

NATURAL RESOURCES REPORT

Identification, Delineation, and Assessment of Wetlands and Waterways Coal River Lock and Dam No. 3



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Coal River Lock and Dam No. 3
Kanawha County, West Virginia
GFT Project No. 084562

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NATURAL RESOURCES REPORT
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Capitol Conservation District
Coal River Watershed Planning Study – Lock and Dam No. 3
Kanawha County, West Virginia

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EXECUTIVE SUMMARY

GFT Infrastructure, Inc. (GFT, formerly Gannett Fleming) is providing engineering services to assist the Capitol Conservation District (CCD) with the preparation of a Watershed Plan and Environmental Assessment (Plan-EA) for the Coal River Watershed to address resource concerns with watershed protection, public recreation, fish and wildlife, water quality and other resource concerns that may be identified during the development of the Plan-EA. The focus of the Plan-EA is a low head dam that spans the Coal River near the town of Tornado, Kanawha County, West Virginia. The concrete dam, which is believed to be located in the same general area as the 1850's navigational Lock and Dam No. 3, was constructed in the 1920's to enhance flow to a gristmill located along the west bank of the river. GFT was retained by CCD to perform a wetlands and waterways investigation and delineation at the dam site as part of a conceptual study to evaluate options to improve public safety. Dam removal is one option being considered to restore the stream to natural conditions, remove a potential public safety hazard, and reduce liability.

This report presents the results of the wetlands and waterways investigation and delineation. A stream assessment was also performed in conjunction with the wetlands and waterways investigation, and the results are presented herein. The information provided in this report will be used as the basis for project impact calculations to support project permitting and mitigation planning. This report was prepared in part to satisfy the regulatory requirements of the U.S. Army Corps of Engineers (USACE) under the purview of Section 404 of the Clean Water Act and the West Virginia Department of Environmental Protection (WVDEP) for Section 401 Water Quality Certification.

The dam is located near the town of Tornado in Kanawha County, West Virginia (38° 20' 32.24'' N, 81° 50' 30.343'' W). The project study area totaled 26 acres. GFT environmental scientists conducted the wetlands and waterways delineation and stream assessment efforts in August 2025. A summary of the wetlands and waterways that were identified, mapped, classified, and evaluated are provided in the following tables. **Table 1, Regulated Features Summary** presents a total project calculation of wetlands and waterways identified and delineated within the given project study area.

Table 1 Regulated Features Summary		
WETLANDS		
Feature Type	Number of Wetland Types Present	Area (Acres)
PEM/PFO	1	0.368
Total	1	0.368
WATERWAYS		
Feature Type	Number of Waterways Present	Length (Feet)
Perennial	2	2,573+
Total	2	2,573+
Note: “+” indicates that feature continues beyond the limits of the project study area.		

1.0 Project Description

GFT is providing engineering services to assist the Capitol Conservation District (CCD) with the preparation of a Watershed Plan and Environmental Assessment (Plan-EA) for the Coal River Watershed to address resource concerns with watershed protection, public recreation, fish and wildlife, water quality and other resource concerns that may be identified during the development of the Plan-EA. Included within this analysis are options to improve public safety at a low head dam that spans the Coal River near the town of Tornado in Kanawha County, West Virginia.

The concrete dam was constructed in the 1920's to enhance water flow to a gristmill that existed along the west bank of the river. The concrete dam is believed to be located in the same general area as the original navigational dam (Lock and Dam No. 3) constructed in the 1850's to support the local coal industry. Today, the dam poses a public safety concern, and numerous drownings have occurred due to the unique hydraulic conditions produced by the dam and the remnants of the lock. One alternative being considered is dam removal. The dam removal alternative would also provide environmental benefits, including enhancing water quality and restoring aquatic movement.

GFT was retained by CCD to perform a wetlands and waterways investigation and delineation at the dam site as part of a conceptual study to evaluate options for improving public safety and reducing liability. This report presents the results of the wetlands and waterways investigation and delineation. A stream assessment was also performed in conjunction with the wetlands and waterways investigation, and the results are presented herein.

2.0 Purpose

The purpose of this report is to present the results of the wetlands and waterways delineation investigation, including the results of a stream assessment performed in conjunction with this investigation. The information provided in this report will be used as the basis for project impact calculations to support project permitting and mitigation planning. This report was prepared in part to satisfy the regulatory requirements of the U.S. Army Corps of Engineers (USACE) under the purview of Section 404 of the Clean Water Act and the West Virginia Department of Environmental Protection (WVDEP) for Section 401 Water Quality Certification.

3.0 Background Information

3.1 Study Area Description

The project study area is located within the Coal River Watershed. The concrete dam and remnants of Lock No. 3 are located on the Coal River near the town of Tornado, Kanawha County, West Virginia (38° 20' 32.24'' N, 81° 50' 30.343'' W). The project study area totaled 26 acres and included the dam and remnants of Lock No. 3; the Coal River upstream to the Smith Creek Road bridge (Route 9) and approximately 1,600 feet downstream of the dam; the surrounding

streambank; and access through Meadowood Park via Pettigrew Lane. The surrounding area included suburban residential homes, local roadways, and Meadowood Park. An excerpt from the USGS Topographic Quadrangle Map is provided as **Figure 1**. A Project Study Area and Location Map is provided as **Figure 2**.

3.2 *Climate*

The study area is located in a humid continental climate region (NOAA National Center for Environmental Information, 2022). The climate of West Virginia consists of moderately cold winters and warm, humid summers. Summer average maximum temperatures range from 85°F in the southwest, near the Ohio River, to less than 80°F in the east-central mountains. Winter minimum average temperatures range from 20-30°F. Average annual rainfall ranges from 40 to 50 inches.

3.3 *Topography*

According to the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map (Alum Creek, WV), the elevation of the project study area ranges from 570 feet above mean sea level (amsl) to approximately 610 feet amsl. The dominant land use in the project area is outdoor recreation including the Coal River, Meadowood Park, and undeveloped riparian forested areas. The surrounding area was primarily residential properties. An excerpt from the USGS Topographic Quadrangle Map is provided as **Figure 1**. A Project Study Area and Location Map is provided as **Figure 2**.

3.4 *Soils*

According to the U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) Web Soil Survey (2024), four (4) soil units were mapped within or immediately adjacent to the project study area (**Table 2**). The Soils Map for the project site is provided as **Figure 3**.

Table 2 Soil Report Summary					
Map Unit Symbol	Map Unit Name	Percent of Project Study Area	Hydric Soil Rating	Percent Hydric Components	Farmland Classification
Ct	Cotaco loam	14.3%	No	5%	All areas are prime farmland
KaA	Kanawha fine sandy loam, 0 to 3 percent slopes	20.8%	No	5%	All areas are prime farmland
UB	Udifluvents, loamy	16.0%	No	0%	Farmland of local importance
W	Water	48.8%	No	0%	Not prime farmland

According to the Soil Data Access (SDA) Hydric Soils List, none of the above soils were listed as hydric for Kanawha County. Ct and KaA soil units were listed as containing hydric components (5%). The hydric components are typically located within floodplains.

3.5 Geology

The project is in the Appalachian Plateau Province (West Virginia Geological and Economic Survey, 2019). The Appalachian Plateau forms the northwestern-most province of the Appalachian Mountains, stretching northeastward from Alabama into New York. The land is composed of sedimentary rocks (sandstones, conglomerates and shales) that were deposited as horizontal beds. The underlying geology within the project study area is composed of Quaternary Alluvium underlain by the Conemaugh Group. The Quaternary Alluvium consists of alluvial deposits of sand, gravel, silt, and clay. The major lithologies are fine alluvium and coarse alluvium from 2.58 million years ago to present (Horton, 2017). Within the bed of the Coal River, the alluvial deposits have been eroded away in areas, leaving exposed bedrock (i.e., the Upper Falls).

3.6 Surface Waters

The U.S. Geological Survey (USGS) identified Coal River and Falls Creek as surface waters within the project study area, according to the 2023 Topographic Map 7.5' Quadrangle for Alum Creek, WV. Falls Creek flows east into Coal River north of the concrete dam. Coal River flows north to the Kanawha River. An excerpt of the USGS topographic map is included as **Figure 1**.

According to the state water quality standards codified in *Title 47, Requirements Governing Water Quality Standard* (47CRS2), all waters of the State are designated at a minimum for the Propagation and Maintenance of Fish and Other Aquatic Life (Category B) and for Water Contact Recreation (Category C) consistent with Federal Act goals unless otherwise designated (WVDEP, 2016). Category B includes Warm Water Fisheries, Trout Waters, and Wetlands.

There are no Tier 3 or Trout Stocked streams within the project study area according to the *2018/2020/2022 Draft West Virginia Integrated Water Quality Monitoring and Assessment Report* (WVDEP, 2022). Falls Creek and Coal River are designated as B1 Warm Water Fisheries. The Integrated Water Quality Report categorized Falls Creek as a Category 4a stream, which denotes waters that have an approved total maximum daily load (TMDL) but are still not meeting standards. Excess levels of fecal coliform were found in Falls Creek. Coal River was designated as Category 5, which denotes waters that have been assessed as impaired and are expected to need a TMDL. Coal River was found to be Not Supporting of the WWF designation due to water quality impairments. Coal River was found to have biological impairments as the result of a benthic macroinvertebrate bioassessment.

3.7 National Wetlands Inventory

The National Wetlands Inventory (NWI) map identified the following wetlands within or immediately adjacent to the project study area:

- One (1) riverine, lower perennial, unconsolidated bottom, permanently flooded (R2UBH) feature was identified. This feature included Falls Creek and Coal River.
- One (1) palustrine, forested, broad-leaved deciduous, seasonally flooded (PFO1C) feature was identified along the eastern bank of Coal River.
- One (1) palustrine, forested, broad-leaved deciduous, temporarily flooded (PFO1A) feature was identified along the eastern bank of Coal River.

The NWI map for the project site is provided as **Figure 4**.

3.8 Floodplains

According to FEMA's National Flood Hazard Layer Viewer, the project study area intersects the following special flood hazard areas: regulatory floodway the 100-year floodplain (Zone AE) (FEMA, 2008). The bed and banks of Coal River are within the regulatory floodway, and the majority of the remaining project study area is within the 100-year floodplain.

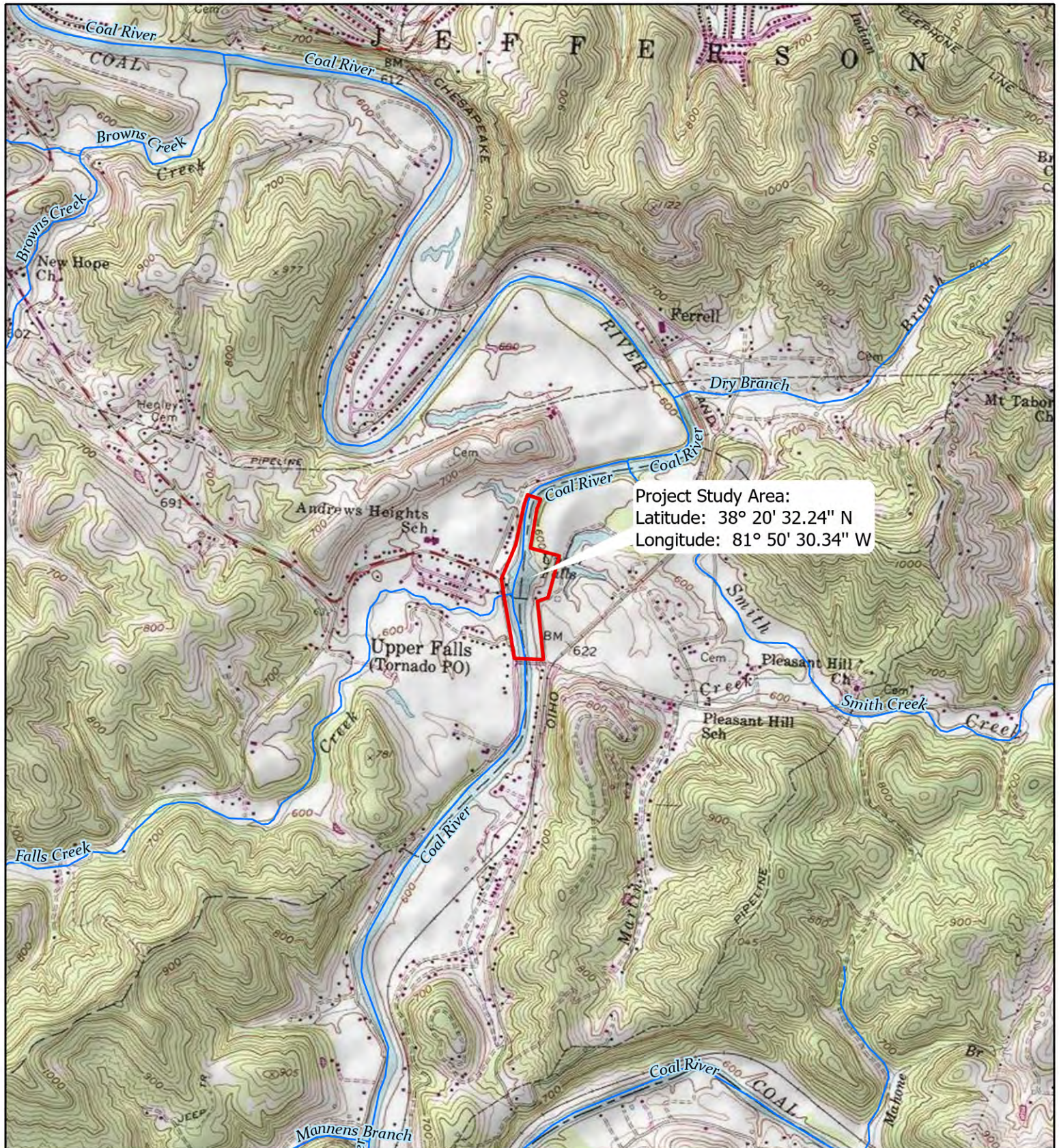


Figure 1: USGS Topographic Location Map

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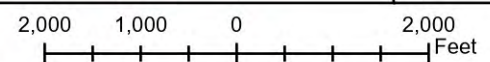
OVERVIEW MAP:



Legend

- Project Study Area
- Streams

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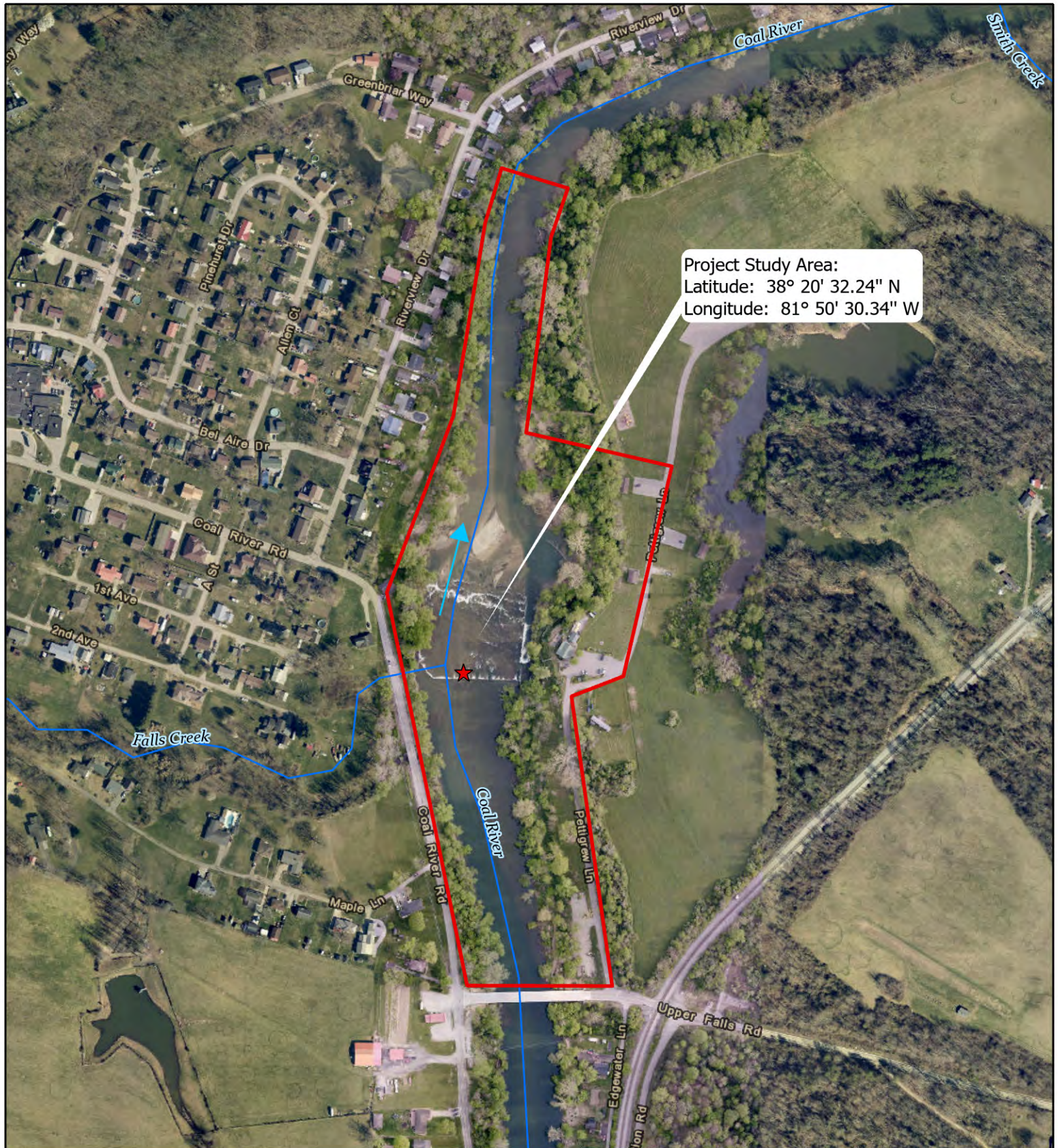
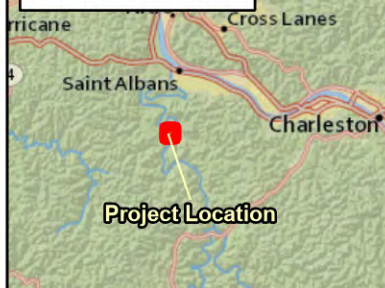


Figure 2: Project Study Area and Location Map

**Coal River Watershed Planning Study
Lock and Dam No. 3**

Kanawha County, West Virginia

OVERVIEW MAP:



Legend

- Project Study Area
- Streams
- ★ Dam

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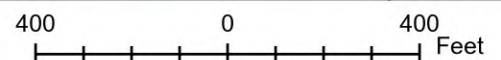


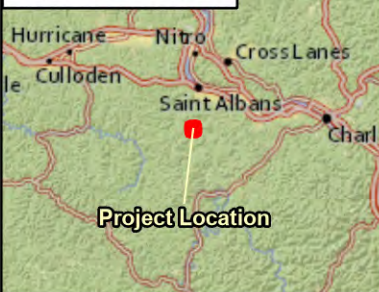


Figure 3: Soils Map

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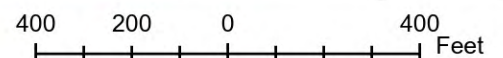
OVERVIEW MAP:



Legend

- Kanawha County Soils
- Project Study Area

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4.0 Wetlands & Waterways Delineation

4.1 Methods

The study area was investigated for palustrine wetland indicators of vegetative composition, soil development, and hydrology. The investigation was conducted in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* (USACE, 2012). Wetland field data forms were completed to document wetland and non-wetland data points (**Appendix C**). If present, wetlands within and directly adjacent to the study areas were delineated so that their presence could be shown on project mapping to aid in impact avoidance and/or minimization during engineering design.

Soils were characterized by evaluating the upper horizons of the soil profile. Soil pits were dug using a “sharpshooter” spade with a 16-inch blade or hand soil auger. Soil horizons were evaluated using normal field protocols for determining texture and nomenclature. The *Munsell Soil Color Charts* (Munsell, 2023) were used to determine the colors of horizons and redoximorphic features. Soil observations of reducing conditions were determined in the field using presence/absence determinations of redoximorphic concretions and oxidized rhizospheres and identifying low chroma matrices.

Vegetation was identified using *The Audubon Society Field Guide to North American Trees, Eastern Region* (Little, 1980), *Ferns of Northeastern and Central North America* (Cobb et al., 2005), *A Field Guide to Trees and Shrubs* (Petrides, 1986), *Grasses: An Identification Guide* (Brown, 1979), and *Newcomb's Wildflower Guide* (Newcomb, 1977). Plant species were assigned an indicator status [i.e., Upland (UPL), Facultative Upland (FACU), Facultative (FAC), Facultative Wetland (FACW), or Obligate Wetland (OBL) based on the USACE's *National Wetland Plant List* (2020)].

Data point locations were investigated for primary and secondary wetland hydrology indicators. If present, wetland boundaries were marked using pink wetland flagging. Wetland boundary data points were located using traditional survey equipment. The survey data were plotted on relevant site mapping using the U.S. State Plane, WV South coordinate system (**Appendix A**). Wetland classifications were assigned to each wetland following the Cowardin et al. methods (1979). Common wetland classifications include palustrine emergent wetlands (PEM), palustrine scrub-shrub wetlands (PSS), palustrine forested wetlands (PFO). Color photographs were taken of all relevant features to document site conditions during the investigations (**Appendix B**).

Wetland functions were assessed using the West Virginia Rapid Assessment Method (WVRAM) by the Watershed Assessment Branch of WVDEP. This standardized, two-part method involves on-site observations and off-site spatial data in order to assess the function and condition of mapped wetlands using 65 metrics that evaluate water quality, flood attenuation, and habitat/ecological integrity. WVDEP states that both components are required for regulatory use related to compensatory mitigation requirements, but the online GIS tool may be used for standalone planning purposes to determine baseline values. For this planning study, only the GIS component was completed.

WVRAM scores are based on a standardized protocol for rapidly assessing the functions, services, values, and condition of wetlands. The initial GIS assessment of delineated wetlands via the online

WVRAM tool generates metrics regarding the wetland’s ability to improve water quality, store flood waters, supplement stream baseflow, provide wildlife habitat, maintain ecological integrity, and the overall condition of the wetland. These scores are then used to determine if a wetland will be regulated as an exemplary or non-exemplary wetland and inform which mitigation requirements are necessary. The WVRAM score criteria as outlined in the WVRM Reference Manual are provided below (WVDEP, 2024). Preliminary GIS scores are typically within 30% of the final regulatory score.

WVRAM Score Criteria		
Preliminary GIS Regulatory Score	1.01 to 2.18	Exemplary Wetland– Special Conservation Concern
	0 to 1.0	Non-Exemplary Wetland
Preliminary Regulatory Restoration Score	1.01 to 2.18	Exemplary Wetland– Special Conservation Concern
	0 to 1.0	Non-Exemplary Wetland
Raw Regulatory Function	86 to 185	Exemplary Wetland– Special Conservation Concern
	0 to 85	Non-Exemplary Wetland
Function	101 to 200	Exemplary Wetland– Special Conservation Concern
	0 to 100	Non-Exemplary Wetland
Condition	77 to 176	Exemplary Wetland– Special Conservation Concern
	0 to 76	Non-Exemplary Wetland

Waterways were identified through a review of available mapping and field investigations. Topographic and engineering maps were reviewed for the presence of streams within the project study area. Field investigations for waterways were performed in conjunction with the wetland field investigation, which included the field verification of mapped waterways and the identification and delineation of streams, springs, and seeps that were not shown on existing engineering plans.

Waterways were identified by the presence of bed and banks and/or ordinary high water marks (OHWM). The flow regime of each identified waterway was characterized based upon field indicators of hydrologic, floral, and faunal character at the time of the investigation. Perennial waterways were identified as streams or portions of streams that flow year-round, and were considered a permanent stream and for which base flow was maintained by groundwater discharge to the streambed due to the groundwater elevation adjacent to the stream being higher than the elevation of the stream bed (West Virginia Code §22-6A-4(9); EPA, 2015). Intermittent waterways were identified as streams which had no flow during sustained periods of no precipitation, and which did not support aquatic life whose life history requires residence in flowing waters for a continuous period of at least six (6) months (West Virginia Code §47-2-2(2.9);

EPA, 2015). Ephemeral waterways were identified as streams that flow briefly in direct response to precipitation; these channels were always above the water table (EPA, 2015). All identified waterways were photographed. Linear, man-made channels (ditches) that were constructed in uplands to divert storm water flow or provide some other historically agricultural purpose were considered to be non-jurisdictional features.

4.2 Field Delineation Results

The project study area was investigated from August 26 to August 27, 2025, for riverine and palustrine wetland indicators of vegetative composition, soil development, and hydrologic characteristics. Weather conditions were sunny and cool. Weather data from the West Virginia International Yeager Airport Station in Charleston, WV (approximately 18 miles east of the project study area) indicated that the daily high temperature was 80 °F with 0.0 inch of precipitation within the 24-hour period before the field investigation (Weather Underground, 2025). No measurable precipitation was recorded within 10 days prior to the field investigation, and no measurable precipitation fell during the investigation. According to the U.S. Drought Monitor, Kanawha County was not experiencing drought during the week of the field investigation (National Drought Mitigation Center, 2025).

The dominant land uses observed within the project study area included the Coal River, Meadowood Park, and associated recreational areas. A gravel driveway provides access to a parking area upstream of the dam with a boat launch. Additional parking is available near Coal River Group outfitters. A forested riparian buffer of varying width was present along the banks of Coal River. Mowed grass areas and managed pollinator gardens were also present. The vegetation observed within the project study area is recorded in **Table 3**. Plant species listed as invasive to West Virginia according to the West Virginia Division of Natural Resources' *Invasive Plant Species of West Virginia* (WVDNR, 2009), are highlighted in **bold**.

Table 3 Plant Species List		
Scientific Name	Common Name	Indicator Status
Tree Species		
<i>Acer negundo</i>	Box Elder	FAC
<i>Acer saccharinum</i>	Silver Maple	FACW
<i>Betula nigra</i>	River Birch	FACW
<i>Juglans nigra</i>	Black Walnut	FACU
<i>Liriodendron tulipifera</i>	Tulip Tree	FACU
<i>Platanus occidentalis</i>	American Sycamore	FACW
<i>Prunus serotina</i>	Black Cherry	FACU
<i>Quercus shumardii</i>	Swamp Red Oak	FACW
<i>Salix nigra</i>	Black Willow	OBL
<i>Ulmus americana</i>	American Elm	FACW
Shrub Species		
<i>Cornus amomum</i>	Silky Dogwood	FACW
<i>Lonicera japonica</i>	Japanese Honeysuckle	FACU
<i>Rosa multiflora</i>	Rambler Rose	FACU
<i>Rhus typhina</i>	Staghorn Sumac	NL
<i>Sambucus nigra</i>	Elderberry	FAC
Herb Species		
<i>Achyranthes aspera</i>	Devil's Horsewhip	UPL
<i>Ageratina altissima</i>	White Snakeroot	FACU
<i>Ambrosia trifida</i>	Great Ragweed	FAC
<i>Arthraxon hispidus</i>	Small Carpetgrass	FAC
<i>Chasmanthium latifolium</i>	Indian Woodoats	FACU
<i>Chenopodium album</i>	Lamb's Quarters	FACU
<i>Cyperus strigosus</i>	Straw-Colored Flat Sedge	FACW
<i>Echinochloa crus-galli</i>	Barnyard Grass	FAC
<i>Eclipta prostrata</i>	False Daisy	FACW
<i>Eleusine indica</i>	Indian Goosegrass	FACU
<i>Elymus canadensis</i>	Nodding Wild Rye	FACU
<i>Euphorbia nutans</i>	Nodding Spurge	FACU

Table 3 Plant Species List		
Scientific Name	Common Name	Indicator Status
<i>Impatiens capensis</i>	Jewelweed	FACW
<i>Justicia americana</i>	American Water-Willow	OBL
<i>Ludwigia decurrens</i>	Wingleaf Primrose-Willow	OBL
<i>Microstegium vimineum</i>	Japanese Stiltgrass	FAC
<i>Panicum dichotomiflorum</i>	Fall Panic Grass	FACW
<i>Persicaria lapathifolia</i>	Swamp Smartweed	OBL
<i>Persicaria maculosa</i>	Spotted Ladysthumb	FACW
<i>Persicaria pensylvanica</i>	Pinkweed	FACW
<i>Phytolacca americana</i>	American Pokeweed	FACU
<i>Pilea fontana</i>	Clearweed	FACW
<i>Pteridium aquilinum</i>	Western Brackenfern	FACU
<i>Reynoutria japonica</i>	Japanese Knotweed	FACU
<i>Rudbeckia laciniata</i>	Green-head Coneflower	FACW
<i>Verbesina occidentalis</i>	Yellow Crownbeard	FACU
<i>Vernonia noveboracensis</i>	New York Ironweed	FACW
<i>Viola sp.</i>	Violets	-
Vine Species		
<i>Amphicarpaea bracteata</i>	American Hogpeanut	FAC
<i>Clematis virginiana</i>	Devil's Darning Needles	FAC
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	FACU
<i>Toxicodendron radicans</i>	Poison Ivy	FAC
INDICATOR STATUS KEY NL – Non-Listed Plants – Plants that have not been classified for an indicator status within the Hawaiian and Pacific Islands region. OBL – Obligate Wetland Plants – Plants that occur almost always (estimated probability >99%) in wetlands under natural conditions, but which may also occur rarely (Estimated probability <1%) in non-wetlands. FACW – Facultative Wetland Plants – Plants that occur usually (estimated probability >67% to 99%) in wetlands but may also occur (estimated probability 1% to 33% in non-wetlands). FAC – Facultative Plants – Plants that occur usually (estimated probability >34% to < 66%) in wetlands. FACU – Facultative Upland Plants – Plants that occur sometimes (estimated probability 1% to <33%) in wetlands but occur more often (estimated probability >67% to 99%) in non-wetlands. UPL – Upland Plants – Plants that occur rarely (estimated probability <1%) in wetlands but occur almost always (estimated probability 99%) in non-wetlands.		

4.2.1 Wetlands

During the field investigations, one (1) palustrine emergent/palustrine forested (PEM/PFO) wetland complex was identified within or immediately adjacent to the project study area. According to the Cowardin classification system, palustrine emergent wetlands (PEM) are dominated by herbaceous vegetation and typically lack or support few shrubs or trees. Palustrine forested wetlands (PFO) typically have herbaceous vegetation but are dominated by woody vegetation over 3 inches in diameter at breast height (DBH). A narrative description of the delineated wetland is provided below.

Wetland 1: Wetland 1 (PEM/PFO) was located downstream of the Coal River Dam in an area of accumulated sediments at the toe of slope of the streambank. This area is highly disturbed by flooding and human recreation. It is a very popular site to access the natural falls, and a variety of trash was observed within the wetland. The PEM portion of the wetland was located in a shallow depression at the toe of slope, and the PFO portion was along the stream edge. Wetland 1 was 0.368 acres, with PEM portion being 0.230 acres and PFO portion being 0.138 acres. No wildlife was observed within the wetlands during the field investigation.

Wetland boundaries and test pits are shown on mapping included in **Appendix A**. Photographs of all wetlands are located in **Appendix B**, along with a photo orientation map. Characteristics for all wetlands identified within the study area are presented in **Table 4** and on the Wetland Determination Data Forms (USACE, 2024) in **Appendix C**. The WVRAM GIS assessment tool results are summarized in **Table 5**. The full results of the WVRAM GIS assessment are provided in **Appendix D**.

Table 4 Delineated Wetlands Summary					
Wetland ID	Cowardin Classification	Area (acres)	Hydric Test Plots	Hydric Soil Indicators	Dominant Vegetation
Wetland 1	PEM	0.230	W1-HYD1	- Depleted Below Dark Surface (A11) - Sandy Redox (A5) - Stripped Matrix (S6) - Redox Depressions (F8)	<i>Persicaria pensylvanica</i> (FACW) <i>Salix nigra</i> (OBL)
	PFO	0.138	W1-HYD2	Sandy Redox (S5)	<i>Acer negundo</i> (FAC) <i>Platanus occidentalis</i> (FACW) <i>Salix nigra</i> (OBL) <i>Acer saccharinum</i> (FACW) <i>Microstegium vimineum</i> (FAC) <i>Pilea pumila</i> (FACW)

Table 5 WVRAM Preliminary GIS Results					
Wetland ID	Preliminary GIS Regulatory Score	Preliminary Regulatory Restoration Score	Raw Regulatory Function	Function	Condition
Wetland 1	0.447	0.447	38	51	31

The preliminary GIS WVRAM results indicate that that Wetland 1 is a non-exemplary wetland with average function and condition scores.

4.2.2 Waterways

During the field investigations, two (2) perennial waterways were identified within or immediately adjacent to the project study area. The USGS-named Coal River and Falls Creek were confirmed as perennial waterways within the project study area. A narrative description of the waterways is provided below. The locations of the waterways are shown on mapping included in **Appendix A**. Falls Creek is labeled as Stream 1 on the delineation mapping. Photographs of the waterways are located in **Appendix B**, along with a photo orientation map. Characteristics for all waterways identified within the study area are presented in **Table 6**. Additional detailed information for the two (2) delineated waterways is provided in **Section 5.0 Stream Assessment**.

Coal River: Coal River was confirmed as a perennial waterway within the project study area, and it continued upstream and downstream beyond the limits of the project study area. A forested riparian buffer of varying widths was observed along both banks of the river. Species commonly observed in the buffer were silver maple, river birch, sycamore, and box elder. The streambanks were steep in most areas, and a band of scarp at the low-flow water line was observed. Downed woody debris was common, especially along the right bank when looking downstream. This section of Coal River is known for frequent flooding.

Upstream of the dam, Coal River averaged 2-3 feet deep with a maximum depth of 7 feet and was composed primarily of pool habitat. Downstream of the dam, natural bedrock falls created slide, riffle, and run habitats interspersed with shallow pools. Downstream of the natural bedrock falls, several large sand bars were observed, and stream habitat transitioned to pool and run. With the exception of the sand bars, the substrate of Coal River was almost entirely bedrock. Crayfish, minnows, and other unidentified fish were observed within Coal River. Osprey and green heron were observed utilizing the river as foraging habitat.

Two (2) vegetated bars composed of sandy/gravelly substrate and populated with water willows were observed within the bed and banks of Coal River. These features are considered temporary and are likely seasonal and do not contain persistent characteristics of wetlands and are considered part of the habitat variability of Coal River.

Stream 1 (Falls Creek): Stream 1 was confirmed as a perennial tributary to Coal River. Stream 1 continues upstream beyond the limits of the project study area. Unlike Coal River, the substrate of Stream 1 was composed primarily of cobbles and boulders. Stream habitats included riffle, run, and pools. Obvious pollution sources were noted, including metal scraps, iron staining, and unpleasant odors. Riparian vegetation included elderberry, silver maple, and river birch.

Table 6 Delineated Waterways Summary					
Stream ID	Flow Regime	Length	Average Stream Width	Substrate Type	Tributary To
Stream 1 (Falls Creek)	Perennial	76+ feet	24 feet	Boulder, cobble, gravel, sand, silt	Coal River
Coal River	Perennial	2,497+ feet	280 feet	Bedrock, silt, gravel, sand, woody debris	Kanawha River

4.3 Summary of Wetlands and Waterways

GFT delineated wetlands and waterways on August 26-27th, 2025 at the Coal River project study area on behalf of Capitol Conservation District. Two (2) perennial waterways and one (1) palustrine wetland were identified within the project study area. The delineated features are summarized below.

Wetlands

- Wetland 1 (PEM/PFO) – 0.368 acres

Waterways

- Coal River (Perennial) – 76+ linear feet
- Stream 1 (Falls Creek) – 2,497+ linear feet

5.0 Stream Assessment

5.1 Purpose of the Section

The purpose of this section is to present the results of the stream assessment. The stream assessment is used to provide an understanding of the function and values of stream system in accordance with WVDEP criteria pursuant to Section 401 Water Quality Certification.

5.2 Methods

GFT's team of environmental scientists conducted the stream assessment field investigations on August 26-27th, 2025. A West Virginia Scientific Collecting Permit (Permit No. 2025.036) was issued to GFT for the purpose of macroinvertebrate sample collection to support the stream assessment effort. A copy of the permit is available in **Appendix K**.

Representative sampling reaches were established for each delineated stream and evaluated using the West Virginia Stream and Wetland Valuation Metric (SWVM) methodology. This methodology involves field and desktop GIS analysis. More than one sampling reach was evaluated if a stream channel's physical condition (flow, depth, bank stability, substrate, gradient, etc.) significantly changed within the project study area.

The SWVM assessment methodology includes sampling for benthic macroinvertebrates in accordance with the *Rapid Bioassessment Protocols (RBP) for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish (2nd Edition)* (Barbour et al., 1999). West Virginia Stream Condition Index (WVSCI) scores were calculated according to the methodology outlined in A Stream Condition Index for West Virginia Wadeable Streams (Gerritsen, Burton, and Barbour 2000). Streams were also evaluated using the Hydrogeomorphic Approach (HGM) in accordance with the *Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Stream and Low-Gradient Perennial Streams in Appalachia* (Summers et al., 2017). The completed SWVM, RBP, WVSCI, and HGM data forms were used to calculate the final SWVM score. Data sheets for the stream assessment are provided in **Appendices G-J**.

Water quality measurements were taken using a Horiba U-52 multiparameter water meter, which was calibrated before use by the rental company Environmental Laboratories. Macroinvertebrates were collected using a D-frame dip net and the kick-netting method for D-frame dip nets. *WVDEP Watershed Assessment Branch 2015 Standard Operating Procedures* for macroinvertebrate collection recommends 11 kicks per sampling reach for comparable data using a D-frame dip net (WVDEP, 2015). For each sampling reach, the collections from all 11 kicks were composited into one sample and stored in 95% denatured ethanol.

To avoid contamination from other watersheds, equipment used for stream assessment fieldwork were thoroughly cleaned prior to use in each stream. New, unused bottles were used to collect samples. The D-frame dip net and sieve were thoroughly scrubbed with 95% denatured ethanol to kill and dislodge remnant organisms from previous use. Waders and boots were cleaned and dry prior to fieldwork, and all footwear had rubber soles. Between sampling reaches the D-frame net and sieve were rinsed with 95% denatured ethanol to kill and dislodge remaining organisms. Boot soles were inspected for trapped organisms to reduce cross-contamination between sampling reaches.

In the lab, macroinvertebrates were sorted and identified to the lowest practical taxonomic level, which was family for most specimens. Macroinvertebrates were identified and reviewed using a Andonstar AD266S digital microscope. Dichotomous keys used for macroinvertebrate identification included:

- The Atlas of Common Freshwater Macroinvertebrates of Eastern North America (Morse et al., 2020)
- Key to Macroinvertebrate Life (University of Wisconsin Extension and Wisconsin Department of Natural Resources)
- Macroinvertebrate Key (Gilroy and Furtado, 2021)
- Identification Guide to Freshwater Macroinvertebrates (Stroud Water Research Center)
- Save Our Streams Guide to Aquatic Macroinvertebrates (Kellog, 1994)
- Guide to the Aquatic Invertebrate Families of the Upper Midwest (Bouchard, 2009)
- Key to Larvae of Mayflies (Freshwater Biological Association)
- WV Save Our Streams: Field Guide to Aquatic Invertebrates (WVDEP)
- Mid-Atlantic Aquatic Invertebrates (Maryland Department of Natural Resources)

A photographic reference collection, depicting identified taxa was assembled and is provided as **Appendix F**.

5.2.1 Stream Assessment Scoring Reference Values

Rapid Bioassessment Protocol

The RBP Habitat Assessment Score is the sum total of the ten criteria for which each sampling reach and waterway was evaluated in the field based on the RBP protocols. The score criteria are provided below. RBP scores are used as an input in the SWVM analysis. The completed RBP worksheets are provided in **Appendix G**.

RBP Habitat Assessment Score Criteria	
200 to 160	Optimal
159 to 110	Sub-Optimal
109 to 60	Marginal
59 to 0	Poor

Hydrogeomorphic Approach

The Hydrogeomorphic Approach (HGM) is a method used to assess wetland functions at a site specific scale. It addresses hydrology, biogeochemical, and habitat functions. It can be used to determine baseline conditions, analyze project alternatives, minimize impacts, and monitor mitigation success. In this case, it was used to determine baseline conditions. The HGM scores are used as an input in the SWVM analysis. Scores range from 0.0 (poor condition) to 1.0. (best condition) and not broken out into further subcategories. The completed HGM worksheets are provided in **Appendix H**.

West Virginia Stream Condition Index

The West Virginia Stream Condition Index (WVSCI) is comprised of six metrics calculated from macroinvertebrate samples. Site-specific standardized metric scores were calculated using the WVSCI methodology. The WVSCI Total Score is the average of the six standardized metric scores. The final WVSCI score is used as an input in the SWVM. The completed WVSCI worksheet, which includes macroinvertebrate counts for all sampled reaches, is provided in **Appendix I**.

WVSCI Score Criteria		
100 to 78.01	Very Good	Unimpaired
78.00 to 68.01	Good	
68.00 to 60.61	Gray Zone	
60.60 to 45.01	Slightly Impaired	Impaired
45.00 to 22.01	Moderately Impaired	
22.00 to 0	Severely Impaired	

Stream and Wetland Valuation Metric

The Stream and Wetland Valuation Metric (SWVM) is an index score generated from various habitat and benthic assessments. It uses the results from the RBP, HGM, and WVSCI assessments to create a final index score that describes stream baseline conditions for planning purposes. It can

also be used to determine mitigation debits and credits for streams and wetlands for regulatory purposes. Index scores range from 0.0 (poor condition) to 1.0 (best condition). The index is multiplied by the length of the stream reach to result in a unit score. The SWVM worksheets are provided in **Appendix J**.

5.3 Stream Assessment Results

Within the project study area, two (2) perennial streams were identified, including Coal River and Falls Creek. These streams were evaluated using the West Virginia Streams Condition Index, which included evaluating the stream using the Rapid Bioassessment Protocol and calculated stream condition scores from the macroinvertebrate sampling. Four (4) total stream reaches were evaluated within the project study area as summarized below. Mapping and photographs of each sampling reach are included in **Appendix B** and macroinvertebrate photos are included in **Appendix F**.

One (1) stream reach was sampled for Stream 1 (Falls Creek). The sampling reach was equal to the entire delineated area of Stream 1. Three (3) stream reaches were sampled in Coal River based on varying types of flow morphology and in-stream habitat within the project area. Coal River Sampling Reach 1 was located upstream of the dam within the impounded pool. Coal River Sampling Reach 2 was located downstream of the dam. Coal River Sampling Reach 3 was limited to the natural bedrock falls directly downstream of the dam. Field data and macroinvertebrate samples were gathered for each sampling reach, and the RBP, HGM, WVSCI, and SWVM assessments were completed, and the associated data sheets are provided in **Appendices G-J**. The results of the stream assessment are summarized in **Table 7**.

Table 7 Stream Assessment Summary					
Sampling Reach ID	Length (ft)	RBP Score	WVSCI Score	HGM Score	SWVM Score
Stream 1 (Falls Creek)	~80	119 Sub-Optimal	65.83 Gray Zone	0.57	0.659
Coal River Reach 1 (Upstream of Dam)	~300	118 Sub-Optimal	37.27 Moderately Impaired	0.67	0.604
Coal River Reach 2 (Downstream of Dam)	~300	136 Sub-Optimal	83.31 Very good	0.68	0.644
Coal River Reach 3 (Natural Bedrock Falls)	~300	133 Sub-Optimal	93.39 Very Good	0.64	0.721

5.4 Stream Assessment Conclusion

The SWVM score calculations include the results of RBP, WVSCI, and HGM assessments, and can therefore be thought of as the average score for each stream. According to the stream assessment results, Coal River Sampling Reach 3 had the highest SWVM score and was therefore in the best condition. The other sampling reaches were not impaired according to the SWVM

results but were in worse condition than Sampling Reach 3. The SWVM scores for the other three sampling reaches were similar.

The biggest difference between the sampled reaches was the WVSCI score, which is based on the macroinvertebrate sampling. The natural bedrock falls of Coal River Stream Reach 3 had the highest condition score. A higher abundance of total macroinvertebrates and sensitive species were recorded in this reach compared to the other reaches. The WVSCI score was also high downstream of the falls in the natural channel of Coal River (Sampling Reach 2). However, upstream of the dam within the impounded pool (Sampling Reach 1), Coal River was moderately impaired according to the WVSCI results and had the lowest SWVM score. It is likely that the impounding effect of the dam has reduced the suitability of this reach for macroinvertebrate habitat, and if the dam were removed, the WVSCI scores for this reach may recover to values similar as those recorded for Reach 2 downstream of the falls. Although the SWVM scores did not indicate any of the sample stream reaches are impaired, if a reach is considered impaired due to its WVSCI score, then it is considered biologically impaired by WVDEP and eligible for 303(d) listing. It is anticipated that if the dam were removed, the upstream reach of Coal River may provide improved habitat for macroinvertebrates and no longer be considered impaired based on WVSCI scoring.

RBP scores were similar across all sampling reaches. However, it was noted that the RBP methodology may be biased against the natural characteristics of Coal River. Coal River is a wide stream, so it was not possible for riparian cover to shade the majority of the stream. This results in a lower score than a narrow stream with a similar riparian buffer that can shade the entire stream. The natural substrate of Coal River is composed primarily of bedrock, with little natural instream cover for macroinvertebrates in the form of cobbles, boulders, submerged logs, leaf litter, etc. This caused the RBP score to be lowered for all Coal River stream reaches, despite the fact that the bedrock substrate is a natural feature and not the result of human-caused impairment. The natural bedrock falls were found to provide unique in-stream habitat for macroinvertebrates, which were observed clinging to the bedrock, in natural fissures between the bedrock, and in shallow pools created by the falls.

6.0 References

- Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling. 1999. Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition. EPA 841-B-99-002. U.S. Environmental Protection Agency; Office of Water; Washington, D.C.
- Bouchard, R. 2009. Guide to Aquatic Invertebrate Families of the Upper Midwest. University of Minnesota.
- Brown, L. 1979. *Grasses: An Identification Guide*. Houghton Mifflin Company; Boston, New York, London.
- Cobb, B., E. Farnsworth, and C. Lowe. 2005. *Ferns of Northeastern and Central North America*, 2nd Edition. New York: Houghton Mifflin Co.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service Report No. FWS/OBS/-79/31. Washington, D.C.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.
- Federal Emergency Management Agency (FEMA). 2008. Flood Insurance Rate Maps, 54039C0376E, 54039C0377E, and 54039C0380E. National Flood Insurance Program.
- Freshwater Biological Association. N.D. Key to the Larvae of Mayflies (Ephemeroptera).
- Gerritsen, J., J. Burton, and M.T. Barbour. 2000. *A Stream Condition Index for West Virginia Wadeable Streams*. Prepared by Tetra Tech on behalf of U.S. EPA Region 3 Environmental Services Division and U.S. EPA Office of Science and Technology, Office of Water.
- Gilroy, M.P. and Furtado R.A. 2021. Macroinvertebrate Key. Colorado River Watch Network.
- Horton, J.D., C.A. San Juan, and D.B. Stoesser. 2017. The Station Geologic Map Compilation (SGMC) geodatabase of the conterminous United States: U.S. Geological Survey Data Series 1052, doi: 10.3133/ds1052.
- Kellog, L. 1994. Save Our Streams Monitor's Guide to Aquatic Macroinvertebrates. Izaak Walton League of America.
- Little, E.L. 1980. *The Audubon Society Field Guide to North American Trees, Eastern Region*. New York: Knopf Doubleday Publishing Group.

- Maryland Department of Natural Resources. N.D. *Mid-Atlantic Aquatic Invertebrates*. West Virginia Save Our Streams.
<https://dep.wv.gov/WWE/getinvolved/sos/Pages/MidAtl.aspx>
- Morse, J., Broomall, M., Wenzel, J., Kautz, A., Louw, M. (Eds). 2020. *The Atlas of Common Freshwater Macroinvertebrates of Eastern North America*. <https://www.macroinvertebrates.org/>
- Munsell. 2023. *Munsell Soil Color Charts*, Revised Edition. Kollmorgen Instruments Corporation. New Windsor, New York.
- National Drought Mitigation Center. 2025. *U.S. Drought Monitor Map Archive – Historical Maps for West Virginia August 2025*. Available online at <https://droughtmonitor.unl.edu/Maps/MapArchive.aspx>.
- Newcomb, Lawrence. 1977. *Newcomb's Wildflower Guide*. Little, Brown and Company.
- NOAA National Centers for Environmental Information. 2022. State Climate Summaries 2022: West Virginia. Available online at <https://statesummaries.ncics.org/chapter/wv/>. Accessed July 2, 2025.
- Petrides, George A. 1986. *A Field Guide to Trees and Shrubs*. New York: Houghton Mifflin Co.
- Soil Survey Staff, Natural Resources Conservation Service, U.S. Department of Agriculture. 2025. *National List of Hydric Soils, Kanawha County, West Virginia*. Available online at <http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/>. Accessed October 2025.
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2025. *Web Soil Survey*. Available online at <http://websoilsurvey.nrcs.usda.gov/>. Accessed October 5, 2025.
- Stroud Water Research Center. Identification Guide to Freshwater Macroinvertebrates. Accessed December 8th, 2025. <https://stroudcenter.org/macros/key/>
- Summers, E.A., C.V. Noble, J.F. Berkowitz, and F.J. Spilker. 2017. *Operational Draft Regional Guidebook for the Functional Assessment of High-Gradient Headwater Streams and Low-Gradient Perennial Streams in Appalachia*. [ERDC/EL TR-17-1](#), U.S. Army Engineer Research and Development Center, Vicksburg, MS.
- U.S. Army Corps of Engineers. 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)*. ERDC/EL TR-12-9. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.
- U.S. Army Corps of Engineers. 2020. *National Wetland Plant List, version 3.5*. Engineer Research and Development Center. Cold Regions Research and Engineering Laboratory, Hanover, NH. http://wetland_plants.usace.army.mil/

- U.S. Army Corps of Engineers. 2024. *ENG 6116-4 Excel Automated Data Sheet for Eastern Mountains and Piedmont (Version 2.0)*. ERDC/EL TR-12-9. Vicksburg, Mississippi: U.S. Army Engineer Research and Development Center.
- U.S. EPA. 2015. *Connectivity of Streams and Wetlands to Downstream Waters: A Review and Synthesis of the Scientific Evidence (Final Report)*. U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-14/475F.
- U.S. Fish and Wildlife Service. 2024. *National Wetlands Inventory Wetlands Mapper*. Available online at <http://www.fws.gov/wetlands/Data/mapper.html>. Accessed July 2, 2025.
- U.S. Geological Survey. 2023. *Topographic Map 7.5' Quadrangle, Alum Creek, WV*.
- University of Wisconsin Extension and Wisconsin Department of Natural Resources. Key to Macroinvertebrate Life in the River. Accessed December 8th, 2025. https://www.tu.org/wp-content/uploads/2019/04/Macroinvertebrate_Key.pdf
- Weather Underground. 2025. *Weather History for International Yeager Airport Station in Charleston, WV*. Available online at <http://www.wunderground.com/>. Accessed August 29, 2025.
- West Virginia Department of Environmental Protection, Division of Water and Waste Management. 2022. *Draft 2018/2020/2022 West Virginia Integrated Water Quality Monitoring and Assessment Report*. Available online at https://dep.wv.gov/wwe/watershed/ir/pages/303d_305b.aspx. Accessed November 2025.
- West Virginia Department of Environmental Protection, Save our Streams Program. N.D. *Field Guide to Aquatic Invertebrates (Level 2 Field Guide)*. Available at https://dep.wv.gov/WWE/getinvolved/sos/Documents/Benthic/WVSOSAdvanced_MacroGuide.pdf
- West Virginia Department of Environmental Protection. 2015. *Watershed Assessment Branch 2015 Standard Operating Procedures*. Division of Water and Waste Management, Watershed Assessment Branch, Charleston, WV.
- West Virginia Department of Environmental Protection. 2016. *Title 47, Requirements Governing Water Quality Standards (47CSR2)*. Legislative Rule, Department of Environmental Protection, Water Resources.
- West Virginia Department of Environmental Protection. 2024. *Reference Manual for the West Virginia Wetland Rapid Assessment Method Version 1.4*. Water Quality Standards and Assessment Section, Division of Water and Wastewater Management, West Virginia Department of Environmental Protection, Charleston, WV.
- West Virginia Division of Natural Resources. 2009. *Invasive Plant species of West Virginia*. Available online at <https://wvdnr.gov/wp-content/uploads/2024/03/Handout-Invasive-Plants-of-WV-2009.pdf>. Accessed December 2025.

West Virginia Division of Natural Resources. 2016. *WV Hunting, Trapping & Fishing Map*. Available online at <http://www.mapwv.gov/huntfish/>. Accessed May 3, 2016.

West Virginia Geological and Economic Survey. 2019. *Physiographic Provinces*. Available online at <https://www.wvgs.wvnet.edu/www/geology/geolphys.htm>. Accessed July 2, 2025.

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Appendix A

Wetlands and Waterways Mapping



Wetlands and Waterways Mapping

Coal River Watershed Planning Study Lock and Dam No. 3

Kanawha County, West Virginia

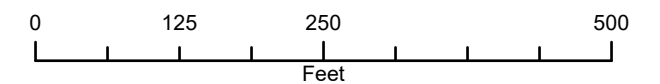
OVERVIEW MAP:



Legend

- | | |
|--|---|
| Project Study Area | PEM |
| ● Stream | PFO |
| ⊕ Test Pit | Vegetative Bar |
| ● Wetland | Stream |
| ● Vegetative Bar | |

Scale:



GFT



Appendix B

Site Photographs & Photo Location Map



Photo Location Map

Coal River Watershed Planning Study Lock and Dam No. 3

Kanawha County, West Virginia

OVERVIEW MAP:



Legend

○→ Photos

⊕ Test Pit

Wetland

◻ PEM

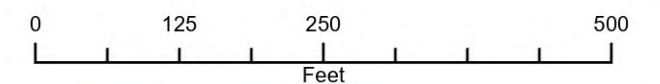
◻ PFO

◻ Vegetative Bar

◻ Stream

◻ Project Study Area

Scale:



GFT



COAL RIVER**Photo 1** (8-26-2025)

View of the dam looking upstream and southeast from the left bank. In the background, the Route 9 bridge and Vegetated Gravel Bar 1 are visible.

**Photo 2** (8-26-2025)

View of the pool impounded by the dam. View was downstream and north.

**Photo 3** (8-26-2025)

View of Coal River downstream of the dam looking upstream and south. The photo was taken within Coal River Sampling Reach 2.

**Photo 4** (8-27-2025)

View of the natural bedrock falls immediately downstream of the dam. The falls are a popular recreational destination. Coal River Sampling Reach #3 was located within this section of the falls. View was upstream and southwest.

**Photo 5** (8-27-2025)

View sandbar development downstream of the falls. View was downstream and north.

**Photo 6** (8-27-2025)

View of Coal River near the boat launch near the southern edge of the project study area. The launch and attached parking lot provide upstream access to the dam. View was upstream and southwest.

**Photo 7** (8-26-2025)

View of Coal River Sampling Reach 1 looking downstream and north. Sampling Reach 1 was within the impounded pool of the dam. Some large woody debris was observed along the banks of the sampling reach.

**Photo 8** (8-27-2025)

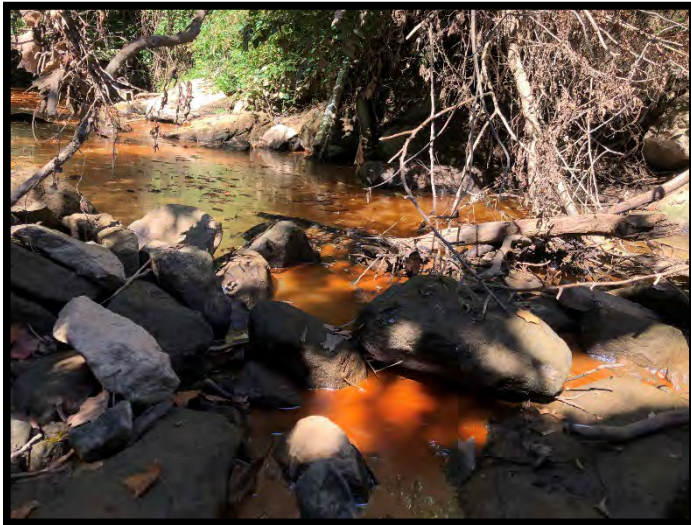
View of Vegetative Bar 1 in Coal River looking downstream and north.

**Photo 9** (8-27-2025)

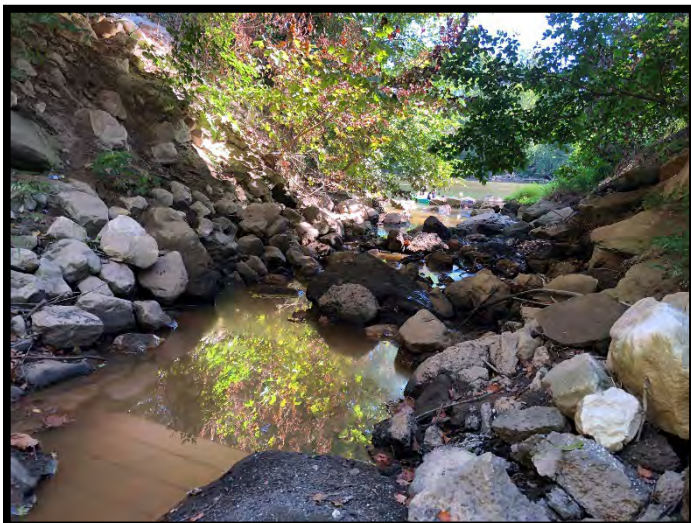
View of Vegetative Bar 2 in Coal River looking downstream and northeast.

Stream 1 (Falls Creek)**Photo 10** (8-27-2025)

View of Stream 1 (Falls Creek) looking upstream and southwest from the upstream edge of the delineated reach. Obvious signs of pollution were visible, including the presence of metal scraps and iron staining.

**Photo 11** (8-27-2025)

Close up view of iron staining in Stream 1 sampling reach. View was northwest.

**Photo 12** (8-27-2025)

View of Stream 1 looking downstream and east towards the confluence with Coal River.

WETLAND 1**Photo 13** (8-26-2025)

View of the PEM portion of Wetland 1. The hydric test plot (W1-HYD1) is visible in the foreground. View was south.

**Photo 14** (8-26-2025)

View of the hydric test pit for the PFO portion of Wetland 1. This portion of the wetland was highly disturbed from flooding and human recreation. Large piles of woody debris, trash, and sediment accumulation were observed. View was northwest.

**Photo 15** (8-26-2025)

View of accumulated trash and a fire pit in Wetland 1. Human disturbance and flooding caused sparse vegetation in some areas, as shown. View was northeast.

UPLAND TEST PITS**Photo 16** (8-26-2025)

View of upland test pit UPL-A. UPL-A was located in a mapped NWI wetland, but hydric soils were not observed and vegetation did not pass the dominance/prevalence tests. View was east.

**Photo 17** (8-26-2025)

View of upland test pit W1-UPL, which was located uphill of Wetland 1 on a floodplain terrace. View was south.

Appendix C

Wetland Datasheets

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Coal River Lock and Dam No. 3 City/County: Tornado/ Kanawha County Sampling Date: 8/26/2025
Applicant/Owner: Capitol Conservation District State: WV Sampling Point: UPL-A
Investigator(s): Anju Ghimirey, Emily Hegedus Section, Township, Range: N/A
Landform (hillside, terrace, etc.): floodplain terrace Local relief (concave, convex, none): None Slope (%): 1
Subregion (LRR or MLRA): LRR N, MLRA 126 Lat: 38.34359 Long: -81.840351 Datum: NAD83
Soil Map Unit Name: Udifulvents, loamy (UB) NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present? Yes <u> </u> No <u>X</u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	

Remarks:
UPL-A was a test pit taken in a floodplain terrace uphill of Wetland 1 in a mapped NWI wetland (PFO). Some hydrophytes were present, but the prevalence/dominance tests were not met, and soils were not hydric. Some weak hydrology was observed, including surface soil cracks and the geomorphic position of the floodplain terrace at the toe of slope.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <u> </u> Surface Water (A1) <u> </u> True Aquatic Plants (B14) <u> </u> High Water Table (A2) <u> </u> Hydrogen Sulfide Odor (C1) <u> </u> Saturation (A3) <u> </u> Oxidized Rhizospheres on Living Roots (C3) <u> </u> Water Marks (B1) <u> </u> Presence of Reduced Iron (C4) <u> </u> Sediment Deposits (B2) <u> </u> Recent Iron Reduction in Tilled Soils (C6) <u> </u> Drift Deposits (B3) <u> </u> Thin Muck Surface (C7) <u> </u> Algal Mat or Crust (B4) <u> </u> Other (Explain in Remarks) <u> </u> Iron Deposits (B5) <u> </u> Inundation Visible on Aerial Imagery (B7) <u> </u> Water-Stained Leaves (B9) <u> </u> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <u>X</u> Surface Soil Cracks (B6) <u> </u> Sparsely Vegetated Concave Surface (B8) <u> </u> Drainage Patterns (B10) <u> </u> Moss Trim Lines (B16) <u> </u> Dry-Season Water Table (C2) <u> </u> Crayfish Burrows (C8) <u> </u> Saturation Visible on Aerial Imagery (C9) <u> </u> Stunted or Stressed Plants (D1) <u>X</u> Geomorphic Position (D2) <u> </u> Shallow Aquitard (D3) <u> </u> Microtopographic Relief (D4) <u> </u> FAC-Neutral Test (D5)
--	--

Field Observations: Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Water Table Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Saturation Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: UPL-A

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	<u>50</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
<u>50</u> =Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>90</u></td> <td>x 3 = <u>270</u></td> </tr> <tr> <td>FACU species <u>15</u></td> <td>x 4 = <u>60</u></td> </tr> <tr> <td>UPL species <u>20</u></td> <td>x 5 = <u>100</u></td> </tr> <tr> <td>Column Totals: <u>125</u> (A)</td> <td><u>430</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>3.44</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>90</u>	x 3 = <u>270</u>	FACU species <u>15</u>	x 4 = <u>60</u>	UPL species <u>20</u>	x 5 = <u>100</u>	Column Totals: <u>125</u> (A)	<u>430</u> (B)	Prevalence Index = B/A = <u>3.44</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>0</u>	x 2 = <u>0</u>																			
FAC species <u>90</u>	x 3 = <u>270</u>																			
FACU species <u>15</u>	x 4 = <u>60</u>																			
UPL species <u>20</u>	x 5 = <u>100</u>																			
Column Totals: <u>125</u> (A)	<u>430</u> (B)																			
Prevalence Index = B/A = <u>3.44</u>																				
50% of total cover: <u>25</u> 20% of total cover: <u>10</u>																				
Sapling/Shrub Stratum (Plot size: <u>N/A</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
_____ =Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Ambrosia trifida</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u>_____</u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Amphicarpaea bracteata</u>	<u>10</u>	<u>No</u>	<u>FAC</u>																	
3. <u>Pteridium aquilinum</u>	<u>15</u>	<u>Yes</u>	<u>FACU</u>																	
4. <u>Achyranthes japonica</u>	<u>20</u>	<u>Yes</u>	<u>UPL</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
<u>75</u> =Total Cover																				
50% of total cover: <u>38</u> 20% of total cover: <u>15</u>																				
Woody Vine Stratum (Plot size: <u>N/A</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ =Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody Vine – All woody vines greater than 3.28 ft in height.																				
Hydrophytic Vegetation Present? Yes <u>_____</u> No <u>X</u>																				
Remarks: (Include photo numbers here or on a separate sheet.)																				

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: UPL-A

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
_____ = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x 1 = _____	FACW species _____	x 2 = _____	FAC species _____	x 3 = _____	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x 1 = _____																			
FACW species _____	x 2 = _____																			
FAC species _____	x 3 = _____																			
FACU species _____	x 4 = _____																			
UPL species _____	x 5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
50% of total cover: _____ 20% of total cover: _____																				
Sapling Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Shrub Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Herb Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Remarks: (Include photo numbers here or on a separate sheet.)																				

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody Plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody Vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes _____	No <u>X</u>
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SOIL

Sampling Point: UPL-A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10YR 3/3	100					Loamy/Clayey	dry, well-drained

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: ☐ Histosol (A1) ☐ Histic Epipedon (A2) ☐ Black Histic (A3) ☐ Hydrogen Sulfide (A4) ☐ Stratified Layers (A5) ☐ 2 cm Muck (A10) (LRR N) ☐ Depleted Below Dark Surface (A11) ☐ Thick Dark Surface (A12) ☐ Sandy Mucky Mineral (S1) ☐ Sandy Gleyed Matrix (S4) ☐ Sandy Redox (S5) ☐ Stripped Matrix (S6) ☐ Dark Surface (S7)	☐ Polyvalue Below Surface (S8) (MLRA 147, 148) ☐ Thin Dark Surface (S9) (MLRA 147, 148) ☐ Loamy Mucky Mineral (F1) (MLRA 136) ☐ Loamy Gleyed Matrix (F2) ☐ Depleted Matrix (F3) ☐ Redox Dark Surface (F6) ☐ Depleted Dark Surface (F7) ☐ Redox Depressions (F8) ☐ Iron-Manganese Masses (F12) (LRR N, MLRA 136) ☐ Umbric Surface (F13) (MLRA 122, 136) ☐ Piedmont Floodplain Soils (F19) (MLRA 148) ☐ Red Parent Material (F21) (MLRA 127, 147, 148)	Indicators for Problematic Hydric Soils³: ☐ 2 cm Muck (A10) (MLRA 147) ☐ Coast Prairie Redox (A16) (MLRA 147, 148) ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147) ☐ Red Parent Material (F21) (outside MLRA 127, 147, 148) ☐ Very Shallow Dark Surface (F22) ☐ Other (Explain in Remarks)
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: <u>N/A</u> Depth (inches): <u> </u>	Hydric Soil Present? Yes <u> </u> No <u> X </u>
Remarks:	

AGENCY DISCLOSURE NOTIFICATION

The public reporting burden for this collection of information, OMB Control Number 0710-0024, is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR REQUEST TO THE ABOVE EMAIL.**

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: <http://dpcl.d.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx>

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Coal River Lock and Dam No. 3 City/County: Tornado/ Kanawha County Sampling Date: 8/26/2025
Applicant/Owner: Capitol Conservation District State: WV Sampling Point: W1-HYD1
Investigator(s): Anju Ghimirey, Emily Hegedus Section, Township, Range: N/A
Landform (hillside, terrace, etc.): floodplain depression Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR or MLRA): LRR N, MLRA 126 Lat: 38.343329 Long: -81.840798 Datum: NAD83
Soil Map Unit Name: Udifulvents, loamy (UB) NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation X, Soil X, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	

Remarks:
W1-HYD2 was the test pit representative of the PFO portion of Wetland 1. Wetland 1 was a PEM/PFO wetland complex located on the streambank downstream of the dam. It began at the toe of slope and continued to the river edge. This area is used regularly for recreation. Trash and firepits were observed within the wetland. The area floods frequently, and large deposits of sediment and woody debris were observed. Therefore, vegetation and soil were naturally problematic due to frequent flooding, which left some areas of the PFO without vegetation due to being covered by sand deposits. The PFO portion of the wetland was the most disturbed due to its location closest to Coal River. The PEM portion was located in a depression behind the PFO area.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators</u> (minimum of one is required; check all that apply) <u> </u> Surface Water (A1) <u> </u> True Aquatic Plants (B14) <u> </u> High Water Table (A2) <u> </u> Hydrogen Sulfide Odor (C1) <u>X</u> Saturation (A3) <u>X</u> Oxidized Rhizospheres on Living Roots (C3) <u> </u> Water Marks (B1) <u> </u> Presence of Reduced Iron (C4) <u> </u> Sediment Deposits (B2) <u> </u> Recent Iron Reduction in Tilled Soils (C6) <u>X</u> Drift Deposits (B3) <u> </u> Thin Muck Surface (C7) <u> </u> Algal Mat or Crust (B4) <u> </u> Other (Explain in Remarks) <u> </u> Iron Deposits (B5) <u> </u> Inundation Visible on Aerial Imagery (B7) <u>X</u> Water-Stained Leaves (B9) <u> </u> Aquatic Fauna (B13)	<u>Secondary Indicators</u> (minimum of two required) <u>X</u> Surface Soil Cracks (B6) <u> </u> Sparsely Vegetated Concave Surface (B8) <u>X</u> Drainage Patterns (B10) <u> </u> Moss Trim Lines (B16) <u> </u> Dry-Season Water Table (C2) <u> </u> Crayfish Burrows (C8) <u> </u> Saturation Visible on Aerial Imagery (C9) <u> </u> Stunted or Stressed Plants (D1) <u>X</u> Geomorphic Position (D2) <u> </u> Shallow Aquitard (D3) <u> </u> Microtopographic Relief (D4) <u>X</u> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Water Table Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Saturation Present? Yes <u>X</u> No <u> </u> Depth (inches): <u>4</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: W1-HYD1

Tree Stratum (Plot size: <u>N/A</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>13</u></td> <td>x 1 = <u>13</u></td> </tr> <tr> <td>FACW species <u>67</u></td> <td>x 2 = <u>134</u></td> </tr> <tr> <td>FAC species <u>19</u></td> <td>x 3 = <u>57</u></td> </tr> <tr> <td>FACU species <u>3</u></td> <td>x 4 = <u>12</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>102</u> (A)</td> <td><u>216</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.12</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>13</u>	x 1 = <u>13</u>	FACW species <u>67</u>	x 2 = <u>134</u>	FAC species <u>19</u>	x 3 = <u>57</u>	FACU species <u>3</u>	x 4 = <u>12</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>102</u> (A)	<u>216</u> (B)	Prevalence Index = B/A = <u>2.12</u>	
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UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>102</u> (A)	<u>216</u> (B)																			
Prevalence Index = B/A = <u>2.12</u>																				
50% of total cover: _____ 20% of total cover: _____																				
Sapling/Shrub Stratum (Plot size: <u>15</u>)																				
1. <u>Salix nigra</u>	<u>10</u>	<u>Yes</u>	<u>OBL</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation ☒ <u>2</u> - Dominance Test is >50% ☒ <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
=Total Cover																				
50% of total cover: <u>5</u> 20% of total cover: <u>2</u>																				
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Persicaria pensylvanica</u>	<u>50</u>	<u>Yes</u>	<u>FACW</u>	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody Vine – All woody vines greater than 3.28 ft in height.																
2. <u>Arthraxon hispidus</u>	<u>15</u>	<u>No</u>	<u>FAC</u>																	
3. <u>Panicum dichotomiflorum</u>	<u>15</u>	<u>No</u>	<u>FACW</u>																	
4. <u>Dysphania ambrosioides</u>	<u>3</u>	<u>No</u>	<u>FACU</u>																	
5. <u>Echinochloa crus-galli</u>	<u>2</u>	<u>No</u>	<u>FAC</u>																	
6. <u>Ludwigia decurrens</u>	<u>3</u>	<u>No</u>	<u>OBL</u>																	
7. <u>Persicaria maculosa</u>	<u>2</u>	<u>No</u>	<u>FACW</u>																	
8. <u>Eclipta prostrata</u>	<u>2</u>	<u>No</u>	<u>FAC</u>																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
=Total Cover																				
50% of total cover: <u>46</u> 20% of total cover: <u>19</u>																				
Woody Vine Stratum (Plot size: <u>N/A</u>)																				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <u>X</u> No _____																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
=Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Remarks: (Include photo numbers here or on a separate sheet.)																				

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: W1-HYD1

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
		=Total Cover		Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
50% of total cover: _____		20% of total cover: _____		
Sapling Stratum (Plot size: _____)				Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0 ¹ _____ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
		=Total Cover		Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody Plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody Vine – All woody vines, regardless of height.
50% of total cover: _____		20% of total cover: _____		
Shrub Stratum (Plot size: _____)				Hydrophytic Vegetation Present? Yes _____ No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
		=Total Cover		
50% of total cover: _____		20% of total cover: _____		
Herb Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
		=Total Cover		
50% of total cover: _____		20% of total cover: _____		
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
		=Total Cover		
50% of total cover: _____		20% of total cover: _____		
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: W1-HYD1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-0.5	10YR 3/3	100					Sandy	
0.5-4	10YR 3/2	90	5YR 4/6	5	C	PL/M	Loamy/Clayey	Prominent redox concentrations
			10YR 2/1	5	C	M		Iron-manganese masses
4-16	7.5YR 7/1	80	7.5YR 6/8	20	C	M	Sandy	Prominent redox concentrations

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: ☐ Histosol (A1) ☐ Histic Epipedon (A2) ☐ Black Histic (A3) ☐ Hydrogen Sulfide (A4) ☐ Stratified Layers (A5) ☐ 2 cm Muck (A10) (LRR N) ☒ Depleted Below Dark Surface (A11) ☐ Thick Dark Surface (A12) ☐ Sandy Mucky Mineral (S1) ☐ Sandy Gleyed Matrix (S4) ☒ Sandy Redox (S5) ☒ Stripped Matrix (S6) ☐ Dark Surface (S7)	☐ Polyvalue Below Surface (S8) (MLRA 147, 148) ☐ Thin Dark Surface (S9) (MLRA 147, 148) ☐ Loamy Mucky Mineral (F1) (MLRA 136) ☐ Loamy Gleyed Matrix (F2) ☐ Depleted Matrix (F3) ☐ Redox Dark Surface (F6) ☐ Depleted Dark Surface (F7) ☒ Redox Depressions (F8) ☐ Iron-Manganese Masses (F12) (LRR N, MLRA 136) ☐ Umbric Surface (F13) (MLRA 122, 136) ☐ Piedmont Floodplain Soils (F19) (MLRA 148) ☐ Red Parent Material (F21) (MLRA 127, 147, 148)	Indicators for Problematic Hydric Soils³: ☐ 2 cm Muck (A10) (MLRA 147) ☐ Coast Prairie Redox (A16) (MLRA 147, 148) ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147) ☐ Red Parent Material (F21) (outside MLRA 127, 147, 148) ☐ Very Shallow Dark Surface (F22) ☐ Other (Explain in Remarks)
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³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: <u>N/A</u> Depth (inches): <u> </u>	Hydric Soil Present? Yes <u>X</u> No <u> </u>
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Remarks:

AGENCY DISCLOSURE NOTIFICATION

The public reporting burden for this collection of information, OMB Control Number 0710-0024, is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR REQUEST TO THE ABOVE EMAIL.**

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: <http://dpcl.d.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx>

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Coal River Lock and Dam No. 3 City/County: Tornado/ Kanawha County Sampling Date: 8/26/2025
Applicant/Owner: Capitol Conservation District State: WV Sampling Point: W1-HYD2
Investigator(s): Anju Ghimirey, Emily Hegedus Section, Township, Range: N/A
Landform (hillside, terrace, etc.): streambank Local relief (concave, convex, none): Concave Slope (%): 2
Subregion (LRR or MLRA): LRR N, MLRA 126 Lat: 38.343362 Long: -81.841001 Datum: NAD83
Soil Map Unit Name: Udifulvents, loamy (UB) NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)
Are Vegetation X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No
Are Vegetation X, Soil X, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present? Yes <u>X</u> No <u> </u>	
Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	

Remarks:
W1-HYD2 was the test pit representative of the PFO portion of Wetland 1. Wetland 1 was a PEM/PFO wetland complex located on the streambank downstream of the dam. It began at the toe of slope and continued to the river edge. This area is used regularly for recreation. Trash and firepits were observed within the wetland. The area floods frequently, and large deposits of sediment and woody debris were observed. Therefore, vegetation and soil were naturally problematic due to frequent flooding, which left some areas of the PFO without vegetation due to being covered by sand deposits. The PFO portion of the wetland was the most disturbed due to its location closest to Coal River. The PEM portion was located in a depression behind the PFO area. Human recreational disturbance caused additional vegetation clearing in the PFO.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators</u> (minimum of one is required; check all that apply) <u> </u> Surface Water (A1) <u> </u> True Aquatic Plants (B14) <u> </u> High Water Table (A2) <u> </u> Hydrogen Sulfide Odor (C1) <u> </u> Saturation (A3) <u> </u> Oxidized Rhizospheres on Living Roots (C3) <u> </u> Water Marks (B1) <u> </u> Presence of Reduced Iron (C4) <u> </u> Sediment Deposits (B2) <u> </u> Recent Iron Reduction in Tilled Soils (C6) <u>X</u> Drift Deposits (B3) <u> </u> Thin Muck Surface (C7) <u> </u> Algal Mat or Crust (B4) <u> </u> Other (Explain in Remarks) <u> </u> Iron Deposits (B5) <u> </u> Inundation Visible on Aerial Imagery (B7) <u> </u> Water-Stained Leaves (B9) <u> </u> Aquatic Fauna (B13)	<u>Secondary Indicators</u> (minimum of two required) <u>X</u> Surface Soil Cracks (B6) <u> </u> Sparsely Vegetated Concave Surface (B8) <u>X</u> Drainage Patterns (B10) <u> </u> Moss Trim Lines (B16) <u> </u> Dry-Season Water Table (C2) <u> </u> Crayfish Burrows (C8) <u> </u> Saturation Visible on Aerial Imagery (C9) <u> </u> Stunted or Stressed Plants (D1) <u> </u> Geomorphic Position (D2) <u> </u> Shallow Aquitard (D3) <u> </u> Microtopographic Relief (D4) <u>X</u> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Water Table Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> Saturation Present? Yes <u> </u> No <u>X</u> Depth (inches): <u> </u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: W1-HYD2

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Acer negundo</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)																
2. <u>Platanus occidentalis</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																	
3. <u>Salix nigra</u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>																	
4. <u>Acer saccharinum</u>	<u>20</u>	<u>Yes</u>	<u>FACW</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
<u>80</u> =Total Cover 50% of total cover: <u>40</u> 20% of total cover: <u>16</u>				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>20</u></td> <td>x 1 = <u>20</u></td> </tr> <tr> <td>FACW species <u>50</u></td> <td>x 2 = <u>100</u></td> </tr> <tr> <td>FAC species <u>50</u></td> <td>x 3 = <u>150</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>120</u> (A)</td> <td><u>270</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>2.25</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>20</u>	x 1 = <u>20</u>	FACW species <u>50</u>	x 2 = <u>100</u>	FAC species <u>50</u>	x 3 = <u>150</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>120</u> (A)	<u>270</u> (B)	Prevalence Index = B/A = <u>2.25</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>20</u>	x 1 = <u>20</u>																			
FACW species <u>50</u>	x 2 = <u>100</u>																			
FAC species <u>50</u>	x 3 = <u>150</u>																			
FACU species <u>0</u>	x 4 = <u>0</u>																			
UPL species <u>0</u>	x 5 = <u>0</u>																			
Column Totals: <u>120</u> (A)	<u>270</u> (B)																			
Prevalence Index = B/A = <u>2.25</u>																				
Sapling/Shrub Stratum (Plot size: <u>N/A</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
_____ =Total Cover 50% of total cover: _____ 20% of total cover: _____																				
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Microstegium vimineum</u>	<u>30</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>X</u> <u>2</u> - Dominance Test is >50% <u>X</u> <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Pilea pumila</u>	<u>10</u>	<u>Yes</u>	<u>FACW</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
<u>40</u> =Total Cover 50% of total cover: <u>20</u> 20% of total cover: <u>8</u>																				
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____	Definitions of Four Vegetation Strata: Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than or equal to 3.28 ft (1 m) tall. Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody Vine – All woody vines greater than 3.28 ft in height.																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
_____ =Total Cover 50% of total cover: _____ 20% of total cover: _____																				
Remarks: (Include photo numbers here or on a separate sheet.)																				

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: W1-HYD2

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
_____ = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <td style="width: 50%;">Total % Cover of:</td> <td style="width: 50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____ (A)</td> <td>_____ (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x 1 = _____	FACW species _____	x 2 = _____	FAC species _____	x 3 = _____	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: _____ (A)	_____ (B)	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x 1 = _____																			
FACW species _____	x 2 = _____																			
FAC species _____	x 3 = _____																			
FACU species _____	x 4 = _____																			
UPL species _____	x 5 = _____																			
Column Totals: _____ (A)	_____ (B)																			
Prevalence Index = B/A = _____																				
50% of total cover: _____ 20% of total cover: _____																				
Sapling Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Shrub Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Herb Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Remarks: (Include photo numbers here or on a separate sheet.)																				

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub - Woody Plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody Vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: W1-HYD2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10YR 7/1	80	5YR 4/6	20	C	M	Sandy	Prominent redox concentrations
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.						² Location: PL=Pore Lining, M=Matrix.		
Hydric Soil Indicators:						Indicators for Problematic Hydric Soils³:		
___ Histosol (A1)			___ Polyvalue Below Surface (S8) (MLRA 147, 148)			___ 2 cm Muck (A10) (MLRA 147)		
___ Histic Epipedon (A2)			___ Thin Dark Surface (S9) (MLRA 147, 148)			___ Coast Prairie Redox (A16)		
___ Black Histic (A3)			___ Loamy Mucky Mineral (F1) (MLRA 136)			___ (MLRA 147, 148)		
___ Hydrogen Sulfide (A4)			___ Loamy Gleyed Matrix (F2)			___ Piedmont Floodplain Soils (F19)		
___ Stratified Layers (A5)			___ Depleted Matrix (F3)			___ (MLRA 136, 147)		
___ 2 cm Muck (A10) (LRR N)			___ Redox Dark Surface (F6)			___ Red Parent Material (F21)		
___ Depleted Below Dark Surface (A11)			___ Depleted Dark Surface (F7)			___ (outside MLRA 127, 147, 148)		
___ Thick Dark Surface (A12)			___ Redox Depressions (F8)			___ Very Shallow Dark Surface (F22)		
___ Sandy Mucky Mineral (S1)			___ Iron-Manganese Masses (F12) (LRR N,			___ Other (Explain in Remarks)		
___ Sandy Gleyed Matrix (S4)			___ MLRA 136)					
X ___ Sandy Redox (S5)			___ Umbric Surface (F13) (MLRA 122, 136)			³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
___ Stripped Matrix (S6)			___ Piedmont Floodplain Soils (F19) (MLRA 148)					
___ Dark Surface (S7)			___ Red Parent Material (F21) (MLRA 127, 147, 148)					
Restrictive Layer (if observed):								
Type: _____ N/A								
Depth (inches): _____							Hydric Soil Present? Yes <u>X</u> No ____	
Remarks: Redox concentrations were somewhat diffuse within the matrix								

AGENCY DISCLOSURE NOTIFICATION

The public reporting burden for this collection of information, OMB Control Number 0710-0024, is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. **PLEASE DO NOT RETURN YOUR REQUEST TO THE ABOVE EMAIL.**

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned. System of Record Notice (SORN). The information received is entered into our permit tracking database and a SORN has been completed (SORN #A1145b) and may be accessed at the following website: <http://dpcl.d.defense.gov/Privacy/SORNsIndex/DOD-wide-SORN-Article-View/Article/570115/a1145b-ce.aspx>

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Eastern Mountains and Piedmont Region See ERDC/EL TR-12-9; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp:11/30/2024 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
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Project/Site: Coal River Lock and Dam No. 3 City/County: Tornado/ Kanawha County Sampling Date: 8/26/2025
Applicant/Owner: Capitol Conservation District State: WV Sampling Point: W1-UPL
Investigator(s): Anju Ghimirey, Emily Hegedus Section, Township, Range: N/A
Landform (hillside, terrace, etc.): Floodplain terrace Local relief (concave, convex, none): None Slope (%): _____
Subregion (LRR or MLRA): LRR N, MLRA 126 Lat: 38.343672 Long: -81.840674 Datum: NAD83
Soil Map Unit Name: Udifluvents, loamy (UB) NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes x No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes _____ No <u>X</u>	
Wetland Hydrology Present? Yes _____ No <u>X</u>	

Remarks:
W1-UPL was the upland test pit for Wetland 1. It was taken on a floodplain terrace uphill of Wetland 1.

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ____ Surface Water (A1) ____ True Aquatic Plants (B14) ____ High Water Table (A2) ____ Hydrogen Sulfide Odor (C1) ____ Saturation (A3) ____ Oxidized Rhizospheres on Living Roots (C3) ____ Water Marks (B1) ____ Presence of Reduced Iron (C4) ____ Sediment Deposits (B2) ____ Recent Iron Reduction in Tilled Soils (C6) ____ Drift Deposits (B3) ____ Thin Muck Surface (C7) ____ Algal Mat or Crust (B4) ____ Other (Explain in Remarks) ____ Iron Deposits (B5) ____ Inundation Visible on Aerial Imagery (B7) ____ Water-Stained Leaves (B9) ____ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ____ Surface Soil Cracks (B6) ____ Sparsely Vegetated Concave Surface (B8) ____ Drainage Patterns (B10) ____ Moss Trim Lines (B16) ____ Dry-Season Water Table (C2) ____ Crayfish Burrows (C8) ____ Saturation Visible on Aerial Imagery (C9) ____ Stunted or Stressed Plants (D1) ____ Geomorphic Position (D2) ____ Shallow Aquitard (D3) ____ Microtopographic Relief (D4) ____ FAC-Neutral Test (D5)
---	--

Field Observations: Surface Water Present? Yes _____ No _____ Depth (inches): _____ Water Table Present? Yes _____ No _____ Depth (inches): _____ Saturation Present? Yes _____ No _____ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No primary or secondary wetland hydrology indicators were observed.

VEGETATION (Four Strata) – Use scientific names of plants.

 Sampling Point: W1-UPL

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																	
1. <u>Prunus serotina</u>	<u>20</u>	<u>Yes</u>	<u>FACU</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50.0%</u> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
20 = Total Cover				Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="width: 50%;">Total % Cover of:</th> <th style="width: 50%;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>5</u></td> <td>x 2 = <u>10</u></td> </tr> <tr> <td>FAC species <u>90</u></td> <td>x 3 = <u>270</u></td> </tr> <tr> <td>FACU species <u>22</u></td> <td>x 4 = <u>88</u></td> </tr> <tr> <td>UPL species <u>3</u></td> <td>x 5 = <u>15</u></td> </tr> <tr> <td>Column Totals: <u>120</u> (A)</td> <td><u>383</u> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <u>3.19</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>5</u>	x 2 = <u>10</u>	FAC species <u>90</u>	x 3 = <u>270</u>	FACU species <u>22</u>	x 4 = <u>88</u>	UPL species <u>3</u>	x 5 = <u>15</u>	Column Totals: <u>120</u> (A)	<u>383</u> (B)	Prevalence Index = B/A = <u>3.19</u>	
Total % Cover of:	Multiply by:																			
OBL species <u>0</u>	x 1 = <u>0</u>																			
FACW species <u>5</u>	x 2 = <u>10</u>																			
FAC species <u>90</u>	x 3 = <u>270</u>																			
FACU species <u>22</u>	x 4 = <u>88</u>																			
UPL species <u>3</u>	x 5 = <u>15</u>																			
Column Totals: <u>120</u> (A)	<u>383</u> (B)																			
Prevalence Index = B/A = <u>3.19</u>																				
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>																				
Sapling/Shrub Stratum (Plot size: <u>N/A</u>)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Herb Stratum (Plot size: <u>5</u>)																				
1. <u>Microstegium vimineum</u>	<u>90</u>	<u>Yes</u>	<u>FAC</u>	Hydrophytic Vegetation Indicators: <u>1</u> - Rapid Test for Hydrophytic Vegetation <u>2</u> - Dominance Test is >50% <u>3</u> - Prevalence Index is ≤3.0 ¹ <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u>_____</u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																
2. <u>Elymus canadensis</u>	<u>2</u>	<u>No</u>	<u>FACU</u>																	
3. <u>Persicaria pensylvanica</u>	<u>5</u>	<u>No</u>	<u>FACW</u>																	
4. <u>Achyranthes aspera</u>	<u>3</u>	<u>No</u>	<u>UPL</u>																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
100 = Total Cover																				
50% of total cover: <u>50</u> 20% of total cover: <u>20</u>																				
Woody Vine Stratum (Plot size: _____)																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
_____ = Total Cover																				
50% of total cover: _____ 20% of total cover: _____																				
Remarks: (Include photo numbers here or on a separate sheet.)																				

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: W1-UPL

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Indicators: _____ 1 - Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test is >50% _____ 3 - Prevalence Index is ≤3.0 ¹ _____ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub - Woody Plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, <u>and</u> woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody Vine – All woody vines, regardless of height.
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
50% of total cover: _____ 20% of total cover: _____				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Remarks: (Include photo numbers here or on a separate sheet.)				

SOIL

Sampling Point: W1-UPL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-16	10YR 3/3	100					Sandy	well-drained

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
☐ Histosol (A1)	☐ 2 cm Muck (A10) (MLRA 147)
☐ Histic Epipedon (A2)	☐ Coast Prairie Redox (A16)
☐ Black Histic (A3)	☐ (MLRA 147, 148)
☐ Hydrogen Sulfide (A4)	☐ Piedmont Floodplain Soils (F19)
☐ Stratified Layers (A5)	☐ (MLRA 136, 147)
☐ 2 cm Muck (A10) (LRR N)	☐ Red Parent Material (F21)
☐ Depleted Below Dark Surface (A11)	☐ (outside MLRA 127, 147, 148)
☐ Thick Dark Surface (A12)	☐ Very Shallow Dark Surface (F22)
☐ Sandy Mucky Mineral (S1)	☐ Other (Explain in Remarks)
☐ Sandy Gleyed Matrix (S4)	
☐ Sandy Redox (S5)	
☐ Stripped Matrix (S6)	
☐ Dark Surface (S7)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: <u>N/A</u> Depth (inches): <u> </u>	Hydric Soil Present? Yes <u> </u> No <u> X </u>
--	---

Remarks:
 Soils were well-drained

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Appendix D

West Virginia Wetland Rapid Assessment Method (WVRAM) Results

WVRAM GIS RESULTS - WETLAND 1 (PEM/PFO)			
OBJECTID	1	ImpairedIn	0
SiteEventID		ImpairedOu	1
WUKey	1	IrrEdge	0
Length	189.3549126	Karst	0
Area	1488.028434	LandEco	1
SiteName	Coal River Lock and Dam No. 3	LandHydro	1
SurveyDate	8/26/2025	LandResil	0
Function	51	LandInteg	0
RegCredPre	0.447058827	LandPos	LR
RegPrelim	0.447058827	LowSlope	1
RegFunction	38	MarlPEM	0
Condition	31	Microtopo	0
DNRLandAcq	44	VegHorInt	1
BRank	none	Organic	N
FAFunction	17	OwnerAcces	2
FAOpportun	2	PublicUse	2
FAPotentia	11	RoadRail	0
FASociety	4	Runoff	4
HCondition	11	Runoff50m	0
HFuncNoBR	16	RunoffWshd	1
HFunction	16	SeaPondRat	1
HOpportun	2	SeasonPond	3
HPotential	9	SLOPE	2
HSociety	5	SlopeWshd	1
WQFunction	18	SoilH	2
WQOpportun	5	SoilOrgCal	0
WQPotentia	9	StreamEdge	1
WQSociety	4	StrucPatch	2
AquaAbund	1	SWOutflow	0
ConnectFL	2	SWOutflow2	0
ClayOrgani	0	VegAll	1
Clay	N	VegByLP	1
ChemTime	0	VegFA	6
BufferPeri	0	Dist50mFQ	0
BufferLand	0	VegFQ	2
BRankHUC	1	VegH	5
BufferCont	0	VegPerUng	5
ConsFocus	0	VegPerUng4	4
Depression	1	VegPerUng1	1
Discharges	2	VegVerStr	2
Disturb50m	3	VegWoody	2
SoilIntact	0	VegWoody4	1
DisturbWsh	1	VegWoodyFo	1
EconRisk	3	VegWQ	8
Fisheries	1	WaterSuppl	1
FloodArea	2	WetIldBird	2
Floodplain	Y	WFlowPath	TP
FloodIn	0	WQPlan	0
Floodway	4	WQUse	2
Headwater	0	WshdPos	0
HIInvest	1	WshdUniq	0
Histosol	0	ElevFt	573.4388428
HUC12WQ	1	Attribute1	PEM1C
HUse	4	Attr1Area	930
HydIntact	0	Attribute2	PFO1C
HydSW	0	Attr2Area	558
HydroH	2	Pres1	0
		PreservPrelim	0

Appendix E

Stream Assessment Reach Map

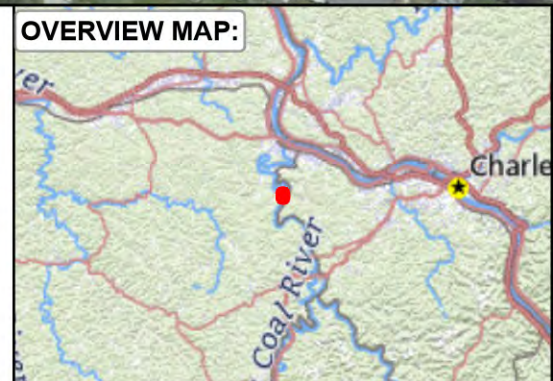


Stream Assessment Reach Map

Coal River Watershed Planning Study
Lock and Dam No. 3

Kanawha County, West Virginia

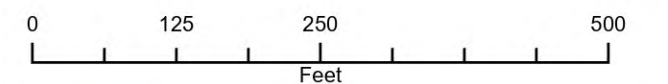
OVERVIEW MAP:



Legend

- Project Study Area
- Stream
- Sampling Reach

Scale:



GFT



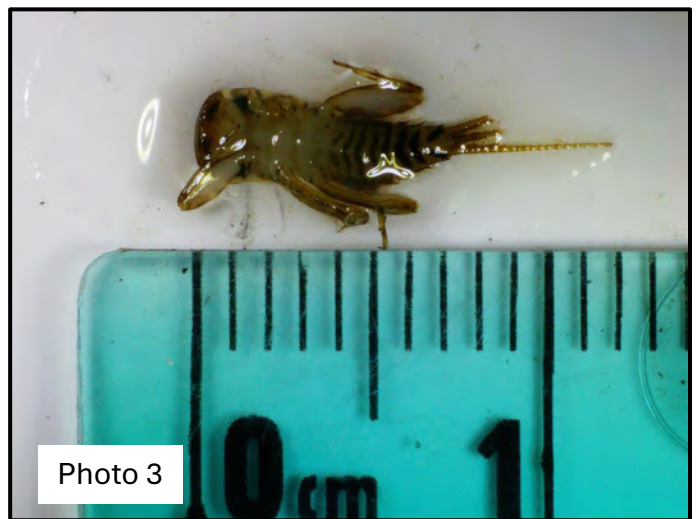
Appendix F

Photographic Macroinvertebrate Reference Collection

MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 1 of 16

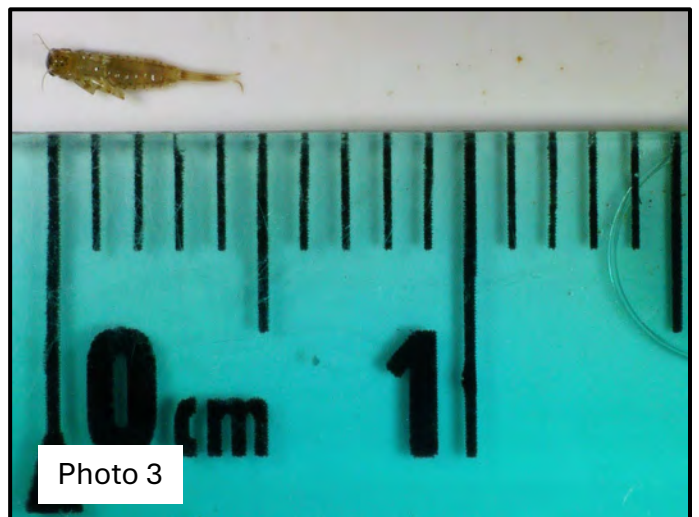
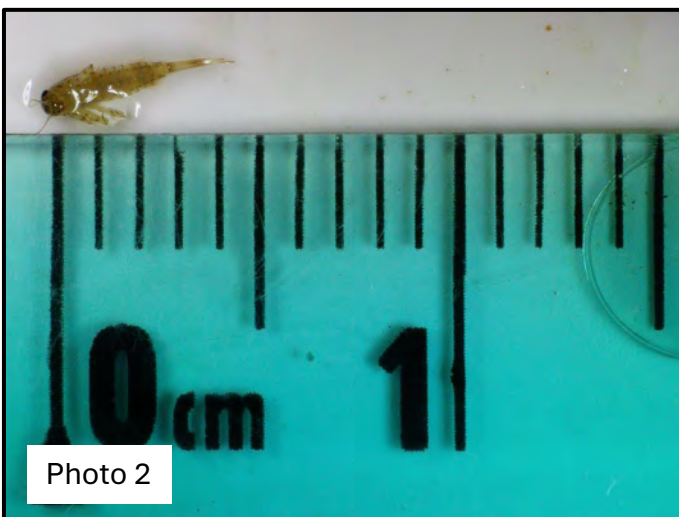
Order:	Ephemeroptera (Mayflies)
Family:	Heptageniidae
Common Name:	Flat-headed Mayflies
WAB Tolerance Value:	4 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Falls Creek, Tributary to Coal River



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 2 of 16

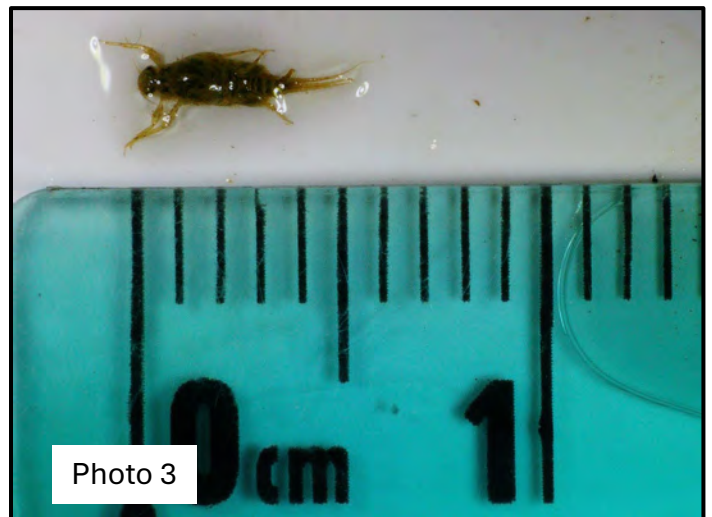
Order:	Ephemeroptera (Mayflies)
Family:	Baetidae
Common Name:	Small Minnow Mayflies
WAB Tolerance Value:	4 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 3 of 16

Order:	Ephemeroptera (Mayflies)
Family:	Ephemeridae
Common Name:	Spiny Crawlers
WAB Tolerance Value:	4 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 4 of 16

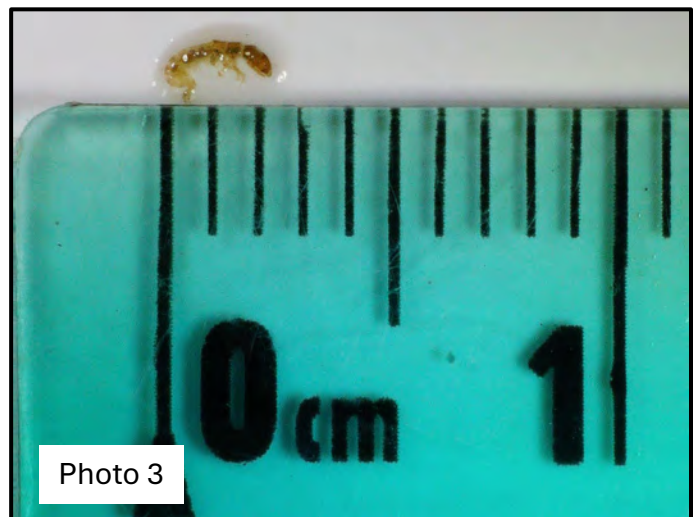
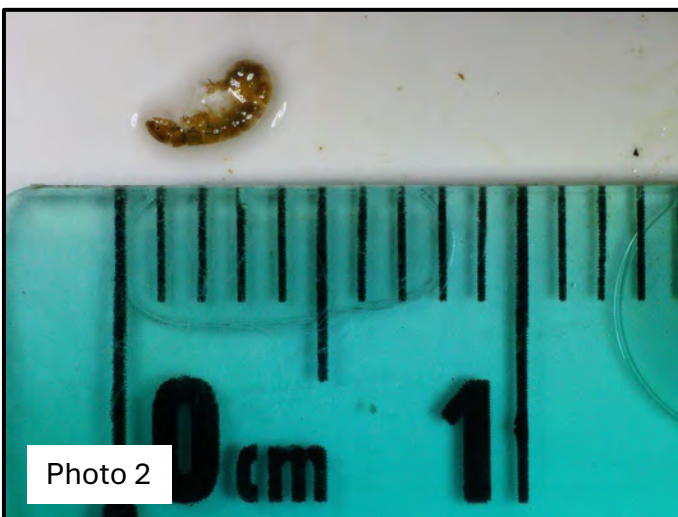
Order:	Plecoptera (Stoneflies)
Family:	Perlidae
Common Name:	Common Stoneflies
WAB Tolerance Value:	1 (Low Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 5 of 16

Order:	Trichoptera (Caddisflies)
Family:	Hydropsychidae
Common Name:	Net-Spinning Caddisflies
WAB Tolerance Value:	5 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 6 of 16

Order:	Coleoptera (Beetles)
Family:	Dytiscidae
Common Name:	Predacious Diving Beetles
WAB Tolerance Value:	5 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Falls Creek



Photo 1

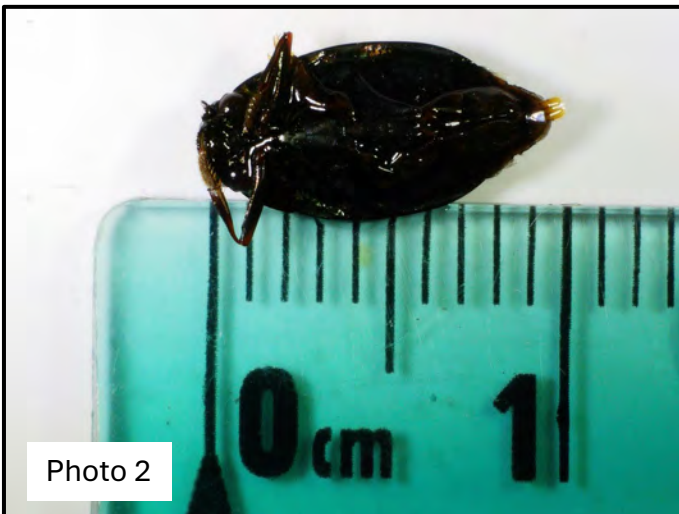


Photo 2

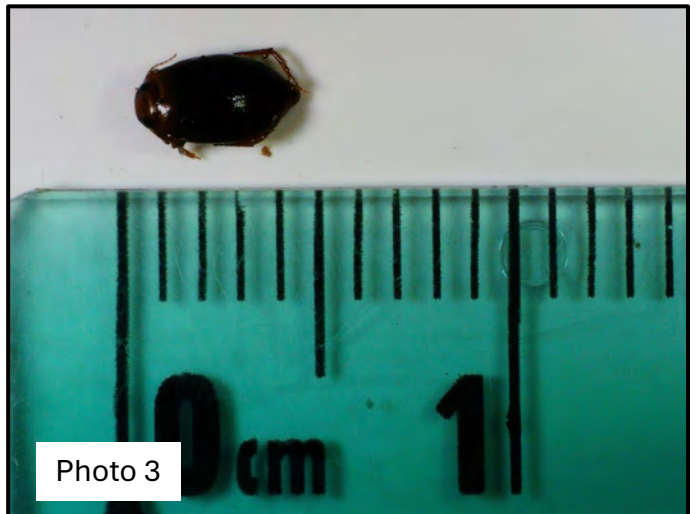
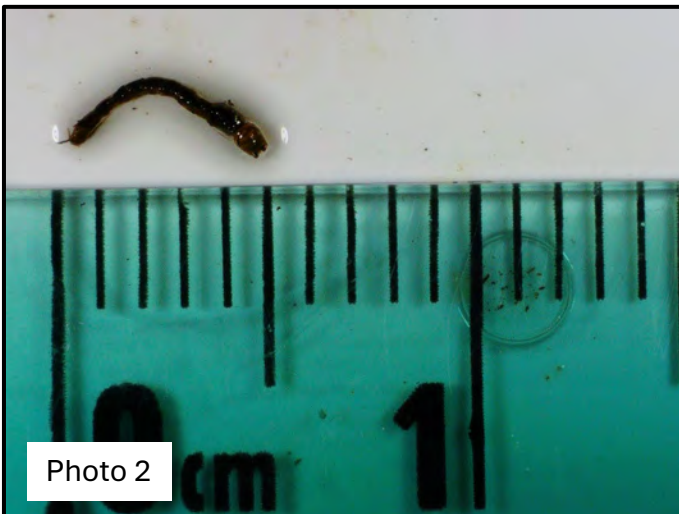


Photo 3

MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 7 of 17

Order:	Coleoptera (Beetles)
Family:	Elmidae
Common Name:	Riffle Beetle
WAB Tolerance Value:	4 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River, Falls Creek



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 8 of 16

Order:	Odonata (Dragonflies and Damselflies)
Family:	Gomphidae
Common Name:	Clubtails
WAB Tolerance Value:	1 (Low Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



Photo 1



Photo 2



Photo 3

MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 9 of 16

Order:	Odonata (Dragonflies and Damselflies)
Family:	Coenagrionidae
Common Name:	Pond Damselfly
WAB Tolerance Value:	9 (High Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Falls Creek



Photo 1



Photo 2

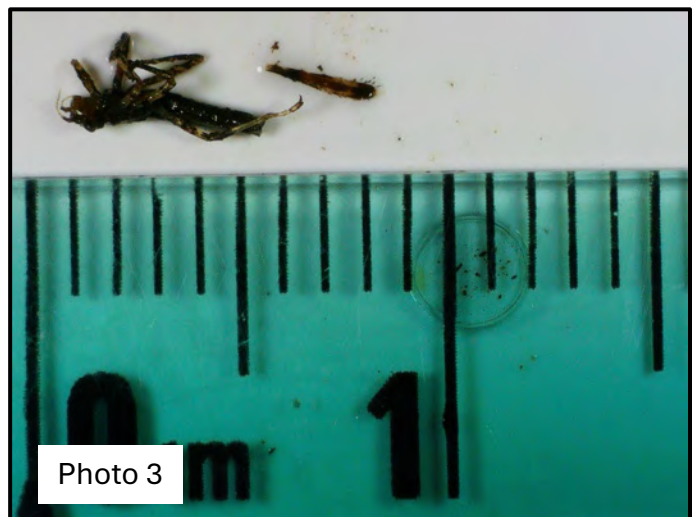
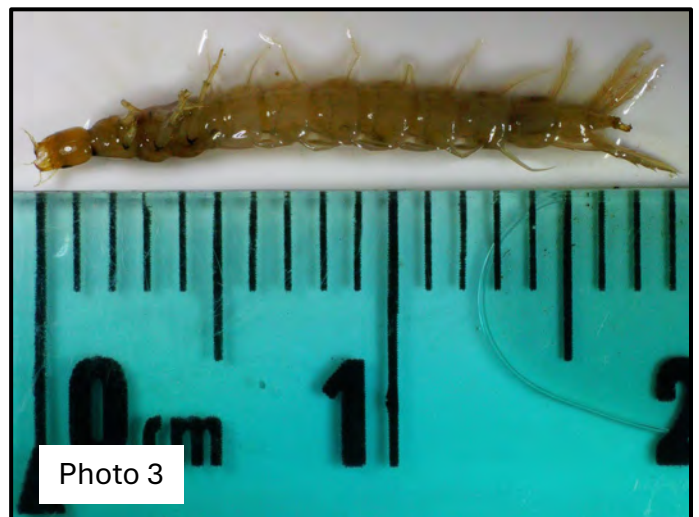
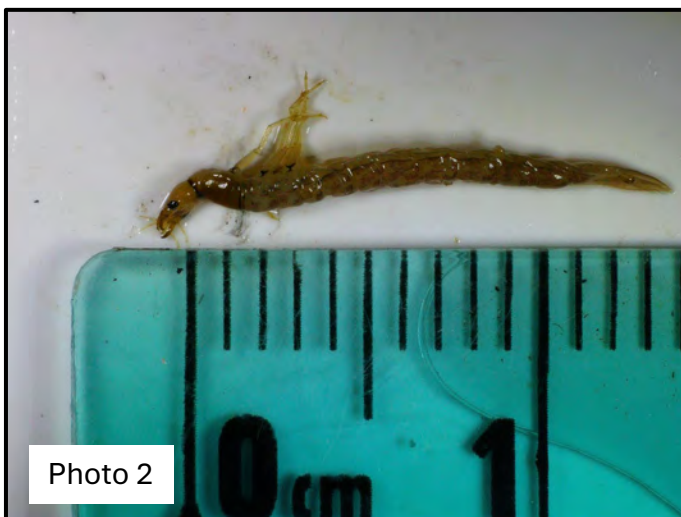


Photo 3

MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 10 of 16

Order:	Megaloptera (Fishflies and Alderflies)
Family:	Sialidae
Common Name:	Alderflies
WAB Tolerance Value:	4 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 11 of 16

Order:	Megaloptera (Fishflies and Alderflies)
Family:	Coenagrionidae
Common Name:	Fishflies
WAB Tolerance Value:	5 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



Photo 1



Photo 2



Photo 3

MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 12 of 16

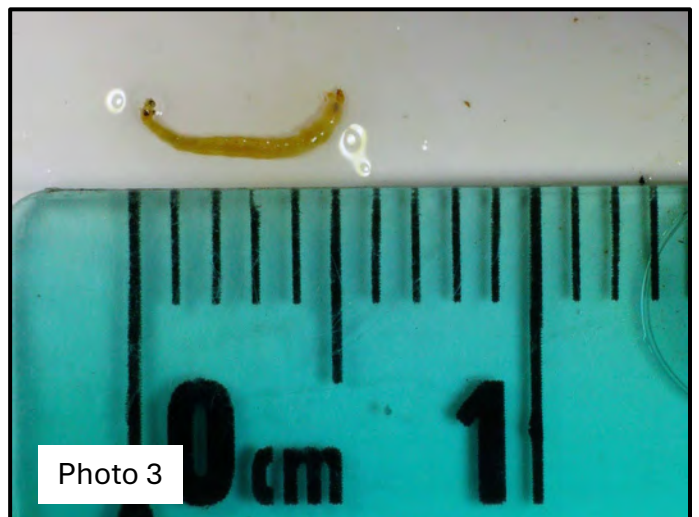
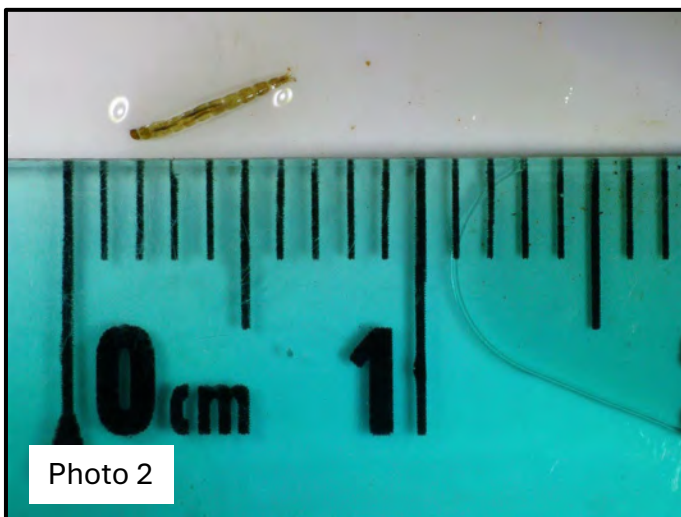
Order:	Diptera (True Flies)
Family:	Tipulidae
Common Name:	Craneflies
WAB Tolerance Value:	3 (Low Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 13 of 16

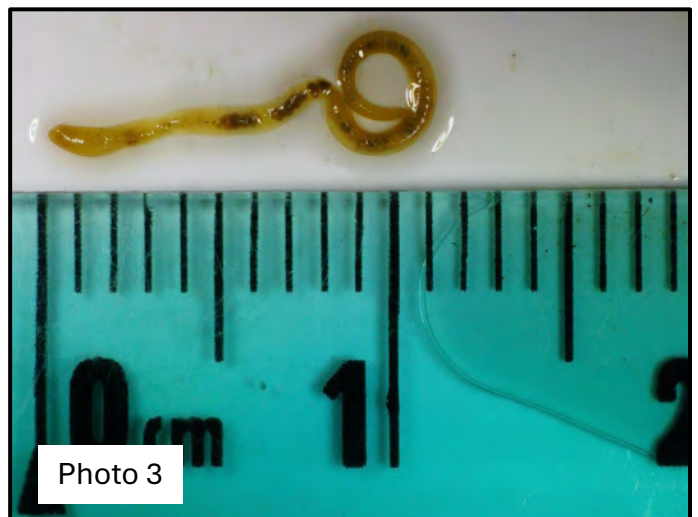
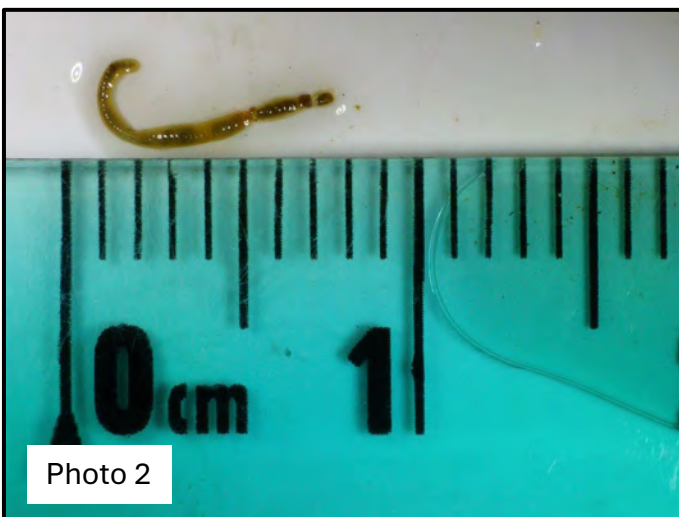
Order:	Diptera (True Flies)
Family:	Chironomidae
Common Name:	Midge Flies
WAB Tolerance Value:	6 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River, Falls Creek



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 14 of 16

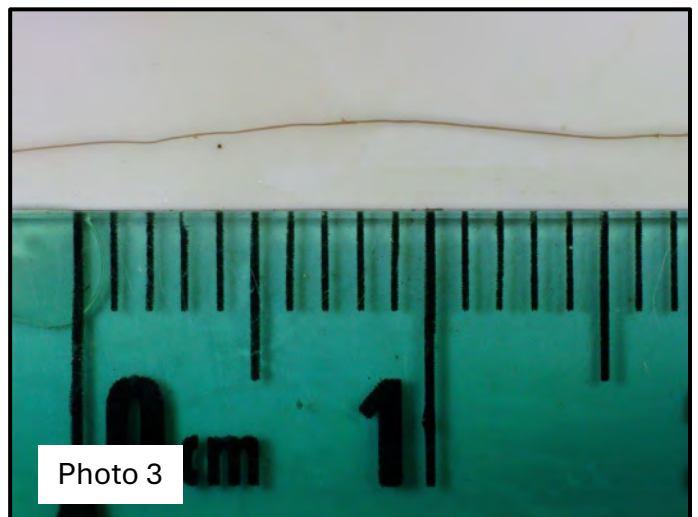
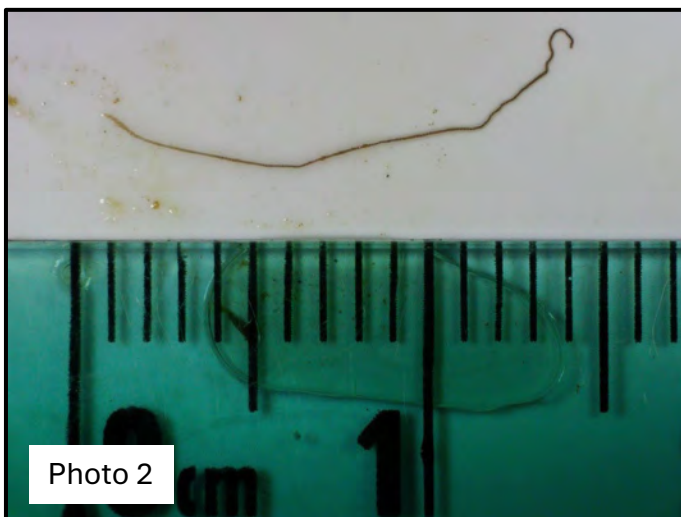
Order:	Annelida (Segmented Worms)
Family:	Oligochaeta
Common Name:	Aquatic Worms
WAB Tolerance Value:	10 (High Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 15 of 16

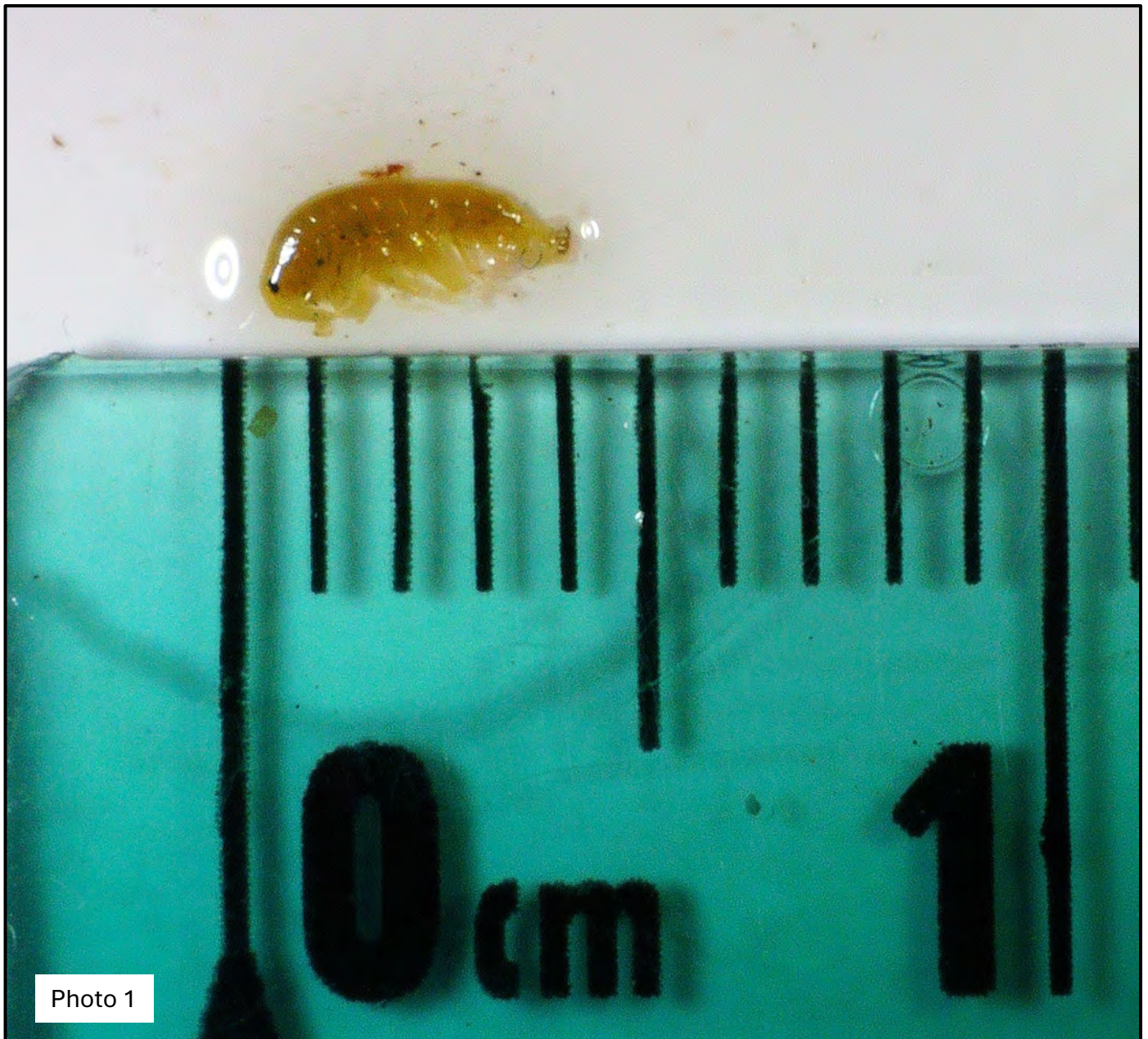
Order:	Nematoda (Nematodes)
Family:	-
Common Name:	Nematodes
WAB Tolerance Value:	5 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



MACROINVERTEBRATE REFERENCE COLLECTION

PLATE 16 of 16

Order:	Decapoda
Family:	Cambaridae
Common Name:	Scuds
WAB Tolerance Value:	5 (Medium Tolerance)
Collection Date:	August 27, 2025
Permit Registration:	WV Collection Permit # 2025.036
Collectors:	Emily Hegedus, Anju Ghimirey
Waterway:	Coal River



Appendix G

Rapid Bioassessment Protocol (RBP) Data Forms

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Coal River	LOCATION Upstream of Lock and Dam No. 3	
STATION # <u>1</u> RIVERMILE <u>--</u>	STREAM CLASS Perennial	
LAT <u>38.339623</u> LONG <u>-81.841187</u>	RIVER BASIN Kanawha River	
STORET #--	AGENCY	
INVESTIGATORS Anju Ghimirey and Emily Hegedus		
FORM COMPLETED BY Anju Ghimirey and Emily Hegedus	DATE <u>8/27/25</u> TIME <u>08:30</u> ☒ AM ☐ PM	REASON FOR SURVEY To support planning efforts associated with dam safety alternatives analysis

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☐ %cloud cover ☒ clear/sunny Past 24 hours ☐ ☐ ☐ ☐ % ☒
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PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☒ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☒ Residential		Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☒ Obvious sources Local Watershed Erosion ☐ None ☒ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous dominant species present sycamore, silver maple, box elder, river birch		
INSTREAM FEATURES	Estimated Reach Length 100 m Estimated Stream Width 20 m Sampling Reach Area 2,000.00 m² Area in km² (m²x1000) 0.002 km² Estimated Stream Depth 1 m Surface Velocity (at thalweg) 0.1 m/sec Canopy Cover ☒ Partly open ☐ Partly shaded ☐ Shaded High Water Mark 6 m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle _____ % ☒ Run 10 % ☒ Pool 90 % Channelized ☐ Yes ☒ No Dam Present ☒ Yes ☐ No		
LARGE WOODY DEBRIS	LWD 2 m ² Density of LWD 0.001 m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☒ Rooted emergent ☒ Rooted submergent ☐ Rooted floating ☐ Free floating ☒ Floating Algae ☒ Attached Algae dominant species present algae, water willow Portion of the reach with aquatic vegetation 5 %		
WATER QUALITY	Temperature 21.31 °C Specific Conductance 1.02 mS/cm Dissolved Oxygen 10.03 mg/L pH 7.98 Turbidity 0.0 NTU WQ Instrument Used Horiba U-52 Multiparameter Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____		
SEDIMENT/SUBSTRATE	Odors ☐ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☒ None ☐ Other _____ Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		80	Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")	5			
Cobble	64-256 mm (2.5"-10")	5	Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	2			
Sand	0.06-2mm (gritty)	5	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	3			
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Coal River		LOCATION Upstream of Lock and Dam No. 3	
STATION # 1 RIVERMILE --		STREAM CLASS Perennial	
LAT 38.339458 LONG -81.840929		RIVER BASIN Kanawha River	
STORET # --		AGENCY	
INVESTIGATORS Anju Ghimirey and Emily Hegedus			
FORM COMPLETED BY Anju Ghimirey and Emily Hegedus		DATE 8/27/25 TIME 08:30 ☒ AM ☐ PM	REASON FOR SURVEY To support planning efforts associated with ~~downstream~~ ~~alternative analysis~~

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 50% 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).	30-50% 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).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE 12	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% 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 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 20	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

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

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
SCORE 15	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.	
SCORE 2	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	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 8 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 8 (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 10 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 9 (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 6 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 119

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Coal River	LOCATION Downstream of Dam and Falls	
STATION # <u>2</u> RIVERMILE <u>--</u>	STREAM CLASS Perennial	
LAT <u>38.343813</u> LONG <u>-81.841411</u>	RIVER BASIN Kanawha River	
STORET # <u>--</u>	AGENCY	
INVESTIGATORS Anju Ghimirey and Emily Hegedus		
FORM COMPLETED BY Anju Ghimirey and Emily Hegedus	DATE <u>8/27/25</u> TIME <u>09:00</u> ☒ AM ☐ PM	REASON FOR SURVEY To support planning efforts associated with dam safety alternatives analysis

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☐ %cloud cover ☒ clear/sunny Past 24 hours ☐ ☐ ☐ ☐ % ☒
---------------------------	---

Has there been a heavy rain in the last 7 days?

☐ Yes ☒ No

Air Temperature 17 °C

Other _____

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☒ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☒ Residential		Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☒ Obvious sources Local Watershed Erosion ☐ None ☒ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous dominant species present river birch, silver maple		
INSTREAM FEATURES	Estimated Reach Length 100 m Estimated Stream Width 20 m Sampling Reach Area 2,000.00 m² Area in km² (m²x1000) 0.002 km² Estimated Stream Depth 1 m Surface Velocity (at thalweg) 0.25 m/sec Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark 6 m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle _____ % ☒ Run 50 % ☒ Pool 50 % Channelized ☒ Yes ☐ No Dam Present ☒ Yes ☐ No		
LARGE WOODY DEBRIS	LWD 1 m ² Density of LWD 0.001 m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☐ Attached Algae dominant species present no aquatic vegetation observed Portion of the reach with aquatic vegetation %		
WATER QUALITY	Temperature 22.28 °C Specific Conductance 0.98 mS/cm Dissolved Oxygen 8.94 mg/L pH 7.98 Turbidity 0.0 NTU WQ Instrument Used Horiba U-52 Multiparameter Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____		
SEDIMENT/SUBSTRATE	Odors ☐ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☒ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand ☐ Relict shells ☒ Other iron _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		60	Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	
Gravel	2-64 mm (0.1"-2.5")	5			
Sand	0.06-2mm (gritty)	35	Marl	grey, shell fragments	
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Coal River		LOCATION Downstream of Dam and Falls	
STATION # 2 RIVERMILE --		STREAM CLASS Perennial	
LAT 38.339458 LONG -81.840929		RIVER BASIN Kanawha River	
STORET # --		AGENCY	
INVESTIGATORS Anju Ghimirey and Emily Hegedus			
FORM COMPLETED BY Anju Ghimirey and Emily Hegedus		DATE 8/27/25 TIME 09:00 ☒ AM ☐ PM	REASON FOR SURVEY To support planning efforts associated with ~~downstream~~ <i>downstream</i>

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 50% 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).	30-50% 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).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 5	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE 15	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% 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 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 17	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	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

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

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
SCORE 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.	
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	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 9 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 9 (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 10 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 10 (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 6 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 136

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Coal River	LOCATION Natural bedrock falls directly downstream of Coal River Dam	
STATION # ³ RIVERMILE --	STREAM CLASS Perennial	
LAT 38.342196 LONG -81.84158	RIVER BASIN Kanawha River	
STORET # --	AGENCY	
INVESTIGATORS Anju Ghimirey and Emily Hegedus		
FORM COMPLETED BY Anju Ghimirey and Emily Hegedus	DATE 8/27/25 TIME 09:30 ☒ AM ☐ PM	REASON FOR SURVEY To support planning efforts associated with dam safety alternatives analysis

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) % ☐ %cloud cover ☒ clear/sunny Past 24 hours ☐ ☐ ☐ ☐ % ☒ % ☒ Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature 17 °C Other _____
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PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☒ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☒ Residential		Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☒ Obvious sources Local Watershed Erosion ☐ None ☒ Moderate ☐ Heavy
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☐ Grasses ☐ Herbaceous dominant species present river birch, silver maple		
INSTREAM FEATURES	Estimated Reach Length 100 m Estimated Stream Width 20 m Sampling Reach Area 2,000.00 m² Area in km² (m²x1000) 0.002 km² Estimated Stream Depth 1 m Surface Velocity (at thalweg) 0.25 m/sec Canopy Cover ☐ Partly open ☒ Partly shaded ☒ Shaded High Water Mark 6 m Proportion of Reach Represented by Stream Morphology Types ☒ Riffle 70% ☒ Run 25% ☒ Pool 5% Channelized ☒ Yes ☐ No Dam Present ☒ Yes ☐ No		
LARGE WOODY DEBRIS	LWD 1 m ² Density of LWD 0 m ² /km ² (LWD/ reach area)		
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☒ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☐ Floating Algae ☒ Attached Algae dominant species present algae, water willow Portion of the reach with aquatic vegetation 5 %		
WATER QUALITY * Water quality parameters were not sampled due to low flow condition.	Temperature _____ °C Specific Conductance _____ Dissolved Oxygen _____ pH _____ Turbidity _____ WQ Instrument Used _____ Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☐ Sheen ☐ Globs ☐ Flecks ☒ None ☐ Other _____ Turbidity (if not measured) ☒ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____		
SEDIMENT/SUBSTRATE	Odors ☐ Normal ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☒ None ☐ Other _____ Deposits ☐ Sludge ☐ Sawdust ☐ Paper fiber ☒ Sand ☐ Relict shells ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse Looking at stones which are not deeply embedded, are the undersides black in color? ☐ Yes ☒ No		

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		95	Detritus	sticks, wood, coarse plant materials (CPOM)	0
Boulder	> 256 mm (10")				
Cobble	64-256 mm (2.5"-10")		Muck-Mud	black, very fine organic (FPOM)	0
Gravel	2-64 mm (0.1"-2.5")	3			
Sand	0.06-2mm (gritty)	2	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm				
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Coal River		LOCATION Natural bedrock falls directly downstream of Coal River Dam	
STATION # ³ RIVERMILE --		STREAM CLASS Perennial	
LAT 38.34230 LONG -81.84152		RIVER BASIN Kanawha River	
STORET # --		AGENCY	
INVESTIGATORS Anju Ghimirey and Emily Hegedus			
FORM COMPLETED BY Anju Ghimirey and Emily Hegedus		DATE 8/27/25 TIME 09:30 ☒ AM ☐ PM	REASON FOR SURVEY To support planning efforts associated with dam safety alternatives analysis

	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
Parameters to be evaluated in sampling reach	1. Epifaunal Substrate/ Available Cover	Greater than 50% 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).	30-50% 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).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 8	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE 11	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% 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 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 17	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	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

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

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
SCORE 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.	
SCORE 3	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	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 9 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 9 (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 10 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 10 (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 6 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 133

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Stream 1 (Falls Creek)	LOCATION Confluence of Falls Creek and Coal River	
STATION # <u>Stream 1</u> RIVERMILE <u>--</u>	STREAM CLASS Perennial	
LAT <u>38.341164</u> LONG <u>-81.842198</u>	RIVER BASIN Kanawha River Basin	
STORET # <u>--</u>	AGENCY Gannett Fleming	
INVESTIGATORS Anju Ghimirey and Emily Hegedus		
FORM COMPLETED BY Anju Ghimirey and Emily Hegedus	DATE <u>8/27/25</u> TIME <u>10:00</u> ☒ AM ☐ PM	REASON FOR SURVEY To support planning efforts associated with dam safety alternatives analysis

WEATHER CONDITIONS	Now ☐ storm (heavy rain) ☐ rain (steady rain) ☐ showers (intermittent) ☐ %cloud cover ☒ clear/sunny Past 24 hours ☐ ☐ ☐ ☐ % ☒ Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No Air Temperature <u>27</u> °C Other _____
SITE LOCATION/MAP	Draw a map of the site and indicate the areas sampled (or attach a photograph) See Appendix E for sampling reach mapping. The entire delineated reach of Stream 1 (Falls Creek) was sampled from its confluence with Coal River to just upstream of the the Coal River Rd bridge which passes over the creek.
STREAM CHARACTERIZATION	Stream Subsystem ☒ Perennial ☐ Intermittent ☐ Tidal Stream Origin ☐ Glacial ☐ Spring-fed ☐ Non-glacial montane ☒ Mixture of origins ☐ Swamp and bog ☐ Other _____ Stream Type ☐ Coldwater ☒ Warmwater Catchment Area <u>10.15</u> km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (BACK)

WATERSHED FEATURES	Predominant Surrounding Landuse ☒ Forest ☒ Commercial ☐ Field/Pasture ☐ Industrial ☐ Agricultural ☐ Other _____ ☒ Residential		Local Watershed NPS Pollution ☐ No evidence ☐ Some potential sources ☐ Obvious sources Local Watershed Erosion ☐ None ☐ Moderate ☒ Heavy	
RIPARIAN VEGETATION (18 meter buffer)	Indicate the dominant type and record the dominant species present ☒ Trees ☐ Shrubs ☒ Grasses ☒ Herbaceous dominant species present silver maple, Japanese stiltgrass			
INSTREAM FEATURES	<table style="width: 100%;"> <tr> <td style="width: 50%;"> Estimated Reach Length 23 _____ m Estimated Stream Width 8 _____ m Sampling Reach Area 200.000 _____ m² Area in km² (m²x1000) 0.0002 _____ km² Estimated Stream Depth 1 _____ m Surface Velocity (at thalweg) 0.25 _____ m/sec </td><td style="width: 50%;"> Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark 4 _____ m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle 50 _____ % ☒ Run 30 _____ % ☒ Pool 20 _____ % Channelized ☒ Yes ☐ No Dam Present ☒ Yes ☐ No </td></tr> </table>		Estimated Reach Length 23 _____ m Estimated Stream Width 8 _____ m Sampling Reach Area 200.000 _____ m ² Area in km² (m²x1000) 0.0002 _____ km ² Estimated Stream Depth 1 _____ m Surface Velocity (at thalweg) 0.25 _____ m/sec	Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark 4 _____ m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle 50 _____ % ☒ Run 30 _____ % ☒ Pool 20 _____ % Channelized ☒ Yes ☐ No Dam Present ☒ Yes ☐ No
Estimated Reach Length 23 _____ m Estimated Stream Width 8 _____ m Sampling Reach Area 200.000 _____ m ² Area in km² (m²x1000) 0.0002 _____ km ² Estimated Stream Depth 1 _____ m Surface Velocity (at thalweg) 0.25 _____ m/sec	Canopy Cover ☐ Partly open ☒ Partly shaded ☐ Shaded High Water Mark 4 _____ m Proportion of Reach Represented by Stream Morphology Types ☐ Riffle 50 _____ % ☒ Run 30 _____ % ☒ Pool 20 _____ % Channelized ☒ Yes ☐ No Dam Present ☒ Yes ☐ No			
LARGE WOODY DEBRIS	LWD 0 _____ m ² Density of LWD 0 _____ m ² /km ² (LWD/ reach area)			
AQUATIC VEGETATION	Indicate the dominant type and record the dominant species present ☐ Rooted emergent ☐ Rooted submergent ☐ Rooted floating ☐ Free floating ☒ Floating Algae ☒ Attached Algae dominant species present unknown Portion of the reach with aquatic vegetation 30 _____ %			
WATER QUALITY	<table style="width: 100%;"> <tr> <td style="width: 50%;"> Temperature 20.20 _____ °C Specific Conductance 0.089 mS/cm Dissolved Oxygen 6.20 mg/L pH 7.32 Turbidity 0.0 NTU WQ Instrument Used Horiba U-52 Multiparameter </td><td style="width: 50%;"> Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☒ Sheen ☒ Globbs ☐ Flecks ☐ None ☐ Other _____ Turbidity (if not measured) ☐ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____ </td></tr> </table>		Temperature 20.20 _____ °C Specific Conductance 0.089 mS/cm Dissolved Oxygen 6.20 mg/L pH 7.32 Turbidity 0.0 NTU WQ Instrument Used Horiba U-52 Multiparameter	Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☒ Sheen ☒ Globbs ☐ Flecks ☐ None ☐ Other _____ Turbidity (if not measured) ☐ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____
Temperature 20.20 _____ °C Specific Conductance 0.089 mS/cm Dissolved Oxygen 6.20 mg/L pH 7.32 Turbidity 0.0 NTU WQ Instrument Used Horiba U-52 Multiparameter	Water Odors ☒ Normal/None ☐ Sewage ☐ Petroleum ☐ Chemical ☐ Fishy ☐ Other _____ Water Surface Oils ☐ Slick ☒ Sheen ☒ Globbs ☐ Flecks ☐ None ☐ Other _____ Turbidity (if not measured) ☐ Clear ☐ Slightly turbid ☐ Turbid ☐ Opaque ☐ Stained ☐ Other _____			
SEDIMENT/SUBSTRATE	<table style="width: 100%;"> <tr> <td style="width: 50%;"> Odors ☐ Normal ☒ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse </td><td style="width: 50%;"> Deposits ☒ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No </td></tr> </table>		Odors ☐ Normal ☒ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse	Deposits ☒ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No
Odors ☐ Normal ☒ Sewage ☐ Petroleum ☐ Chemical ☐ Anaerobic ☐ None ☐ Other _____ Oils ☒ Absent ☐ Slight ☐ Moderate ☐ Profuse	Deposits ☒ Sludge ☐ Sawdust ☐ Paper fiber ☐ Sand ☐ Relict shells ☐ Other _____ Looking at stones which are not deeply embedded, are the undersides black in color? ☒ Yes ☐ No			

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	Diameter	% Composition in Sampling Reach	Substrate Type	Characteristic	% Composition in Sampling Area
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	5
Boulder	> 256 mm (10")	85			
Cobble	64-256 mm (2.5"-10")	8	Muck-Mud	black, very fine organic (FPOM)	15
Gravel	2-64 mm (0.1"-2.5")	2			
Sand	0.06-2mm (gritty)	3	Marl	grey, shell fragments	
Silt	0.004-0.06 mm	2			
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—LOW GRADIENT STREAMS (FRONT)

STREAM NAME Stream 1 (Falls Creek)		LOCATION Confluence of Falls Creek and Coal River	
STATION # Stream 1 RIVERMILE --		STREAM CLASS Perennial	
LAT 38.3411984 LONG -81.8421653		RIVER BASIN Kanawha River Basin	
STORET # --		AGENCY Gannett Fleming	
INVESTIGATORS Anju Ghimirey and Emily Hegedus			
FORM COMPLETED BY Anju Ghimirey and Emily Hegedus		DATE 8/27/25 TIME 10:00 ☒ AM ☐ PM	REASON FOR SURVEY To support planning efforts associated with ~~downstream~~ ~~alternative analysis~~

Parameters to be evaluated in sampling reach	Habitat Parameter	Condition Category			
		Optimal	Suboptimal	Marginal	Poor
	1. Epifaunal Substrate/ Available Cover	Greater than 50% 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).	30-50% 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).	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
	SCORE 16	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	2. Pool Substrate Characterization	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
	SCORE 6	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	3. Pool Variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
	SCORE 18	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	4. Sediment Deposition	Little or no enlargement of islands or point bars and less than <20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80% 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 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
	SCORE 20	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
	5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
	SCORE 15	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

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

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.	
SCORE 10	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Channel Sinuosity The bends in the stream increase the stream length 3 to 4 times longer than if it was in a straight line. (Note - channel braiding is considered normal in coastal plains and other low-lying areas. This parameter is not easily rated in these areas.)	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	The bends in the stream increase the stream length 1 to 2 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.	
SCORE 4	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	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 5 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 5 (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 6 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 6 (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 4 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 4 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0

Total Score 119

Appendix H

Hydrogeomorphic Approach (HGM) Data Form

FCI Calculator for the Low-Gradient Perennial Streams in Appalachia

Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells or drop down menus. 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 2015).

Project Name: Coal River Watershed Planning Study - Lock and Dam No. 3

Location: Tornado, Kanawha County

Sampling Date: 8/27/25

Project Site Before
Project

SAR number: CR-1

**Enter Results in Section A
of the Mitigation Sufficiency
Calculator**

Functional Results Summary:

Function	Functional Capacity Index
Hydrology	0.91
Biogeochemical Cycling	0.50
Habitat	0.60

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
V _{CCANOPY}	Percent canopy over channel.	6.75	0.00
V _{EMBED}	Average embeddedness of channel.	4.93	1.00
V _{SUBSTRATE}	Median stream channel substrate particle size.	99.00	1.00
V _{BANKSTAB}	Weighted lengths of erosion by class	26.00	0.83
V _{LWD}	Number of down woody stems per 100 feet of stream.	5.00	0.36
V _{TDBH}	Average dbh of trees.	12.16	1.00
V _{TDEN}	Average Density of Trees	304.69	0.79
V _{CVALUE}	Average Coefficient of Conservatism of riparian species.	2.70	0.61
V _{FOREST}	Percent forest cover for Catchment.	87.00	1.00

Low-Gradient Perennial Streams in Appalachia Field Data Sheet and Calculator

Assessment Team:	Anju Ghimirey and Emily Hegedus			
Project Name:	Coal River Watershed Planning Study - Lock and Dam No. 3			
Location:	Tornado, Kanawha County			
SAR Number:	CR-1	Thalweg Length (ft):	300	(300 ft sug

Latitude/UTM Northing: 38.339458
Longitude/UTM Easting: -81.840929
Sampling Date: 8/27/25

Site and Timing: **Project Site** **Before Project**

Sample Variables 1-4 in stream channel

1	V _{CCANOPY}	Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure for all streams, even if cover is less than 20%.
---	----------------------	--

6.8 %

List the percent cover measurements at each point below (between 0 and 100):

10	15	5	5	5	5	5	10	5	5
10	5	10	5	5	5	5	5	5	10

2	V _{EMBED}	Average embeddedness of the stream channel. Measure at no fewer than 60 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5.
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4.93

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

[illegible]

3	$V_{\text{SUBSTRATE}}$	Median stream channel substrate particle size. Measure at no fewer than 60 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED} .
---	------------------------	---

99.00 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

[illegible]

26.0

— Check here if there is no erosion on either bank.

Length of SAR at thalweg (ft): 300

Total Weighted Erosion length (ft):	78
-------------------------------------	----

Left Stream Bank				Right Stream Bank			
Height of Erosion Category	Height Index	Length	Contribution	Height of Erosion Category	Height Index	Length	Contribution
1) 0.1 - 2 ft.	0.5	50 ft	25.0 ft	1) 0.1 - 2 ft.	0.5	50 ft	25.0 ft
2) 2.1 - 4 ft.	0.7	20 ft	14.0 ft	2) 2.1 - 4 ft.	0.7	20 ft	14.0 ft
Left Bank Erosion length:			70 ft	Right Bank Erosion length:			70 ft

5	V _{LWD}	Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire buffer: 50' from each bank and within the channel. The amount per 100 feet of stream will be calculated based on the stream reach length entered at the top of the page.
---	------------------	--

Number of downed woody stems: 15

6 V_{TDBH} Average dbh of trees. Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.

12.16 in

List the dbh measurements of individual trees (at least 4 in) within 4-6 plots placed in the buffer on each side of the stream:

Plot 1		Plot 2		Plot 3		Plot 4		Plot 5		Plot 6	
☒ Plot Used		☒ Plot Used		☒ Plot Used		☒ Plot Used		☐ Plot Used		☐ Plot Used	
☐ No Trees		☐ No Trees		☐ No Trees		☐ No Trees		☐ No Trees		☐ No Trees	
18		17		4		6					
22		7		4		7					
7		25		20		11					
16		16		19		13					
20		8		6		5					
24		5		7		18					
8		4		18		19					
9		5				9					
10		18				9					
12						17					
6						8					
						22					
Plot Average		Plot Average		Plot Average		Plot Average		Plot Average		Plot Average	
13.82 in.		11.67 in.		11.14 in.		12.00 in.					

[illegible]

Add Notes and a Site Sketch in this space:

FCI Calculator for the Low-Gradient Perennial Streams in Appalachia

Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells or drop down menus. 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 2015).

Project Name: Coal River Watershed Planning Study - Lock and Dam No. 3

Location: Tornado, Kanawha County

Sampling Date: 8/27/25

Project Site Before
Project

SAR number: CR-2

**Enter Results in Section A
of the Mitigation Sufficiency
Calculator**

Functional Results Summary:

Function	Functional Capacity Index
Hydrology	0.50
Biogeochemical Cycling	0.50
Habitat	0.65

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
V _{CCANOPY}	Percent canopy over channel.	15.75	0.00
V _{EMBED}	Average embeddedness of channel.	4.29	1.00
V _{SUBSTRATE}	Median stream channel substrate particle size.	99.00	1.00
V _{BANKSTAB}	Weighted lengths of erosion by class	104.00	0.00
V _{LWD}	Number of down woody stems per 100 feet of stream.	10.00	0.71
V _{TDBH}	Average dbh of trees.	12.22	1.00
V _{TDEN}	Average Density of Trees	296.88	0.83
V _{CVALUE}	Average Coefficient of Conservatism of riparian species.	2.70	0.61
V _{FOREST}	Percent forest cover for Catchment.	87.00	1.00

Low-Gradient Perennial Streams in Appalachia

Field Data Sheet and Calculator

Assessment Team: Anju Ghimirey and Emily Hegedus	Latitude/UTM Northing: 38.339458
Project Name: Coal River Watershed Planning Study - Lock and Dam No. 3	Longitude/UTM Easting: -81.840929
Location: Tornado, Kanawha County	Sampling Date: 8/27/25
SAR Number: CR-2 Thalweg Length (ft): 300 (300 ft suggested minimum)	
Site and Timing: Project Site Before Project	

Sample Variables 1-4 in stream channel

- 1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure for all streams, even if cover is less than 20%. 15.8 %

List the percent cover measurements at each point below (between 0 and 100):

15	15	15	10	15	15	15	15	20	15
15	20	40	10	15	15	15	15	5	15

- 2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 60 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5. 4.29

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

5	4	2	3	3	3	5	4	5	4
5	4	2	3	3	4	5	4	5	4
5	4	2	4	3	4	5	4	5	4
5	4	2	4	5	4	5	4	5	5
5	4	2	5	5	4	5	5	5	5
5	4	2	5	5	4	5	5	5	5
5	4	3	5	5	4	5	5	5	5
5	4	4	5	5	4	5	5	5	5

- 3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 60 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED} . 99.00 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

99.00	0.08	0.08	0.08	0.08	0.08	99.00	1.00	99.00	1.00
99.00	0.08	0.08	0.08	0.08	0.08	99.00	99.00	99.00	0.08
99.00	0.08	0.08	0.08	0.08	0.08	99.00	99.00	99.00	0.08
99.00	0.08	0.08	0.08	99.00	0.08	99.00	99.00	99.00	99.00
99.00	0.08	0.08	0.08	99.00	0.08	99.00	99.00	99.00	99.00
99.00	0.08	0.08	99.00	99.00	0.08	99.00	99.00	99.00	99.00
99.00	0.08	0.08	99.00	99.00	0.08	99.00	99.00	99.00	99.00
99.00	0.08	0.08	99.00	99.00	0.08	99.00	99.00	99.00	99.00

104.0

— Check here if there is no erosion on either bank.

Length of SAR at thalweg (ft): 300

Total Weighted Erosion length (ft):	312
-------------------------------------	-----

Left Stream Bank				Right Stream Bank			
Height of Erosion Category	Height Index	Length	Contribution	Height of Erosion Category	Height Index	Length	Contribution
1) 0.1 - 2 ft.	0.5	250 ft	125.0 ft	1) 0.1 - 2 ft.	0.5	290 ft	145.0 ft
2) 2.1 - 4 ft.	0.7	50 ft	35.0 ft	2) 2.1 - 4 ft.	0.7	10 ft	7.0 ft
Left Bank Erosion length:		300 ft		Right Bank Erosion length:		300 ft	

Sample Variable 5 within the entire riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

5	V _{LWD}	Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire buffer: 50' from each bank and within the channel. The amount per 100 feet of stream will be calculated based on the stream reach length entered at the top of the page.
---	------------------	--

10.0

Number of downed woody stems: 30

Sample Variable 6-8 within at least four 0.032-acre (21' radius) plots within the riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

6 V_{TDBH} Average dbh of trees. Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.

12.22 in

List the dbh measurements of individual trees (at least 4 in) within 4-6 plots placed in the buffer on each side of the stream:

Plot 1		Plot 2		Plot 3		Plot 4		Plot 5		Plot 6	
☒ Plot Used		☒ Plot Used		☒ Plot Used		☒ Plot Used		☐ Plot Used		☐ Plot Used	
☐ No Trees		☐ No Trees		☐ No Trees		☐ No Trees		☐ No Trees		☐ No Trees	
12		6		6		8					
16		12		8		9					
7		24		12		22					
8		18		8		17					
6		17		16		12					
15		22		18		12					
12		5		20		18					
6		10				6					
8				6		16					
13						5					
						12					
						14					
Plot Average		Plot Average		Plot Average		Plot Average		Plot Average		Plot Average	
10.30 in.		14.25 in.		11.75 in.		12.58 in.					

[illegible]

Add Notes and a Site Sketch in this space:

FCI Calculator for the Low-Gradient Perennial Streams in Appalachia

Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells or drop down menus. 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 2015).

Project Name: Coal River Watershed Planning Study - Lock and Dam No. 3

Location: Tornado, Kanawha County

Sampling Date: 8/27/25

Project Site Before
Project

SAR number: CR-3

**Enter Results in Section A
of the Mitigation Sufficiency
Calculator**

Functional Results Summary:

Function	Functional Capacity Index
Hydrology	0.86
Biogeochemical Cycling	0.50
Habitat	0.57

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
V _{CCANOPY}	Percent canopy over channel.	9.00	0.00
V _{EMBED}	Average embeddedness of channel.	5.00	1.00
V _{SUBSTRATE}	Median stream channel substrate particle size.	99.00	1.00
V _{BANKSTAB}	Weighted lengths of erosion by class	35.67	0.72
V _{LWD}	Number of down woody stems per 100 feet of stream.	2.00	0.14
V _{TDBH}	Average dbh of trees.	10.14	1.00
V _{TDEN}	Average Density of Trees	304.69	0.79
V _{CVALUE}	Average Coefficient of Conservatism of riparian species.	2.70	0.61
V _{FOREST}	Percent forest cover for Catchment.	87.00	1.00

Before Project

[illegible]

4

V_{BANKSTAB}

This variable is an index incorporating three elements of bank stability: 1) bank erosion length, 2) height category of eroded bank (0.1–2 ft, 2.1–4 ft, >4 ft, or artificial stabilization), and 3) length of artificial stream bank stabilization. Measure the length of the SAR along the thalweg, and enter at the top of the page. Record the length of each eroded area, using the drop down menus to select erosion class. Measure erosion on both sides of the stream. Index ranges from 0 to 200.

35.7

—

Check here if there is no erosion on either bank.

Length of SAR at thalweg (ft):

300

Total Weighted Erosion length (ft):

107

Left Stream Bank				Right Stream Bank			
Height of Erosion Category	Height Index	Length	Contri-bution	Height of Erosion Category	Height Index	Length	Contri-bution
1) 0.1 - 2 ft.	0.5	100 ft	50.0 ft	1) 0.1 - 2 ft.	0.5	100 ft	50.0 ft
2) 2.1 - 4 ft.	0.7	0 ft	0.0 ft	2) 2.1 - 4 ft.	0.7	10 ft	7.0 ft
Left Bank Erosion length:		100 ft		Right Bank Erosion length:		110 ft	

Sample Variable 5 within the entire riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

5

V_{LWD}

Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire buffer: 50' from each bank and within the channel. The amount per 100 feet of stream will be calculated based on the stream reach length entered at the top of the page.

2.0

Number of downed woody stems:

6

Sample Variable 6-8 within at least four 0.032-acre (21' radius) plots within the riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

6

V_{TDBH}

Average dbh of trees. Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.

10.14 in

List the dbh measurements of individual trees (at least 4 in) within 4-6 plots placed in the buffer on each side of the stream:

Plot 1		Plot 2		Plot 3		Plot 4		Plot 5		Plot 6	
☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☐ Plot Used	☐ Plot Used	☐ Plot Used	☐ Plot Used
☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees
20		6		9		15	12				
6		8		15		16					
12		12		6		17					
6		15		6		14					
6		12		6		17					
8		7		8		12					
9		9		11		15					
7		12				6					
15				13		6					
12						5					
						4					
						5					
Plot Average	Plot Average	Plot Average	Plot Average	Plot Average	Plot Average	Plot Average	Plot Average	Plot Average	Plot Average	Plot Average	Plot Average
10.10 in.	10.13 in.	9.25 in.	11.08 in.								

7	V _{TDEN}	Tree density, based on trees recorded for V _{TDBH} in four to six 0.032-acre plots. At least four plots must be used.						304.7
8	V _{CVALUE}	Coefficient of conservatism. The average published Coefficients of Conservatism for all native trees and all non-natives in any strata. Coefficients of Conservatism range from 0 (non-natives) to 10 (natives with high fidelity to a specific habitat). Use Drop down menus to select species, once per species. Non-natives are recorded if they occur anywhere in the riparian/buffer zone						2.70
Native Trees				Non-Natives in Any Strata				
Species	C-Value	Species	C-Value	Species	C-Value	Species	C-Value	
Acer negundo	2			Rosa multiflora	0			
Betula nigra	5			Lonicera japonica	0			
Liriodendron tulipifera	5			Microstegium vimineum	0			
Platanus occidentalis	5			Fallopia japonica	0			
Salix nigra	2							
Ulmus americana	5							
Juglans nigra	5							
Prunus serotina	3							

Add Notes and a Site Sketch in this space:

FCI Calculator for the Low-Gradient Perennial Streams in Appalachia

Go to the SAR Data Entry tab and enter site characteristics and data in the yellow cells or drop down menus. 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 2015).

Project Name: Coal River Watershed Planning Study - Lock and Dam No. 3

Location: Tornado, Kanawha County

Sampling Date: 8/27/25

Project Site Before
Project

SAR number: S1

**Enter Results in Section A
of the Mitigation Sufficiency
Calculator**

Functional Results Summary:

Function	Functional Capacity Index
Hydrology	0.50
Biogeochemical Cycling	0.52
Habitat	0.68

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
V _{CCANOPY}	Percent canopy over channel.	23.25	0.05
V _{EMBED}	Average embeddedness of channel.	4.54	1.00
V _{SUBSTRATE}	Median stream channel substrate particle size.	10.00	1.00
V _{BANKSTAB}	Weighted lengths of erosion by class	110.00	0.00
V _{LWD}	Number of down woody stems per 100 feet of stream.	12.50	0.89
V _{TDBH}	Average dbh of trees.	8.49	0.91
V _{TDEN}	Average Density of Trees	265.63	0.98
V _{CVALUE}	Average Coefficient of Conservatism of riparian species.	2.70	0.61
V _{FOREST}	Percent forest cover for Catchment.	92.00	1.00

Low-Gradient Perennial Streams in Appalachia Field Data Sheet and Calculator

Assessment Team: Anju Ghimirey and Emily Hegedus	Latitude/UTM Northing: 38.3411984
Project Name: Coal River Watershed Planning Study - Lock and Dam No. 3	Longitude/UTM Easting: -81.842165
Location: Tornado, Kanawha County	Sampling Date: 8/27/25
SAR Number: S1	Thalweg Length (ft): 80 (300 ft suggested minimum)
Site and Timing: Project Site Before Project	

Sample Variables 1-4 in stream channel

- 1 $V_{CCANOPY}$ Average percent cover over channel by tree and sapling canopy. Measure at no fewer than 10 roughly equidistant points along the stream. Measure for all streams, even if cover is less than 20%. 23.3 %

List the percent cover measurements at each point below (between 0 and 100):

30	15	30	10	15	20	30	40	20	15
30	20	40	10	15	20	30	40	20	15

- 2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 60 roughly equidistant points along the stream. Select a particle from the bed. Before moving it, determine the percentage of the surface and area surrounding the particle that is covered by fine sediment, and enter the rating according to the following table. If the bed is an artificial surface, or composed of fine sediments, use a rating score of 1. If the bed is composed of bedrock, use a rating score of 5. 4.54

Embeddedness rating for gravel, cobble and boulder particles (rescaled from Platts, Megahan, and Minshall 1983)

Rating	Rating Description
5	<5 percent of surface covered, surrounded, or buried by fine sediment (or bedrock)
4	5 to 25 percent of surface covered, surrounded, or buried by fine sediment
3	26 to 50 percent of surface covered, surrounded, or buried by fine sediment
2	51 to 75 percent of surface covered, surrounded, or buried by fine sediment
1	>75 percent of surface covered, surrounded, or buried by fine sediment (or artificial surface)

List the ratings at each point below:

5	4	5	4	3	3	5	4	5	4
5	4	5	5	3	4	5	4	5	4
5	4	4	5	3	4	5	4	5	4
5	4	4	5	5	4	5	4	5	5
5	4	4	5	5	4	5	5	5	5
5	4	4	5	5	4	5	5	5	5
5	4	4	5	5	4	5	5	5	5
5	4	4	5	5	4	5	5	5	5

- 3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 60 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED} . 10.00 in

Enter particle size in inches to the nearest 0.1 inch at each point below (bedrock should be counted as 99 in, asphalt or concrete as 0.0 in, sand or finer particles as 0.08 in):

20.00	0.08	30.00	0.08	0.08	0.08	12.00	0.08	29.00	0.08
12.00	0.08	34.00	20.00	0.08	0.08	20.00	0.08	40.00	0.08
8.00	0.08	0.08	20.00	0.08	0.08	15.00	0.08	30.00	0.08
18.00	0.08	0.08	12.00	20.00	0.08	15.00	0.08	20.00	8.00
20.00	0.08	0.08	8.00	22.00	0.08	16.00	22.00	24.00	12.00
20.00	0.08	0.08	8.00	40.00	0.08	17.00	24.00	12.00	20.00
24.00	0.08	0.08	10.00	30.00	0.08	18.00	26.00	10.00	16.00
30.00	0.08	0.08	7.00	24.00	0.08	20.00	20.00	8.00	18.00

4

V_{BANKSTAB}

This variable is an index incorporating three elements of bank stability: 1) bank erosion length, 2) height category of eroded bank (0.1–2 ft, 2.1–4 ft, >4 ft, or artificial stabilization), and 3) length of artificial stream bank stabilization. Measure the length of the SAR along the thalweg, and enter at the top of the page. Record the length of each eroded area, using the drop down menus to select erosion class. Measure erosion on both sides of the stream. Index ranges from 0 to 200.

110.0

—

Check here if there is no erosion on either bank.

Length of SAR at thalweg (ft):

80

Total Weighted Erosion length (ft):

88

Left Stream Bank				Right Stream Bank			
Height of Erosion Category	Height Index	Length	Contri-bution	Height of Erosion Category	Height Index	Length	Contri-bution
1) 0.1 - 2 ft.	0.5	60 ft	30.0 ft	1) 0.1 - 2 ft.	0.5	60 ft	30.0 ft
2) 2.1 - 4 ft.	0.7	20 ft	14.0 ft	2) 2.1 - 4 ft.	0.7	20 ft	14.0 ft
Left Bank Erosion length:		80 ft		Right Bank Erosion length:		80 ft	

Sample Variable 5 within the entire riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

5

V_{LWD}

Number of down woody stems (at least 4 inches in diameter and 36 inches in length) per 100 feet of stream reach. Enter the number from the entire buffer: 50' from each bank and within the channel. The amount per 100 feet of stream will be calculated based on the stream reach length entered at the top of the page.

12.5

Number of downed woody stems:

10

Sample Variable 6-8 within at least four 0.032-acre (21' radius) plots within the riparian/buffer zone adjacent to the stream channel (50 feet from each bank).

6

V_{TDBH}

Average dbh of trees. Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.

8.49 in

List the dbh measurements of individual trees (at least 4 in) within 4-6 plots placed in the buffer on each side of the stream:

Plot 1		Plot 2		Plot 3		Plot 4		Plot 5		Plot 6	
☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☒ Plot Used	☐ Plot Used	☐ Plot Used	☐ Plot Used	☐ Plot Used
☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees	☐ No Trees
6		5		5		5					
6		5		6		12					
5		18		7		5					
16		12		12		5					
12		8		15		6					
8		7		14		7					
7		5		6		8					
5		10				11					
9											
15											
5											
Plot Average		Plot Average		Plot Average		Plot Average		Plot Average		Plot Average	
8.55 in.		8.75 in.		9.29 in.		7.38 in.					

[illegible]

Add Notes and a Site Sketch in this space:

Appendix I

West Virginia Stream Condition Index (WVSCI) Macroinvertebrate Counts and Score Calculations

**West Virginia Stream Condition Index (WVSCI) and
Macroinvertebrate Sample Composition to Family Level**

COAL RIVER DAM LOCK AND DAM NO. 3					
WEST VIRGINIA STREAM CONDITION INDEX	Stream 1	Coal River Reach 1	Coal River Reach 2	Coal River Reach 3	Standard
TOTAL WVSCI SCORE	65.83	37.27	83.31	93.39	
% 2 Dominant Taxa	63	86	50	64	51.88
% Chironomidae	44	71	25	38	27.02
% EPT	19	7	38	46	44.86
HBI	5.38	5.71	4.13	5.21	4.29
# EPT Taxa	2	1	2	5	4.55
# Total Taxa	7	4	6	10	9.55

MACROINVERTEBRATE COUNTS							
Macroinvertebrate Taxa	Life Stage	WAB Tolerance Value	Stream 1	Coal River Reach 1	Coal River Reach 2	Coal River Reach 3	Total
INSECTA							
EPHEMEROPTERA (MAYFLIES)							
Heptageniidae	larvae	4	1	0	2	3	6
Caenidae	larvae	7	0	0	0	0	0
Ephemeridae	larvae	4	0	0	0	1	1
Ameletidae	larvae	0	0	1	0	0	1
Baetidae	larvae	4	2	0	0	2	4
Leptophlebiidae	larvae	2	0	0	0	0	0
PLECOPTERA (STONEFLIES)							
Perlidae	larvae	1	0	0	0	2	2
Leuctridae	larvae	3	0	0	0	0	0
Nemouridae	larvae	2	0	0	0	0	0
Chloroperlidae	larvae	1	0	0	0	0	0
Perlodidae	larvae	2	0	0	0	0	0
TRICHOPTERA (CADDISFLIES)							
Molannidae	larvae	6	0	0	0	0	0
Hydropsychidae	larvae	5	0	0	1	10	11
Lepidostomatidae	larvae	1	0	0	0	0	0
Limnephilidae	larvae	4	0	0	0	0	0
Philopotamidae	larvae	6	0	0	0	0	0
Dipseudopsidae	larvae	6	0	0	0	0	0
COLEOPTERA (BEETLES)							
Hydrophilidae	larvae	5	0	0	0	0	0
Psephenidae	larvae	4	0	0	0	0	0
Elmidae	larvae	4	1	0	1	1	3
	mature	4	0	0	0	0	0
Dytiscidae	mature	5	3	0	0	0	3
Chrysomelidae	larvae	5	0	0	0	0	0
ODONATA (DRAGONFLIES AND DAMSELFLIES)							
Gomphidae	larvae	1	0	0	1	0	1
Coenagrionidae	larvae	9	1	0	0	0	1
Cordulegastridae	larvae	3	0	0	0	0	0
LEPIDOPTERA (AQUATIC MOTHS)							
Crambidae	larvae	6	0	0	0	0	0
MEGALOPTERA (FISHFLIES AND ALDERFLIES)							
Corydalidae	larvae	5	0	0	0	1	1
Sialidae	larvae	4	0	0	0	2	2
HEMIPTERA (TRUE BUGS)							
Gerridae	mature	8	0	0	0	0	0

**West Virginia Stream Condition Index (WVSCI) and
Macroinvertebrate Sample Composition to Family Level**

DIPTERA (TRUE FLIES)							
Tipulidae	larvae	3	0	0	1	0	1
	pupae	3	0	0	0	0	0
Tabanidae	larvae	6	0	0	0	0	0
Athericidae	larvae	2	0	0	0	0	0
Sciomyzidae	larvae	10	0	0	0	0	0
Empididae	larvae	6	0	0	0	0	0
Culicidae	pupae	8	0	0	0	0	0
Ceratopogonidae	larvae	6	0	0	0	0	0
Muscidae	larvae	8	0	0	0	0	0
Simuliidae	larvae	6	0	0	0	0	0
Chironomidae	larvae	6	7	10	2	15	34
NON-INSECTA							
GASTROPODA - Physidae	mature	8	0	0	0	0	0
GASTROPODA - Planorbidae	mature	7	0	0	0	0	0
BIVALVIA - Sphaeriidae	mature	8	0	0	0	0	0
BIVALVIA - Corbiculidae	mature	8	0	0	0	0	0
ANNELIDA - Hirudinae	mature	10	0	0	0	0	
ANNELIDA - Oligochaeta	mature	10	0	1	0	2	3
AMPHIPODA - Gammaridae	mature	4	1	0	0	0	1
NEMATODA	mature	5	0	2	0	0	2
DECAPODA - Cambaridae	mature	5	0	0	0	0	0
SAMPLE TOTAL			16	14	8	39	77

Appendix J

Stream and Wetland Valuation Metric (SWVM) Data Forms

Streams Parts I-II

West Virginia Stream and Wetland Valuation Metric (SWVM) 9-15-25

USACE FILE NO./ Project Name: (Version 7-30-24)			Coal River Lock and Dam No. 3			IMPACT COORDINATES: (in Decimal Degrees)		Lat.	38.339458		Lon.	-81.840929		WEATHER:		Clear, 70 degrees F		DATE:		August 27, 2025							
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)				Coal River Sampling Reach 1						MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)				Test stream				PRECIPITATION PAST 48 HRS:		0							
STREAM IMPACT LENGTH (ft):		300		FORM OF MITIGATION:		RESTORATION (Levels I-III)		MIT COORDINATES: (in Decimal Degrees)		Lat.	N/A		Lon.	N/A		COMMENTS:		No mitigation proposed at this time - baseline conditions assessment only		STREAM MITIGATION LENGTH (ft):							
DRAINAGE AREA (mi²)		862								MITIGATION DRAINAGE AREA (mi²):																	
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:		Perennial		Stream Classification:		Perennial		Stream Classification:		Perennial		Stream Classification:		Perennial		Stream Classification:		Perennial					
Percent Stream Channel Slope:		2		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4					
PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators											
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):											
Low-Gradient Perennial Streams				Low-Gradient Perennial Streams				Low-Gradient Perennial Streams				Low-Gradient Perennial Streams				Low-Gradient Perennial Streams											
		Average				Average				Average				Average				Average				Average					
Hydrology (0-1)		0.91				0.1				0.2				0.5				0.8				0.667					
Biogeochemical Cycling (0-1)		0.5				0.1				0.2				0.5				0.8				0.667					
Habitat (0-1)		0.6				0.1				0.2				0.2				0.4				0.4					
PHYSICAL INDICATOR				PHYSICAL INDICATOR				PHYSICAL INDICATOR				PHYSICAL INDICATOR				PHYSICAL INDICATOR											
		Points Scale		Range		Site Score				Points Scale		Range		Site Score				Points Scale		Range		Site Score					
USEPA RBP (Low Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)											
1. Epifaunal Substrate/Available Cover		0-20				2		1. Epifaunal Substrate/Available Cover		0-20				4		1. Epifaunal Substrate/Available Cover		0-20				20					
2. Pool Substrate Characterization		0-20				2		2. Embeddedness		0-20				4		2. Embeddedness		0-20				8					
3. Pool Variability		0-20				12		3. Velocity/ Depth Regime		0-20				4		3. Velocity/ Depth Regime		0-20				20					
4. Sediment Deposition		0-20				18		4. Sediment Deposition		0-20				4		4. Sediment Deposition		0-20				20					
5. Channel Flow Status		0-20				20		5. Channel Flow Status		0-20				4		5. Channel Flow Status		0-20				20					
6. Channel Alteration		0-20				15		6. Channel Alteration		0-20		0-1		4		6. Channel Alteration		0-20		0-1		20					
7. Channel Sinuosity		0-20				2		7. Frequency of Riffles (or bends)		0-20				4		7. Frequency of Riffles (or bends)		0-20				20					
8. Bank Stability (LB & RB)		0-20				16		8. Bank Stability (LB & RB)		0-20				4		8. Bank Stability (LB & RB)		0-20				15					
9. Vegetative Protection (LB & RB)		0-20				19		9. Vegetative Protection (LB & RB)		0-20				4		9. Vegetative Protection (LB & RB)		0-20				15					
10. Riparian Vegetative Zone Width (LB & RB)		0-20				12		10. Riparian Vegetative Zone Width (LB & RB)		0-20				4		10. Riparian Vegetative Zone Width (LB & RB)		0-20				15					
Total RBP Score		Suboptimal				118		Total RBP Score		Poor				40		Total RBP Score		Marginal				60					
PHYSICAL INDICATOR SUBTOTAL				RBP				0.100				PHYSICAL INDICATOR SUBTOTAL				RBP				0.200							
CHEMICAL INDICATOR (Not used for Ephemeral Streams)				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.) Set to 0 for Establishment Mitigation.				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.)				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.)				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.)				CHEMICAL INDICATOR (Set to 0 for Ephemeral Streams. Data must be entered for Intermittent and Perennial Streams. No default values.)							
Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)							
☒ Default values not used. Stream has associated collected water quality data																											
Specific Conductivity (µS/cm)								Specific Conductivity (µS/cm)								Specific Conductivity (µS/cm)											
1000-1499 = 20 points		0-90				1020		<100 = 90 points		0-90				3		<100 = 90 points		0-90				8					
pH								pH								6		pH									
6.00-8.00 = 80 points		0-80				7.98		<3.60 = 0 points		0-80				4		6.00-8.00 = 80 points		0-80				6					
Dissolved Oxygen (DO) (mg/L)								Dissolved Oxygen (DO) (mg/L)								5		Dissolved Oxygen (DO) (mg/L)									
5 or greater = 30 points		0-30				10.03		0.1 - 4.9 = 10 points		0-30				5		5 or greater = 30 points		0-30				6					
CHEMICAL INDICATOR SUBTOTAL								0.500				CHEMICAL INDICATOR SUBTOTAL				0.625				CHEMICAL INDICATOR SUBTOTAL				1.000			
BIOLOGICAL INDICATOR (Not used for Ephemeral Streams)				☒ Enter Data. Do not use Default values.				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams) Set to 0 for Establishment Mitigation.				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)							
WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)							
WVSCI Score		0-100		0-1		37.27		WVSCI Score		0-100		0-1		30		WVSCI Score		0-100		0-1		75					
BIOLOGICAL INDICATOR SUBTOTAL								0.300				BIOLOGICAL INDICATOR SUBTOTAL				0.500				BIOLOGICAL INDICATOR SUBTOTAL				0.750			
PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score							
		Index		Stream Length		Unit Score				Index		Stream Length		Unit Score				Index		Stream Length		Unit Score					
Total Index		0.604		300		181.2		Total Index		0.200		N/A		N/A		Total Index		0.321		N/A		N/A					

		Index		Stream Length		Unit Score	
Total Index		0.794		N/A		N/A	

Streams Parts I-II

West Virginia Stream and Wetland Valuation Metric (SWVM) 9-15-25

USACE FILE NO./ Project Name: (Version 7-30-24)			Coal River Lock and Dam No. 3			IMPACT COORDINATES: (in Decimal Degrees)		Lat.	38.343813		Lon.	-81.841411		WEATHER:		Clear, 70 degrees F		DATE:		August 27, 2025																																			
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)				Coal River Sampling Reach 2				MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)				Test stream				PRECIPITATION PAST 48 HRS:		0																																					
STREAM IMPACT LENGTH (ft):		300		FORM OF MITIGATION:		RESTORATION (Levels I-III)		MIT COORDINATES: (in Decimal Degrees)		Lat.	N/A		Lon.	N/A		COMMENTS:		No mitigation proposed at this time - baseline conditions assessment only		STREAM MITIGATION LENGTH (ft):																																			
DRAINAGE AREA (mi ²)		862																		MITIGATION DRAINAGE AREA (mi ²):																																			
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:		Perennial		Stream Classification:		Perennial		Stream Classification:		Perennial		Stream Classification:		Perennial		Stream Classification:		Perennial																																	
Percent Stream Channel Slope:		2		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4																																	
PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators																																							
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):																																							
Low-Gradient Perennial Streams				Low-Gradient Perennial Streams				Low-Gradient Perennial Streams				Low-Gradient Perennial Streams				Low-Gradient Perennial Streams																																							
		Average				Average				Average				Average				Average				Average																																	
Hydrology (0-1)		0.5				0.1				0.2				0.5				0.8				0.667																																	
Biogeochemical Cycling (0-1)		0.5				0.1				0.2				0.5				0.8				0.667																																	
Habitat (0-1)		0.65				0.1				0.2				0.2				0.4				0.4																																	
PHYSICAL INDICATOR				PHYSICAL INDICATOR				PHYSICAL INDICATOR				PHYSICAL INDICATOR				PHYSICAL INDICATOR																																							
		Points Scale		Range		Site Score				Points Scale		Range		Site Score				Points Scale		Range		Site Score																																	
USEPA RBP (Low Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)																																							
1. Epifaunal Substrate/Available Cover		0-20				5		1. Epifaunal Substrate/Available Cover		0-20				4		1. Epifaunal Substrate/Available Cover		0-20				20																																	
2. Pool Substrate Characterization		0-20				8		2. Embeddedness		0-20				4		2. Embeddedness		0-20				8																																	
3. Pool Variability		0-20				15		3. Velocity/ Depth Regime		0-20				4		3. Velocity/ Depth Regime		0-20				20																																	
4. Sediment Deposition		0-20				17		4. Sediment Deposition		0-20				4		4. Sediment Deposition		0-20				20																																	
5. Channel Flow Status		0-20				20		5. Channel Flow Status		0-20				4		5. Channel Flow Status		0-20				20																																	
6. Channel Alteration		0-20				18		6. Channel Alteration		0-20		0-1		4		6. Channel Alteration		0-20		0-1		20																																	
7. Channel Sinuosity		0-20				3		7. Frequency of Riffles (or bends)		0-20				4		7. Frequency of Riffles (or bends)		0-20				20																																	
8. Bank Stability (LB & RB)		0-20				18		8. Bank Stability (LB & RB)		0-20				4		8. Bank Stability (LB & RB)		0-20				15																																	
9. Vegetative Protection (LB & RB)		0-20				20		9. Vegetative Protection (LB & RB)		0-20				4		9. Vegetative Protection (LB & RB)		0-20				15																																	
10. Riparian Vegetative Zone Width (LB & RB)		0-20				12		10. Riparian Vegetative Zone Width (LB & RB)		0-20				4		10. Riparian Vegetative Zone Width (LB & RB)		0-20				15																																	
Total RBP Score		Suboptimal				136		Total RBP Score		Poor				40		Total RBP Score		Marginal				60																																	
PHYSICAL INDICATOR SUBTOTAL				0.680				PHYSICAL INDICATOR SUBTOTAL				RBP				0.100				PHYSICAL INDICATOR SUBTOTAL				RBP				0.200				PHYSICAL INDICATOR SUBTOTAL				RBP				0.300				PHYSICAL INDICATOR SUBTOTAL				RBP				0.865			
CHEMICAL INDICATOR (Not used for Ephemeral Streams)				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.) Set to 0 for Establishment Mitigation.				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.)				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.)				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.)				CHEMICAL INDICATOR (Set to 0 for Ephemeral Streams. Data must be entered for Intermittent and Perennial Streams. No default values.)																																			
Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)																																			
☒ Default values not used. Stream has associated collected water quality data																																																							
Specific Conductivity (µS/cm)								Specific Conductivity (µS/cm)								Specific Conductivity (µS/cm)								Specific Conductivity (µS/cm)								Specific Conductivity (µS/cm)																							
750-999 = 30 points		0-90				980		<100 = 90 points		0-90				2		<100 = 90 points		0-90				6		<100 = 90 points		0-90				8		<100 = 90 points		0-90																					
pH								pH								3		pH						4		pH						5		pH																					
6.00-8.00 = 80 points		0-80				7.98		<3.60 = 0 points		0-80		0-1		3		3.60-4.50 = 5 points		0-80		0-1		4		6.00-8.00 = 80 points		0-80		0-1		6		6.00-8.00 = 80 points		0-80		0-1		6																	
Dissolved Oxygen (DO) (mg/L)								Dissolved Oxygen (DO) (mg/L)								5		Dissolved Oxygen (DO) (mg/L)						6		Dissolved Oxygen (DO) (mg/L)						6		Dissolved Oxygen (DO) (mg/L)																					
5 or greater = 30 points		0-30				7.98		0.1 - 4.9 = 10 points		0-30				4		5 or greater = 30 points		0-30				5		5 or greater = 30 points		0-30				6		5 or greater = 30 points		0-30				6																	
CHEMICAL INDICATOR SUBTOTAL				0.700				CHEMICAL INDICATOR SUBTOTAL				0.500				CHEMICAL INDICATOR SUBTOTAL				0.625				CHEMICAL INDICATOR SUBTOTAL				1.000				CHEMICAL INDICATOR SUBTOTAL				1.000																			
BIOLOGICAL INDICATOR (Not used for Ephemeral Streams)				☒ Enter Data. Do not use Default values.				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams) Set to 0 for Establishment Mitigation.				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)																															
WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)				WV Stream Condition Index (WVSCI)																															
WVSCI Score		0-100		0-1		83.31		WVSCI Score		0-100		0-1		30		WVSCI Score		0-100		0-1		50		WVSCI Score		0-100		0-1		75		WVSCI Score		0-100		0-1		90																	
BIOLOGICAL INDICATOR SUBTOTAL				0.833				BIOLOGICAL INDICATOR SUBTOTAL				0.300				BIOLOGICAL INDICATOR SUBTOTAL				0.500				BIOLOGICAL INDICATOR SUBTOTAL				0.750				BIOLOGICAL INDICATOR SUBTOTAL				0.900																			
PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score																															
		Index		Stream Length		Unit Score				Index		Stream Length		Unit Score				Index		Stream Length		Unit Score				Index		Stream Length		Unit Score				Index		Stream Length		Unit Score																	
Total Index		0.644		300		193.2		Total Index		0.200		N/A		N/A		Total Index		0.321		N/A		N/A		Total Index		0.542		N/A		N/A		Total Index		0.794		N/A		N/A																	

Streams Parts I-II

West Virginia Stream and Wetland Valuation Metric (SWVM) 9-15-25

USACE FILE NO./ Project Name: (Version 7-30-24)			Coal River Lock and Dam No. 3			IMPACT COORDINATES: (in Decimal Degrees)		Lat.	38.342196		Lon.	-81.84158		WEATHER:		Clear, 70 degrees F		DATE:		August 27, 2025																											
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)				Coal River Sampling Reach 3				MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)				Test stream				PRECIPITATION PAST 48 HRS:		0																													
STREAM IMPACT LENGTH (ft):		300		FORM OF MITIGATION:		RESTORATION (Levels I-III)		MIT COORDINATES: (in Decimal Degrees)		Lat.	N/A		Lon.	N/A		COMMENTS:		No mitigation proposed at this time - baseline conditions assessment only		STREAM MITIGATION LENGTH (ft):																											
DRAINAGE AREA (mi²)		862																		MITIGATION DRAINAGE AREA (mi²):																											
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:		Perennial		Stream Classification:		Perennial		Stream Classification:		Perennial		Stream Classification:		Perennial		Stream Classification:		Perennial																									
Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4		Percent Stream Channel Slope:		4																									
PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators				PART I - HGM, Physical, Chemical and Biological Indicators																															
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):																															
Low-Gradient Perennial Streams				Low-Gradient Perennial Streams				Low-Gradient Perennial Streams				Low-Gradient Perennial Streams				Low-Gradient Perennial Streams																															
		Average				Average				Average				Average				Average				Average																									
Hydrology (0-1)		0.86		0.1		0.1		0.1		0.2		0.2		0.2		0.5		0.4		0.8		0.667																									
Biogeochemical Cycling (0-1)		0.5		0.1		0.1		0.1		0.2		0.2		0.2		0.5		0.5		0.8		0.8																									
Habitat (0-1)		0.57		0.1		0.1		0.1		0.2		0.2		0.2		0.2		0.2		0.4		0.4																									
PHYSICAL INDICATOR				PHYSICAL INDICATOR				PHYSICAL INDICATOR				PHYSICAL INDICATOR				PHYSICAL INDICATOR																															
		Points Scale		Range		Site Score				Points Scale		Range		Site Score				Points Scale		Range		Site Score																									
USEPA RBP (Low Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)				USEPA RBP (High Gradient Data Sheet)																															
1. Epifaunal Substrate/Available Cover		0-20		0-1		8		1. Epifaunal Substrate/Available Cover		0-20		0-1		2		1. Epifaunal Substrate/Available Cover		0-20		0-1		20																									
2. Pool Substrate Characterization		0-20		0-1		11		2. Embeddedness		0-20		0-1		2		2. Embeddedness		0-20		0-1		8																									
3. Pool Variability		0-20		0-1		6		3. Velocity/ Depth Regime		0-20		0-1		2		3. Velocity/ Depth Regime		0-20		0-1		20																									
4. Sediment Deposition		0-20		0-1		17		4. Sediment Deposition		0-20		0-1		2		4. Sediment Deposition		0-20		0-1		20																									
5. Channel Flow Status		0-20		0-1		20		5. Channel Flow Status		0-20		0-1		2		5. Channel Flow Status		0-20		0-1		20																									
6. Channel Alteration		0-20		0-1		18		6. Channel Alteration		0-20		0-1		2		6. Channel Alteration		0-20		0-1		20																									
7. Channel Sinuosity		0-20		0-1		3		7. Frequency of Riffles (or bends)		0-20		0-1		2		7. Frequency of Riffles (or bends)		0-20		0-1		20																									
8. Bank Stability (LB & RB)		0-20		0-1		18		8. Bank Stability (LB & RB)		0-20		0-1		2		8. Bank Stability (LB & RB)		0-20		0-1		15																									
9. Vegetative Protection (LB & RB)		0-20		0-1		20		9. Vegetative Protection (LB & RB)		0-20		0-1		2		9. Vegetative Protection (LB & RB)		0-20		0-1		15																									
10. Riparian Vegetative Zone Width (LB & RB)		0-20		0-1		12		10. Riparian Vegetative Zone Width (LB & RB)		0-20		0-1		2		10. Riparian Vegetative Zone Width (LB & RB)		0-20		0-1		15																									
Total RBP Score		Suboptimal				133		Total RBP Score		Poor				20		Total RBP Score		Marginal				60																									
PHYSICAL INDICATOR SUBTOTAL				RBP				0.665				PHYSICAL INDICATOR SUBTOTAL				RBP				0.200				PHYSICAL INDICATOR SUBTOTAL				RBP				0.300				PHYSICAL INDICATOR SUBTOTAL				RBP				0.865			
CHEMICAL INDICATOR (Not used for Ephemeral Streams)				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.) Set to 0 for Establishment Mitigation.				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.) Set to 0 for Establishment Mitigation.				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.) Set to 0 for Establishment Mitigation.				CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.) Set to 0 for Establishment Mitigation.				CHEMICAL INDICATOR (Set to 0 for Ephemeral Streams. Data must be entered for Intermittent and Perennial Streams. No default values.) Set to 0 for Establishment Mitigation.				CHEMICAL INDICATOR (Set to 0 for Ephemeral Streams. Data must be entered for Intermittent and Perennial Streams. No default values.) Set to 0 for Establishment Mitigation.																							
Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)				Basic Water Quality Indicators (BWQ)																											
☐ Default values not used. Stream has associated collected water quality data				☐ Default values not used. Stream has associated collected water quality data				☐ Default values not used. Stream has associated collected water quality data				☐ Default values not used. Stream has associated collected water quality data				☐ Default values not used. Stream has associated collected water quality data				☐ Default values not used. Stream has associated collected water quality data																											
Specific Conductivity (µS/cm)		0-90		0-1		N/A		Specific Conductivity (µS/cm)		0-90		0-1		2		Specific Conductivity (µS/cm)		0-90		0-1		8																									
Assumed Value = 85 pts		0-90		0-1		N/A		<100 = 90 points		0-90		0-1		3		<100 = 90 points		0-90		0-1		6																									
pH		0-80		0-1		N/A		pH		0-80		0-1		4		pH		0-80		0-1		6																									
Assumed Value = 45 pts		0-80		0-1		N/A		<3.60 = 0 points		0-80		0-1		5		6.00-8.00 = 80 points		0-80		0-1		6																									
Dissolved Oxygen (DO) (mg/L)		0-30		0-1		N/A		Dissolved Oxygen (DO) (mg/L)		0-30		0-1		5		Dissolved Oxygen (DO) (mg/L)		0-30		0-1		6																									
Assumed Value = 30 pts		0-30		0-1		N/A		0.1 - 4.9 = 10 points		0-30		0-1		4		5 or greater = 30 points		0-30		0-1		6																									
CHEMICAL INDICATOR SUBTOTAL				0.800				CHEMICAL INDICATOR SUBTOTAL				0.500				CHEMICAL INDICATOR SUBTOTAL				0.625				CHEMICAL INDICATOR SUBTOTAL				1.000				CHEMICAL INDICATOR SUBTOTAL				1.000											
BIOLOGICAL INDICATOR (Not used for Ephemeral Streams)				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams) Set to 0 for Establishment Mitigation.				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams) Set to 0 for Establishment Mitigation.				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams) Set to 0 for Establishment Mitigation.				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams) Set to 0 for Establishment Mitigation.				BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams) Set to 0 for Establishment Mitigation.																											
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)				WV Stream Condition Index (WVSCI)																											
WVSCI Score		0-100		0-1		93.39		WVSCI Score		0-100		0-1		30		WVSCI Score		0-100		0-1		50																									
BIOLOGICAL INDICATOR SUBTOTAL				0.934				BIOLOGICAL INDICATOR SUBTOTAL				0.300				BIOLOGICAL INDICATOR SUBTOTAL				0.500				BIOLOGICAL INDICATOR SUBTOTAL				0.750				BIOLOGICAL INDICATOR SUBTOTAL				0.900											
PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score				PART II - Index and Unit Score																											
		Index		Stream Length		Unit Score				Index		Stream Length		Unit Score				Index		Stream Length		Unit Score																									
Total Index		0.721		300		216.3		Total Index		0.200		N/A		N/A		Total Index		0.542		N/A		N/A																									
Total Index		0.794		N/A		N/A		Total Index		0.321		N/A		N/A		Total Index		0.542		N/A		N/A																									

Streams Parts I-II

West Virginia Stream and Wetland Valuation Metric (SWVM) 9-15-25

USACE FILE NO./ Project Name: (Version 7-30-24)			Coal River Lock and Dam No. 3			IMPACT COORDINATES: (in Decimal Degrees)		Lat.	38.341164		Lon.	-81.842198		WEATHER:		Clear, 70 degrees F		DATE:		August 27, 2025									
IMPACT STREAM/SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)					Stream 1 (Falls Creek)					MITIGATION STREAM CLASS./SITE ID AND SITE DESCRIPTION: (watershed size (acreage), unaltered or impairments)					Test stream					PRECIPITATION PAST 48 HRS:		0							
STREAM IMPACT LENGTH (ft):		80		FORM OF MITIGATION:		RESTORATION (Levels I-III)		MIT COORDINATES: (in Decimal Degrees)		Lat.	N/A		Lon.	N/A		COMMENTS:		No mitigation proposed at this time - baseline conditions assessment only		STREAM MITIGATION LENGTH (ft):									
DRAINAGE AREA (mi ²)		3.92																		MITIGATION DRAINAGE AREA (mi ²):									
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:		Perennial			Stream Classification:		Perennial			Stream Classification:		Perennial			Stream Classification:		Perennial							
Percent Stream Channel Slope:		3			Percent Stream Channel Slope:		4			Percent Stream Channel Slope:		4			Percent Stream Channel Slope:		4			Percent Stream Channel Slope:		4							
PART I - HGM, Physical, Chemical and Biological Indicators					PART I - HGM, Physical, Chemical and Biological Indicators					PART I - HGM, Physical, Chemical and Biological Indicators					PART I - HGM, Physical, Chemical and Biological Indicators					PART I - HGM, Physical, Chemical and Biological Indicators									
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):									
Low-Gradient Perennial Streams					Low-Gradient Perennial Streams					Low-Gradient Perennial Streams					Low-Gradient Perennial Streams					Low-Gradient Perennial Streams									
				Average					Average					Average					Average										
Hydrology (0-1)		0.5		0.567		Hydrology (0-1)		0.1		0.1		Hydrology (0-1)		0.2		0.2		Hydrology (0-1)		0.5		0.667							
Biogeochemical Cycling (0-1)		0.52				Biogeochemical Cycling (0-1)		0.1				Biogeochemical Cycling (0-1)		0.2				Biogeochemical Cycling (0-1)		0.5									
Habitat (0-1)		0.68				Habitat (0-1)		0.1				Habitat (0-1)		0.2				Habitat (0-1)		0.2									
PHYSICAL INDICATOR					PHYSICAL INDICATOR					PHYSICAL INDICATOR					PHYSICAL INDICATOR					PHYSICAL INDICATOR									
				Points Scale	Range	Site Score					Points Scale	Range	Site Score					Points Scale	Range	Site Score					Points Scale	Range	Site Score		
USEPA RBP (Low Gradient Data Sheet)					USEPA RBP (High Gradient Data Sheet)					USEPA RBP (High Gradient Data Sheet)					USEPA RBP (High Gradient Data Sheet)					USEPA RBP (High Gradient Data Sheet)									
1. Epifaunal Substrate/Available Cover		0-20		0-1		1. Epifaunal Substrate/Available Cover		0-20		0-1		1. Epifaunal Substrate/Available Cover		0-20		0-1		1. Epifaunal Substrate/Available Cover		0-20		0-1							
2. Pool Substrate Characterization		0-20				2. Embeddedness		0-20				2. Embeddedness		0-20				2. Embeddedness		0-20				2. Embeddedness		0-20			
3. Pool Variability		0-20				3. Velocity/ Depth Regime		0-20				3. Velocity/ Depth Regime		0-20				3. Velocity/ Depth Regime		0-20				3. Velocity/ Depth Regime		0-20			
4. Sediment Deposition		0-20				4. Sediment Deposition		0-20				4. Sediment Deposition		0-20				4. Sediment Deposition		0-20				4. Sediment Deposition		0-20			
5. Channel Flow Status		0-20				5. Channel Flow Status		0-20				5. Channel Flow Status		0-20				5. Channel Flow Status		0-20				5. Channel Flow Status		0-20			
6. Channel Alteration		0-20				6. Channel Alteration		0-20				6. Channel Alteration		0-20				6. Channel Alteration		0-20				6. Channel Alteration		0-20			
7. Channel Sinuosity		0-20				7. Frequency of Riffles (or bends)		0-20				7. Frequency of Riffles (or bends)		0-20				7. Frequency of Riffles (or bends)		0-20				7. Frequency of Riffles (or bends)		0-20			
8. Bank Stability (LB & RB)		0-20				8. Bank Stability (LB & RB)		0-20				8. Bank Stability (LB & RB)		0-20				8. Bank Stability (LB & RB)		0-20				8. Bank Stability (LB & RB)		0-20			
9. Vegetative Protection (LB & RB)		0-20				9. Vegetative Protection (LB & RB)		0-20				9. Vegetative Protection (LB & RB)		0-20				9. Vegetative Protection (LB & RB)		0-20				9. Vegetative Protection (LB & RB)		0-20			
10. Riparian Vegetative Zone Width (LB & RB)		0-20				10. Riparian Vegetative Zone Width (LB & RB)		0-20				10. Riparian Vegetative Zone Width (LB & RB)		0-20				10. Riparian Vegetative Zone Width (LB & RB)		0-20				10. Riparian Vegetative Zone Width (LB & RB)		0-20			
Total RBP Score		Suboptimal		119		Total RBP Score		Poor		20		Total RBP Score		Marginal		60		Total RBP Score		Optimal		173							
PHYSICAL INDICATOR SUBTOTAL				0.595		PHYSICAL INDICATOR SUBTOTAL				RBP		0.100		PHYSICAL INDICATOR SUBTOTAL				RBP		0.200		PHYSICAL INDICATOR SUBTOTAL				RBP		0.300	
CHEMICAL INDICATOR (Not used for Ephemeral Streams)					CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.) Set to 0 for Establishment Mitigation.					CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.)					CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.)					CHEMICAL INDICATOR (Data must be entered for Intermittent and Perennial Streams. No default values.)									
Basic Water Quality Indicators (BWQ)					Basic Water Quality Indicators (BWQ)					Basic Water Quality Indicators (BWQ)					Basic Water Quality Indicators (BWQ)					Basic Water Quality Indicators (BWQ)									
☒ Default values not used. Stream has associated collected water quality data																													
Specific Conductivity (µS/cm)		<100 = 90 points		0-1		Specific Conductivity (µS/cm)		<100 = 90 points		0-1		Specific Conductivity (µS/cm)		<100 = 90 points		0-1		Specific Conductivity (µS/cm)		<100 = 90 points		0-1							
pH		0-90				pH		0-90				pH		0-90				pH		0-90									
6.00-8.00 = 80 points		0-80				6.00-8.00 = 80 points		0-80				6.00-8.00 = 80 points		0-80				6.00-8.00 = 80 points		0-80									
Dissolved Oxygen (DO) (mg/L)		5 or greater = 30 points				Dissolved Oxygen (DO) (mg/L)		0.1 - 4.9 = 10 points				0-30		Dissolved Oxygen (DO) (mg/L)				5 or greater = 30 points		0-30									
CHEMICAL INDICATOR SUBTOTAL				1.000		CHEMICAL INDICATOR SUBTOTAL				0.500		CHEMICAL INDICATOR SUBTOTAL				0.625		CHEMICAL INDICATOR SUBTOTAL				1.000		CHEMICAL INDICATOR SUBTOTAL				1.000	
BIOLOGICAL INDICATOR (Not used for Ephemeral Streams)					BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams) Set to 0 for Establishment Mitigation.					BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)					BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)					BIOLOGICAL INDICATOR (Applies to Intermittent and Perennial Streams)									
☒ Enter Data. Do not use Default values.																													
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)									
WVSCI Score		0-100		0-1		WVSCI Score		0-100		0-1		WVSCI Score		0-100		0-1		WVSCI Score		0-100		0-1							
BIOLOGICAL INDICATOR SUBTOTAL				0.658		BIOLOGICAL INDICATOR SUBTOTAL				0.300		BIOLOGICAL INDICATOR SUBTOTAL				0.500		BIOLOGICAL INDICATOR SUBTOTAL				0.750		BIOLOGICAL INDICATOR SUBTOTAL				0.900	
PART II - Index and Unit Score					PART II - Index and Unit Score					PART II - Index and Unit Score					PART II - Index and Unit Score					PART II - Index and Unit Score									
		Index		Stream Length		Unit Score				Index		Stream Length		Unit Score				Index		Stream Length		Unit Score							
Total Index		0.659		80		52.72		Total Index		0.200		N/A		N/A		Total Index		0.321		N/A		N/A							
Total Index		0.542		N/A		N/A		Total Index		0.794		N/A		N/A															

Appendix K

Scientific Collection Permit

ADDENDUM TO SCIENTIFIC COLLECTING PERMIT NO. 2025.036

Permittee: Anju Ghimirey
Address: Gannett Fleming, Inc.
207 Senate Avenue
Camp Hill, PA 17011

Expiration Date: December 31, 2025

THE FOLLOWING PROVISIONS ARE ADDED TO THIS PERMIT: Surveys for fishes and benthic macroinvertebrates may be conducted in Falls Creek and Coal River in Kanawha County, WV.

THIS ADDENDUM MUST BE ATTACHED TO ORIGINAL PERMIT.

Must be signed before valid.

The seal of the West Virginia Department of Natural Resources is circular with a gold border. Inside the border, the words "DEPARTMENT OF WEST VIRGINIA" are written in a circular path at the top, and "MONTANI SEMPER LIBERI" at the bottom. In the center of the seal is a smaller circular emblem featuring a landscape with a river, trees, and a sun, with the date "JUNE 20 1863" below it.

Anju Ghimirey

Signature of permittee

Jared Vanner

Scientific Collecting Permit Coordinator

Date of Issue: July 25, 2025

NUMBER 2025.036

SCIENTIFIC COLLECTING PERMIT

Under Authority Conferred by Chapter 20, Article 2, Section 50, Code of West Virginia, As Amended

Anju Ghimirey
Gannett Fleming, Inc.
207 Senate Avenue
Camp Hill, PA 17011

is hereby permitted to collect specimens according to the attached application and the Special Provisions on the reverse side of this permit.

This permit is not transferable and expires on **December 31, 2025.**

A complete list of all specimens collected will be kept and reported to the Director of the Division of Natural Resources of West Virginia no later than 45 days after the expiration date of this permit.

PERMIT PROVISIONS

I understand that (1) The privileges granted under this permit are not transferable, and to allow anyone other than myself to use my permit is unlawful and will be considered cause for revocation of said permit; (2) A Federal Scientific Collection Permit issued by the U.S. Department of Interior must be obtained before any migratory birds, or their nests or eggs, are collected or held in captivity; (3) The Federal Permit does not extend the privileges of the permittee beyond those granted by the Division of Natural Resources; (4) Permission must be obtained from either the owner or the custodian of any fenced or posted land before entering same for the purpose of collecting scientific specimens; (5) It is unlawful to sell, offer for sale, barter, or offer to barter any wildlife collected; (6) When traps or nets or other devices are used UNATTENDED while exercising the privileges of this permit, said traps, nets, or devices must have attached thereto a tag bearing the name, address and number of the Scientific Collecting Permit; (7) It is unlawful to take or attempt to take any wildlife under said permit except for scientific and propagation purposes; (8) A hunting or fishing license must be obtained before specimens may be taken for sport; (9) Only those species or classes of wildlife listed below, and in the numbers stated, may be lawfully taken under said permit; and (10) I am required by law to carry my Scientific Collecting Permit, on my person while exercising the privileges granted thereunder, and to exhibit the permit to anyone requesting to see the same.

Must be signed before valid.



Signature of permittee

Director, WVDNR

1/22/2025

**SIGN
&
DATE**

Date of issue

1/22/2025