

S-140 BASELINE THALWEG PROFILE



PROFILE LEGEND

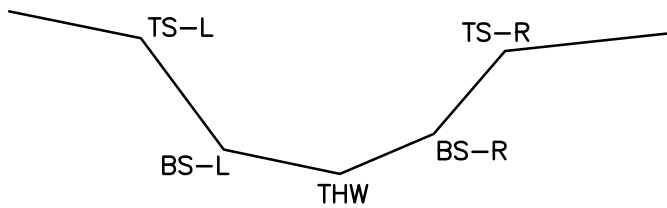
EXISTING STREAM PROFILE
INVERT ALONG THALWEG

PROFILE

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

AS-BUILT TABLE: S-140 CROSS SECTION B					
PRE-CROSSING			AS-BUILT		
PT. LOC.	NORTHING	EASTING	ELEV.	VERT. DIFF.	HORZ. DIFF.
TS-L	13866966.145	1719994.75	2255.57		
BS-L	13866966.78	1719995.20	2254.27		
THW	13866971.83	1719996.24	2253.87		
BS-R	13866972.44	1719995.74	2253.97		
TS-R	13866973.25	1719996.01	2254.84		

TYPICAL 5-POINT CROSS-SECTION
(FACING DOWNSTREAM)



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

CROSS SECTION LEGEND

EXISTING GRADE

CROSS SECTION

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

PRE-CROSSING PHOTOS



PHOTO TAKEN LOOKING DOWNSTREAM
FROM UPSTREAM IMPACT LIMITS



PHOTO TAKEN LOOKING UPSTREAM FROM
DOWNSTREAM IMPACT LIMITS

POST-CROSSING PHOTOS

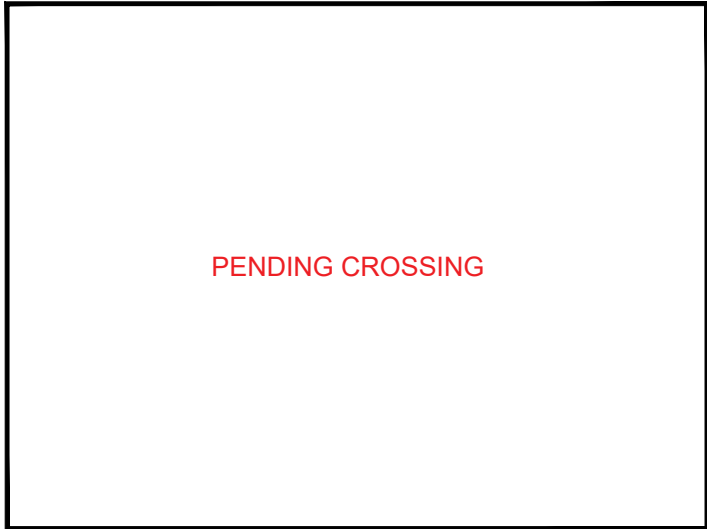


PHOTO TAKEN LOOKING DOWNSTREAM
UPSTREAM FROM IMPACT LIMITS

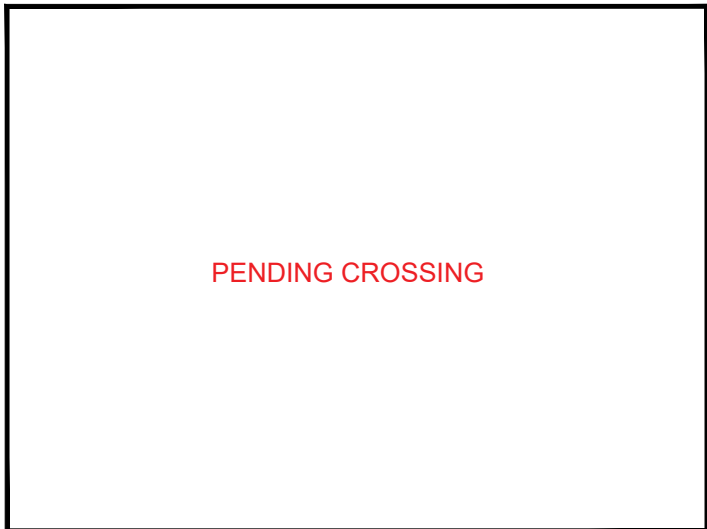


PHOTO TAKEN LOOKING UPSTREAM FROM
UPSTREAM IMPACT LIMITS

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

PRE-CROSSING