Reach S-VV18 (Temporary Access Road) Ephemeral Spread B Lewis County, West Virginia

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

Spread B Stream S-VV18 (Temporary Access Road) Lewis County



Photo Type: DS, US View Location, Orientation, Photographer Initials: Downstream Edge of ROW, Upstream View, AJE/KAY Lat: 38.897028 Long: -80.567634



Photo Type: DS, DS View Location, Orientation, Photographer Initials: Downstream Edge of ROW, Downstream View, AJE/KAY Lat: 38.897028 Long: -80.567634

Spread B Stream S-VV18 (Temporary Access Road) Lewis County



Photo Type: US View at Center Location, Orientation, Photographer Initials: Center ROW, Upstream View, AJE/KAY Lat: 38.897028 Long: -80.567634



Photo Type: DS View at Center Location, Orientation, Photographer Initials: ROW Center, Downstream View, AJE/KAY Lat: 38.897028 Long: -80.567634

Spread B Stream S-VV18 (Temporary Access Road) Lewis County



Photo Type: US, US View Location, Orientation, Photographer Initials: Upstream Edge of ROW, Upstream View, AJE/KAY Lat: 38.897028 Long: -80.567634



Photo Type: US, DS View Location, Orientation, Photographer Initials: Upstream Edge of ROW, Downstream View, AJE/KAY Lat: 38.897028 Long: -80.567634

West Virginia Stream and Wetland Valuation Metric (SWVM) Version 2.1, September 2017

| USACE FILE NO./ Project Name: (v2.1, Sept 2015) | | Mountain | Valley Pipeline | IMPACT COORDINATES (in Decimal Degrees) | : Lat. | 38.897028 L | .on. | -80.567634 | WEATHER: | 99% Cloud Cover | DATE: | 09/10/21 | |
|-----------------------------------------------------|---------------------|------------------------|---------------------------------------------------------|--------------------------------------------|--------|---------------------------------------------------------------|-------------------------|--------------|-----------------------------------------------------|-------------------------------|-----------------------------------------------------|-----------------------------|------------|
| IMPACT STREAM/SITE ID (watershed size (acreage) | | | S-V | V18 | | MITIGATION STREAM CLASS./SIT (watershed size (acreage), ur | | | | | Comments: | N/A - Water Qu (No Flow) | |
| STREAM IMPACT LENGTH: | 41 | FORM OF MITIGATION: | RESTORATION (Levels I-III) | MIT COORDINATES: (in Decimal Degrees) | Lat. | L | .on. | | PRECIPITATION PAST 48 HRS: | | Mitigation Length: | | |
| Column No. 1- Impact Existing | g Condition (De | bit) | Column No. 2- Mitigation Existing Co | ondition - Baseline (Credit) | | Column No. 3- Mitigation Project Post Completion (C | cted at Five Credit) | rears | Column No. 4- Mitigation Proje Post Completion (| ected at Ten Years Credit) | Column No. 5- Mitigation Project | ed at Maturity (Credit) | ı) |
| Stream Classification: | Ephe | emeral | Stream Classification: | | | Stream Classification: | | 0 | Stream Classification: | 0 | Stream Classification: | 0 | |
| Percent Stream Channel SI | lope | 18.5 | Percent Stream Channel Slo | pe | | Percent Stream Channel Slope | e | 0 | Percent Stream Channel SI | ope 0 | Percent Stream Channel S | lope | 0 |
| HGM Score (attach d | lata forms): | | HGM Score (attach o | lata forms): | | HGM Score (attach dat | ta forms): | | HGM Score (attach da | ata forms): | HGM Score (attach d | ata forms): | |
| | | Average | | Average | | | | Average | | Average | | A | Average |
| Hydrology | 0.63 | | Hydrology | | | Hydrology | | | Hydrology | | Hydrology | | |
| Biogeochemical Cycling Habitat | 0.43 | 0.50333333 | Biogeochemical Cycling Habitat | 0 | | Biogeochemical Cycling Habitat | | 0 | Biogeochemical Cycling Habitat | 0 | Biogeochemical Cycling Habitat | | 0 |
| PART I - Physical, Chemical and | | cators | PART I - Physical, Chemical and | Biological Indicators | | PART I - Physical, Chemical and B | Biological Ind | licators | PART I - Physical, Chemical and | Biological Indicators | PART I - Physical, Chemical and | Biological Indicators | _ |
| | Points Scale Range | Site Score | | Points Scale Range Site Score | | P | oints Scale Range | Site Score | | Points Scale Range Site Score | | Points Scale Range | Site Score |
| PHYSICAL INDICATOR (Applies to all streams | s classifications) | | PHYSICAL INDICATOR (Applies to all streams of | lassifications) | | PHYSICAL INDICATOR (Applies to all streams class | ssifications) | | 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 | 0 | Epifaunal Substrate/Available Cover | 0-20 | | | 0-20 | | 1. Epifaunal Substrate/Available Cover | 0-20 | 1. Epifaunal Substrate/Available Cover | 0-20 | _ |
| 2. Embeddedness | 0-20 | 17 | 2. Pool Substrate Characterization | 0-20 | | | 0-20 | | 2. Embeddedness | 0-20 | 2. Embeddedness | 0-20 | |
| 3. Velocity/ Depth Regime 4. Sediment Deposition | 0-20 | 0 | 3. Pool Variability 4. Sediment Deposition | 0-20 | | | 0-20 | | 3. Velocity/ Depth Regime 4. Sediment Deposition | 0-20 | 3. Velocity/ Depth Regime 4. Sediment Deposition | 0-20 | ļ |
| 5. Channel Flow Status | 0-20 0.4 | 0 | 5. Channel Flow Status | 0-20 0.1 | | | 0-20 | | 5. Channel Flow Status | 0-20 | 5. Channel Flow Status | 0-20 | |
| 6. Channel Alteration | 0-20 0-1 | 2 | 6. Channel Alteration | 0-20 0-1 | | | 0-20 0-1 | | 6. Channel Alteration | 0-20 0-1 | 6. Channel Alteration | 0-20 0-1 | |
| 7. Frequency of Riffles (or bends) | 0-20 | 0 | 7. Channel Sinuosity | 0-20 | | | 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 | 10 | 8. Bank Stability (LB & RB) | 0-20 | | | 0-20 | | 8. Bank Stability (LB & RB) | 0-20 | 8. Bank Stability (LB & RB) | 0-20 | |
| 9. Vegetative Protection (LB & RB) | 0-20 | 12 | 9. Vegetative Protection (LB & RB) | 0-20 | | | 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 | 8 | 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 | Marginal | 49 | Total RBP Score | Poor 0 | | Total RBP Score | Poor | 0 | Total RBP Score | Poor 0 | Total RBP Score | Poor | 0 |
| Sub-Total | | 0.40833333 | Sub-Total | 0 | | Sub-Total | | 0 | Sub-Total | 0 | Sub-Total | | 0 |
| CHEMICAL INDICATOR (Applies to Intermittee | nt and Perennial St | reams) | CHEMICAL INDICATOR (Applies to Intermittent | and Perennial Streams) | | CHEMICAL INDICATOR (Applies to Intermittent and | d Perennial Str | eams) | CHEMICAL INDICATOR (Applies to Intermitten | t and Perennial Streams) | CHEMICAL INDICATOR (Applies to Intermitter | nt and Perennial Streams) | (|
| WVDEP Water Quality Indicators (General | D | | WVDEP Water Quality Indicators (General) | | | WVDEP Water Quality Indicators (General) | | | WVDEP Water Quality Indicators (General) | | WVDEP Water Quality Indicators (General | 1 | |
| Specific Conductivity | -4 | | Specific Conductivity | | | Specific Conductivity | | | Specific Conductivity | | Specific Conductivity | | |
| | 0-90 | | | 0-90 | | | 0-90 | | | 0-90 | | 0-90 | |
| 100-199 - 85 points | - | | -14 | | | -11 | _ | | -11 | | - 11 | | - |
| рп | 0-80 0-1 | | ph | 5-90 0-1 | | рн | 5.90 0-1 | | pA | 5-90 0-1 | ph | 5-90 0-1 | _ |
| 5.6-5.9 = 45 points | 0-80 | | | 0-90 | | | 0-90 | | | 5-30 | | 5-50 | |
| DO | | | DO | | | DO | | | DO | | DO | | |
| | 10-30 | | | 10-30 | | | 10-30 | | | 10-30 | | 10-30 | |
| Sub-Total | 1 1 | | Sub-Total | 0 | - | Sub-Total | I | 0 | Sub-Total | 0 | Sub-Total | | 0 |
| BIOLOGICAL INDICATOR (Applies to Intermit | ttent and Perennial | Streams) | BIOLOGICAL INDICATOR (Applies to Intermitter | nt and Perennial Streams) | | BIOLOGICAL INDICATOR (Applies to Intermittee | ent and Perenr | ial Streams) | BIOLOGICAL INDICATOR (Applies to Interm | ittent and Perennial Streams) | BIOLOGICAL INDICATOR (Applies to Intern | nittent and Perennial Stre | reams) |
| WV Stream Condition Index (WVSCI) | | | WV Stream Condition Index (WVSCI) | | | WV Stream Condition Index (WVSCI) | | | WV Stream Condition Index (WVSCI) | | WV Stream Condition Index (WVSCI) | | |
| | 0-100 0-1 | | | 0-100 0-1 | | | 0-100 0-1 | | | 0-100 0-1 | | 0-100 0-1 | |
| 0 | | | | | | | | | - | | - | | |
| Sub-Total | | 0 | Sub-Total | 0 | _ | Sub-Total | | 0 | Sub-Total | 0 | Sub-Total | | 0 |
| PART II - Index and U | Unit Score | | PART II - Index and I | Jnit Score | | PART II - Index and Un | nit Score | | PART II - Index and U | nit Score | PART II - Index and U | Jnit Score | |
| Index | Linear Feet | Unit Score | Index | Linear Feet Unit Score | | Index | Linear Feet | Unit Score | Index | Linear Feet Unit Score | Index | Linear Feet Un | nit Score |
| 0.554 | 41 | 22.70375 | 0 | 0 0 | 1 | 0 | 0 | 0 | 0 | 0 0 | 0 | 0 | 0 |
| L | 1 | L | I | | 4 | L | | 4 | L | | <u> </u> | I | |

FCI Calculator for the High-Gradient Headwater Streams in Appalachia

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

| | MVP Stream Assessment Lewis County, Spread B 9-10-21 | | Project Site | Before Project |
|---------------------|------------------------------------------------------------|----------------------------|------------------------------|----------------------|
| Subclass for this S | A R: Ephemeral Stream | | | |
| Uppermost stratun | n present at this SAR: Shrub/Herb Strata | | SAR number: | S-VV18 |
| Functional Resu | Ilts Summary: | Enter Results in Section A | of the Mitigation Su | fficiency Calculator |
| | Func | tion | Functional Capacity Index | |
| | Hydrology | | 0.63 | |
| | Biogeochemical Cycling | | 0.43 | |

0.45

Variable Measure and Subindex Summary:

Habitat

| Variable | Name | Average Measure | Subindex |
|------------------------|-------------------------------------------------------|--------------------|----------|
| VCCANOPY | Percent canpoy over channel. | Not Used, <20% | Not Used |
| V _{EMBED} | Average embeddedness of channel. | 2.20 | 0.53 |
| V _{SUBSTRATE} | Median stream channel substrate particle size. | 3.00 | 1.00 |
| V _{BERO} | Total percent of eroded stream channel bank. | 10.81 | 1.00 |
| V _{LWD} | Number of down woody stems per 100 feet of stream. | 0.00 | 0.00 |
| V _{TDBH} | Average dbh of trees. | Not Used | Not Used |
| V _{SNAG} | Number of snags per 100 feet of stream. | 0.00 | 0.10 |
| V _{SSD} | Number of saplings and shrubs per 100 feet of stream. | 24.32 | 0.37 |
| V _{SRICH} | Riparian vegetation species richness. | 0.00 | 0.00 |
| | Average percent cover of leaves, sticks, etc. | 80.00 | 0.98 |
| V _{HERB} | Average percent cover of herbaceous vegetation. | 20.00 | 0.27 |
| V _{WLUSE} | Weighted Average of Runoff Score for Catchment. | 1.00 | 1.00 |

| | | | High-C | | | ter Strea | | | | a | versio | on 10-20-17 |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------|------------------------------------------|------------------------------------|--------------------------------------------------------|---------------------------------------------|-------------------------------|------------------|
| | - | | | Field L | Jala She | et and C | aicu | | | | ~~~~~~~~ | |
| D - | | AJE KAY | | | | | | | | - | 38.897028 | |
| FI | | MVP Streat Lewis Court | | | | | | L | • | nor Easting. | -80.567634 | • |
| | | | | | | | | | Jan | ipility Date. | 9-10-21 | - |
| SA | AR Number: | | | Length (ft): | 37 | Stream Ty | | | meral Stream | | | • |
| Sito | Top Strata: | Project Site | rub/Herb St | rata | (determine | d from perce | | | | PY) | | - |
| | | 1-4 in strea | | | | | Before | Proje | ct | | | |
| 1 | V _{CCANOPY} | Average pe equidistant | points alon at least one | over chann g the strean value betw | n. Measure reen 0 and 1 | nd sapling c only if tree/s 19 to trigger | sapling | cove | er is at least | | | Not Used <20% |
| | 0 | | | | | | | | | | | |
| 2 | V _{EMBED} | along the s surface and according t rating score | tream. Sele d area surro to the follow e of 1. If the | ect a particle unding the p ing table. If bed is com | from the be particle that the bed is a posed of be | I. Measure ed. Before r is covered t an artificial s edrock, use a | noving by fine surface a rating | it, de sedir , or c g sco | etermine the nent, and er omposed of re of 5. | percentage nter the ratir fine sedime | e of the ng ents, use a | 2.2 |
| | | Minshall 19 | 983) | | obble and b | oulder parti | cles (re | escale | ed from Plat | ts, Megahai | n, and | |
| | | Rating 5 4 | | of surface of | | rounded, or , surrounded | | | | | k) | |
| | | 3 | | | | d, surrounde | | | | | | 1 |
| | | 2 | | | | d, surrounde | | | | | | |
| | | 1 | | | covered, su | urrounded, a | r burie | d by | fine sedime | nt (or artifici | al surface) |] |
| | | ings at each | <u>.</u> | | | | | | | | | |
| | 2 | 2 | 3 | 1 | 3 | 1 | 2 | | 4 | 1 | 1 | |
| | 1 | 3 | 3 | 4 | 3 | 1 | 2 | | 4 | 1 | 1 | |
| | 1 | 3 | 3 | 4 | 3 | 1 | 2 | 2 | 4 | 1 | 1 | |
| 3 | V | Median str | aam channe | l substrate i | particle size | . Measure a | at no fe | wort | han 30 roug | the aguidist | tant points | |
| | Enter partic | along the s | tream; use t iches to the | the same po nearest 0.1 | ints and par inch at eacl | rticles as us h point belov | ed in V | емвес |). | | | 3.00 in |
| | 4.50 | 2.00 | 2.30 | 2.30 | 4.00 | 3.00 | 3.5 | 50 | 0.70 | 1.50 | 3.00 | |
| | 2.00 | 5.00 | 3.00 | 4.00 | 0.50 | 3.00 | 3.5 | | 0.80 | 1.50 | 2.50 | |
| | 2.00 | 3.50 | 3.00 | 4.00 | 0.50 | 3.00 | 3.5 | | 0.70 | 1.50 | 3.00 | |
| | | | | | | | | | | | | |
| 4 | V _{BERO} | | | | | Enter the to d If both ba | | | | | | 11 % |
| | | may be up | to 200%. Left Bank: | 2 | ft | | Right E | Bank: | 2 | ft | | |
| ample | e Variables | 5-9 within t | the entire ri | parian/buff | er zone adj | acent to the | e strea | ım ch | annel (25 f | eet from ea | ich bank). | |
| 5 | V _{LWD} | stream rea | | e number fr | om the entir | es in diamet e 50'-wide b | | | | | | 0.0 |
| | | | | | Number of | f downed wo | ody st | ems: | | 0 | | |
| 6 | V _{TDBH} | inches (10 | cm) in diam | eter. Enter | tree DBHs i | | | | | | e at least 4 | Not Used |
| | List the dbh measurements of individual trees (at least 4 in) within the buffer on each side of the stream below: Left Side Right Side Right Side | | | | | | | | | | | |
| | 0 | | | 0 | | | | | | | | |
| | | | | | | Ť | | | | | | |
| | | | | | | | | | | | | |
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| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| _ | | | | | | | | | | | | |
| 7 | V _{SNAG} | | | | | per 100 fee et will be cal | | | Enter numb | er of snags | on each | 0.0 |
| | | | Left Side: | | 0 | | Right | Side | | 0 | | |
| 8 | V | Number of | | | - | up to 4 inch | | | | - | asure only | |
| 8 | V _{SSD} | if tree cove | | Enter numb | er of saplin | gs and shru | | | | | | 24.3 |
| | | | Left Side: | | 4 | | Right | Sido | | 5 | | |

| Land Use (Choose From Drop List) Runoff Score % in Catch ment Runo Perce (not >1 Forest and native range (>75% ground cover) ▼ 1 99.9 | 9 V _{SRICH} | | the tallest s | tratum. Ch | eck all exotio | | ive species p | resent in a | ill strata. Sp | pecies | 0.00 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|---------------------------------------------------|---------------|---------------|-------------|-----------------------|-----------------------------|---------------------------------------|
| 1 Acer rubrum Megnolis tripetalis Alienthus altissims Lonicera isponce 1 Aces accharum Mysa synhole Alienthus altissims Lonicera isponce 1 Acesulus Mare Lonicera isponce Alienthus altissima Lonicera isponce 1 Assoulus Mare Lonicera isponce Alienthus altissima Lonicera isponce 1 Assoulus Mare Lonicera isponce Alienthus altissima Lonicera isponce 1 Aster lataricus Pulus cornuclius Pulus cornuclius 1 Garya alia Quercus inhibraria Carras funditionatio correctifica Palenaria montana 1 Carrya ovisia Quercus prinus Carras funditional Researcharum Pulus mathia 1 Carras funditional Ssessfras altidum Lespectaz ubcalitum Verbreis brasiliens 1 Carrus funditional Tilia americana Liguatum obustifium Verbreis brasiliens 1 Carrus funditional Tilia americana Liguatum obustifium Lespectaz ubcalitum 1 O species in Group 1 0 Species in Group 2 Imple Variables 10-11 within a tasta Suma anaricana 1 Megnolia acu | | | | ind the subi | index will be | calculated | from these d | | 0 (1 0) | | |
| A Acer saccharum Nyssa sylvatica Alibita julibrisain Lonicerra Istance Alibita julibrisain Lonicerra Istance Lotus comiculture Alima petiolate Lotus comiculture Lotus Lotus comiculture Lotus Lotus Lotus comiculture Lotus Lot | 7 | | | Magnalia | vinatolo | _ | Ailanthua a | | . , | l anisara ia | |
| Assculus flava Ovjetendrum arkoneur Asimine tribba Lotus corriculatus Assimine tribba Prunus serotria Alternambra Lythrim salicatis Betuki anginerinates Ouercus alba Alternambra Lythrim salicatis Carya alba Ouercus alba Alternambra Paulownie tornent, Carya alba Ouercus albaria Corros flow aria Paulownie tornent, Carya alba Ouercus albaria Corros flow aria Poesenia montana Carya avata Ouercus albaria Corros flow aria Rosa mutéhora Carya avata Ouercus veluma Lespecteza unebala Rosa mutéhora Carya avata Ouercus ablaria Lespecteza unebala Rosa mutéhora Carya avata Ouercus ablaria Lespecteza unebala Verbena brasiliens Corrus florida Saszafras abldum Lespecteza unebala Verbena brasiliens Libodrichon tulpière Umus americana Lipustum albaria Voerbena brasiliens Magnolia acuminata O Species in Group 1 O Species in Group 2 Imple Variables 10-11 Marca Trib versities should be paced rought ogadiation (measure onty) If thes cover is -20%). D. ondrincude woo | | | | | | | | | | | |
| 1 Admine trilobe Prurus serotine □ Atternanthera □ Lythrum salicarie 1 Betuik enterine in allephaniensis □ Overcus sociale □ Atternanthera □ Publication in allephaniensis □ □ Publication in allephaniensis □ Publication in allephaniensis □ □ Publication in allephaniensis □ □ Publication in allephaniensis □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ | | | | | | | - | | | | |
| Betula alteghaniensis Quercus alte philoseroides Monostigum vanise Carya glabra Quercus prinus Cersatum frontarum Paulownic torrent Carya glabra Quercus prinus Cersatum frontarum Paulownic torrent Carya glabra Quercus prinus Corontila varia Paulownic torrent Carya ovaiis Quercus prinus Corontila varia Paulownic torrent Carya ovaiis Quercus valina Corontila varia Paulownic torrent Carya ovaiis Quercus valina Lespedeza boton Sogafum halpenei Fasious gamonifolia Tita americana Lespedeza boton Sogafum halpenei Fasious gamonifolia Tita americana Ligustrum obtasifuturi Verbena brasiliens Magnolia scuminata Curruns Nerdees in Group 1 0 Species in Group 2 mple Variables 10-11 within at tast 8 subplots (40° x 40°, or finx 1 m) in the riparian/buffer zone within 25 feet from sech intert the percent cover of the derital layer at each subplot. 800 10 Vectorura Average percentages cover of the derital layer at each subplot. 800 90 70 80 90 70 80 00 90 70 80 | | | | - | | _ | | | _ | | |
| abelule lends □ Quercus concinea □ Aster tataricus □ Pauloninis tornets 1 Carya glabra □ Quercus concinea □ Aster tataricus □ Pauloninis tornets 1 Carya glabra □ Quercus prixus □ Coronila varia □ Poseraria montana 1 Carya ovais □ Quercus value □ Lespedeza bicolor □ Sorg muthitapens 1 Carya ovais □ Quercus value □ Lespedeza bicolor □ Sorg muthitapens 1 Carya ovais □ Quercus value □ Lespedeza bicolor □ Sorg muthitapens 1 Carya ovais □ Sussafras abloutin □ Lespedeza bicolor □ Sorg muthitapens 1 Fraue granoffolie □ Itilia emericana □ Liguatum obtainaloitum □ Vectorus Aster tataricus ■ 0 Sorg muthitapens 1 Varianus Aster tataricus □ Diataria □ Diataria Diataria Diataria Diataria Diataria | - | | | | | | | | _ | - | |
| Carya alba Quercus imbricaria Cerastium fontanum Polygonum cuspidal Carya globra Quercus prinis Coronila varia Pelarasin nontana Carya globra Quercus prinis Carya valis Pelarasin nontana Carya evalis Quercus valina Eleasaguas umbellata Pelarasin nontana Carya evalis Quercus valina Eleasaguas umbellata Pelarasin nontana Carya evalis Quercus valina Lespedeza biolor Sagafina halbpana Pagua grandifolia Tilia americana Ligustrum oblusfolium Verbena brasilens Linidendron hulpfera Ullmus americana Ligustrum oblusfolium 1 0 Species in Group 1 0 Species in Group 2 mple Variables 10-11 within at least 8 subplots (40° x 40°, or fm x 1m) in the riparianbuffer zone within 25 feet from each na. 10 Nermana Nerenge percentage cover of hedbaccus vegetation 10 Species in Group 1 0 Species in Group 1 0 10 10 Species in Group 1 0 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>_</td><td>-</td><td></td></td<> | | | | | | | | | _ | - | |
| 1 Carya glabra Quercus prinus Corronlla varia Puarana montana 1 Carya ovalia Quercus rubra Eleasgnus unheliata Ross multifora 1 Carya ovalia Quercus velutina Lespedeza bicolor Sorghum heleponts 1 Carus finda Sasaafras albidum Lespedeza cuneata Vertena brasiliens 1 Frazinus americana 174a americana Ligustrum shense Ligustrum shense 1 Frazinus americana 100 Species in Group 1 0 Species in Group 2 molecular terms mple Variables 10-11 within at less1 8 subplots (40° x 40°, or 1m x 1m) in the riparian/buffer zone within 25 feet from each nk. The four subplots should be placed roughly equidatantly along each side of the stream. 80.00 10 Vertrus Average percent concore of flaws, 54.06, or 0ther organic meterial. 80.00 11 Vertrus Average percent concore of laws, 54.06, or 0ther organic blam of the stream of stream stream layers of concore stream layers of concore or or ground vegetation or yoeptation percentages up through 200% are accepted. Enter the percent cover of ground vegetation or yoeptation or pavement) 100 11 Vertrus Left Stile Right Stile 100 20 20 10 30 100 | Betula leni | a | | Quercus c | occinea | | | | | | |
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| V _{CCANOPY} Not Used, Not Used V _{EMBED} 2.2 0.53 V _{SUBSTRATE} 3.00 in 1.00 V _{BERO} 11 % 1.00 V _{LWD} 0.0 0.00 V _{TDBH} Not Used V _{SNAG} 0.0 0.10 | 12 V _{wLUSE} Forest and r Newly grade | 20 22 within the Weighted A mative range (s ad areas (bare | Left 20 e entire cato Average of F Land | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| V _{CCANOPY} Not Used V _{EMBED} 2.2 0.53 V _{SUBSTRATE} 3.00 in 1.00 V _{BERO} 11 % 1.00 V _{LWD} 0.0 0.00 V _{TDBH} Not Used Not Used V _{SNAG} 0.0 0.10 | 12 V _{wLUSE} Forest and r Newly grade | 20 22 within the Weighted A mative range (s ad areas (bare | Left 20 e entire cato Average of F Land | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| V _{EMBED} 2.2 0.53 V _{SUBSTRATE} 3.00 in 1.00 V _{BERO} 11 % 1.00 V _{LWD} 0.0 0.00 V _{TDBH} Not Used Not Used V _{SNAG} 0.0 0.10 | 12 V _{WLUSE} | 20 2 within the Weighted A native range (s ad areas (bare | Left 20 9 entire cate Average of F Land -75% ground soil, no vege | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percer (not >10 99.9 |
| Vsubstrate 3.00 in 1.00 Vgero 11 % 1.00 VLWD 0.0 0.00 VTDBH Not Used Not Used Vsnag 0.0 0.10 | 12 V _{WLUSE} Forest and r Newly grade S Variable | 20 22 within the Weighted A native range (3 ad areas (bare ad areas (bare -VV18 Value Not Used, | Left 20 e entire cato Verage of F Land -75% ground soil, no vege VSI | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percer (not >10 99.9 |
| VBERO 11 % 1.00 VLWD 0.0 0.00 VTDBH Not Used Not Used VSNAG 0.0 0.10 | Veriable | 20 22 within the Weighted A native range (3 ad areas (bare ad areas (bare ad areas (bare Add areas (bare) Add areas (bare Add areas (bare) Add | Left 20 Average of F Land -75% ground soil, no vege VSI Not Used | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percer (not >10 99.9 |
| VLWD 0.0 0.00 VTDBH Not Used Not Used VSNAG 0.0 0.10 | Variable Vermed | 20 2 within the Weighted A native range (s ad areas (bare ad areas (bare -VV18 Value Not Used, <20% 2.2 | Left 20 a entire cate Average of F Land -75% ground soil, no vege VSI Not Used 0.53 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| V _{TDBH} Not Used V _{SNAG} 0.0 | Variable Vermed | 20 2 within the Weighted A native range (s ad areas (bare ad areas (bare -VV18 Value Not Used, <20% 2.2 | Left 20 a entire cate Average of F Land -75% ground soil, no vege VSI Not Used 0.53 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| VTDBHNot UsedVSNAG0.00.10 | 12 VwLuse Forest and r Forest and r Newly grade Newly grade Variable Variable Vccanopy Vembed Vsubstrate | 20 22 within the Weighted A native range (s ad areas (bare ad areas (bare ad areas (bare Add areas (bare) Add | Left 20 e entire cato Verage of P Land -75% ground soil, no vege VSI Not Used 0.53 1.00 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| V_{SNAG} 0.0 0.10 | 12 V _{wLUSE} Forest and r Newly grade Newly grade Veriable Vccanopy Vembed Vsubstrate VBERO | 20 2 within the Weighted A native range (3 ad areas (bare ad areas (bare ad areas (bare Add areas (bare) Add a | Left 20 Average of F Land 50% ground soil, no vege VSI Not Used 0.53 1.00 1.00 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| | 12 V _{wLUSE} Forest and r Newly gradu Newly gradu Versiable Vccanopy VemBeD Vsubstrate VBERO VLWD | 20 2 within the Weighted A native range (s ad areas (bare ad areas (bare VV18 Value Not Used, <20% 2.2 3.00 in 11 % 0.0 | Left 20 a entire cate Average of F Land -75% ground soil, no vege vsii, no vege VSI Not Used 0.53 1.00 1.00 0.00 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| | 12 V _{wLUSE} Forest and r Newly gradu Newly gradu Versiable Vccanopy VemBeD Vsubstrate VBERO VLWD | 20 2 within the Weighted A native range (s ad areas (bare ad areas (bare VV18 Value Not Used, <20% 2.2 3.00 in 11 % 0.0 | Left 20 a entire cate Average of F Land -75% ground soil, no vege vsii, no vege VSI Not Used 0.53 1.00 1.00 0.00 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percer (not >10 99.9 |
| ▼SSD 24.3 0.37 | 12 V _{wLUSE} Forest and r Newly grade Newly grade Newly grade S Variable Variable Variable Variable Variable Variable Variable Variable Variable Variable Variable Variable VLWD VLWD VTDBH | 20 22 within the Weighted A native range (s ad areas (bare ad areas (bare ad areas (bare A areas (bare) A | Left 20 e entire cato Verage of F Land -75% ground soil, no vege VSI Not Used 0.53 1.00 1.00 0.00 Not Used | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| | 12 V _{WLUSE} Forest and r Newly gradu Newly gradu Variable Vccanopy VemBeD Vsubstrate VBERO VLWD VtDBH VsNAG | 20 2 within the Weighted A hative range (second second | Left 20 e entire cate Average of F Land 50, no vege visit, no vege | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10) 99.9 |
| V _{SRICH} 0.00 0.00 | 12 V _{wLUSE} Forest and r Newly gradu Newly gradu Variable Vccanopy VemBeD Vsubstrate VBERO VLWD VtDBH VsNAG | 20 2 within the Weighted A hative range (second second | Left 20 e entire cate Average of F Land 50, no vege visit, no vege | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| V _{DETRITUS} 80.0 % 0.98 | 12 V _{wLUSE} Forest and r Newly gradu Newly gradu Variable Vccanopy VemBeD Vsubstrate VBERO VLWD VTDBH VsNAG VsSD | 20 2 within the Weighted A native range (s ad areas (bare ad areas (bare) Ad areas (bar | Left 20 a entire cate Average of F Land -75% ground soil, no vege vsii, no vege vsii Not Used 0.53 1.00 1.00 0.00 Not Used 0.10 0.37 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| | 12 V _{WLUSE} Forest and r Newly gradu Newly gradu Newly gradu Variable Vccanopy VEMBED Vsubstrate VBERO VLWD VTDBH VSNAG VSSD VSRICH | 20 2 within the Weighted A native range (second and areas (bare and areas (bare) and areas | Left 20 e entire cate Average of F Land -75% ground soil, no vege VSI Not Used 0.53 1.00 1.00 0.00 Not Used 0.10 0.37 0.00 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percer (not >10 99.9 |
| | 12 Vwluse Forest and r Forest and r Newly gradue Newly gradue Variable Variable Vccanopy Vembed Vsubstrate VBERO VLWD VTDBH VSNAG Vssd Vsrich Vbetritus | 20 22 within the Weighted A native range (s ad areas (bare ad areas (bare ad areas (bare 2.2 3.00 in 11 % 0.0 Not Used 0.0 24.3 0.00 80.0 % | Left 20 e entire cato Verage of F Land -75% ground soil, no vege vSI Not Used 0.53 1.00 1.00 0.00 Not Used 0.10 0.37 0.00 0.98 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnin Percen (not >10 99.9 |
| | 12 V _{WLUSE} Forest and r Newly grad | 20 22 within the Weighted A native range (s ad areas (bare ad areas (bare ad areas (bare 2.2 3.00 in 11 % 0.0 Not Used 0.0 24.3 0.00 80.0 % | Left 20 e entire cato Verage of F Land -75% ground soil, no vege vSI Not Used 0.53 1.00 1.00 0.00 Not Used 0.10 0.37 0.00 0.98 | 10 chment of Runoff Scor Use (Choos cover) | 30 the stream. e for watersh se From Dro | 20 ned: | Right 20 | Side 10 | 30 Runoff Score | % in Catch- ment 99.9 | Runnii Perce (not >10 99.9 |

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

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

| WEATHER CONDITIONS | Now Past 24 hours Has there been a heavy rain in the last 7 days? Storm (heavy rain) rain (steady rain) showers (intermittent) % Air Temperature0 C % %cloud cover clear/sunny |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SITE LOCATION/MAP | Draw a map of the site and indicate the areas sampled (or attach a photograph) |
| STREAM CHARACTERIZATION | Stream Subsystem Perennial Tidal Stream Type Coldwater Warmwater Stream Origin Glacial Spring-fed Mixture of origins Swamp and bog Catchment Areakm² |

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

| WATERSHED FEATURES RIPARIAN VEGETATION (18 meter buffer) | Predominant Surrounding Landuse Local Watershed NPS Pollution Forest Commercial Field/Pasture Industrial Agricultural Other Residential Other Indicate the dominant type and record the dominant species present Herbaceous Trees Shrubs Grasses Dominant species present Herbaceous |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSTREAM FEATURES | Dominant species present |
| LARGE WOODY | LWDm ² |
| DEBRIS | Density of LWDm ² /km ² (LWD/ reach area) |
| AQUATIC | Indicate the dominant type and record the dominant species present |
| VEGETATION | Rooted emergent Rooted submergent Rooted floating Free floating Floating Algae Attached Algae Booted floating Free floating Free floating Dominant species present |
| WATER QUALITY (DS, US) | Temperature0 C Water Odors Normal/None Sewage Specific Conductance Petroleum Fishy Chemical Other Dissolved Oxygen Water Surface Oils Slick Sheen None Globs Flecks pH Turbidity (if not measured) Clear Slightly turbid Turbid Turbid Turbid Opaque Turbid |
| SEDIMENT/ | Odors |
| SUBSTRATE | Normal Sewage Petroleum Deposits Chemical Anaerobic None Sludge Sawdust Paper fiber Sand Other Other Epoking at stones which are not deeply embedded are the undersides black in color? How are the undersides black in color? |

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

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

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

| | Habitat | | Condition | ı Category | |
|----------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Parameter | Optimal | Suboptimal | Marginal | Poor |
| | 1. Epifaunal Substrate/ Available Cover | Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are <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 | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| n sampling reach | 2. Embeddedness | Gravel, cobble, and boulder particles are 0- 25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. | Gravel, cobble, and boulder particles are 25- 50% surrounded by fine sediment. | Gravel, cobble, and boulder particles are 50- 75% surrounded by fine sediment. | Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment. |
| ted i | SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| Parameters to be evaluated in sampling reach | 3. Velocity/Depth Regime | All four velocity/depth regimes present (slow- deep, slow-shallow, fast- deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.) | Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes). | Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low). | Dominated by 1 velocity/ depth regime (usually slow-deep). |
| uram | SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| Pa | 4. Sediment Deposition | Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition. | Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools. | Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent. | Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition. |
| | SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |
| | 5. Channel Flow Status | Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. | Water fills >75% of the available channel; or <25% of channel substrate is exposed. | Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed. | Very little water in channel and mostly present as standing pools. |
| | SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 |

Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition - Form 2

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

| Habitat | | Condition | 1 Category | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| Parameter | Optimal | Suboptimal | Marginal | Poor | | | | | |
| 6. Channel Alteration | Channelization or dredging absent or minimal; stream with normal pattern. | Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present. | Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted. | Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely. | | | | | |
| SCORE | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 | | | | | |
| 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 | 20 19 18 17 16 | 15 14 13 12 11 | 10 9 8 7 6 | 5 4 3 2 1 0 | | | | | |
| SCORE 8. Bank Stability (score each bank) Note: determine left or right side by facing downstream. SCORE (LB) SCORE (RB) 9. Vegetative Protection (score each bank) | 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 (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 | | | | | |
| SCORE (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 | | | | | |
| 9. Vegetative Protection (score each bank) | More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally. | 70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well- represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining. | 50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one- half of the potential plant stubble height remaining. | Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height. | | | | | |
| SCORE(LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 | | | | | |
| SCORE(RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 | | | | | |
| 10. Riparian Vegetative Zone Width (score each bank riparian zone) | Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone. | Width of riparian zone 12-18 meters; human activities have impacted zone only minimally. | Width of riparian zone 6- 12 meters; human activities have impacted zone a great deal. | Width of riparian zone <6 meters: little or no riparian vegetation due to human activities. | | | | | |
| SCORE (LB) | Left Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 | | | | | |
| SCORE (RB) | Right Bank 10 9 | 8 7 6 | 5 4 3 | 2 1 0 | | | | | |

Total Score _____

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

| STREAM NAME | | LOCATION | | | | | |
|----------------------|-------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------|--|--|--|--|
| STATION # | _ RIVERMILE | STREAM CLASS | | | | | |
| LAT | LONG | RIVER BASIN | | | | | |
| STORET # | | AGENCY | | | | | |
| INVESTIGATORS | | | LOT NUMBER | | | | |
| FORM COMPLETED | BY | DATE TIME | REASON FOR SURVEY | | | | |
| HABITAT TYPES | Indicate the percentage of Cobble% Sn Submerged Macrophytes | ags% Vegetated B | anks% Sand%)% | | | | |
| SAMPLE COLLECTION | Indicate the number of jab | lected? wading fi ps/kicks taken in each habitat ty lags Vegetated B | anks Sand | | | | |
| GENERAL COMMENTS | | | | | | | |

QUALITATIVE LISTING OF AQUATIC BIOTA

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

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

FIELD OBSERVATIONS OF MACROBENTHOS

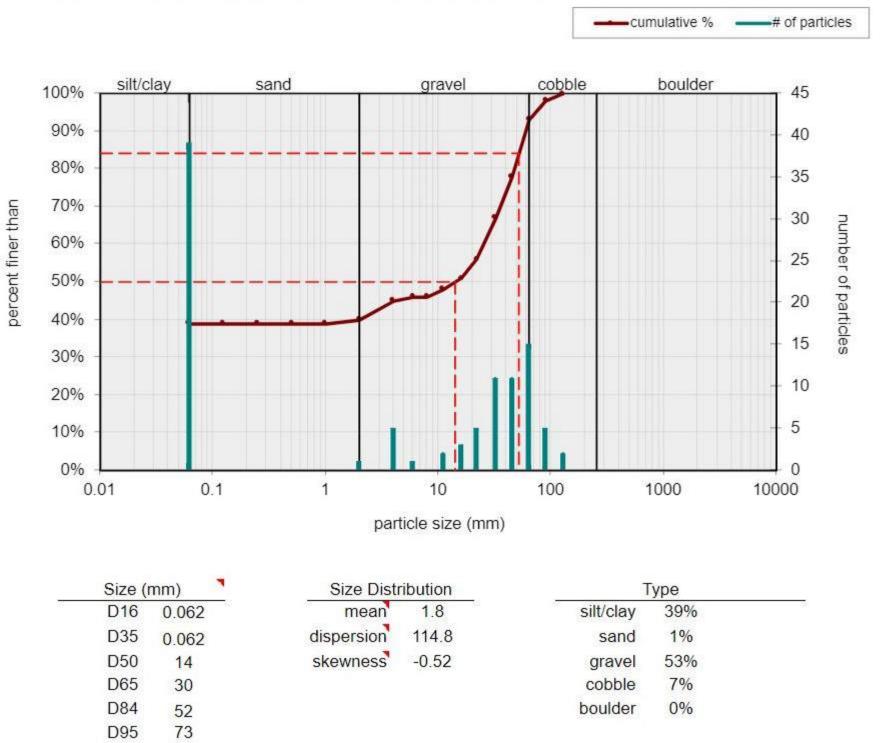
Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

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

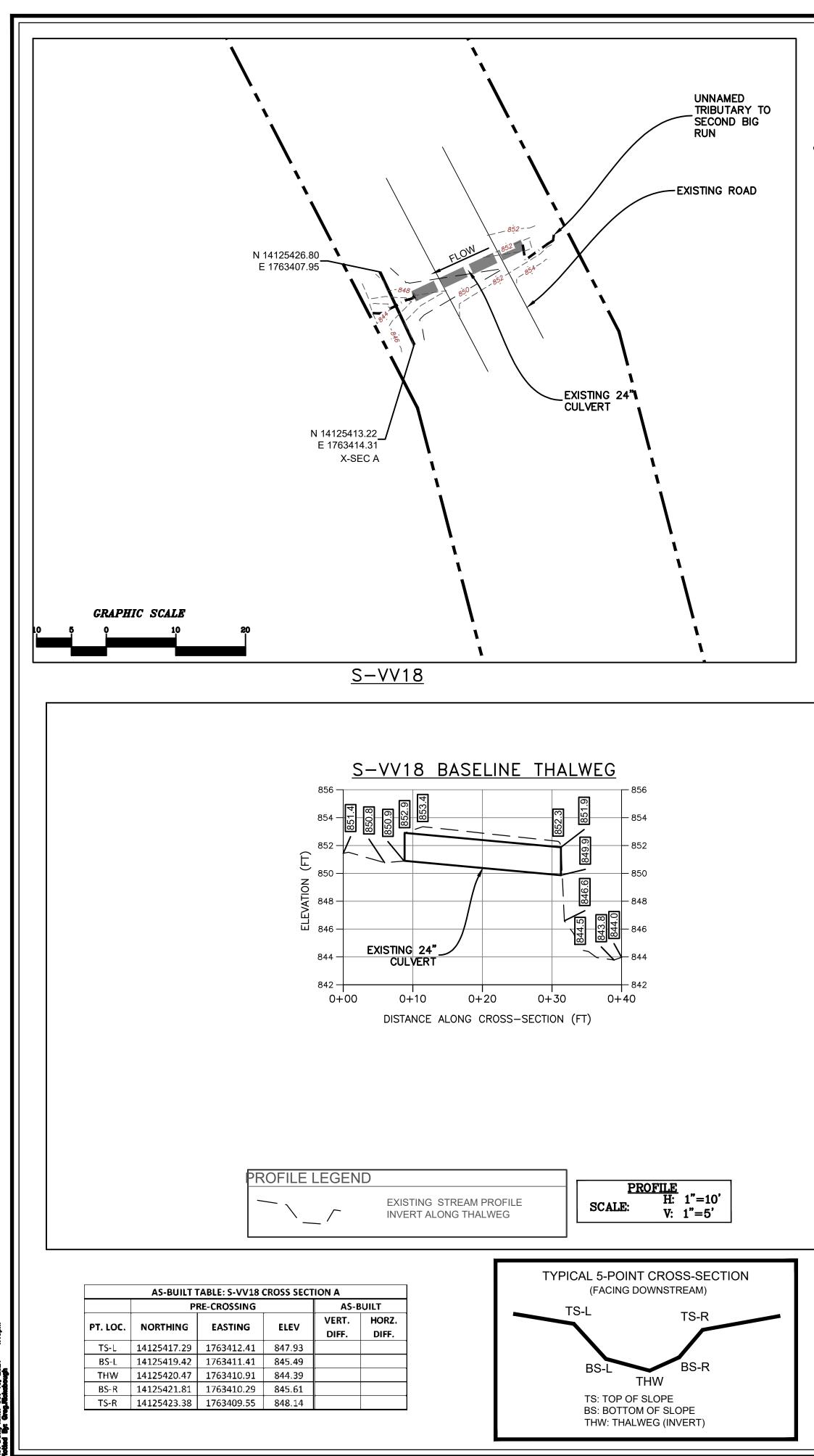
WOLMAN PEBBLE COUNT FORM

| County: | Lewis | Stream ID: | S-VV18 |
|--------------|-----------------------|---------------|--------|
| Stream Name: | UNT to Second Big Run | | |
| HUC Code: | | Basin: | |
| Survey Date: | 9/10/2021 | | |
| Surveyors: | AJE, KAY | Impact Reach: | 11.3 m |
| Type: | Bankfull Channel | | |

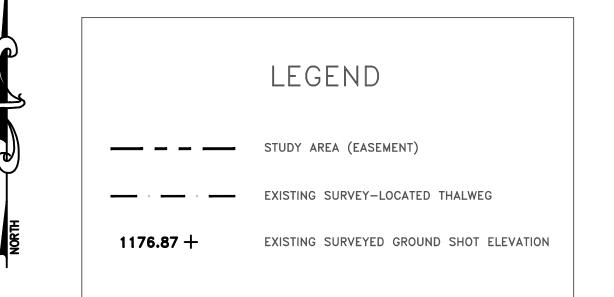
| x 1 | DIDETAT | | LE COUNT | D | | w | a |
|-------------|-------------|-------------|----------|-------------------|---------|--------|--------|
| Inches | PARTICLE | Millimeters | | Particle Count | Total # | Item % | % Cun |
| | Silt/Clay | < .062 | S/C | • | 39 | 39.00 | 39.00 |
| | Very Fine | .062125 | | ▲ ▼ | 0 | 0.00 | 39.00 |
| | Fine | .12525 | | ▲ ▼ | 0 | 0.00 | 39.00 |
| | Medium | .255 | S A N D | ▲ ▼ | 0 | 0.00 | 39.00 |
| | Coarse | .50-1.0 | | * * | 0 | 0.00 | 39.00 |
| .0408 | Very Coarse | 1.0-2 | | • | 1 | 1.00 | 40.00 |
| .0816 | Very Fine | 2 -4 | | ▲ ▼ | 5 | 5.00 | 45.00 |
| .1622 | Fine | 4 -5.7 | | ▲ ▼ | 1 | 1.00 | 46.00 |
| .2231 | Fine | 5.7 - 8 | | ▲ ▼ | 0 | 0.00 | 46.00 |
| .3144 | Medium | 8 -11.3 | | ▲ ▼ | 2 | 2.00 | 48.00 |
| .4463 | Medium | 11.3 - 16 | GRAVEL | ▲ ▼ | 3 | 3.00 | 51.00 |
| .6389 | Coarse | 16 -22.6 | | ▲ ▼ | 5 | 5.00 | 56.00 |
| .89 - 1.26 | Coarse | 22.6 - 32 | | ▲ ▼ | 11 | 11.00 | 67.00 |
| 1.26 - 1.77 | Vry Coarse | 32 - 45 | | ▲ ▼ | 11 | 11.00 | 78.00 |
| 1.77 -2.5 | Vry Coarse | 45 - 64 | | ▲ ▼ | 15 | 15.00 | 93.00 |
| 2.5 - 3.5 | Small | 64 - 90 | | ▲ ▼ | 5 | 5.00 | 98.00 |
| 3.5 - 5.0 | Small | 90 - 128 | | ▲ ▼ | 2 | 2.00 | 100.00 |
| 5.0 - 7.1 | Large | 128 - 180 | COBBLE | ▲ ▼ | 0 | 0.00 | 100.00 |
| 7.1 - 10.1 | Large | 180 - 256 | | ▲ ▼ | 0 | 0.00 | 100.00 |
| 10.1 - 14.3 | Small | 256 - 362 | | ▲ ▼ | 0 | 0.00 | 100.00 |
| 14.3 - 20 | Small | 362 - 512 | 1 | ▲ ▼ | 0 | 0.00 | 100.00 |
| 20 - 40 | Medium | 512 - 1024 | BOULDER | ▲ ▼ | 0 | 0.00 | 100.00 |
| 40 - 80 | Large | 1024 -2048 | 1 | ▲ ▼ | 0 | 0.00 | 100.00 |
| 80 - 160 | Vry Large | 2048 -4096 | 1 | • • | 0 | 0.00 | 100.00 |
| | Bedrock | | BDRK | ▲ ▼ | 0 | 0.00 | 100.00 |
| | | | 1 | Totals: | 100 | | |



Bankfull Channel Pebble Count, S-VV18, UNT to Second Big Run



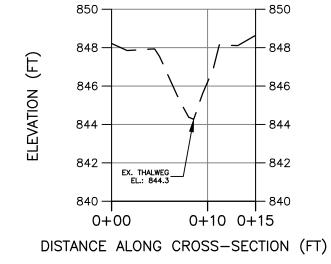
Fle: X/CUD/_PitchurghEUT/7157 - IMP/Creating Permits/Next Wrights WSB Creatings/Creatings/Access Reads/Completed/2021-00-10 - S-W18 SINEME TOPO MP 61.5/3-W18 - MP 61.5 - 22/34. Pict Inde/Times Oct 10. 2021 - 4:18mm



SURVEY NOTES:

- 1. THIS MAP HAS BEEN ORIENTED TO NAD 1983 UTM ZONE 17N, AND VERTICALLY TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), USING REAL TIME DGPS. FIELD LOCATIONS WERE COMPLETED ON SEPTEMBER 10, 2021.
- 2. EASEMENT LINES SHOWN ON PLAN VIEW WERE PROVIDED BY MOUNTAIN VALLEY PIPELINE.
- 3. SURVEY POINTS FOR CROSS SECTIONS AND THALWEG PROFILES COLLECTED IN 2021 HAVE BEEN USED IN COMBINATION WITH SURVEY POINTS COLLECTED PREVIOUSLY IN 2020 IN ORDER TO GENERATE THE PRE-CROSSING SURFACE SHOWN IN PLAN. DUE TO NATURAL EROSIONAL STREAM PROCESSES THAT CAN OCCUR OVER TIME, MINOR ADJUSTMENTS TO THE PROFILE ALIGNMENTS MAY HAVE BEEN REQUIRED IN ORDER TO GENERATE A CLEAN PRE-CROSSING SURFACE.
- 4. ALL SECTION VIEWS SHOWN LEFT TO RIGHT FACING DOWNSTREAM.
- 5. POST-CROSSING SURVEY INFORMATION SHOWN IN RED. DATA PENDING.
- 6. POST-CROSSING SURVEY POINTS FOR CROSS SECTIONS AND THALWEG ARE PROJECTED ONTO PRE-CROSSING SECTION AND PROFILE VIEWS FOR COMPARISON.





| CROSS SE | CROSS SECTION LEGEND | | | | | |
|-----------------|-----------------------------------------|--|--|--|--|--|
| — — EX | ISTING GRADE | | | | | |
| CROSS SCALE: | <u>SECTION</u> H: 1"=10' V: 1"=5' | | | | | |

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

