SOIL				37		an in the	Sam	ppling Point: U010
	scription: (Descri			to docu		indicato	or or confirm the absence of	of indicators.)
Depth (Inches)	Color (moist)	. %	Color (moist)	lox Fea %	Type*	Loc**	Texture	Remarks
0-18	10YR 3/3	100					silt loam	
RY57 - 15	The state of the s	10/42/		X	d becter			
					A PARTY	ERL THE	HEY SHILLING	
New Addition			89A 54Unota	TE IN	n hat like	$M_{\rm BSH} p_{\rm c}$	CASE MALE TO THE	
		NA SEE	QEAW LIE			M.J.J.		
				I E		lan, play	A SELECT RECEIVED	
2012 强流				N R				
		Talk at				The Paris		
沙龙生物			0.51410000					建设国际的国际工程 包含
				21-0	A STEEL SE	Elime		
2-			The American	A-A-	30-6			
				d Matri	ix, CS=C	overed o	or Coated Sand Grains	
	: PL=Pore Lining,	M=Mai	IFIX				to display for Di	At the day of the
Hydric Soi	il Indicators:		Dark Su	face	(87)		Indicators for Pr	roblematic Hydric Soils:
Histiso	il (A1)				ow Surfac	ce (S8)	2 cm Muck (#	A10) (MLRA 147)
	Epipedon (A2)		(MLRA			2 (00)	Coast Prairie	Redox (A16) (MLRA 147, 148)
Black H	Histic (A3)		Thin Da	ark Surf	face (S9)	,	Piedmont Floo	odplain Soils (F19)
	gen Sulfide (A4)		(MLRA				(MLRA 136, 1	
	ed Layers (A5)	50			Matrix (F	F2)		Dark Surface (TF12)
	Muck (A10) (LRR ed Below Dark Si		Deplete		rix (F3) Surface (F	·e)	Other (Explain	n in Remarks)
	ed Below Dark St Dark Surface (A1)				CSurface			
	Mucky Mineral (S				ssions (F8			
(LRR N	N, MLRA 147, 14	18)	Iron-Ma	anganes	se Masse	es (F12)	(LRR N, MLRA 136)	
	Gleyed Matrix (S	<i>i</i> 4)			æ (F13) (I			
	Redox (S5)						9) (MLRA 148) BA 127, 147)	
Strippe	ed Matrix (S6)		Keu rai	ent ivid	atenai (F.	21) (MLr	RA 127, 147)	
*Indicators	of hydrophytic ve	egetatio	on and wetland hy	/drolog	y must b	e preser	nt, unless disturbed or prob	olematic
Restrictive	Layer (if observe	ed):						
Туре:		A STORY	ELECTRIC DE LES	ALL V	AT LEVEL		Hydric soil present	? <u>N</u>
Depth (inch	nes):							
Remarks:								

CONFIDENTIAL PROPRIETARY TRADE SECRET DUKE- WALTON TO BIG BONE

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Landform (hillslope, terrace, etc.): depression	ong.: -84.625699 Datum: WGS 84 NWI Classification: N/A X No (If no, explain in remarks) Are "normal Yes circumstances" present? (If needed, explain any answers in remarks) within a wetland? Yes W011 econdary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Landform (hillslope, terrace, etc.): Subregion (LRR or MLRA): Soil Map Unit Name No-Nolin silt loam, 0 to 2 percent slopes, occasionally flooded Are climatic/hydrologic conditions of the site typical for this time of the year? Yes Are vegetation , soil , or hydrology significantly disturbed are vegetation , soil , or hydrology naturally problematic? SUMMARY OF FINDINGS Hydrophytic vegetation present? Yes Hydric soil present? Yes Wetland hydrology present? Yes Wetland hydrology present? PEM wetland along road ROW HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) X. Surface Water (A1) True Aquatic Plants (B14) X. High Water Table (A2) Hydrogen Sulfide Odor (C1) X. Saturation (A3) Oxidized Rhizospheres on Living Water Marks (B1) X. Roots (C3) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Iron Deposits (B5) Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7)	vex, none): concave Slope (%): 0 png.: -84.625699 Datum: WGS 84 NWI Classification: N/A X No (If no, explain in remarks) Are "normal Yes circumstances" present? (If needed, explain any answers in remarks) within a wetland? Yes W011 econdary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Subregion (LRR or MLRA): LRR N Lat.: 38.889762 L Soil Map Unit Name No-Nolin silt loam, 0 to 2 percent slopes, occasionally flooded Are climatic/hydrologic conditions of the site typical for this time of the year? Yes	ong.: -84.625699 Datum: WGS 84 NWI Classification: N/A X No (If no, explain in remarks) Are "normal Yes circumstances" present? (If needed, explain any answers in remarks) within a wetland? Yes W011 econdary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Soil Map Unit Name No-Nolin silt loam, 0 to 2 percent slopes, occasionally flooded Are climatic/hydrologic conditions of the site typical for this time of the year? Yes Are vegetation, soil, or hydrology significantly disturbed Are vegetation, soil, or hydrology naturally problematic? SUMMARY OF FINDINGS Hydrophytic vegetation present?	NWI Classification: N/A X No (If no, explain in remarks) Are "normal Yes circumstances" present? (If needed, explain any answers in remainstances in remainstances. Yes Woll 1 within a wetland? Yes Woll 1 econdary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Are climatic/hydrologic conditions of the site typical for this time of the year? Yes Are vegetation, soil, or hydrology significantly disturbed are vegetation, soil, or hydrology naturally problematic. SUMMARY OF FINDINGS Hydrophytic vegetation present? Yes Hydric soil present? Yes Ves Wetland hydrology present? Yes Is the sampled area Wetland hydrology present? Yes Is the sampled area HYDROLOGY Wetland Hydrology Indicators: Serimary Indicators (minimum of one is required; check all that apply) Xeriace Water (A1)	X No (If no, explain in remarks) Are "normal Yes circumstances" present? (If needed, explain any answers in remaxwithin a wetland? Woll Econdary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Are vegetation soil or hydrology significantly disturbed naturally problematic. SUMMARY OF FINDINGS Hydrophytic vegetation present? Yes Hydric soil present? Yes Wetland hydrology present? Yes Wetland hydrology present? PEM wetland along road ROW HYDROLOGY Wetland Hydrology Indicators: Perimary Indicators (minimum of one is required; check all that apply) X Surface Water (A1) True Aquatic Plants (B14) X High Water Table (A2) Hydrogen Sulfide Odor (C1) X Saturation (A3) Oxidized Rhizospheres on Living Water Marks (B1) X Roots (C3) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Iron Deposits (B5) Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7)	Are "normal Yes circumstances" present? (If needed, explain any answers in remains in re
Are vegetation, soil, or hydrology	circumstances" present? (If needed, explain any answers in rema
Hydrophytic vegetation present? Hydric soil present? Wetland hydrology present? PEM wetland along road ROW HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) X Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Is the sampled area	within a wetland? Yes W011 econdary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Hydric soil present? Wetland hydrology present? PEM wetland along road ROW HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) X Surface Water (A1) X High Water Table (A2) Yes True Aquatic Plants (B14) Hydrogen Sulfide Odor (C1) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Inundation Imagery (B7)	econdary Indicators (minimum of two required Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Remarks: PEM wetland along road ROW HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) X Surface Water (A1) X High Water Table (A2) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Irun Aquatic Plants (B14) X Roots (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7)	econdary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Remarks: PEM wetland along road ROW HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) X Surface Water (A1) True Aquatic Plants (B14) X High Water Table (A2) Hydrogen Sulfide Odor (C1) X Saturation (A3) Oxidized Rhizospheres on Living Water Marks (B1) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) HYDROLOGY Sediment Jenoid (C1) A Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	econdary Indicators (minimum of two required) Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
PEM wetland along road ROW HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) X Surface Water (A1) X High Water Table (A2) Water Marks (B1) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sediment Deposits (B0) Thin Muck Surface (C7) Other (Explain in Remarks)	_ Surface Soil Cracks (B6) _ Sparsely Vegetated Concave Surface (B8)
Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) X Surface Water (A1) True Aquatic Plants (B14) X High Water Table (A2) Hydrogen Sulfide Odor (C1) X Saturation (A3) Oxidized Rhizospheres on Living Water Marks (B1) X Roots (C3) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Algal Mat or Crust (B4) Soils (C6) Iron Deposits (B5) Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7)	Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
Primary Indicators (minimum of one is required; check all that apply) X Surface Water (A1) True Aquatic Plants (B14) X High Water Table (A2) Hydrogen Sulfide Odor (C1) X Saturation (A3) Oxidized Rhizospheres on Living Water Marks (B1) X Roots (C3) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Algal Mat or Crust (B4) Soils (C6) Iron Deposits (B5) Thin Muck Surface (C7) Inundation Visible on Aerial Imagery (B7)	Surface Soil Cracks (B6) Sparsely Vegetated Concave Surface (B8)
X Surface Water (A1) X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) True Aquatic Plants (B1) X Routs (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	Sparsely Vegetated Concave Surface (B8)
X High Water Table (A2) X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Hydrogen Sulfide Odor (C1) X Roots (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	
X Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Oxidized Rhizospheres on Living X Roots (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	Drainege Detterne (D10)
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) X Roots (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	Drainage Patterns (B10)
Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	_Moss Trim Lines (B16)
Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	Dry-Season Water Table (C2)
Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	Crayfish Burrows (C8)
Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Thin Muck Surface (C7) Other (Explain in Remarks)	_ Saturation Visible on Aerial Imagery (C9)
Inundation Visible on Aerial Other (Explain in Remarks) Imagery (B7)	_ Stunted or Stressed Plants (D1)
Imagery (B7)	Geomorphic Position (D2)
	_Shallow Aquitard (D3)
vvater-Stained Leaves (B9)	_ Microtopographic Relief (D4)
	FAC-Neutral Test (D5)
Aquatic Fauna (B13)	
Field Observations:	
Surface water present? Yes X No Depth (inches): 3	Wetland
Water table present? Yes X No Depth (inches): 0 Saturation present? Yes X No Depth (inches): 0	hydrology
Saturation present? Yes X No Depth (inches): 0 (includes capillary fringe)	present?Y
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspec	tions), if available:
Remarks:	

EGETATION - I	Use scientific	names of pla	ants			Sampling Pol	nt: W01	1
			Absolute	Dominant	Indicator	50/20 Thresholds	20%	50%
Tree Stratum	Plot Size (30 ft.)	% Cover	Species	Status	Tree Stratum	0	0
			70 COVE	Opedes	Status	The state of the s		0
						Sapling/Shrub Stratum	0	
			1 1 1			Herb Stratum	20	50
						Woody Vine Stratum	0	0
Share then		National States			70715150	Dominance Test Worksho	eet	
					15 DE 15 DE 1	Number of Dominant		
wante na enter						Species that are OBL,		
			Garment			FACW, or FAC:	1	(A)
TOWN THE TANK		P. Talley Vice of				Total Number of Dominant	-	``
set being		The second	ALCOHOL:			Species Across all Strata:	1	(B)
			0	= Total Cover		Percent of Dominant		
						Species that are OBL,		
Sapling/Shrub			Absolute	Dominant	Indicator	FACW, or FAC:	100.00	% (A/E
Stratum	Plot Size (15 ft.)	% Cover	Species	Status	17.000, 0.17.0.	100.00	/0 (, 02
						Prevalence Index Worksi	neet	
		A 1 1 1 1 1 1 1		THE RE		Total % Cover of:		
Waller To State Control	A TABLE OF STREET			1000 TO 100 TO	TARRELIA CO	OBL species 10 x 1	= 10)
				O SERVICE OF THE PARTY OF THE P		FACW species 90 x 2		
						FAC species 0 x 3		
STATE OF STATE								
Charles and		HINKAN L	T. E.					
		A A THE STATE OF			100	UPL species 0 x 5		
				1		Column totals 100 (A)		0 (B)
		MINERAL SECTION				Prevalence Index = B/A =	1.90	
			A Source of		4 NEWS / 1			
				= Total Cover		Under histo Vocatation I	ndlastan	
						Hydrophytic Vegetation I		
Herb Stratum	Plot Size (5 ft.)	Absolute	Dominant	Indicator	X Rapid test for hydrophy		ation
		,	% Cover	Species	Status	X Dominance test is >50		
Phalaris arun			65	Y	FACW	X Prevalence index is ≤3	.0*	
Scirpus cyper	rinus		15	N	FACW	Morphological adaptati	ons* (pro	vide
Typha latifolia	THE TOTAL STREET	EVERY TO .	10	N	OBL	supporting data in Ren	narks or c	n a
Juncus effusi	IS		10	N	FACW	separate sheet)		
rateValue of a		3110 3 4 4 4	E HATTEY TO A	in married	Talk the	Problematic hydrophyti	ic vegeta	tion*
	and the sine		St. Ber Sugar-		A SHAN	(explain)		
	of the California	The state of the s	E STATESTA	A CONTRACT		the state of the s		
						*Indicators of hydric soil and wetle present, unless disturbed or problem.		gy must b
APPENDENT AND ALL AL		On the last				present, divess disturbed or prob	BITIQUE	
				The Therm		Definitions of Vegetation	Strata:	
ALL SO THE		THE SECTION OF SECTION		NEW THE PARTY OF T		Tree - Woody plants 3 in. (7.6 cm	n) or more in	diameter
	M Cloude - 22			110000000000000000000000000000000000000	THE REAL PROPERTY.	breast height (DBH), regardless of		
						Sapling/shrub - Woody plants le	ss than 3 in	. DBH and
	VI (高度) 2007					greater than 3.28 ft (1 m) tall.		
			100	= Total Cover		Herb - All herbaceous (non-wood	ly) plants, re	egardless
Moody Vine			Absolute	Dominant	Indicator	size, and woody plants less than		100
Woody Vine	Plot Size (30 ft.)	Absolute P. Cover		Indicator			A DEC
Stratum	Sem holes		% Cover	Species	Status	Woody vines - All woody vines g height.	reater than	3.28 ft in
	COLON DE LA COL	egit gallassa.	A STATE OF A SECOND		THE PERSON			
	Lancach III	1.00			Vincens 1.5	LANGE BELLEVIE	() () () () () ()	
P. W. L. C. '90'						Hydrophytic		
						vegetation		
9-12-13-3	4.7 - 7.5 E.		0 :	= Total Cover	YELLAM DO	present? Y		
			ENEMATIC S		The same of			140
emarks: (Include p	hoto numbers h	ere or on a se	eparate sheet)	The Parket			lands a	

the state of the paper and the man it is entirely as

	Matrix	oe to tri		o docu		Indicato	r or confirm the absence	of indicators.)
Depth (Inches)	Color (moist)	%	Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18	10YR 4/2	90	10YR 5/8	10	C	PL/M	silt loam	
	YAMBEROWN O	FEM	The State	Total P	WA ST	14.18		
and the of the	R THE LINE	Tall and T		Dr. Sylvan	0.00	N. Carl		
11 27 10	Re Ministra	1, 170	in the Starting	Name of	E Tent	II all		
			REPARKS (NO. 1)	SAL TO B	1. 11. 7	#IFE VI		BENESIAC STREETS 20: - 5
		1277			117.14	生姜		
					1	1-1		
7.76.83		10-11	Para Electric	<u>-</u> 0 , 114				
				1 1 2 1				
	EST 124 35 - 18							
		V III		4				
Tune: C=C	ancontrotion D	Donloti	on BM=Boduce	d Matri	, CS=C	overed o	- Coated Sand Crains	
	PL=Pore Lining,			a iviatri.	x, CS=C	overed o	r Coated Sand Grains	
	I Indicators:			4-71	1 20 (V Marie	Indicators for F	Problematic Hydric Soils:
iyano oo	, maioatoro.		Dark Su	rface (S7)		Indicators for t	Toblemade Tryante Cons.
Histisol			Polyvalu	e Belo	w Surfac	æ (S8)		(A10) (MLRA 147)
	pipedon (A2)		(MLRA					e Redox (A16) (MLRA 147, 148
	Histic (A3)				ace (S9)			oodplain Soils (F19)
	en Sulfide (A4) ed Layers (A5)		(MLRA Loamy (=2)	(MLRA 136,	, 147) w Dark Surface (TF12)
Ollaune						2)		W Daik Sullace (1112)
2 cm M	luck (A10) (LRR	N)	X Deplete	d Matri	x (F3)		Other (Expla	ain in Remarks)
	luck (A10) (LRR ed Below Dark St		X Deplete A11) Redox D			6)	Other (Expla	ain in Remarks)
Deplete Thick D	ed Below Dark Su Dark Surface (A12	urface (A 2)	A11) Redox Deplete	Dark Su d Dark	rface (Fo	(F7)	Other (Expla	ain in Remarks)
Deplete Thick D Sandy	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S	urface (<i>i</i> 2) 31)	A11) Redox Deplete Redox D	Dark Su d Dark Depress	rface (Fo Surface sions (F8	(F7) 3)		ain in Remarks)
Deplete Thick D Sandy	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 148	urface (<i>i</i> 2) 31) 8)	A11) Redox Deplete Redox Deplete Iron-Ma	Dark Su d Dark Depress nganes	orface (Fo Surface sions (Fo e Masse	(F7) 8) es (F12) ((LRR N, MLRA 136)	ain in Remarks)
Deplete Thick D Sandy (LRR N Sandy	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S	urface (<i>i</i> 2) 31) 8)	A11) Redox I Deplete Redox I Iron-Ma Umbric	Dark Sud Dark Depressinganes Surface	urface (Formula Surface Sions (Formula Sions (Formu	(F7) 3) es (F12) (MLRA 1:	(LRR N, MLRA 136) 36, 122)	ain in Remarks)
Deplete Thick D Sandy (LRR N Sandy Sandy	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5)	urface (<i>i</i> 2) 31) 8)	A11) Redox I Deplete Redox I Iron-Ma Umbric Piedmoi	Dark Sud Dark Depress Inganes Surface Int Floor	urface (Formula Surface Sions (Formula Surface (F13) (F13) (Formula Surface (F13) (F	(F7) 3) es (F12) MLRA 1: oils (F19)	(LRR N, MLRA 136)	ain in Remarks)
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6)	urface (<i>i</i> 2) 31) 31) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) tA 127, 147)	
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6)	urface (<i>i</i> 2) 31) 31) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148)	
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6)	urface (<i>i</i> 2) 31) 31) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) tA 127, 147)	
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe *Indicators	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6)	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe Indicators Restrictive Type:	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) tA 127, 147)	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe *Indicators	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe Indicators Restrictive Type:	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe Indicators Restrictive Type:	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe *Indicators Restrictive Type: Depth (inch	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe *Indicators Restrictive Type: Depth (inch	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe *Indicators Restrictive Type: Depth (inch	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe *Indicators Restrictive Type: Depth (inch	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe *Indicators Restrictive Type: Depth (inch	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe *Indicators Restrictive Type: Depth (inch	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe *Indicators Restrictive Type: Depth (inch	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic
Deplete Thick D Sandy (LRR N Sandy Sandy Strippe Indicators Restrictive Type: Depth (inch	ed Below Dark Su Dark Surface (A12 Mucky Mineral (S I, MLRA 147, 144 Gleyed Matrix (S Redox (S5) d Matrix (S6) of hydrophytic ve	urface (12) 61) 81) 4)	A11) Redox [Deplete Redox [Iron-Ma Umbric Piedmol Red Par	Dark Sud Dark Depress nganes Surface nt Floor rent Ma	orface (Fo Surface sions (F8 se Masse e (F13) (I dplain So tterial (F2	(F7) 8) es (F12) MLRA 1; bils (F19) 21) (MLF	(LRR N, MLRA 136) 36, 122) (MLRA 148) (A 127, 147) t, unless disturbed or pro	oblematic

CONFIDENTIAL PROPRIETARY TRADE SECRET DUKE- WALTON TO BIG BONE

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Walton-Big Bone Na	itural Gas Pipeline	City/County:	Boone	Sampling I	Date: 4/1/16
Applicant/Owner: Duke Energy		State:	Kentucky	Sampling I	Point U011
Investigator(s): Sarah Miloski, Julie	Freer			Range: No PLSS i	
Landform (hillslope, terrace, etc.):	hillslope	Local relief (co			Slope (%): 10
Subregion (LRR or MLRA): LRR N	Lat.:	38.889527		g.: -84.628204	Datum: WGS 84
Soil Map Unit Name No-Nolin silt loa	m, 0 to 2 percent slop	es, occasionally t	looded	NWI Classification	: N/A
Are climatic/hydrologic conditions of	the site typical for this	time of the year?	? Yes>	(No(lf	no, explain in remarks)
Are vegetation, soil, soil	, or hydrology , or hydrology		y disturbed? roblematic?	Are "normal circumstances (If needed, exp	Yes_ " present? plain any answers in rema
SUMMARY OF FINDINGS					
Hydrophytic vegetation present?	No				
Hydric soil present?	No	Is the sam	pled area wi	thin a wetland?	No
Wetland hydrology present?	No		Upland	for W011	
Remarks: Upland pit for wetland W011					
HYDROLOGY					
Wetland Hydrology Indicators:			Sec	ondary Indicators (minimum of two required)
Primary Indicators (minimum of one i	s required; check all t	nat apply)		Surface Soil Cracks	s (B6)
Surface Water (A1)	True Aqua	tic Plants (B14)		Sparsely Vegetated	Concave Surface (B8)
High Water Table (A2)	Hydrogen	Sulfide Odor (C1)	Feet Feet	Drainage Patterns (B10)
Saturation (A3)	Oxidized R	hizospheres on L	iving	Moss Trim Lines (B	16).
Water Marks (B1)	Roots (C3)			Dry-Season Water	Table (C2)
Sediment Deposits (B2)	Presence	of Reduced Iron (C		Crayfish Burrows (C	
Drift Deposits (B3)		Reduction in Till			n Aerial Imagery (C9)
Algal Mat or Crust (B4)	Soils (C6)			Stunted or Stressed	
Iron Deposits (B5)		Surface (C7)	District Control of the Control of t	Geomorphic Positio	
Inundation Visible on Aerial	Other (Exp	lain in Remarks)		Shallow Aquitard (C	
Imagery (B7)			AVE TOTAL DEVIL NAME OF	Microtopographic R	
Water-Stained Leaves (B9)				FAC-Neutral Test (I	05)
Aquatic Fauna (B13)					E. 24-57 - 15 2 2 2 2
Field Observations:					
Surface water present? Yes	No X	Depth (inches)		Wetland	
Water table present? Yes Saturation present? Yes	No X	Depth (inches)		hydrology	
	No X	_Depth (inches)	: NA	present?	<u> </u>
(includes capillary fringe)					
	ge, monitoring well, ae	rial photos, previ	ous inspectio	ns), if available:	
(includes capillary fringe) Describe recorded data (stream gaug	ge, monitoring well, ae	rial photos, previ	ous inspectio	ns), if available:	
(includes capillary fringe)	ge, monitoring well, ae	rial photos, previ	ous inspectio	ns), if available:	
(includes capillary fringe) Describe recorded data (stream gaug	ge, monitoring well, ae	rial photos, previ	ous inspectio	ns), if available:	

EGETATION - U	lse scientific	names of p	olants			Sampling Po	int: U011
						50/20 Thresholds	
Tree Stratum	Plot Size (30 ft.) Absolute	Dominant	Indicator		20% 50%
100 Ouatum	T TOT GIZE (00 It.	% Cover	Species	Status	Tree Stratum	0 0
						Sapling/Shrub Stratum	6 15
	The second second	- <u> </u>			ELECTION .	Herb Stratum	20 50
	TEN HALLE					Woody Vine Stratum	0 0
		19.4	Manual Co			Dominance Test Worksh	eet
1971 / 690		Thanks and				Number of Dominant	
		TO THE REAL PROPERTY.			Tile See	Species that are OBL,	
	The same of the sa	-		- 1	Territoria	FACW, or FAC:	0 (A)
						Total Number of Dominant	
			THE PERIOD AND ADDRESS OF THE PERIOD ADDRESS OF THE PERIOD AND ADDRESS OF THE PERIOD ADDRESS O			Species Across all Strata:	
	Lift Files		0	= Total Cover		Percent of Dominant	
						Species that are OBL,	
apling/Shrub			. Absolute	Dominant	Indicator	FACW, or FAC:	0.00% (A/B
Stratum	Plot Size (15 ft.) % Cover	Species	Status		
Lonicera maac	:ki		30	Υ	UPL	Prevalence Index Works	heet
						Total % Cover of:	
			A STATE OF	-		OBL species 0 x 1	= 0
					9 (8 100	FACW species 0 x 2	
	•			-			
The control of the control	1989					FAC species 0 x 3	
						FACU species 100 x 4	
						UPL species 30 x 5	
				THE SAME		Column totals 130 (A)	550 (B)
TAREL BEILD						Prevalence Index = B/A =	4.23
	Taranta da Mila			When the same of	7/15/31/19		
	110		30	= Total Cover	The state of the s		
						Hydrophytic Vegetation I	ndicators:
			. Absolute	Dominant	Indicator	Rapid test for hydrophy	
lerb Stratum	Plot Size (5 ft.) % Cover	Species	Status	Dominance test is >50	A STATE OF THE PARTY OF THE PAR
Cimium anione			30	Y	FACU	Prevalence index is ≤3	
Cirsium arvens	28					The state of the s	
Poa pratensis		ENG.	30	Y	FACU	Morphological adaptati	
Allium canadei			20	Υ	FACU	supporting data in Ren	narks or on a
Plantago majo	r 11 11 11 11 11 11 11 11 11 11 11 11 11		10	N	FACU	separate sheet)	
Lamium purpu	reum		10	N	FACU	Problematic hydrophyt	ic vegetation*
		7	Walter 1985 1985 1985 1985 1985 1985 1985 1985			(explain)	
EHONE OF SV. D	Additional English		TE IS BEING "		Thursday.	*Indicators of hydric soil and wet	and bydrology must b
All the second	White Table	Was San Made	PARTITION	el trace name is	NAMES IN COLUMN	present, unless disturbed or prob	
		3/2 1/2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		- 44 TEST - 11 TEST		
en de la State de			ere ya Kilon	0.	PER STATE OF	Definitions of Vegetation	Strata:
E-3-9709 - 1914 -	y Villa Villa Link	ASE RELIEF	THE MENT OF THE	· 数据的 100 0	real descrip	Tree - Woody plants 3 in. (7.6 cm breast height (DBH), regardless of	
		refrey = 10	Total Light			Sapling/shrub - Woody plants le greater than 3.28 ft (1 m) tall.	ss than 3 in. UBH and
and the same of the			100	= Total Cover		Herb - All herbaceous (non-wood	tv) niants renardiess
A/			A	Dominord	Indiana	size, and woody plants less than	
Noody Vine	Plot Size (30 ft.) Absolute	Dominant	Indicator		
Stratum			% Cover	Species	Status	Woody vines - All woody vines g	reater than 3.28 ft in
				-		height.	
	A STATE OF THE STA						
					7.月世制8	Hydrophytic	
HILTERACOTT TO SE						vegetation	
Paraling Inch	WINDS AND DESCRIPTION	in July 1-5	0	= Total Cover		present? N	
				Total Cover		processes and the second	
narks: (Include ph	noto numbers h	ere or on a	separate sheet)				

	Matrix	De to the	the same of the sa	ox Feat	NAME OF TAXABLE PARTY.	r or confirm the absence o	
Depth (Inches)	Color (moist)	%	Color (moist)	%		Texture	Remarks
0-18		100	Coloi (moist)	/0	Type* Loc**	silt loam	
0-10	10YR 4/3	100				Silt IUairi	
		U.=0		plant.			
			Company of the second				
		es Plan	April 1	g let up			
- 1 V	100	44.5		2/4/1			
					Full Ed Art Lan		
		110		1.5	建物质和发展		Frank Start English
A 14 1				VISU.	5_529 EUGEN		
The same			September 1988	No orași			
Day II		salir haiss		2 13 1		in a - I have no week	
		20			SAFETTY THE VE		
Tuno: Oct	Concentration D	-Desist	on DMmDaduss	d Backet	CC-Causard	Contact Cond Cooling	
	Concentration, Dance Pore Lining,			ı Matrix	, Co=Covered o	r Coated Sand Grains	
A COUNTY OF THE PARTY.		IVI-IVIAL	rix .				
ydric Soi	I Indicators:					Indicators for Pro	blematic Hydric Soils:
			Dark Su			0 14 14	10) (841 D.A. 4.4T)
_ Histisol					v Surface (S8)		10) (MLRA 147)
	pipedon (A2)		(MLRA				Redox (A16) (MLRA 147, 14
	listic (A3)		Thin Da				dplain Soils (F19)
	en Sulfide (A4)		(MLRA			(MLRA 136, 1	
	ed Layers (A5)	M			Matrix (F2)		Dark Surface (TF12)
	luck (A10) (LRR		Depleted		UCASTRIC HALLIST CONTRACTOR OF THE PARTY OF	Other (Explain	in Remarks)
	ed Below Dark So Dark Surface (A1)				face (F6) Surface (F7)		
	Mucky Mineral (§	and the same of th			ions (F8)		
	I, MLRA 147, 14					LRR N, MLRA 136)	
	Gleyed Matrix (S				(F13) (MLRA 13		
	Redox (S5)	"			plain Soils (F19)		
Cuildy	d Matrix (S6)				erial (F21) (MLR		
	a maan (oo)						
			n and wetland hy	drology	must be present	t, unless disturbed or probl	ematic
Strippe	of hydrophytic ve	egetatio					
Strippe							
Strippe Indicators Restrictive	of hydrophytic ve					Hydric soil present?	N
Strippe Indicators Restrictive	Layer (if observe					Hydric soll present?	N
Strippe Indicators Restrictive	Layer (if observe					Hydric soil present?	

CONFIDENTIAL PROPRIETARY TRADE SECRET DUKE- WALTON TO BIG BONE

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Walton-Big Bone	Natural Gas Pipeline	City/County:	Boone	Sampling Date: 4	/1/16
Applicant/Owner: Duke Energy			Kentucky	Sampling Point V	
Investigator(s): Sarah Miloski, Ju		Section,	Township, Ra	inge: No PLSS in Area	CHANGE OF THE
Landform (hillslope, terrace, etc.):				none): concave	Slope (%): 0
Subregion (LRR or MLRA): LRR				-84.625699	Datum: WGS 84
Soil Map Unit Name No-Nolin silt		oes, occasionally flo	oded N	VI Classification: N/A	
Are climatic/hydrologic conditions	of the site typical for this	s time of the year?	Yes X	_No(If no, exp	olain in remarks)
	, or hydrology	significantly	disturbed?	Are "normal	Yes
Are vegetation, soil	, or hydrology	naturally pro	blematic?	circumstances" prese	
				(If needed, explain an	y answers in remark
SUMMARY OF FINDINGS					
Hydrophytic vegetation present?	Yes				
Hydric soil present?	Yes	is the samp	led area with	in a wetland? Yes	
Wetland hydrology present?	Yes			W01	2
Remarks: PEM wetland along road R	ow				
HYDROLOGY					
Wetland Hydrology Indicators			Secon	dary Indicators (minimu	um of two required)
Primary Indicators (minimum of or	ne is required; check all	that apply)	Su	urface Soil Cracks (B6)	
X Surface Water (A1)	True Aqu	atic Plants (B14)	Sp	arsely Vegetated Conca	ve Surface (B8)
X High Water Table (A2)	Hydrogen	Sulfide Odor (C1)	X Dr	ainage Patterns (B10)	
X Saturation (A3)	Ovidized	Rhizospheres on Liv	ing Mo	oss Trim Lines (B16)	
Water Marks (B1)	X Roots (C3		9	y-Season Water Table ((2)
Sediment Deposits (B2)	The state of the s	of Reduced Iron (C4	100	ayfish Burrows (C8)	
Drift Deposits (B3)		on Reduction in Tille		turation Visible on Aeria	I Imagery (C9)
Algal Mat or Crust (B4)	Soils (C6)			unted or Stressed Plants	the second secon
Iron Deposits (B5)	The state of the s	k Surface (C7)		eomorphic Position (D2)	
Inundation Visible on Aerial		plain in Remarks)		nallow Aquitard (D3)	
Imagery (B7)	The state of the s			crotopographic Relief (D	4)
Water-Stained Leaves (B9)				C-Neutral Test (D5)	
Aquatic Fauna (B13)					
Field Observations:					
Surface water present? Yes	X No	Depth (inches):	3	Wetland	
Water table present? Yes		Depth (inches):	2	hydrology	
Saturation present? Yes		Depth (inches):	0	present?	Y
(includes capillary fringe)				<u> </u>	
Describe recorded data (stream g	auge, monitoring well, a	erial photos, previo	us inspections	i), if available:	
Remarks:					

EGETATION - (Use scientific	names of	plan	ts			Sampling Po	int: W0	12
							50/20 Thresholds		
Tree Stratum	Plot Size (30 ft.)	Absolute	Dominant	Indicator		20%	50%
nec cuatam	1 lot Olze (00 IL.	,	% Cover	Species	Status	Tree Stratum	0	0
Y-GUE							Sapling/Shrub Stratum	0	0
	The Transfer of the Control of the C						Herb Stratum	20	50
THE VENTER OF THE							Woody Vine Stratum	0	0
		Miller			10000	THE PARTY		- 21/4	
		di na					Dominance Test Worksh	eet	
				E SEC		-	Number of Dominant		
		No.					Species that are OBL,		
		2114		11/1			FACW, or FAC:	2	(A)
	THE TANK DOLL					-	Total Number of Dominant		(0)
			_	0 :	= Total Cover	1021 - 13	Species Across all Strata:	2	(B)
					- Total Cover		Percent of Dominant		
							Species that are OBL,		
Sapling/Shrub	Plot Size (15 ft.)	Absolute %	Dominant Species	Indicator Status	FACW, or FAC:	100.00)%_(A/B
Stratum				% Cover	Species	Status		E (7/E)	
	AL MARKS IN	31 102		I I I I I I I I I I I I I I I I I I I			Prevalence Index Works	neet	
		ALC: N	1011				Total % Cover of:		
production as a pro-							OBL species 85 x 1		5
		Ha Hill					FACW species 15 x 2	2 = 3	0
	18 16 41 6		1	THE PHOLICAL	THE THE PERSON OF THE PERSON O	BLEST BEST	FAC species 0 x 3	3 = ()
				1000			FACU species 0 x 4	l = ()
				- 1, 8 PE			UPL species 0 x 5	5 = ()
					IIII Aserts		Column totals 100 (A)	1	15 (B)
			100		THE PERSON OF TH	THE REAL PROPERTY.	Prevalence Index = B/A =		
	and the same		_		S TO STATE OF THE		THE STATE OF THE S		_
THE PART IS			1555	0 =	Total Cover	The second			
							Hydrophytic Vegetation I		
Llank Charleson	Diet Cine (,	Absolute	Dominant	Indicator	X Rapid test for hydroph	ytic vege	tation
Herb Stratum	Plot Size (5 ft.)	% Cover	Species	Status	X Dominance test is >50		
Typha latifolia				50	Y	OBL	X Prevalence index is ≤3	3.0*	
Typha angust		4 11	7.77	35	Y	OBL	Morphological adaptat		ovide
Phalaris arun			_	15	N	FACW	supporting data in Rer		
T Halans alum	umacea					TAOW	separate sheet)	ilaika Ui	ona
		all I de la	_					lia vaaate	Alant.
			_				Problematic hydrophyl	lic vegeta	luon
	<u> </u>	(All Markets	_				(explain)		
	Section and			_			*Indicators of hydric soil and wet		ogy must b
			THE STATE OF			The state of the s	present, unless disturbed or prob	lematic	
			H. H.		The state of the	THE PARTY OF THE P	Definitions of Vegetation	Strata:	
	William Street	Control of							
	sitemet in	Hall Str.		Telliows.			Tree - Woody plants 3 in. (7.6 cm breast height (DBH), regardless		in diameter
				15 F 0-18 JUL					- DO::-
			A Tr	TOTAL PRINCE	APPLICATION AND ADDRESS OF THE PARTY.	- AF (4-1976)	Sapling/shrub - Woody plants le greater than 3.28 ft (1 m) tall.	11 C (1811) 861	II. DBH and
VIVE OF STREET				100 :	= Total Cover			da planta	mandle e
							Herb - All herbaceous (non-wood size, and woody plants less than		
Woody Vine	Plot Size (30 ft.)	Absolute	Dominant	Indicator			
Stratum				% Cover	Species	Status	Woody vines - All woody vines (reater than	3.28 ft in
	m des lesa	La disease de la constante de	<u>=/</u> _		Table 1	- RUPSING	height.		
						277			
			y Jr.			English S	Mudronhudo		
		The State		On the later with			Hydrophytic		
		Text of the last			Total Cause		vegetation		
				0 :	= Total Cover		present? Y	- 300 (1)	
emarks: (Include p	hoto numbers h	ere or on a	sepa	rate sheet)					

is the state of the state of the state of the state of

	Matrix			ox Feat			r or confirm the absence o	
Depth (Inches)	Color (moist)	%	Color (moist)	%	Type*	Loc**	Texture	Remarks
0-18	2.5Y 4/1	80	2.5Y 3/1	10	D	PL/M	silt loam	
	CONTRACTOR		10YR 5/8	10	С	PL/M	silt loam	
		184	THE SHAPE	#13 E2 E1	WE THE	S INC		And Supplied to the State of th
					Jan. #	Et wez		
	(MR), 7-11, [4]			(SPAN)	S	and the		
0.00				163	A SEA			
CHE SELY				L HAI				
	KELLET VILLE							
					W. T. W.			斯特· 12/5 医 15 15 15 15 15 15 15 15 15 15 15 15 15
		DELL'S R		Tell li		10.00		
THE AVE					1525 121 2	2 1		
							Year Area Control of	THE PARTY WATER
				d Matrix	k, CS=C	overed o	r Coated Sand Grains	
	PL=Pore Lining,	M=Mat	rix					
lydric Sol	I Indicators:		D-4.0		27		Indicators for Pro	oblematic Hydric Soils:
Histina	1/41)		Dark Su Polyvalu			~ (68)	2 cm Muck (A	10) (MLRA 147)
Histic F	Epipedon (A2)		(MLRA			æ (30)		Redox (A16) (MLRA 147, 1
	Histic (A3)		Thin Da					odplain Soils (F19)
and the same of the	en Sulfide (A4)		(MLRA				(MLRA 136, 1	
	ed Layers (A5)		Loamy (F2)	Very Shallow	Dark Surface (TF12)
A STATE OF THE PARTY OF THE PAR	luck (A10) (LRR I		X Deplete				Other (Explain	n in Remarks)
	ed Below Dark Su				100 m			
	Dark Surface (A12		Deplete					
THE RESERVE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAME	Mucky Mineral (S I, MLRA 147, 148		Redox C				LRR N, MLRA 136)	
	Gleyed Matrix (S4					MLRA 1		
	Redox (S5)	1					(MLRA 148)	
	d Matrix (S6)						A 127, 147)	
Indicators	of hydrophytic ve	getatio	n and wetland hy	drology	must be	e presen	t, unless disturbed or prob	lematic
	l (if abases							
la aksiski sa	Layer (II observe	u).					Hydric soil present?	y y
							riyane son presenti	
уре:			DEPOSITE STORY					
Restrictive Type: Depth (inch								

CONFIDENTIAL PROPRIETARY TRADE SECRET DUKE- WALTON TO BIG BONE

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Walton-Big Bone N	latural Gas Pipeline	City/County: Boo	one	Sampling Date: 4	/1/16
Applicant/Owner: Duke Energy		State: Ker		Sampling Point L	
Investigator(s): Sarah Miloski, Julie	Freer		wnship, Range:		
Landform (hillslope, terrace, etc.):		Local relief (concav			Slope (%): 10
Subregion (LRR or MLRA): LRR N	Lat.:	38.889829	Long.: -84.0		Datum: WGS 84
Soil Map Unit Name No-Nolin silt loa	am, 0 to 2 percent slop	es, occasionally flood	ed NWI Cla	ssification: N/A	
Are climatic/hydrologic conditions of	f the site typical for this	time of the year? Y	es X No	(If no, ex	plain in remarks)
Are vegetation, soil	, or hydrology	significantly dis	turbed? Are	"normal	Yes
Are vegetation , soil	, or hydrology	naturally proble	matic? circu	umstances" prese	ent?
			(If no	eeded, explain ar	ny answers in remark
SUMMARY OF FINDINGS					
Hydrophytic vegetation present?	No				
Hydric soil present?	No	is the sampled	l area within a w	retland? No	
Wetland hydrology present?	No		Upland for W012	2	
Remarks: Upland pit for wetland W012					
HYDROLOGY					
Wetland Hydrology Indicators:			Secondary I	ndicators (minimi	um of two required)
Primary Indicators (minimum of one	is required; check all t	hat apply)	Surface	Soil Cracks (B6)	
Surface Water (A1)	True Aqua	tic Plants (B14)	Sparsely	Vegetated Conca	ive Surface (B8)
High Water Table (A2)	Hydrogen	Sulfide Odor (C1)		Pattems (B10)	
Saturation (A3)		Rhizospheres on Living		m Lines (B16)	
Water Marks (B1)	Roots (C3)		AND THE RESERVE	son Water Table (C2)
Sediment Deposits (B2)		of Reduced Iron (C4)		Burrows (C8)	
Drift Deposits (B3)		n Reduction in Tilled	The second secon	n Visible on Aeria	I Imagery (C9)
Algal Mat or Crust (B4)	Soils (C6)			or Stressed Plants	
Iron Deposits (B5)	Thin Muck	Surface (C7)	A STATE OF THE PARTY OF THE PAR	ohic Position (D2)	
Inundation Visible on Aerial		olain in Remarks)	Shallow	Aquitard (D3)	
Imagery (B7)			The second secon	ographic Relief (D	14)
Water-Stained Leaves (B9)				utral Test (D5)	
Aquatic Fauna (B13)					
Field Observations:					
Surface water present? Yes	No X	Depth (inches):	NA I	Wetland	
Water table present? Yes	No X	Depth (inches):		hydrology	
Saturation present? Yes	No X	Depth (inches):		present?	N
(includes capillary fringe)			Mary of the		100 m
Describe recorded data (stream gau	ige, monitoring well, ae	rial photos, previous	inspections), if av	/ailable:	
	Vone of States				生 连 进 图
Remarks:					

	Absolute % Cover 30	Dominant Species Total Cover Dominant Species Y Total Cover Dominant Species Y Dominant Species Y Y	Indicator Status Indicator Status UPL Indicator Status FACU	Tree Stratum Sapling/Shrub Stratum Herb Stratum Woody Vine Stratum Dominance Test Workshee Number of Dominant Species that are OBL, FACW, or FAC: Total Number of Dominant Species Across all Strata: Percent of Dominant Species Total % Cover of: OBL species O x 1 = FACW species O x 2 = FAC species O x 3 = FACU species O x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0°	0 6 20 5 0 5 0 5 0 5 0 5 7 0 5 7 0 4 38 5 1 1 cators: c vegetati	
	O Absolute % Cover 30 Absolute % Cover 30 Absolute % Cover 30	= Total Cover Dominant Species Y = Total Cover Dominant Species Y	Indicator Status UPL	Herb Stratum Woody Vine Stratum Dominance Test Workshee Number of Dominant Species that are OBL, FACW, or FAC: Total Number of Dominant Species Across all Strata: Percent of Dominant Species That are OBL, FACW, or FAC: Prevalence Index Workshee Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 0 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0°	6 20 5 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(A) (B) (A/B)
	Absolute % Cover 30 30 Absolute % Cover 30	Dominant Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	Herb Stratum Woody Vine Stratum Dominance Test Workshee Number of Dominant Species that are OBL, FACW, or FAC: Total Number of Dominant Species Across all Strata: Percent of Dominant Species That are OBL, FACW, or FAC: Prevalence Index Workshee Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 0 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0°	0 4 0.00% et 0 0 320 250 570 4.38 dicators: c vegetati	(A) (A) (B) (A/B
	Absolute % Cover 30 30 Absolute % Cover 30	Dominant Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	Dominance Test Workshee Number of Dominant Species that are OBL, FACW, or FAC: Total Number of Dominant Species Across all Strata: Percent of Dominant Species that are OBL, FACW, or FAC: Prevalence Index Workshee Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 0 x 4 = UPL species 0 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0°	0 4 0.00% et 0 0 320 250 570 4.38 dicators: c vegetati	(A) (B) (A/B) (B) (B) (B) (B) (B) (B) (B) (B) (B) (
	Absolute % Cover 30 30 Absolute % Cover 30	Dominant Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	Number of Dominant Species that are OBL, FACW, or FAC: Total Number of Dominant Species Across all Strata: Percent of Dominant Species that are OBL, FACW, or FAC: Prevalence Index Worksher Total % Cover of: OBL species	0 4 0.00% et 0 0 320 250 570 4.38 dicators: c vegetati	_(A/B
	Absolute % Cover 30 30 Absolute % Cover 30	Dominant Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	Species that are OBL, FACW, or FAC: Total Number of Dominant Species Across all Strata: Percent of Dominant Species that are OBL, FACW, or FAC: Prevalence Index Workshe Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 0 x 3 = FACU species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytit Dominance test is >50% Prevalence index is ≤3.0°	0.00% et 0 0 320 250 570 4.38	_(A/B
	Absolute % Cover 30 30 Absolute % Cover 30	Dominant Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	FACW, or FAC: Total Number of Dominant Species Across all Strata: Percent of Dominant Species that are OBL, FACW, or FAC: Prevalence Index Workshe Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0°	0.00% et 0 0 320 250 570 4.38	_(A/B
	Absolute % Cover 30 30 Absolute % Cover 30	Dominant Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	Total Number of Dominant Species Across all Strata: Percent of Dominant Species that are OBL, FACW, or FAC: Prevalence Index Workshe Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 0 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0°	0.00% et 0 0 320 250 570 4.38	_(A/E
	Absolute % Cover 30 30 Absolute % Cover 30	Dominant Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	Species Across all Strata: Percent of Dominant Species that are OBL, FACW, or FAC: Prevalence Index Workshe Total % Cover of: OBL species 0 x 2 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 0 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	0.00% et 0 0 0 320 250 570 4.38 dicators: c vegetati	_(A/E
	Absolute % Cover 30 30 Absolute % Cover 30	Dominant Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	Percent of Dominant Species that are OBL, FACW, or FAC: Prevalence Index Workshe Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	0.00% et 0 0 0 320 250 570 4.38 dicators: c vegetati	_(A/E
	Absolute % Cover 30 30 Absolute % Cover 30	Dominant Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	Species that are OBL, FACW, or FAC: Prevalence Index Workshe Total % Cover of: OBL species 0 x 1 = FACW species 0 x 3 = FAC species 0 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	0 0 0 320 250 570 4.38	(B)
	30 30 30 Absolute % Cover 30	Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	FACW, or FAC: Prevalence Index Workshe Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	0 0 0 320 250 570 4.38	(B)
	30 30 30 Absolute % Cover 30	Species Y Total Cover Dominant Species Y	Status UPL Indicator Status FACU	Prevalence Index Worksher Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0°	0 0 0 320 250 570 4.38	(B)
	30 30 Absolute % Cover 30	= Total Cover Dominant Species Y	UPL	Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	0 0 320 250 570 4.38	
5 ft.	30 Absolute % Cover 30	= Total Cover Dominant Species Y	Indicator Status FACU	Total % Cover of: OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	0 0 320 250 570 4.38	
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Index	0 320 250 570 4.38	
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	OBL species 0 x 1 = FACW species 0 x 2 = FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Index	0 320 250 570 4.38	
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	FACW species 0 x 2 = FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	0 320 250 570 4.38	
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	FAC species 0 x 3 = FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	0 320 250 570 4.38	
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	FACU species 80 x 4 = UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Index	320 250 570 4.38 dicators: c vegetati	
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	UPL species 50 x 5 = Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	250 570 4.38 dicators:	
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	Column totals 130 (A) Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	4.38 dicators:	
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	Prevalence Index = B/A = Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	4.38 Ilcators: c vegetati	
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	Hydrophytic Vegetation Ind Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0°	ficators: c vegetati	on
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	c vegetati	on
5 ft.	Absolute % Cover 30	Dominant Species Y	Status FACU	Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	c vegetati	on
5 ft.	% Cover 30	Species Y	Status FACU	Rapid test for hydrophytic Dominance test is >50% Prevalence index is ≤3.0	c vegetati	on
5 π.	30	Υ	FACU	Dominance test is >50% Prevalence index is ≤3.0		
		Υ				
resin Telesia of tellecons						
STATE IN GUY.			UPL	Morphological adaptation		le
	20	Y	FACU	supporting data in Rema		
CONTRACTOR OF	15	N	FACU	separate sheet)		
Emiliary Maria	10	N	FACU	Problematic hydrophytic	vegetation	n*
ALCOHOLD S	5	N	FACU	(explain)		
or an analysis of	AN HOUSE SHEETING	L. Retrigge State		*Indicators of hydric soil and wetland	d hydrology	must h
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		2 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1	V. 27-13 10/40	Definitions of Vegetation S	trata:	T ICE
				Tree - Woody plants 3 in. (7.6 cm) o	or more in di	ameter
and an arrest					than 3 in. Di	BH and
	100	= Total Cover			plants. reca	rdless
	Absolute	Dominant	Indicator			
30 ft.	THE RESERVE OF THE PARTY OF THE					
	78 00461	Ореско	Otatus	height.	ater than 3.2	8 ft in
753/27/25				Hydrophytic		
	Sent William	医外形性见处	4 Table 1891	vegetation		
	0	= Total Cover		present? N		
HE THE		Providence of the			V. D. P. C.	
here or on a s	eparate sheet)					GY I
		30 ft.) Absolute % Cover	100 = Total Cover 30 ft.) Absolute Dominant Species 0 = Total Cover	30 ft.) Absolute Dominant Species Status 0 = Total Cover	Definitions of Vegetation S Tree - Woody plants 3 in. (7.6 cm) of breast height (DBH), regardless of he sast height (DBH). regardless of he sast height (DBH). regardless of he sast height (DBH). regardless of height. 100	30 ft.) Absolute Dominant Species Status Herb - All herbaceous (non-woody) plants, regasize, and woody plants less than 3.28 ft tall. Woody vines - All woody vines greater than 3.28 ft tall. Woody vines - All woody vines greater than 3.2 ft tall. Herb - All herbaceous (non-woody) plants, regasize, and woody plants less than 3.28 ft tall. Woody vines - All woody vines greater than 3.2 ft tall. Hydrophytic vegetation present? N

SOIL				A			San	npling Point: U012
Profile Des Depth	cription: (Descri	be to th		o docu		indicato	r or confirm the absence	of indicators.)
(Inches)	Color (moist)	%	Color (moist)	%	Type*	Loc**	Texture	Remarks
0-6	10YR 3/4	100	ME TOTAL	1	1777		silt loam	
6-12	10YR 4/6	100			¥ 1000 2	132 27	silt loam	
Note that								
		ST KI			I FAT	E 18 110		
					PLANT			
					STEEL HOLL	# 1		
	12 1 3					FIE		
7 4 19	marks and	72-			Taso 1			
S 42 - 18	IEUS VIII - MIL	100	建 型。於是3倍					
Pale I					100			
1,400					S. Danie	Figure		
					1			
				d Matr	ix, CS=C	overed o	r Coated Sand Grains	
	PL=Pore Lining,	M=Mai	ITIX					
Hydric Soi	I Indicators:		Dark Su	rface ((27)		Indicators for P	roblematic Hydric Soils:
Histiso	(A1)				w Surfac	e (S8)	2 cm Muck (A10) (MLRA 147)
	pipedon (A2)		(MLRA			(00)		Redox (A16) (MLRA 147, 14
	listic (A3)				face (S9)		Piedmont Flo	oodplain Soils (F19)
	en Sulfide (A4)		(MLRA				(MLRA 136,	
	ed Layers (A5)	A11			Matrix (F	F2)		v Dark Surface (TF12)
- TO 10 THE RESERVE	luck (A10) (LRR ed Below Dark S		Deplete		ıx (F3) urface (F0	e)	Other (Expla	in in Remarks)
	Park Surface (A1				Surface			
	Mucky Mineral (sions (F8			
	I, MLRA 147, 14						(LRR N, MLRA 136)	
	Gleyed Matrix (S	(4)			e (F13) (I			
	Redox (S5)						(MLRA 148)	
Strippe	d Matrix (S6)		Red Pai	ent Ma	atenai (F2	21) (IVILI	RA 127, 147)	
*Indicators	of hydrophytic ve	egetatio	n and wetland hy	drolog	y must be	e presen	t, unless disturbed or pro	blematic
Restrictive	Layer (if observe	eq).						
Type:						2 19 4	Hydric soil present	t? N
Depth (inch	nes):	3 2 E V	Letter page half					
Remarks:								
Remarks.								

CONFIDENTIAL PROPRIETARY TRADE SECRET DUKE- WALTON TO BIG BONE

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Walton-Big Bone Nat	tural Gas Pipeline	City/County:	Boone	Sampling Date: 4	1/1/16
Applicant/Owner: Duke Energy	WINE TO BE FOR THE		Kentucky	Sampling Point V	
Investigator(s): Sarah Miloski, Julie I	reer	Section	, Township, Rang	e: No PLSS in Area	Parin w Turk
Landform (hillslope, terrace, etc.):	lepression	Local relief (con	cave, convex, no		Slope (%): 0
Subregion (LRR or MLRA): LRR N	Lat.:	38.88906		84.615092	Datum: WGS 84
Soil Map Unit Name FcD-Faywood sil	ty clay loam, 12 to 20	percent slopes	NWI	Classification: PUB	Hh
Are climatic/hydrologic conditions of t	he site typical for this			lo(If no, ex	plain in remarks)
	, or hydrology	significantly		re "normal	Yes
Are vegetation, soil	, or hydrology	naturally pro		ircumstances" prese	
				lf needed, explain ai	ny answers in remark
SUMMARY OF FINDINGS					
Hydrophytic vegetation present?	Yes				
Hydric soil present?	Yes	is the samp	oled area within		
Wetland hydrology present?	Yes			W0	13
Remarks: PEM wetland along road ROV	v				
HYDROLOGY					
Wetland Hydrology Indicators:				ry Indicators (minim	um of two required)
Primary Indicators (minimum of one is			and the second second	ce Soil Cracks (B6)	
X Surface Water (A1)		tic Plants (B14)	The state of the s	sely Vegetated Conca	ave Surface (B8)
X High Water Table (A2)	Hydrogen :	Sulfide Odor (C1)	X Drain	age Patterns (B10)	
X Saturation (A3)	Oxidized R	hizospheres on Liv	ring Moss	Trim Lines (B16)	
Water Marks (B1)	X Roots (C3)		Dry-S	Season Water Table (C2)
Sediment Deposits (B2)	The state of the s	of Reduced Iron (C	The second secon	ish Burrows (C8)	
Drift Deposits (B3)		n Reduction in Tille		ation Visible on Aeria	
Algal Mat or Crust (B4)	Soils (C6)			ed or Stressed Plants	
Iron Deposits (B5)		Surface (C7)		norphic Position (D2)	
Inundation Visible on Aerial	Other (Exp	lain in Remarks)		ow Aquitard (D3)	
Imagery (B7)				topographic Relief (D)4)
Water-Stained Leaves (B9)			X FAC-	Neutral Test (D5)	
Aquatic Fauna (B13)					
Field Observations:					
Surface water present? Yes _	X No	_Depth (inches):	1 1 1	Wetland	
Water table present? Yes	X No	Depth (inches):		hydrology	
Saturation present? Yes	X No	Depth (inches):	0	present?	<u>Y</u>
(includes capillary fringe)					
Describe recorded data (stream gaug	e, monitoring well, ae	rial photos, previo	ous inspections), i	f available:	
Remarks:					

		ames of	pidiri	S			Sampling Poi	nt: VVU	10
	Plot Size (30 ft.)	Absolute % Cover	Dominant Species	Indicator Status	Tree Stratum Sapling/Shrub Stratum Herb Stratum	20% 0 0 20	50% 0 0 50
						107	Woody Vine Stratum	0	0
	WP)	49 PF	913				Dominance Test Worksho Number of Dominant	et	
		g les qu'il					Species that are OBL,		
	. S. 1940 (SI)	400	ON THE	STRAVEASAN		D. William	FACW, or FAC: Total Number of Dominant	2	(A)
					2.00	10000	Species Across all Strata:	2	(B)
				0 :	Total Cover		Percent of Dominant		
Sapling/Shrub	Plot Size (15 ft.	100	Absolute	Dominant	Indicator	Species that are OBL, FACW, or FAC:	100.00	% (A/
Stratum	TOL SIZE (15 11.	-	% Cover	Species	Status		1924	Mark
				Market Inte			Prevalence Index Worksh Total % Cover of:	eet	
						- William 17	OBL species 0 x 1	= 0	
and the season of				FULCES STA		BOLSHI LIN	FACW species 85 x 2		
				W. IIIIIWAK E.			FAC species 0 x 3 FACU species 15 x 4		
							UPL species 0 x 5		
		OUTHER	MEL.	32,37	accessible neg	11111111	Column totals 100 (A)	23	0 (B
		N				THE RESERVE	Prevalence Index = B/A =	2.30	
	Taylor III			0 :	Total Cover				
							Hydrophytic Vegetation II		
Herb Stratum F	Plot Size (5 ft.)	Absolute % Cover	Dominant Species	Indicator Status	Rapid test for hydrophy X Dominance test is >50	AND DESCRIPTION OF THE PERSON NAMED IN	tation
Cyperus strigosus				30	Y	FACW	X Prevalence index is ≤3		
Phalaris arundinad	æa	JEP MA		25	Y	FACW	Morphological adaptati		vide
Poa pratensis	e Teuille	194.45	1	15	N	FACU	supporting data in Rem	arks or o	on a
			47/15	15	N	FACW	separate sheet)		dian*
Juncus effusus	-	THE RELEASE			NI NI	EACIAL	Decklometic budgeshidi		uon"
Epilobium coloratu	m		—	15	<u> </u>	FACW	Problematic hydrophyti (explain)	c vegeta	
	m			15	N	FACW	(explain)		gy musi
	m			15	N	FACW	The state of the s	and hydrolo	gy must
	m			15	N	FACW	(explain) *Indicators of hydric soil and wetla	and hydrolo ematic	ogy must
	m			15	N .	FACW	(explain) "Indicators of hydric soil and wetla present, unless disturbed or problem." Definitions of Vegetation Tree - Woody plants 3 in. (7.6 cm	and hydrolo ematic Strata:	
	m			15		FACW	(explain) *Indicators of hydric soil and wetle present, unless disturbed or probi Definitions of Vegetation Tree - Woody plants 3 in. (7.6 cm breast height (DBH), regardless of	and hydrolo ematic Strata:) or more in f height.	n diame
Epilobium coloratu						FACW	(explain) "Indicators of hydric soil and wetla present, unless disturbed or problem." Definitions of Vegetation Tree - Woody plants 3 in. (7.6 cm	and hydrolo ematic Strata:) or more in f height.	n diame
Epilobium coloratu	m				N N	FACW	(explain) *Indicators of hydric soil and wetle present, unless disturbed or problem of the present of the p	Strata:) or more in f height.	n diame
Epilobium coloratu		20.8				FACW	(explain) *Indicators of hydric soil and wetle present, unless disturbed or problem of the present height (DBH), regardless of the present of the pres	strata:) or more in f height. ss than 3 in	n diame
Epilobium coloratu	m Plot Size (30 ft.	<u>. </u>	100 =	Total Cover		(explain) *Indicators of hydric soil and wetle present, unless disturbed or problem of the present, unless disturbed or problem of the present, unless disturbed or problem of the present of the p	strata: Strata:) or more in the interest of t	n diamei n. DBH a egardies
Epilobium coloratu		30 ft.)	100 =	Total Cover Dominant	Indicator	(explain) *Indicators of hydric soil and wetle present, unless disturbed or problem of the present of the pre	strata: Strata:) or more in the interest of t	n diamet ı. DBH a egardles
Epilobium coloratu Woody Vine Stratum) 	100 =	Total Cover Dominant	Indicator	(explain) *Indicators of hydric soil and wetle present, unless disturbed or problems. Definitions of Vegetation Tree - Woody plants 3 in. (7.6 cm breast height (DBH), regardless of Sapling/shrub - Woody plants les greater than 3.26 ft (1 m) tall. Herb - All herbaceous (non-wood size, and woody plants less than 3 woody vines - All woody vines greater than 3.26 ft (1 m) tall.	strata: Strata:) or more in the interest of t	n diamet 1. DBH a egardies
Epilobium coloratu Woody Vine Stratum	Plot Size ()	100 =	Total Cover Dominant	Indicator	(explain) *Indicators of hydric soil and wetle present, unless disturbed or problem of the present, unless disturbed or problem of the present, unless disturbed or problem of the present of the p	strata: Strata:) or more in the interest of t	n diamet n. DBH a egardles:

Depth (Inches) 0-18							r or confirm the absence of	
	Matrix	%		ox Feat		Loc**	Texture	Remarks
0-10	Color (moist) 10YR 4/2	70	Color (moist) 10YR 5/6	% 30	Type*	PL/M	silt loam	
	101K 4/2	70	101K 5/6	30	C	PL/W	Siit ioam	
		1						
	8 21 / 2							
		50 II = 0				-0.		
TIL MEDI		400				1		
		ANTAN						
	MALLES TRANSPORTERS		761	. The say	= =1014/052	1000		
					100			
Trees and the				rei ire e	= 100 p.	N 75 00		
					BESTON	DELINE OF		
Type: C=C	oncentration D=	Depleti	on. RM=Reduce	d Matrix	CS=C	overed o	r Coated Sand Grains	
	PL=Pore Lining,				MB.			
	Indicators:		La Para UPS in the				Indicators for Pro	oblematic Hydric Solls:
			Dark Su	rface (S	S7)			
Histisol			Polyvalu			œ (S8)		10) (MLRA 147)
	pipedon (A2)		(MLRA					Redox (A16) (MLRA 147, 1
	istic (A3)		Thin Da		The state of the s			odplain Soils (F19)
	en Sulfide (A4) d Layers (A5)		(MLRA Loamy (=2)	(MLRA 136, 1	47) Dark Surface (TF12)
	uck (A10) (LRR	N)	X Deplete			2)	Other (Explain	
	d Below Dark Su					6)		
	ark Surface (A12		Deplete	d Dark	Surface	(F7)		
The second secon	Mucky Mineral (S		Redox [A STATE OF THE STA	
	, MLRA 147, 148						LRR N, MLRA 136)	
	Gleyed Matrix (Se	4)				MLRA 1		
	Redox (S5) d Matrix (S6)						(MLRA 148) RA 127, 147)	
_Suipped	I Wattix (SU)			CITE IVIA	terial (1 2	21) (1811-1	A 121, 141)	
Indicators of	of hydrophytic ve	getation	and wetland hy	drology	must be	e presen	t, unless disturbed or prob	lematic
				A PAGE		Satial I		
	St. A. P. St. T.				Physics	HWE TO		
		d):				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Restrictive L	Layer (if observe							
Restrictive L					•		Hydric soil present?	YY
Restrictive L							Hydric soil present?	Y <u>Y</u>

CONFIDENTIAL PROPRIETARY TRADE SECRET DUKE- WALTON TO BIG BONE

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: Walton-Big Bone N	latural Gas Pipeline	City/County:	Boone	Sampling Date:	4/1/16
Applicant/Owner: Duke Energy			Kentucky	Sampling Point:	
Investigator(s): Sarah Miloski, Julie	Freer	Section	, Township, Ra	nge: No PLSS in Area	
Landform (hillslope, terrace, etc.):		Local relief (cor			Slope (%): 10
Subregion (LRR or MLRA): LRR N		38.88901		-84.615131	Datum: WGS 84
Soil Map Unit Name FcD-Faywood	silty clay loam, 12 to 20	percent slopes	NV	VI Classification: N/A	
Are climatic/hydrologic conditions o					plain in remarks)
Are vegetation , soil , soil SUMMARY OF FINDINGS	or hydrology , or hydrology , or hydrology	significantly pr	disturbed? oblematic?	Are "normal circumstances" pres (If needed, explain a	Yes_ ent? ny answers in remark
Hydrophytic vegetation present? Hydric soil present? Wetland hydrology present?	No No No	is the sam	pled area with i Upland for		
Remarks:					
Upland pit for wetland W013 HYDROLOGY					
Wetland Hydrology Indicators:			Secon	dary Indicators (minim	um of two required)
Primary Indicators (minimum of one	is required; check all t	that apply)	Su	rface Soil Cracks (B6)	
Surface Water (A1)	True Aqua	atic Plants (B14)	Sp	arsely Vegetated Conc	ave Surface (B8)
High Water Table (A2)	Hydrogen	Sulfide Odor (C1)	and the same of th	ainage Patterns (B10)	
Saturation (A3)	Ovidized F	Rhizospheres on Li		oss Trim Lines (B16)	
Water Marks (B1)	Roots (C3			y-Season Water Table	(C2)
Sediment Deposits (B2)		of Reduced Iron (C		ayfish Burrows (C8)	
Drift Deposits (B3)		n Reduction in Tille	The state of the s	turation Visible on Aeri	al Imagery (C9)
Algal Mat or Crust (B4)	Soils (C6)		Stu	unted or Stressed Plant	s (D1)
Iron Deposits (B5)	Thin Muck	Surface (C7)	Ge	eomorphic Position (D2)	
Inundation Visible on Aerial	Other (Exp	plain in Remarks)	Sh	allow Aquitard (D3)	
Imagery (B7)			Mi	crotopographic Relief (I	04)
Water-Stained Leaves (B9)			FA	C-Neutral Test (D5)	
Aquatic Fauna (B13)					
Field Observations:					
Surface water present? Yes	No X	Depth (inches):	NA	Wetland	
Water table present? Yes	No X	Depth (inches):		hydrology	
Saturation present? Yes	No X	Depth (inches):		present?	N
(includes capillary fringe)			ALERT EN PL		
Describe recorded data (stream gat	uge, monitoring well, ac	erial photos, previo	ous inspections), if available:	
Remarks:					

se scientific i	iailles of	piaino			Sampling Po	0010
Plot Size (30 ft.			Indicator Status	50/20 Thresholds Tree Stratum Sapling/Shrub Stratum	20% 50% 0 0 0 0 22 55
		4 - 544			Woody Vine Stratum	0 0
					The Colonia Colonia and State Colonia and the	eet
	14.3-1-1	and the Market	The state of the s		Species that are OBL,	
					A STATE OF THE PARTY OF THE PAR	(A)
					Species Across all Strata:	(B)
			_ = Total Cover		Percent of Dominant	
Plot Size (15 ft.		The state of the s	Indicator Status	FACW, or FAC:	(A/B
				UPL		heet
						= 0
		Rep (Herencen)		The Marie P.	FACW species 0 x 2	2 = 0
E Misaranii	EWIE O		g - Filling	TAME DIST	UPL species 30 x 5	150
8 27 Landy II - 1 - 1						
		THE WASTERN			Trovalonee index - Birt	
		0	= Total Cover		Hydrophytic Vegetation I	ndicators:
Plot Size (5 ft.			Indicator	Rapid test for hydroph	ytic vegetation
A 10 10 10 10 10 10 10 10 10 10 10 10 10		% Cove		and the second		The state of the s
S	1765	30	Y	UPL		
eum .		20	N	FACU		narks or on a
cinale	esta altera	10	- N	FACU		ic vegetation*
0	Epillinas,	5	N ·	FACU	(explain)	
	41142-21		100 - 100 100 100 100		Definitions of Vegetation	Strata:
2						ss than 3 in. DBH and
		110	= Total Cover		Herb - All herbaceous (non-wood	
Plot Size (30 ft.	TOTAL THE STREET, WINDOWS PROPERTY		Indicator Status		
Constitution (All					height.	
					Hydrophytic	
		0	= Total Cover		vegetation present? N	
ato numbere he	are or on a					
oto numbers he	ere or on a	separate sneet				
oto numbers h	ere or on a	separate sneet				
	Plot Size (Plot Size (um s eum cinale	Plot Size (30 ft. Plot Size (15 ft. Plot Size (5 ft. num s eum cinale e	Plot Size (30 ft.) Absolute % Covers O Plot Size (15 ft.) Absolute % Covers O Plot Size (5 ft.) Absolute % Covers O In the state of the sta	Plot Size (30 ft.)	Plot Size (30 ft.)	Plot Size (

Depth (Inches) · 0-12	Matrix Color (moist) 10YR 4/4	%		ux real	ures	Y. S. S. S. S.		
0-12	10YR 4/4		Color (moist)	%	Type*	Loc**	Texture	Remarks
		100		14-1		J. F. L.	silt loam	1000 HOE HELEN
							MUSEUM PROPERTY	
				100	FEE 1			
				A MITTER				
			THE PROPERTY		5. 一次			
					T. Direct	B/Will		
					a with	DENIE CH		4. 但如何的是因为"现代"
		Harry I					思想到 法统治 法	
		Te la	经验					
			THE PARTY OF THE PARTY					
	And Strict of		建设工作的		MINARY.			
				d Matrix	x, CS=C	overed o	r Coated Sand Grains	
	L=Pore Lining,	M=Mat	TIX					
lydric Soil I	ndicators:		Dorde Su	-face //	07)		Indicators for Pro	oblematic Hydric Soils:
Histisol (/	Δ1)		— Dark Su		w Surfac	e (S8)	2 cm Muck (A	10) (MLRA 147)
CONTRACTOR OF STREET,	ipedon (A2)		(MLRA			e (00)	The state of the s	Redox (A16) (MLRA 147, 1
Black His	A STATE OF THE PARTY OF THE PAR		Thin Da					odplain Soils (F19)
Hydroger	Sulfide (A4)		(MLRA				(MLRA 136, 1	
	Layers (A5)		Loamy (2)		Dark Surface (TF12)
	k (A10) (LRR		Deplete				Other (Explain	in Remarks)
	Below Dark St							
The second control of the second	rk Surface (A1: ucky Mineral (S	No. of the last of	Redox D		Surface			
	MLRA 147, 14						(LRR N, MLRA 136)	
	eyed Matrix (S		Umbric					
	edox (S5)						(MLRA 148)	
Stripped	Matrix (S6)		Red Par	ent Ma	terial (F2	21) (MLF	RA 127, 147)	
Indicators of	hydrophytic ve	egetatio	n and wetland hy	drology	must be	e presen	t, unless disturbed or prob	lematic
Pestrictive La	yer (if observe	q).				10.0		
ype:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						Hydric soil present?	N
Depth (inches	3):		Tabal Managorial.	5 1				

Appendix B Rapid Bioassessment Datasheets

High Gradient Bioassessment Stream Visit Sheet

		Tigir Gradie	it Diou	SSCSSITICITE ST				
STREAM NAM				LOCATION:	4-110-VI		PROGRAM:	
STATION #: N			100	COUNTY: BO	one		PROJECT:	
INVESTIGATO				DATE: 3/29	/2016	TIME S	Start:	
Verify Site LAT	LONG vs GPS	YES NO NO		ach		(24nr)]	Finish:	
	Station	Downstre		Upstrear	n	CANOPY Fully Expo	COVER::	STREAM TYPE:
LAT						Partially Ex	cposed (25-50	%) Perennial
LONG						Fully Shade		
WEATHER	Now Past 24 hor	urs	LOCAL	WATERSHED F	EATURE	ES (Predomina	nt Surrounding	g Land Use):
Has there been a scouring rain		y rain Iy rain		ce Mining Mining	Const		Forest Pasture/	Grazing
in the last 14 days?	☐ ☐ Inten	mittent showers	Oil W	Vells	☐ Indus	trial	Silvicul	ture
Yes No		r/sunny dy	Resid	Disposal lential	Row	Crops	Urban K	unoff/Storm Sewers
INSTREAM Stream Width	1 FEATURES 3.5 ft	HYDRAUL	ıc		Domi	ARIAN VEGE	TATION	出版。
Maximum Depti	n ² ft	STRUCTUR	When the same of t	STREAM FLOW	Tr	ees Herbaceo	us	CHANNEL
Reach Length Riffle/Run/l	Pool Sequence	☐ Dams ☐ Bridge Abutn	nents	Pooled Low	Numb	asses Shrubs er of strata 2	Dom.	ALTERATIONS Dredging
	led in Reach)	☐ Island ☐ Waterfalls		High	Tree/S	Shrub Taxa		Channelization (Full Partial)
1 Riffle 1	Run 1Pool	Other:		☐ Normal	Celtis	occidentalis, Lo	onicera sp.	
P-CHEM	Instru	ment Used:	N Day			Date	Calibrated:	
Temp(°C)	D.O. (mg/l)	%Satr	uration	pH(S.U	.) <u> </u>	Cond	Tu	urb
			Sample C	Collection Verific	ation		里 原料 11年1	
Algae	Sample: QualM	HC Other		☐ Visual Assessm	ent	Lead Co	lector:	
Fish	□BPEF □ Seine		e: BPEF	Seine		Lead Co	llector:	
Habitat	RBP Substra					Lead Col		
Invertebrates	1m² Qual Qual		Va	g. Banks San	d N	Lead Col lacrophytes		
Tissue:	No. of Samples col			g. DanksSan	iuiv	Lead Col		
Water Chem	☐ Acid/Alk ☐ Bu			Low Hg		Lead Col		
	☐ Herbicides ☐ F	Pesticides Ortho	P 🔲 Oth	er:				
Duplicate Sam	ples Taken:							
			Substrat	te Characteriz	ation			
Substrate Es	t. P.C. Riffle 2	.5 %	R	un_25 %	I	ool 50 %		Reach Total
Silt/Clay (<0.0	6 mm)							30
Sand (0.06 – 2	mm)							20
Gravel (2-64 m	m)							30
Cobble (64 – 2	56 mm)							15
Boulders (>256	mm)							5
Bedrock								0
NOTES/CO	OMMENTS:	10-10-0	147		11 A 0			Name of the second
				SIT	E NO	T SAMPL	ED:	
				□ I	and owne	r denial 🔲	Dry □T	oo deep/Impounded
					Site not for	and/Secluded	Unsafe	

Other (indicate under comments)

RBP High Gradient Habitat

Habitat		RBP High Gradient	Category	
Parameter	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness 11 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 10	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 5	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel, or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration 10 Score	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat, distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 6	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection 7 LBRB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 3	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

NOTES/COMMENTS:

r gradie de 2000 de mario de la composición del composición de la composición del composición de la co

STREAM NAM	E: S003	3	144		LOCATION: E	Bigbon	e, KY		
STATION #: N		161			COUNTY: BO		emerge Val	PROGRAM PROJECT:	
INVESTIGATO		JF			DATE: 3/29/			Start:	
Verify Site LAT/I	LONG vs	GPS 🗖	YES NO IN			2010	(24hr)	Finish:	
	Station		Downstr		ach Upstrean	n	CANOP ☐ Fully Expe	Y COVER:	STREAM TYPE:
LAT							Partially E	xposed (25-5	0%) Perennial
LONG		100					Fully Shad		
WEATHER Has there been a scouring rain in the last 14 days? Yes No INSTREAM Stream Width Maximum Depth Reach Length Riffle/Run/P (No. Sample	FEATUR 3 3 18	Clear Cloud RES ft ft m nnce h)	y rain y rain nittent showers /sunny ty HYDRAUI STRUCTUI Dams Bridge Abut Island Waterfalls	Surfa Deep Oil V Land Resid	Disposal dential STREAM FLOW Dry Pooled Low High	Const Comm Indust Row C RIP Domir Tre Gran Numb Tree/S	ruction nercial rial Crops ARIAN VEGE nate Type: nes Herbace asses Shrubs er of strata hrub Taxa	Forest Pasture Silvicu Urban TATION Dom.	e/Grazing
1 Riffle 1	_Run 1	Pool	Other: Culvert	apron	Normal	Pop	ulus de	Itoides	
Р-СНЕМ			nent Used:		ase English		Date	e Calibrated:	
Temp(°C)	D.C). (mg/l)	%Sa	turation	pH(S.U	.)	Cond	Т	Turb
			10111111111111111111111111111111111111	Sample (Collection Verific	ation			
Algae			HC Other		☐ Visual Assessm	ent	Lead Co	ollector:	
Fish Habitat		Seine	Other Tir	ne: BPEF	Seine		Lead Co	AND DESCRIPTION OF THE PARTY OF	
nvertebrates		Qual					Lead Co		
			obbleSnag	gsVe	g. BanksSan	d M	acrophytes	Other	
lissue:			ected				Lead Co	ollector:	
Water Chem			lk Nutrients				Lead Co	ollector:	
Duplicate Sam			esticides Orth	io P 🔲 Oth	ier:	la i			
				Substra	te Characteriz	ation			
Substrate Est	. □P.C.	Riffle 6	0 %		un ¹⁰ %		001 30	/6	Reach Total
Silt/Clay (<0.06	mm)								30
Sand (0.06 – 2 r									15
Gravel (2-64 mi			ALLEDY TO THE TOTAL TOTA						15
Cobble (64 – 25								CARUT CO	30
Boulders (>256									5
Bedrock								Very State	5
NOTES/CO	MMEN	TC.							
NOTES/CO	IVIIVIEIN	15:			SIT	E NO	Γ SAMPI	ED.	
									Too doe-//
						and owne			Too deep/Impounded
					□s	lite not fou	nd/Secluded	Unsafe	
						Other (indi	cate under com	ments)	

RBP High Gradient Habitat

Habitat		RBP High Gradient	Category	
Parameter	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/- Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
2.Embeddedness 12 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 11	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score 13	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration 9 Score	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 6	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection 7 LB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 10	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

NOTES/COMMENTS:

promotion comments of the solution

STREAM NAME: SO STATION #: N/A				LOCATION: E					
STATION #: ' "				COUNTY: BO			PROG PROJE		
INVESTIGATORS: SI	/, JF	LINE ADVIS C. A. A. BERT XVIII.		DATE: 3/29		TIME	Start:	179 8	
Verify Site LAT/LONG	vs GPS	YES INO IN/			2010	(24hr)	Finish:	14-17-2	K
Stati	on	Downstre		each Upstrean	1	CAN	OPY COV		STREAM TYPE:
LAT	150 150					Partiall Partiall	y Exposed	(25-50%)	Perennial Ephemera
LONG						Fully S	haded (75-	100%)	Intermitte
WEATHER Has there been a scouring rain in the last 14 days? Yes No INSTREAM FEAT Stream Width Maximum Depth Riffle/Run/Pool Sec (No. Sampled in R 1 Riffle 1 Run P-CHEM Temp(°C) 1	Clear Cloud URES ft ft ft muuence each) 1 Pool Instrur	y rain y rain y rain nittent showers /sunny ity HYDRAUL STRUCTUR Dams Bridge Abutn Island Waterfalls Other: Culv ment Used: %Sate	Surf Dee Oil Lan. Resi	d Disposal idential STREAM FLOW Dry Pooled Low High Normal	Consti	ruction nercial rial Crops ARIAN VE nate Type: pes Herba asses Shrer of strata hrub Taxa	GETATIO GETATIO CCCOUS Ubs 2 Dom. Date Calibr	Pasture/Grazisitviculture Urban Runo ON A III III III III III III III III III	CHANNEL LTERATIONS Dredging Channelization Full Partial)
Fish BP Habitat RE Invertebrates 1m 20 Fissue: No. of Water Chem Ac He	EF Seine Substra P Substra P Qual Jab (#Jabs: C Samples coll id/Alk Bu rbicides P	te Other: Other: Obble Snags	s V p:] Metals	☐ Low Hg		Lead Lead Lead acrophytes Lead	Collector: Collector: Collector: Othe Collector: Collector:	er)	
Fish BP Habitat RE Invertebrates 1m 20 Tissue: No. of Water Chem Ac	EF Seine Substra P Substra P Qual Jab (#Jabs: C Samples coll id/Alk Bu rbicides P	Other Tim te Other: Other: obble Snags ected S lk Nutrients esticides Ortho	sV p:] Metals D P Ot	Seine eg. Banks San	dM	Lead Lead Lead acrophytes Lead	Collector: Collector: Othe	er)	
Fish BP Habitat RE Invertebrates In 20 Fissue: No. of Water Chem Ac He Duplicate Samples T	EF Seine P P Substra Qual D Jab (#Jabs: C Samples coll id/Alk Bu rbicides P aken:	Other Tim te Other: Other: obble Snags ected S lk Nutrients esticides Ortho	sV p:] Metals b P Ot	Seine eg. Banks San Low Hg her:	dM	Lead Lead Lead acrophytes Lead	Collector: Collector: Othe	:r)	ach Total
Fish BP Habitat RE nvertebrates In 20 Fissue: No. of Water Chem Ac He Duplicate Samples T	EF Seine P P Substra P Qual D Jab (#Jabs: C Samples coll id/Alk Bu rbicides P aken:	Other Tim te Other: Other: obble Snags ected S lk Nutrients esticides Ortho	sV p:] Metals b P Ot	Seine eg. Banks San Low Hg her:	dM	Lead Lead acrophytes Lead Lead	Collector: Collector: Othe Collector: Collector:	:r)	ach Total
Fish BP Habitat RE Invertebrates In 20 Fissue: No. of Water Chem Ac He Duplicate Samples T Substrate Est. P. C Silt/Clay (<0.06 mm)	EF Seine P P Substra P Qual D Jab (#Jabs: C Samples coll id/Alk Bu rbicides P aken:	Other Tim te Other: Other: obble Snags ected S lk Nutrients esticides Ortho	sV p:] Metals b P Ot	Seine eg. Banks San Low Hg her:	dM	Lead Lead acrophytes Lead Lead	Collector: Collector: Othe Collector: Collector:	:r)	19.50 mm
Fish BP Habitat RE Invertebrates In 20 Tissue: No. of Water Chem Ac He Duplicate Samples T Substrate Est. P.C Silt/Clay (<0.06 mm) Sand (0.06 - 2 mm)	EF Seine P P Substra P Qual D Jab (#Jabs: C Samples coll id/Alk Bu rbicides P aken:	Other Tim te Other: Other: obble Snags ected S lk Nutrients esticides Ortho	sV p:] Metals b P Ot	Seine eg. Banks San Low Hg her:	dM	Lead Lead acrophytes Lead Lead	Collector: Collector: Othe Collector: Collector:	:r)	30
Fish BP Habitat RE Invertebrates In 20 Tissue: No. of Water Chem Ac He Duplicate Samples T Substrate Est. P.C Silt/Clay (<0.06 mm) Sand (0.06 - 2 mm) Gravel (2-64 mm)	EF Seine P P Substra Qual G Jab (#Jabs: C Samples coll id/Alk Bu rbicides P aken: C. Riffle 4	Other Tim te Other: Other: obble Snags ected S lk Nutrients esticides Ortho	sV p:] Metals b P Ot	Seine eg. Banks San Low Hg her:	dM	Lead Lead acrophytes Lead Lead	Collector: Collector: Othe Collector: Collector:	:r)	30 15
Fish BP Habitat RE Invertebrates 1m 20 Tissue: No. of Water Chem Ac He	EF Seine P P Substra Qual G Jab (#Jabs: C Samples coll id/Alk Bu rbicides P aken: C. Riffle 4	Other Tim te Other: Other: obble Snags ected S lk Nutrients esticides Ortho	sV p:] Metals b P Ot	Seine eg. Banks San Low Hg her:	dM	Lead Lead acrophytes Lead Lead	Collector: Collector: Othe Collector: Collector:	:r)	30 15 15

RBP High Gradient Habitat

Habitat	Condition Category										
Parameter	Optimal	Suboptimal	Marginal	Poor							
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0							
1.Epifaunal Substrate/ Available Cover 11	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.							
2.Embeddedness 8 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.							
3.Velocity/ Depth Regime Score 10	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).							
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.							
5.Channel Flow Status Score 10	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.							
6.Channel Alteration 10 Score	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.							
7.Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.							
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0							
8.Bank Stability LB 5	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.							
9. Vegetative Protection 5 LB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation, disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.							
10. Riparian Vegetative Zone Width LB 7	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.							

Total Score

NOTES/COMMENTS:

 $(\mathbf{H}^{-1}) \circ (\mathbf{H}^{-1}) = (\mathbf{H}^{-1}) \circ (\mathbf{H}^{-1}) \circ$

High Gradient Bioassessment Stream Visit Sheet

STREAM NAI	ME: S005		13.86		LOCATION:				Y BALL
STATION #:		Will			COUNTY: BO	The state of the s		PROGRAM PROJECT:	
INVESTIGAT		E) ELL			The state of the s		CONTRACTOR	Start:	
No Park Ass			YES NO NO	A	DATE: 3/29	/2016	(24hr)	Finish:	
	Station		Downstre		Upstream CANOPY COVER:: STREAM				
LAT	Station		Downstre	MAG	Opstream	Fu		osed (0-25%) exposed (25-5	TYPE: Perennial
LONG							Partially S Fully Shace		
WEATHER Has there been a scouring rain in the last 14 days? Yes No		Stead	y rain ly rain mittent showers /sunny	Surfa Deep Oil V	Disposal	Const Comm	ruction nercial trial	Forest Pasture Silvicu	/Grazing
Stream Width Maximum Dep Reach Length Riffle/Rum (No. Sam	th 5 3 18 V/Pool Sequentipled in Reach	ft ft m ce)	HYDRAULI STRUCTUR Dams Bridge Abutn Island Waterfalls Other: Apri	ES nents	STREAM FLOW Dry Pooled Low High Normal	Domir Tree/S	ARIAN VEGE nate Type: ees Herbace asses Shrub er of strata 2 thrub Taxa	ous 3 _ Dom.	CHANNEL ALTERATIONS Dredging Channelization (Full Partial)
P-CHEM		Instru	ment Used:	var to			Dat	e Calibrated:	
Temp(°C)	D.O.	(mg/l)	%Sat	uration	pH(S.U	l.)	Cond	Т	urb
	*			Sample (Collection Verific	ation		基個品質	
Algae	Sample:	QualM	HC Other		☐ Visual Assessm	ent	Lead Co	ollector:	
Fish	□BPEF [- W. C. C. L.		e: BPEF	Seine		Lead Co		
Habitat			ite Other:				Lead Co		
Invertebrates	☐ 1 m² ☐			. Ve	g. BanksSan	nd M	Lead Co		
Tissue:			lected S		B. Duitto but		Lead Co		
Water Chem	☐ Acid/A	lk 🔲 Bı	alk Nutrients C	Metals [Lead Co	ollector:	
Duplicate Sa	mples Take	n:		Substra	te Characteriz	etion			
Substrate EE	st. \square P.C.	Riffle 3		_	tun 10 %		ool 60	/6	Reach Total
Silt/Clay (<0.									30
Sand (0.06 – 2	2 mm)								15
Gravel (2-64 i	mm)	100			Figure 8				15
Cobble (64 –	256 mm)								30
Boulders (>25	56 mm)								5
Bedrock									5
NOTES/C	COMMENT	rs:			_ I	and owne	Γ SAMPI r denial □		Too deep/Impounded

Other (indicate under comments)

RBP High Gradient Habitat

Habitat	Condition Category											
Parameter	Optimal	Suboptimal	Marginal	Poor								
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0								
1.Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.								
2.Embeddedness 10 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.								
3.Velocity/ Depth Regime Score 10	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).								
4. Sediment Deposition 9 Score	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.								
5.Channel Flow Status Score 10	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.								
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Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0								
8.Bank Stability 7 LB 7	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.								
9. Vegetative Protection 5 LBRB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.								
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Total Score

NOTES/COMMENTS:

STREAM NAM	S008				LOCATION: E				
STATION #:	I/A				COUNTY: BO		1	PROGRAM:	
STATION #: ' INVESTIGAT	ORS. SM.	JF						PROJECT: Start:	the state of the s
Verify Site LAT			YES NO	N/A	DATE: 3/29/	2016	(24hr)	Finish:	
	Station		Downs		each Upstream			COVER:	
LAT	Station		DOWIIS	tream	Opstream		Fully Expo		
LONG							☐ Partially SI☐ Fully Shad		
WEATHER Has there been a scouring rain in the last 14 days? Yes No INSTREAL Stream Width Maximum Dep Reach Length Riffle/Run.	M FEATURE 1.5 20 Pool Seque pled in Reac Run 1 D.C Sample: BPEF RBP 1 Im² [20 Jal No. of Sa Acid/ Herbi	Stead Intern Clear Clouw RES ft ft m nnce ch) Pool Instruct O. (mg/l) Seine Substra Qual Qual Usubstra Qual Cumples col Alk Bu cides F	y rain ly rain nittent showers /sunny dy HYDRAU STRUCTI Dams Bridge Ab Island Used: Other: ment Used: % HC Other Other Other Other:	Saturation Sample Sample Sample Sample Sample Sample	STREAM FLOW Dry Pooled Low High Normal PH(S.U Collection Verific Visual Assessm Seine Low Hg	Const Comn Indust Row (RIP Domir Tree/S Seta	ARIAN VEGE Take Type: Bes Herbaceo Bes Shrubs Ber of strata I hrub Taxa Date	Forest Pastur Pastur Silvic Urban Urban Dom. Pastur Pastu	CHANNEL ALTERATIONS Dredging Channelization (Full Partial) Straightened Turb.
					te Characteriza				
Substrate DE		Riffle_1	0_%	He I	Run_10 %	P	ool_80	6	Reach Total
Silt/Clay (<0.0)6 mm)	37.1	A STATE OF THE STA						30
Sand (0.06 – 2	mm)								30
Gravel (2-64 n	nm)								15
Cobble (64 – 2	256 mm)								15
Boulders (>25	6 mm)	91							10
Bedrock									
NOTES/C	OMMEN	TS:			□ 1 □ s	and owne	Γ SAMPL r denial □ and/Secluded cate under comi	Dry Unsafe	Too deep/Impounded

RBP High Gradient Habitat

Habitat	RBP High Gradient Habitat Condition Category											
Parameter	Optimal	Suboptimal	Marginal	Poor								
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1.Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.								
2.Embeddedness 6 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.								
3.Velocity/ Depth Regime Score 6	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).								
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.								
5.Channel Flow Status Score 12	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.								
6.Channel Alteration 11 Score	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.								
7.Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.								
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0								
8.Bank Stability LB 6	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.								
9. Vegetative Protection 7 LB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.								
10. Riparian Vegetative Zone Width LB 0	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.								

Total Score

NOTES/COMMENTS:

STREAM NAME: S009 LOCATION: Bigbone, KY								
STATION #: N/A				COUNTY: BO	one		PROGRAM PROJECT:	
INVESTIGATORS: SM	, JF	III aliani			Par Salt	TIME	Start:	
Verify Site LAT/LONG v		YES NO NA		DATE: 3/29	2010	(24hr)	Finish:	
Statio	10	Downstrea		ach Upstream	n		Y COVER:	
LAT	8 3		A M		a longit	Fully Exp Partially I	Exposed (25-	50%) Perennial
LONG						☐ Partially S ☐ Fully Sha		
WEATHER Has there been a scouring rain in the last 14 days? Yes No	Stea Inter Clea X Clou	vy rain dy rain rmittent showers ur/sunny	Surfa Deep Oil W	Vells Disposal	Const Comn Indust Row (ruction nercial trial Crops	☐ Forest ☐ Pastur ☐ Silvic ☐ Urbar	t re/Grazing
INSTREAM FEAT Stream Width 3	ft ft m mence ach)	HYDRAULI STRUCTURI Dams Bridge Abutm Island Waterfalls Other: Cul	ES nents	STREAM FLOW Dry Pooled Low High Normal	Domir Tree/S	ARIAN VEGInate Type: Des Herbace Des Shrub Der of strata Der ub Taxa Des Sp.	ous	CHANNEL ALTERATIONS Dredging Channelization (□Full ■Partial)
P-CHEM		ument Used:					e Calibrated:	The second second second
Temp(°C) D	.O. (mg/l)_			THE RESERVE OF THE PARTY OF THE	19 E U.S.	Cond		Turb
				Collection Verific				
	F Seine	AHC Other	ng Rames A	☐ Visual Assessm	ent		ollector:	
		rate Other:	e: BPEF	Seine			ollector:	
	Qual [ollector:	
□ 20 1	ab (#Jabs:	CobbleSnags	Ve	g. Banks San	dM	acrophytes	Other	
		llectedS			West of	Lead C	ollector:	
	SATUR SERVICE	ulk Nutrients				Lead C	ollector:	
Duplicate Samples Ta		Pesticides Ortho	P Oth	er:				
		8	Substrat	te Characteriz	ation			
Substrate Est. P.C	Riffle			un 0 %		ool_50	%	Reach Total
ilt/Clay (<0.06 mm)				· 使 · 自 · 自 · 自				50
and (0.06 – 2 mm)								10
Gravel (2-64 mm)								25
Cobble (64 – 256 mm)								10
Boulders (>256 mm)								5
Bedrock								0
NOTES/COMME	NTS:	UNITED BEAUTY						
				SIT	E NO	SAMPI	LED:	
					and owne	r denial	Dry [Too deep/Impounded
						ind/Secluded	Unsaf	
					Other (indi	cate under con	ments)	

RBP High Gradient Habitat

Habitat	STANKE STANKE	Condition	Category	
Parameter	Optimal	Suboptimal	Marginal	Poor
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
1.Epifaunal Substrate/ Available Cover 5 Score	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat, lack of habitat is obvious, substrate unstable or lacking.
2.Embeddedness 6 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
3.Velocity/ Depth Regime Score 8	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
5.Channel Flow Status Score	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
6.Channel Alteration 7 Score	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
7.Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0
8.Bank Stability LB 5	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
9. Vegetative Protection 2 LBRB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
10. Riparian Vegetative Zone Width LB 1	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.

Total Score

NOTES/COMMENTS:

communication of the

STREAM NAME: S012			LOCATION: E				A STATE OF THE STATE OF	
STATION #: N/A			COUNTY: BO			PROGRAM PROJECT:		
INVESTIGATORS: SM,	JF			SILENIA	TIME	Start:		
Verify Site LAT/LONG vs	GPS □YES □NO ■N		DATE: 3/30/	2010	(24hr)	Finish:		
Station	Downstr	Ream Ream	upstream			PY COVER:: posed (0-25%)	STREAM	
LAT) -) 1 	☐ Partially	Exposed (25-5	0%) Perennial	
LONG						Shaded (50-75 aded (75-100%		
Has there been a scouring rain in the last 14	ft HYDRAU ft STRUCTU Dams cnce Bridge Abu	Surfar Deep Oil W Land Resid	ells Disposal ential STREAM FLOW Dry Pooled Low	Const Comm Indust Row C	ruction nercial trial	Forest Pasture Silvicu Urban ETATION eous	c/Grazing liture Runoff/Storm Sewers CHANNEL ALTERATIONS Dredging Channelization	
1 Riffle 1 Run 1	☐ Waterfalls	4	☐ High ■ Normal				(Full Partial)	
P-CHEM	Instrument Used:			2 pg 12		te Calibrated:		
	O. (mg/l)%S	aturation	pH(S.U.)			`urb.	
		and the state of	ollection Verifica				NAME OF THE OWNER OF THE OWNER.	
Algae Sample:	QualMHC Other	ATTENDED TO THE PERSON NAMED IN COLUMN	Visual Assessme		Lead C	Collector:		
		me: BPEF	Seine		Lead C	Collector:		
	Substrate Other:					Collector:		
	☐ Qual ☐ Other: b (#Jabs: Cobble Sna	os Vei	Ranks San	d M		Collector:		
	amples collected				A PARTY DESCRIPTION	Collector:		
Water Chem	Alk Bulk Nutrients	Metals [Low Hg		Lead C	Collector:		
Duplicate Samples Tak	icides Pesticides Ort	ho P 🔲 Oth	er:					
Duplicate Samples Tak	(1)							
		Substrat	e Characteriza	tion				
Substrate Est. P.C.	Riffle 80 %		un 10 %		ool 10	%	Reach Total	
Silt/Clay (<0.06 mm)					计值		50	
Sand (0.06 – 2 mm)			19 SERIES				30	
Gravel (2-64 mm)							5	
Cobble (64 – 256 mm)							10	
Boulders (>256 mm)							5	
Bedrock		ā will					0	
NOTES/COMMEN	ITS:							
1.0125,COMME			SIT	E NO	r SAMP	LED:		
			Tank and the same	and owne			Too deep/Impounded	
			TO THE REAL PROPERTY.					
			□□s	ite not fou	ind/Secluded	Unsafe		
				ther (indi	cate under cor	nments)		

RBP High Gradient Habitat

Habitat	RBP High Gradient Habitat Condition Category										
Parameter	Optimal	Suboptimal	Marginal	Poor							
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0							
1.Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.							
2.Embeddedness 10 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.							
3.Velocity/ Depth Regime Score 7	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).							
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.							
5.Channel Flow Status Score	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.							
6.Channel Alteration 8 Score	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.							
7.Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.							
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0							
8.Bank Stability LB 6	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.							
9. Vegetative Protection 6 LB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.							
10. Riparian Vegetative Zone Width LB 5	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.							

Total Score

NOTES/COMMENTS:

STREAM NAME: SO1	4		- 74	LOCATION: E	Bigbon	e, KY		
STATION #: N/A		- 154 P		COUNTY: BO	one		PROGRAM: PROJECT:	
INVESTIGATORS: SM,	JF	W. Adiaba	4	DATE: 3/30/	2016	TIME	Start:	
Verify Site LAT/LONG vs	GPS YE	S NO NO	A Re	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2010	(24hr)	Finish:	
Station		Downstre		Upstrean	1	CANOP Fully Exp	Y COVER:: osed (0-25%)	STREAM TYPE:
LAT	#					Partially E	exposed (25-50%) haded (50-75%)) Perennial
LONG							ied (75-100%)	Intermitte
Has there been a scouring rain in the last 14 days? INSTREAM FEATU Stream Width Maximum Depth Reach Length Riffle/Run/Pool Seque (No. Sampled in Reach 1 Riffle 1 Run 1 P-CHEM Temp(°C) D.0	Pool Instrumer D. (mg/l)	HYDRAULI STRUCTUR Dams Bridge Abutm Island Waterfalls Other: Catch but Used: %Sate	Surface Surfac	STREAM FLOW Dry Pooled Low High Normal PH(S.U	Const Comm Indust Row (RIP Domin Tre Gra Numb Tree/S Juniper	ARIAN VEGI hate Type: Bases Herbace asses Shrub: Ber of strata hrub Taxa us virginiana, Ar	Forest Pasture/C Silviculte Urban Re CTATION Dous Dom. adropogon sp. c Calibrated: Tur	Grazing ure unoff/Storm Sewer CHANNEL ALTERATIONS Dredging Channelization (Full Partial)
Algae Sample:	QualMHC	Other	I	Visual Assessm	ent	Lead Co	ollector:	
Fish □BPEF	Seine 🗆	Other Tim	e: BPEF	Seine	Page 1141	Lead Co	ollector:	
	Substrate					Lead Co	ollector:	
Rent British Forey Mar 27 (2)	☐ Qual ☐ Ot b (#Jabs: Cobl	her: ble Snags	. Ve	z Banks San	d M	Lead Co acrophytes	Other	•
		edS				Lead Co		
		Nutrients				Lead Co	ollector:	
☐ Herb Duplicate Samples Tak		icides Ortho	P Othe	er.				
Duplicate Samples Tak	en.					1		
			Substant	e Characteriza	tion			
Substrate Est. P.C.	Riffle 80	%		un 10 %		ool 10	/6	Reach Total
Silt/Clay (<0.06 mm)								50
Sand (0.06 – 2 mm)								10
Gravel (2-64 mm)								
		an estad Legal de se						25
Cobble (64 – 256 mm)								10
Boulders (>256 mm)								5
Bedrock								0
NOTES/COMMEN	TS:			CTT	E NO	COARECT	ED	
				IVEL STATE		SAMPI		
				□ L	and owner	r denial	Dry To	oo deep/Impounded
				□s	ite not fou	nd/Secluded	Unsafe	
					ther (indi	cate under com	ments)	

RBP High Gradient Habitat

Habitat	RBP High Gradient Habitat Condition Category											
Parameter	Optimal	Suboptimal	Marginal	Poor								
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0								
1.Epifaunal Substrate/ Available Cover 7	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.								
2.Embeddedness 10 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.								
3.Velocity/ Depth Regime Score 8	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).								
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.								
5.Channel Flow Status Score 11	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel, or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.								
6.Channel Alteration 8 Score	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.								
7.Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.								
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0								
8.Bank Stability LB 4	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.								
9. Vegetative Protection 5 LBRB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.								
10. Riparian Vegetative Zone Width LB 6	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.								

Total Score

NOTES/COMMENTS:

STREAM NAME: S01	5			LOCATION: E	Bigbon	e, KY		
STATION #: N/A				COUNTY: BC			PROGRAM PROJECT:	
INVESTIGATORS: SM	JF				THE JULY	TIME	Start:	
Verify Site LAT/LONG vs	and the second	YES NO NO	A	DATE: 3/30	2016	(24hr)	Finish:	
Statio		Downstre		ach Upstrean			Y COVER:	
LAT	The Park	Downstre	1	Opstican		☐ Partially	osed (0-25%) Exposed (25-5	0%) Perennial
LONG			SVA O				Shaded (50-75 ded (75-100%	
Fish BPEI Habitat RBF Invertebrates 1m² 20 Ji Tissue: No. of S Water Chem Acid	Stead Intern Clear Cloud RES ft ft m ence ch) Pool Instruction (mg/l) Qual M Seine Substration Qual Carrow (Jabs: Claar Color) Alk Buicides F	y rain ly rain ly rain mittent showers /sunny dy HYDRAULI STRUCTUR Dams Bridge Abutn Island Waterfalls Other: Culv ment Used: ### Waterfalls Other Other Other Other Other Other: Cobble Snage	Surfa Deep Oil V Land Residue	Vells Disposal lential STREAM FLOW Dry Pooled Low High Normal PH(S.U Collection Verific Visual Assessm Seine Banks San Low Hg	Const Comn Indust Row (RIPA Domir Tree/S Junipe	ARIAN VEGI atate Type: ess Struber of strata 3 hrub Taxa Prus virginia Cond. Lead C Lead C	Forest Pasture Silvice Urban ETATION Bous Sis Dom. The Calibrated: Ollector: Collector: Collect	c/Grazing alture Runoff/Storm Sewers CHANNEL ALTERATIONS Dredging Channelization (Full Partial)
Duplicate Samples Tal	ken:							
			Substra	te Characteriza	ation			
Substrate Est. P.C.	Riffle 3	5 %	R	un_35%	P	ool 30	%	Reach Total
Silt/Clay (<0.06 mm)								40
Sand (0.06 – 2 mm)	3/1							25
Gravel (2-64 mm)								25
Cobble (64 – 256 mm)								10
Boulders (>256 mm)								0
Bedrock					A Livery			0
NOTES/COMME	NTS:			□ 1 □ s	and owner	Γ SAMPI r denial nd/Secluded cate under con	Dry □	Too deep/Impounded

RBP High Gradient Habitat

Habitat	RBP High Gradient Habitat Condition Category									
Parameter	Optimal	Suboptimal	Marginal	Poor						
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.						
2.Embeddedness 3 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.						
3.Velocity/ Depth Regime Score 7	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).						
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% (<20% for low-gradient streams) of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% (20-50% for low-gradient) of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% (50-80% for low-gradient) of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% (80% for low-gradient) of the bottom changing frequently; pools almost absent due to substantial sediment deposition.						
5.Channel Flow Status Score 11	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel, or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.						
6.Channel Alteration 7 Score	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr.) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.						
7.Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.						
Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0						
8.Bank Stability LB 2	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.						
9. Vegetative Protection 4 LBRB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.						
10. Riparian Vegetative Zone Width LB 2	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.						

Total Score

NOTES/COMMENTS:

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Orang con the more relative contribution

STREAM NAME: S017			LOCATION: Bigbone, KY					
STATION #: N/A				COUNTY: Boone			PROGRAM PROJECT:	
INVESTIGATORS: SM, JF								
Verify Site LAT/LONG vs GPS ☐ YES ☐ NO ☐ N/A			DATE: 3/30	DATE: 3/30/2016 (24)		Finish:		
Res Station Downstream				Upstream				
LAT						Fully Exp Partially E	exposed (25-5	60%) Perennial
LONG	Jan 1					Partially Shaded (50-75%) Fully Shaded (75-100%)		
Has there been a scouring rain in the last 14	Stead Interr Clear Cloude RES ft ft mence	y rain y rain nittent showers /sunny ly HYDRAULI STRUCTUR Dams Bridge Abutm Island	Surface Surfac	ells Disposal	Const Comr Indus Row RIP Domin	ruction nercial trial	Forest Pastur Silvice Urban	e/Grazing ulture Runoff/Storm Sewer CHANNEL ALTERATIONS Dredging Channelization
Waterfalls			Normal				(Full Partial)	
P-CHEM	Instru	ment Used:				Dat	e Calibrated:	
Temp(°C) D.C	O. (mg/l)	%Satt	ıration	pH(S .U	l.)	Cond	1	Гигь
			Sample C	ollection Verific	ation	all editions		
		HC Other	a year	☐ Visual Assessm	ent	Lead Co	ollector:	
	Seine	- 1111	e: BPEF_	Seine		Lead C	Section 1997	
		te Other:				Lead Co		
	Qual []	obble Snags	Ver	Banks Sar	id M	Lead Co		,
		ected . S			106,10418		ollector:	
Water Chem Acid	Alk 🔲 Bu	lk Nutrients	Metals [Low Hg	11/46	Lead Co	ollector:	6 9 SA 614 #aj
		esticides Ortho	P Oth	er:				
Duplicate Samples Tak	en:							
							Appendix 1	
		S	Substrat	e Characteriz	ation			
Substrate Est. P.C.	Riffle_5	0 %	R	un 20 %	F	00130	/6	Reach Total
Silt/Clay (<0.06 mm)								30
Sand (0.06 – 2 mm)								20
Gravel (2-64 mm)								20
Cobble (64 – 256 mm)			F70 ¹					20
Boulders (>256 mm)								5
Bedrock								5
NOTES/COMMEN	TS:				E BASE VIII		Prison RIA	
				SIT	E NO	Г SAMPI	ED:	1
				☐ Land owner denial ☐ Dry ☐ Too deep/Impounded				
							To the	
						ind/Secluded	Unsafe	
				Other (indicate under comments)				

RBP High Gradient Habitat

Habitat	RBP High Gradient Habitat Condition Category									
Parameter	Optimal	Suboptimal	Marginal	Poor						
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0						
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2.Embeddedness 10 Score	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.						
3.Velocity/ Depth Regime Score 16	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Sow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast- shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow- deep).						
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5.Channel Flow Status Score 10	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.						
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Left/Right Bank	10 9	8 7 6	5 4 3	2 1 0						
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9. Vegetative Protection 6 LB	More than 90% of the stream bank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the stream bank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the stream bank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the stream bank surfaces covered by vegetation; disruption of stream bank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.						
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Total Score

NOTES/COMMENTS: