

## Baseline Assessment – Stream Attributes

**Reach S-H108 (Pipeline ROW)**  
**Perennial**  
**Spread C**  
**Webster County, West Virginia**

<b>Data</b>	<b>Included</b>
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	✓
Reference Reach Software Pebble Count Data	✓
Longitudinal Profile and Cross Sections	✓

**Spread C      Stream S-H108 (Pipeline Right of Way)      Webster County**



Photo Type: US, US View

Location, Orientation, Photographer Initials: Upstream Edge of Right of Way, Upstream View, ABK/CH/TA/WP



Photo Type: US, DS View

Location, Orientation, Photographer Initials: Upstream Edge of Right of Way, Downstream View, ABK/CH/TA/WP





Photo Type: CP, US View

Location, Orientation, Photographer Initials: Center of Right of Way, Upstream View, ABK/CH/TA/WP



Photo Type: CP, DS View

Location, Orientation, Photographer Initials: Center of Right of Way, Downstream View, ABK/CH/TA/WP





Photo Type: DS, DS View

Location, Orientation, Photographer Initials: Downstream Edge of Right of Way, Downstream View, ABK/CH/TA/WP



Photo Type: DS, US View

Location, Orientation, Photographer Initials: Downstream Edge of Right of Way, Upstream View, ABK/CH/TA/WP

*"Q:\Charleston\2021 Projects\21-0244- MVP- STREAM AND WETLAND CONDITIONS ASSESSMENT AND SURVEY PLAN\002 - Pre-Crossing Monitoring\Spread C\S-H108"*

USCE FILE NO./ Project Name: (v2.1, Sept 2015)				MOUNTAIN VALLEY PIPELINE				IMPACT COORDINATES: (in Decimal Degrees)				Lat.	38.549358				Lon.	-80.53926				WEATHER:				100% Cloudy				DATE:				8/17/21																													
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)												Lower Laurel Fork (S-H108)												MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)																								Comments:															
STREAM IMPACT LENGTH:				78				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)												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:												Stream Classification:				0								Stream Classification:				0								Stream Classification:				0											
Percent Stream Channel Slope				1.9								Percent Stream Channel Slope												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):												HGM Score (attach data forms):												HGM Score (attach data forms):												HGM Score (attach data forms):															
Average												Average												Average												Average												Average															
Hydrology												Hydrology												Hydrology												Hydrology												Hydrology															
Biogeochemical Cycling												Biogeochemical Cycling												Biogeochemical Cycling												Biogeochemical Cycling												Biogeochemical Cycling															
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												PART I - Physical, Chemical and Biological Indicators												PART I - Physical, Chemical and Biological Indicators															
				Points Scale				Range				Site Score								Points Scale				Range				Site Score								Points Scale				Range				Site Score								Points Scale				Range				Site Score			
PHYSICAL INDICATOR (Applies to all streams classifications)												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 (Low 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								16				1. Epifaunal Substrate/Available Cover				0-20								0				1. Epifaunal Substrate/Available Cover				0-20								0				1. Epifaunal Substrate/Available Cover				0-20								0			
2. Embeddedness				0-20								15				2. Embeddedness				0-20								0				2. Embeddedness				0-20								0				2. Embeddedness				0-20								0			
3. Velocity/ Depth Regime				0-20								9				3. Velocity/ Depth Regime				0-20								0				3. Velocity/ Depth Regime				0-20								0				3. Velocity/ Depth Regime				0-20								0			
4. Sediment Deposition				0-20								14				4. Sediment Deposition				0-20								0				4. Sediment Deposition				0-20								0				4. Sediment Deposition				0-20								0			
5. Channel Flow Status				0-20								15				5. Channel Flow Status				0-20								0				5. Channel Flow Status				0-20								0				5. Channel Flow Status				0-20								0			
6. Channel Alteration				0-20								19				6. Channel Alteration				0-20								0				6. Channel Alteration				0-20								0				6. Channel Alteration				0-20								0			
7. Frequency of Riffles (or bends)				0-20								12				7. Frequency of Riffles (or bends)				0-20								0				7. Frequency of Riffles (or bends)				0-20								0				7. Frequency of Riffles (or bends)				0-20								0			
8. Bank Stability (LB & RB)				0-20								18				8. Bank Stability (LB & RB)				0-20								0				8. Bank Stability (LB & RB)				0-20								0				8. Bank Stability (LB & RB)				0-20								0			
9. Vegetative Protection (LB & RB)				0-20								17				9. Vegetative Protection (LB & RB)				0-20								0				9. Vegetative Protection (LB & RB)				0-20								0				9. Vegetative Protection (LB & RB)				0-20								0			
10. Riparian Vegetative Zone Width (LB & RB)				0-20								12				10. Riparian Vegetative Zone Width (LB & RB)				0-20								0				10. Riparian Vegetative Zone Width (LB & RB)				0-20								0				10. Riparian Vegetative Zone Width (LB & RB)				0-20								0			
Total RBP Score				Suboptimal								147				Total RBP Score				Poor								0				Total RBP Score				Poor								0				Total RBP Score				Poor								0			
Sub-Total												0.735				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)												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)												WVDEP Water Quality Indicators (General)															
Specific Conductivity												36				Specific Conductivity												0																																			

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME <u>Lower Laurel Fork</u>	LOCATION <u>S-H108 Spread C</u>	
STATION # _____ RIVERMILE _____	STREAM CLASS <u>Perennial</u>	
LAT <u>38.549358</u> LONG <u>-80.53926</u>	COUNTY <u>Webster</u>	
STORET # _____	AGENCY <u>Potesta</u>	
INVESTIGATORS <u>AK/CH</u>		
FORM COMPLETED BY <u>A. Kincaid</u>	DATE <u>8/17/2021</u> TIME <u>1000 AM</u>	REASON FOR SURVEY <u>Preliminary Assessment</u>

<b>WEATHER CONDITIONS</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>Now</b></p> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;"> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> </div> <div> <p>100 %</p> <p>storm (heavy rain) rain (steady rain) showers (intermittent) %cloud cover clear/sunny</p> </div> </div> </div> <div style="width: 45%;"> <p><b>Past 24 hours</b></p> <div style="display: flex; align-items: center;"> <div style="margin-right: 5px;"> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </div> <div> <p>%</p> </div> </div> </div> </div> <div style="margin-top: 10px;"> <p><b>Has there been a heavy rain in the last 7 days?</b></p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Air Temperature <u>75 F</u> °C</p> <p>Other _____</p> </div>
<b>SITE LOCATION/MAP</b>	<p>Draw a map of the site and indicate the areas sampled (or attach a photograph)</p>
<b>STREAM CHARACTERIZATION</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><b>Stream Subsystem</b></p> <p><input checked="" type="checkbox"/> Perennial <input type="checkbox"/> Intermittent <input type="checkbox"/> Tidal</p> <p><b>Stream Origin</b></p> <p><input type="checkbox"/> Glacial <input type="checkbox"/> Spring-fed  <input type="checkbox"/> Non-glacial montane <input checked="" type="checkbox"/> Mixture of origins  <input type="checkbox"/> Swamp and bog <input type="checkbox"/> Other _____</p> </div> <div style="width: 45%;"> <p><b>Stream Type</b></p> <p><input checked="" type="checkbox"/> Coldwater <input type="checkbox"/> Warmwater</p> <p><b>Catchment Area</b> _____ km<sup>2</sup></p> </div> </div>

# PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

<b>WATERSHED FEATURES</b>	<b>Predominant Surrounding Landuse</b> <input checked="" type="checkbox"/> Forest <input type="checkbox"/> Commercial <input type="checkbox"/> Field/Pasture <input type="checkbox"/> Industrial <input type="checkbox"/> Agricultural <input type="checkbox"/> Other _____ <input type="checkbox"/> Residential	<b>Local Watershed NPS Pollution</b> <input type="checkbox"/> No evidence <input checked="" type="checkbox"/> Some potential sources <input type="checkbox"/> Obvious sources <b>Local Watershed Erosion</b> <input checked="" type="checkbox"/> None <input type="checkbox"/> Moderate <input type="checkbox"/> Heavy
<b>RIPARIAN VEGETATION (18 meter buffer)</b>	<b>Indicate the dominant type and record the dominant species present</b> <input type="checkbox"/> Trees <input type="checkbox"/> Shrubs <input type="checkbox"/> Grasses <input type="checkbox"/> Herbaceous <b>Dominant species present</b> _____	
<b>INSTREAM FEATURES</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Estimated Reach Length</b> 75 ft    m  <b>Estimated Stream Width</b> 4 ft    m  <b>Sampling Reach Area</b> _____ m<sup>2</sup>  <b>Area in km<sup>2</sup> (m<sup>2</sup>x1000)</b> _____ km<sup>2</sup>  <b>Estimated Stream Depth</b> _____ m  <b>Surface Velocity (at thalweg)</b> _____ m/sec  <b>Stream Dry</b> <input type="checkbox"/> </div> <div style="width: 45%;"> <b>Canopy Cover</b>  <input type="checkbox"/> Partly open    <input type="checkbox"/> Partly shaded    <input type="checkbox"/> Shaded  <b>High Water Mark</b> _____ m  <b>Proportion of Reach Represented by Stream Morphology Types</b>            Riffle <u>40</u> %    Run <u>30</u> %            Pool <u>40</u> %  <b>Channelized</b>    <input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No  <b>Dam Present</b>    <input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No         </div> </div>	
<b>LARGE WOODY DEBRIS</b>	<b>LWD</b> _____ m <sup>2</sup> <b>Density of LWD</b> _____ m <sup>2</sup> /km <sup>2</sup> (LWD/ reach area)	
<b>AQUATIC VEGETATION</b>	<b>Indicate the dominant type and record the dominant species present</b> <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 checked="" type="checkbox"/> Attached Algae <b>Dominant species present</b> _____ <b>Portion of the reach with aquatic vegetation</b> _____ %	
<b>WATER QUALITY</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Temperature</b> 19.7 °C  <b>Specific Conductance</b> 0.036 ms/cm  <b>Dissolved Oxygen</b> 6.16 mg/L  <b>pH</b> 6.58 SU  <b>Turbidity</b> 5.54 ntu  <b>WQ Instrument Used</b> YSI/Turbidity meters         </div> <div style="width: 45%;"> <b>Water Odors</b>  <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 _____  <b>Water Surface Oils</b>  <input type="checkbox"/> Slick    <input type="checkbox"/> Sheen    <input type="checkbox"/> Globs    Flecks  <input checked="" type="checkbox"/> None    <input type="checkbox"/> Other _____  <b>Turbidity (if not measured)</b>  <input checked="" type="checkbox"/> Clear    <input type="checkbox"/> Slightly turbid    <input type="checkbox"/> Turbid  <input type="checkbox"/> Opaque    <input type="checkbox"/> Stained    <input type="checkbox"/> Other _____         </div> </div>	
<b>SEDIMENT/ SUBSTRATE</b>	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <b>Odors</b>  <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 _____  <b>Oils</b>  <input checked="" type="checkbox"/> Absent    <input type="checkbox"/> Slight    <input type="checkbox"/> Moderate    <input type="checkbox"/> Profuse         </div> <div style="width: 45%;"> <b>Deposits</b>  <input type="checkbox"/> Sludge    <input type="checkbox"/> Sawdust    <input type="checkbox"/> Paper fiber    <input checked="" type="checkbox"/> Sand  <input type="checkbox"/> Relict shells    <input type="checkbox"/> Other _____  <b>Looking at stones which are not deeply embedded, are the undersides black in color?</b>  <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		-	Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")	-			
Cobble	64-256 mm (2.5"-10")	35	Muck-Mud	black, very fine organic (FPOM)	-
Gravel	2-64 mm (0.1"-2.5")	40			
Sand	0.06-2mm (gritty)	15	Marl	grey, shell fragments	-
Silt	0.004-0.06 mm	10			
Clay	< 0.004 mm (slick)	-			



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

STREAM NAME Lower Laurel Fork		LOCATION S-H108 Spread C	
STATION # _____ RIVERMILE _____		STREAM CLASS Perennial	
LAT 38.549358 LONG -80.53926		COUNTY Webster	
STORET # _____		AGENCY Potesta	
INVESTIGATORS AK/CH			
FORM COMPLETED BY A. Kincaid		DATE 8/17/2021 TIME 1000 AM AM PM	REASON FOR SURVEY Preliminary Assessment

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
<b>1. Epifaunal Substrate/ Available Cover</b>  <input type="checkbox"/> N/A  <b>SCORE 16</b>	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 <b>16</b>	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
<b>2. Embeddedness</b>  <b>SCORE 15</b>	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.  20 19 18 17 <b>16</b>	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.  <b>15</b> 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
<b>3. Velocity/Depth Regime</b>  <input type="checkbox"/> N/A  <b>SCORE 9</b>	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 <b>9</b> 8 7 6	Dominated by 1 velocity/depth regime (usually slow-deep).  5 4 3 2 1 0
<b>4. Sediment Deposition</b>  <b>SCORE 14</b>	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 <b>14</b> 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
<b>5. Channel Flow Status</b> <input type="checkbox"/> N/A  <b>SCORE 15</b>	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.  <b>15</b> 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
<b>6. Channel Alteration</b>  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 <b>19</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>7. Frequency of Riffles (or bends)</b>  <input type="checkbox"/> N/A	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 <b>12</b>	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
<b>8. Bank Stability (score each bank)</b>  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.
SCORE <b>9</b> SCORE <b>9</b>	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
<b>9. Vegetative Protection (score each bank)</b>  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 <b>9</b> SCORE <b>8</b>	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
<b>10. Riparian Vegetative Zone Width (score each bank riparian zone)</b>  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 <b>6</b> SCORE <b>6</b>	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 **147**

## BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME <u>Lower Laurel Fork</u>		LOCATION <u>S-H108</u> <u>Spread C</u>	
STATION # <u>          </u> RIVERMILE <u>          </u>		STREAM CLASS <u>Perennial</u>	
LAT <u>38.549358</u> LONG <u>-80.53926</u>		COUNTY <u>Webster</u>	
STORET # <u>          </u>		AGENCY <u>Potesta</u>	
INVESTIGATORS <u>AK/CH</u>		LOT NUMBER <u>          </u>	
FORM COMPLETED BY <u>A. Kincaid</u>		DATE <u>8/17/2021</u> TIME <u>1000 AM</u>	REASON FOR SURVEY <u>Preliminary Assessment</u>

<b>HABITAT TYPES</b>	<b>Indicate the percentage of each habitat type present</b> <input checked="" type="checkbox"/> Cobble <u>100</u> % <input type="checkbox"/> Snags <u>          </u> % <input checked="" type="checkbox"/> Vegetated Banks <u>100</u> % <input checked="" type="checkbox"/> Sand <u>30</u> % <input type="checkbox"/> Submerged Macrophytes <u>          </u> % <input type="checkbox"/> Other ( <u>Gravel</u> ) <u>50</u> %
<b>SAMPLE COLLECTION</b>	<b>Gear used</b> <input type="checkbox"/> D-frame <input checked="" type="checkbox"/> kick-net <input type="checkbox"/> Other <u>          </u> <b>How were the samples collected?</b> <input checked="" type="checkbox"/> wading <input type="checkbox"/> from bank <input type="checkbox"/> from boat <b>Indicate the number of jabs/kicks taken in each habitat type.</b> <input checked="" type="checkbox"/> Cobble <u>4</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>
<b>GENERAL COMMENTS</b>	<p style="font-size: 1.2em;">4 kicks done in riffles where gravel is dominant.</p>

### 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	<div>stonefly</div>					
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						

Benthic WVSCI

Sample ID 1

West Virginia Stream Condition Index (WVSCI)

ORG ID REIC2513

**IMPORTANT: A blank screen below means that you have not entered the Benthic Identifications correctly! All individuals that are part of the 200-count subsample must be designated as such in the Sample Methodolgy column on the Benthic ID forms (Family or Genus)!**

WVSCI Family	Count	TV
Aeshnidae	1	3
Baetidae	1	4
Baetiscidae	1	3
Calopterygidae	1	5
Ceratopogonidae	1	6
Chironomidae	40	6
Corydalidae	4	5
Dryopidae	11	5
Elmidae	52	4
Empididae	4	6
Ephemerellidae	9	3
Glossosomatidae	2	0
Goeridae	3	4
Gomphidae	1	3
Heptageniidae	5	4
Hydrachnidae	1	6
Hydrophilidae	2	5
Hydropsychidae	29	5
Hydroptilidae	3	4
Leptophlebiidae	1	2
Leuctridae	31	3
Perlidae	6	1
Philopotamidae	1	3
Polycentropodidae	2	6
Rhyacophilidae	5	3
Tipulidae	2	3

**WVSCI Metrics and Scores**

ORG ID REIC2513

Metrics	BSV	WVSCI Standardized Score w BSV 1996-2001
% 2 Dominant Taxa (Family)	42.01	37.3
% Chironomidae	18.26	1.7
% EPT (Family)	45.21	89.3
IBI (Family)	4.29	2.61
# EPT Taxa (Family)	14	13
# Total Taxa (Family)	26	22
WVSCI Score w/ BSV 1996-2001		83.92

**WVSCI Category** Unimpaired-Very Good

**WVSCI Thresholds**  
 Unimpaired = >68.00  
 Gray Zone = 60.61 to 68.00  
 Impaired = <60.61

**Benthic Density**

ORG ID REIC2513

# of grids Picked	43	Total # of grids	100
Total IBI Individuals	219		
# of Organisms per Grid	5.09		
Organisms per Sq cm	0.0509		
Organisms per Sq m	509.30		



SITE ID: S-H108 Lower Laurel Fork

DATE: 8-17-21

COLLECTOR(S): CH/AK

Wolman Pebble Count (Reach Wide)										NOTES:  MM
41	50	FSA	28	62	49	62	31	16	57	
46	FSA	72	19	44	98	69	35	114	93	
33	132	57	82	36	77	55	57	56	36	
122	19	36	117	51	68	53	27	44	142	
34	42	135	137	35	51	78	68	39	74	
110	40	92	148	72	133	45	72	79	97	
82	106	FSA	74	56	207	110	57	38	46	
60	62	FSA	CSA	62	76	211	22	47	28	
63	113	54	FSA	66	37	28	86	46	33	
52	53	FSA	18	43	CSA	60	21	58	56	

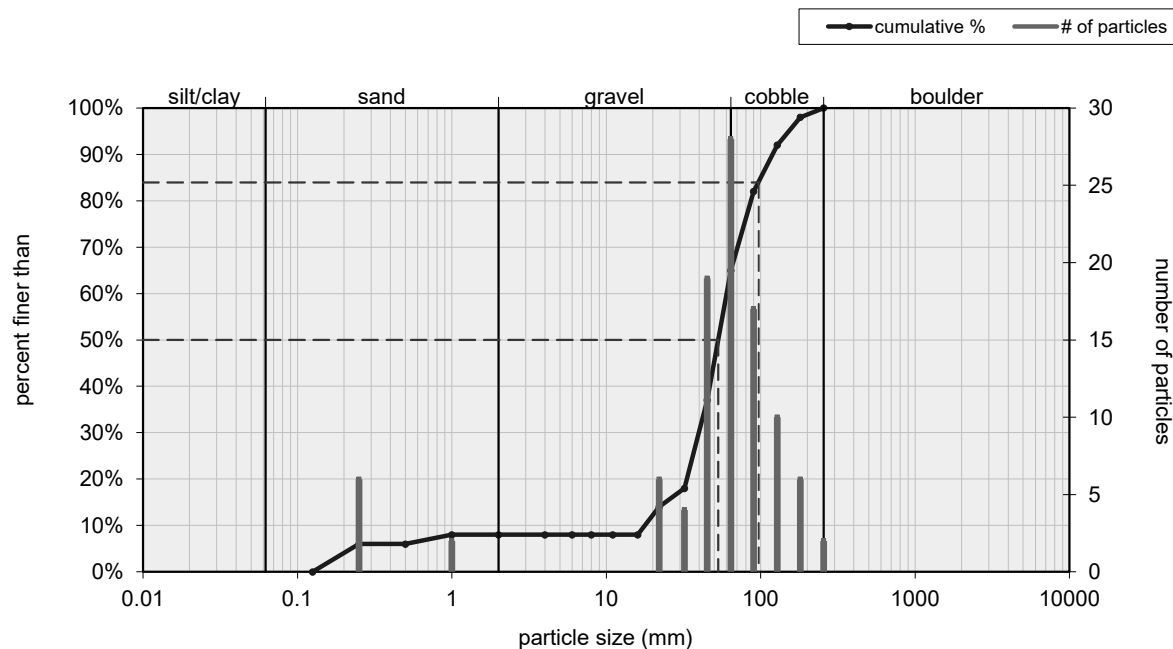
Riffle Pebble Count										NOTES:

										NOTES:

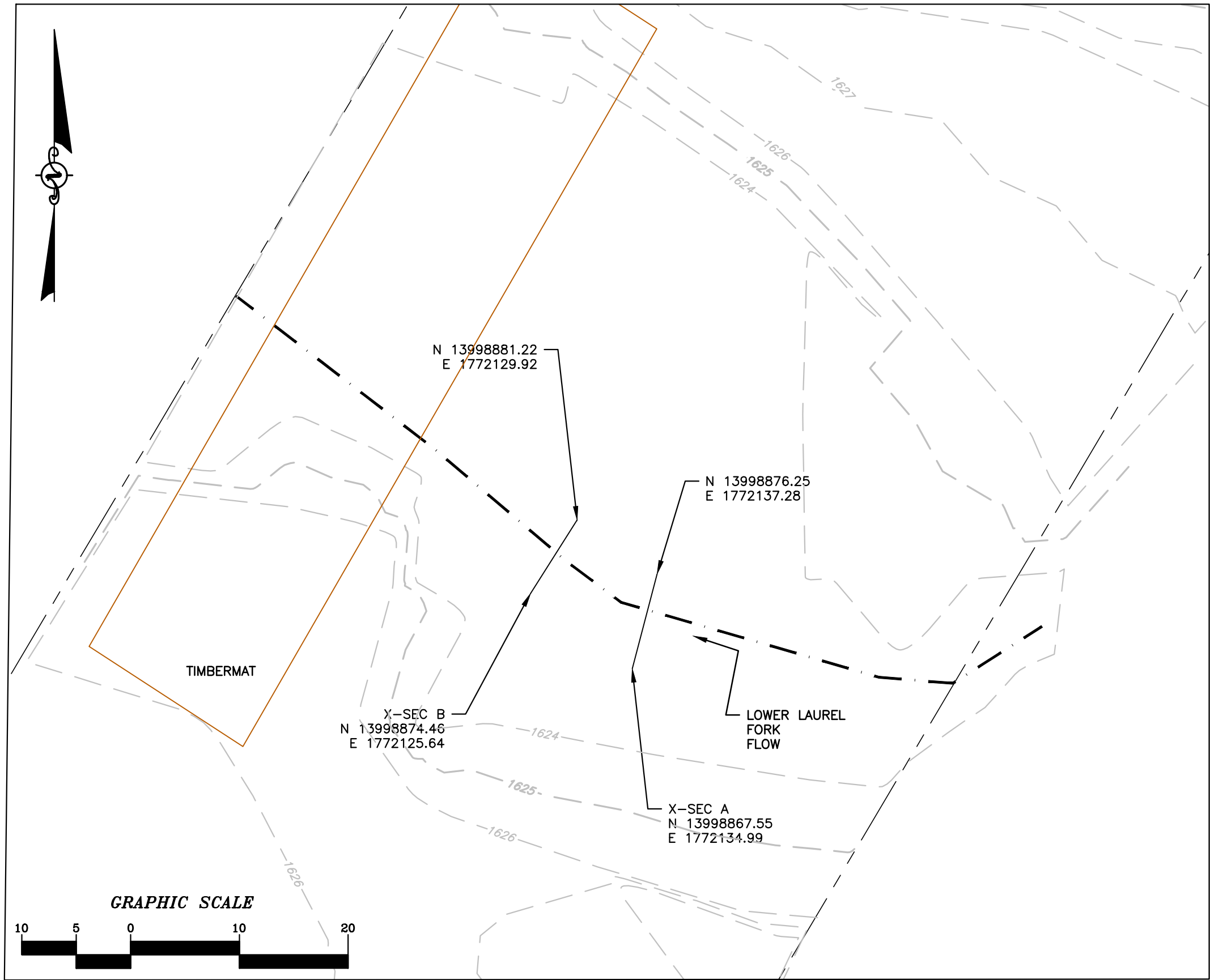
Inches	PARTICLE	Millimeters	S/C
	Silt/Clay	< .062	
	Very Fine	.062 - .125	SAND
	Fine	.125 - .25	
	Medium	.25 - .50	
	Coarse	.50 - 1.0	
04 - 08	Very Coarse	1.0 - 2	GRAVEL
08 - 16	Very Fine	2 - 4	
16 - 22	Fine	4 - 5.7	
22 - 31	Fine	5.7 - 8	
31 - 44	Medium	8 - 11.3	
44 - 53	Medium	11.3 - 16	
53 - 89	Coarse	16 - 22.6	COBBLE
89 - 1.3	Coarse	22.6 - 32	
1.3 - 1.8	Very Coarse	32 - 45	
1.8 - 2.5	Very Coarse	45 - 64	
2.5 - 3.5	Small	64 - 90	BOULDER
3.5 - 5.0	Small	90 - 128	
5.0 - 7.1	Large	128 - 180	
7.1 - 10.1	Large	180 - 256	
10.1 - 14.3	Small	256 - 362	BDRK
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	
very fine sand	0.062 - 0.125	
fine sand	0.125 - 0.25	6
medium sand	0.25 - 0.5	
coarse sand	0.5 - 1	2
very coarse sand	1 - 2	
very fine gravel	2 - 4	
fine gravel	4 - 6	
fine gravel	6 - 8	
medium gravel	8 - 11	
medium gravel	11 - 16	
coarse gravel	16 - 22	6
coarse gravel	22 - 32	4
very coarse gravel	32 - 45	19
very coarse gravel	45 - 64	28
small cobble	64 - 90	17
medium cobble	90 - 128	10
large cobble	128 - 180	6
very large cobble	180 - 256	2
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: _____		

Bankfull Channel Pebble Count, Lower Laurel Fork (S-H108)

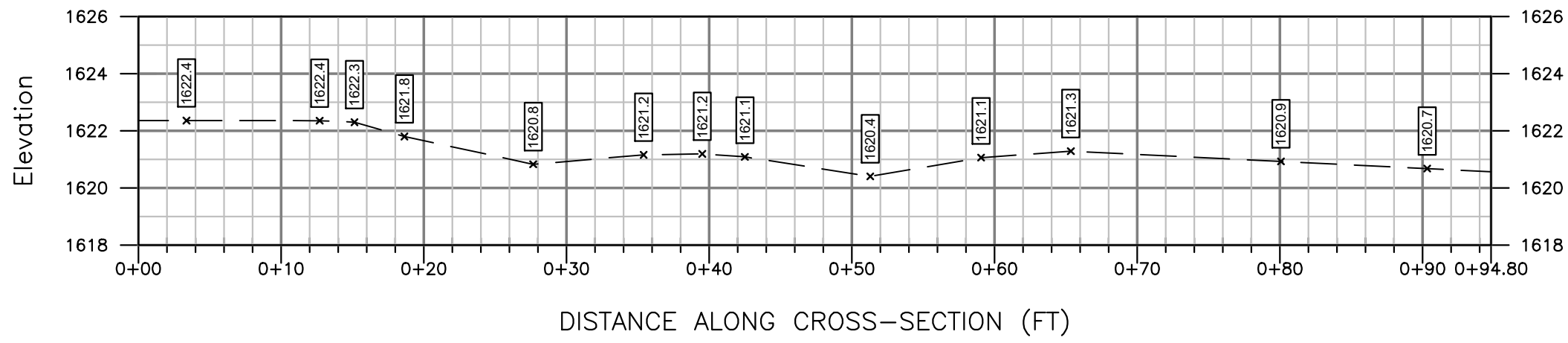


Size (mm)		Size Distribution		Type	
D16	27	mean	51.2	silt/clay	0%
D35	43	dispersion	1.9	sand	8%
D50	53	skewness	-0.02	gravel	57%
D65	64			cobble	35%
D84	97			boulder	0%
D95	150				



S-H108

### S-H108 BASELINE THALWEG PROFILE



#### PROFILE LEGEND

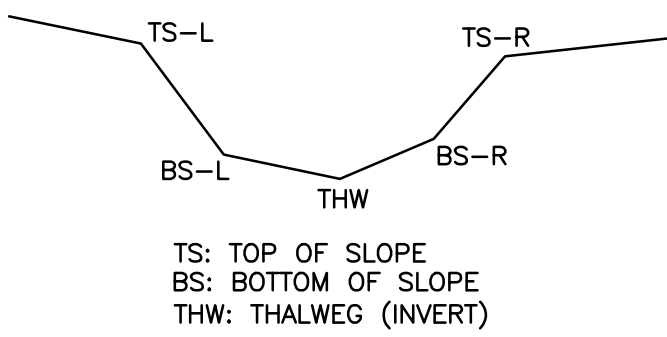
EXISTING STREAM PROFILE  
INVERT ALONG THALWEG

#### PROFILE

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

AS-BUILT TABLE: S-H108 CROSS SECTION B					
	PRE-CROSSING			AS-BUILT	
PT. LOC.	NORTHING	EASTING	ELEV.	VERT. DIFF.	HORZ. DIFF.
TS-L	13998874.73	1772125.45	1622.33		
BS-L	13998875.66	1772126.07	1621.43		
THW	13998878.34	1772127.97	1620.40		
BS-R	13998880.14	1772129.39	1620.97		
TS-R	13998881.12	1772129.93	1622.24		

#### TYPICAL 5-POINT CROSS-SECTION (FACING DOWNSTREAM)



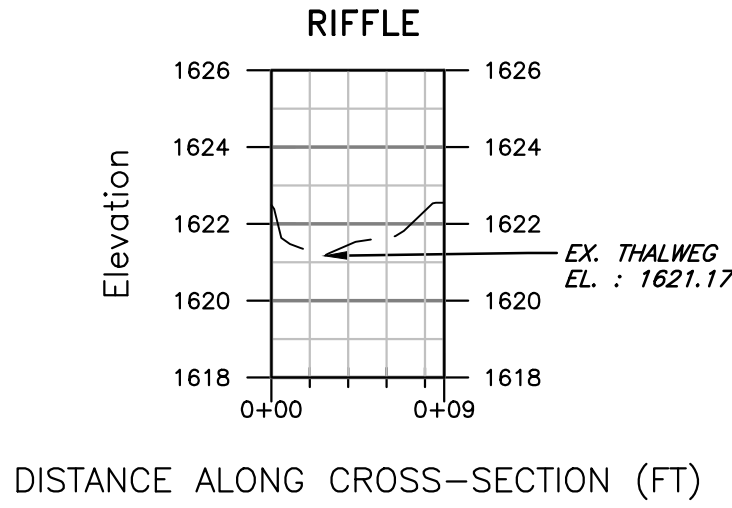
### LEGEND

- STUDY AREA (EASEMENT)
- EXISTING SURVEY-LOCATED THALWEG
- EXISTING SURVEYED GROUND SHOT ELEVATION

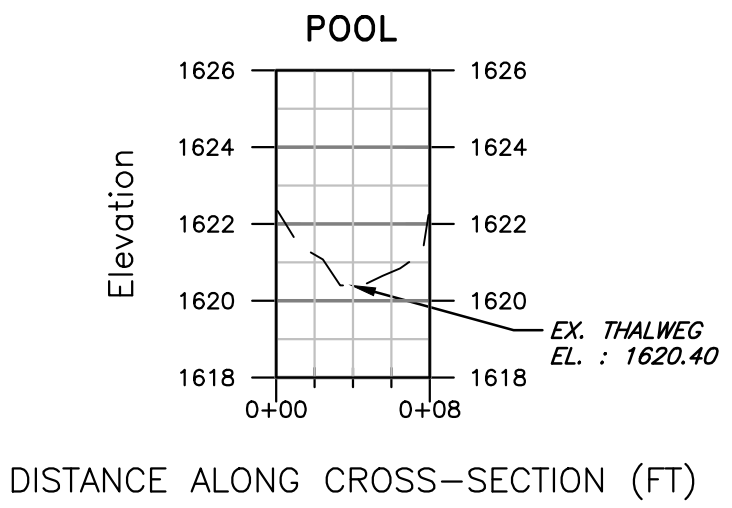
#### SURVEY NOTES:

- 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 8-17-2021.
- 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-H108 BASELINE CROSS-SECTION A



### S-H108 BASELINE CROSS-SECTION B



#### CROSS SECTION LEGEND

EXISTING GRADE

#### CROSS SECTION

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

NOTE: ALL SECTION 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

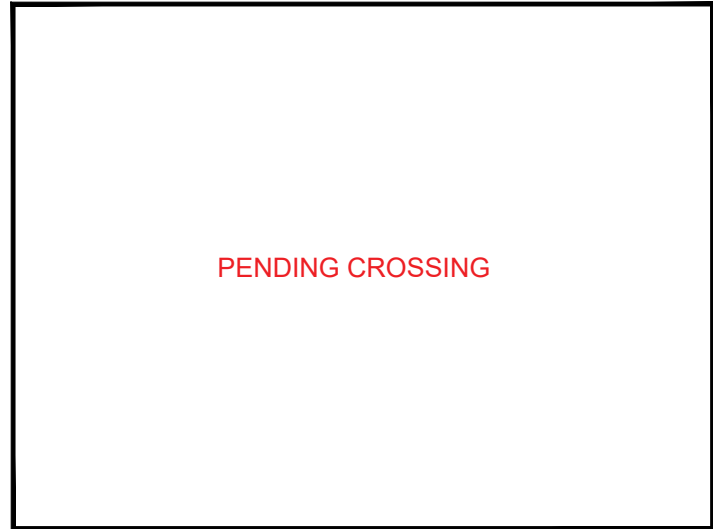


PHOTO TAKEN LOOKING DOWNSTREAM  
UPSTREAM FROM IMPACT LIMITS

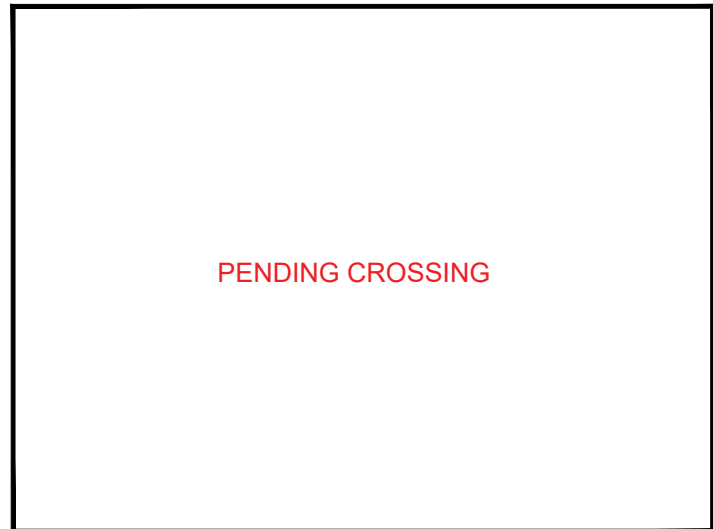


PHOTO TAKEN LOOKING UPSTREAM FROM  
UPSTREAM IMPACT LIMITS

PRE-CROSSING

--S-H108  
CAD File No.

MBS  
Drawn

CHH  
Checked

BB/JLY  
Approved

NOTED  
Scale:

SEPT. 2021  
Date:

21-0244-005  
Project No.

POTESTA & ASSOCIATES, INC.  
ENGINEERS AND ENVIRONMENTAL CONSULTANTS  
7012 MacCubbin Avenue SE, Charleston, WV 25304  
TEL: (304) 342-1400 FAX: (304) 343-9051  
E-Mail: Address: potesta@potesta.com

POTESTA

Client  
MOUNTAIN VALLEY PIPELINE, LLC  
2200 ENERGY DRIVE, 2ND FLOOR  
CANONSBURG, PA 15317

Profile and Cross-Sections  
Baseline Survey  
CROSSING H-108 - LOWER LAUREL  
FORK (WP 92.99)  
WEBSTER COUNTY, WV

Title

1

Drawing No.

DATE ISSUED 9/27/2021