APPENDIX A

Function-Based Rapid Assessment Form

EXISTING and PROPOSED REACH LEVEL STREAM FUNCTION-BASED RAPID ASSESSMENT FIELD DATA SHEET

Watershed: _____ Rater(s): RRS

Stream: _____ Date: _____

Reach Length: _____ Latitude: _____

Photo(s): _____ Longitude: _____

Reach ID: _____

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning			Functioning-at-Risk				Not Functioning		
Stream Function Pyramid Level 1 Hydrology											
Runoff	1. Concentrated Flow	No potential for concentrated flow/impairments from adjacent land use			Some potential for concentrated flow/impairments to reach restoration site, however, measures are in place to protect resources				Potential for concentrated flow/impairments to reach restoration site and no treatments are in place		
	Existing Condition	10	9	8	7	6	5	4	3	2	1
	Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Proposed Condition	10	9	8	7	6	5	4	3	2	1
	2. Flashiness	Non-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover less than 6%			Semi-flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover 7 - 15%				Flashy flow regime as a result of rainfall patterns, geology, and soils, impervious cover greater than 15%		
	Existing Condition	10	9	8	7	6	5	4	3	2	1
	Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Proposed Condition	10	9	8	7	6	5	4	3	2	1
	If existing runoff is FAR or NF, provide description of cause(s) and stability trend and if F can not be potentially achieved, provide reason										
		Runoff Overall EXISTING Condition		F	FAR	NF		Score:			
		Runoff Overall Restoration Potential		F	FAR	NF		Score:			
		Runoff Overall PROPOSED Condition		F	FAR	NF		Score:			
	Stream Function Pyramid Level 1 Hydrology Overall EXISTING Condition			**F**	**FAR**	**NF**		**Score:**			
	Stream Function Pyramid Level 1 Hydrology Overall Restoration Potential			**F**	**FAR**	**NF**		**Score:**			
	Stream Function Pyramid Level 1 Hydrology Overall PROPOSED Condition			**F**	**FAR**	**NF**		**Score:**			
Stream Function Pyramid Level 2 Hydraulics											
Floodplain Connectivity (Vertical Stability)	3. Bank Height Ratio (BHR)	<1.20			1.21 - 1.50				>1.50		
	Existing Condition	10	9	8	7	6	5	4	3	2	1
	Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Proposed Condition	10	9	8	7	6	5	4	3	2	1
	4a. Entrenchment (Meandering streams in alluvial valleys or Rosgen C, E, DA Streams)	>2.2			2.1 - 1.4				<1.4		
	Existing Condition	10	9	8	7	6	5	4	3	2	1
	Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Proposed Condition	10	9	8	7	6	5	4	3	2	1
	4b. Entrenchment (Non meandering streams in colluvial valleys or Rosgen B Streams)	>1.4			1.3 - 1.1				<1.1		
	Existing Condition	10	9	8	7	6	5	4	3	2	1
	Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Proposed Condition	10	9	8	7	6	5	4	3	2	1
	5. Floodplain Drainage	no concentrated flow; runoff is primarily sheet flow; hillslopes < 10%; hillslopes >200 ft from stream; ponding or wetland areas and litter or debris jams are well represented			runoff is equally sheet and concentrated flow (minor gully and rill erosion occurring); hillslopes 10 - 40%; hillslopes 50 - 200 ft from stream; ponding or wetland areas and litter or debris jams are minimally represented				concentrated flows present (extensive gully and rill erosion); hillslopes >40%; hillslopes <50 ft from stream; ponding or wetland areas and litter or debris jams are not well represented or absent		
	Existing Condition	10	9	8	7	6	5	4	3	2	1
	Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Proposed Condition	10	9	8	7	6	5	4	3	2	1

Reach ID:	

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning			Functioning-at-Risk				Not Functioning		
Floodplain Connectivity (Vertical Stability)	6. Vertical Stability Extent	Stable			Localized Instability				Widespread Instability		
	Existing Condition	10	9	8	7	6	5	4	3	2	1
	Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Proposed Condition	10	9	8	7	6	5	4	3	2	1
	If existing floodplain connectivity is FAR or NF, provide description of cause(s) and stability trend and if F can not be potentially achieved, provide reason										
	Floodplain Connectivity Overall EXISTING Condition	F	FAR	NF	Score:						
	Floodplain Connectivity Overall Restoration Potential	F	FAR	NF	Score:						
	Floodplain Connectivity Overall PROPOSED Condition	F	FAR	NF	Score:						
	Stream Function Pyramid Level 2 Hydraulics Overall EXISTING Condition	**F**	**FAR**	**NF**	**Score:**						
	Stream Function Pyramid Level 2 Hydraulics Overall Restoration Potential	**F**	**FAR**	**NF**	**Score:**						
	Stream Function Pyramid Level 2 Hydraulics Overall PROPOSED Condition	**F**	**FAR**	**NF**	**Score:**						

Stream Function Pyramid Level 3 Geomorphology

Riparian Vegetation	7. Riparian Vegetation Zone (EPA, 1999, modified)	Riparian zone extends to a width of >100 feet; good vegetation community diversity and density; human activities do not impact zone; invasive species not present or sparse			Riparian zone extends to a width of 25-100 feet; species composition is dominated by 2 or 3 species; human activities greatly impact zone; invasive species well represented and alter the community				Riparian zone extends to a width of <25 feet; little or no riparian vegetation due to human activities; majority of vegetation is invasive		
	Left Bank Existing	10	9	8	7	6	5	4	3	2	1
	Left Bank Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Left Bank Proposed	10	9	8	7	6	5	4	3	2	1
	Right Bank Existing	10	9	8	7	6	5	4	3	2	1
	Right Bank Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Right Bank Proposed	10	9	8	7	6	5	4	3	2	1
	If existing riparian vegetation is FAR or NF, provide description of cause(s) and stability trend and if F can not be potentially achieved, provide reason										
	Riparian Vegetation Overall EXISTING Condition	F	FAR	NF	Score:						
	Riparian Vegetation Overall Restoration Potential	F	FAR	NF	Score:						
	Riparian Vegetation Overall PROPOSED Condition	F	FAR	NF	Score:						

Lateral Stability	8. Dominant Bank Erosion Rate Potential	Dominate bank erosion rate potential is low or BEHI/NBS Rating: L/VL, L/L, L/M, L/H, L/VH, M/VL			Dominate bank erosion rate potential is moderate or BEHI/NBS Rating: M/L, M/M, M/H, L/Ex, H/L, M/VH, M/Ex, H/L, H/M, VH/VL, Ex/VL				Dominate bank erosion rate potential is high or BEHI/NBS Rating: H/H, H/Ex, VH/H, Ex/M, Ex/H, Ex/VH, VH/VH, Ex/Ex		
	Existing Condition (Right bank)	10	9	8	7	6	5	4	3	2	1
	Restoration Potential (Right Bank)	10	9	8	7	6	5	4	3	2	1
	Proposed Condition (Right Bank)	10	9	8	7	6	5	4	3	2	1
	Existing Condition (Left bank)	10	9	8	7	6	5	4	3	2	1
	Restoration Potential (Left Bank)	10	9	8	7	6	5	4	3	2	1
	Proposed Condition (Left Bank)	10	9	8	7	6	5	4	3	2	1
	9. Lateral Stability Extent	Stable			Localized Instability				Widespread Instability		
	Existing Condition	10	9	8	7	6	5	4	3	2	1
	Restoration Potential	10	9	8	7	6	5	4	3	2	1
	Proposed Condition	10	9	8	7	6	5	4	3	2	1

Reach ID:	

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category		
		Functioning	Functioning-at-Risk	Not Functioning
Lateral Stability	If existing lateral stability is FAR or NF, provide description of cause(s) and stability trend and if F can not be potentially achieved, provide reason			

Lateral Stability Overall EXISTING Condition	F	FAR	NF	Score:
Lateral Stability Overall Restoration Potential	F	FAR	NF	Score:
Lateral Stability Overall PROPOSED Condition	F	FAR	NF	Score:

Bedform Diversity (Do not complete if stream is ephemeral)

10. Shelter for Fish and Macroinvertebrates (EPA 1999)	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, rubble, gravel, cobble and large rocks, or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient)			20-70% mix of stable habitat; suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale)				Less than 20% mix of stable habitat; lack of habitat availability less than desirables obvious; substrate unstable or lacking		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
11a. Pool-to-Pool Spacing Ratio (Watersheds < 10 mi^2)	4.0 - 5.0			3.0 - 4.0 ***or*** 5.0 - 7.0				< 3.0 ***or*** >7.0		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
11b. Pool-to-Pool Spacing Ratio (Watersheds > 10 mi^2)	5.0 - 7.0			3.5 - 5.0 ***or*** 7.0 - 8.0				<3.5 ***or*** >8.0		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
12a. Pool Max Depth Ratio/Depth Variability (Gravel Bed Streams)	>1.5			1.2 - 1.5				<1.2		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
12b. Pool Max Depth Ratio/Depth Variability (Sand Bed Streams)	>1.2			1.1 - 1.2				<1.1		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
Moderate Gradient Perennial Streams in Colluvial Valleys										
11. Pool-to-Pool Spacing Ratio (3-5% Slope)	2.0 - 4.0			4.0 - 6.0				>6.0		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
12. Pool Max Depth Ratio/Depth Variability	>1.5			1.2 - 1.5				<1.2		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1

Reach ID:	

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category: Functioning	Functioning-at-Risk	Not Functioning
Bedform Diversity	If existing bedform diversity is FAR or NF, provide description of cause(s) and stability trend and if F can not be potentially achieved, provide reason			

Bedform Diversity Overall EXISTING Condition	F	FAR	NF	Score:
Bedform Diversity Overall Restoration Potential	F	FAR	NF	Score:
Bedform Diversity Overall PROPOSED Condition	F	FAR	NF	Score:

Stream Function Pyramid Level 3 Geomorphology Overall EXISTING Condition F FAR NF **Score:**

Stream Function Pyramid Level 3 Geomorphology Overall Restoration Potential F FAR NF **Score:**

Stream Function Pyramid Level 3 Geomorphology Overall PROPOSED Condition F FAR NF **Score:**

Stream Function Pyramid Level 4 Physicochemical

Water Quality and Nutrients (Do not complete if stream is ephemeral)

13. Water Appearance and Nutrient Enrichment (USDA 1999)	Very clear, or clear but tea-colored; objects visible at depth 3 to 6 ft (less if slightly colored); no oil sheen on surface; no noticeable film on submerged objects or rocks. Clear water along entire reach; diverse aquatic plant community includes low quantities of many species of macrophytes; little algal growth present			Frequent cloudiness especially after storm events; objects visible to depth 0.5 to 3.0 ft; may have slight green color; no oil sheen on water surface. Fairly clear or slightly greenish water along entire reach; moderate algal growth on stream substrate				Very turbid or muddy appearance most of the time; objects visible at depth< 0.5 ft; slow moving water maybe bright green; other obvious water pollutants; floating algal mats, surface scum, sheen or heavy coat of foam on surface; or strong odor of chemicals, oil, sewage, or other pollutants. Pea-green, gray, or brown water along entire reach; dense stands of macrophytes clogging stream; severe algal blooms creating thick algal mats in stream		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
14. Detritus (Petersen, 1992)	Mainly consisting of leaves and wood without sediment covering it			Leaves and wood scarce; fine organic debris without sediment				Fine organic sediment - black in color and foul odor (anaerobic) or detritus absent		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
If existing water quality is FAR or NF, provide description of cause(s) and stability trend and if F can not be potentially achieved, provide reason										

Stream Function Pyramid Level 4 Physicochemical Overall EXISTING Condition F FAR NF **Score:**

Stream Function Pyramid Level 4 Physicochemical Overall Restoration Potential F FAR NF **Score:**

Stream Function Pyramid Level 4 Physicochemical Overall PROPOSED Condition F FAR NF **Score:**

Stream Function Pyramid Level 5 Biology

Biology (Do not complete if stream is ephemeral)

15. Macroinvertebrate	Abundant			Rare				Not present		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
16. Macroinvertebrate Tolerance	Abundant intolerant species			Limited intolerant species				Only tolerant species		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1
17. Fish Presence	Abundant			Rare				Not present		
Existing Condition	10	9	8	7	6	5	4	3	2	1
Restoration Potential	10	9	8	7	6	5	4	3	2	1
Proposed Condition	10	9	8	7	6	5	4	3	2	1

Reach ID:	

Function-based Rapid Reach Level Stream Assessment

Assessment Parameter	Measurement Method	Category		
		Functioning	Functioning-at-Risk	Not Functioning
Biology	If existing biology is FAR or NF, provide description of cause (s) and stability trend and if F can not be potentially achieved, provide reason			
	Stream Function Pyramid Level 5 Biology Overall EXISTING Condition	**F**	**FAR**	**NF** **Score:**
	Stream Function Pyramid Level 5 Biology Overall Restoration Potential	**F**	**FAR**	**NF** **Score:**
	Stream Function Pyramid Level 5 Biology Overall PROPOSED Condition	**F**	**FAR**	**NF** **Score:**

Bankfull Determination and Rosgen Stream Classification

Rosgen Stream Type (Observation)				
Regional Curve (circle one):	Piedmont	Coastal Plain	Allegheny Plateau/Ridge and Valley	Urban Karst
DA (sqmi)			Rosgen Valley Type	
BF Width (ft)			BF Area (sqft)	
BF Depth (ft)			Percent Impervious (%)	

Field Measurements

Parameter	Measurements and Ratios			
Water surface to geomorphic feature elevation difference				
Riffle Mean Depth at Bankfull Stage (dbkf)				
Riffle Width at Bankfull Stage (Wbkf)				
Riffle XS Area at Bankfull Stage (Abkf = dbkf*Wbkf)				
Floodprone Area Width (Wfpa) (Wfpa=Width at elevation determined by 2xDmax)				
Entrenchment Ratio (ER) (ER=Wfpa/Wbkf)				
Low Bank Height (LBH)				
Riffle Maximum Depth at Bankfull Stage (Dmax)				
Bank Height Ratio (BHR) (BHR=LBH/Dmax)				
BEHI/NBS Ratings and Lengths				
Pool to Pool Spacing (P-P)				
Pool to Pool Spacing Ratio (P-P Ratio) (P-P Ratio=P-P/Wbkf)				
Pool Maximum Depth at Bankfull Stage (Dmbkfp)				
Pool Depth Ratio (Dmbkfp Ratio) (Dmbkfp Ratio=Dmbkfp/dbkf)				
Macroinvertebrate Species Observed				

APPENDIX B

Stream Restoration Feasibility Assessment Form

STREAM RESTORATION FEASIBILITY ASSESSMENT FIELD DATA SHEET

Watershed: Hamilton Run

Stream: Hamitlon Run Rater(s): RRS

Reach ID: _____ Date: _____

STREAM RESTORATION POTENTIAL SOLUTION, COST, and FEASIBILITY

Parameter	Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
1. Potential Restoration Solution Approach	Localized Restoration - bioengineering and/or minor bank grading. Less than 50 % of reach requires localized restoration.	Localized Restoration - bioengineering and/or minor bank grading and some localized placement of instream structures. Greater than 50 % of reach requires localized restoration.	Widespread Restoration - in-channel adjustments, instream structures, and bioengineering throughout entire project area.	Widespread Restoration - new channel and/or channel realignment, in-channel adjustments, instream structures, and bioengineering throughout entire project area.
SCORE _____	10 9	8 7 6	5 4 3	2 1
2. Potential Restoration Solution Uplift	**Existing Condition** - All parameters in Pyramid Levels 2 and 3 have Not Functioning scores. Parameters in Levels 4 and 5 are Not Functioning or Functioning-at-Risk. **Potential Condition** - Functioning scores for Levels 1-5.	**Existing Condition** - Mix of Not-Functioning and Functioning-at-Risk scores for parameter Levels 2 through 5. **Potential Condition** - Functioning scores for Levels 1-5. or **Existing Condition** - All parameters in Pyramid Levels 2 and 3 have Not Functioning scores. **Potential Condition** - Functioning scores for Levels 1-3.	**Existing Condition** -Mix of Not-Functioning, Functioning-at-Risk and Functioning scores for parameter Levels 2 through 5. **Potential Condition** - Functioning scores for Levels 1-5. or **Existing Condition** - Mostly Functioning-at-Risk and Functioning scores for parameter Levels 2 through 3. May include some Not-Functioning scores. **Potential Condition** - Functioning scores for Levels 1-3.	
SCORE _____	10 9 8	7 6 5 4	3 2 1	
3. TMDL Restoration Potential for Sediment Nutrient and Phosporous Reduction	Potential for all 3	Potential for 2	Potential for 1	No Potential
SCORE _____	10 9	8 7 6	5 4 3	2 1
4. Stream Length	>2,000 LF	1,500 to 2,000 LF	1,000 to 1,500 LF	<1,000 LF
SCORE _____	10 9	8 7 6	5 4 3	2 1
Parameter	**Optimal**	**Suboptimal**	**Marginal**	**Poor**
5. Construction Access	Access location relatively flat, open, dry, and within 100 feet of a road	Access location relatively flat, open, dry, over 100 feet of a road, and requires special construction road treatments	Access location has some steep slopes, some vegetation clearing required, some wet areas, and is within 100 feet of a road, and requires special construction road treatments	Access location has steep slopes, wet areas, heavily vegetated, is over 100 feet of a road, and requires special construction road treatments
SCORE _____	10 9	8 7 6	5 4 3	2 1
6. Constraints	No Constraints or impacts to existing healthy habitat and no infrastructure	Slight vegetation clearing required and minor impacts to existing healthy habitat and no infrastructure	Moderate vegetation clearing required, infrastructure crossing and/or potential repair or relocation required, impacts to healthy habitat and/or potential impact of T & E species	Vegetation clearing required, infrastructure repair or relocation required, special access treatments required, impacts to healthy habitat, impacts to T & E species
SCORE _____	10 9	8 7 6	5 4 3	2 1

STREAM RESTORATION POTENTIAL SOLUTION, COST, and FEASIBILITY

Parameter	Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
7. Potential Success/Risk	Shallow gradient slope < 0.5 %, cohesive bed and banks, incision ratio 1.00 - 1.10, entrenchment ratio > 2.2, meander width ratio of 3.0 to 8.0 for Rosgen E and C stream types, design complexity low, minimum restoration construction, no infrastructure, upstream and downstream conditions stable	Shallow gradient slope 0.6 - 1.0 %, cohesive bed and banks, incision ratio 1.10 - 1.30, entrenchment ratio > 2.2, meander width ratio of 3.0 to 4.0 for Rosgen E and C stream types, design complexity moderate, moderate restoration construction, infrastructure crossing, upstream and/or downstream conditions have localized stablity issues	Moderate gradient slope 1.1 - 2.0 %, cohesive bed, non-cohesive banks, incision ratio 1.31 - 1.50, entrenchment ratio 1.4 - 2.2, meander width ratio of 2.5 to 3.0 for Rosgen E and C stream types, design complexity moderate to high, moderate to high restoration construction, infrastructure crossing and potential repair and/or protection, upstream and/or downstream conditions have localized to widespread stablity issues	Steep gradient slope > 2.0 %, non-cohesive bed and banks, incision ratio >1.51, entrenchment ratio > 2.3, meander width ratio of < 2.5 for Rosgen E and C stream types, design complexity high, high restoration construction, infrastructure crossing repair and/or /orprotection, upstream and downstream conditions have widespread stablity issues
SCORE _____	10 9	8 7 6	5 4 3	2 1
8.BMP Restoration Potential	Potential for 3-4 BMPs	Potential for 2 BMPs	Potential for 1 BMP	No Potential for BMPs
SCORE _____	10 9	8 7 6	5 4 3	2 1
9.Ownership	Public or 1 Private Landower	1-2 Private Landowner(s)	3-4 Private Landowners	5 or more Private Landowners
SCORE _____	10 9	8 7 6	5 4 3	2 1
Restoration Potential Solution Approach Description				

Stream Restoration Total Score _____

RESTORATION ESTIMATED COST

Parameter	Category and cost			
Project difficulty	Minor localized bank grading (< 50% of reach), localized bank plantings (< 50% of reach), low cost bio-engineering (i.e.,…….),	Moderate localized bank grading (> 50% of reach), localized bank plantings (> 50% of reach), moderate cost bio-engineering, instream structures to address localized instability problem (i.e.,…….),	In-channel adjustments, bank grading, instream structures (i.e., vanes, cross vanes, W weirs, sills, etc.) reach-wide plantings and/or bio-engineering, repair of infrastructure,	In-channel adjustments and new channel construction, bank grading, instream structures (i.e., vanes, cross vanes, W weirs, sills, etc.) reach-wide plantings and/or bio-engineering, protections and repair of infrastructure
Cost Per Linear Foot	$100 - $200	$200 - $300	$300 - $400	$400 - $600

Cost/foot: $_____ Area to be treated: _____ feet Total cost: $_____

Note: If there are site constraints or access is poor, move up one cost category.

APPENDIX C

Water Quality Laboratory Reports

Fredericktowne Labs Inc.
ENVIRONMENTAL TESTING
3020 Ventrie Court ● P.O. BOX 245 ● Myersville, MD 21773 ● 800-332-3340 ● FAX 301-293-2366
www.fredericktownelabs.com ● info@fredericktownelabs.com

Certificate of Analysis

Acct. No. 10482 - 1-1

Field Record

Site visit performed on: Thursday, September 29, 2016 9:00 AM
by: Doug Hutzell
Affiliation: FSA
Property Owner: Frederick, Seibert & Associates, Inc.
Project: Washington County Stream Project
Property Address: 128 South Potomac Street
Hagerstown, MD 21740
Sample Source: Stream Hamilton Run Golf Crs Lwr Bridg
Field pH: 8.5

Temp: 17.1° C

Laboratory Report

Sample Received at laboratory: 9/29/2016 10:36 AM

Bacteriological results:

Total Colif. (/100ml)	E.coli.(/100ml)	Start Date	Start Time	End Date	End Time	Method	Analyst
	>2400	09/29/16	11:09	09/30/16	11:26	9223B	JD

Bacteriological analysis of this sample indicates the water is unsafe for human consumption. Analysis was performed according to the 20th edition of Standard Methods

Inorganic Chemical results:

Parameter	Result	Units	MCL	Date of Analysis	Method	Analyst
Nitrate-Nitrogen	0.8	mg/l	10	9/29/2016	300.0	PH
Nitrite Nitrogen	<0.2	mg/l		9/29/2016	300.0	PH
Phosphorous-Total	0.220	mg/l		10/3/2016	SM4500P BE*	VVK
Solids - Total Suspend	56	mg/l		9/29/2016	2540D	JD
Total Kjeldahl Nitrogen	0.748	mg/l		10/6/2016	4500NH3-D*	RMT
Total Nitrogen	1.5	mg/l		10/7/2016	Calculation	PH
Turbidity	39	NTU'		9/29/2016	180.1	KMW

Reported by: Cristy Phelps 10/11/16
Name Date

Fredericktowne Labs, Inc. is a State Certified Water Quality Laboratory
Maryland Cert. No. 116 Virginia Cert. No. 00444
MDOT WBE Cert. No.: 91-158

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(base report)

WO#: **16091817**

Date Reported: **10/6/2016**

CLIENT: Fredericktowne Labs, Inc
Matrix: NON-POTABLE WATER
Lab ID: 16091817-001A
Project: 10482-1-1
Client Sample ID 10482-1-1-1

Tag Number:
Collection Date: 9/29/2016 9:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PHOSPHORUS (EPA 200.7)				**E200.7**	**E200.2**	Analyst: **VVK**
Phosphorus(P)	0.220	0.0500		mg/L	1	10/3/2016 5:23:25 PM
TOTAL KJELDAHL NITROGEN (4500-NH3-D)				**A4500-NH3-D**	**A4500-NOR**	Analyst: **RMT**
TKN	0.748	0.500		mg/L	1	10/6/2016 8:00:00 AM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
M	Manual Integration used to determine area response
PL	Permit Limit
W	Sample container temperature is out of limit as specified at testcode

Chain of Custody Form

Fredericktowne Labs, Inc.
3020 Ventrie Ct. P. O. Box 245
Myersville , MD 21773-
(301) 293-3340 / FAX (301) 293-2366

Acct. No.: 10482-1-1

Project: Frederick, Seibert & Associates, Inc. Washington County Stream Project 128 South Potomac Street Hagerstown, MD 21740	**Collected by:** DOUG HUTZELL + KEVIN PERKINS **Affiliation:** FSA

Sample Description / Sample Number	Date of Collection	Time of Collection	Analysis to be Performed	Field Observations	Preservation	Verif. By:
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab			STREAM HAMILTON RUN RAIN GOLF COURSE AT LOWER BRIDGE	ICE TEMP. 17.1 pH 8.5		
10482-1-1-1	~~9/28/16~~ 9/29/16	~~1330~~ 0900	Phosphorous-Total		H2SO4 pH < 2	PO
			Total Kjeldahl Nitrogen			
			Total Nitrogen			
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab						
10482-1-1-2	9/29/16	0900	Bacteria - Colilert 2000 E.Coli Only		Na2S2O3	
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab						
10482-1-1-3	9/29/16	0900	Nitrate-Nitrogen		4 degrees C	
			Nitrite Nitrogen			
			Solids - Total Suspended			
			Turbidity			

If lead or copper are sample collection forms attached?
Yes ☐ No ☐ Water last used: _____ (Date) _____ (Time)

Relinquished by: [signature] 9/29/16 1074	Received by: Ellen Mellott 9/29/16 10:34
Relinquished by:	Received by:
Relinquished by:	Received by:

Method of Shipment:	Iced: Yes ☑ No ☐ Temp 4.0	Treatment:

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www.fredericktownelabs.com ● info@fredericktownelabs.com

Certificate of Analysis

Acct. No. 10482 - 2-1

Field Record

Site visit performed on: Thursday, September 29, 2016 9:30 AM
by: Doug Hutzell
Affiliation: FSA
Property Owner: Frederick, Seibert & Associates, Inc.
Project: Washington County Stream Project
Property Address: 128 South Potomac Street
Hagerstown, MD 21740
Sample Source: Stream Hamilton Run Magnolia St Cross
Field pH: 8.0

Temp: 17° C

Laboratory Report

Sample Received at laboratory: 9/29/2016 10:36 AM

Inorganic Chemical results:

Parameter	Result	Units	MCL	Date of Analysis	Method	Analyst
Nitrate-Nitrogen	1.3	mg/l	10	9/29/2016	300.0	PH
Nitrite Nitrogen	<0.2	mg/l		9/29/2016	300.0	PH
Phosphorous-Total	0.210	mg/l		10/3/2016	200.7*	VVK
Solids - Total Suspend	140	mg/l		9/29/2016	2540D	JD
Total Kjeldahl Nitrogen	0.921	mg/l		10/6/2016	4500NH3-D*	RMT
Total Nitrogen	2.2	mg/l		10/17/2016	Calculation	PH
Turbidity	60	NTU'		9/29/2016	180.1	KMW

Reported by: _____
Name Date

Fredericktowne Labs, Inc. is a State Certified Water Quality Laboratory
Maryland Cert. No. 116 Virginia Cert. No. 00444
MDOT WBE Cert. No.: 91-158

No Regulatory Reports Required

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Analysis Results

REVISED 11/15/16 CP

Account No.: 10482 - 2-1

Washington County Stream Project
Frederick, Seibert & Associates, Inc.
128 South Potomac Street
Hagerstown, MD 21740

Date Received: Thursday, September 29, 2016
Collected By: Doug Hutzell
FSA
Date Reported: Monday, October 10, 2016

Matrix: Water

Lab#	Parameter	Result	Limit of Detection	Method	Start Date	Start Time	End Date	End Time	Analyst
Source: -	Stream Hamilton Run Magnolia St Cross	Type: Grab	Collection Date: 9/29/2016 - 09:30						
10482-2-1-1	**Phosphorous-Total**	**0.210 mg/l**	0.05 mg/l	200.7*	10/03/16-17:23		10/03/16		VVK
10482-2-1-1	**Total Kjeldahl Nitrogen**	**0.921 mg/l**	0.5 mg/l	4500NH3-D*	10/06/16-08:00		10/06/16		RMT
10482-2-1-1	**Total Nitrogen**	**2.2 mg/l**	mg/l	Calculation	10/17/16-16:20		10/17/16-16:20		PH
10482-2-1-2	**E. Coli**	**>2400 /100ml**	1 /100ml	9223B	09/29/16-11:09		09/30/16-11:26		JD
10482-2-1-3	**Nitrate-Nitrogen**	**1.3 mg/l**	0.2 mg/l	300.0	09/29/16-15:14		09/29/16-15:29		PH
10482-2-1-3	**Nitrite Nitrogen**	**<0.2 mg/l**	0.2 mg/l	300.0	09/29/16-15:14		09/29/16-15:29		PH
10482-2-1-3	**Solids - Total Suspended**	**140 mg/l**	1 mg/l	2540D	09/29/16-15:00		09/30/16-11:30		JD
10482-2-1-3	**Turbidity**	**60 NTU's**	0.1 NTU's	180.1	09/29/16-12:35		09/29/16		KMW

Notes:
1. mg/l stands for milligrams per liter and is nearly synonymous with parts per million
   ug/l stands for micrograms per liter and is nearly synonymous with parts per billion
2. < stands for "less than" and indicates that the component in question was not detected (i.e. was less than the detection limit)
3. All analyses performed using EPA accepted methods per: (1) Methods for the Chemical Analysis of Water & Wastewater EPA-600/4-79-020, (2) Standard Methods for the Examination of Water & Wastewater – AWWA 19th /20th eds., (3) Test Methods for Evaluating Solid Waste – EPA SW-8
4. "*" denotes an analysis that was subcontracted to a State of Maryland approved lab.

Verified by: Cindy Phelps 11/15/16
for M. L. Miller, Ph.D.
Laboratory Director

Fredericktowne Labs is a State Certified Water Quality Laboratory
MD Cert. No.: 116 VA Cert. No.: 444
MDOT WBE Cert. No.: 91-158

No Regulatory Reports Required

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(base report)

WO#: **16091815**

Date Reported: **10/6/2016**

CLIENT: Fredericktowne Labs, Inc
Matrix: NON-POTABLE WATER
Lab ID: 16091815-001A
Project: 10482-2-1
Client Sample ID 10482-2-1-1

Tag Number:
Collection Date: 9/29/2016 9:30:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PHOSPHORUS (EPA 200.7)				**E200.7**	**E200.2**	Analyst: **VVK**
Phosphorus(P)	0.210	0.0500		mg/L	1	10/3/2016 5:23:25 PM
TOTAL KJELDAHL NITROGEN (4500-NH3-D)				**A4500-NH3-D**	**A4500-NOR**	Analyst: **RMT**
TKN	0.921	0.500		mg/L	1	10/6/2016 8:00:00 AM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
M	Manual Integration used to determine area response
PL	Permit Limit
W	Sample container temperature is out of limit as specified at testcode

Chain of Custody Form

Fredericktowne Labs, Inc.
3020 Ventrie Ct. P. O. Box 245
Myersville , MD 21773-
(301) 293-3340 / FAX (301) 293-2366

Acct. No.: 10482-2-1

Project: Frederick, Seibert & Associates, Inc.
Washington County Stream Project
128 South Potomac Street
Hagerstown, MD 21740

Collected by: DOUG HUTZELL & KEVIN PERKINS

Affiliation: FSA

Sample Description / Sample Number	Date of Collection	Time of Collection	Analysis to be Performed	Field Observations	Preservation	Verif. By:
Source: Describe Source Matrix: Water Grab/Comp: Grab		STREAM, HAMILTON RUN MAGNOLIA ST. CROSSING		RAIN 1.75 IN	ICE TEMP 17 C pH 8.0	
10482-2-1-1	9/29/16	0930	Phosphorous-Total		H2SO4 pH < 2	
			Total Kjeldahl Nitrogen			
			Total Nitrogen			
Source: Describe Source Matrix: Water Grab/Comp: Grab						
10482-2-1-2	9/29/16	0930	Bacteria - Colilert 2000 E.Coli Only		Na2S2O3	
Source: Describe Source Matrix: Water Grab/Comp: Grab						
10482-2-1-3	9/29/16	0930	Nitrate-Nitrogen		4 degrees C	
			Nitrite Nitrogen			
			Solids - Total Suspended			
			Turbidity			

If lead or copper are sample collection forms attached?
Yes ☐ No ☐

Water last used: _____ (Date) _____ (Time)

Relinquished by: [signature] 9/29/16 1034	Received by: Tollie Mellott 9/29/16 10:36
Relinquished by:	Received by:
Relinquished by:	Received by:

Method of Shipment:	Iced: Yes ☑ No ☐ Temp 7.7	Treatment:

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Certificate of Analysis

Acct. No. 10482 - 3-1

Field Record

Site visit performed on: Thursday, September 29, 2016 10:00 AM
by: Doug Hutzell
Affiliation: FSA
Property Owner: Frederick, Seibert & Associates, Inc.
Project: Washington County Stream Project
Property Address: 128 South Potomac Street
Hagerstown, MD 21740
Sample Source: Stream Hamilton Run MillsPk atTrib Con
Field pH: 7.8

Temp: 16.4° C

Laboratory Report

Sample Received at laboratory: 9/29/2016 10:36 AM

Inorganic Chemical results:

Parameter	Result	Units	MCL	Date of Analysis	Method	Analyst
Nitrate-Nitrogen	0.8	mg/l	10	9/29/2016	300.0	PH
Nitrite Nitrogen	<0.2	mg/l		9/29/2016	300.0	PH
Phosphorous-Total	0.150	mg/l		10/3/2016	SM4500P BE*	VVK
Solids - Total Suspend	30	mg/l		9/29/2016	2540D	JD
Total Kjeldahl Nitrogen	0.608	mg/l		10/6/2016	4500NH3-D*	RMT
Total Nitrogen	1.4	mg/l		10/7/2016	Calculation	PH
Turbidity	23	NTU'		9/29/2016	180.1	KMW

Reported by: Cristy Phelps 10/11/16
Name Date

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MDOT WBE Cert. No.: 91-158

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Analysis Results

REVISED 11/15/16 CP

Account No.: 10482 - 3-1

Washington County Stream Project
Frederick, Seibert & Associates, Inc.
128 South Potomac Street
Hagerstown, MD 21740

Date Received: Thursday, September 29, 2016
Collected By: Doug Hutzell
FSA
Date Reported: Friday, October 07, 2016

Matrix: Water

Lab#	Parameter	Result	Limit of Detection	Method	Start Date	Start Time	End Date	End Time	Analyst
Source: -	Stream Hamilton Run MillsPk atTrib Con	Type: Grab	Collection Date: 9/29/2016 - 10:00						
10482-3-1-1	**Phosphorous-Total**	**0.150 mg/l**	0.05 mg/l	SM4500P BE*	10/03/16-17:23		10/03/16		VVK
10482-3-1-1	**Total Kjeldahl Nitrogen**	**0.608 mg/l**	0.5 mg/l	4500NH3-D*	10/06/16-08:00		10/06/16		RMT
10482-3-1-1	**Total Nitrogen**	**1.4 mg/l**	mg/l	Calculation	10/07/16-15:00		10/07/16-15:00		PH
10482-3-1-2	**E. Coli**	**>2400 /100ml**	1 /100ml	9223B	09/29/16-11:09		09/30/16-11:27		JD
Source: -	Stream Hamilton RunMillsPk atTrib Conf	Type: Grab	Collection Date: 9/29/2016 - 10:00						
10482-3-1-3	**Nitrate-Nitrogen**	**0.8 mg/l**	0.2 mg/l	300.0	09/29/16-15:30		09/29/16-15:45		PH
10482-3-1-3	**Nitrite Nitrogen**	**<0.2 mg/l**	0.2 mg/l	300.0	09/29/16-15:30		09/29/16-15:45		PH
10482-3-1-3	**Solids - Total Suspended**	**30 mg/l**	1 mg/l	2540D	09/29/16-15:00		09/30/16-11:30		JD
10482-3-1-3	**Turbidity**	**23 NTU's**	0.1 NTU's	180.1	09/29/16-12:35		09/29/16		KMW

Notes:
1. mg/l stands for milligrams per liter and is nearly synonymous with parts per million
   ug/l stands for micrograms per liter and is nearly synonymous with parts per billion
2. < stands for "less than" and indicates that the component in question was not detected (i.e. was less than the detection limit)
3. All analyses performed using EPA accepted methods per: (1) Methods for the Chemical Analysis of Water & Wastewater EPA-600/4-79-020, (2) Standard Methods for the Examination of Water & Wastewater – AWWA 19th /20th eds., (3) Test Methods for Evaluating Solid Waste – EPA SW-8
4. "*" denotes an analysis that was subcontracted to a State of Maryland approved lab.

Verified by: Cristy Phelps 11/15/16
for M. L. Miller, Ph.D.
Laboratory Director

Fredericktowne Labs is a State Certified Water Quality Laboratory
MD Cert. No.: 116 VA Cert. No.: 444
MDOT WBE Cert. No.: 91-158

No Regulatory Reports Required

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(base report)

WO#: **16091816**

Date Reported: **10/6/2016**

CLIENT: Fredericktowne Labs, Inc
Matrix: NON-POTABLE WATER
Lab ID: 16091816-001A
Project: 10482-3-1
Client Sample ID 10482-3-1-1

Tag Number:
Collection Date: 9/29/2016 10:00:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PHOSPHORUS (EPA 200.7)				**E200.7**	**E200.2**	Analyst: **VVK**
Phosphorus(P)	0.150	0.0500		mg/L	1	10/3/2016 5:23:25 PM
TOTAL KJELDAHL NITROGEN (4500-NH3-D)				**A4500-NH3-D**	**A4500-NOR**	Analyst: **RMT**
TKN	0.608	0.500		mg/L	1	10/6/2016 8:00:00 AM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
M	Manual Integration used to determine area response
PL	Permit Limit
W	Sample container temperature is out of limit as specified at testcode

Chain of Custody Form

Fredericktowne Labs, Inc.
3020 Ventrie Ct. P. O. Box 245
Myersville , MD 21773-
(301) 293-3340 / FAX (301) 293-2366

Acct. No.: 10482-3-1

Project: Frederick, Seibert & Associates, Inc. Washington County Stream Project 128 South Potomac Street Hagerstown, MD 21740	**Collected by:** DOUG HUTZELL & KEVIN PERKINS **Affiliation:** FSA

Sample Description / Sample Number	Date of Collection	Time of Collection	Analysis to be Performed	Field Observations	Preservation	Verif. By:
Source: Describe Source STREAM, HAMILTON RUN **Matrix:** Water **Grab/Comp:** Grab				RAIN	ICE TEMP ~~17~~ 16.4 pH ~~8.5~~ 7.8	
10482-3-1-1	9/29/16	~~0900~~	Phosphorous-Total		H2SO4 pH < 2	DM
		1000	Total Kjeldahl Nitrogen			
			Total Nitrogen			
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab						
10482-3-1-2	9/29/16	~~0900~~	Bacteria - Colilert 2000 E.Coli Only		Na2S2O3	
Source: Describe Source 1000 **Matrix:** Water **Grab/Comp:** Grab						
10482-3-1-3	9/29/16	~~0900~~	Nitrate-Nitrogen		4 degrees C	
		1000	Nitrite Nitrogen			
			Solids - Total Suspended			
			Turbidity			

If lead or copper are sample collection forms attached?
Yes ☐ No ☐

Water last used: _____ (Date) _____ (Time)

Relinquished by: A.W. Hatfield 9/29/16 10:36	Received by: Tellen Mellott 9/29/16 10:36
Relinquished by:	Received by:
Relinquished by:	Received by:

Method of Shipment:	Iced: Yes ☑ No ☐ Temp 8.0	Treatment:

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Certificate of Analysis

Acct. No. 10482 - 4-1

Field Record

Site visit performed on: Wednesday, September 28, 2016 1:30 PM
by: Doug Hutzell
Affiliation: FSA
Property Owner: Frederick, Seibert & Associates, Inc.
Project: Washington County Stream Project
Property Address: 128 South Potomac Street
Hagerstown, MD 21740
Sample Source: Stream, Hamilton Run Golf C. Bridge

Laboratory Report

Sample Received at laboratory: 9/28/2016 3:04 PM

Bacteriological results:

Total Colif. (/100ml)	E.coli.(/100ml)	Start Date	Start Time	End Date	End Time	Method	Analyst
	410	09/28/16	15:25	09/29/16	15:27	9223B	JD

Bacteriological analysis of this sample indicates the water is unsafe for human consumption.
Analysis was performed according to the 20th edition of Standard Methods

Inorganic Chemical results:

Parameter	Result	Units	MCL	Date of Analysis	Method	Analyst
Nitrate-Nitrogen	3.2	mg/l	10	9/29/2016	300.0	PH
Nitrite Nitrogen	<0.2	mg/l		9/29/2016	300.0	PH
Phosphorous-Total	<0.05	mg/l		9/29/2016	200.7*	VVK
Solids - Total Suspend	7	mg/l		9/29/2016	2540D	JD
Total Kjeldahl Nitrogen	<0.5	mg/l		10/4/2016	4500NH3-D*	RMT
Total Nitrogen	3.2	mg/l		10/5/2016	Calculation	PH
Turbidity	4.8	NTU'		9/28/2016	180.1	KB

Reported by: Cindy Phelps 10/5/16
Name Date

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MDOT WBE Cert. No.: 91-158

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Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(base report)

WO#: **16091729**

Date Reported: **10/5/2016**

CLIENT: Fredericktowne Labs, Inc
Matrix: NON-POTABLE WATER
Lab ID: 16091729-001A
Project: 10482-4-1
Client Sample ID 10482-4-1-1

Tag Number:
Collection Date: 9/28/2016 1:30:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PHOSPHORUS (EPA 200.7)				**E200.7**	**E200.2**	Analyst: **VVK**
Phosphorus(P)	ND	0.0500		mg/L	1	9/29/2016 5:25:33 PM
TOTAL KJELDAHL NITROGEN (4500-NH3-D)				**A4500-NH3-D**	**A4500-NOR**	Analyst: **RMT**
TKN	ND	0.500		mg/L	1	10/4/2016 12:17:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
M	Manual Integration used to determine area response
PL	Permit Limit
W	Sample container temperature is out of limit as specified at testcode

Chain of Custody Form

Fredericktowne Labs, Inc.
3020 Ventrie Ct. P. O. Box 245
Myersville , MD 21773-
(301) 293-3340 / FAX (301) 293-2366

Acct. No.: 10482-4-1

Project: Frederick, Seibert & Associates, Inc. Washington County Stream Project 128 South Potomac Street Hagerstown, MD 21740	**Collected by:** DOUG HUTZELL **Affiliation:** FSA

Sample Description / Sample Number	Date of Collection	Time of Collection	Analysis to be Performed	Field Observations	Preservation	Verif. By:
Source: Describe Source STREAM, HAMILTON RUN **Matrix:** Water **Grab/Comp:** Grab GOLF C. BRIDGE				BASE FLOW BEFOR RAIN	ICE 8.5 PH ? 17.6 C	
10482-4-1-1	9/28/16	1330	Phosphorous-Total		H2SO4 pH < 2	
			Total Kjeldahl Nitrogen			
			Total Nitrogen			
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab						
10482-4-1-2	9/28/16	1330	Bacteria - Colilert 2000 E.Coli Only		Na2S2O3	
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab						
10482-4-1-3	9/28/16	1330	Nitrate-Nitrogen		4 degrees C	
			Nitrite Nitrogen			
			Solids - Total Suspended			
			Turbidity			

If lead or copper are sample collection forms attached? Yes ☐ No ☐

Water last used: _____ (Date) _____ (Time)

Relinquished by: D. W. Hutzell 9/28/16 1504	Received by: Ellen Mellott 9/28/16 15:04
Relinquished by: Ellen Mellott 9/28/16	Received by:
Relinquished by:	Received by:

Method of Shipment:	Iced: Yes ☑ No ☐ Temp ☐	Treatment:

SET 9/28

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Certificate of Analysis

Acct. No. 10482 - 5-1

Field Record

Site visit performed on: Wednesday, September 28, 2016 2:00 PM
by: Doug Hutzell
Affiliation: FSA
Property Owner: Frederick, Seibert & Associates, Inc.
Project: Washington County Stream Project
Property Address: 128 South Potomac Street
Hagerstown, MD 21740
Sample Source: Stream, Hamilton Run Magnolia St Cross

Laboratory Report

Sample Received at laboratory: 9/28/2016 3:04 PM

Bacteriological results:

Total Colif. (/100ml)	E.coli.(/100ml)	Start Date	Start Time	End Date	End Time	Method	Analyst
	730	09/28/16	15:25	09/29/16	15:27	9223B	JD

Bacteriological analysis of this sample indicates the water is unsafe for human consumption.
Analysis was performed according to the 20th edition of Standard Methods

Inorganic Chemical results:

Parameter	Result	Units	MCL	Date of Analysis	Method	Analyst
Nitrate-Nitrogen	3.8	mg/l	10	9/29/2016	300.0	PH
Nitrite Nitrogen	<0.2	mg/l		9/29/2016	300.0	PH
Phosphorous-Total	0.110	mg/l		9/29/2016	200.7*	VVK
Solids - Total Suspend	11	mg/l		9/29/2016	2540D	JD
Total Kjeldahl Nitrogen	<0.5	mg/l		10/4/2016	4500NH3-D*	RMT
Total Nitrogen	3.9	mg/l		10/5/2016	Calculation	PH
Turbidity	7.6	NTU'		9/28/2016	180.1	KB

Reported by: Cathy Phelps 10/5/16
Name Date

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Maryland Cert. No. 116 Virginia Cert. No. 00444
MDOT WBE Cert. No.: 91-158

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Analytical Laboratories

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TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(base report)

WO#: **16091730**

Date Reported: **10/5/2016**

CLIENT: Fredericktowne Labs, Inc
Matrix: NON-POTABLE WATER
Lab ID: 16091730-001A
Project: 10482-5-1
Client Sample ID 10482-5-1-1

Tag Number:
Collection Date: 9/28/2016 2:00:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PHOSPHORUS (EPA 200.7)				**E200.7**	**E200.2**	Analyst: **VVK**
Phosphorus(P)	0.110	0.0500		mg/L	1	9/29/2016 5:25:33 PM
TOTAL KJELDAHL NITROGEN (4500-NH3-D)				**A4500-NH3-D**	**A4500-NOR**	Analyst: **RMT**
TKN	ND	0.500		mg/L	1	10/4/2016 12:17:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
M	Manual Integration used to determine area response
PL	Permit Limit
W	Sample container temperature is out of limit as specified at testcode

Chain of Custody Form

Fredericktowne Labs, Inc.
3020 Ventrie Ct. P. O. Box 245
Myersville , MD 21773-
(301) 293-3340 / FAX (301) 293-2366

Acct. No.: 10482-5-1

Project: Frederick, Seibert & Associates, Inc. Washington County Stream Project 128 South Potomac Street Hagerstown, MD 21740	**Collected by:** Doug Hutzell **Affiliation:** FSA

Sample Description / Sample Number	Date of Collection	Time of Collection	Analysis to be Performed	Field Observations	Preservation	Verif. By:
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab			Stream, Hamilton Run Magnolia St. Crossing	Base Flow Before Rain	Ice 3.4 pH Col. C	
10482-5-1-1	9/28/16	1400	Phosphorous-Total		H_2SO_4 pH < 2	M
			Total Kjeldahl Nitrogen			
			Total Nitrogen			
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab						
10482-5-1-2	9/28/16	1400	Bacteria - Colilert 2000 E.Coli Only		$Na_2S_2O_3$	
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab						
10482-5-1-3	9/28/16	1400	Nitrate-Nitrogen		4 degrees C	
			Nitrite Nitrogen			
			Solids - Total Suspended			
			Turbidity			

If lead or copper are sample collection forms attached?
Yes ☐ No ☐ Water last used: _____ (Date) _____ (Time)

Relinquished by: Doug Hutzell 9/28/16 1504	Received by: Ellen Mellott 9/28/16 15:04
Relinquished by: Ellen Mellott 9/28/16	Received by:
Relinquished by:	Received by:

Method of Shipment:	Iced: Yes ☑ No ☐ Temp ☐	Treatment:

Fredericktowne Labs Inc.
ENVIRONMENTAL TESTING
3020 Ventrie Court ● P.O. BOX 245 ● Myersville, MD 21773 ● 800-332-3340 ● FAX 301-293-2366
www.fredericktownelabs.com ● info@fredericktownelabs.com

Certificate of Analysis

Acct. No. 10482 - 6-1

Field Record

Site visit performed on: Wednesday, September 28, 2016 2:30 PM
by: Doug Hutzell
Affiliation: FSA
Property Owner: Frederick, Seibert & Associates, Inc.
Project: Washington County Stream Project
Property Address: 128 South Potomac Street
Hagerstown, MD 21740
Sample Source: Stream, Hamilton Run Mills Pk @ Confl

Laboratory Report

Sample Received at laboratory: 9/28/2016 3:04 PM

Bacteriological results:

Total Colif. (/100ml)	E.coli.(/100ml)	Start Date	Start Time	End Date	End Time	Method	Analyst
	>2400	09/28/16	15:25	09/29/16	15:27	9223B	JD

Bacteriological analysis of this sample indicates the water is unsafe for human consumption.
Analysis was performed according to the 20th edition of Standard Methods

Inorganic Chemical results:

Parameter	Result	Units	MCL	Date of Analysis	Method	Analyst
Nitrate-Nitrogen	3.1	mg/l	10	9/29/2016	300.0	PH
Nitrite Nitrogen	<0.2	mg/l		9/29/2016	300.0	PH
Phosphorous-Total	<0.05	mg/l		9/29/2016	200.7*	VVK
Solids - Total Suspend	22	mg/l		9/29/2016	2540D	JD
Total Kjeldahl Nitrogen	0.516	mg/l		10/4/2016	4500NH3-D*	RMT
Total Nitrogen	3.6	mg/l		10/5/2016	Calculation	PH
Turbidity	17	NTU'		9/28/2016	180.1	KB

Reported by: Cindy Phelps 10/5/16
Name Date

Fredericktowne Labs, Inc. is a State Certified Water Quality Laboratory
Maryland Cert. No. 116 Virginia Cert. No. 00444
MDOT WBE Cert. No.: 91-158

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Analytical Report

(base report)

WO#: **16091731**

Date Reported: **10/5/2016**

CLIENT: Fredericktowne Labs, Inc
Matrix: NON-POTABLE WATER
Lab ID: 16091731-001A
Project: 10482-5-1
Client Sample ID 10482-6-1-1

Tag Number:
Collection Date: 9/28/2016 2:30:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
PHOSPHORUS (EPA 200.7)				**E200.7**	**E200.2**	Analyst: **VVK**
Phosphorus(P)	ND	0.0500		mg/L	1	9/29/2016 5:25:33 PM
TOTAL KJELDAHL NITROGEN (4500-NH3-D)				**A4500-NH3-D**	**A4500-NOR**	Analyst: **RMT**
TKN	0.516	0.500		mg/L	1	10/4/2016 12:17:00 PM

Qualifiers:

H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
RL	Reporting Detection Limit
M	Manual Integration used to determine area response
PL	Permit Limit
W	Sample container temperature is out of limit as specified at testcode

Chain of Custody Form

Fredericktowne Labs, Inc.
3020 Ventrie Ct. P. O. Box 245
Myersville , MD 21773-
(301) 293-3340 / FAX (301) 293-2366

Acct. No.: 10482-6-1

Project: Frederick, Seibert & Associates, Inc. Washington County Stream Project 128 South Potomac Street Hagerstown, MD 21740	**Collected by:** DOUG HUTZELL **Affiliation:** FSA

Sample Description / Sample Number	Date of Collection	Time of Collection	Analysis to be Performed	Field Observations	Preservation	Verif. By:
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab			STREAM, HAMILTON RUN MILLS PARK AT CONFL.	CLOUDY BASE FLOW OF TRIB.	ICE 8.2 PH 16.4 C	
10482-6-1-1	9/28/16	1430	Phosphorous-Total		H2SO4 pH < 2	
			Total Kjeldahl Nitrogen			
			Total Nitrogen			
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab						
10482-6-1-2	9/28/16	1430	Bacteria - Colilert 2000 E.Coli Only		Na2S2O3	
Source: Describe Source **Matrix:** Water **Grab/Comp:** Grab						
10482-6-1-3	9/28/16	1430	Nitrate-Nitrogen		4 degrees C	
			Nitrite Nitrogen			
			Solids - Total Suspended			
			Turbidity			

If lead or copper are sample collection forms attached?
Yes ☐ No ☐

Water last used: _____ (Date) _____ (Time)

Relinquished by: [illegible] 9/28/16 1504	Received by: Ellen Mellott 9/28/16 15:04
Relinquished by: Ellen Mellott 9/28/16	Received by:
Relinquished by:	Received by:

Method of Shipment:	Iced: Yes ☑ No ☐ Temp ☐	Treatment:

TC & FC limits for natural waters
(Ref.: EPA Water Quality Standards for Coastal and Great Lakes Recreation Waters, 1986)

Acceptable swimming-associated gastroenteritis rate per 1000 swimmers	**Steady state geometric mean indicator density**	**Designated beach area (upper 75% C.L.)**	**Moderate full body contact recreation (upper 82% C.L.)**	**Lightly used full body contact recreation (upper 82% C.L.)**	**Infrequently used full body contact recreation (upper 95% C.L.)**
Freshwater-**Enterococci** (8)	33/100ml	61	78	107	151
Freshwater-**E. Coli** (8)	126/100ml	235	298	409	575
Marine Water-**Enterococci** (19)	35/100ml	104	158	276	501

	Desirable	Permissible
Primary contact water (swimming)		
Total coliforms / 100 ml	<1000	<2400
Fecal coliforms / 100 ml	<200	<1000
Secondary contact (boating, fishing)		
Total coliforms / 100 ml	<5000	<10000
Fecal coliforms / 100 ml	<1000	<5000

APPENDIX D

Reach Level Function-Based Assessments

Hamilton Run, Hagerstown, MD: HR-R1														
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**					
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	6	**FAR**	**9**			F	9	**FAR***	**12**		
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	6	**FAR**	**29**			F	10	**F**	**40**		
		Entrenchment Ratio	F	10					F	10				
	Floodplain Drainage	FWS Rapid Assessment	FAR	6					F	10				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	10				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	7	**FAR**	**28**	**FAR**	**88**	F	9	**F**	**54**	**FAR***	**140**
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	5					F	9				
		Lateral Stabity Extent	NF	3					F	9				
	Bedform Diversity	Shelter for Fish	FAR	4					F	9				
		Pool-to-pool Spacing	FAR	4					F	9				
		Pool Depth Variability	FAR	5					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	5	**FAR**	**9**			FAR*	7	**FAR***	**15**		
	Detritus	FWS Rapid Assessment	FAR	4					FAR*	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**13**			FAR*	7	**FAR***	**19**		
		Tolerance	FAR	5					FAR	5				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Slightly incised, laterally eroding C4. Trending toward functioning- downcutting done. Outside meanders eroding. Most likely decades before equilibrium reached

	Constraints
Constraints	Bridge at upstream end.

	Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R2														
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**					
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	NF	3	**NF**	**6**			FAR*	7	**FAR***	**10**		
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	6	**FAR**	**23**			F	9	**FAR***	**33**		
		Entrenchment Ratio	FAR	7					F	8				
	Floodplain Drainage	FWS Rapid Assessment	NF	3					FAR*	7				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	3	**FAR**	**36**	**FAR**	**87**	FAR*	6	**FAR***	**50**	**FAR***	**127**
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	7					F	9				
		Lateral Stabity Extent	FAR	7					F	9				
	Bedform Diversity	Shelter for Fish	FAR	5					F	8				
		Pool-to-pool Spacing	FAR	7					F	9				
		Pool Depth Variability	FAR	7					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	5	**FAR**	**10**			FAR*	7	**FAR***	**16**		
	Detritus	FWS Rapid Assessment	FAR	5					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**12**			FAR*	7	**FAR***	**18**		
		Tolerance	FAR	4					FAR	4				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	B4c because of floodplain encroachment from development. Reach is mostly stable because of dense vegetation.

	Constraints
Constraints	Bridge at downstream end.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R3															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	5	**FAR**	**8**			FAR*	6	**FAR***	**9**		
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	F	8	**FAR**	**31**			F	9	**F**	**34**		
		Entrenchment Ratio	F	8					F	8				
	Floodplain Drainage	FWS Rapid Assessment	FAR	6					F	8				
	Vertical Stability Extent	FWS Rapid Assessment	F	9					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	3	**FAR**	**35**	**FAR**	**93**	FAR*	6	**FAR***	**50**	**FAR***	**124**
	Lateral Stability	Dominant Bank Ersoion Rate	F	8					F	9				
		Lateral Stabity Extent	F	8					F	9				
	Bedform Diversity	Shelter for Fish	FAR	5					F	8				
		Pool-to-pool Spacing	NF	2					F	9				
		Pool Depth Variability	F	9					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**7**			FAR*	7	**FAR***	**15**		
	Detritus	FWS Rapid Assessment	NF	3					F	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**12**			FAR*	6	**FAR***	**16**		
		Tolerance	FAR	4					FAR	4				
	Fish	Presence	FAR	4					FAR*	6				

	Rating	Channel Evolution
Channel Evolution	FAR	Evolved into a B4c. Should be a C4 but has been straightened. Reach is mostly stable because of dense vegetation

	Constraints
Constraints	Bridge at upstream and downstream end, neither of which can pass BF flows. Encroachment from development on both sides of the stream.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R4															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	6	**FAR**	**9**	**NF**	**80**	FAR	6	**FAR***	**9**	**FAR***	**126**
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	3	**NF**	**19**			F	9	**F**	**35**		
		Entrenchment Ratio	NF	2					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	8				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	3	**FAR**	**32**			FAR*	7	**FAR***	**51**		
	Lateral Stability	Dominant Bank Ersoion Rate	F	9					F	9				
		Lateral Stabity Extent	FAR	6					F	9				
	Bedform Diversity	Shelter for Fish	FAR	4					F	8				
		Pool-to-pool Spacing	NF	3					F	9				
		Pool Depth Variability	FAR	7					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**8**			FAR*	7	**FAR***	**15**		
	Detritus	FWS Rapid Assessment	FAR	4					F	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**12**			FAR*	6	**FAR***	**16**		
		Tolerance	FAR	4					FAR	4				
	Fish	Presence	FAR	4					FAR*	6				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	F4 trying to evovle into a B4c. Right bank fairly stable but left banl eroding at a low to moderate rate. Vegetation is helping slow rate.

	Constraints
Constraints	Bridge at downstream end, neither of which can pass BF flows. Encroachment from development on both sides of the stream.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R5															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	6	**FAR**	**9**	**NF**	**79**	FAR	6	**FAR**	**9**	**FAR***	**83**
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	3	**NF**	**20**			NF	3	**NF**	**20**		
		Entrenchment Ratio	NF	3					NF	3				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					FAR	7				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					FAR	7				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	2	**FAR**	**32**			NF	3	**FAR***	**33**		
	Lateral Stability	Dominant Bank Ersoion Rate	F	8					F	8				
		Lateral Stabity Extent	F	8					F	8				
	Bedform Diversity	Shelter for Fish	FAR	4					FAR	4				
		Pool-to-pool Spacing	FAR	5					FAR	5				
		Pool Depth Variability	FAR	5					FAR	5				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**8**			FAR	4	**FAR**	**8**		
	Detritus	FWS Rapid Assessment	FAR	4					FAR	4				
5 - Biology	Macro	Presence	NF	3	**FAR**	**10**			FAR*	5	**FAR***	**13**		
		Tolerance	NF	3					FAR	3				
	Fish	Presence	FAR	4					FAR*	5				

Channel Evolution	**Rating**	**Channel Evolution**
Channel Evolution	NF	Hardened F4 because of rock and concrete walls on both banks. It is entrencheded. Bed is controlled by bedrock. Residental development encroaching on bith sides of stream.

Constraints	**Constraints**
Constraints	Bridge at downstream end, neither of which cannot pass BF flows. Encroachment from development on both sides of the stream.

Restoration Potential	**Restoration Potential**
Restoration Potential	Partial Lvl 3 only, if walls can be removed and Priority 3 completed.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R6															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	6	**FAR**	**9**			FAR	6	**FAR**	**9**		
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	7	**FAR**	**31**			F	9	**F**	**35**		
		Entrenchment Ratio	F	9					F	9				
	Floodplain Drainage	FWS Rapid Assessment	F	8					F	8				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	2	**FAR**	**36**	**FAR**	**95**	NF	3	**FAR***	**47**	**FAR***	**118**
	Lateral Stability	Dominant Bank Ersoion Rate	F	9					F	9				
		Lateral Stabity Extent	FAR	7					F	8				
	Bedform Diversity	Shelter for Fish	FAR	6					F	9				
		Pool-to-pool Spacing	FAR	6					F	9				
		Pool Depth Variability	FAR	6					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**8**			FAR*	5	**FAR***	**12**		
	Detritus	FWS Rapid Assessment	FAR	4					FAR*	7				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR	6	**FAR***	**15**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	4					FAR	6				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Moving towards a B4c because of residental development encroachment on both sides of stream.

	Constraints
Constraints	Bridge in middle of reach but can pass BF flows. Encroachment from development on both sides of the stream.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 only, if walls can be removed and Priority 3 completed.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R7															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	7	**FAR**	**10**			F	9	**FAR***	**16**		
		Flashniess	NF	3					FAR	7				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	F	8	**FAR**	**32**			F	9	**F**	**37**		
		Entrenchment Ratio	F	9					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	10				
	Vertical Stability Extent	FWS Rapid Assessment	F	8					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	6	**FAR**	**34**	**FAR**	**95**	F	8	**F**	**52**	**FAR***	**139**
	Lateral Stability	Dominant Bank Ersoion Rate	F	9					F	9				
		Lateral Stabity Extent	F	9					F	8				
	Bedform Diversity	Shelter for Fish	NF	4					F	9				
		Pool-to-pool Spacing	NF	3					F	9				
		Pool Depth Variability	NF	3					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**8**			FAR*	7	**FAR***	**16**		
	Detritus	FWS Rapid Assessment	FAR	4					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**18**		
		Tolerance	FAR	3					FAR	4				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Straight C4

	Constraints
Constraints	None

	Restoration Potential
Restoration Potential	Full Lvl 3 only, if walls can be removed and Priority 3 completed.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R8															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	4	**FAR**	**7**	**NF**	**74**	FAR*	6	**FAR***	**13**	**NF***	**90**
		Flashniess	NF	3					FAR	7				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	3	**NF**	**21**			NF	3	**NF**	**21**		
		Entrenchment Ratio	NF	3					NF	3				
	Floodplain Drainage	FWS Rapid Assessment	FAR	8					F	8				
	Vertical Stability Extent	FWS Rapid Assessment	F	7					FAR	7				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	2	**NF**	**27**			NF	3	**NF**	**33**		
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	7					F	9				
		Lateral Stabity Extent	F	8					F	8				
	Bedform Diversity	Shelter for Fish	NF	4					NF	5				
		Pool-to-pool Spacing	NF	3					NF	4				
		Pool Depth Variability	NF	3					NF	4				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	NF	4	**NF**	**8**			NF	5	**NF**	**10**		
	Detritus	FWS Rapid Assessment	NF	4					NF	5				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	5	**FAR***	**13**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	4					FAR*	5				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	F4 - Harden on right bank by concrete/rock wall. Encroached on left bank by Pangborn Pond and homes on the right. U/S of reach is piped

	Constraints
Constraints	Homes, Pangborn Pond and piped section u/s of reach.

	Restoration Potential
Restoration Potential	Potential only add some limited veg on banks. Pond would have to be removed to increase any additional potential uplift.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R9														
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**					
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	6	**FAR**	**9**	**FAR**	**95**	F	8	**FAR***	**14**	**FAR***	**139**
		Flashniess	NF	3					FAR	6				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	F	9	**FAR**	**34**			F	10	**F**	**40**		
		Entrenchment Ratio	F	9					F	10				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	10				
	Vertical Stability Extent	FWS Rapid Assessment	F	9					F	10				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	6	**FAR**	**30**			FAR*	7	**FAR***	**52**		
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	7					F	9				
		Lateral Stabity Extent	FAR	5					F	9				
	Bedform Diversity	Shelter for Fish	FAR	5					F	9				
		Pool-to-pool Spacing	NF	3					F	9				
		Pool Depth Variability	FAR	4					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	6	**FAR**	**11**			FAR*	7	**FAR***	**15**		
	Detritus	FWS Rapid Assessment	FAR	5					F	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**18**		
		Tolerance	NF	3					FAR	4				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Straight C4/6. Very silty channel bottom because of d/s undersized culvert causing back water.

	Constraints
Constraints	D/s culvert undersided, homes on right bank and mowed lawn on left bank.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5. There is potential to build a large wetland complex within the leftbank floodplain because the land is owned by the City.

Hamilton Run, Hagerstown, MD: HR-R10															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	6	**FAR**	**9**	**NF**	**80**	F	9	**FAR***	**15**	**FAR***	**139**
		Flashniess	NF	3					FAR	6				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	3	**NF**	**19**			F	9	**F**	**36**		
		Entrenchment Ratio	NF	3					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	9				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	6					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	4	**FAR**	**30**			F	9	**F**	**54**		
	Lateral Stability	Dominant Bank Ersoion Rate	F	8					F	9				
		Lateral Stabity Extent	FAR	6					F	9				
	Bedform Diversity	Shelter for Fish	FAR	5					F	9				
		Pool-to-pool Spacing	NF	3					F	9				
		Pool Depth Variability	FAR	4					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	6	**FAR**	**11**			FAR*	7	**FAR***	**16**		
	Detritus	FWS Rapid Assessment	FAR	5					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**18**		
		Tolerance	NF	3					FAR	4				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	Hardened F4/6. Harden on right bank from placed rocks. Entrenched because of artifical berm on left bank. Very silty channel bottom because of d/s undersized culvert causing back water.

	Constraints
Constraints	D/s culvert undersided and homes on right bank.

	Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5. There is potential to build a large wetland complex within the leftbank floodplain because the land is owned by the City.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R11															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	6	**FAR**	**9**			FAR	6	**FAR***	**12**		
		Flashniess	NF	3					FAR	6				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	6	**FAR**	**30**			F	9	**F**	**36**		
		Entrenchment Ratio	F	9					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	9				
	Vertical Stability Extent	FWS Rapid Assessment	F	8					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	6	**FAR**	**36**	**FAR**	**97**	F	8	**F**	**53**	**FAR***	**135**
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	7					F	9				
		Lateral Stabity Extent	FAR	7					F	9				
	Bedform Diversity	Shelter for Fish	FAR	5					F	9				
		Pool-to-pool Spacing	FAR	4					F	9				
		Pool Depth Variability	FAR	7					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	5	**FAR**	**11**			FAR*	7	**FAR***	**16**		
	Detritus	FWS Rapid Assessment	FAR	6					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**18**		
		Tolerance	NF	3					FAR	4				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Straight C4/6. Very silty channel bottom because of slightly high w/d ratio. A lot of hardening on right bank from landowners. Left bank stable from vegetation.

	Constraints
Constraints	Homes on right bank, school on left bank and bridge at u/s end of reach.

	Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R12															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	5	**FAR**	**8**			F	8	**FAR***	**11**		
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	6	**FAR**	**29**			F	9	**F**	**36**		
		Entrenchment Ratio	F	9					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	9				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	2	**FAR**	**35**	**FAR**	**95**	FAR	6	**FAR***	**50**	**FAR***	**130**
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	7					F	9				
		Lateral Stabity Extent	FAR	7					F	9				
	Bedform Diversity	Shelter for Fish	FAR	6					F	9				
		Pool-to-pool Spacing	NF	4					F	8				
		Pool Depth Variability	F	9					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	6	**FAR**	**12**			FAR*	7	**FAR***	**15**		
	Detritus	FWS Rapid Assessment	FAR	6					F	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**18**		
		Tolerance	NF	3					FAR	4				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Straight and incised C4/6. Very silty channel bottom because of slightly high w/d ratio. Channel is slight incised because of artifical berm on left bank. Vegetation is helping keep the banks stable. Plus there is a backwater effect from d/s bridge/road crossing

	Constraints
Constraints	Homes on left bank and bridge/road at d/s end of reach.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R13															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	7	**FAR**	**10**	**FAR**	**91**	F	8	**FAR***	**11**	**FAR***	**115**
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	3	**FAR**	**20**			F	8	**F**	**33**		
		Entrenchment Ratio	NF	3					F	8				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	8				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	2	**FAR**	**36**			FAR	6	**FAR***	**45**		
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	7					F	9				
		Lateral Stabity Extent	FAR	6					F	9				
	Bedform Diversity	Shelter for Fish	FAR	6					FAR*	6				
		Pool-to-pool Spacing	FAR	7					FAR*	7				
		Pool Depth Variability	F	8					F	8				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	6	**FAR**	**12**			FAR*	7	**FAR***	**13**		
	Detritus	FWS Rapid Assessment	FAR	6					FAR	6				
5 - Biology	Macro	Presence	FAR	5	**FAR**	**13**			FAR	5	**FAR**	**13**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	5					FAR	5				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	F4/1 → B4c. This reach is like a nick point. It is dominated by bedrock grade control and much steeper than other reaches within the project area. It is an F channel because of placed fill by adjacent landowners

	Constraints
Constraints	Homes on both banks and bridge/road at u/s end of reach.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3. Can only really improve floodplain connectivity and riparian veg because of existing bedrock grade control.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R14															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	NF	3	**FAR**	**6**			FAR	7	**FAR***	**10**		
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	7	**FAR**	**30**			F	8	**F**	**34**		
		Entrenchment Ratio	F	9					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	8				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	7	**FAR**	**41**	**FAR**	**99**	F	9	**FAR***	**48**	**FAR***	**121**
	Lateral Stability	Dominant Bank Ersoion Rate	F	9					F	9				
		Lateral Stabity Extent	F	9					F	9				
	Bedform Diversity	Shelter for Fish	FAR	4					FAR*	7				
		Pool-to-pool Spacing	NF	3					FAR	6				
		Pool Depth Variability	F	9					F	8				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	5	**FAR**	**11**			FAR*	6	**FAR***	**14**		
	Detritus	FWS Rapid Assessment	FAR	6					F	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	6	**FAR***	**15**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	4					FAR*	6				

	Rating	**Channel Evolution**
Channel Evolution	FAR	Slightly incised and straight C5/6. This reach has a silt channel bottom because of a high w/d ratio and is very flat as a result of the bedrock grade control and bridge/road crossing d/s.

	Constraints
Constraints	Bridge/road at u/s end of reach.

	Restoration Potential
Restoration Potential	Possibably Full Lvl 3, bedform diversity could be improved if backwater is addressed.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R15															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	5	**FAR**	**8**			FAR*	7	**FAR***	**10**		
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	3	**FAR**	**16**			F	8	**F**	**32**		
		Entrenchment Ratio	NF	3					F	8				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	8				
	Vertical Stability Extent	FWS Rapid Assessment	NF	3					F	8				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	6	**FAR**	**38**	**FAR**	**83**	F	9	**F**	**51**	**FAR***	**125**
	Lateral Stability	Dominant Bank Ersoion Rate	F	8					F	9				
		Lateral Stabity Extent	FAR	7					F	9				
	Bedform Diversity	Shelter for Fish	FAR	6					F	8				
		Pool-to-pool Spacing	NF	3					F	8				
		Pool Depth Variability	F	8					F	8				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**10**			FAR*	7	**FAR***	**15**		
	Detritus	FWS Rapid Assessment	FAR	6					F	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**17**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	F4/6 → B4c. This reach has a silt channel bottom because of a high w/d ratio.

	Constraints
Constraints	Stream piped at u/s end of reach.

	Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R16															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	5	**FAR**	**8**	**NF**	**70**	FAR*	7	**FAR***	**10**	**FAR***	**117**
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	3	**NF**	**18**			F	9	**FAR***	**32**		
		Entrenchment Ratio	NF	3					F	8				
	Floodplain Drainage	FWS Rapid Assessment	FAR	6					FAR*	7				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	6					F	8				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	3	**FAR**	**26**			FAR	6	**FAR***	**48**		
	Lateral Stability	Dominant Bank Ersoion Rate	F	8					F	9				
		Lateral Stabity Extent	F	8					F	9				
	Bedform Diversity	Shelter for Fish	NF	3					F	8				
		Pool-to-pool Spacing	NF	2					F	8				
		Pool Depth Variability	NF	2					F	8				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**9**			FAR*	7	**FAR***	**14**		
	Detritus	FWS Rapid Assessment	FAR	5					FAR*	7				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**9**			FAR*	6	**FAR***	**13**		
		Tolerance	NF	1					NF	1				
	Fish	Presence	FAR	4					FAR*	6				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	F4 moving to a B4c with some bedrock grade control.

	Constraints
Constraints	Stream piped at d/s end of reach. Three road crossings and landowners on both sides of stream

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R17															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	NF	3	**FAR**	**6**			FAR*	5	**FAR***	**8**		
		Flashniess	NF	3					NF	3				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	2	**NF**	**15**			F	8	**FAR***	**31**		
		Entrenchment Ratio	NF	2					F	8				
	Floodplain Drainage	FWS Rapid Assessment	FAR	5					FAR*	7				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	6					F	8				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	6	**FAR**	**34**	**NF**	**73**	F	8	**F**	**50**	**FAR***	**114**
	Lateral Stability	Dominant Bank Ersoion Rate	NF	3					F	9				
		Lateral Stabity Extent	FAR	6					F	8				
	Bedform Diversity	Shelter for Fish	FAR	6					F	8				
		Pool-to-pool Spacing	FAR	6					F	8				
		Pool Depth Variability	FAR	7					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**9**			FAR*	5	**FAR***	**14**		
	Detritus	FWS Rapid Assessment	FAR	5					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**9**			FAR*	5	**FAR***	**11**		
		Tolerance	NF	1					NF	1				
	Fish	Presence	FAR	4					FAR*	5				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	F4 moving to a B4c in some areas.
		Constraints
Constraints	Two road crossings and landowners on both sides of stream	
		Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5.	

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R18															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	5	**FAR**	**9**			FAR*	7	**FAR***	**11**		
		Flashniess	FAR	4					FAR	4				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	F	10	**FAR**	**34**			F	10	**F**	**37**		
		Entrenchment Ratio	F	8					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	9				
	Vertical Stability Extent	FWS Rapid Assessment	F	9					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	6	**FAR**	**38**	**FAR**	**100**	F	8	**F**	**51**	**FAR***	**124**
	Lateral Stability	Dominant Bank Ersoion Rate	F	8					F	9				
		Lateral Stabity Extent	F	8					F	8				
	Bedform Diversity	Shelter for Fish	FAR	7					F	9				
		Pool-to-pool Spacing	FAR	4					F	8				
		Pool Depth Variability	FAR	5					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**10**			FAR*	5	**FAR***	**14**		
	Detritus	FWS Rapid Assessment	FAR	6					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**9**			FAR*	5	**FAR***	**11**		
		Tolerance	NF	1					NF	1				
	Fish	Presence	FAR	4					FAR*	5				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Low sinuosity E4 near stable condition.
		Constraints
Constraints	One road crossings and limited space for vegetation on left bank.	
		Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5.	

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R19															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	4	**FAR**	**8**	**FAR**	**96**	FAR*	7	**FAR***	**11**	**FAR***	**120**
		Flashniess	FAR	4					FAR	4				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	7	**FAR**	**30**			F	9	**FAR***	**34**		
		Entrenchment Ratio	F	9					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	6					FAR*	7				
	Vertical Stability Extent	FWS Rapid Assessment	F	8					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	6	**FAR**	**39**			FAR*	7	**FAR***	**50**		
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	6					F	9				
		Lateral Stabity Extent	FAR	6					F	8				
	Bedform Diversity	Shelter for Fish	FAR	7					F	9				
		Pool-to-pool Spacing	F	9					F	9				
		Pool Depth Variability	FAR	5					F	8				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**10**			FAR*	5	**FAR***	**14**		
	Detritus	FWS Rapid Assessment	FAR	6					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**9**			FAR*	5	**FAR***	**11**		
		Tolerance	NF	1					NF	1				
	Fish	Presence	FAR	4					FAR*	5				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Low sinuosity and slightly incised C4/1 with some localized bank erosion. Vegetation and bedrock grade control is providing system wide stability.

	Constraints
Constraints	Buildings and parking lots encroaching on the left bank.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5. Riparian vegetation width is limited because of encroachment.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R20														
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**					
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	NF	3	**FAR**	**7**	**NF**	**64**	FAR	5	**FAR***	**9**	**FAR***	**108**
		Flashniess	FAR	4					FAR	4				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	3	**NF**	**13**			F	8	**FAR***	**30**		
		Entrenchment Ratio	NF	3					F	8				
	Floodplain Drainage	FWS Rapid Assessment	NF	3					FAR	6				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	4					F	8				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	2	**NF**	**25**			FAR*	5	**FAR***	**45**		
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	6					F	8				
		Lateral Stabity Extent	FAR	6					F	8				
	Bedform Diversity	Shelter for Fish	NF	3					F	8				
		Pool-to-pool Spacing	NF	3					F	8				
		Pool Depth Variability	FAR	5					F	8				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**10**			FAR*	5	**FAR***	**13**		
	Detritus	FWS Rapid Assessment	FAR	6					F	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**9**			FAR*	5	**FAR***	**11**		
		Tolerance	NF	1					NF	1				
	Fish	Presence	FAR	4					FAR*	5				

Channel Evolution	**Rating**	**Channel Evolution**
Channel Evolution	NF	F4 channel evolving to a B4c with RR track on right bank and parking lot on left bank, although left bank has a thin strip of riparian vegetation helping stabilize the banks.

Constraints	
Constraints	RR track on right bank, parking lot on left bank and culvert at u/s end.

Restoration Potential	
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5. Riparian vegetation width is limited because of encroachment.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R21														
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**					
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	3	**FAR**	**7**	**FAR**	**83**	FAR*	6	**FAR***	**10**	**FAR***	**114**
		Flashniess	FAR	4					FAR	4				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	5	**FAR**	**24**			F	8	**FAR***	**32**		
		Entrenchment Ratio	FAR	6					F	8				
	Floodplain Drainage	FWS Rapid Assessment	FAR	6					FAR*	7				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	3	**FAR**	**33**			FAR*	6	**FAR***	**47**		
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	7					F	9				
		Lateral Stabity Extent	FAR	6					F	8				
	Bedform Diversity	Shelter for Fish	FAR	4					F	8				
		Pool-to-pool Spacing	FAR	6					F	8				
		Pool Depth Variability	FAR	7					F	8				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	4	**FAR**	**10**			FAR*	5	**FAR***	**14**		
	Detritus	FWS Rapid Assessment	FAR	6					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**9**			FAR*	5	**FAR***	**11**		
		Tolerance	NF	1					NF	1				
	Fish	Presence	FAR	4					FAR*	5				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	F4 moving to a B4c in some areas with d/s end being a C4 because of backwater from RR crossing.

	Constraints
Constraints	Buildings and parking lots encroaching on the left bank and DOT encroaching on right bank. RR culvert at d/s end opf reach.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5. Riparian vegetation width is limited because of encroachment.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R22														
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**					
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	NF	3	**NF**	**6**			F	9	**FAR***	**14**		
		Flashniess	NF	3					FAR	5				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	F	8	**FAR**	**31**			F	9	**F**	**36**		
		Entrenchment Ratio	F	8					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	6					F	9				
	Vertical Stability Extent	FWS Rapid Assessment	F	9					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	2	**FAR**	**34**	**FAR**	**94**	F	8	**F**	**52**	**FAR***	**135**
	Lateral Stability	Dominant Bank Ersoion Rate	F	9					F	9				
		Lateral Stabity Extent	F	9					F	8				
	Bedform Diversity	Shelter for Fish	FAR	6					F	9				
		Pool-to-pool Spacing	FAR	4					F	9				
		Pool Depth Variability	FAR	4					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	6	**FAR**	**12**			FAR*	7	**FAR***	**16**		
	Detritus	FWS Rapid Assessment	FAR	6					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**17**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	4					FAR*	7				

	Rating	**Channel Evolution**
Channel Evolution	FAR	High w/d C4/wetland BMP in stable condition.
		Constraints
Constraints	One road crossings and school property on both sides of stream.	
		Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5.	

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R23															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	NF	3	**NF**	**6**			F	8	**FAR***	**13**		
		Flashniess	NF	3					FAR	5				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	6	**FAR**	**27**			F	9	**F**	**36**		
		Entrenchment Ratio	F	8					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	6					F	9				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	3	**FAR**	**33**	**FAR**	**88**	F	8	**F**	**53**	**FAR***	**135**
	Lateral Stability	Dominant Bank Ersoion Rate	F	8					F	9				
		Lateral Stabity Extent	FAR	6					F	9				
	Bedform Diversity	Shelter for Fish	FAR	6					F	9				
		Pool-to-pool Spacing	NF	3					F	9				
		Pool Depth Variability	FAR	7					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	5	**FAR**	**11**			FAR*	7	**FAR***	**16**		
	Detritus	FWS Rapid Assessment	FAR	6					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**17**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Straight and slightly incised C4 with localized bank erosion. Vegetation helping to stablize the banks

	Constraints
Constraints	Road crossings at u/s and d/s end of reach. Parking losts and buildings on the left bank.

	Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R24															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	NF	3	**NF**	**6**			F	9	**FAR***	**14**		
		Flashniess	NF	3					FAR	5				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	NF	3	**NF**	**19**			F	9	**F**	**36**		
		Entrenchment Ratio	NF	3					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	7					F	9				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	6					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	3	**NF**	**28**	**NF**	**74**	F	8	**F**	**53**	**FAR***	**136**
	Lateral Stability	Dominant Bank Ersoion Rate	F	8					F	9				
		Lateral Stabity Extent	FAR	6					F	9				
	Bedform Diversity	Shelter for Fish	FAR	5					F	9				
		Pool-to-pool Spacing	NF	3					F	9				
		Pool Depth Variability	NF	3					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	5	**FAR**	**10**			FAR*	7	**FAR***	**16**		
	Detritus	FWS Rapid Assessment	FAR	5					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**17**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	F4 evolving into a B4c, dense vegetation on banks is prevented some erosion

	Constraints
Constraints	Road crossings at d/s end of reach. Stream on school property. This will influence riparian buffer width and potential BMP creation.

	Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R25															
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**						
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	FAR	6	**FAR**	**9**			F	8	**FAR***	**13**		
		Flashniess	NF	3					FAR	5				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	F	9	**F**	**36**			F	9	**F**	**36**		
		Entrenchment Ratio	F	9					F	9				
	Floodplain Drainage	FWS Rapid Assessment	F	9					F	9				
	Vertical Stability Extent	FWS Rapid Assessment	F	9					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	FAR	5	**FAR**	**30**	**FAR**	**96**	F	8	**F**	**53**	**FAR***	**135**
	Lateral Stability	Dominant Bank Ersoion Rate	F	8					F	9				
		Lateral Stabity Extent	FAR	7					F	9				
	Bedform Diversity	Shelter for Fish	FAR	4					F	9				
		Pool-to-pool Spacing	NF	3					F	9				
		Pool Depth Variability	NF	3					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	5	**FAR**	**10**			FAR*	7	**FAR***	**16**		
	Detritus	FWS Rapid Assessment	FAR	5					F	9				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**17**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Straight C4 with backwater from large debris jam and old concrete weir at d/s end of reach.

	Constraints
Constraints	Road crossings at u/s end of reach. Stream on school property. This will influence riparian buffer width and potential BMP creation.

	Restoration Potential
Restoration Potential	Full Lvl 3 and partial Lvls 4 and 5.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R26														
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**					
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	F	8	**FAR**	**11**			F	9	**FAR***	**13**		
		Flashniess	NF	3					FAR	4				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	4	**FAR**	**21**			F	9	**F**	**35**		
		Entrenchment Ratio	FAR	4					F	9				
	Floodplain Drainage	FWS Rapid Assessment	FAR	6					F	8				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	7					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	1	**FAR**	**19**	**FAR**	**72**	FAR	6	**FAR***	**48**	**FAR***	**125**
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	5					F	9				
		Lateral Stabity Extent	FAR	5					F	9				
	Bedform Diversity	Shelter for Fish	FAR	4					F	8				
		Pool-to-pool Spacing	NF	2					F	8				
		Pool Depth Variability	NF	2					F	8				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	5	**FAR**	**10**			FAR*	6	**FAR***	**14**		
	Detritus	FWS Rapid Assessment	FAR	5					F	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	6	**FAR***	**15**		
		Tolerance	NF	3					NF	3				
	Fish	Presence	FAR	4					FAR*	6				

Channel Evolution	**Rating**	**Channel Evolution**
	NF	F4 moving to a B4c in some areas.

	Constraints
Constraints	Ponds at u/s and d/s end of reach. Four road crossings throughout the reach. Stream on cemetary property. This will influence riparian buffer width.

	Restoration Potential
Restoration Potential	Nearly full Lvl 3 and partial Lvls 4 and 5. Riparian vegetation width is limited because of encroachment.

Note: "*" means partial uplift

Hamilton Run, Hagerstown, MD: HR-R27														
Level and Category	**Parameter**	**Measurement Method**	**Pre-Restoration Condition**						**Proposed Condition**					
			Rating	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**	**Rating**	**Score**	**Overall by Level**	**Score**	**Overall Reach**	**Score**
1 - Hydrology	Runoff	Concentrated Flow	F	8	**FAR**	**11**	**FAR**	**90**	F	9	**FAR***	**15**	**FAR***	**136**
		Flashniess	NF	3					FAR	6				
2 - Hydraulics	Floodplain Connectivity	Bank Height Ratio	FAR	4	**FAR**	**23**			F	9	**F**	**35**		
		Entrenchment Ratio	FAR	5					F	9				
	Floodplain Drainage	FWS Rapid Assessment	F	8					F	8				
	Vertical Stability Extent	FWS Rapid Assessment	FAR	6					F	9				
3 - Geomorphology	Riparain Vegetation	FWS Rapid Assessment	NF	3	**FAR**	**31**			FAR	6	**FAR***	**51**		
	Lateral Stability	Dominant Bank Ersoion Rate	FAR	6					F	9				
		Lateral Stabity Extent	FAR	6					F	9				
	Bedform Diversity	Shelter for Fish	FAR	7					F	9				
		Pool-to-pool Spacing	NF	3					F	9				
		Pool Depth Variability	FAR	6					F	9				
4 - Physicochemical	Water Appearance and Nutrients	FWS Rapid Assessment	FAR	7	**FAR**	**14**			F	9	**F**	**17**		
	Detritus	FWS Rapid Assessment	FAR	7					F	8				
5 - Biology	Macro	Presence	FAR	4	**FAR**	**11**			FAR*	7	**FAR***	**18**		
		Tolerance	NF	3					FAR	4				
	Fish	Presence	FAR	4					FAR*	7				

Channel Evolution	**Rating**	**Channel Evolution**
	FAR	Incised and nearly straight C4 with a moderate level of bank erosion. Bank erosion occurring to build correct sinuocity.

	Constraints
Constraints	Road crossing at d/s end of reach. Stream on cemetary property. This will influence riparian buffer width. This reach is the beginning of Hamilton Run and is spring fed by several springs.

	Restoration Potential
Restoration Potential	Nearly full Lvl 4 and partial Lvl 5. Riparian vegetation width is limited because of encroachment.

Note: "*" means partial uplift

APPENDIX E

Proposed Project Prioritization Matrix

Proposed Project Reach	Potential Restoration Solution Approach	Potential Restoration Solution Uplift	TMDL Restoration Potential for Sediment, Nutrient and Phosporous Reduction	Stream Length	Construction Access	Constraints	Potential Success/Risk	BMP Restoration Potential	Ownership Score	Potential sediment reduction through bank stabilization	Proposed restoration costs per linear foot	Weighted Prioritization Score	Ranking by Prioritization Score	Categorical Ranking	Adjusted Final Categorical Ranking	Ranking adjustment justification
1	6	10	8	9	9	5	8	5	8	9	6	**7.6**	**1**	**High**	**High**	
2	8	7	6	3	5	5	6	6	4	5	7	**5.4**	**9**	**Medium**	**Medium**	
3	9	5	2	2	8	4	8	3	9	1	10	**6.3**	**4**	**High**	**Low**	**Lack of eroding banks**
4	8	8	3	1	7	5	7	2	5	0	7	**4.3**	**17**	**Low**	**Low**	
5	3	1	1	1	7	3	5	2	8	0	2	**3.2**	**18**	**Low**	**Low**	
6	8	3	3	1	6	8	8	2	6	0	7	**4.5**	**15**	**Low**	**Low**	
7	5	8	9	4	8	6	8	8	8	0	4	**4.8**	**13**	**Low**	**Medium**	**Lack of eroding banks, large open parcel with one land owner may create opportunity to obtain TMDL credits from large wetland creation**
8	9	2	1	1	7	8	3	1	10	3	9	**6.5**	**3**	**High**	**Medium**	**Lack of eroding banks, very limited space for restoration**
9	5.6	9	4	9	7	5	7.3	7.3	3	9	3	**5.4**	**8**	**Medium**	**High**	**Increased ranking because potential to a create large wetland BMP and achieve high TMDL credits**
10	5.5	4	4	4	6.5	5	5	2	3	9	4	**5.1**	**11**	**Medium**	**Medium**	
11	5.3	5	5.6	6	8	6.5	7	5	7	5	7	**6.3**	**5**	**High**	**Medium**	**This area contains a forest conservation easement that may create difficulty in doing stream stabilization work**
12	4.5	8	4.5	2	7.5	5	4.5	2.5	3	10	2	**5.0**	**12**	**Medium**	**High**	**Highly eroding banks**
13	6.3	3	5	2	8	6	3.5	3	6	4	8	**5.7**	**7**	**Medium**	**High**	**Moderately eroding banks, work is just upstream of the American Legion, concept plan for area is already in place**
14	4.7	4	3.7	1.7	7.7	6	5	2	3	8	3	**4.6**	**14**	**Low**	**Medium**	**Moderately eroding banks**
15	6	8	9	2	8	6	7	6	9	0	6	**5.4**	**10**	**Medium**	**Low**	**Lack of eroding banks, limited area for BMP wetland limits potential TMDL reduction credits**
16	5	9	6	2	9	6	6	3	8	0	4	**4.4**	**16**	**Low**	**Low**	
17	5	10	5	1	9	6	5	2	9	1	8	**5.8**	**6**	**High**	**Medium**	**Low bank erosion amounts and floodplain connectivity potential results in low TMDL crediting**
18	5	9	7.5	6	9	5.5	6	3	9	8	4	**6.8**	**2**	**High**	**Medium**	**Highly eroding banks but sensitivity of cemetery property will be large constraint to construction**

*** Shaded cells have had their final prioritization changed from what was determined in the priority matrix**