ALDEN RESOURCES LLC

USACE# LRN-2018-00397
NATIONWIDE PERMIT 49
&
ARAP# NR19MS.001
AQUATIC RESOURCE ALTERATION PERMIT

AREA 6 MITIGATION SITE
2023 MITIGATION MONITORING REPORT

WAYPOINT# 2023-04
DECEMBER 2023

WAYPOINT LLC

Alden Resources LLC

USACE# LRN-2018-00397
Nationwide Permit 49
&
ARAP# NR19MS.001
Aquatic Resource Alteration Permit

Area 6 Project
2023 Mitigation Monitoring Report
Waypoint# 2023-04

Prepared for:

U.S. Army Corps of Engineers
Nashville District Regulatory Branch
3701 Bell Road
Nashville, Tennessee 37214-2660

&

State of Tennessee
Department of Environment and Conservation
Knoxville Environmental Field Office
3711 Middlebrook Pike
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December 2023

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2023 Annual Monitoring Report
Area #6 Project
Nationwide Permit 49 - LRN-2018-00397
ARAP# NR19MS.001

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Date of Monitoring: April 25, 2023
Date of Report: December 2023

Project Purpose
In order to meet the purpose and need of the project, 1,048 linear feet (LF) of stream and 0.56 acres of wetlands, which were considered to be "waters of the U.S.", were proposed to be altered. Approximately 980' of the proposed stream impacts and 0.23 acres of wetland impacts within the watershed did not occur. This avoidance eliminated the impact to stream Functional Credit Units (FCUs) and reduced Functional Wetland Units (FWUs) by 11. Therefore, work consists of 141 LF of stream channel restoration using natural stream design techniques and 15 FWUs within constructed wetlands, while simultaneously reclaiming abandoned mine lands. Once restoration is complete and given time to mature, an overall increase in physical, chemical, and biological habitat is expected.

Location
The permit area is in Campbell County, Tennessee. It is located 2 miles east of the intersection of Westbourne Road and Cotula Road, on the La Follette, Tennessee 7.5' United States Geological Survey (USGS) topographic quadrangles, near NAD83 latitude N 36.4926587°, NAD83 longitude W 84.0245239°. The tract is positioned within the Lower Hickory Creek watershed (Figure 1, Appendix A).

Mitigation Timeline
Channel construction has been implemented within Stream 4 (S4). The project is within the timelines of the permit as wetland restoration and continued stream restoration efforts are planned after the grading and construction of the mitigation areas is complete.

Table 1. Mitigation Area Status			
MITIGATION OFFSET	**MITIGATION TYPE**	**MITIGATION STATUS**	**MONITORING YEAR**
Streams 2 and 3	Stream Restoration	Stream 4 Restored, 2022	2
Wetland 2	Wetland Creation	Wetland Restoration Pending	-

Performance Standards
During this second year of monitoring, performance standards were assessed at Stream 4.

Maintenance Activities
Pond removals will be completed upon approval from the Office of Surface Mining Reclamation and Enforcement (OSMRE). The wetland restoration site construction is pending the breach of the outfall and will begin after the pond has drained. Tree planting on the right bank of S4 and connection of the upstream ephemeral channel to the intermittent stream will be completed after the required drainage ditch is approved for removal by the OSMRE.

Recommendations
Restoration efforts were in progress at the time of the 2022 monitoring event and a longitudinal profile was not conducted. A longitudinal profile and cross sectional data was documented during the 2023 monitoring event and is being submitted with this report (Appendix B). No additional recommendations are being made at this time. Future monitoring events will include assessments based on each mitigation area's restoration year. Table 2 summarizes the proposed monitoring activities. The Year 1 monitoring event for the stream restoration included cross-sections, a Hydrogeomorphic Method (HGM) habitat assessment and a stem count. The second-year monitoring event coincided with the schedule in table 2, including a riparian zone assessment. Monitoring of the wetland creation site would include wetland delineation and a Tennessee Rapid Assessment Method (TRAM) for wetlands. However, the wetland restoration site construction is pending the breach of the outfall and will begin after the pond has drained.

Table 2. Stream and Wetland Mitigation Monitoring Timeline					
PARAMETER	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Geomorphology					
Cross-sections	X		X		X
Longitudinal Profile	X				X
Habitat					
HGM	X		X		X
Riparian Zone					
Stem Count/Measure Width	X	X	X	X	X
Wetlands					
Wetland Delineation			X		X
TRAM		X	X	X	X

Mitigation Requirements

Stream and Wetland Mitigation Performance Standards	
Stream	
Performance Standard	**Current Status**
Stream channels shall be constructed using natural stream design techniques. Additionally, a 50-foot riparian buffer on each side of the stream will be established along the restored stream channels to provide the riparian buffer.	Stream 4 channel construction has been completed. The avoidance of impacts to the left bank of S4 has kept that riparian buffer intact. Tree planting on the right bank of S4 will be completed after the required drainage ditch is approved for removal by the OSMRE permit.
The riparian zone shall be vegetated in a random or scattered method planted at a density of at least 300 native tree stems and 100 native shrub stems per acre. Native tree species shall be planted, with no single species representing more than 30% of tree diversity on the site.	The riparian zone was evaluated during the Year 2 monitoring event as proposed. Table 3, below, summarizes the results from the 2023 stem count survey.
The Permittee shall assess and submit HGM data sheets for the stream restoration sites.	Existing habitat scores at the mitigation site were assessed using the HGM method in Year 1. This data is summarized in Table 4, below.
Wetland	
Restore 15 FWUs	Wetland restoration has not commenced.
Meet TRAM Scores	Wetland restoration has not commenced.

Table 3. 2023 Stem Count Survey (0.25 Acre)	
***Scientific name* (Common Name)**	**S4 Mitigation Segment**
Acer rubrum (Red Maple)	5
Acer saccharum (Sugar Maple)	7
Carya cordiformis (Bitternut Hickory)	3
Carya glabra (Pignut Hickory)	9
Carya ovata (Shagbark Hickory)	6
Cornus amomum (Silky Dogwood)	3
*Fagus grandifolia (*American Beech)	6
Fraxinus americana (White ash)	1
Liriodendron tulipifera (Tuliptree)	2
Oxydendrum arboreum (Sourwood)	14
Platanus occidentalis (American Sycamore)	2
Quercus alba (White Oak)	8
Quercus michauxii (Swamp Chestnut Oak)	1
Quercus rubra (Red Oak)	13
Rhus glabra (Smooth sumac)	1
Salix nigra (Black Willow)	35
Tsuga canadensis (Eastern Hemlock)	1
Elaeagnus umbellata (Autumn Olive)	4
Totals	
Tree Stems per 0.25 acre	**121**
Average Density - Tree Stems per acre	**484**

Table 3 summarizes the results from the 2023 stem count survey.

As illustrated in Table 3, the riparian zone of the restoration stream has exceeded 300 native tree and shrub stems per acre, with no single species representing more than 30% of tree diversity on the site. Planting on the right bank of S4 will be completed after the required drainage ditch is approved for removal by the OSMRE permit and will help fulfill the vegetation requirements.

29 feet of Stream 2 and 39 feet of Stream 3 were impacted, as proposed. However, 253 feet of the intermittent portion of Stream 4 that was proposed to be mined through was avoided. This reach has been enhanced to compensate for impacts to Streams 2 and 3. These impacts and enhancements are summarized in Table 4, below.

Table 4. 2022 HGM Mitigation Summary for the Stream Alteration Areas

	Previous Conditions			Impacted		Existing Conditions			
Site	FCI	Length (LF)	FCU	Length (LF)	FCU	FCI	Length (LF)	FCU	Credit / Debit
Stream 2	0.59	29	17	29	17	0	0	0	-17
Stream 3	0.79	39	31	39	31	0	0	0	-31
Stream 4 I	0.47	141	66	0	0	0.86	141	121	+55
TOTAL		**209**	**114**	**68**	**48**		**141**	**121**	**+7**

Table 4 compares the pre-impact and current stream conditions within the project.

As summarized in Table 4, through avoidance and restoration, the impacted streams have been compensated for and a net gain of FCUs now exists on site.

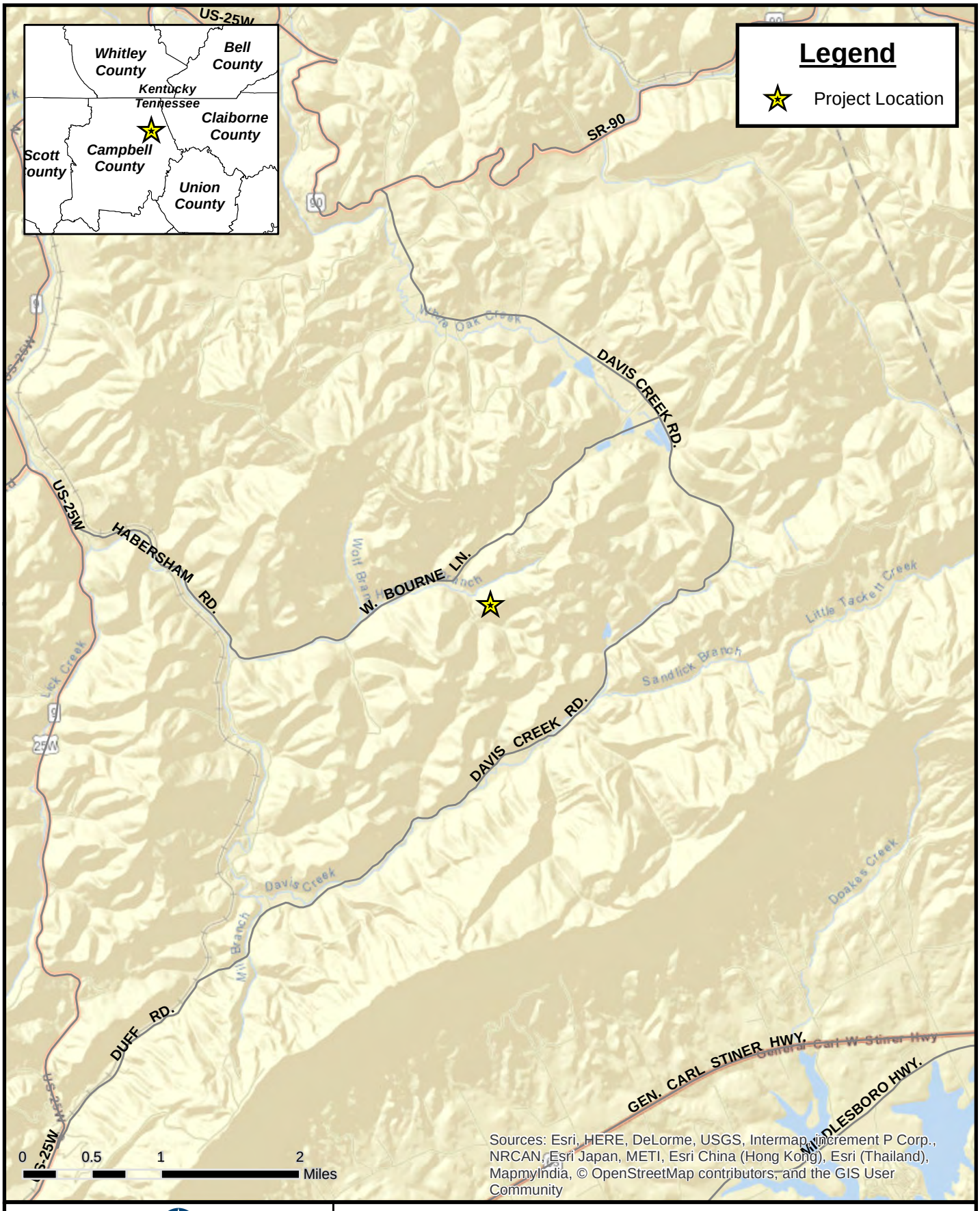
Conclusions and Recommendations

Discharges into “waters of the U.S.” associated with this project are complete and stream mitigation efforts have commenced. Wetland restoration and creation activities will occur after approval to remove sediment ponds.

Channel construction has been implemented within Stream 4 (S4). The project is within the timelines of the permit as wetland restoration and continued stream restoration efforts are planned after the grading and construction of the mitigation areas is complete. Tree planting on the right bank of S4 and connection of the upstream ephemeral channel to the intermittent stream will be completed after the required drainage ditch is approved for removal by the Office of Surface Mining Reclamation and Enforcement (OSMRE) permit. This connection will provide more stream length and more FCUs. Once restoration is complete and given time to mature, a lift in Functional Credit Units (FCUs) for stream habitat and FWUs for wetlands is anticipated after 5 years.

Appendix A contains site maps. Appendix B has cross section illustrations and a longitudinal profile. Appendix C contains photographs of the site and Appendix D contains the Hydrogeomorphic Method (HGM) data used to determine the existing FCUs for the site.

Appendix A
Site Location Maps

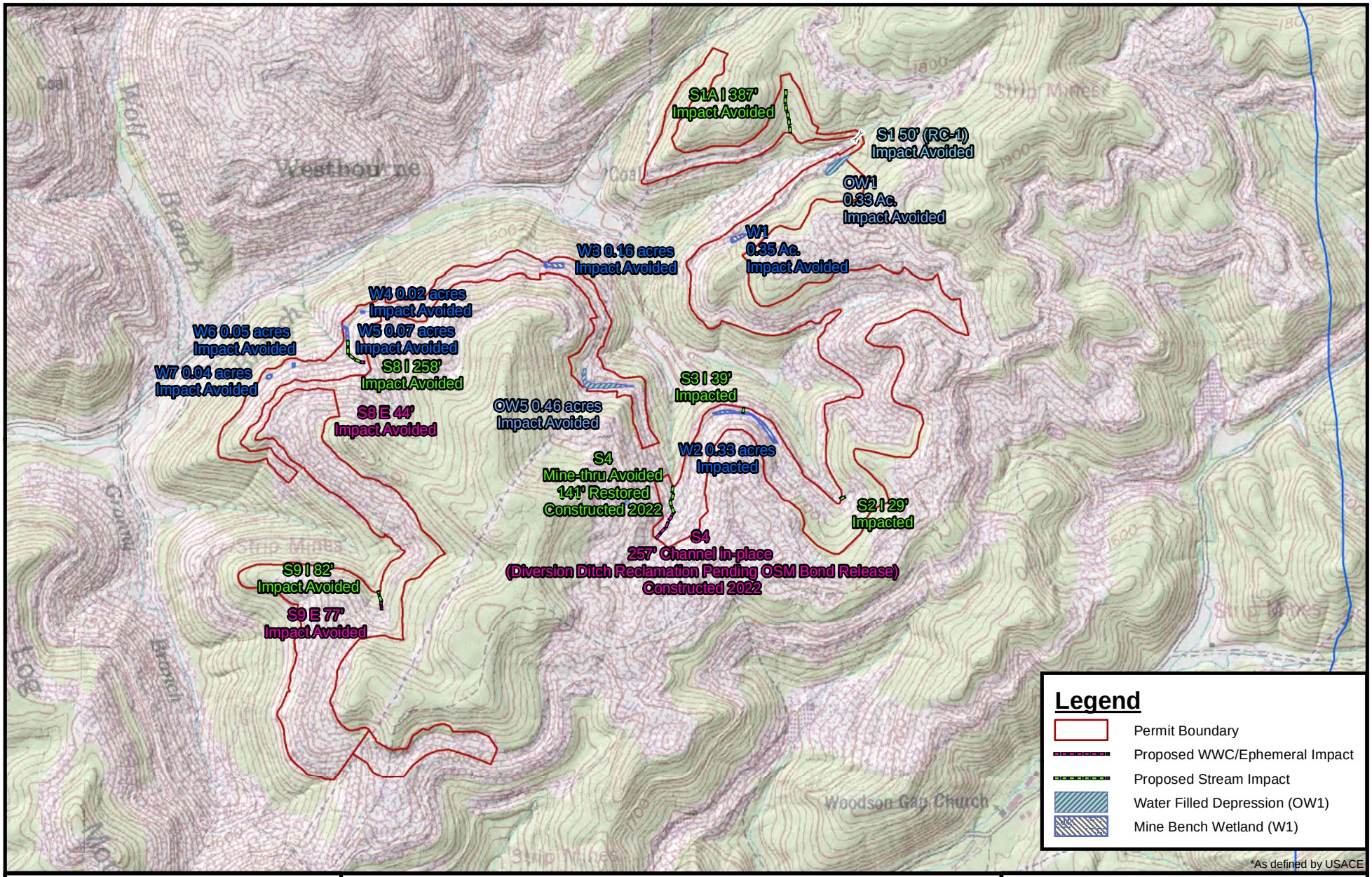


Prepared by: WAYPOINT LLC

Prepared for: ALDEN Resources LLC

Figure 1: Highway Location Map

Waypoint#: 2023-04	N	USACE#: LRN 2018-00397
DATE: January 31, 2019		ARAP# NR19MS.001
Drawn By: BES		Checked By: BES



Prepared by:

Ferroglobe
Alden Resources LLC

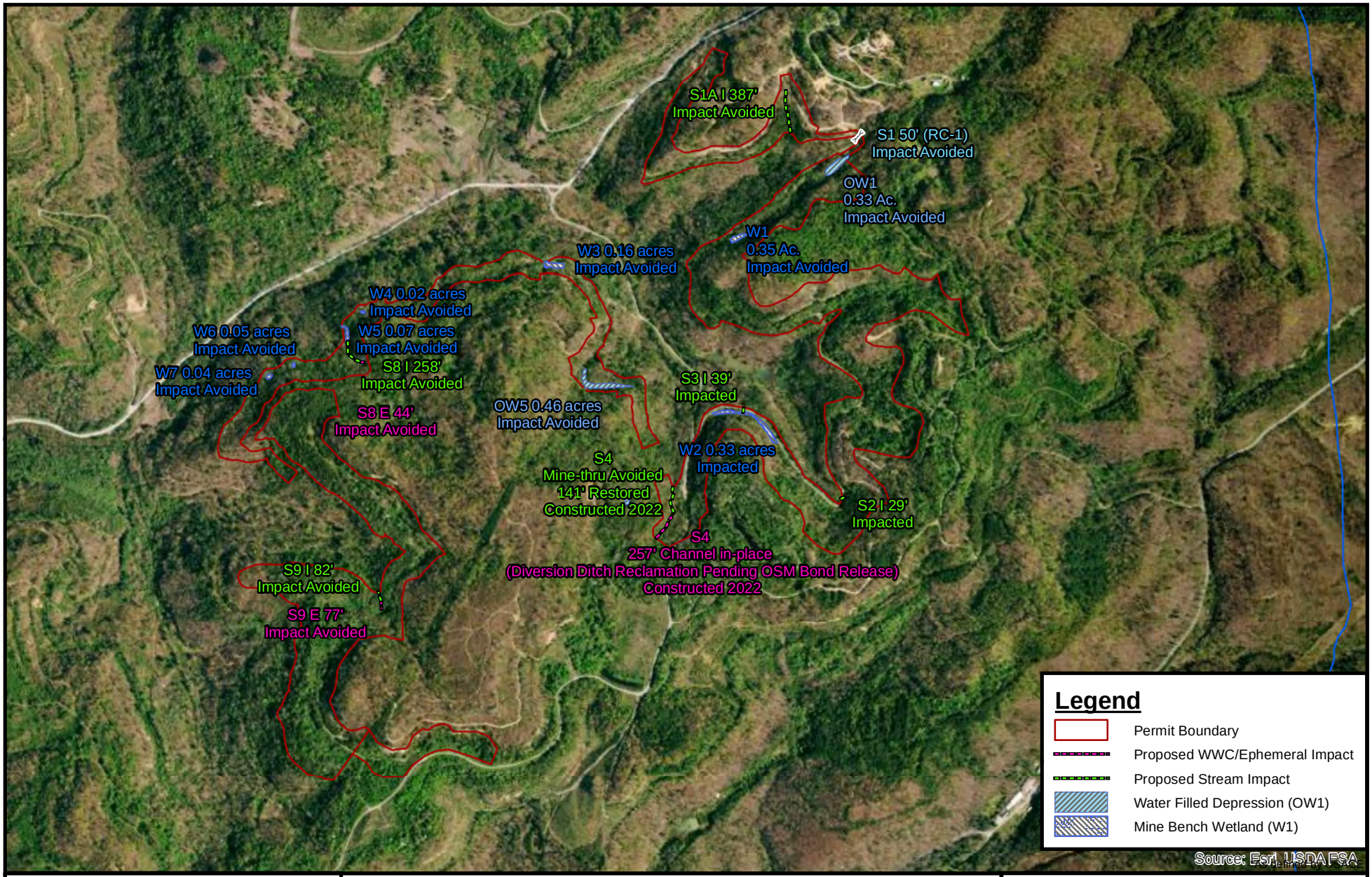
Prepared for:

WAYPOINT LLC

Figure 2: Impacts and Mitigation Topo Map

Waypoint#: 2023-04	N	ARAP#: NR19MS.001
DATE: December 29, 2023		USACE#: LRN 2018-00397
Drawn By: BES		Checked By: JRR

0 650 1,300 2,600 Feet



Prepared by:

Ferroglobe
Alden Resources LLC

Prepared for:

WAYPOINT LLC

Figure 3: Impacts and Mitigation Aerial Map

0 650 1,300 2,600 Feet

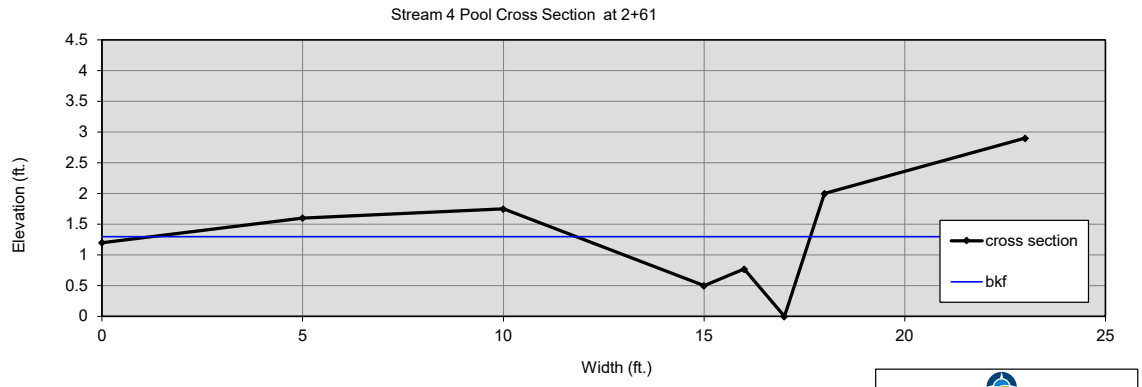
N

Waypoint#: 2023-04	ARAP#: NR19MS.001
DATE: December 29, 2023	USACE#: LRN 2018-00397
Drawn By: BES	Checked By: JRR

Appendix B
As-built Data

Cross Section Drawings:
Stream 4

Stream 4 - Cross Section 1 (X1)

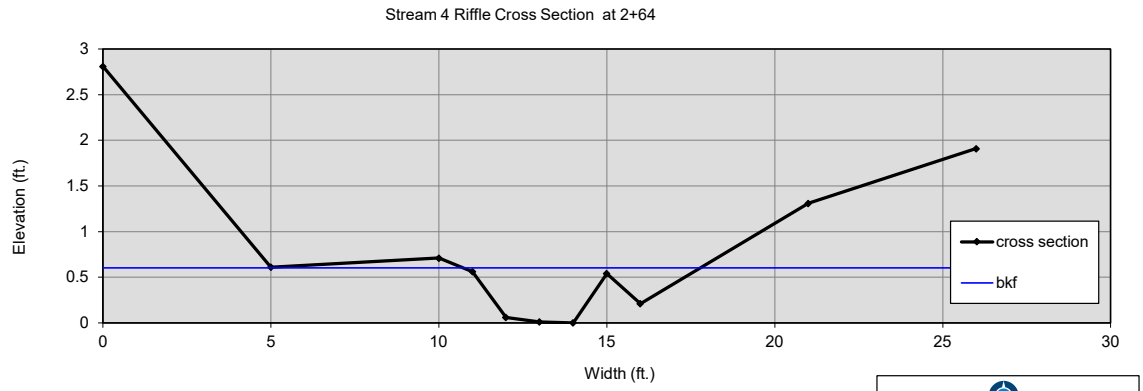


Bankfull Dimensions	
3.3	x-section area (ft.sq.)
7.1	width (ft)
0.5	mean depth (ft)
1.3	max depth (ft)
8.3	wetted parimeter (ft)
0.4	hyd radi (ft)
15.1	width-depth ratio

WAYPOINT

Cross Sections:
Stream 4 Restoration Site
USACE#: LRN 2018-00397
ARAP#: NR19MS.001
Waypoint#: 2023-04

Hollowfill #2 Side Drain - Cross Section 2 (X2)

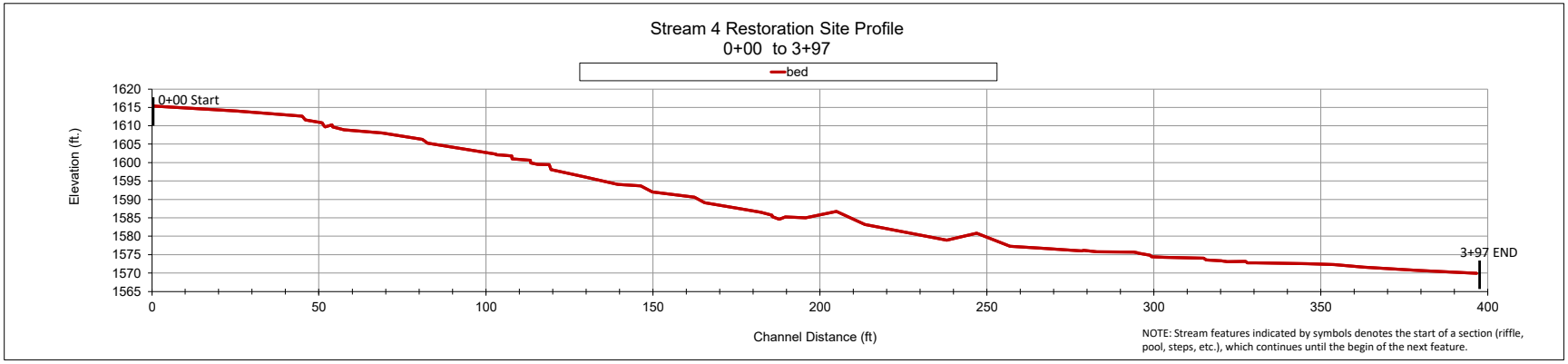


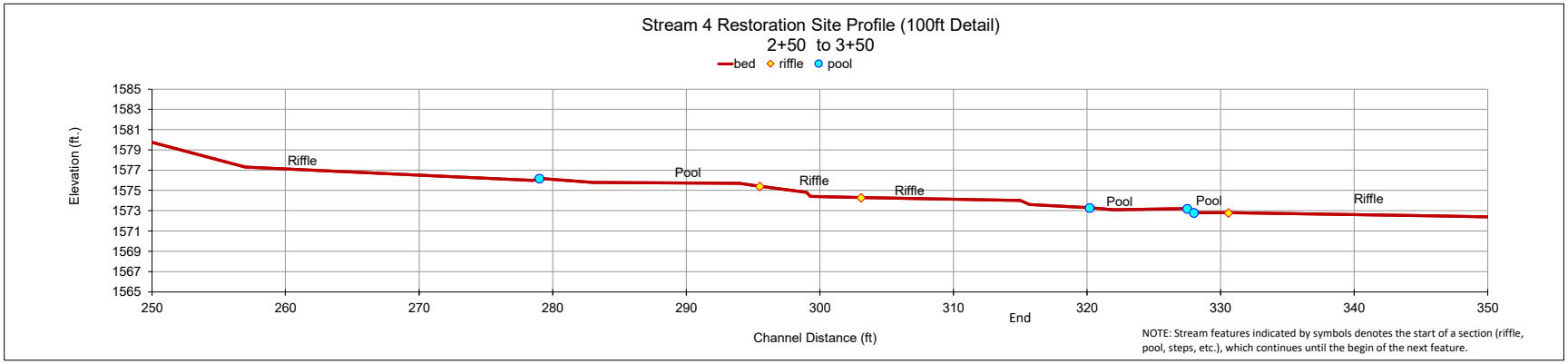
Bankfull Dimensions	
2.4	x-section area (ft.sq.)
7.0	width (ft)
0.3	mean depth (ft)
0.6	max depth (ft)
7.4	wetted parimeter (ft)
0.3	hyd radi (ft)
21.0	width-depth ratio

WAYPOINT

Cross Sections:
Stream 4 Restoration Site
USACE#: LRN 2018-00397
ARAP#: NR19MS.001
Waypoint#: 2023-04

Stream 4 Restoration Site Profile





WAYPOINT

Profile:
Stream 4 Restoration Site
USACE#: LRN 2018-00397
ARAP#: NR19MS.001
Waypoint#: 2023-04

Appendix C
Site Photographs

Stream 4, Lower
Photo Point 1 | 2023-04-25
Lat. 36.48612°, Long. -84.02315° | Looking South, Upstream

Stream 4, Upper
Photo 2 | 2023-04-25
Lat. 36.48577°, Long. -84.02333° | Looking North, Downstream

Stream 4 Left Bank Riparian Zone
Photo Point 3 | 2023-04-25
Lat. 36.48568°, Long. -84.02322° | Looking West

Stream 4 Right Bank Riparian Zone
Photo Point 3 | 2023-04-25
Lat. 36.48568°, Long. -84.02322° | Looking East

Fraxinus americana (White ash)
Photo Point 3 | 2023-04-25
Lat. 36.48568°, Long. -84.02322° | Riparian Species Example

Quercus rubra (Red Oak)
Photo Point 3 | 2023-04-25
Lat. 36.48568°, Long. -84.02322° | Riparian Species Example

Salix nigra (Black Willow)
Photo Point 3 | 2023-04-25
Lat. 36.48568°, Long. -84.02322° | Riparian Species Example

Acer rubrum (Red Maple)
Photo Point 3 | 2023-04-25
Lat. 36.48568°, Long. -84.02322° | Riparian Species Example

Appendix D
HGM Data Sheets

Ver. 10-20-17

FCI Calculator for the High-Gradient Headwater Streams in Appalachia

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

Project Name: Area 6
Location: Stream 4 Intermittent
Sampling Date: 10-13-22

Mitigation Site | After Project

Subclass for this SAR:
Intermittent Stream

Uppermost stratum present at this SAR:
Tree/Sapling Strata

SAR number: 1

Functional Results Summary:

Enter Results in Section D of the Mitigation Sufficiency Calculator

Function	Functional Capacity Index
Hydrology	0.94
Biogeochemical Cycling	0.92
Habitat	0.72

Variable Measure and Subindex Summary:

Variable	Name	Average Measure	Subindex
$V_{CCANOPY}$	Percent canpoy over channel.	35.00	0.30
V_{EMBED}	Average embeddedness of channel.	3.73	1.00
$V_{SUBSTRATE}$	Median stream channel substrate particle size.	2.75	1.00
V_{BERO}	Total percent of eroded stream channel bank.	0.00	1.00
V_{LWD}	Number of down woody stems per 100 feet of stream.	6.00	0.75
V_{TDBH}	Average dbh of trees.	7.93	0.85
V_{SNAG}	Number of snags per 100 feet of stream.	3.00	1.00
V_{SSD}	Number of saplings and shrubs per 100 feet of stream.	Not Used	Not Used
V_{SRICH}	Riparian vegetation species richness.	4.20	1.00
$V_{DETRITUS}$	Average percent cover of leaves, sticks, etc.	38.75	0.47
V_{HERB}	Average percent cover of herbaceous vegetation.	Not Used	Not Used
V_{WLUSE}	Weighted Average of Runoff Score for Catchment.	1.00	1.00

Version 10-20-17

High-Gradient Headwater Streams in Appalachia
Field Data Sheet and Calculator

Team: Boller, Riddle, Wilson
Project Name: Area 6
Location: Stream 4 Intermittent
SAR Number: 1
Reach Length (ft): 100
Stream Type: Intermittent Stream

Latitude/UTM Northing: N36.485885°
Longitude/UTM Easting: W84.02313°
Sampling Date: 10-13-22

Top Strata: Tree/Sapling Strata (determined from percent calculated in $V_{CCANOPY}$)

Site and Timing: Mitigation Site — After 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 only if tree/sapling cover is at least 20%. (If less than 20%, enter at least one value between 0 and 19 to trigger Top Strata choice.)

35.0 %

List the percent cover measurements at each point below:

25	20	50	50	45	20	30	60	20	30

2 V_{EMBED} Average embeddedness of the stream channel. Measure at no fewer than 30 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.

3.7

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	5	3	5	4	5				
4	4	4	1	4	4				
1	4	4	5	4	5				
3	3	5	4	5	5				
3	1	5	5	1	1				

3 $V_{SUBSTRATE}$ Median stream channel substrate particle size. Measure at no fewer than 30 roughly equidistant points along the stream; use the same points and particles as used in V_{EMBED}.

2.75 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):

3.30	5.00	1.70	4.30	1.00	7.70				
7.50	2.20	2.50	0.08	0.80	3.50				
0.08	4.50	4.50	4.70	1.80	3.00				
4.80	1.30	2.00	9.50	4.00	3.10				
1.20	0.08	2.10	8.50	0.08	0.08				

4 V_{BERO} Total percent of eroded stream channel bank. Enter the total number of feet of eroded bank on each side and the total percentage will be calculated If both banks are eroded, total erosion for the stream may be up to 200%.

0 %

Left Bank: 0 ft Right Bank: 0 ft

Sample Variables 5-9 within the entire riparian/buffer zone adjacent to the stream channel (25 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 50'-wide buffer and within the channel, and the amount per 100 feet of stream will be calculated.

6.0

Number of downed woody stems: 6

6 V_{TDBH} Average dbh of trees (measure only if $V_{CCANOPY}$ tree/sapling cover is at least 20%). Trees are at least 4 inches (10 cm) in diameter. Enter tree DBHs in inches.

7.9

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

Left Side					Right Side				
9.2	7.1	4	4	9.2					
8.1	4	12.7	6.3	7.9					
5.5	27.8	6.4	4	4.1					
12.5	4	7	6.8						

7 V_{SNAG} Number of snags (at least 4" dbh and 36" tall) per 100 feet of stream. Enter number of snags on each side of the stream, and the amount per 100 feet will be calculated.

3.0

Left Side: 3 Right Side: 0

8 V_{SSD} Number of saplings and shrubs (woody stems up to 4 inches dbh) per 100 feet of stream (measure only if tree cover is <20%). Enter number of saplings and shrubs on each side of the stream, and the amount per 100 ft of stream will be calculated.

Not Used

Left Side: Right Side:

9 V_{SRICH} Riparian vegetation species richness per 100 feet of stream reach. Check all species present from Group 1 in the tallest stratum. Check all exotic and invasive species present in all strata. Species richness per 100 feet and the subindex will be calculated from these data. **4.20**

Group 1 = 1.0				Group 2 (-1.0)	
☑	*Acer rubrum*	☐	*Magnolia tripetala*	☐ *Ailanthus altissima*	☑ *Lonicera japonica*
☑	*Acer saccharum*	☐	*Nyssa sylvatica*	☐ *Albizia julibrissin*	☐ *Lonicera tatarica*
☐	*Aesculus flava*	☑	*Oxydendrum arboreum*	☐ *Alliaria petiolata*	☐ *Lotus corniculatus*
☐	*Asimina triloba*	☐	*Prunus serotina*	☐ *Alternanthera philoxeroides*	☐ *Lythrum salicaria*
☐	*Betula alleghaniensis*	☑	*Quercus alba*		☐ *Microstegium vimineum*
☐	*Betula lenta*	☐	*Quercus coccinea*	☐ *Aster tataricus*	☐ *Paulownia tomentosa*
☐	*Carya alba*	☐	*Quercus imbricaria*	☐ *Cerastium fontanum*	☐ *Polygonum cuspidatum*
☑	*Carya glabra*	☐	*Quercus prinus*	☐ *Coronilla varia*	☐ *Pueraria montana*
☐	*Carya ovalis*	☑	*Quercus rubra*	☑ *Elaeagnus umbellata*	☑ *Rosa multiflora*
☑	*Carya ovata*	☐	*Quercus velutina*	☐ *Lespedeza bicolor*	☐ *Sorghum halepense*
☐	*Cornus florida*	☐	*Sassafras albidum*	☐ *Lespedeza cuneata*	☐ *Verbena brasiliensis*
☑	*Fagus grandifolia*	☐	*Tilia americana*	☐ *Ligustrum obtusifolium*	
☐	*Fraxinus americana*	☐	*Tsuga canadensis*	☐ *Ligustrum sinense*	
☑	*Liriodendron tulipifera*	☐	*Ulmus americana*		
☐	*Magnolia acuminata*				
9	Species in Group 1			3 Species in Group 2	

Sample Variables 10-11 within at least 8 subplots (40" x 40", or 1m x 1m) in the riparian/buffer zone within 25 feet from each bank. The four subplots should be placed roughly equidistantly along each side of the stream.

10 $V_{DETRITUS}$ Average percent cover of leaves, sticks, or other organic material. Woody debris <4" diameter and <36" long are include. Enter the percent cover of the detrital layer at each subplot. **38.75 %**

Left Side				Right Side			
90	60	60	80	0	10	0	10

11 V_{HERB} Average percentage cover of herbaceous vegetation (measure only if tree cover is <20%). Do *not* include woody stems at least 4" dbh and 36" tall. Because there may be several layers of ground cover vegetation percentages up through 200% are accepted. Enter the percent cover of ground vegetation at each subplot. **Not Used**

Left Side				Right Side			

Sample Variable 12 within the entire catchment of the stream.

12 V_{WLUSE} Weighted Average of Runoff Score for watershed: **1.00**

Land Use (Choose From Drop List)	Runoff Score	% in Catchment	Running Percent (not >100)
Forest and native range (>75% ground cover)	1	100	100

Summary: SAA Number 1		
Variable	Value	VSI
$V_{CCANOPY}$	35 %	0.30
V_{EMBED}	3.7	1.00
$V_{SUBSTRATE}$	2.75 in	1.00
V_{BERO}	0 %	1.00
V_{LWD}	6.0	0.75
V_{TDBH}	7.9	0.85
V_{SNAG}	3.0	1.00
V_{SSD}	Not Used	Not Used
V_{SRICH}	4.20	1.00
$V_{DETRITUS}$	38.8 %	0.47
V_{HERB}	Not Used	Not Used
V_{WLUSE}	1	1.00

Notes:

Recently constructed channel. Only herbaceous vegetation within right riparian zone. Left riparian zone not recently disturbed.