## **APPENDIX K**

## Water Resources

#### Memo

Date: January, 27, 2020, revised May 12, 2020

Project: CLT Airport Expansion (SAW-2018-01071)

Subject: Mitigation Assessment for Proposed Impacts

#### Introduction

Charlotte Douglas International Airport (CLT or Airport) is a publicly-owned airport operated by the City of Charlotte and managed by the Aviation Department. CLT is located on approximately 6,000 acres of land, of which 4,652 acres are considered within a Clean Water Act (CWA) Section 404 Individual Permit Boundary. The Airport is located in the City of Charlotte, in west Mecklenburg County, North Carolina (Figure 1).

The purpose of the project is to increase airfield capacity to meet demand over the next 10 years, enhance terminal gate and ramp capacity to reduce delays, and to enhance the efficiency and operational safety of the Airport taxiway system. Due to the long term nature of the Airport's development, the impacts associated with various airport elements will not occur all at once and will be phased in multiple major phases. Ratios for all permanent impacts are proposed herein; however, impact credits will be requested in accordance with the phasing.

There are multiple projects associated with the Airport's future development; however, not all of the project elements propose impacts to jurisdictional waters (Table 1). Phase 1 includes the first two major Airport elements that propose impacts to Waters of the US (WOUS), consisting of the North End Around Taxiway (NEAT) and the Deicing Pad and South Crossfield Taxiway (SCF) (Figure 2). The NEAT element is located within Hydrologic Unit Code (HUC) 03050101 and the SCF element is located within HUC 03050103.

Phase 2 includes the next major Airport elements that propose impacts to WOUS, which consist of the South Ramp Expansion and the 4<sup>th</sup> Parallel Runway and Taxiway Enhancement (Figure 5). The South Ramp Expansion element is located within HUC 03050103, while the 4<sup>th</sup> Parallel Runway element is located across HUCs 03050101 and 03050103. The remaining phases do not necessitate impacts to WOUS. Phases 2 through 5 have yet to be approved by the Federal Aviation Administration (FAA), and are not funded or designed.

Table 1. Summary of CLT projects and phasing

Proposed CLT Projects	Impacts to Waters of the US	Phase
Long Term 1 Parking Lot Expansion	No	On Hold
Addition of a Centralized Receiving and Distribution Center (CRDC)	No	1
West Ramp and Concourse A Expansion	No	1
Joint Operations Center (JOC)	No	1
Amazon and FedEx Airport Facilities Expansion	No	1
Addition of the General Aviation Group Hangar	No	1
Charter Terminal Expansion	No	1
Deicing Pad and South Crossfield Taxiway for Existing Runway 18C/36C Includes:	Yes	1

Proposed CLT Projects	Impacts to Waters of the US	Phase
Deicing Pad and South Crossfield Taxiway (Taxiway H) Taxiway F Extension Yorkmont Road Realignment Coffey Creek Stormwater Detention		
North End Around Taxiway Project for Existing Runway 18C/36C Includes:  NEAT Old Dowd Road Relocation New Utility Installation Airport Overlook Relocation Hold Pads Private Access Drive Ticer Branch Stormwater Detention	Yes	1
South Ramp Expansion	Yes	2
10,000-foot 4 <sup>th</sup> Parallel Runway and associated Taxiway Enhancement Includes:  South End Around Taxiway for Existing Runway 18C/36C Hold Pad	Yes	2
Concourse C Expansion	No	3
Concourse B Expansion	No	4
Daily North Parking Expansion	No	4
Satellite Terminal	No	5

#### Methods

In April 2019, September 2019, and October 2019 HDR environmental scientists reviewed the project area for waters of the U.S. under Section 404/401 of the Clean Water Act (CWA). The North Carolina Stream and Wetland Assessment Methodologies (NCSAM and NCWAM) were also utilized to assess stream and wetland quality and function of the features identified for future proposed, permanent impacts. The NCSAM, NCWAM, and representative photographs are provided for Phase 1 in Appendix B and for Phase 2 in Appendix C.

A schedule of ratios was provided by the US Army Corps of Engineers (USACE) associated with NCSAM/NCWAM scores (Table 2).

Table 2. Schedule of mitigation ratios

rable 2. Ochicadic of fillingation ratios					
Ratio	NCSAM/ NCWAM Score	Feature	Credit Type		
0.5:1	n/a	Open Water	Wetland		
2:1	High	Wetlands	Wetland		
1.75:1	Medium	Wetlands	Wetland		
1.5:1	Low	Wetlands	Wetland		
2:1	High	Streams	Stream		
1.75:1	Medium	Streams	Stream		
1.5:1	Low	Streams	Stream		
2:1	All unauthorized Impacts				

#### Results

Phases 1 and 2 would result in 12,057 linear feet of permanent and temporary impacts to stream channels. Permanent loss stream impacts total 11,435 linear feet, consisting of 11,117 linear feet of perennial tributary and 318 linear feet of intermittent tributary. Permanent non-loss stream impacts total 204 linear feet, consisting of 174 linear feet of perennial tributary and 30 linear feet of intermittent tributary. Temporary stream impacts total 418 linear feet, consisting of 246 linear feet of perennial tributary and 172 linear feet of intermittent tributary. Phases 1 and 2 would also result in permanent loss impacts to 5.89 acre of jurisdictional wetlands. There are no temporary impacts to wetlands proposed. Permanent non-loss and temporary impacts do not require mitigation and are therefore not assessed below. The results of NCSAM and NCWAM were used to formulate mitigation ratios for the proposed permanent impacts.

Phase 1 of the project (NEAT and SCF) proposes 3,284 linear feet of permanent loss stream impacts, 174 linear feet of permanent non-loss impacts, and 418 linear feet of temporary impacts. NEAT impacts consist of 1,302 linear feet of permanent loss of stream impacts, 174 linear feet of permanent non-loss stream impacts, and 418 linear feet of temporary stream impacts. SCF impacts consist of 1,982 linear feet of permanent loss of stream impacts and 30 linear feet of permanent non-loss stream impacts. Permanent wetland impacts associated with Phase I include 0.68 acres related to NEAT and 0.14 acres of related to SCF (Table 3 and Figures 3 and 4). Impacts to 2,614 linear feet of stream channel were previously permitted under SAW-2006-32521 (expires 12/31/2024) and are not included in the impact totals due to its previous approval, but mitigation credits are included as mitigation for this approved impact has not been paid.

Table 3. Summary of proposed permanent impacts and corresponding mitigation ratios for Phase I

Impact Number^	Feature	Project	NCWAM/ NCSAM Score	Ratio	Impact Amount (linear feet/acre)	Proposed Credits
				Impacts		
PS2-1	S2	NEAT	High	2:1	215	430
D00.4	00	NIFAT	High	2:1	66	132
PS3-1	S2	NEAT	Permanent	Non-Loss	42	0
PS4-1	S1	NEAT	High	2:1	400	800
PS5-1	S10	NEAT	High	2:1	484	968
PS6-1	S9	NEAT	High	2:1	137	274
PS7-1	S25	SCF	Low	1.5:1	823	1,234.5
PS8-1*	S25	SCF	-	1:1	(2,614)*	2,614
PS9-1; Reach 1	S26	SCF	Low	1.5:1	91	136.5
PS9-1; Reach 2	S26	SCF	High	2:1	444	888
PS10-1	S27	SCF	Medium	1.75:1	42	73.5
PS11-1	S25	SCF	High	2:1	457	914
DC40.4	C24	COF	High	2:1	125	250
PS12-1	S34	SCF	Permanent	Non-Loss	30	0
PS13-1	S1	NEAT	Permanent	Non-Loss	63	0
PS14-1	S11	NEAT	Permanent	Non-Loss	18	0
PS15-1	S11	NEAT	Permanent	Non-Loss	51	0
Total Propos	ed Perman	ent Loss S	tream Impac	ts/Credits:	3,284 LF*	8,714.50
Total Prop	osed Perm	nanent Nor	n-Loss Stream	n Impacts:	204 LF	0.00
			Wetland	d Impacts		
PW1-1	W5	NEAT	High	2:1	0.46	1
PW2-1	W6	NEAT	Low	1.5:1	0.22	0.5
PW3-1	W15	SCF	High	2:1	0.01	0.25
PW4-1	W22	SCF	High	2:1	0.04	0.25
PW5-1	W24	SCF	High	2:1	0.09	0.25
A DC4 4 - Dawe on and		•	etland Impac		0.82 AC	2.25

<sup>^</sup> PS1-1 = Permanent Stream Impact 1 - Phase 1; PS2-1 = Permanent Stream Impact 2 - Phase 1, etc.

Phase 2 of the project (4<sup>th</sup> Parallel Runway and South Ramp Expansion) proposes 8,151 linear feet of permanent stream impacts and 5.07 acres of permanent wetlands impacts. Permanent stream and wetlands impacts related to the 4<sup>th</sup> Parallel Runway project consist of 6,431 linear feet stream impacts and 4.91 acres of wetlands impacts, respectively. Permanent stream and wetlands impacts related to the South Ramp Expansion project consist of 1,720 linear feet of stream impacts and 0.16 acres of wetland impacts, respectively (Table 4 and Figure 5). The remaining phases of the CLT development do not incur impacts to Waters of the US.

PW1-1 = Permanent Wetland Impact 1 - Phase 1; PW2-1 = Permanent Wetland Impact 2 - Phase 1, etc.

<sup>\*</sup> Does not include the 2,614 LF of a previous approved impact per SAW-2006-32521; however, mitigation has not been paid for **and is** included in the credit totals.

Table 4. Summary of proposed permanent impacts and corresponding mitigation ratios for Phase 2

Table 4. Sullilla	able 4. Summary of proposed permanent impacts and corresponding mitigation ratios for Phase 2							
Impact Number*	Feature	Project	NCWAM/ NCSAM Score	Ratio	Impact Amount (linear feet/acre)	Proposed Credits		
Stream Impacts								
HUC 03050103								
PS1-2; R1	S27	4th Parallel	High	2:1	976	1,952		
PS1-2; R2	S27	4th Parallel	High	2:1	357	714		
PS1-2; R3	S27	4th Parallel	High	2:1	394	788		
PS1-2; R4	S27	4th Parallel	High	2:1	282	564		
PS2-2	S28	4th Parallel	High	2:1	68	136		
PS3-2; R1	S29	4th Parallel	High	2:1	1,293	2,586		
PS3-2; R2	S29	4th Parallel	Low	1.5:1	276	414		
PS3-2; R3	S29	4th Parallel	Low	1.5:1	86	129		
PS3-2; R4	S29	4th Parallel	Low	1.5:1	173	259.5		
PS4-2	S24	South Ramp Expansion	Low	1.5:1	193	289.5		
PS5-2	S25	South Ramp Expansion	Low	1.5:1	1,527	2,290.50		
PS6-2	S25	4th Parallel	High	2:1	1,175	2,350		
PS7-2; R1	S30	4th Parallel	Low	1.5:1	368	552		
PS7-2; R2	S30	4th Parallel High		2:1	983	1,966		
		Total Propos	sed Stream Imp	acts/Credits:	8,151 LF	14,990.5		
			Wetland Impac	ts				
			HUC 0305010	1				
PW1-2	W6	4th Parallel	Low	1.5:1	0.76	1.25		
			HUC 0305010	3				
PW2-2	W7	4th Parallel	Low	1.5:1	0.61	1		
PW3-2	W8	4th Parallel	Low	1.5:1	1.75	2.75		
PW4-2	W14	South Ramp Expansion	Low	1.5:1	0.16	0.25		
PW5-2	W16	4th Parallel	Medium	1.75:1	0.14	0.25		
PW6-2	W17	4th Parallel	High	2:1	0.06	0.25		
PW7-2	W18	4th Parallel	Low	1.5:1	0.01	0.25		
PW8-2	W20	4th Parallel	Medium	1.75:1	1.41	2.5		
PW9-2	W19	4th Parallel	Low	1.5:1	0.17	0.25		
		5.07 AC	8.75					

#### Conclusion

For Phase 1 impacts, mitigation will be requested from the City of Charlotte's Stream and Wetland Mitigation Bank for permanent stream and wetland impacts in both HUCs 03050101 and 03050103 (Table 5). All impact ratios reported herein are not considered final until the Section 404 Individual Permit approval is issued by the US Army Corps of Engineers (USACE). Credit fees are subject to change yearly. Mitigation will be requested for Phase 2 impacts at a later time when those projects move forward with FAA approval.

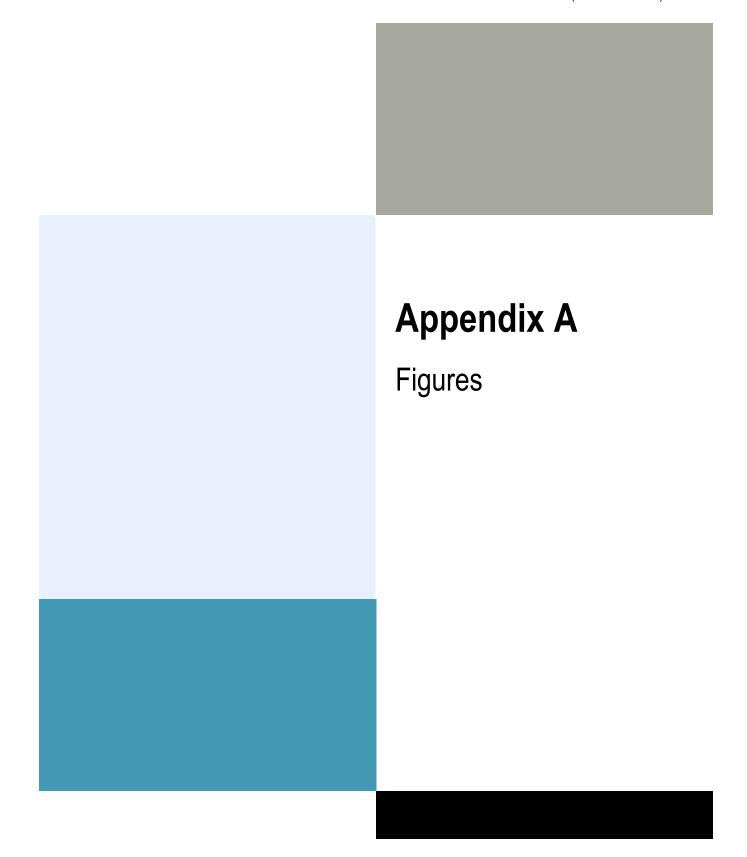
Table 5. Summary of Phase 1 permanent impacts and proposed credits per HUC

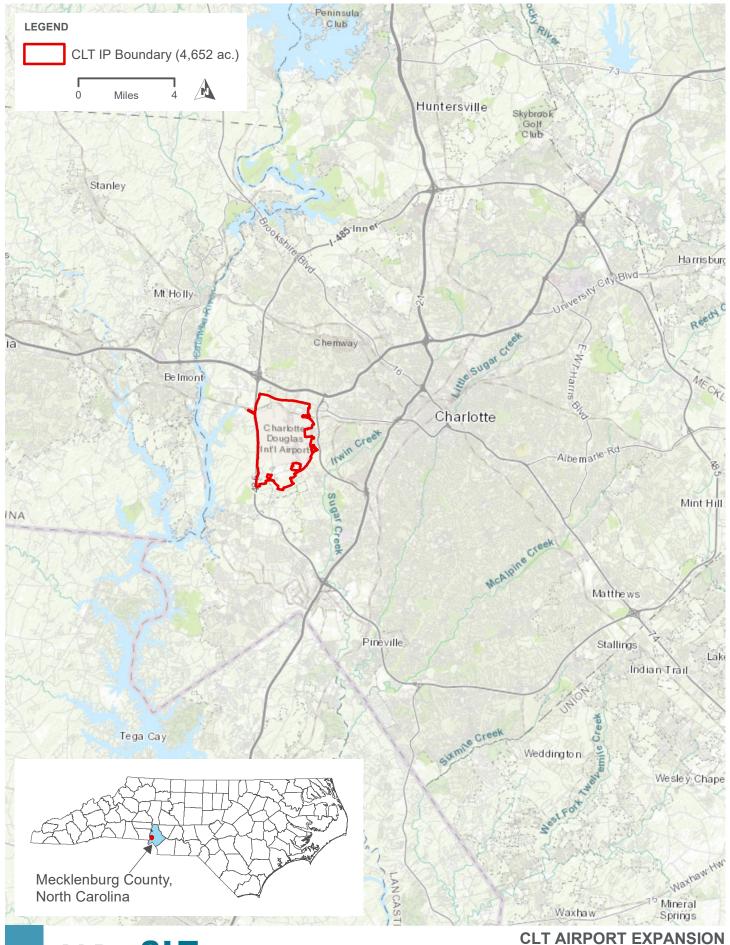
Phase 1						
Project	Feature	Impact Amount (LF/AC)	Proposed Credits			
	HUC 03050101					
NEAT	Streams	1,302 LF	2,604			
	Wetlands	0.68 AC	1.50			
	HUC 03050103					
SCF	Streams	Streams 1,982LF*				
	Wetlands	0.14 AC	0.75			

<sup>\*</sup> Does not include the 2,614 LF of a previous approved impact per SAW-2006-32521; however, mitigation has not been paid for **and is** included in the credit totals

Appendices: Appendix A: Figures

Appendix B: Phase 1 – NCSAM and NCWAM Forms and Photographs Appendix C: Phase 2– NCSAM and NCWAM Forms and Photographs

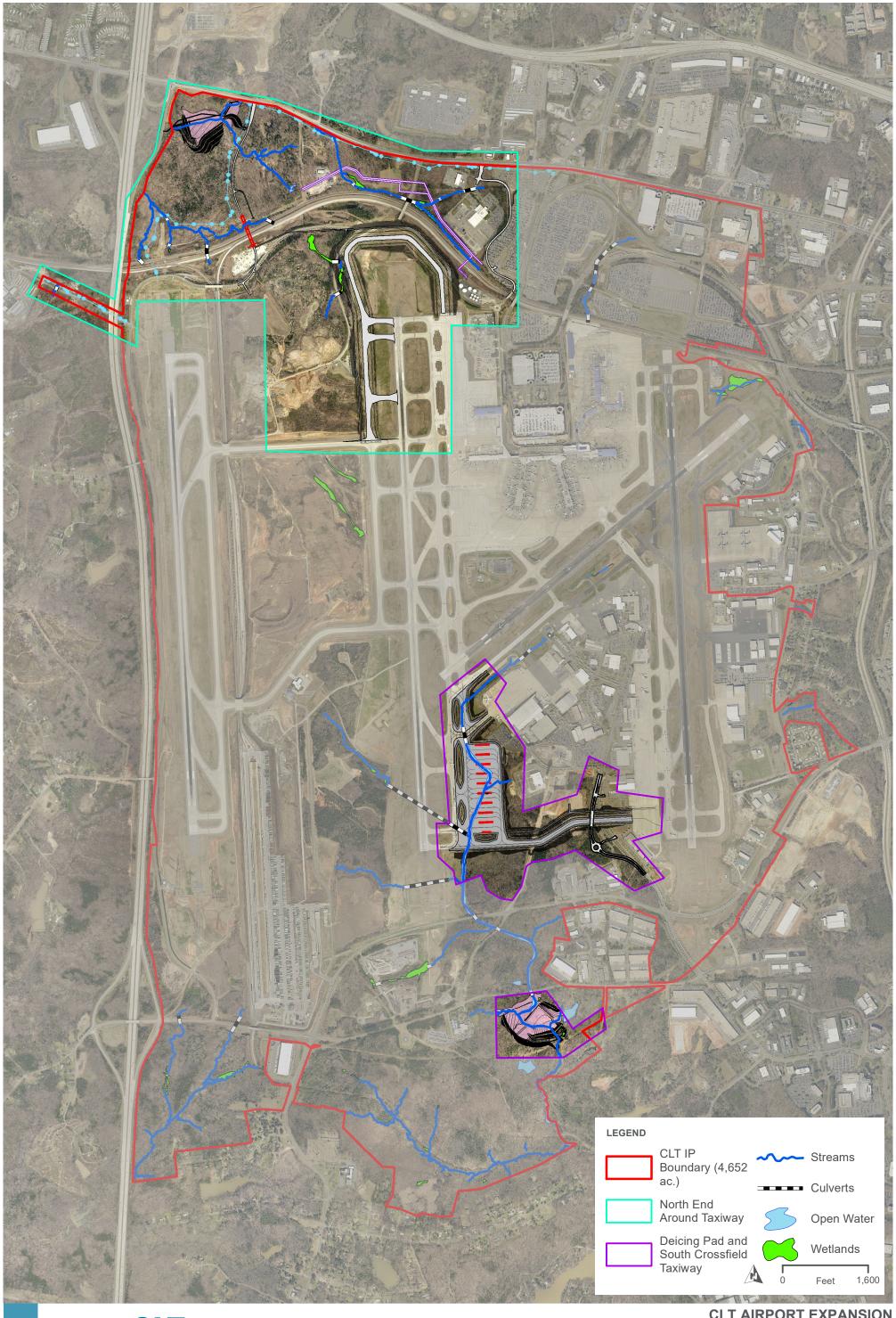






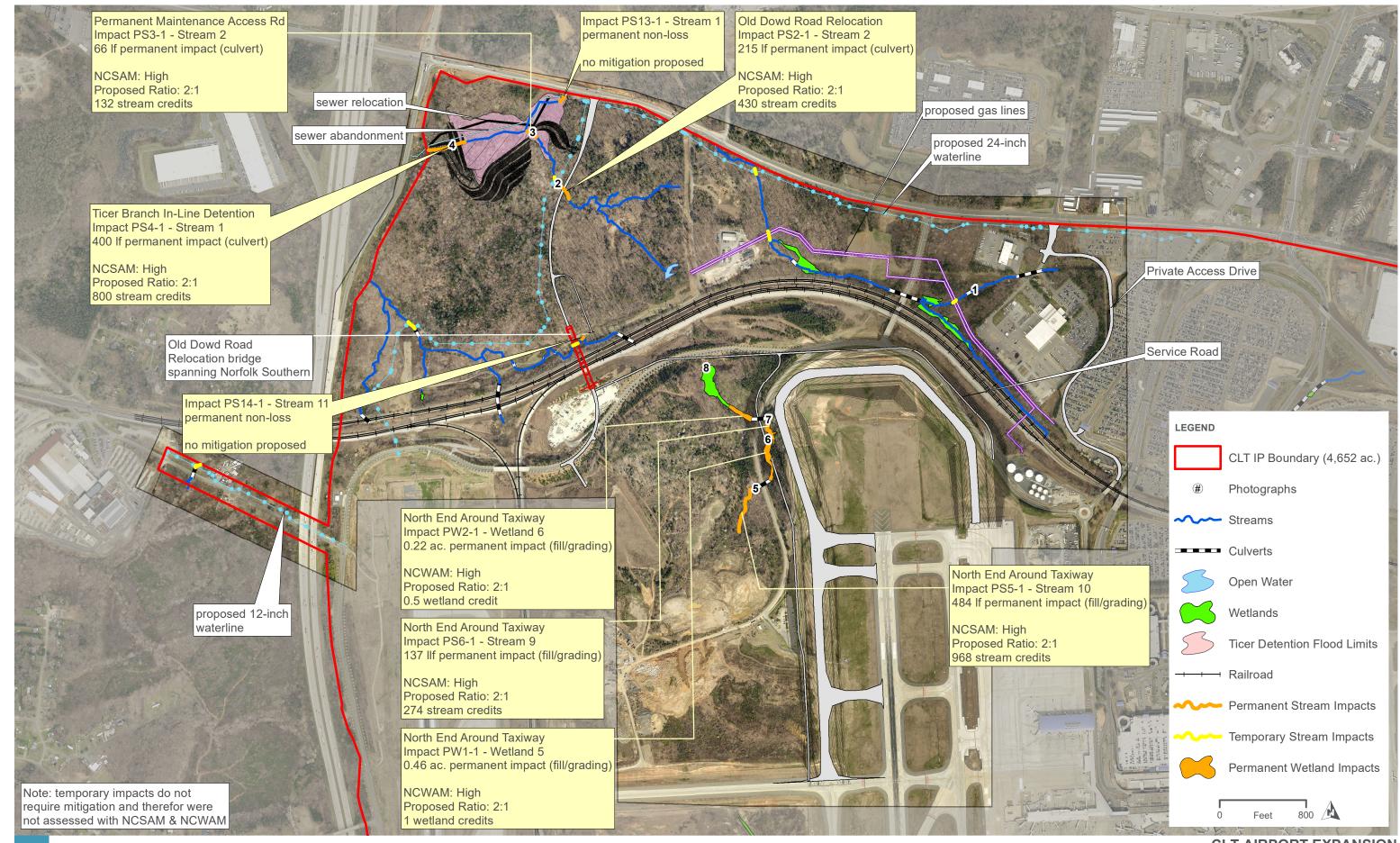
CLT AIRPORT EXPANSION PROJECT VICINITY

FIGURE 1



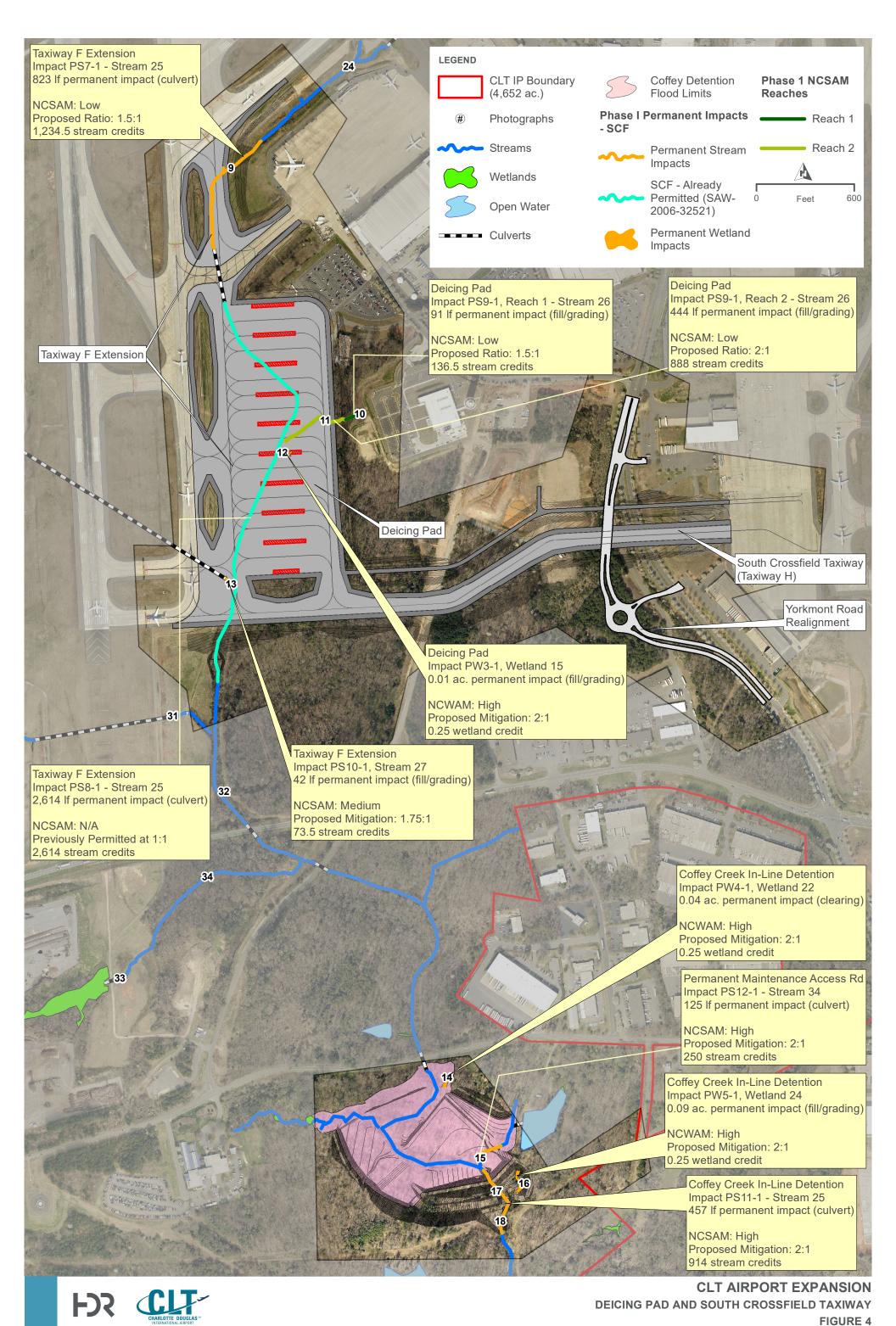
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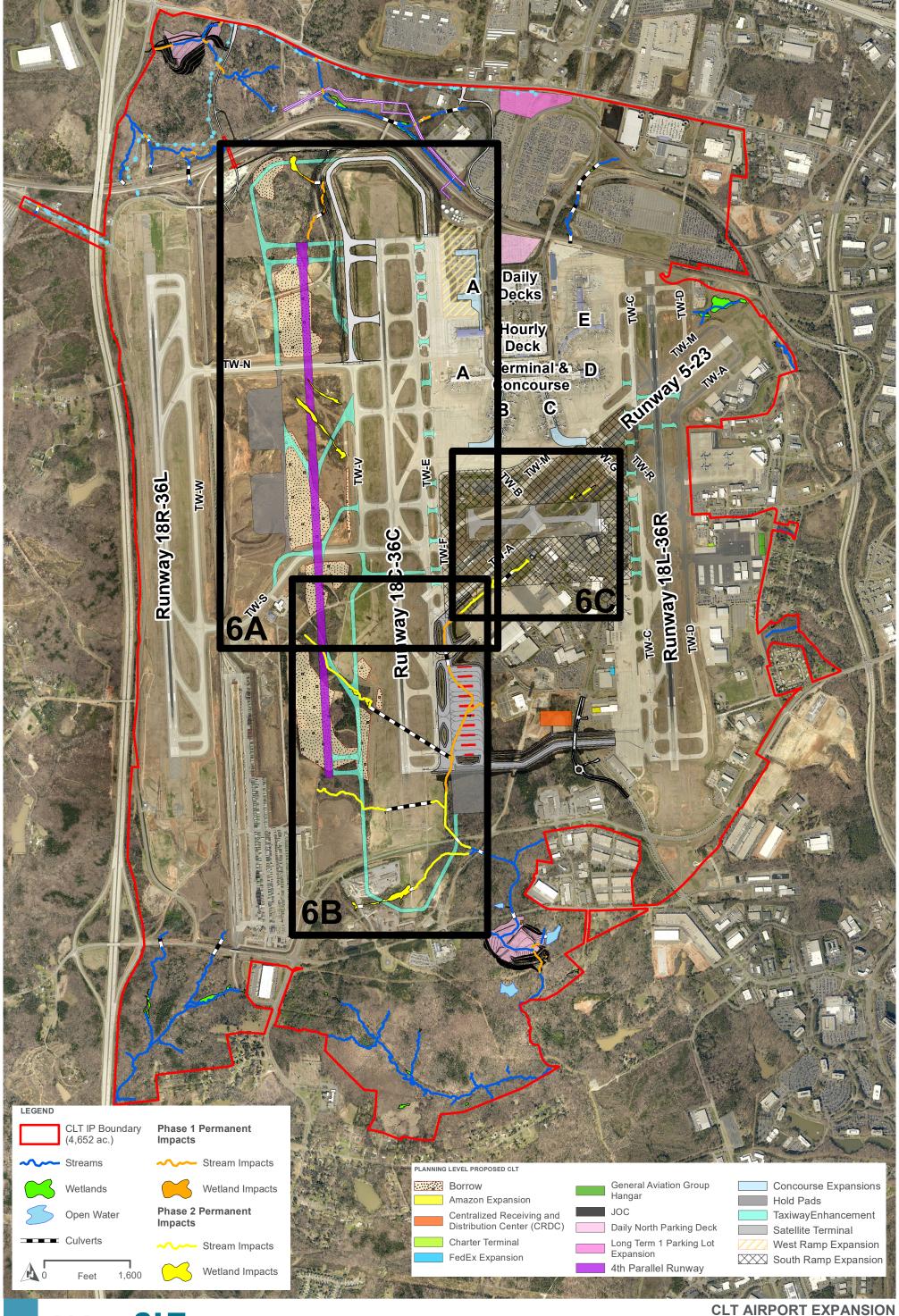
CLT AIRPORT EXPANSION
PHASE 1 OF CLT ELEMENTS
FIGURE 2

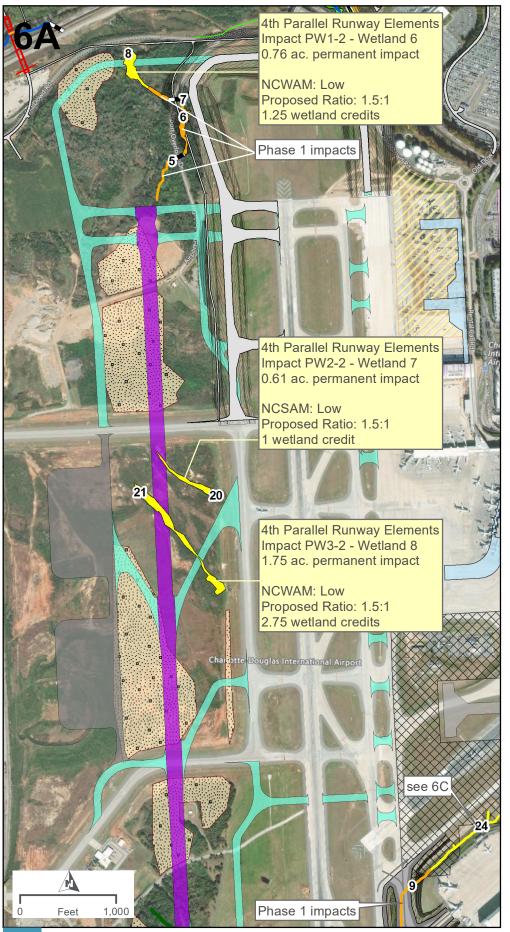


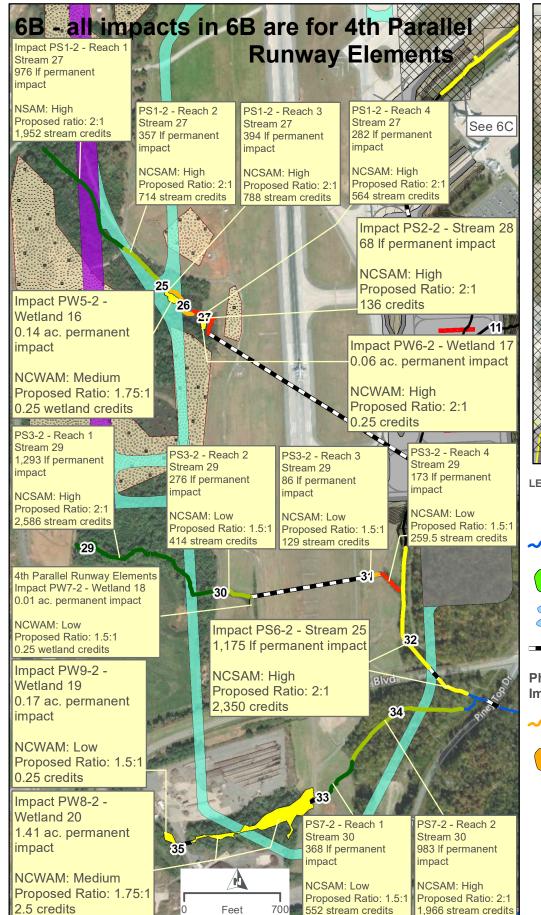
FOR CHARLOTTE DOUGLAS"
INTERNATIONAL AIRPORT

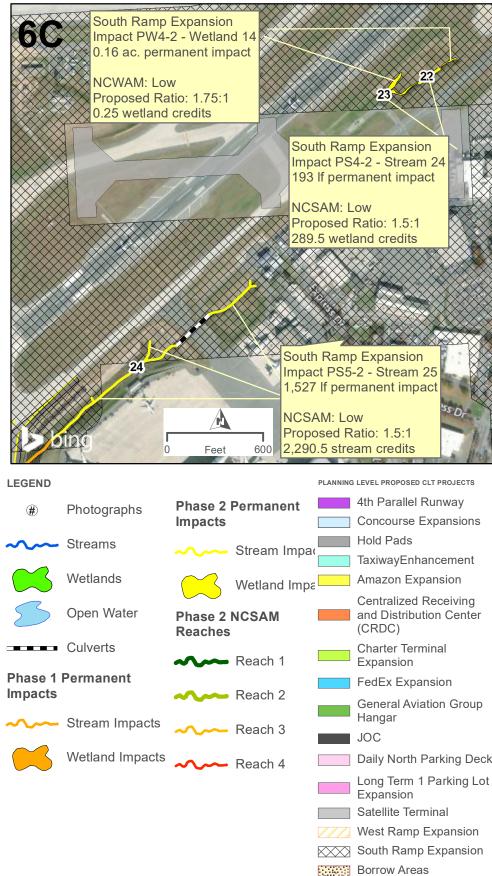
CLT AIRPORT EXPANSION NORTH END AROUND TAXIWAY













CLT AIRPORT EXPANSION
REMAINING CLT ELEMENTS

# **Appendix B**

Phase 1: NCSAM and NCSAM Forms, and Photographs

## NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

USACE AID #:	NCDWR #:
	a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
	he stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
	attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
	ested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
	examples of additional measurements that may be relevant.
	RESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE INFORM	
1. Project name (if any):	CLT Airport Expansion 2. Date of evaluation: May 2019
3. Applicant/owner name:	CLT 4. Assessor name/organization: KMT, BGB/HDR
5. County: 7. River basin:	Mecklenburg 6. Nearest named water body Catawba on USGS 7.5-minute quad: Ticer Branch
-	al degrees, at lower end of assessment reach): 35.233570, -80.950471
9. Site number (show on a	i: <b>(depth and width can be approximations)</b> attached map): PS1-1 - Stream 8 10. Length of assessment reach evaluated (feet): 207
	ed (in riffle, if present) to top of bank (feet):  1  Unable to assess channel depth.
12. Channel width at top of	
	nnial flow Intermittent flow Italial Marsh Stream
STREAM CATEGORY IN	
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
10.140 6/ 110/ 20116.	Modificanto (M)
16. Estimated geomorphic	
valley shape ( <b>skip for</b> <b>Tidal Marsh Stream</b> ):	
17. Watershed size: (skip	
for Tidal Marsh Strea	
ADDITIONAL INFORMAT	,
	derations evaluated? ⊠Yes □No If Yes, check all that apply to the assessment area.
☐Section 10 water	☐ Classified Trout Waters ☐ Water Supply Watershed (☐ I ☐ II ☐ IV ☐ V)
☐Essential Fish Habi	
☐Publicly owned prop	
☐Anadromous fish	☐303(d) List ☐CAMA Area of Environmental Concern (AEC)
☐Documented preser	nce of a federal and/or state listed protected species within the assessment area.
List species:	
☐Designated Critical	
19. Are additional stream	information/supplementary measurements included in "Notes/Sketch" section or attached? ⊠Yes ☐No
1 Channal Water age	popular reach matric (akin for Size 4 atreams and Tidal March Streams)
	essment reach metric (skip for Size 1 streams and Tidal Marsh Streams) hout assessment reach.
	er in pools only.
_	assessment reach.
	striction – assessment reach metric
	of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction <u>or</u> fill to the
	ructing flow <u>or</u> a channel choked with aquatic macrophytes <u>or</u> ponded water <u>or</u> impoundment on flood or ebb within
	ent reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver dams	).
⊠B Not A	
3. Feature Pattern – ass	sessment reach metric
☐A A majority of	the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
⊠B Not A	
4. Feature Longitudinal	Profile – assessment reach metric
	ssessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over
	tive aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
disturbances	
⊠B Not A	
5. Signs of Active Insta	bility – assessment reach metric
_	nt instability, not past events from which the stream has currently recovered. Examples of instability include
	ive channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
	innel unstable
<u>—</u>	channel unstable
□C > 25% of cha	nnel unstable

6.				raction - st						
	LB	RB	ne Len	Bank (LB) a	and the K	ignt bar	ik (RB).			
	⊠A □B	⊠A □B	Mod refe	derate evide erence intera	ence of con action (exa	nditions imples: l	limited streams	rms, levee ide area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	□c	□c	Exte [exa of fl mos	ensive evide amples: cau lood flows th	ence of co seways w rough stre ng]) <u>or</u> flo	nditions vith floodp amside a	that adversely plain and chanr area] <u>or</u> too mu	affect refe nel constric ch floodpla	rence inte tion, bulk in/intertid	eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption al zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – assess	sment rea	ach/inte	rtidal zone me	tric		
		k all that								
	∐A ∏B						e (milky white, n features or inf			er discoloration, oil sheen, stream foam)
	□с	Notic	eable ev	vidence of po	ollutant dis	scharges				<u>nd</u> causing a water quality problem
	□D □E			luding naturalished or coll			ting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
		section	on.					,,,,,,	,	
	□F □G			h access to : gae in strear						
	□H □I	Degr	aded ma	arsh vegetati	ion in the i	intertidal	l zone (removal	_	-	owing, destruction, etc)
	⊠J		to no sti			(explain	in "Notes/Sketo	on section	1)	
8.	Rece	nt Weath	er – wa	tershed me	tric (skip	for Tida	al Marsh Strea	ms)		
	For S ☐A						idered a drougl Il not exceeding			eams, D2 drought or higher is considered a drought.
	□в	Drou	ght cond	ditions <u>and</u> ra			inch within the			or 40 flodio
	⊠c		•	onditions						
9.	<b>Large</b> □Ye	`	-	Stream – as tream is too				f Yes, skip	to Metric	13 (Streamside Area Ground Surface Condition).
10.			eam Hab □No	bitat Types				of the a	coccmor	at reach (examples of stressors include excessive
	iva.	Птез	Пио	sedimenta	ation, min	ing, exc	avation, in-stream al Plain stream	eam harde	ning [for	example, rip-rap], recent dredging, and snagging)
	10b.	Check a □A					e of assessmen uatic mosses			ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms
			(include	e liverworts,	lichens, a	ınd algal	mats)	Check for Tidal Marsh Streams Only	□F □G	Submerged aquatic vegetation
		⊠В	Multiple vegetat		or leaf pa	acks and	l/or emergent	k for T h Strei Only	□H □I	Low-tide refugia (pools) Sand bottom
		□c	Multiple	e snags and				Shecl Marsh	□J	5% vertical bank along the marsh
		□D		dercut banks as extend to			and/or roots perimeter	0 2	□K	Little or no habitat
		□E	Little or	r no habitat						
****	*****	******	*****	**REMAININ	NG QUES	TIONS A	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedfe	orm and	Substra	ite – assess	sment rea	ıch metr	ic (skip for Siz	ze 4 Coas	al Plain s	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is assessm	nent reach	n in a nat	ural sand-bed	stream? (s	kip for C	oastal Plain streams)
	11b.			ed. Check t			ox(es).			
		□A □B		un section <b>(e</b> ide section <b>(</b>						
		⊠C	Natural	l bedform ab	sent ( <b>ski</b> p	p to Met	ric 12, Aquatio	: Life)		
	11c.	at least	one box	in each rov	w (skip fo	r Size 4	<b>Coastal Plain</b>	streams a	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should no	ot excee R	ed 100% for C		essment P	reach.			
							Bedrock/sapro			
		H	H	H	H	H	Boulder (256 Cobble (64 –		n)	
			፱	፱		፱	Gravel (2 – 64	4 mm)		
		H	H	님	$\vdash$	H	Sand (.062 – Silt/clay (< 0.0			
			Ħ	Ë		Ē	Detritus	•	4=4. \	
	44.		□	<b>∐</b>			Artificial (rip-ra	•	,	december of Tables (1.0)
	11 <b>d</b> .	□Yes	□No	Are pools t	liled with s	seaimen	te (SKIP for Siz	e 4 Coast	ai Piain s	streams and Tidal Marsh Streams)

-		sessment reach metric (skip for Tidal Marsh Streams)
		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
12b. □`	Yes ⊠	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
		Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
		Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> ) Crustacean (isopod/amphipod/crayfish/shrimp)
		Damselfly and dragonfly larvae Dipterans Mayfly larvae (E)
		Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
		Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> ) Mussels/Clams (not <i>Corbicula</i> ) Other fish
		Salamanders/tadpoles Snails Stonefly larvae (P)
		Tipulid larvae Worms/leeches
Conside	r for the	Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
⊠a □B	⊠a □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
		Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
Conside LB	r for the RB	Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
∐A □B □C	∐A □B □C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
Conside wetted pe	<b>r for the</b> erimeter	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?
		outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.
□A □B □C □D	Ponds (i Obstruc	and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins) ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage)
□E ⊠F	Stream	ped or bank soil reduced (dig through deposited sediment if present) the above
Check al	ll that ap	
□в ⊠c	Obstruc Urban s	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) ream (≥ 24% impervious surface for watershed) that the streamside area has been modified resulting in accelerated drainage into the assessment reach
□E □F	Assessr	nent reach relocated to valley edge the above
		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
⊠A □B □C	Stream : Degrade	shading is appropriate for stream category (may include gaps associated with natural processes)  d (example: scattered trees)  shading is gone or largely absent
	12a. If N 12b. I	12a.   Yes     If No, select   12b.   Yes       1

	Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB  □A □A □ A ≥ 100 feet wide or extends to the edge of the watershed  □B □B □B □B □B From 50 to < 100 feet wide  □C □C □C □C □C From 30 to < 50 feet wide  □D □D □D □D □D From 10 to < 30 feet wide  □E □E □E □E □ < 10 feet wide or no trees
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  LB RB  A Mature forest  B Non-mature woody vegetation or modified vegetation structure  C C Herbaceous vegetation with or without a strip of trees < 10 feet wide  D D Maintained shrubs  E E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).
	LB RB  ⊠A ⊠A Medium to high stem density  □B □B Low stem density  □C □C No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         ☑A       ✓ Lower stratum composed of native species, with non-native invasive species absent or sparse.         □B       □B       ✓ Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  □Yes □No Was conductivity measurement recorded?  If No, select one of the following reasons. □No Water □Other: □  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  □A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230
	es/Sketch: vert and instream riprap creating flow restriction.

19. Buffer Width – streamside area metric (skip for Tidal Marsh Streams)

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

Stream Site Name	CLT Airport Expansion	Date of Assessment	May 2019	
Stream Category	Pa1	Assessor Name/Organization	KMT, BGB/F	IDR
Notes of Field Asses	ssment Form (Y/N)		YES	
Presence of regulator	ory considerations (Y/N)		NO	_
Additional stream inf	formation/supplementary measu	rements included (Y/N)	YES	=
NC SAM feature typ	e (perennial, intermittent, Tidal N	Marsh Stream)	Perennial	=
				-
			LIO A OF	NODWD

	USACE/	NCDWR
Function Class Rating Summary	All Streams	Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	MEDIUM	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	HIGH	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	MEDIUM	
(2) Baseflow	MEDIUM	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	MEDIUM	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	HIGH	
, ,	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation (2) Tidal Marsh In-stream Habitat		
	NA NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	MEDIUM	

### NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

	7100011	npariioo occi iiio	andar reference	
USACE AID #:			NCDWR #:	
INSTRUCTIONS: Attach a s	ketch of the assessment are	ea and photograp	hs. Attach a copy of the USGS	7.5-minute topographic quadrangle,
				on the same property, identify and
number all reaches on the att	ached map, and include a s	separate form for	each reach. See the NC SAM U	ser Manual for detailed descriptions
and explanations of requeste	d information. Record in th	ne "Notes/Sketch"	' section if supplementary meas	urements were performed. See the
NC SAM User Manual for exa				·
NOTE EVIDENCE OF STRE	SSORS AFFECTING THE	ASSESSMENT A	AREA (do not need to be within	n the assessment area).
PROJECT/SITE INFORMAT	-	_		
1. Project name (if any):	CLT Airport Expansion		Date of evaluation: April 20	
3. Applicant/owner name:	CLT		. Assessor name/organization:	KMT, BGB/HDR
5. County:	Mecklenburg	6	. Nearest named water body	
7. River basin:	Catawba		on USGS 7.5-minute quad:	Ticer Branch
8. Site coordinates (decimal of	=	· ·	35.236184, -80.963544	
STREAM INFORMATION: (c 9. Site number (show on attac			ength of assessment reach evalu	ated (feet): 250.0
11. Channel depth from bed (			_	Inable to assess channel depth.
12. Channel width at top of ba			sessment reach a swamp steam	<u>-</u>
14. Feature type: ⊠Perennia				
STREAM CATEGORY INFO				
15. NC SAM Zone:		□ Piedmont (P)	☐ Inner Coastal Plain (I)	Outer Coastal Plain (O)
				,
16. Estimated geomorphic			\	
valley shape ( <b>skip for</b>	$\boxtimes$ A		□В	
Tidal Marsh Stream):	(more sinuous stream,	flatter valley slop	e) (less sinuous st	ream, steeper valley slope)
17. Watershed size: (skip	Size 1 (< 0.1 mi²)	☐Size 2 (0.1 to	< 0.5 mi <sup>2</sup> ) Size 3 (0.5 to <	5 mi²)
for Tidal Marsh Stream)				
ADDITIONAL INFORMATIO	N:			
	ations evaluated? ⊠Yes [	☐No If Yes, che	ck all that apply to the assessme	ent area.
☐Section 10 water	☐Classified Trou			shed ( I II III IV V)
☐Essential Fish Habitat	<b>–</b> ,			s/Outstanding Resource Waters
□ Publicly owned propert		rian buffer rule in		
Anadromous fish	□303(d) List			onmental Concern (AEC)
I	of a federal and/or state lis	sted protected spe	ecies within the assessment area	a.
List species:	1. (c. ( // ) - (			
Designated Critical Ha		acuromonto inclu	dad in "Natas/Skatah" saction or	attached2 DVac MNo
19. Are additional stream inic	mation/supplementary mea	asurements inclu	ded in "Notes/Sketch" section or	attached?   Tes   MN0
1. Channel Water - assess	ment reach metric (skip fo	or Size 1 stream	s and Tidal Marsh Streams)	
	ut assessment reach.			
☐B No flow, water in	. ,			
☐C No water in asse	essment reach.			
2. Evidence of Flow Restri	ction – assessment reach	metric		
☐A At least 10% of	assessment reach in-stream	ım habitat or riffle	-pool sequence is severely affe	cted by a flow restriction or fill to the
				impoundment on flood or ebb within
	reach (examples: undersiz	zed or perched cu	llverts, causeways that constrict	the channel, tidal gates, debris jams,
beaver dams).				
⊠B Not A				
3. Feature Pattern – assess	sment reach metric			
	assessment reach has alte	ered pattern (exa	mples: straightening, modification	n above or below culvert).
⊠B Not A				
4. Feature Longitudinal Pro	ofile – assessment reach i	metric		
			eam profile (examples: channel	down-cutting, existing damming, over
				has not reformed from any of these
disturbances).			•	-
⊠B Not A				
5. Signs of Active Instabili	ty – assessment reach me	etric		
=			e stream has currently recove	ered. Examples of instability include
active bank failure, active				uch as concrete, gabion, rip-rap).
⊠A < 10% of channe				
☐B 10 to 25% of cha				
□C > 25% of channe	al unstable			

6.				raction – s						
			he Left	Bank (LB)	and the	Right Ba	nk (RB).			
	LB ⊠A □B	RB ⊠A ⊟B	Mod refe	derate evid erence inter	ence of coaction (ex	onditions amples:	limited streams	erms, levee ide area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	□c	□c	[exa of flo mos	amples: ca ood flows t	useways v hrough str ning]) <u>or</u> fl	with flood eamside	plain and chanr area] <u>or</u> too mu	nel constric ch floodpla	ction, bulk ain/intertic	eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse	ssment re	each/inte	rtidal zone me	tric		
		k all that								
	ΠA									er discoloration, oil sheen, stream foam)
	□B □C						n features or info			nd causing a water quality problem
	∐ŏ			luding natu			s critoring the c	0000011101	10 100011 <u>01</u>	duality problem
	□E			shed or co	ollected da	ata indica	ting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F	section Lives		h access to	stream o	r intertida	al zone			
	□G			gae in strea						
							I zone (remova in "Notes/Sket			nowing, destruction, etc)
	⊠j		to no str			(Oxpiairi	III TTOLOGIONOL	011 0001101	'/	
8.	Rece	nt Weath	er – wat	tershed m	etric (skij	p for Tida	al Marsh Strea	ms)		
										eams, D2 drought or higher is considered a drought.
	□A □B						II not exceeding I inch within the			st 48 hours
	⊠c			onditions					0 0.0	
9.	Large	e or Dang	gerous S	Stream – a	ssessme	nt reach	metric			
	□Ye	s 🖾 No	) Is st	tream is to	o large or	dangerou	us to assess? I	f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							ach metric	, of the o	22222	at reach (examples of etropoers include examples
	iua.	∐Yes	□No	sedimer	itation, mi	ining, exc	cavation, in-stream tal Plain stream	eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.	Check a  ☐A					e of assessmen quatic mosses			ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms
				e liverworts				Check for Tidal Marsh Streams Only	□F □G	Submerged aquatic vegetation
		⊠в			d/or leaf p	acks and	d/or emergent	k for T h Stre Only	□H H	Low-tide refugia (pools) Sand bottom
		⊠c	vegetat Multiple	anags an	d logs (inc	cluding lar	o trees)	arsh	□J	5% vertical bank along the marsh
		□D	5% unc	dercut banl	ks and/or	root mats	s and/or roots	ō≊	□κ	Little or no habitat
		□E		s extend to no habitat		ial wetted	l perimeter			
		_								
****	******	*******	******	**REMAIN	ING QUES	STIONS A	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	ite – asses	sment re	ach metr	ic (skip for Siz	ze 4 Coas	tal Plain :	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is assess	ment read	ch in a nat	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.			ed. Check			ox(es).			
		⊠A □B		un section ide section						
		□c					ric 12, Aquatio	: Life)		
	11c.	at least	one box	in each ro	ow (skip f	or Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
				ed 100% fo				n (1 1) - 2	10 1070, 1	Todominani (i ) = > 7078. Gamalativo porosinagos
		NP ⊠	R □	C	A	P □	Bedrock/sapr	olite		
			Ħ		Ħ		Boulder (256		m)	
							Cobble (64 –			
		H		H		H	Gravel (2 – 64 Sand (.062 –			
			፱		Ĭ		Silt/clay (< 0.0	,		
			H	$\vdash$	H		Detritus Artificial (rip-r	ap, concre	ete, etc.)	
	11d.	□Yes	□No	Are pools	ifilled with	_		-		streams and Tidal Marsh Streams)
							,			- /

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles Caddisfly larvae (T)
			Asian clam ( <i>Corbicula</i> )  Crustacean (isopod/amphipod/crayfish/shrimp)
	H		Damselfly and dragonfly larvae Dipterans Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> ) Mussels/Clams (not <i>Corbicula</i> ) Other fish
			Salamanders/tadpoles  Snails  Stonefly larvae (P)
			Tipulid larvae  Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	⊠a □B	⊠a □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	□C	С	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.		r for the RB	Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B □C	□A □B □C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	te – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	□Y ⊠N	∐Y ⊠N	Are wetlands present in the streamside area?
16.	Check a ☐A	II contrib Streams	butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) butors within the assessment reach. and/or springs (jurisdictional discharges)
	□B □C □D □E □F	Obstruc Evidenc Stream	nclude wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) te of bank seepage or sweating (iron in water indicates seepage) toed or bank soil reduced (dig through deposited sediment if present) the above
17.		w Detrac	tors – assessment area metric (skip for Tidal Marsh Streams)
	□A □B □C □D	Evidenc Obstruc Urban s	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed) that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E □F	Assessr	the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠A □B □C	Stream : Degrade	shading is appropriate for stream category (may include gaps associated with natural processes)  d (example: scattered trees)  shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB $A A A A A A A A A A A A A A A A A A A$
20.	□E □E □E < 10 feet wide or no trees  Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  □B □E □E < 10 feet wide or no trees  LB □E < 10 feet wide or no trees
	⊠A       Mature forest         □B       □B       Non-mature woody vegetation or modified vegetation structure         □C       □C       Herbaceous vegetation with or without a strip of trees < 10 feet wide         □D       □D       Maintained shrubs         □E       □E       Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	□C □C □C □C □C Pasture (no livestock)/commercial horticulture □D □D □D □D □D Pasture (active livestock use)  Stem Density – streamside area metric (skip for Tidal Marsh Streams)
	Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density  B DB Low stem density  C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         ☑A       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       B       Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  ☐ Yes ☐ No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐ No Water ☐ Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).
Note	□A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230 ′ es/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019	
Stream Category	Pa1	Assessor Name/Organization	KMT, BGB/HDR	
Notes of Field Asses	sment Form (Y/N)		NO	
Presence of regulator	ory considerations (Y/N)		NO	
Additional stream inf	ormation/supplementary measu	urements included (Y/N)	NO	
NC SAM feature type	e (perennial, intermittent, Tidal	Marsh Stream)	Perennial	

Aporoninal, intornittorit, Tradi Maron Ctrodiny	1 OTOTINA	<u>.                                    </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	memment
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access		
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	HIGH	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	MEDIUM	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat		
	NA NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Stream Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	HIGH	

### NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

	7,0001	inpained door inc	inda voroion zir	
USACE AID #:			NCDWR #:	
INSTRUCTIONS: Attach a s	ketch of the assessment ar	rea and photograp	hs. Attach a copy of the USGS	7.5-minute topographic quadrangle,
and circle the location of the	stream reach under evalua	ation. If multiple s	tream reaches will be evaluated	on the same property, identify and
number all reaches on the att	ached map, and include a	separate form for	each reach. See the NC SAM U	ser Manual for detailed descriptions
				urements were performed. See the
NC SAM User Manual for exa				
NOTE EVIDENCE OF STRE	SSORS AFFECTING THE	ASSESSMENT A	AREA (do not need to be within	n the assessment area).
PROJECT/SITE INFORMAT	ION:			
1. Project name (if any):	CLT Airport Expansion		. Date of evaluation: April 20	
3. Applicant/owner name:	CLT		. Assessor name/organization:	KMT, BGB/HDR
5. County:	Mecklenburg	6	. Nearest named water body	
7. River basin:	Catawba		on USGS 7.5-minute quad:	Ticer Branch
8. Site coordinates (decimal of	=	•	35.237388; -80.964356	
STREAM INFORMATION: (d				
9. Site number (show on atta			ngth of assessment reach evalu	
11. Channel depth from bed				Inable to assess channel depth.
12. Channel width at top of b			sessment reach a swamp steam	I? ∐Yes ∐No
14. Feature type: ⊠Perenni		☐ Huai Marsh St	ieaili	
15. NC SAM Zone:		□ Piedmont (P)	☐ Inner Coastal Plain (I)	☐ Outer Coastal Plain (O)
13. NO SAWI ZUITE.	☐ IVIOUITAIIIS (IVI)	M FIGUITION (P)	☐ IIIIIei Coastai Fiaiii (I)	United Coastal Fidili (O)
	,	,		
16. Estimated geomorphic	$\boxtimes A$		□в	
valley shape (skip for Tidal Marsh Stream):	(more sinuous stream,	flatter valley slon	(less sinuous st	ream, steeper valley slope)
, i	Size 1 (< 0.1 mi²)		,	
17. Watershed size: (skip for Tidal Marsh Stream)		□3ize 2 (0.1 to	$< 0.5 \text{ mi}^2$ ) Size 3 (0.5 to <	5 mi²)
ADDITIONAL INFORMATIO				
		□No If Yes che	ck all that apply to the assessme	ent area
Section 10 water	Classified Tro			shed ( I I II III IV V)
☐Essential Fish Habitat	<del></del>			s/Outstanding Resource Waters
Publicly owned proper		arian buffer rule in		<u> </u>
☐Anadromous fish	☐303(d) List		☐CAMA Area of Envir	onmental Concern (AEC)
☐Documented presence	of a federal and/or state lis	sted protected spe	ecies within the assessment area	а.
List species:				
☐Designated Critical Ha				
19. Are additional stream info	rmation/supplementary me	easurements inclu	ded in "Notes/Sketch" section or	attached? ∐Yes ⊠No
1 Channel Water cooper	mont rooch motric (akin (	for Cizo 1 otroom	a and Tidal March Streams)	
	ut assessment reach.	ioi Size i Stream	s and Tidal Marsh Streams)	
☐B No flow, water in				
☐C No water in asse	, ,			
	ction – assessment reach	h matria		
			-nool seguence is severely affe	cted by a flow restriction or fill to the
				impoundment on flood or ebb within
				the channel, tidal gates, debris jams,
beaver dams).	, .	•	•	
⊠B Not A				
3. Feature Pattern – asses	sment reach metric			
☐A A majority of the	assessment reach has alt	tered pattern (exar	mples: straightening, modificatio	n above or below culvert).
⊠B Not A				,
4. Feature Longitudinal Pr	ofile – assessment reach	metric		
			eam profile (examples: channel	down-cutting, existing damming, over
				has not reformed from any of these
disturbances).	55 - 7 - 2 - 3 - 1 - 3 - 3 - 3		, , ,	
⊠B Not A				
5. Signs of Active Instabili	ty – assessment reach m	netric		
_	=		e stream has currently recove	ered. Examples of instability include
				uch as concrete, gabion, rip-rap).
⊠A < 10% of chann	el unstable	÷ *	-	
☐B 10 to 25% of ch				
□C > 25% of chann	el unstable			

6.					streamsic					
			the Left	Bank (LB	) and the	Right Ba	nk (RB).			
	LB ⊠A □B	RB ⊠A □B	Mod refe or in	derate evi erence inte ntermitten	dence of ceraction (ex t bulkhead	conditions xamples: ls, causev	limited streams vays with floodp	rms, levee ide area a lain const	es, down- ccess, dis riction, mi	cutting, aggradation, dredging) that adversely affect truption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	□c	□c	[exa of flo mos	amples: canonical canonica	auseways through st :hing]) <u>or</u> f	with flood reamside	plain and chanr area] <u>or</u> too mu	nel constric ch floodpla	ction, bulk ain/intertic	eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	ertidal zone me	tric		
		k all that								
										er discoloration, oil sheen, stream foam)
	□B □C						n features or int s entering the a			nd causing a water quality problem
	$\Box$ D	Odor	(not incl	luding nat	ural sulfide	e odors)	_			
	□E	Curre section		shed or c	ollected d	ata indica	ting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F			n access t	o stream o	or intertida	al zone			
	□G				am or inte			به منصب ا		touring doctruction ato)
							in "Notes/Sket			nowing, destruction, etc)
	⊠J		to no str			_ (-			,	
8.					•	•	al Marsh Strea	•		
	For S ☐A									eams, D2 drought or higher is considered a drought.
	⊟B						II not exceeding 1 inch within the			ist 46 flours
	⊠c			onditions	-"	J				
9.	<b>Large</b> □Ye		-		assessme oo large or			f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							ach metric			
	10a.	∐Yes	□No	sedime	ntation, m	ining, exc	at over majority cavation, in-stre tal Plain strean	eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.									ize 4 Coastal Plain streams)
		□A			s, lichens,		quatic mosses   mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠в			nd/or leaf	packs and	d/or emergent	k for T h Stre Only	∏H.	Low-tide refugia (pools) Sand bottom
		□с	vegetat Multiple		nd logs (in	cluding la	p trees)	heck arsh	□J	5% vertical bank along the marsh
		□D	5% und	dercut bar	nks and/or	root mats	s and/or roots	טֿ≥	□K	Little or no habitat
		□E		s extend t no habita		nai wetted	l perimeter			
****	******	*******	******	**REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	te – asse	ssment re	each meti	ric (skip for Siz	ze 4 Coas	tal Plain	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is asses	sment read	ch in a na	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.				k the app		oox(es).			
		⊠A □B			<b>(evaluate</b> ∩ (evaluat					
		□c					ric 12, Aquatio	: Life)		
	11c.	at least	one box	in each r	ow (skip	for Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams).</b> Not Present (NP) = absent, Rare
					or each as			II (A) = >	40-70%, r	Predominant (P) = > 70%. Cumulative percentages
		NP	R □	C	A	P	De dreek/eeer	مانده		
			百	H	H		Bedrock/sapre Boulder (256		m)	
			$\boxtimes$				Cobble (64 –	256 mm)	,	
		님	H		H	님	Gravel (2 – 64 Sand (.062 –			
						Ĭ	Silt/clay (< 0.0	,		
			$\exists$	H	H	$\Box$	Detritus Artificial (rip-ra	ap, concre	ete, etc )	
	11d.	□Yes	□No	Are pool	 s filled witl			•		streams and Tidal Marsh Streams)
							,			-,

12.	•		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> ) Crustacean (isopod/amphipod/crayfish/shrimp)
			Dipterans
			Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )  Mussels/Clams (not <i>Corbicula</i> )
			Other fish  Salamanders/tadpoles  Snails
			Stonefly larvae (P) Tipulid larvae
13.		ide Area	Worms/leeches  Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)
	LB A	r for the RB ⊠A	Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.  Little or no alteration to water storage capacity over a majority of the streamside area
	□B □C	□B □C	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B □C	□A □B □C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the erimeter	e – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?
16.		II contrib	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) outors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)
	□B □C □D ⊠E □F	Obstruc Evidenc Stream	nclude wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) te of bank seepage or sweating (iron in water indicates seepage) toed or bank soil reduced (dig through deposited sediment if present) the above
17.			tors – assessment area metric (skip for Tidal Marsh Streams) ply.
	□A □B □C □D	Obstructure Urban s	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (> 24% impervious surface for watershed) to the assessment reach as been modified resulting in accelerated drainage into the assessment reach
	□E □F	Assessr	the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠A □B □C	Stream : Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) d (example: scattered trees) shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB $A A A A A A A A A A A A A A A A A A A$
20.	□E □E □E < 10 feet wide or no trees  Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  □B □E □E < 10 feet wide or no trees  LB □E < 10 feet wide or no trees
	⊠A       Mature forest         □B       □B       Non-mature woody vegetation or modified vegetation structure         □C       □C       Herbaceous vegetation with or without a strip of trees < 10 feet wide         □D       □D       Maintained shrubs         □E       □E       Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	□C □C □C □C □C Pasture (no livestock)/commercial horticulture □D □D □D □D □D Pasture (active livestock use)  Stem Density – streamside area metric (skip for Tidal Marsh Streams)
	Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density  B DB Low stem density  C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         ☑A       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       B       Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  ☐ Yes ☐ No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐ No Water ☐ Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).
Note	□A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230 ′ es/Sketch:

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019	
Stream Category	Pa1	Assessor Name/Organization	KMT, BGB/HDR	
Notes of Field Asses	sment Form (Y/N)		NO	
Presence of regulator	ory considerations (Y/N)		NO	
Additional stream inf	ormation/supplementary measu	urements included (Y/N)	NO	
NC SAM feature type	e (perennial, intermittent, Tidal	Marsh Stream)	Perennial	

, , , , , , , , , , , , , , , , , , , ,	-	<del></del>
	USACE/	NCDWR
Function Class Rating Summary	All Streams	Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	HIGH	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	HIGH	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	MEDIUM	
(2) Intertidal Zone Filtration	NA NA	
(1) Habitat	HIGH	
• •	HIGH	
(2) In-stream Habitat	HIGH	
(3) Substate		
(3) Substrate	HIGH	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	HIGH	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	HIGH	

## NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

USACE AID #:		NCDWR #:				
INSTRUCTIONS: Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,						
	cation of the stream reach under evaluation. If mul	•	, , , , ,			
	es on the attached map, and include a separate for					
	s of requested information. Record in the "Notes/S		urements were performed. See the			
	anual for examples of additional measurements that					
NOTE EVIDENC	E OF STRESSORS AFFECTING THE ASSESSM	ENT AREA (do not need to be withir	the assessment area).			
PROJECT/SITE	INFORMATION:					
1. Project name (	(if any): CLT Airport Expansion	2. Date of evaluation: April 20				
3. Applicant/own	er name: CLT	4. Assessor name/organization:	Benjamin Burdette/HDR			
5. County:	Mecklenburg	6. Nearest named water body				
7. River basin:	Catawba	on USGS 7.5-minute quad:	Ticer Branch			
<ol><li>Site coordinate</li></ol>	es (decimal degrees, at lower end of assessment re	each): 35.236870, -80.967351				
	RMATION: (depth and width can be approximation					
		10. Length of assessment reach evalue				
	th from bed (in riffle, if present) to top of bank (feet)		nable to assess channel depth.			
	· · · · · · · · · · · · · · · · · · ·	. Is assessment reach a swamp steam	? ∐Yes ∐No			
	: ⊠Perennial flow □Intermittent flow □Tidal Ma	rsh Stream				
_	GORY INFORMATION:	<u>_</u>	_			
15. NC SAM Zon	ne:	nt (P)	☐ Outer Coastal Plain (O)			
I		<b>\</b>	,			
16. Estimated ge	eomorphic 5.					
valley shape	(skip for					
Tidal Marsh	<b>Stream</b> ): (more sinuous stream, flatter valle	ey slope) (less sinuous str	ream, steeper valley slope)			
17. Watershed si	ize: <b>(skip</b> ☐ Size 1 (< 0.1 mi²) ☐ Size 2 (	0.1 to < 0.5 mi <sup>2</sup> ) $\square$ Size 3 (0.5 to <	5 mi <sup>2</sup> )			
for Tidal Mai	rsh Stream)	·				
<b>ADDITIONAL IN</b>	FORMATION:					
18. Were regulate	ory considerations evaluated? ⊠Yes □No If Yes	s, check all that apply to the assessme	ent area.			
☐Section 10	<b>_</b> -	☐Water Supply Water	shed (□I □II □III □IV □V)			
☐Essential F	_ , ,		s/Outstanding Resource Waters			
-	wned property					
☐Anadromo	<b>—</b>		onmental Concern (AEC)			
	ed presence of a federal and/or state listed protect	ed species within the assessment area	A.			
List specie						
	d Critical Habitat (list species)		,, , , , , , , , , , , , , , , , , , ,			
19. Are additiona	al stream information/supplementary measurements	s included in "Notes/Sketch" section or	attached? ∐Yes ⊠No			
1. Channel Wat	ter – assessment reach metric (skip for Size 1 s	troams and Tidal March Stroams)				
	ter throughout assessment reach.	treams and maism streams,				
	flow, water in pools only.					
	water in assessment reach.					
	Flour Postuistion - secondary work works					
	Flow Restriction – assessment reach metric	er riffle need enguence is enverally offer	ated by a flaw rootriction or fill to the			
	east 10% of assessment reach in-stream habitat o nt of obstructing flow <u>or</u> a channel choked with aqu					
	assessment reach (examples: undersized or perch					
	ver dams).	,,	<b>-</b> , <b>-</b> ,,			
⊠B Not						
3. Feature Patte	orn – accoccment reach metric					
	ern – assessment reach metric najority of the assessment reach has altered pattern	(evamples: straightening modification	a above or below culvert)			
⊠B Not		r (examples: straightening, modification	Tabove of below curverty.			
	gitudinal Profile – assessment reach metric					
	ority of assessment reach has a substantially altere					
	ening, active aggradation, dredging, and excavation	on where appropriate channel profile	nas not reformed from any of these			
disti ⊠B Not	urbances). Δ					
_	ive Instability – assessment reach metric					
	Consider only current instability, not past events from which the stream has currently recovered. Examples of instability include					
	ailure, active channel down-cutting (head-cut), activ	ve widening, and artificial hardening (su	uch as concrete, gabion, rip-rap).			
=	0% of channel unstable to 25% of channel unstable					
_	o 25% of channel unstable 5% of channel unstable					
	,, or oriented anotable					

<ol><li>Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB).</li></ol>										
	LB	RB	e Leil Däl	ik (LD) allu ine	Nigiit Ba	шк ( <b>КБ</b> ).				
<ul> <li>☑A</li> <li>☑B</li> <li></li></ul>						area, leaky				
	□c	□c	Extensi [examp of flood mosqui	ve evidence of o les: causeways flows through st	conditions with flood reamside	s that adversely dplain and chanr area] <u>or</u> too mu	affect refe nel constric ch floodpla	rence inte ction, bulk ain/intertion	eraction (little to no floodplain/intertidal zo heads, retaining walls, fill, stream incision, lal zone access [examples: impoundments or assessment reach is a man-made feat	ne access disruption , intensive
7.	Wate	er Quality S	Stressors -	- assessment r	each/inte	ertidal zone me	tric			
	Check all that apply.  ☐ A Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)  ☐ B Excessive sedimentation (burying of stream features or intertidal zone)  ☐ Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem									
	D D D D D	Odor (	not includii nt publishe	ng natural sulfide	e odors)	_			assessment reach. Cite source in "Note	es/Sketch"
	□F □G □H	Livesto Excess	ock with ac sive algae	cess to stream or inte vegetation in the	rtidal zon e intertida	ie al zone (removal			owing, destruction, etc)	
	∐I ∐I		o no stress	ors	_ (explain	n in "Notes/Sketo	ch" section	1)		
8.		Recent Weather – watershed metric (skip for Tidal Marsh Streams)  For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.  Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours  Drought conditions and rainfall exceeding 1 inch within the last 48 hours								
9.	<b>Larg</b> □Ye			<b>am – assessme</b> m is too large or			f Yes, skip	to Metric	13 (Streamside Area Ground Surface Co	ndition).
10. Natural In-stream Habitat Types – assessment reach metric  10a. Yes No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include exce sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snag (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)					excessive snagging)					
	10b.	□A	Multiple aq (include liv Multiple sti	<b>r</b> (occurs if > 5% uatic macrophyt erworts, lichens, cks and/or leaf	es and ac and alga	quatic mosses Il mats)	Check for Tidal as Marsh Streams (4)	□F □G □H	ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools)	3
			5% underc	ags and logs (in ut banks and/or ctend to the norn habitat	root mat	s and/or roots	Check Marsh	□I □K	Sand bottom 5% vertical bank along the marsh Little or no habitat	
****	*****	******	**************************************	EMAINING QUE	STIONS .	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS***************	*****
11.	Bedf	orm and S	ubstrate -	assessment re	each met	ric (skip for Siz	ze 4 Coas	tal Plain s	streams and Tidal Marsh Streams)	
	11a.	□Yes [	⊠No Is	assessment rea	ch in a na	itural sand-bed	stream? (s	kip for C	oastal Plain streams)	
	11b.	⊠A F □B F	Riffle-run s Pool-glide :	Check the applection (evaluate section (evaluate strong form absent (see	e 11c) e 11d)		: Life)			
	<b>11c.</b>	In riffle sec at least or (R) = pres should not NP	ctions, che ne box in d sent but <u>&lt;</u>	ck all that occur each row (skip 10%, Common ( 00% for each as A D D D D D D D D D D D D D D D D D D	below the for Size 4 C) = > 10	e normal wetted 4 Coastal Plain 0-40%, Abundar t reach. Bedrock/sapri Boulder (256 Cobble (64 – Gravel (2 – 64 Sand (.062 – Silt/clay (< 0.06 Detritus	perimeter streams and (A) = > 100 olite - 4096 mm 256 mm) 4 mm) 2 mm) 2062 mm)	<b>and Tidal</b> 40-70%, F n)	essment reach – whether or not submerge <b>Marsh Streams)</b> . Not Present (NP) = absect of the predominant (P) = > 70%. Cumulative pe	sent, Rare
	11d.		⊔ ∟ □No Are	_	ப n sedimer	Artificial (rip-rant? ( <b>skip for Siz</b>	-	· ·	streams and Tidal Marsh Streams)	

12.	-		ssessment reach metric (skip for Tidal Marsh Streams)	
	12a. ⊠` If N		No Was an in-stream aquatic life assessment performed as described in the User Manual?  t one of the following reasons and skip to Metric 13. □No Water □Other:	
	12b. ⊠`	Yes [	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all t apply. If No, skip to Metric 13.	hat
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. ]Adult frogs ]Aquatic reptiles	
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles	
	片	Þ	Caddisfly larvae (T)	
			]Asian clam ( <i>Corbicula</i> ) ]Crustacean (isopod/amphipod/crayfish/shrimp)	
	R		]Damselfly and dragonfly larvae ]Dipterans	
	Ë		Midges/mosquito larvae	
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea)</i> Mussels/Clams (not <i>Corbicula</i> )	
			]Other fish ]Salamanders/tadpoles	
	R	_	]Snails ]Stonefly larvae (P)	
	Ē		Tipulid larvae  Worms/leeches	
13.	Streams Conside	ide Area r for the	a Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland run	off.
	LB ⊠A	RB ⊠A	Little or no alteration to water storage capacity over a majority of the streamside area	
	□B □C	∐B □C	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compacti livestock disturbance, buildings, man-made levees, drainage pipes)	on,
14.			a Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.	
	□A ⊠B □C	□a ⊠b □C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep	
15. Wetland Presence – streamside area metric (skip for Tidal Marsh Streams) Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area wetted perimeter of assessment reach.			Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the nor	nal
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?	
16.	_		butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)	
	Check al		butors within the assessment reach or within view of <u>and</u> draining to the assessment reach. s and/or springs (jurisdictional discharges)	
	□B □C □D	Ponds ( Obstruc	(include wet detention basins; do not include sediment basins or dry detention basins) ction passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, we be of bank seepage or sweating (iron in water indicates seepage)	ir)
	⊠E □F	Stream	bed or bank soil reduced (dig through deposited sediment if present) f the above	
17.	Baseflow Check al		ctors – assessment area metric (skip for Tidal Marsh Streams)	
	□A □B □C	Evidend Obstruc	ce of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ction not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) stream (≥ 24% impervious surface for watershed)	
	□D □E	Evidend Assessi	be that the streamside area has been modified resulting in accelerated drainage into the assessment reach ment reach relocated to valley edge	
18.	⊠F Shading		f the above ssment reach metric (skip for Tidal Marsh Streams)	
	Consider ⊠A		Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)	
	□B □C	Degrad	ed (example: scattered trees) shading is gone or largely absent	

19.	<ol> <li>Buffer Width – streamside area metric (skip for Tidal Marsh Streams)</li> <li>Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.</li> </ol>					
	Vegetated       Wooded         LB       RB       LB       RB         □A       □A<					
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).					
	LB RB  □ A Mature forest □ B Non-mature woody vegetation or modified vegetation structure □ C □ C Herbaceous vegetation with or without a strip of trees < 10 feet wide □ D □ D Maintained shrubs □ E Little or no vegetation					
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A					
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density B B Low stem density C C No wooded riparian buffer or predominantly herbaceous species or bare ground					
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.					
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes assessment reach habitat.					
	LB RB  □A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species with non-native invasive species absent or sparse.  □B □B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing in the communities.					
	communities with non-native invasive species present, but not dominant, over a large portion of the expected strata communities missing understory but retaining canopy trees.  UC UC Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of plants stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.					
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a. ☐Yes ☑No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐No Water ☐Other:					
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  ☐A < 46 ☐B 46 to < 67 ☐C 67 to < 79 ☐D 79 to < 230 ☐E ≥ 230					
	s/Sketch: e amounts of privet in streamside area					

## Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019			
Stream Category	Pa2	Assessor Name/Organization	Benjamin Burdette/HDR			
Notes of Field Asses	YES					
Presence of regulator	ory considerations (Y/N)		NO			
Additional stream information/supplementary measurements included (Y/N) NO						
NC SAM feature typ	C SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial					

(perennial, intermittent, ridal Marsh Stream)	Ferennia	<u>'</u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	MEDIUM	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
• •	MEDIUM	
(4) Steam Commercial (4) Steam Commercial (4)		
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA NA	
(2) Longitudinal Tidal Flow	NA NA	
(2) Tidal Marsh Stream Stability	NA NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	HIGH	
(2) In-stream Habitat	MEDIUM	
(3) Baseflow	HIGH	
(3) Substrate	MEDIUM	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	HIGH	

### NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

		Acc	ompanies oser m	allual Version 2.1	1
USACE A				NCDWR #:	
					7.5-minute topographic quadrangle,
					d on the same property, identify and
					Iser Manual for detailed descriptions
					urements were performed. See the
		amples of additional meas		•	
NOTEEV	IDENCE OF STREE	SSORS AFFECTING TH	E ASSESSMENT	AREA (do not need to be withi	n the assessment area).
	T/SITE INFORMATI	-			
-	name (if any):	CLT Airport Expansion		2. Date of evaluation: April 20	
	ant/owner name:	CLT		Assessor name/organization:	KMT,BGB/HDR
5. County		Mecklenburg		6. Nearest named water body	
7. River b		Catawba		on USGS 7.5-minute quad:	Ticer Branch
	•	legrees, at lower end of a	•	35.228427, -80.957136	
		lepth and width can be		anoth of accomment reach evalu	reted (feet). 404!
	mber (show on attached don't	in riffle, if present) to top		ength of assessment reach evalu 1 □ □	Jnable to assess channel depth.
	nel width at top of ba		· · · · · · -	ssessment reach a swamp stean	·
		al flow ☐Intermittent flow			i: Lies Lino
	CATEGORY INFO			a odini	
_	AM Zone:	☐ Mountains (M)	□ Piedmont (P)	☐ Inner Coastal Plain (I)	☐ Outer Coastal Plain (O)
10.110.0	tivi Zono.	mountaine (m)	<u> </u>	_ miler codetair idiir (i)	Gater Seastar Flam (S)
16 Fatima	atad gaagagabia	1	,		
	ated geomorphic shape ( <b>skip for</b>	$\Box$ A $\frown$	$\sqrt{}$	⊠B	
	Marsh Stream):	(more sinuous strear	m, flatter valley slo	pe) (less sinuous st	ream, steeper valley slope)
17. Water	rshed size: (skip	Size 1 (< 0.1 mi²)	-		
	dal Marsh Stream)	<b>L</b> ( ' ' '	_ (-	,	,,
ADDITIO	NAL INFORMATIO	N:			
		ations evaluated?  ☐Yes	s ∐No If Yes, che	eck all that apply to the assessm	
	ction 10 water	☐Classified T		• • •	rshed ( I II III IIV IV)
_	sential Fish Habitat	□Primary Nur	•		s/Outstanding Resource Waters
	blicly owned propert adromous fish		parian buffer rule ir		
		☐303(d) List	listed protected sp	ecies within the assessment are	ronmental Concern (AEC)
	t species:	or a reactar aria/or state	iistea protectea sp	coles within the assessment are	a.
	signated Critical Hal	bitat (list species)			
			neasurements inclu	uded in "Notes/Sketch" section o	r attached?
		· · ·			
			o for Size 1 stream	ns and Tidal Marsh Streams)	
		ut assessment reach.			
∐B □C	No flow, water in No water in asse				
_					
		ction – assessment rea			
□A					cted by a flow restriction or fill to the impoundment on flood or ebb within
					the channel, tidal gates, debris jams,
	beaver dams).	rodon (oxampioon dindon	5.254 5. po. 5.154 5.		and ontaining, and garder, according,
⊠B	Not A				
3. Featu	re Pattern – assess	sment reach metric			
□A	A majority of the	assessment reach has a	altered pattern (exa	mples: straightening, modificatio	n above or below culvert).
⊠в	Not A		, ,		,
4. Featu	re Longitudinal Pre	ofile – assessment reac	h metric		
	_			eam profile (examples: channel	down-cutting, existing damming, over
					has not reformed from any of these
	disturbances).			•	•
⊠B	Not A				
5. Signs	of Active Instabilit	ty – assessment reach	metric		
				ne stream has currently recove	ered. Examples of instability include
active	bank failure, active	channel down-cutting (he			uch as concrete, gabion, rip-rap).
⊠A	< 10% of channe				
□B □C	10 to 25% of channel				
	- 20 /0 OI CHAIIIR	או שוטנטטוכ			

6.					streamsid					
	LB	RB	ne Len	Bank (LB	3) and the	Right Ba	nk (RB).			
	⊠a □B	⊠A □B	Mo refe	derate eviderence inte	dence of c eraction (ex	onditions camples:	limited streams	rms, levee ide area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	С	□c	Ext [exa of fl mos	ensive evi amples: ca lood flows	dence of causeways through streaming]) or fl	conditions with flood reamside	that adversely lplain and chanr area] <u>or</u> too mu	affect refe nel constric ch floodpla	erence inte ction, bulk ain/intertion	peraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stress	ors – asse	essment r	each/inte	ertidal zone me	tric		
	Chec	k all that	apply.							
	∐A ∏B						ne (milky white, m features or int			er discoloration, oil sheen, stream foam)
	۵c									nd causing a water quality problem
		Odor	(not inc	luding nat	ural sulfide	e odors)	_			
	ШΕ	section		isned or c	ollected da	ata indica	iting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F				o stream c					
	□G □H				eam or inte			burning	regular m	nowing, destruction, etc)
		Othe	r:				in "Notes/Sket		-	g, 2001.2010, 210/
	⊠J		to no st							
8.					•	-	al Marsh Strea sidered a drough	•	3 or 4 str	eams, D2 drought or higher is considered a drought.
	$\square A$	Drou	ght cond	ditions <u>and</u>	l no rainfal	l or rainfa	II not exceeding	1 inch wi	thin the la	
	□B ⊠C			ditions <u>and</u> conditions	rainfall ex	ceeding '	1 inch within the	last 48 ho	ours	
9.			•		assessme	nt reach	metric			
	∐Ye	s ⊠No	ls s	stream is to	oo large or	dangerou	us to assess? I	f Yes, skip	to Metric	13 (Streamside Area Ground Surface Condition).
10.		ral In-stre □Yes	<b>eam Ha</b> l ⊠No				each metric	of the a	ccoccmor	nt reach (examples of stressors include excessive
	10a.	Птеѕ		sedime	ntation, m	ining, exc	cavation, in-stre tal Plain strean	eam harde	ning [for	example, rip-rap], recent dredging, and snagging)
	10b.									ize 4 Coastal Plain streams)
		□A			macrophytes, lichens,		quatic mosses I mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠B			nd/or leaf p	oacks and	d/or emergent	k for T h Strei Only	□H.	Low-tide refugia (pools) Sand bottom
		⊠c	vegeta Multiple		nd logs (ind	cluding la	p trees)	heck arsh C	□J	5% vertical bank along the marsh
		□D	5% un	dercut bar	nks and/or	root mats	s and/or roots	ΰ≌	□κ	Little or no habitat
		□E		r no habita		nai wetted	l perimeter			
****	******	*******	******	**REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	ate – asse	ssment re	each met	ric (skip for Siz	ze 4 Coas	tal Plain s	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is assess	sment read	ch in a na	tural sand-bed	stream? (s	kip for C	oastal Plain streams)
	11b.	Bedform ⊠A			k the appr (evaluate		oox(es).			
		□B			n <b>(evaluate</b> n <b>(evaluat</b> e					
		□с	Natura	l bedform	absent <b>(sk</b>	ip to Met	tric 12, Aquatic	: Life)		
	11c.	at least	one box	c in each r	row (skip f	for Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should n	ot excee	ed 100% fo	or each as	sessment		• /	•	
		NP ⊠	R □	C □	A	P	Bedrock/sapro	olite		
							Boulder (256		n)	
		H	$\square$		H	H	Cobble (64 – 64 Gravel (2 – 64			
							Sand (.062 -	2 mm)		
		$\exists$		⊠ □	片	H	Silt/clay (< 0.0 Detritus	ენ2 mm)		
			$\boxtimes$				Artificial (rip-ra	ap, concre	ete, etc.)	
	11d.	∐Yes	□No	Are pools	s filled with	n sedimer	nt? ( <b>skip for Si</b> z	e 4 Coast	tal Plain s	streams and Tidal Marsh Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠` If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. ⊠`	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1   X		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> )
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
	片		Dipterans Mayfly larvae (E)
	Ä	$\boxtimes$	Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> ) Mussels/Clams (not <i>Corbicula</i> ) Other fish
	Ä		Salamanders/tadpoles Snails
	Ä		Stonefly larvae (P) Tipulid larvae
10			Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	⊠A □B	⊠a □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	□с	□c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□a □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted pe	r for the erimeter	ee – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?
16.	Baseflov	v Contril	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check al □A □B	Streams	outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.  and/or springs (jurisdictional discharges)  nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C □D ⊠E	Obstruc Evidenc Stream	tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present)
17.	□F Baseflov		the above tors – assessment area metric (skip for Tidal Marsh Streams)
	Check al	Evidenc Obstruc	ply. e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	□D □E ⊠F	Evidenc Assessr	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge the above
18.			sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠A □B □C	Stream Degrade	shading is appropriate for stream category (may include gaps associated with natural processes)  d (example: scattered trees)  shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded
	LB RB LB RB
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).
	LB RB  □ A Mature forest □ B □ B Non-mature woody vegetation or modified vegetation structure □ C □ C Herbaceous vegetation with or without a strip of trees < 10 feet wide □ D □ D Maintained shrubs □ E □ E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet
	LB RB LB RB LB RB  A A A A A A A A A A Row crops B B B B B B B Maintained turf C C C C C C C Pasture (no livestock)/commercial horticulture D D D D D D D Pasture (active livestock use)
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).
	LB RB  ⊠A
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  □A □A The total length of buffer breaks is < 25 percent.
	<ul> <li>□B □B The total length of buffer breaks is between 25 and 50 percent.</li> <li>□C □C The total length of buffer breaks is &gt; 50 percent.</li> </ul>
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.  LB RB
	☑A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.
	□B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.
	UC Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). $\Box A < 46$ $\Box B = 46$ to < 67 $\Box C = 67$ to < 79 $\Box D = 79$ to < 230 $\Box E = 230$
Note	es/Sketch:

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019			
Stream Category	Pb1	Assessor Name/Organization	on KMT,BGB/HDR			
Notes of Field Asses		NO				
Presence of regulator		NO				
Additional stream information/supplementary measurements included (Y/N) NO						
NC SAM feature type	IC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial					

	USACE/	NCDWR
Function Class Rating Summary	All Streams	Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	NA	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	MEDIUM	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA NA	
	HIGH	
(1) Habitat		
(2) In-stream Habitat	MEDIUM	
(3) Baseflow	HIGH	
(3) Substrate	MEDIUM	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	HIGH	

		ACC	ompanies Oser i	vialiuai veisioli 2. i	
US	SACE AID #:			NCDWR #:	
					7.5-minute topographic quadrangle,
			•		d on the same property, identify and
					Iser Manual for detailed descriptions
					urements were performed. See the
	SAM User Manual for exam				
NO	TE EVIDENCE OF STRESS	SORS AFFECTING TH	E ASSESSMENT	AREA (do not need to be withi	n the assessment area).
	OJECT/SITE INFORMATIO				
		CLT Airport Expansion		2. Date of evaluation: April 20	
	· ·	CLT		4. Assessor name/organization:	KMT,BGB/HDR
		Mecklenburg		6. Nearest named water body	<del>-</del>
	_	Catawba		on USGS 7.5-minute quad:	Ticer Branch
	Site coordinates (decimal de	<u>-</u>		·	
	REAM INFORMATION: (dep				usted (foot): 126 El
	Site number (show on attach			Length of assessment reach evalu 1 □ □	` '
	Channel depth from bed (in Channel width at top of ban			assessment reach a swamp stean	Jnable to assess channel depth.
	Feature type:     Perennial				I! Lifes Lino
	REAM CATEGORY INFORM		v 🔲 Hual Iviai SII	Oueam	
	NC SAM Zone:	☐ Mountains (M)	□ Piedmont (F	P) Inner Coastal Plain (I)	Outer Coastal Plain (O)
13.	NO SAM ZONE.	☐ Modritains (M)	⊠ i ledinoni (i	) Inner Coastai Fiam (i)	United Coastai Flaiif (C)
		,		,	
	Estimated geomorphic	$\boxtimes$ A $\smile$	$\overline{}$	/ □B ¬	
	valley shape (skip for Tidal Marsh Stream):	(more sinuous strear	m flatter vallev sl	one) (less sinuous st	ream, steeper valley slope)
	,	Size 1 (< 0.1 mi²)			
17.	Watershed size: (skip for Tidal Marsh Stream)		☐Size 2 (0.1 t	to < 0.5 fill-)	
ΔD	DITIONAL INFORMATION:				
			s ⊟No If Yes. ch	neck all that apply to the assessme	ent area.
	☐Section 10 water	☐Classified T			rshed ( I II III IV V)
	☐Essential Fish Habitat	— □Primary Nur	sery Area		s/Outstanding Resource Waters
	⊠Publicly owned property	□NCDWR Rip	parian buffer rule	in effect	/aters
	☐Anadromous fish	☐303(d) List		□CAMA Area of Envi	ronmental Concern (AEC)
		f a federal and/or state	listed protected s	pecies within the assessment are	a.
	List species:				
	Designated Critical Habit				
19.	Are additional stream inform	nation/supplementary m	neasurements inc	eluded in "Notes/Sketch" section of	r attached? ⊠Yes ∐No
1.	Channel Water assessm	ant raach matria (akin	for Size 1 stree	ms and Tidal Marsh Streams)	
	✓A Water throughout	` .	o ioi size i sirea	ilis aliu Tidai maisii Streams)	
	B No flow, water in p				
	C No water in assess	•			
2.	Evidence of Flow Restricti	ion – accoecment read	ch motric		
				fle-nool seguence is severely affe	cted by a flow restriction or fill to the
					impoundment on flood or ebb within
					the channel, tidal gates, debris jams,
	beaver dams).				
	⊠B Not A				
3.	Feature Pattern – assessm	nent reach metric			
	☐A A majority of the a	ssessment reach has a	ltered pattern (ex	amples: straightening, modification	n above or below culvert).
	⊠B Not A				·
4.	Feature Longitudinal Profi	ile – assessment reac	h metric		
				ream profile (examples: channel	down-cutting, existing damming, over
					has not reformed from any of these
	disturbances).	. 5 57			,
	⊠B Not A				
5.	Signs of Active Instability	- assessment reach r	metric		
				the stream has currently recove	ered. Examples of instability include
	active bank failure, active ch	nannel down-cutting (he		idening, and artificial hardening (s	
				- 1	·
	☐B 10 to 25% of chan				
	☐C > 25% of channel	unstable			

6.					streamsic					
			he Left	Bank (LE	3) and the	Right Ba	nk (RB).			
	LB ⊠A □B	RB ⊠A □B	Mod refe	derate evi erence inte	dence of certaction (ex	conditions xamples:	limited streams	rms, leve ide area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affect cruption of flood flows through streamside area, leaky inor ditching [including mosquito ditching])
	□c	□c	Exte [exa of fl mos	ensive evi amples: c ood flows	dence of on auseways through standard	conditions with flood reamside	that adversely Iplain and chanr area] <u>or</u> too mu	affect refe nel constric ch floodpla	erence inte ction, bulk ain/intertic	eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption dal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	ertidal zone me	tric		
		k all that								
										er discoloration, oil sheen, stream foam)
	□B □C						m features or int es entering the a			nd causing a water quality problem
	$\Box$ D	Odor	(not inc	luding nat	ural sulfide	e odors)	_			
	□E	Curre section		shed or c	collected d	ata indica	ating degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F			h access t	o stream o	or intertida	al zone			
	□G				am or inte			به منصباط ا		anuing doctruction ato
							ai zone (removal n in "Notes/Sketo			nowing, destruction, etc)
	⊠J		to no str			_ (-   -			,	
8.					•	•	al Marsh Strea	•		
	For S ☐A						sidered a drough all not exceeding			reams, D2 drought or higher is considered a drought.
	⊟̂B						1 inch within the			181 40 HOUIS
	⊠c			onditions	_	J				
9.	<b>Large</b> □Ye		-		<b>assessme</b> oo large or			f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							each metric			
	10a.	∐Yes	⊠No	sedime	ntation, m	ining, exc	at over majority cavation, in-stre tal Plain strean	eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.									ize 4 Coastal Plain streams)
		□A			s, lichens,		quatic mosses I mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠в			nd/or leaf	packs and	d/or emergent	k for T h Stre Only	∏H.	Low-tide refugia (pools) Sand bottom
		⊠c	vegetat Multiple		nd logs (in	cluding la	p trees)	heck arsh	□J	5% vertical bank along the marsh
		□D	5% und	dercut bar	nks and/or	root mats	s and/or roots	טֿ≥	□K	Little or no habitat
		□E		s extend t no habita		nai wetted	d perimeter			
****	******	*******	******	**REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	ite – asse	ssment re	each met	ric (skip for Siz	ze 4 Coas	tal Plain	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is asses	sment read	ch in a na	tural sand-bed	stream? (s	skip for C	coastal Plain streams)
	11b.				k the app		oox(es).			
		⊠A □B			i (evaluate n (evaluat					
		□c					tric 12, Aquatio	: Life)		
	11c.	at least	one box	in each i	ow (skip	for Size 4	4 Coastal Plain	streams a	and Tidal	messment reach – whether or not submerged. Check Marsh Streams). Not Present (NP) = absent, Rare
					or each as			II (A) = >	40-70%, r	Predominant (P) = > 70%. Cumulative percentages
		NP	R □	C	A	P	Dodrook/oone	مانده		
		$\boxtimes$	H	H	H		Bedrock/sapre Boulder (256		m)	
		$\boxtimes$					Cobble (64 –	256 mm)	,	
				片		片	Gravel (2 – 6 <sup>2</sup> Sand (.062 –			
				፱	Ĭ	Ĭ	Silt/clay (< 0.0	,		
			$\boxtimes$		$\Box$	$\mathbb{R}$	Detritus Artificial (rip-ra	ap, concre	ete, etc.)	
	11d.	□Yes	□No	Are pool	 s filled with			•		streams and Tidal Marsh Streams)
							, .			-,

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛛	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> ) Crustacean (isopod/amphipod/crayfish/shrimp)
			Damselfly and dragonfly larvae Dipterans
			Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea)</i> Mussels/Clams (not <i>Corbicula</i> )
			Other fish Salamanders/tadpoles
			Snails Stonefly larvae (P)
			Tipulid larvae Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	⊠a □B	⊠a □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	С	□с	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.	Conside LB	r for the RB	Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	<ul> <li>e – streamside area metric (skip for Tidal Marsh Streams)</li> <li>Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.</li> </ul>
	□Y ⊠N	∏Y ⊠N	Are wetlands present in the streamside area?
16.			outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) utors within the assessment reach or within view of and draining to the assessment reach.
	□A □B	Ponds (i	and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C 図D 図E □F	Evidence Stream	ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) ped or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov Check a		ors – assessment area metric (skip for Tidal Marsh Streams) ply.
	□A □B □C	Evidence Obstruct	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) ream (≥ 24% impervious surface for watershed)
	□D □E ⊠F	Evidence Assessn	the that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge the above
18.	Shading		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠a □B	Stream : Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) d (example: scattered trees)
	□C	Stream	shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded
	LB RB LB RB $\square$ A $\square$ A $\square$ A $\square$ A $\square$ A ≥ 100 feet wide <u>or</u> extends to the edge of the watershed $\square$ B $\square$ B $\square$ B $\square$ B From 50 to < 100 feet wide $\square$ C $\square$ C $\square$ C $\square$ C $\square$ C From 30 to < 50 feet wide $\square$ D $\square$ D $\square$ D $\square$ D $\square$ D $\square$ D From 10 to < 30 feet wide $\square$ E $\square$ E $\square$ E $\square$ E $\square$ E $\square$ E $\square$ C 10 feet wide $\square$ C no trees
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).
	B RB  □ A Mature forest □ B Non-mature woody vegetation or modified vegetation structure □ C □ C Herbaceous vegetation with or without a strip of trees < 10 feet wide □ D □ D Maintained shrubs □ E □ E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A A Medium to high stem density  B B Low stem density  C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.
	LB RB  □ A The total length of buffer breaks is < 25 percent. □ B □ B The total length of buffer breaks is between 25 and 50 percent. □ C □ C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.  LB RB
	☐A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.
	communities missing understory but retaining canopy trees.  Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). $\Box A < 46$ $\Box B = 46$ to < 67 $\Box C = 67$ to < 79 $\Box D = 79$ to < 230 $\Box E = 230$
Note	es/Sketch:
	land draining to stream, privet stands in streamside area

Stream Site Name	CL1 Airport Expansion	Date of Assessment	April 2019			
Stream Category	KMT,BGB/HDR					
Notes of Field Asses		YES				
Presence of regulatory considerations (Y/N) NO						
Additional stream inf	Additional stream information/supplementary measurements included (Y/N)  YES					
NC SAM feature type	C SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial					

Aporoninal, intornittorit, Tradi Maron Ctrodiny	1 OTOTINA	<u>.                                    </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	memment
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access		
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	HIGH	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	MEDIUM	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat		
	NA NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Stream Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	HIGH	

USACE AID #:	NCDWR #:
	ttach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
	n of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
	on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
•	requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
	al for examples of additional measurements that may be relevant.
NOTE EVIDENCE O	F STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE INF	
1. Project name (if ar	··
3. Applicant/owner na	
5. County:	Mecklenburg 6. Nearest named water body
7. River basin:	Catawba on USGS 7.5-minute quad: Coffey Creek
-	decimal degrees, at lower end of assessment reach): 35.206473, -80.948574
	TION: (depth and width can be approximations)
9. Site number (show	
12. Channel width at	· , i , i , i , i , i , i , i , i , i ,
	Perennial flow Intermittent flow Tidal Marsh Stream
STREAM CATEGOR	
15. NC SAM Zone:	Mountains (M) ⊠ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
10. INO OAIVI ZUIIC.	
16. Estimated geomo	
valley shape ( <b>ski</b> <b>Tidal Marsh Str</b> e	p ror —
17. Watershed size: for Tidal Marsh	
ADDITIONAL INFOR	'
	considerations evaluated? ⊠Yes □No If Yes, check all that apply to the assessment area.
☐Section 10 wa	
☐Essential Fish	
☐ ☐Publicly owned	
☐Anadromous f	
□Documented p	presence of a federal and/or state listed protected species within the assessment area.
List species:	
	itical Habitat (list species)
19. Are additional str	eam information/supplementary measurements included in "Notes/Sketch" section or attached? ⊠Yes □No
4 Ohammal Water	and Tidel March Ottosare)
	- assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams) nroughout assessment reach.
	, water in pools only.
	er in assessment reach.
	v Destriction - second west reach matrix
	<b>w Restriction – assessment reach metric</b> 10% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction <u>or</u> fill to the
	obstructing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb within
	essment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver	
⊠B Not A	
3. Feature Pattern	- assessment reach metric
	ity of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
□B Not A	
4. Feature Longitue	dinal Profile – assessment reach metric
	of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over
	g, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
disturba	
⊠B Not A	
	Instability – assessment reach metric
_	urrent instability, not past events from which the stream has currently recovered. Examples of instability include
	e, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
	of channel unstable
☐B 10 to 25	5% of channel unstable
□C > 25% c	of channel unstable

6.				raction – s						
	LB	RB	ne Len	Bank (LB)	and the	Right Ba	nk (RB).			
	□A □B	□A □B	Mod refe	derate evid rence inter	ence of coaction (ex	onditions amples:	limited streams	rms, levee ide area a	es, down- ccess, dis	cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky
	⊠C	⊠c	Exte [exa of flo mos	ensive evid amples: ca ood flows t	lence of c useways v hrough str ning]) <u>or</u> fl	onditions with flood eamside	that adversely plain and chanr area] <u>or</u> too mu	affect refe nel constric ch floodpla	rence inte ction, bulk ain/intertid	nor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse:	ssment re	each/inte	rtidal zone me	tric		
		k all that								
										er discoloration, oil sheen, stream foam)
	□B □C						n features or int s entering the a			nd causing a water quality problem
	$\Box$ D	Odor	(not incl	luding natu	ral sulfide	odors)	_			
	□E	Curre section		shed or co	ollected da	ata indica	ting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F	Lives	tock with	n access to						
	□G □H			gae in strea				Lhurning	regular m	nowing, destruction, etc)
	⊠ı						in "Notes/Sket			owing, destruction, etc)
	□J	Little	to no str	essors						
8.							al Marsh Stream	•	0 4 -4-	D2 d
	For S						ll not exceeding			eams, D2 drought or higher is considered a drought. st 48 hours
	В	Droug	ght cond	itions and			1 inch within the			
•	⊠c		•	onditions						
9.	∐Ye		•	Stream – a tream is to				f Yes, skip	to Metric	13 (Streamside Area Ground Surface Condition).
10.							ach metric	. of the c		st reach (everynles of atreacers include everynise
	iua.	∐Yes	⊠No	sedimen	tation, mi	ning, exc	at over majority cavation, in-stre tal Plain strean	eam harde	ning [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.									ize 4 Coastal Plain streams)
		□A		e aquatic m e liverworts			quatic mosses l mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠B	Multiple	sticks and			d/or emergent	k for T h Strea Only	□н	Low-tide refugia (pools)
		□с	vegetati Multiple	ion snags and	d loas (inc	luding lar	o trees)	arsh O	□J	Sand bottom 5% vertical bank along the marsh
		ΠĎ	5% und	lercut bank	ks and/or	root mats	s and/or roots	ວ ຊັ	□κ	Little or no habitat
		□E		s extend to no habitat		al wetted	l perimeter			
****	*****	******	******	*REMAIN	ING QUES	STIONS A	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	te – asses	sment re	ach metr	ric (skip for Siz	ze 4 Coas	tal Plain s	streams and Tidal Marsh Streams)
	11a.	∐Yes	⊠No	ls assess	ment reac	h in a nat	tural sand-bed	stream? (s	kip for C	oastal Plain streams)
	11b.	Bedform ⊠A		ed. <b>Check</b> un section (			ox(es).			
		□B		ide section						
		□с	Natural	bedform a	bsent (sk	ip to Met	ric 12, Aquatio	: Life)		
	11c.	at least	one box	in each ro	ow (skip f	or Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should no	ot excee	d 100% for	r each ass	essment		( )	,	( )
		NP ⊠	R □	C	A	P	Bedrock/sapro	olite		
				፱			Boulder (256	– 4096 mr	n)	
		H			H	H	Cobble (64 – 64 Gravel (2 – 64			
			፱			፱	Sand (.062 -	2 mm)		
		님		님	$\square$	H	Silt/clay (< 0.0 Detritus	062 mm)		
							Artificial (rip-ra	ap, concre	te, etc.)	
	11d.	∐Yes	□No	Are pools	filled with	sedimen	nt? (skip for Siz	e 4 Coast	tal Plain s	streams and Tidal Marsh Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If I	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? t one of the following reasons and skip to Metric 13.  □No Water □Other:
	12b. ⊠	Yes [	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all tha apply. If No, skip to Metric 13.
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. Adult frogs Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
		$ar{ar{ar{ar{ar{ar{ar{ar{ar{ar{$	Beetles Caddisfly larvae (T)
			Asian clam ( <i>Corbicula</i> )  Crustacean (isopod/amphipod/crayfish/shrimp)
			Damselfly and dragonfly larvae Dipterans
			Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
		$\triangleright$	Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )
			Mussels/Clams (not <i>Corbicula</i> ) Other fish
			Salamanders/tadpoles  Snails
			Stonefly larvae (P) Tipulid larvae
			Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff
	□A	□A	Little or no alteration to water storage capacity over a majority of the streamside area
	□B ⊠C	∐в ⊠с	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□a □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	er for the erimeter	ce – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma of assessment reach.
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?
16.	Baseflo	w Contri	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a  ☐A		outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.  and/or springs (jurisdictional discharges)
	□B □C	Ponds (	include wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
	$\overline{\boxtimes}$ D	Evidend	e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F		bed or bank soil reduced (dig through deposited sediment if present) the above
17.			tors – assessment area metric (skip for Tidal Marsh Streams)
	Check a ☐A	Evidend	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
	⊟в ⊠с		tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	□D □E	Evidend	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□F		nent reach relocated to valley edge the above
18.	_		sment reach metric (skip for Tidal Marsh Streams)
	$\square$ A	Stream	Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)
	∏в ⊠С		ed (example: scattered trees) shading is gone or largely absent

19.	<ol> <li>Buffer Width – streamside area metric (skip for Tidal Marsh Streams)</li> <li>Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.</li> </ol>					
	LB RB LB  ⊠A ⊠A □A  □B □B □E  □C □C □C	A				
20.		– streamside area metric (skip for Tidal Marsh Streams) bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).				
	LB RB  □A □A  □B □B  □C □C  □D □D  □E □E	Mature forest Non-mature woody vegetation or modified vegetation structure Herbaceous vegetation with or without a strip of trees < 10 feet wide Maintained shrubs Little or no vegetation				
21.	Check all approp within 30 feet of st	- streamside area metric (skip for Tidal Marsh Streams)  viate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is tream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  lowing stressors occurs on either bank, check here and skip to Metric 22:   □				
	Abuts < 30 LB RB LB □A □A □A □B □B □E □C □C □C	0 feet 30-50 feet				
22.	Stem Density - s	treamside area metric (skip for Tidal Marsh Streams)				
	LB RB □A □A □B □B	bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  Medium to high stem density  Low stem density				
23.	<ul><li></li></ul>	No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground getated Buffer – streamside area metric (skip for Tidal Marsh Streams)				
	LB RB	vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.				
	⊠A ⊠A □B □B □C □C	The total length of buffer breaks is < 25 percent.  The total length of buffer breaks is between 25 and 50 percent.  The total length of buffer breaks is > 50 percent.				
24.	Evaluate the domi	position – streamside area metric (skip for Tidal Marsh Streams) inant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to a habitat.				
	LB RB □A □A	Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.				
	□в □в	Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.				
	⊠c ⊠c	Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.				
25.	25a. □Yes ⊠	ssessment reach metric (skip for all Coastal Plain streams)  No Was conductivity measurement recorded? one of the following reasons.   No Water  Other:				
	25b. Check the b ☐A < 46	ox corresponding to the conductivity measurement (units of microsiemens per centimeter).  ☐B 46 to < 67 ☐C 67 to < 79 ☐D 79 to < 230 ☐E ≥ 230				
	es/Sketch: am is located in the	e middle of an airport airfield,				
	a io iodatod iii tiik					

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019					
Stream Category	Stream Category Pb3 Assessor Name/Organization							
Notes of Field Asses	sment Form (Y/N)		YES					
Presence of regulator	NO							
Additional stream inf	Additional stream information/supplementary measurements included (Y/N)  YES							
NC SAM feature type	C SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial							

(poronnial, intornittorit, fradi Maron Guodin)	1 Oronnia	<u>.                                    </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	LOW	
(2) Baseflow	HIGH	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	LOW	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	NA NA	
(3) Stream Stability	MEDIUM	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	MEDIUM	
(2) Stream/Intertidal Zone Interaction	NA	
• •	NA NA	
(2) Longitudinal Tidal Flow		
(2) Tidal Marsh Stream Stability	NA NA	
(3) Tidal Marsh Channel Stability	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA NA	
(1) Water Quality	MEDIUM	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	LOW	
(3) Upland Pollutant Filtration	MEDIUM	
(3) Thermoregulation	LOW	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	LOW	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	LOW	

		Acce	impanies osci wi	anaan versi	/II Z. I	
USACE AI				NCDWF		
						7.5-minute topographic quadrangle,
						on the same property, identify and
						er Manual for detailed descriptions rements were performed. See the
		nples of additional mea				rements were performed. See the
						the assessment area).
	SITE INFORMATIO	N:		`		,
•		CLT Airport Expansion		2. Date of eva		
		CLT			ame/organization:	KMT,BGB/HDR
5. County:	_	Mecklenburg	6		med water body	0 " 0 1
7. River ba		Catawba grees, at lower end of a	accomment roach)		7.5-minute quad: 621, -80.945763	Coffey Creek
	,	pth and width can be	,	. 33.2030	021, -00.945705	
SINLAWI	INFORMATION. (de	PS9-1 -	Stream			
	nber (show on attach			ength of asse	ssment reach evalua	ated (feet): 90'
		riffle, if present) to top		1		nable to assess channel depth.
	el width at top of ban				ach a swamp steam?	? ∐Yes ∐No
		flow Intermittent flow	w ∐Tidal Marsh S	tream		
	CATEGORY INFOR	_	<b>⊠</b> Diad (D)	П I	Coostal Dis:- //\	Outer Coastal Blair (C)
15. NC SAI	WI ZUIIE:	☐ Mountains (M)	☑ Piedmont (P)	∟ innei	Coastal Plain (I)	Outer Coastal Plain (O)
16 Estimat	ted geomorphic	\	.1		_ \	
	ted geomorphic shape ( <b>skip for</b>	$\Box$ A	$\overline{}$		⊠в	
	larsh Stream):	(more sinuous stream	m, flatter valley slop	oe)	(less sinuous stre	eam, steeper valley slope)
17. Waters	hed size: <b>(skip</b>	Size 1 (< 0.1 mi²)	☐ Size 2 (0.1 to	< 0.5 mi <sup>2</sup> )	☐ Size 3 (0.5 to < 5	5 mi²) ☐ Size 4 (≥ 5 mi²)
	al Marsh Stream)					
	AL INFORMATION:			1 . 11 41 . 4	1. ()	
	egulatory considerat ion 10 water	ions evaluated? ⊠Yes □Classified T				shed ( $\Box$ I $\Box$ II $\Box$ III $\Box$ IV $\Box$ V)
	ential Fish Habitat	☐ Primary Nur		_		Outstanding Resource Waters
	icly owned property		parian buffer rule in		Nutrient Sensitive Wa	•
	dromous fish	☐303(d) List				onmental Concern (AEC)
		f a federal and/or state	listed protected sp	ecies within t	he assessment area	•
	species: gnated Critical Habit	at (list species)				
			neasurements inclu	ıded in "Note	s/Sketch" section or	attached? ⊠Yes □No
		nent reach metric (sk	(ip for Size 1 stre	ams and Tid	al Marsh Streams)	
⊠a □B	•	assessment reach.				
□c	No flow, water in p No water in asses					
		tion – assessment re	ach motric			
Z. EVIGETI				-nool seque	nce is severely affec	eted by a flow restriction or fill to the
						impoundment on flood or ebb within
		each (examples: under	sized or perched co	ulverts, cause	eways that constrict t	he channel, tidal gates, debris jams,
□в	beaver dams). Not A					
3. Feature ⊠A		ment reach metric	altored pattern (eve	implos: etroje	htoning modification	a above or holow culvert)
□В	Not A	issessment reach has a	allered pallern (exa	impies. straig	mening, modification	above or below culvert).
		filo – accocoment ==	ach metric			
4. Feature □A	_	file – assessment rea		am nrofile (e	avamnles, channel d	own-cutting, existing damming, over
						nas not reformed from any of these
<b>.</b>	disturbances).				•	,
⊠в	Not A					
5. Signs o	of Active Instability	/ – assessment reach	metric			
						red. Examples of instability include
active b □A	ank failure, active cl < 10% of channel		ead-cut), active wid	iening, and a	rtificial hardening (st	uch as concrete, gabion, rip-rap).
□B	10 to 25% of chan					
⊠c	> 25% of channel					

6.	Strea	amside Are	ea Interaction	- streamside	e area metric					
	Cons LB	sider for th RB	ne Left Bank (	LB) and the F	Right Bank (RB	).				
	□a ⊠B	□a ⊠B	Moderate ev reference in	vidence of con teraction (exar	mples: limited st	es: berr reamsid	ns, levee e area ad	es, down- ccess, dis	teraction cutting, aggradation, dredging) that adversely ruption of flood flows through streamside area nor ditching [including mosquito ditching])	
	□с	□c	[examples: of flood flow	causeways wit s through strea tching]) <u>or</u> floo	th floodplain and amside area] <u>or</u> t	channe oo much	el constric n floodpla	tion, bulk iin/intertic	eraction (little to no floodplain/intertidal zone a heads, retaining walls, fill, stream incision, disr dal zone access [examples: impoundments, into or assessment reach is a man-made feature	ruption ensive
7.	Wate	r Quality S	Stressors – as	sessment re	ach/intertidal z	one m	etric			
Check all that apply.  ☐ A ☐ Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) ☐ B ☐ Excessive sedimentation (burying of stream features or intertidal zone) ☐ C ☐ Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem										
	□D □E		not including na It published or			aded w	ater qua	ity in the	assessment reach. Cite source in "Notes/S	Sketch"
	□F □G	section Livesto Excess	n. ock with access sive algae in sti	to stream or i	ntertidal zone dal zone		-			
	□H □I ⊠J	Other:			ntertidal zone (re explain in "Notes				nowing, destruction, etc)	
8.		Size 1 or 2 s Drough Drough	treams, D1 dro nt conditions <u>ar</u>	ught or higher ad no rainfall c ad rainfall exce	p for Tidal Mars is considered a or rainfall not exceeding 1 inch wit	drought eeding	; for Size 1 inch wi	thin the la	eams, D2 drought or higher is considered a dr ast 48 hours	ought.
9.	<b>Larg</b> e				nt reach metric angerous to ass		Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condit	tion).
					n habitat over m ng, excavation,	najority in-strea	ım harde	ning [for	nt reach (examples of stressors include exc example, rip-rap], recent dredging, and sna p to Metric 12)	
	10b.	⊠A M	Multiple aquation include liverwo	: macrophytes rts, lichens, ar	and aquatic mo	sses		skip for S	Size 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools)	
			vegetation Multiple snags a 5% undercut ba	and logs (incluants and/or ro	ıding lap trees) oot mats and/or ı	oots	Check for Tidal Marsh Streams Only	□I □J □K	Sand bottom 5% vertical bank along the marsh Little or no habitat	
			n banks extend ∟ittle or no habi		l wetted perimete	er				
****	******								AL MARSH STREAMS************************************	**
• • •			_			-			Coastal Plain streams)	
					priate box(es)			, , , , , , , , , , , , , , , , , , ,	ouciai i iaiii cii caiiic,	
		□A F	Riffle-run sectio Pool-glide secti	n <b>(evaluate</b> 1 on <b>(evaluate</b>	11c)		Life)			
	11c.	at least or (R) = pres	ne box in each	row (skip fo Common (C)	r Size 4 Coastal = > 10-40%, Ab	Plain s	treams a	and Tidal	essment reach – whether or not submerged. (Marsh Streams). Not Present (NP) = absent Predominant (P) = $> 70\%$ . Cumulative percent	t, Rare
			R C			r (256 –	4096 mr	n)		
					Cobble Gravel	`	,			
					☐ Sand (. ☐ Silt/clay	062 – 2	mm)			
					☐ Detritus	·	p, concre	ete, etc.)		
	11d.	□Yes [	□No Are poo	ols filled with s					streams and Tidal Marsh Streams)	

12.	Aquatic	Life – a	sessment reach metric (skip for Tidal Marsh Streams)	
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐ No Water ☐ Other:	
	12b. 🛚	Yes [	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all the apply. If No, skip to Metric 13.	nat
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles	
		$\triangleright$	Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)	
			Beetles Caddisfly larvae (T)	
			Asian clam (Corbicula)	
	H		Crustacean (isopod/amphipod/crayfish/shrimp)  Damselfly and dragonfly larvae	
	R		Dipterans Mayfly larvae (E)	
			Megaloptera (alderfly, fishfly, dobsonfly larvae)	
	H		Midges/mosquito larvae Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )	
			Mussels/Clams (not Corbicula)	
			Other fish Salamanders/tadpoles	
			Snails Stonefly larvae (P)	
			Tipulid larvae Worms/leeches	
13.	Streams	ide Are	a Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)	
	Conside LB	erforthe RB	Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland rune	off.
	□a □B	□a □B	Little or no alteration to water storage capacity over a majority of the streamside area  Moderate alteration to water storage capacity over a majority of the streamside area	
	⊠c	⊠c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)	n,
14.			a Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types)	
	Conside LB	erforth RB	e Left Bank (LB) and the Right Bank (RB) of the streamside area.	
	□a □B	□a □B	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep	
	⊠c	⊠c	Majority of streamside area with depressions able to pond water < 3 inches deep  Majority of streamside area with depressions able to pond water < 3 inches deep	
15.			ce – streamside area metric (skip for Tidal Marsh Streams)	
			<b>Left Bank (LB) and the Right Bank (RB).</b> Do not consider wetlands outside of the streamside area or within the norr of assessment reach.	nai
	LB □Y	RB □Y	Are wetlands present in the streamside area?	
	⊠'n	⊠'n	Are wellands present in the streamside area:	
16.			butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)	
	Check a  □ A		butors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)	
	⊠в □c		nclude wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, we	ir)
	$\boxtimes$ D	Evidend	e of bank seepage or sweating (iron in water indicates seepage)	",
	⊠e □F		bed or bank soil reduced (dig through deposited sediment if present) the above	
17.	Baseflo	w Detra	ctors – assessment area metric (skip for Tidal Marsh Streams)	
	Check a  ☐ A		oply. e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)	
	□в	Obstruc	tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)	
	□c ⊠d		tream (≥ 24% impervious surface for watershed) e that the streamside area has been modified resulting in accelerated drainage into the assessment reach	
	□E □F	Assess	nent reach relocated to valley edge the above	
18.	Shading	ı – asse	ssment reach metric (skip for Tidal Marsh Streams)	
	Consider A		Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)	
	□в	Degrad	ed (example: scattered trees)	
	⊠c	Stream	shading is gone or largely absent	

	Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB  □ A □ A □ A □ A ≥ 100 feet wide or extends to the edge of the watershed  □ B □ B □ B □ B From 50 to < 100 feet wide				
	□ C       □ C       □ C       □ C       From 30 to < 50 feet wide         □ D       <				
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).				
	LB RB  □ A □ A Mature forest □ B □ B Non-mature woody vegetation or modified vegetation structure □ C □ C Herbaceous vegetation with or without a strip of trees < 10 feet wide □ D □ D Maintained shrubs □ E □ E Little or no vegetation				
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet				
	LB RB LB RB LB RB  \[ \begin{array}{c c c c c c c c c c c c c c c c c c c				
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A A Medium to high stem density B B Low stem density  C C C No wooded riparian buffer or predominantly herbaceous species or bare ground				
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A A The total length of buffer breaks is < 25 percent.  B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.				
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.  LB RB  ☐ A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.  ☐ B ☐ B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.				
	Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.				
<ul> <li>25. Conductivity – assessment reach metric (skip for all Coastal Plain streams)</li> <li>25a. ☐Yes ☒No Was conductivity measurement recorded?</li> <li>If No, select one of the following reasons. ☐No Water ☐Other:</li> </ul>					
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). $\Box$ A < 46 $\Box$ B 46 to < 67 $\Box$ C 67 to < 79 $\Box$ D 79 to < 230 $\Box$ E ≥ 230				
	es/Sketch:				
Sue	eam contains riprap throughout. Is surrounded by fill slopes.				

19. Buffer Width – streamside area metric (skip for Tidal Marsh Streams)

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019				
Stream Category	Pb1	Assessor Name/Organization	KMT,BGB/HDR				
Notes of Field Asses	sment Form (Y/N)		YES				
Presence of regulato	Presence of regulatory considerations (Y/N) NO						
Additional stream inf	Additional stream information/supplementary measurements included (Y/N)  YES						
NC SAM feature type	IC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial  Perennial						

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	LOW	
(2) Baseflow	MEDIUM	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	MEDIUM	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	NA	
(3) Stream Stability	LOW	
(4) Channel Stability	LOW	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	MEDIUM	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	LOW	
(2) Baseflow	MEDIUM	
(2) Streamside Area Vegetation	MEDIUM	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	LOW	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	MEDIUM	
(3) Substrate	LOW	
(3) Stream Stability	LOW	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	LOW	
(2) Tidal Marsh In-stream Habitat	NA NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Stream Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	LOW	

		Acco	inpanics osci wi	andar version	1 2.1	
	E AID #:			NCDWR		
						.5-minute topographic quadrangle,
						on the same property, identify and
						er Manual for detailed descriptions
		mples of additional meas			opiementary measu	rements were performed. See the
					t need to be within	the assessment area).
	ECT/SITE INFORMATION			•		,
1. Proj	ect name (if any):	<b>CLT Airport Expansion</b>		2. Date of eval		
	licant/owner name:	CLT			me/organization:	KMT,BGB/HDR
5. Cou		Mecklenburg	6		ned water body	
	er basin:	Catawba			.5-minute quad:	Coffey Creek
	,	egrees, at lower end of a	,	35.20322	27, -80.947018	
SIKE	AW INFORMATION: (d)	epth and width can be PS9-1 - 3				
	number (show on attac			ength of asses	sment reach evalua	
		n riffle, if present) to top		1		nable to assess channel depth.
	annel width at top of ba				ch a swamp steam?	' ∐Yes ∐No
		I flow Intermittent flow	v ∟ Fidal Marsh St	ream		
_	AM CATEGORY INFOR	-	M D:1 (/2)		Occatal District	Outer Cot-l Di-: (O)
15. NC	SAM Zone:	☐ Mountains (M)	□ Piedmont (P)	⊔ Inner	Coastal Plain (I)	Outer Coastal Plain (O)
						/
16 ==	timated accompanhia		1			
	timated geomorphic lley shape ( <b>skip for</b>	$\boxtimes$ A	$\mathcal{L}$		□в	<i></i>
	dal Marsh Stream):	(more sinuous strear	m, flatter valley slop	oe)	(less sinuous stre	eam, steeper valley slope)
17. Wa	atershed size: (skip	Size 1 (< 0.1 mi²)	☐ Size 2 (0.1 to	< 0.5 mi <sup>2</sup> )	☐ Size 3 (0.5 to < 5	5 mi²) ☐ Size 4 (≥ 5 mi²)
	r Tidal Marsh Stream)					
	IONAL INFORMATION					
	ere regulatory considera Section 10 water	itions evaluated? XYes				
	Essential Fish Habitat	☐ Classified T ☐ Primary Nur				hed (□I □II □III □IV □V)  Outstanding Resource Waters
	Publicly owned property		parian buffer rule in		utrient Sensitive Wa	•
	Anadromous fish	☐303(d) List				nmental Concern (AEC)
	Documented presence	of a federal and/or state	listed protected spe			
	List species:					
	Designated Critical Hab				/Ol4-b"ti	-4110 DV MN-
19. Are	e additional stream infor	mation/supplementary n	neasurements inclu	ided in "Notes	Sketch" section or a	attached? Lifes Mino
1. Ch	annel Water – assess	ment reach metric (sk	ip for Size 1 stre	ams and Tida	ıl Marsh Streams)	
$\boxtimes A$		t assessment reach.				
		ction – assessment re				
						ted by a flow restriction <u>or</u> fill to the mpoundment on flood or ebb within
						he channel, tidal gates, debris jams,
_	beaver dams).	(1.1.)	,	,	,	,
⊠E	3 Not A					
3. <u>F</u> e	ature Pattern – asses	sment reach metric				
		assessment reach has a	altered pattern (exa	mples: straigh	tening, modification	above or below culvert).
⊠E	3 Not A					
4. Fe	ature Longitudinal Pro	ofile – assessment rea	ach metric			
						own-cutting, existing damming, over
		aggradation, dredging,	and excavation wh	ere appropria	ite channel profile r	has not reformed from any of these
⊠E	disturbances). 3 Not A					
		ty – assessment reach	metric			
_		=		e stream has	currently recove	red. Examples of instability include
						ich as concrete, gabion, rip-rap).
	A < 10% of channe	l unstable			- `	,
		i uristabi <del>c</del>				

б.					- streams						
	Cons LB	ider for t RB	he Left	Bank (L	B) and th	e Right I	Bank (RB).				
	⊠a □B	⊠A □B	Mod refe	lerate evi rence inte	dence of eraction (e	conditions examples:	limited streams	erms, leve side area <i>a</i>	es, down- iccess, dis	teraction cutting, aggradation, dredging) that adverse ruption of flood flows through streamside are nor ditching [including mosquito ditching])	
	□с	С	[exa of flo mos	mples: c	auseways through s ching]) <u>or</u>	with flood treamside	dplain and chan e area] <u>or</u> too mu	nel constri ch floodpl	ction, bulk ain/intertio	eraction (little to no floodplain/intertidal zone heads, retaining walls, fill, stream incision, d dal zone access [examples: impoundments, i or assessment reach is a man-made featu	lisruption intensive
7.	Wate	r Quality	Stress	ors – ass	essment	reach/ir	ntertidal zone	metric			
	Chec □ A □ B □ C	Exces	lored wa sive se	dimentation	on (buryin	g of strea	am features or in	itertidal zo	ne)	er discoloration, oil sheen, stream foam)  und causing a water quality problem	
	□D □E				tural sulfic			water qua	ality in the	assessment reach. Cite source in "Notes	s/Sketch'
	□F □G	sectio Livest	n. ock with	access t	to stream	or intertid	dal zone		,		
	□H □I □J	Degra Other	ided ma	rsh vege		ne intertid				nowing, destruction, etc)	
8.	Rece	Recent Weather – watershed metric (skip for Tidal Marsh Streams)  For Size 1 or 2 streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought.  Drought conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours  Drought conditions and rainfall exceeding 1 inch within the last 48 hours									
9.	<b>Larg</b> e		•				ch metric ous to assess?	lf Yes, ski	p to Metric	: 13 (Streamside Area Ground Surface Con	dition).
10.	Natu	ral In-stre	am Hal	bitat Typ	es – asse	essment	reach metric				
	10a.	□Yes	□No	sedime	ntation, n	nining, ex	cavation, in-stre	eam hard	ening [for	nt reach (examples of stressors include e example, rip-rap], recent dredging, and s p to Metric 12)	
	10b.	□А	Multiple	aquatic		tes and a	quatic mosses		(skip for □F □G	Size 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation	
			Multiple vegetat		nd/or leaf	packs an	nd/or emergent	k for J h Stre Only	□H □I	Low-tide refugia (pools) Sand bottom	
		⊠c □d	Multiple 5% und	snags a lercut bar		r root mat	ts and/or roots	Check for Tidal Marsh Streams Only	□J □K	5% vertical bank along the marsh Little or no habitat	
				s extend in no habita		mai wette	ed perimeter				
****	*****	** ** ** ** **	*****	REMAIN	ING QUE	ESTIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************	****
11.			Substra	ite – ass	essment	reach m	etric (skip for	Size 4 Co	astal Pla	in streams and Tidal Marsh Streams)	
			⊠No					stream?	skip for (	Coastal Plain streams)	
	11b.	⊠a □B	Riffle-ru Pool-gli	ın sectior de sectio	n (evalua n (evalua	te 11c) ate 11d)	e box(es). etric 12, Aquat	ic Life)			
	11c.	In riffle se at least o (R) = pres should no NP	ections, one box sent but ot excee R	check all t in each : ≤ 10%, 0 d 100% fo C	that occur row (skip Common or each as A	below the for Size (C) = > 10 ssessmen P	e normal wetted <b>4 Coastal Plain</b> 0-40%, Abundant t reach.	perimeter streams nt (A) = >	and Tida	essment reach – whether or not submerged   Marsh Streams). Not Present (NP) = absertedominant (P) = > 70%. Cumulative percent	ent, Rare
							Bedrock/sapr Boulder (256 Cobble (64 – Gravel (2 – 6 Sand (.062 –	– 4096 m 256 mm) 4 mm)	ım)		
							Silt/clay (< 0. Detritus Artificial (rip-	062 mm)	ete, etc.)		
	11d.		□No	Are pool	s filled wit	h sedime		-		streams and Tidal Marsh Streams)	

12.			essment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		Was an in-stream aquatic life assessment performed as described in the User Manual? The of the following reasons and skip to Metric 13. ☐ No Water ☐ Other:
	12b. 🛛	Yes □N	Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all tha apply. If No, skip to Metric 13.
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.
			quatic reptiles quatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
		⊠в	petles
			addisfly larvae (T) sian clam ( <i>Corbicula</i> )
			rustacean (isopod/amphipod/crayfish/shrimp)
			amselfly and dragonfly larvae pterans
			ayfly larvae (E) egaloptera (alderfly, fishfly, dobsonfly larvae)
			idges/mosquito larvae
			osquito fish (Gambusia) or mud minnows (Umbra pygmaea)
			ussels/Clams (not <i>Corbicula</i> ) ther fish
		⊠sa □si	alamanders/tadpoles
		□St	onefly larvae (P)
			pulid larvae 'orms/leeches
13.	Streams Conside	side Area C	Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  If Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff
	LB ⊠A	RB ⊠A L	ittle or no alteration to water storage capacity over a majority of the streamside area
	□в	$\Box$ B N	Moderate alteration to water storage capacity over a majority of the streamside area
	□с		Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction vestock disturbance, buildings, man-made levees, drainage pipes)
14.	Streams	ide Area V	Vater Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types)
	Conside LB	r for the L RB	eft Bank (LB) and the Right Bank (RB) of the streamside area.
	$\Box$ A	$\square$ A N	Aajority of streamside area with depressions able to pond water ≥ 6 inches deep
	□B ⊠C		Aajority of streamside area with depressions able to pond water 3 to 6 inches deep  Aajority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside	r for the L	e – streamside area metric (skip for Tidal Marsh Streams) eft Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma
		erimeter of RB	assessment reach.
	□Y ⊠N	□Y A ⊠N	Are wetlands present in the streamside area?
16.	Baseflo	w Contribu	itors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check a □ A		tors within the assessment reach or within view of <u>and</u> draining to the assessment reach.
	□в	Ponds (inc	nd/or springs (jurisdictional discharges) ·lude wet detention basins; do not include sediment basins or dry detention basins)
	□c □d		n passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) of bank seepage or sweating (iron in water indicates seepage)
	⊠E	Stream be	d or bank soil reduced (dig through deposited sediment if present)
17	□F	None of th	e above ors – assessment area metric (skip for Tidal Marsh Streams)
17.		II that app	
	□a □B		of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) n not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)
	□с		am (≥ 24% impervious surface for watershed)
	□D □E		hat the streamside area has been modified resulting in accelerated drainage into the assessment reach
	⊠F	None of th	nt reach relocated to valley edge e above
18.	_		ment reach metric (skip for Tidal Marsh Streams)
	Consider ⊠A		onsider "leaf-on" condition. ading is appropriate for stream category (may include gaps associated with natural processes)
	□в	Degraded	(example: scattered trees)
	$\Box$ C	Stream sh	ading is gone or largely absent

19.	Buffer Width - 9	streamside area metric (skip for Tidal Marsh Streams)							
	Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.								
	0	poded							
	LB RB LB								
		A							
		C □C From 30 to < 50 feet wide							
		D □D From 10 to < 30 feet wide							
		E □E < 10 feet wide <u>or</u> no trees							
20.	Buffer Structure	e – streamside area metric (skip for Tidal Marsh Streams)							
		ft bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).							
	LB RB ⊠A ⊠A	Mature forest							
	$\Box$ B $\Box$ B	Non-mature woody vegetation <u>or</u> modified vegetation structure							
	□с □с	Herbaceous vegetation with or without a strip of trees < 10 feet wide							
	$\Box$ D $\Box$ D	Maintained shrubs							
		Little or no vegetation							
21.		s – streamside area metric (skip for Tidal Marsh Streams)							
		priate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is							
		stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  bllowing stressors occurs on either bank, check here and skip to Metric 22:							
		30 feet 30-50 feet							
	LB RB LB								
		A □A □A Row crops B □B 図B Maintained turf							
		B □B ☑B ☑B Maintained turf C □C □C Pasture (no livestock)/commercial horticulture							
		D D D Pasture (active livestock use)							
22.	Stem Density -	streamside area metric (skip for Tidal Marsh Streams)							
	_	ft bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).							
	LB RB								
	⊠a ⊠a	Medium to high stem density							
	□в	Low stem density No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground							
22									
23.	=	egetated Buffer – streamside area metric (skip for Tidal Marsh Streams) r vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.							
	LB RB	r vegetated buller is continuous along stream (parallel). Dreaks are areas lacking vegetation > 10 reet wide.							
	$\boxtimes A$ $\boxtimes A$	The total length of buffer breaks is < 25 percent.							
	□в □в	The total length of buffer breaks is between 25 and 50 percent.							
	□с □с	The total length of buffer breaks is > 50 percent.							
24.		position – streamside area metric (skip for Tidal Marsh Streams)							
	Evaluate the don assessment reac	ninant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to							
	LB RB	ii ilabitat.							
	$\boxtimes A$ $\boxtimes A$	Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species,							
		with non-native invasive species absent or sparse.							
	□в □в	Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or							
		communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or							
		communities missing understory but retaining canopy trees.							
	□с □с	Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities							
		with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.							
25	Conductivity -	assessment reach metric (skip for all Coastal Plain streams)							
25.		No Was conductivity measurement recorded?							
		et one of the following reasons.  No Water Other:							
	25h Check the	box corresponding to the conductivity measurement (units of microsiemens per centimeter).							
	$\Box$ A < 46								
Note	es/Sketch:								

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019				
Stream Category	Pa1	Assessor Name/Organization	KMT,BGB/HDR				
		_					
Notes of Field Asses	sment Form (Y/N)		NO				
Presence of regulato	ry considerations (Y/N)		NO				
Additional stream inf	ormation/supplementary measu	rements included (Y/N)	NO				
NC SAM feature type	C SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial  Perennial						

(perennial, intermittent, Tidal Marsh Stream)	Perennia	<u> </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	HIGH	
(3) Stream Stability	MEDIUM	
(4) Channel Stability	MEDIUM	
(4) Sediment Transport	MEDIUM	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA NA	
(1) Habitat	HIGH	
(2) In-stream Habitat	MEDIUM	
(3) Baseflow	HIGH	
(3) Substrate	MEDIUM	
(3) Stream Stability	MEDIUM	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Stream Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	HIGH	

		Accom	-		
	SACE AID #:		NCDV		
					7.5-minute topographic quadrangle,
					on the same property, identify and
					ser Manual for detailed descriptions rements were performed. See the
		or examples of additional measur			rements were performed. See the
		TRESSORS AFFECTING THE			the assessment area).
	ROJECT/SITE INFOR	MATION:	,		,
	Project name (if any):		2. Date of e		ber 2019
	Applicant/owner name			name/organization:	KMT,BGB/HDR
	County: River basin:	Mecklenburg Catawba		named water body	Coffey Crook
		imal degrees, at lower end of ass		3 7.5-minute quad: 0804; -80.948082	Coffey Creek
	,	N: (depth and width can be ap	, <u> </u>	0004, 00.040002	
0.	INCAM IN ORMAN	PS10-1 - S			
	Site number (show or			sessment reach evalua	
		bed (in riffle, if present) to top of			nable to assess channel depth.
	2. Channel width at top			reach a swamp steam	? ∐Yes ∐No
		rennial flow Intermittent flow	⊔ i idal Marsh Stream		
_	TREAM CATEGORY  5. NC SAM Zone:		⊠ Piedmont (P)    □ Inn	er Coastal Plain (I)	☐ Outer Coastal Plain (O)
10	D. INC SAIVI ZONE:	□ IVIOUITIAIITS (IVI)	⊠ rieumont (r) ⊔ lnn	ei Guasiai Pialli (I)	☐ Outer Coastal Plain (O)
16	6. Estimated geomorpl	nic \	J	_ \	
10	valley shape ( <b>skip f</b>			⊠в	
	Tidal Marsh Stream		flatter valley slope)	(less sinuous str	eam, steeper valley slope)
17	7. Watershed size: (sk	<b>ip</b> ⊠ Size 1 (< 0.1 mi²)	☐ Size 2 (0.1 to < 0.5 mi <sup>2</sup> )	☐ Size 3 (0.5 to <	5 mi²) ☐ Size 4 (≥ 5 mi²)
	for Tidal Marsh Str	•			
	DDITIONAL INFORM				
10	Section 10 water	siderations evaluated? ⊠Yes [ Classified Tro			shed ( $\Box$ I $\Box$ II $\Box$ III $\Box$ IV $\Box$ V)
	☐ Essential Fish Ha	_		_	/Outstanding Resource Waters
	⊠Publicly owned pr		_	Nutrient Sensitive W	•
	☐ Anadromous fish	☐303(d) List			onmental Concern (AEC)
		sence of a federal and/or state lis	ted protected species within	the assessment area	
	List species:	al Habitat (list species)			
19			acuraments included in "Not	es/Sketch" section or	attached? □Yes ⊠No
		n information/supplementary me:			attachea: Bree Bree
		m information/supplementary mea	asurements included in No.		
1.	Channel Water – a	m information/supplementary meassessment reach metric (skip			
1.	Channel Water – a ⊠A Water thro	ssessment reach metric (skip ughout assessment reach.			
1.	Channel Water – a  ⊠A Water thro  □B No flow, wa	ssessment reach metric (skip ughout assessment reach. ater in pools only.			
1.	Channel Water – a  ⊠ A Water thro  □ B No flow, wa  □ C No water in	ssessment reach metric (skip ughout assessment reach. ater in pools only. n assessment reach.	o for Size 1 streams and T		
1. 2.	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow	ssessment reach metric (skip ughout assessment reach. ater in pools only. n assessment reach. Restriction – assessment reac	o for Size 1 streams and T	idal Marsh Streams)	
1. 2.	Channel Water – a  ⊠ A Water thro □ B No flow, wa □ C No water in  Evidence of Flow I  ⊠ A At least 10	ssessment reach metric (skip ughout assessment reach. ater in pools only. In assessment reach. Restriction – assessment reach % of assessment reach in-strea	o for Size 1 streams and T ch metric im habitat or riffle-pool sequ	idal Marsh Streams) ence is severely affec	sted by a flow restriction <u>or</u> fill to the
1. 2.	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob	ssessment reach metric (skip ughout assessment reach. ater in pools only. In assessment reach.  Restriction – assessment reach in-streach in assessment reach in-streach in assessment channel chokenstructing flow or a channel chokens	o for Size 1 streams and T  ch metric  m habitat or riffle-pool sequed with aquatic macrophyte	idal Marsh Streams) ence is severely affec s or ponded water or	sted by a flow restriction <u>or</u> fill to the impoundment on flood or ebb within
1. 2.	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar	ssessment reach metric (skip ughout assessment reach. ater in pools only. In assessment reach.  Restriction – assessment reach in-streat structing flow or a channel chokement reach (examples: undersize with the struction of the	o for Size 1 streams and T  ch metric  m habitat or riffle-pool sequed with aquatic macrophyte	idal Marsh Streams) ence is severely affec s or ponded water or	sted by a flow restriction <u>or</u> fill to the impoundment on flood or ebb within
1.	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob the assess	ssessment reach metric (skip ughout assessment reach. ater in pools only. In assessment reach.  Restriction – assessment reach in-streat structing flow or a channel chokement reach (examples: undersize with the struction of the	o for Size 1 streams and T  ch metric  m habitat or riffle-pool sequed with aquatic macrophyte	idal Marsh Streams) ence is severely affec s or ponded water or	cted by a flow restriction <u>or</u> fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams,
	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a	ssessment reach metric (skip ughout assessment reach. ater in pools only. assessment reach.  Restriction – assessment reach in-streach grundersizes assessment reach in-streach in-streach in-streach (examples: undersizens).	ch metric Im habitat or riffle-pool seque with aquatic macrophyte ared or perched culverts, cau	idal Marsh Streams) Hence is severely affects or ponded water or seeways that constrict to	cted by a flow restriction <u>or</u> fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams,
	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority	ssessment reach metric (skip ughout assessment reach. ater in pools only. In assessment reach.  Restriction – assessment reach in-streat structing flow or a channel choken ment reach (examples: undersizens).	ch metric Im habitat or riffle-pool seque with aquatic macrophyte ared or perched culverts, cau	idal Marsh Streams) Hence is severely affects or ponded water or seeways that constrict to	cted by a flow restriction <u>or</u> fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams,
3.	Channel Water – a  A Water thro B No flow, water in C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority B Not A	ssessment reach metric (skip ughout assessment reach. ater in pools only. In assessment reach.  Restriction – assessment reach in-streat structing flow or a channel choke ment reach (examples: undersizens).  assessment reach metric of the assessment reach has alter	ch metric Im habitat or riffle-pool sequed with aquatic macrophyte zed or perched culverts, cau	idal Marsh Streams) Hence is severely affects or ponded water or seeways that constrict to	cted by a flow restriction <u>or</u> fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams,
3.	Channel Water – a  A Water thro B No flow, water in C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority B Not A  Feature Longitudio	ssessment reach metric (skip ughout assessment reach. atter in pools only. In assessment reach.  Restriction – assessment reach in-streat structing flow or a channel choke ment reach (examples: undersizens).  assessment reach metric of the assessment reach has alternal Profile – assessment reach	ch metric Im habitat or riffle-pool sequed with aquatic macrophyte zed or perched culverts, cau ered pattern (examples: stra	idal Marsh Streams) ence is severely affects or ponded water or seways that constrict to	sted by a flow restriction <u>or</u> fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams, above or below culvert).
1. 2. 3.	Channel Water – a  A Water thro B No flow, water in C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority B Not A  Feature Longitudia A Majority of	ssessment reach metric (skip ughout assessment reach. atter in pools only. In assessment reach.  Restriction – assessment reach in-streat structing flow or a channel choke ment reach (examples: undersizens).  assessment reach metric of the assessment reach has alternal Profile – assessment reach as substantial metric and profile – assessment reach has a substantial profile – ass	ch metric Im habitat or riffle-pool sequed with aquatic macrophyte zed or perched culverts, cau ered pattern (examples: strace.) In metric Intially altered stream profile	ence is severely affects or ponded water or seways that constrict to ightening, modification (examples: channel of	sted by a flow restriction or fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams, above or below culvert).
3.	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority B Not A  Feature Longitudin A Majority of widening, a	ssessment reach metric (skip ughout assessment reach. ater in pools only. In assessment reach.  Restriction – assessment reach with a ssessment reach in-streat structing flow or a channel choke ment reach (examples: undersizens).  Assessment reach metric of the assessment reach has alternal Profile – assessment reach as substantactive aggradation, dredging, and	ch metric Im habitat or riffle-pool sequed with aquatic macrophyte zed or perched culverts, cau ered pattern (examples: strace.) In metric Intially altered stream profile	ence is severely affects or ponded water or seways that constrict to ightening, modification (examples: channel of	sted by a flow restriction or fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams, above or below culvert).
3.	Channel Water – a  A Water thro B No flow, water in C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority B Not A  Feature Longitudia A Majority of	ssessment reach metric (skip ughout assessment reach. ater in pools only. In assessment reach.  Restriction – assessment reach with a ssessment reach in-streat structing flow or a channel choke ment reach (examples: undersizens).  Assessment reach metric of the assessment reach has alternal Profile – assessment reach as substantactive aggradation, dredging, and	ch metric Im habitat or riffle-pool sequed with aquatic macrophyte zed or perched culverts, cau ered pattern (examples: strace.) In metric Intially altered stream profile	ence is severely affects or ponded water or seways that constrict to ightening, modification (examples: channel of	sted by a flow restriction or fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams, above or below culvert).
<b>3</b> .	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority B Not A  Feature Longitudin A Majority of widening, a disturbance B Not A	ssessment reach metric (skip ughout assessment reach. atter in pools only. In assessment reach.  Restriction – assessment reach in-streat structing flow or a channel choke ment reach (examples: undersizens).  assessment reach metric of the assessment reach has alternal Profile – assessment reach as ubstantactive aggradation, dredging, and es).	ch metric Im habitat or riffle-pool sequed with aquatic macrophyte and or perched culverts, caused or perched culverts are the metric Intially altered stream profile and excavation where appropri	ence is severely affects or ponded water or seways that constrict to ightening, modification (examples: channel of	sted by a flow restriction or fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams, above or below culvert).
<b>3</b> .	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority of widening, a disturbance B Not A  Signs of Active Ins	ssessment reach metric (skip ughout assessment reach. atter in pools only. In assessment reach.  Restriction – assessment reach in-streat structing flow or a channel choke ment reach (examples: undersizens).  assessment reach metric of the assessment reach has alternal Profile – assessment reach assessment reach as substantiative aggradation, dredging, and es).	ch metric Im habitat or riffle-pool seque and the dwith aquatic macrophyte are dor perched culverts, caused or perched culverts, caused the metric Intially altered stream profile and excavation where approprincetric	ence is severely affects or ponded water or seways that constrict to ightening, modification (examples: channel doriate channel profile I	cted by a flow restriction <u>or</u> fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams,
3.	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority B Not A  Feature Longitudin A Majority of widening, a disturbance B Not A  Signs of Active Ins  Consider only curr active bank failure, a	ssessment reach metric (skip ughout assessment reach. atter in pools only. In assessment reach.  Restriction – assessment reach assessment reach in-strea structing flow or a channel choke ment reach (examples: undersizens).  assessment reach metric of the assessment reach has alternated assessment reach has a substant active aggradation, dredging, and es).  atability – assessment reach metric active aggradation, dredging, and es).	ch metric Im habitat or riffle-pool sequenced with aquatic macrophyte are or perched culverts, caused or perched culverts, caused the metric Intially altered stream profile and excavation where appropriate is from which the stream is	ence is severely affects or ponded water or seways that constrict to ightening, modification (examples: channel or criate channel profile I	cted by a flow restriction or fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams, a above or below culvert).  Sown-cutting, existing damming, over has not reformed from any of these
<b>3</b> .	Channel Water – a  A Water thro B No flow, wa C No water in  Evidence of Flow I  A At least 10 point of ob the assess beaver dar B Not A  Feature Pattern – a  A A majority B Not A  Feature Longitudin A Majority of widening, a disturbance B Not A  Signs of Active Ins  Consider only curr active bank failure, a	ssessment reach metric (skip ughout assessment reach. atter in pools only. In assessment reach.  Restriction – assessment reach assessment reach in-strea structing flow or a channel choke ment reach (examples: undersizens).  assessment reach metric of the assessment reach has alternal Profile – assessment reach has a substant active aggradation, dredging, and es).	ch metric Im habitat or riffle-pool sequenced with aquatic macrophyte are or perched culverts, caused or perched culverts, caused the metric Intially altered stream profile and excavation where appropriate is from which the stream is	ence is severely affects or ponded water or seways that constrict to ightening, modification (examples: channel or criate channel profile I	cted by a flow restriction or fill to the impoundment on flood or ebb within the channel, tidal gates, debris jams, a above or below culvert).  Sown-cutting, existing damming, over has not reformed from any of these or examples of instability include

6.					– stream						
			the Lef	t Bank (L	₋B) and tl	he Right	Bank (RB).				
	LB ⊠A □B	RB □A □B	Mod refe or in Exte [exa of fl mod	derate everence intermitter ensive everence ensive everence ensive everence ensive everence ensive e	ridence of eraction (on the bulkheat ridence of causeways through s ching]) or	conditions examples: ads, cause condition s with floo streamside	limited streamsi eways with floodp is that adversely idplain and chann e area] or too mud	rms, leve de area a lain consi affect refe el constri ch floodpl	es, down- ccess, dis triction, mi erence int ction, bulk ain/intertion	teraction cutting, aggradation, dredging) that adversely affective flows through streamside area, leak inor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone access theads, retaining walls, fill, stream incision, disruptional zone access [examples: impoundments, intensivor assessment reach is a man-made feature on a	ss on ve
7.	Wate	r Quality	Stress	ors – as	sessmen	t reach/ii	ntertidal zone n	netric			
	Check all that apply.  Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)  Excessive sedimentation (burying of stream features or intertidal zone)  Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem  Odor (not including natural sulfide odors)  Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section.						า"				
	□F □G					or intertic tertidal zoi					
	□H ⊠I □J	Othe					dal zone (removal n in "Notes/Sketo			mowing, destruction, etc)	
8.		ize 1 or 2 Drou Drou	streams ght cond ght cond	s, D1 drou ditions <u>an</u>	ught or hig <u>d</u> no rainf <u>d</u> rainfall (	her is con all or raint	Tidal Marsh Stronsidered a drough fall not exceeding and inch within the	nt; for Size	ithin the la	reams, D2 drought or higher is considered a drough ast 48 hours	ıt.
9.	Large □Yes	_	-				ch metric ous to assess? I	f Yes, ski <sub>l</sub>	p to Metric	c 13 (Streamside Area Ground Surface Condition).	
10.		r <b>al In-str</b> □Yes		Degrae sedime	ded in-str entation, r	eam habi mining, ex		am hard	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging to Metric 12)	
	10b.	Check a  A  B  C  D  C  D  M  E	Multiple (include Multiple vegeta Multiple 5% und in bank	e aquatic e liverwor e sticks a tion e snags a dercut ba	macrophyrts, lichens and/or leaf and logs (inks and/or to the no	ytes and a s, and alga f packs ar ncluding la or root ma	aquatic mosses al mats) nd/or emergent	Check for Tidal and Marsh Streams Check for Tidal ()	(skip for    F    G    H    I    J    K	Size 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat	
****										AL MARSH STREAMS************************************	
11.		orm and □Yes	Substra ⊠No							in streams and Tidal Marsh Streams) Coastal Plain streams)	
								stream: (	SKIP IOI V	oustai i iaili streams)	
	11b.	Bedform □ A □ B □ C	Riffle-r Pool-gl	un section lide section	n <b>(evalua</b> on <b>(evalu</b>	ite 11c) ate 11d)	e box(es). etric 12, Aquati	c Life)			
		at least (R) = pre	one box esent bu	<b>x in each</b> It <u>&lt;</u> 10%,	row (ski) Common	o for Size	4 Coastal Plain 0-40%, Abundan	streams t (A) = >  blite - 4096 m 256 mm) 4 mm) 2 mm) 062 mm)	and Tida 40-70%, I m)	sessment reach – whether or not submerged. <b>Chec I Marsh Streams)</b> . Not Present (NP) = absent, Rar Predominant (P) = > 70%. Cumulative percentage	re
	11d.	□Yes	□No	Are poo	ls filled wi	th sedime	nt? (skip for Siz	e 4 Coas	stal Plain	streams and Tidal Marsh Streams)	

12.	Aquatic	Life – asse	essment reach metric (skip for Tidal Marsh Streams)
	12a. 🛭 If N		Was an in-stream aquatic life assessment performed as described in the User Manual?  The of the following reasons and skip to Metric 13. □No Water □Other: □
	12b. □	Yes ⊠No	Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all tha apply. If No, skip to Metric 13.
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.
			quatic reptiles quatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)
		□Ве	petles
		∐Ca □ As	addisfly larvae (T) sian clam ( <i>Corbicula</i> )
		□Cr	rustacean (isopod/amphipod/crayfish/shrimp)
			amselfly and dragonfly larvae
			pterans ayfly larvae (E)
			egaloptera (alderfly, fishfly, dobsonfly larvae)
			dges/mosquito larvae osquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea)</i>
		□М	ussels/Clams (not Corbicula)
	님		rher fish alamanders/tadpoles
		□Sr	
			onefly larvae (P) pulid larvae
			orms/leeches
13.	Conside	r for the Le	round Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  ft Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff
	LB □A	RB □A L	ittle or no alteration to water storage capacity over a majority of the streamside area
	⊠в	⊠B M	oderate alteration to water storage capacity over a majority of the streamside area
	□с		levere alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction vestock disturbance, buildings, man-made levees, drainage pipes)
14.			/ater Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types)
	Conside LB	erforthe L RB	eft Bank (LB) and the Right Bank (RB) of the streamside area.
	$\Box$ A	$\square$ A M	fajority of streamside area with depressions able to pond water ≥ 6 inches deep
	□B ⊠C		fajority of streamside area with depressions able to pond water 3 to 6 inches deep fajority of streamside area with depressions able to pond water < 3 inches deep
15.			<ul> <li>streamside area metric (skip for Tidal Marsh Streams)</li> <li>the Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma</li> </ul>
			assessment reach.
		RB	as wellow do assess in the atreasurable case 0
	□y ⊠n	□Y A ⊠N	re wetlands present in the streamside area?
16.	Baseflo	w Contribu	tors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	_		tors within the assessment reach or within view of <u>and</u> draining to the assessment reach.
	∐A □B		nd/or springs (jurisdictional discharges) lude wet detention basins; do not include sediment basins or dry detention basins)
	$\Box$ C	Obstruction	n passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)
	□D □E		of bank seepage or sweating (iron in water indicates seepage) d or bank soil reduced (dig through deposited sediment if present)
	⊠F	None of the	e above
17.	Baseflo	w Detracto	rs – assessment area metric (skip for Tidal Marsh Streams)
		II that appl	
	□a □B		of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)  n not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)
	⊠c	Urban stre	am (≥ 24% impervious surface for watershed)
	□D □E		hat the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□F	None of the	nt reach relocated to valley edge e above
18.	Shading	j – assessn	nent reach metric (skip for Tidal Marsh Streams)
	Consider □ A		onsider "leaf-on" condition.
	⊠в		ading is appropriate for stream category (may include gaps associated with natural processes) (example: scattered trees)
	□c		ading is gone or largely absent

	Consider "vegeta to the first break Vegetated Woo							
	$\Box$ B $\Box$ B $\Box$ B $\Box$ C	RB  □ A ≥ 100 feet wide or extends to the edge of the watershed □ B From 50 to < 100 feet wide □ C From 30 to < 50 feet wide □ D From 10 to < 30 feet wide						
		☐E < 10 feet wide or no trees						
20.		– streamside area metric (skip for Tidal Marsh Streams) bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).						
	□A □A □B □C □C □D □D	Mature forest Non-mature woody vegetation <u>or</u> modified vegetation structure Herbaceous vegetation with or without a strip of trees < 10 feet wide Maintained shrubs Little or no vegetation						
21.	Check all approp	<ul> <li>streamside area metric (skip for Tidal Marsh Streams)</li> <li>riate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is ream (&lt; 30 feet), or is between 30 to 50 feet of stream (30-50 feet).</li> </ul>						
		lowing stressors occurs on either bank, check here and skip to Metric 22: 🛭 feet 30-50 feet						
	□в □в □в	RB LB RB  A A A Row crops B B B Maintained turf C C C Pasture (no livestock)/commercial horticulture						
		□D □D Pasture (active livestock use)						
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB							
		Medium to high stem density Low stem density No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground						
23.		etated Buffer – streamside area metric (skip for Tidal Marsh Streams)						
	Consider whether v	Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB						
	□в ⊠в	The total length of buffer breaks is < 25 percent. The total length of buffer breaks is between 25 and 50 percent. The total length of buffer breaks is > 50 percent.						
24.	Evaluate the domin	osition – streamside area metric (skip for Tidal Marsh Streams) nant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to						
	assessment reach LB RB							
	□A □A	Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species with non-native invasive species absent or sparse.						
	⊠в ⊠в	Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or						
	□с □с	communities missing understory but retaining canopy trees.  Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.						
25.	25a. □Yes ⊠I	sessment reach metric (skip for all Coastal Plain streams)  No Was conductivity measurement recorded?  one of the following reasons. □No Water □Other:						
	25b. Check the bo ☐A < 46	ox corresponding to the conductivity measurement (units of microsiemens per centimeter).  □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230						
Note	es/Sketch:							
		ncrete flume. Surrounding stream are fill slopes up to airfield.						

19. Buffer Width – streamside area metric (skip for Tidal Marsh Streams)

CLI Airport Expansion	Date of Assessment	September 20	019
Pb1	Assessor Name/Organization	KMT,BGB/HD	R
sment Form (Y/N)		YES	
ry considerations (Y/N)		NO	
ormation/supplementary measu	rements included (Y/N)	NO	
e (perennial, intermittent, Tidal M	Narsh Stream)	Perennial	
	Pb1  sment Form (Y/N) ry considerations (Y/N) ormation/supplementary measu	Pb1 Assessor Name/Organization sment Form (Y/N)	Pb1 Assessor Name/Organization KMT,BGB/HD  sment Form (Y/N) YES ry considerations (Y/N) NO  ormation/supplementary measurements included (Y/N) NO

e (perennial, intermittent, Tidal Marsh Stream)	Perennial	<u> </u>
	USACE/	NCDWR
Function Class Rating Summary	All Streams	Intermittent
(1) Hydrology	LOW	
(2) Baseflow	MEDIUM	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	MEDIUM	
(4) Floodplain Access	MEDIUM	
(4) Wooded Riparian Buffer	MEDIUM	
(4) Microtopography	NA	
(3) Stream Stability	LOW	
(4) Channel Stability	LOW	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	MEDIUM	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA NA	
(2) Tidal Marsh Stream Stability	NA NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	MEDIUM	
(2) Baseflow	MEDIUM	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	MEDIUM	
(2) Indicators of Stressors	YES	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	MEDIUM	
(2) In-stream Habitat	LOW	
(3) Baseflow	MEDIUM	
(3) Substrate	LOW	
(3) Stream Stability	LOW	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	MEDIUM	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	MEDIUM	

		Acce	impanies osci wi	unuun versio	/II <b>Z</b> . I	
USACE A				NCDWF		
						7.5-minute topographic quadrangle,
						on the same property, identify and
						ser Manual for detailed descriptions urements were performed. See the
		nples of additional mea				urements were penormed. See the
						n the assessment area).
	SITE INFORMATIO			•		•
	name (if any):	<b>CLT Airport Expansion</b>		2. Date of eva		
		CLT			ame/organization:	KMT,BGB/HDR
5. County:	_	Mecklenburg			med water body	
7. River ba		Catawba			7.5-minute quad:	Coffey Creek
	,	grees, at lower end of	,	35.1900	08; -80.942270	
			- Stream			
	mber (show on attach			-	ssment reach evalu	
	· · · · · · · · · · · · · · · · · · ·	riffle, if present) to top k (feet): 20		15		Inable to assess channel depth.
	el width at top of ban	flow Intermittent flow			ach a swamp steam	i! Lifes Lino
	CATEGORY INFOR		w 🗀 Hual Mai Sil S	u <del>c</del> aiii		
15. NC SA		MATION: ☐ Mountains (M)	□ Piedmont (P)	□ Inner	Coastal Plain (I)	☐ Outer Coastal Plain (O)
	20110.	ountaino (IVI)	loamont (I )		1	
					/	
16 Estima	ited geomorphic	_ \	,			_
	shape ( <b>skip for</b>	⊠a	$\overline{}$		□в	_
Tidal N	Marsh Stream):	(more sinuous stream	m, flatter valley slo <sub>l</sub>	pe)	(less sinuous st	ream, steeper valley slope)
	shed size: <b>(skip</b>	$\square$ Size 1 (< 0.1 mi <sup>2</sup> )	☐ Size 2 (0.1 to	o < 0.5 mi <sup>2</sup> )	⊠ Size 3 (0.5 to <	5 mi²) ☐ Size 4 (≥ 5 mi²)
	dal Marsh Stream)					
	IAL INFORMATION:	ions evaluated? ⊠Yes	n □No If Voc. obe	al all that an	nly to the accessme	ont area
	tion 10 water	Classified T				shed (
	ential Fish Habitat	☐ Primary Nur		_		s/Outstanding Resource Waters
⊠Pub	licly owned property		parian buffer rule ir		Nutrient Sensitive W	•
	dromous fish	☐303(d) List				onmental Concern (AEC)
		f a federal and/or state	listed protected sp	ecies within th	ne assessment area	а.
	species: ignated Critical Habit	est (list appaiss)				
			neasurements inclu	ıded in "Notes	s/Sketch" section or	attached? XYes No
10.7110 44	anona or cam mon	nation/oupplementary i	neasarements inoic	14000	S/CROTOTI GOOTION OF	attached. 2100 1110
	el Water – assessr	nent reach metric (sk	cip for Size 1 stre	ams and Tid	al Marsh Streams	)
⊠A	•	assessment reach.				
□в □с	No flow, water in p No water in asses					
		tion – assessment re			:	atad by a flavy reatriction or fill to the
□А						cted by a flow restriction or fill to the impoundment on flood or ebb within
						the channel, tidal gates, debris jams,
Π-	beaver dams).		·		•	
⊠в	Not A					
		ment reach metric				
⊠A		issessment reach has a	altered pattern (exa	imples: straig	htening, modificatio	n above or below culvert).
□в	Not A					
	=	file – assessment re				
⊠A						down-cutting, existing damming, over
	disturbances).	aggradation, dredging,	and excavation wh	еге арргорга	ate channel profile	has not reformed from any of these
□в	Not A					
	of Active Instability	/ – assessment reach	n metric			
_	-			e stream ha	s currently recove	ered. Examples of instability include
active b	bank failure, active cl	hannel down-cutting (h				such as concrete, gabion, rip-rap).
ΠA	< 10% of channel					
□в ⊠с	10 to 25% of char > 25% of channel					
	- 20 /0 OI GIIAIIIEI	andlabic				

6.	Strea	amside Ar	ea Interac	ction – stre	amside area	i metric				
	Cons LB	sider for tl RB	ne Left Ba	ank (LB) and	d the Right	Bank (RB).				
	□A ⊠B	□а ⊠в	Modera referer	ate evidence nce interactio	of conditions of camples:	limited streamsi	rms, levee ide area ad	es, down- ccess, dis	teraction cutting, aggradation, dredging) that adversely affor ruption of flood flows through streamside area, lea nor ditching [including mosquito ditching])	
	□с	□с	[examp of flood mosqui	les: causew I flows throug	ays with floo ghstreamside	dplain and chann e area] <u>or</u> too mud	el constric ch floodpla	tion, bulk iin/intertic	eraction (little to no floodplain/intertidal zone acce heads, retaining walls, fill, stream incision, disrupti lal zone access [examples: impoundments, intensi or assessment reach is a man-made feature on	on ive
7.	Wate	r Quality	Stressors	– assessm	ent reach/ir	ntertidal zone n	netric			
	Check all that apply.  ☐ A Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)  ☐ B Excessive sedimentation (burying of stream features or intertidal zone)  ☐ C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem									
	□D □E				ulfide odors) ed data indic		water qual	ity in the	assessment reach. Cite source in "Notes/Sketo	:h"
	□F □G	section Livesto	n. ock with ac	ccess to stre	am or intertio	dal zone	·	,		
	□H □I ⊠J	Other:				lal zone (remova n in "Notes/Sketo			nowing, destruction, etc)	
8.		B Drought conditions and rainfall exceeding 1 inch within the last 48 hours								
9.	<b>Larg</b> e				ssment rea		f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition)	
10.		ral In-stre □Yes [	□No □	Degraded in- sedimentation	-stream habi n, mining, ex		am harde	ning [for	nt reach (examples of stressors include excessi example, rip-rap], recent dredging, and snaggir p to Metric 12)	
	10b.	⊠A I	Multiple ad (include liv	quatic macro erworts, lich	phytes and a ens, and alga	quatic mosses		skip for S	Size 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools)	
		⊠c ⊠D	vegetation Multiple sr 5% underd	nags and log cut banks an	s (including land) ad/or root ma	ap trees) ts and/or roots	Check for Tidal Marsh Streams Only	□i □j □K	Sand bottom 5% vertical bank along the marsh Little or no habitat	
			n banks e Little or no		normal wette	d perimeter				
**** <sup>*</sup>	****** Bedf								AL MARSH STREAMS************************************	
			_			• •			Coastal Plain streams)	
	11b.	⊠a I □B I	evaluated. Riffle-run s Pool-glide	Check the section (eva	appropriate luate 11c) aluate 11d)	e box(es).		·		
	11c.	In riffle sec	ctions, che	eck all that oc	cur below the	4 Coastal Plain	perimeter of streams a	and Tidal	essment reach – whether or not submerged. <b>Che Marsh Streams)</b> . Not Present (NP) = absent, Ra Predominant (P) = > 70%. Cumulative percentage	are
		should no	t exceed 1 R (	00% for eac	h assessmen P				Todominan (i )	
						Boulder (256 Cobble (64 – Gravel (2 – 64	– 4096 mr 256 mm)	n)		
						Sand (.062 -	2 mm)			
			$\boxtimes$			Silt/clay (< 0.0 Detritus Artificial (rip-r	,	ete, etc.)		
	11d.	□Yes [	□No Ar	e pools filled	with sedime	nt? (skip for Siz	ze 4 Coas	tal Plain	streams and Tidal Marsh Streams)	

12.	Aquatic	Life – a	sessment reach metric (skip for Tidal Marsh Streams)	
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13.   No Water Other:	
	12b. 🛚	Yes [	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all the apply. If No, skip to Metric 13.	ıat
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles	
	ä	$\triangleright$	Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)	
	H		Beetles Caddisfly larvae (T)	
			Asian clam (Corbicula)	
	$\vdash$		Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae	
	日		Dipterans Mayfly larvae (E)	
			Megaloptera (alderfly, fishfly, dobsonfly larvae)	
			Midges/mosquito larvae Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )	
			Mussels/Clams (not Corbicula)	
	H		Other fish Salamanders/tadpoles	
		$\triangleright$	Snails Stonefly larvae (P)	
			Tipulid larvae	
			Worms/leeches	
13.			I Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runce	)ff
	$\boxtimes$ A	$\boxtimes$ A	Little or no alteration to water storage capacity over a majority of the streamside area	
	□в □С	□в □С	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compactio livestock disturbance, buildings, man-made levees, drainage pipes)	n,
14.	Streams	ide Are	ı Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types)	
	Conside LB	r for the RB	Left Bank (LB) and the Right Bank (RB) of the streamside area.	
	$\Box$ A	$\Box$ A	Majority of streamside area with depressions able to pond water ≥ 6 inches deep	
	⊠в □c	⊠в □c	Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep	
15.			ce – streamside area metric (skip for Tidal Marsh Streams)	
			Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norm of assessment reach.	na
	LB □Y	RB ⊠Y	Are wetlands present in the streamside area?	
	⊠N	□N	Are wettarius present in the streamside area?	
16.			butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)	
	Check a □A		outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.  and/or springs (jurisdictional discharges)	
	□в □С	Ponds (	nclude wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, wei	ir۱
	$\boxtimes D$		e of bank seepage or sweating (iron in water indicates seepage)	')
	⊠E □F		ped or bank soil reduced (dig through deposited sediment if present) the above	
17.		w Detra	tors – assessment area metric (skip for Tidal Marsh Streams)	
	Check a  □ A		oply. e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)	
	□в	Obstruc	tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)	
	⊠c □d		tream (≥ 24% impervious surface for watershed) ethat the streamside area has been modified resulting in accelerated drainage into the assessment reach	
	□E □F	Assessi	nent reach relocated to valley edge the above	
18.			ssment reach metric (skip for Tidal Marsh Streams)	
			Consider "leaf-on" condition.	
	⊠a □B	Degrad	shading is appropriate for stream category (may include gaps associated with natural processes) ed (example: scattered trees)	
	$\Box$ C	Stream	shading is gone or largely absent	

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)									
	Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded									
	LB RB LB RB									
	□C □C □C From 30 to < 50 feet wide									
	D D D From 10 to < 30 feet wide									
	□E □E □E < 10 feet wide <u>or</u> no trees									
<ol> <li>Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)</li> <li>Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).</li> </ol>										
	LB RB									
	☑A ☑A Mature forest □B □B Non-mature woody vegetation <u>or</u> modified vegetation structure									
	☐C ☐C Herbaceous vegetation with or without a strip of trees < 10 feet wide									
	□ D									
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)									
	Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is									
	within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:									
	Abuts < 30 feet 30-50 feet									
	LB RB LB RB  □A □A □A □A □A Row crops									
	□A □A □A □A □A Row crops □B □B □B □B ⊠B Maintained turf									
	□ C □ C □ C □ C □ C Pasture (no livestock)/commercial horticulture									
	□ D □ D □ D □ D □ D Pasture (active livestock use)									
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).									
	LB RB									
	<ul><li>✓ A Medium to high stem density</li><li>✓ B ☐ B Low stem density</li></ul>									
	□C □C No wooded riparian buffer or predominantly herbaceous species or bare ground									
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)									
	Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB									
	□B □B The total length of buffer breaks is between 25 and 50 percent. □C □C The total length of buffer breaks is > 50 percent.									
	· ·									
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to									
	assessment reach habitat.									
	LB RB									
	□ A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.									
	☑B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or									
	communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or									
	communities missing understory but retaining canopy trees.									
	UC Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted									
	stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.									
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)									
	25a. ☐ Yes ☐ No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐ No Water ☐ Other:									
	· · · · · · · · · · · · · · · · · · ·									
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  □ A < 46 □ B 46 to < 67 □ C 67 to < 79 □ D 79 to < 230 □ E ≥ 230									

Notes/Sketch:

Coffey Creek is extrememly incised with failing banks. Many trees are in the stream damming up the stream in places. Abundant privet and autumn olive in streamside area.

Stream Site Name	CLT Airport Expansion	Date of Assessment	October 2019					
Stream Category	n KMT,BGB/HDR							
Notes of Field Assessment Form (Y/N)  YES								
Presence of regulato	NO							
Additional stream information/supplementary measurements included (Y/N)  YES								
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial  Perennial								

(perennial, intermittent, Tidal Marsh Stream)	Perennia	<u> </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	MEDIUM	
(2) Baseflow	HIGH	
(2) Flood Flow	MEDIUM	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	MEDIUM	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	MEDIUM	
(3) Stream Stability	LOW	
(4) Channel Stability	LOW	
(4) Sediment Transport	MEDIUM	
(4) Stream Geomorphology	LOW	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	HIGH	
(2) In-stream Habitat	MEDIUM	
(3) Baseflow	HIGH	
(3) Substrate	MEDIUM	
(3) Stream Stability	LOW	
(3) In-stream Habitat	HIGH	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	HIGH	

		Acco	inpanies osci me	illuai version z.i					
USACE AII				NCDWR #:					
						.5-minute topographic quadrang			
						on the same property, identify a			
						er Manual for detailed description rements were performed. See t			
		nples of additional meas			ry moada	rements were performed. Gee			
					oe within	the assessment area).			
	SITE INFORMATIO		_						
•		CLT Airport Expansion		. Date of evaluation:	October				
5. County:		CLT Mecklenburg		. Assessor name/organia		KMT,BGB/HDR			
7. River bas	_	Catawba		<ol> <li>Nearest named water to on USGS 7.5-minute of</li> </ol>	-	Coffey Creek			
	_	grees, at lower end of a	assessment reach):			- Concy Creek			
	•	pth and width can be PS12-1	approximations)						
9. Site num	ber (show on attach			ength of assessment read	ch evalua	ated (feet): 35'			
		riffle, if present) to top		3		nable to assess channel depth.			
	I width at top of ban			sessment reach a swam	p steam?	? □Yes □No			
		flow ⊠Intermittent flow	v □Tidal Marsh St	ream					
	ATEGORY INFOR		N			□ a . a			
15. NC SAN	/I Zone:	☐ Mountains (M)	□ Piedmont (P)	☐ Inner Coastal Pla	ain (I)	☐ Outer Coastal Plain (O)			
				/		1			
				")					
	ed geomorphic	$\boxtimes$ A $\longrightarrow$	$\mathcal{L}$	□в	7	~			
	hape ( <b>skip for</b> arsh Stream):	(more sinuous strear	m. flatter vallev slor	oe) (less sin	nuous stre	eam, steeper valley slope)			
	ned size: (skip	Size 1 (< 0.1 mi²)							
	al Marsh Stream)	23 0120 1 (		0.01111)	(0.0 10 < 0				
	L INFORMATION:								
		_		ck all that apply to the as					
	on 10 water	☐ Classified T			•	shed ( I I II III III IV IV			
	ntial Fish Habitat cly owned property	☐ Primary Nur	sery Area parian buffer rule in		•	Outstanding Resource Waters			
_	romous fish	□303(d) List	dian buller rule in			onmental Concern (AEC)			
			listed protected spe	ecies within the assessm					
_ List s	species:								
	nated Critical Habit								
19. Are add	itional stream inforr	nation/supplementary n	neasurements inclu	ded in "Notes/Sketch" se	ection or a	attached? ⊠Yes □No			
1. Channe	l Water – assessr	nent reach metric (sk	tip for Size 1 strea	ams and Tidal Marsh S	Streams)				
$\Box$ A		assessment reach.	•		,				
□в	No flow, water in p								
⊠c	No water in asses	sment reach.							
		tion – assessment re							
□А						ted by a flow restriction or fill to			
						mpoundment on flood or ebb w he channel, tidal gates, debris ja			
	beaver dams).	each (examples, under	sized of perched co	iiveris, causeways iilai c	onstrict ti	ne chamiei, tidai gates, debris ja			
⊠в	Not A								
3. Feature	Pattern – assess	ment reach metric							
□А	A majority of the a	assessment reach has a	altered pattern (exa	mples: straightening, mo	dification	above or below culvert).			
⊠в	Not A			-					
4. Feature	Longitudinal Pro	file – assessment rea	ach metric						
$\Box$ A						own-cutting, existing damming,			
	widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of t								
⊠в	disturbances). [B Not A								
		/ 000000mom4 == == !-	motric						
_	-	y – assessment reach		o etroam has ourrently	v ro covo	rad Evamples of instability ins			
						red. Examples of instability incuch as concrete, gabion, rip-rap			
⊠a	< 10% of channel	unstable	y,	<u> </u>	3 (30	- 1.17 G 21-11 17 1 17 1 17 1 17 1 17 1 17 1 17			
□в □с	10 to 25% of chan								
1 10	> 25% of channel	unsiable							

ο.					eamside area				
	LB	RB	tne Len	Bank (LB) ar	nd the Right E	sank (RB).			
	⊠a □B	⊠a □B	Mod refe or in	derate evidenc rence interacti ntermittent bull	e of conditions on (examples: kheads, cause	limited streamsion	rms, leve de area a lain const	es, down- ccess, dis riction, mi	cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	□с	□с	[exa of fl mos	emples: cause ood flows throu	ways with flood ugh streamside ]) <u>or</u> floodplain	dplain and chann area] <u>or</u> too mud	el constri ch floodpla	ction, bulk ain/intertio	eraction (little to no floodplain/intertidal zone access neads, retaining walls, fill, stream incision, disruption al zone access [examples: impoundments, intensive or assessment reach is a man-made feature on ar
7.	Wate	r Quality	Stress	ors – assessi	ment reach/in	itertidal zone m	netric		
	Chec □A	k all that		ator in stroom	or intertidal zer	aa (millay whita k	ممير مياه	stural wate	er discoloration, oil sheen, stream foam)
	□в □с	Exce: Notic	<u>ssive</u> se eable ev	dimentation (b	urying of strea utant discharge	m features or int	tertidal zo	ne)	nd causing a water quality problem
	□D □E		ent publi	luding natural shed or collec		ating degraded v	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F □G				eam or intertid or intertidal zon				
	□H □H □H	Degr Othe	aded ma	rsh vegetation	n in the intertida				nowing, destruction, etc)
В.					ric (skin for T	idal Marsh Str	ame)		
		Drought conditions and rainfall exceeding 1 inch within the last 48 hours							
9.	<b>Larg</b> ∘	e or <u>D</u> an	gerous	Stream – ass	essment read		f Yes, skip	o to Metric	13 (Streamside Area Ground Surface Condition).
10.					assessment				
	10a.	□Yes	∐No	sedimentation	on, mining, ex		am harde	ening [for	t reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.	Check a ⊠A	Multiple	aquatic macr	if > 5% coverage ophytes and a hens, and alga	quatic mosses		skip for S	Size 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠в	Multiple	sticks and/or		d/or emergent	ok for Ti h Strea Only	□H □I	Low-tide refugia (pools)
		⊠c		snags and lo	gs (including la		Check for Tidal Marsh Streams Only	□J	Sand bottom 5% vertical bank along the marsh
		⊠D □E	in bank		nd/or root mat e normal wetted	s and/or roots d perimeter	02	□к	Little or no habitat
****	****	******	****	*R FM AINING	QUESTIONS	ARE NOT APPI	ICABI E	FOR TIDA	AL MARSH STREAMS************************************
11.	Bedf								n streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	ls assessmer	nt reach in a na	atural sand-bed	stream? (	skip for C	coastal Plain streams)
	11b.	⊠a □b	Riffle-ru Pool-gli	un section <b>(ev</b> ide section <b>(ev</b>	(aluate 11d)				
	11-				• •	etric 12, Aquatio	•	of the coo	Charles
	TTC.	at least (R) = pre	one box esent but	t <b>in each row</b> ( t <u>&lt;</u> 10%, Comr	(skip for Size	<b>4 Coastal Plain</b> 0-40%, Abundan	streams	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		NP ⊠	R □	C A	P	Bedrock/sapro	olite		
						Boulder (256 -	– 4096 m	m)	
						Cobble (64 – 2 Gravel (2 – 64	1 mm)		
						Sand (.062 – 2 Silt/clay (< 0.0	,		
			$\square$			Detritus Artificial (rip-ra		ete, etc.)	
	11d.	_ □Yes	_ □No		ed with sedimer	` '	•	,	streams and Tidal Marsh Streams)

12.	Aquatic	Lite -	asses	sment reach metric (skip for Tidal Marsh Streams)			
	12a. ⊠ If I			Was an in-stream aquatic life assessment performed as described in the User Manual? of the following reasons and skip to Metric 13. ☐ No Water ☐ Other:			
	12b. □	Yes	⊠No	Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all tha apply. If No, skip to Metric 13.			
	1		>1 □ Adul				
	H			atic reptiles atic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)			
			Beet	les			
	님			disfly larvae (T) n clam ( <i>Corbicula</i> )			
	H			tacean (isopod/amphipod/crayfish/shrimp)			
				selfly and dragonfly larvae			
	H			erans fly larvae (E)			
			□Meg	aloptera (alderfly, fishfly, dobsonfly larvae)			
				res/mosquito larvae			
				quito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea)</i> sels/Clams (not <i>Corbicula</i> )			
			Othe	er fish			
	片		∐Sala ∐Snai	manders/tadpoles			
			Ston	efly larvae (P)			
				lid larvae ms/leeches			
13.	Streams	side Ar	ea Gro	ound Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff			
	LB ⊠A	RB ⊠A	1 :441				
	□B	□B		e or no alteration to water storage capacity over a majority of the streamside area derate alteration to water storage capacity over a majority of the streamside area			
	□с	□с	Sev	rere alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction stock disturbance, buildings, man-made levees, drainage pipes)			
14.				ter Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types)			
	Conside LB	er for ti RB	he Lef	t Bank (LB) and the Right Bank (RB) of the streamside area.			
	$\Box$ A	$\square$ A	Maj	ority of streamside area with depressions able to pond water ≥ 6 inches deep			
	⊠B □C	⊠B □C		ority of streamside area with depressions able to pond water 3 to 6 inches deep ority of streamside area with depressions able to pond water < 3 inches deep			
15.	Wetland Presence – streamside area metric (skip for Tidal Marsh Streams)  Consider for the Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma						
				sessment reach.			
	LB		۸	wettende present in the etreoposide erec?			
	□Y ⊠N	□Y ⊠N	Are	wetlands present in the streamside area?			
۱6.	Baseflo	w Cont	tributo	rs – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)			
				rs within the assessment reach or within view of <u>and</u> draining to the assessment reach.			
	□a ⊠b			or springs (jurisdictional discharges) de wet detention basins; do not include sediment basins or dry detention basins)			
	$\Box$ C	Obstru	uction p	passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)			
	□d ⊠e			pank seepage or sweating (iron in water indicates seepage) or bank soil reduced (dig through deposited sediment if present)			
	□F		of the a	t y y t			
17.				- assessment area metric (skip for Tidal Marsh Streams)			
	Check a  ☐ A			substantial unter with drawale from the approximent reach (includes areas everysted for nump installation)			
	□В □В			substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)			
	□с	Urban	strean	n (≥ 24% impervious surface for watershed)			
	□D □E			t the streamside area has been modified resulting in accelerated drainage into the assessment reach reach relocated to valley edge			
	⊠F		of the a				
18.				nt reach metric (skip for Tidal Marsh Streams)			
	Conside ⊠A			sider "leaf-on" condition.			
	□в			ing is appropriate for stream category (may include gaps associated with natural processes) xample: scattered trees)			
	□c			ing is gone or largely absent			

19.	Buffer Width -	streamside area metric (skip for Tidal Marsh Streams)
	Consider "vege to the first brea	tated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out lk.
	0	poded
	LB RB LB	
		A
		C □C From 30 to < 50 feet wide
		D □D From 10 to < 30 feet wide
		E □E < 10 feet wide <u>or</u> no trees
20.	Buffer Structure	e – streamside area metric (skip for Tidal Marsh Streams)
		ft bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).
	LB RB ⊠A ⊠A	Mature forest
	$\Box$ B $\Box$ B	Non-mature woody vegetation <u>or</u> modified vegetation structure
	$\Box c$ $\Box c$	Herbaceous vegetation with or without a strip of trees < 10 feet wide
	$\Box$ D $\Box$ D	Maintained shrubs
		Little or no vegetation
21.		s – streamside area metric (skip for Tidal Marsh Streams)
		priate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is
		stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  bllowing stressors occurs on either bank, check here and skip to Metric 22:
		30 feet 30-50 feet
	LB RB LB	
		A □A □A Row crops B □B 図B Maintained turf
		B □B ☑B ☑B Maintained turf C □C □C Pasture (no livestock)/commercial horticulture
		D D D Pasture (active livestock use)
22.	Stem Density -	streamside area metric (skip for Tidal Marsh Streams)
	_	ft bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).
	LB RB	
	⊠a ⊠a	Medium to high stem density
	□в	Low stem density No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground
22		
23.	=	egetated Buffer – streamside area metric (skip for Tidal Marsh Streams) r vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.
	LB RB	r vegetated buller is continuous along stream (parallel). Dreaks are areas lacking vegetation > 10 feet wide.
	$\boxtimes A$ $\boxtimes A$	The total length of buffer breaks is < 25 percent.
	□в □в	The total length of buffer breaks is between 25 and 50 percent.
	□с □с	The total length of buffer breaks is > 50 percent.
24.		position – streamside area metric (skip for Tidal Marsh Streams)
	Evaluate the don assessment reac	ninant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to
	LB RB	ii ilabitat.
	$\boxtimes A$ $\boxtimes A$	Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species,
		with non-native invasive species absent or sparse.
	□в □в	Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or
		communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or
		communities missing understory but retaining canopy trees.
	□с □с	Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities
		with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.
25	Conductivity -	assessment reach metric (skip for all Coastal Plain streams)
25.		No Was conductivity measurement recorded?
		et one of the following reasons.  No Water Other:
	25h Check the	box corresponding to the conductivity measurement (units of microsiemens per centimeter).
	$\Box$ A < 46	
Note	es/Sketch:	

### Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

Stream Site Name	CLT Airport Expansion	Date of Assessment	October 2019 KMT,BGB/HDR				
Stream Category	Pa1	Assessor Name/Organization					
		<del></del>		,			
Notes of Field Asses	ssment Form (Y/N)		NO				
Presence of regulato	ory considerations (Y/N)		NO				
Additional stream inf	YES						
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream) Intermittent							

e (perennial, intermittent, Tidal Marsh Stream)	Intermitter	<u>nt</u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	HIGH
(2) Baseflow	HIGH	HIGH
(2) Flood Flow	HIGH	HIGH
(3) Streamside Area Attenuation	HIGH	HIGH
(4) Floodplain Access	HIGH	HIGH
(4) Wooded Riparian Buffer	HIGH	HIGH
(4) Microtopography	HIGH	HIGH
(3) Stream Stability	HIGH	HIGH
(4) Channel Stability	HIGH	HIGH
(4) Sediment Transport	LOW	LOW
(4) Stream Geomorphology	HIGH	HIGH
(2) Stream/Intertidal Zone Interaction	NA	NA
(2) Longitudinal Tidal Flow	NA	NA
(2) Tidal Marsh Stream Stability	NA	NA
(3) Tidal Marsh Channel Stability	NA	NA
(3) Tidal Marsh Stream Geomorphology	NA	NA
(1) Water Quality	HIGH	HIGH
(2) Baseflow	HIGH	HIGH
(2) Streamside Area Vegetation	HIGH	HIGH
(3) Upland Pollutant Filtration	HIGH	HIGH
(3) Thermoregulation	HIGH	HIGH
(2) Indicators of Stressors	NO	NO
(2) Aquatic Life Tolerance	OMITTED	NA
(2) Intertidal Zone Filtration	NA NA	NA NA
(1) Habitat	HIGH	HIGH
(2) In-stream Habitat	MEDIUM	MEDIUM
(3) Baseflow	HIGH	HIGH
(3) Substrate	LOW	LOW
(3) Stream Stability	HIGH	HIGH
(3) In-stream Habitat	HIGH	HIGH
(2) Stream-side Habitat	HIGH	HIGH
(3) Stream-side Habitat	HIGH	HIGH
(3) Thermoregulation	HIGH	HIGH
(2) Tidal Marsh In-stream Habitat	NA NA	NA NA
(3) Flow Restriction		
. ,	NA NA	NA NA
(3) Tidal Marsh Stream Stability (4) Tidal Marsh Channel Stability		
	NA NA	NA NA
(4) Tidal Marsh Stream Geomorphology (3) Tidal Marsh In-stream Habitat	NA NA	NA NA
(2) Intertidal Zone	NA NA	NA NA
( )	NA NA	NA
Overall	HIGH	HIGH

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

			Accompanies	User Manual Version 5.0	
U:	SACE AID			NCDWR#	
	Pr	oject Name	e CLT Airport Expansion	Date of Evaluation	April 2019
Α.	pplicant/O	wner Name	CLT	Wetland Site Name	PW1-1 - Wetland 5
	We	etland Type	Headwater Forest	Assessor Name/Organization	KMT, BGB/HDR
		l Ecoregior		Nearest Named Water Body	Ticer Branch
		River Basir		USGS 8-Digit Catalogue Unit	03050101
	·	County	-	NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.229386; -80.956805
		.5 🔼 140	7 Teophaion within 40 me.	Editiddo/Editigitado (addi dogredo)	00.220000, 00.000000
PI re	ease circle cent past (I	and/or ma for instance drological r face and s ks, underg ns of veger bitat/plant of sment are Considera adromous f derally prot DWR ripar ats a Prima blicly owne	e, within 10 years). Noteworthy stressors nodifications (examples: ditches, dams, bub-surface discharges into the wetland (exround storage tanks (USTs), hog lagoons, tation stress (examples: vegetation mortate community alteration (examples: mowing, a intensively managed? Yes tions - Were regulatory considerations evish ected species or State endangered or threst ian buffer rule in effect ary Nursery Area (PNA)	stressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) camples: discharges containing obvious pollu, etc.) ality, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No raluated?  Yes  No If Yes, check all the eatened species	utants, presence of nearby septic , salt intrusion, etc.)
	Des	uts a strear signated N		upplemental classifications of HQW, ORW,	or Trout
w	hat type o	f natural s	tream is associated with the wetland, i	f any? (check all that apply)	
ΙË		ckwater		and the formation and appropriate	
	Bro	wnwater			
	Tid	al (if tidal.	check one of the following boxes)	unar ☐ Wind ☐ Both	
		` .	<b>3</b> , _		
Is	the asses	sment are	a on a coastal island?   Yes	No	
le	the acces	smont aro	a's surface water storage canacity or d	luration substantially altered by beaver?	☐ Yes ☒ No
D	bes the as	sessment	area experience overbank flooding dur	ring normal rainfall conditions? U Yes	⊠ No
1.	Ground S	Surface Co	ondition/Vegetation Condition – assess	ment area condition metric	
	assessme area base	ent area. C		und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
		⊠A N □B S s	edimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ice, herbicides, salt intrusion [where appropron)	s pollutants) (vegetation structure
2.	Surface a	and Sub-S	urface Storage Capacity and Duration	- assessment area condition metric	
	Consider deep is es	both increace to Sub	ase and decrease in hydrology. A ditch s	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface r. Consider tidal flooding regime, if applicab	water only, while a ditch > 1 foot
	□в	□B V	Vater storage capacity or duration are sub	ot altered. ered, but not substantially (typically, not suffice estantially altered (typically, alteration sufficiention, inderg	ent to result in vegetation change)
3.	Water St	orage/Sur	face Relief – assessment area/wetland	type condition metric (skip for all marshe	es)
	Check a	box in eac	h column. Select the appropriate storage	e for the assessment area (AA) and the wetl	land type (WT).
	AA			, ,	· · · ·
	3a.	□A M □B M □C M	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to pond water < 3 inches	to pond water 6 inches to 1 foot deep to pond water 3 to 6 inches deep	
	□В	Evidence t	hat maximum depth of inundation is great hat maximum depth of inundation is between	een 1 and 2 feet	

	Make so	il obser		<b>the three soil property groups below.</b> Dig soil profile in the dominant assessment area landscape feature. nin the top 12 inches.  Use most recent National Technical Committee for Hydric Soils guidance for regional
	indicators 4a. □A □B □C □D □D	Sa Lo Lo	amy or clar	yey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) yey soils not exhibiting redoximorphic features yey gleyed soil stic epipedon
	4b. ⊠A ⊟B		oil ribbon < oil ribbon ≥	
	4c. ⊠A ⊟B	No A		uck presence ck presence
5.	Discharç	ge into '	Wetland -	opportunity metric
	of sub-su Surf	ırface di Sub		nn. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples aclude presence of nearby septic tank, underground storage tank (UST), etc.
	⊠A □B	⊠a □B	Noticeab	no evidence of pollutants or discharges entering the assessment area sle evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the totapacity of the assessment area
	□с	□C	potential	ble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and ly overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive tation, odor)
6.	Land Us	e – opp	ortunity m	etric (skip for non-riparian wetlands)
	to assess	sment a	rea within e	ast one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M), in the watershed draining to the assessment area (2M).
	□A □B □C	□A □B □C	□A □B □C	≥ 10% impervious surfaces Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
	□D ⊠E ⊠F	□D ⊠E ⊠F	□D ⊠E ⊠F	≥ 20% coverage of agricultural land (regularly plowed land) ≥ 20% coverage of maintained grass/herb ≥ 20% coverage of clear-cut land
	ĞG	ĞĠ	ĞG	Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturbance in the watershed <u>or</u> hydrologic alterations that prevent drainage <u>and/or</u> overbank flow from affecting the assessment area.
7.	Wetland	Acting	as Vegeta	ted Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
	$\boxtimes$	Yes [	]No If \	ithin 50 feet of a tributary or other open water? /es, continue to 7b. If No, skip to Metric 8. only be present on one side of the water body. Make buffer judgment based on the average width of wetland.
	Re 7b. Ho	cord a r w much	ote if a por of the first	tion of the buffer has been removed or disturbed. 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Maked on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
		A ≥ B F	50 feet from 30 to	< 50 feet
		D F	rom 5 to <	
	7c. Tril		idth. If the	tributary is anastomosed, combine widths of channels/braids for a total width.  ]> 15-feet wide
	7d. Do	roots o		nt area vegetation extend into the bank of the tributary/open water?
	7e. Is s	stream o	or other ope ed – adjace	en water sheltered or exposed? nt open water with width < 2500 feet <u>and</u> no regular boat traffic. t open water with width ≥ 2500 feet or regular boat traffic.
8.	Wetland	Width	at the Asse	essment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and donly; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest
	only)		_	nn for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and
	the wetla WT	nd com WC	plex at the	assessment area (WC). See User Manual for WT and WC boundaries.
	∏A ⊠B	∏A ⊠B	≥ 100 fe	et to < 100 feet
	□C	□C		to < 80 feet
	□D	$\Box$ D	From 40	to < 50 feet
	□E □F	□E □F		to < 40 feet to < 30 feet
	□F □G □H	∐F □G		to < 30 feet o < 15 feet
		Ηĭ	< 5 feet	

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column. WT WC FW (if applicable) $ \begin{array}{cccccccccccccccccccccccccccccccccc$
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
12	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C From 50 to < 100 acres D D From 10 to < 50 acres E = E < 10 acres F F Wetland type has a poor or no connection to other natural habitats  13b. Evaluate for marshes only.
	Yes No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>□A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>□B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>□C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vege	Vegetative Structure – assessment area/wetland type condition metric						
	17a.		ation pres					
		⊠Yes	∐No	If Yes, continue to 17b. If No, skip to Metric 18.				
	17b.	Evaluate □A □B	≥ 25% c	coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation				
		structur		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Considered above the assessment area (AA) and the wetland type (WT) separately.	de			
		À ⊠A □B □C	WI ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent				
	Mid-Story	□A □B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent				
	Shrub	B □A B □C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent				
	Herb	A ⊠B □C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent				
18.	Snag	gs – wetla	and type	condition metric (skip for all marshes)				
	□A ⊠B	-	e snags (r	nore than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).				
19.	Diam	neter Clas	ss Distrib	ution – wetland type condition metric (skip for all marshes)				
	□A			opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are				
	⊠B □C		rity of car	opy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. opy trees are < 6 inches DBH or no trees.				
20.	Large	e Woody	Debris -	wetland type condition metric (skip for all marshes)				
	Includ □A ⊠B		e logs (mo	ris and man-placed natural debris.  ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).				
21.	Vege	etation/O <sub>l</sub>	pen Wate	r Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)				
		-		est describes the amount of interspersion between vegetation and open water in the growing season. Patterr I areas, while solid white areas indicate open water.  □B □C □D	nec			
		0	3					
22.	-	_		ty – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)				
				at may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversity	on			
	man- ⊠A			er dams, and stream incision. Documentation required if evaluated as B, C, or D. overland flow are not severely altered in the assessment area.				
	□в	Over	bank flow	is severely altered in the assessment area.				
				is severely altered in the assessment area.  and overland flow are severely altered in the assessment area.				

Wetland Site Name _		Date of Assessment April 2		
Wetland Type _	Headwater Forest A	Assessor Name/OrganizationKMT, BO		
Notes on Field Assess	ment Form (Y/N)		NO	
Presence of regulatory	considerations (Y/N)		YES	
Wetland is intensively		NO		
Assessment area is loc	cated within 50 feet of a natural tributary	or other open water (Y/N)	YES	
Assessment area is su	bstantially altered by beaver (Y/N)		NO	
Assessment area expe	riences overbank flooding during norma	al rainfall conditions (Y/N)	NO	
Assessment area is on	a coastal island (Y/N)		NO	
Sub-function Rating S	ummarv			
Function	Sub-function	Metrics	Rating	
Hydrology	Surface Storage and Retention	Condition	HIGH	
	Sub-surface Storage and	Condition	ШСП	
Motor Quality	Retention  Rethogon Change	Condition  Condition	HIGH	
Water Quality	Pathogen Change		HIGH	
		Condition/Opportunity	HIGH NO	
	Particulate Change	Opportunity Presence (Y/N) Condition	HIGH	
	Faiticulate Change	Condition/Opportunity	NA	
		Opportunity Presence (Y/N)	NA NA	
	Soluble Change	Condition	MEDIUM	
	Colubie Change	Condition/Opportunity	MEDIUM	
		Opportunity Presence (Y/N)	NO	
	Physical Change	Condition	LOW	
	. Hydioa. Chango	Condition/Opportunity	LOW	
		Opportunity Presence (Y/N)	YES	
	Pollution Change	Condition	NA	
	Š	Condition/Opportunity	NA	
		Opportunity Presence (Y/N)	NA	
Habitat	Physical Structure	Condition	MEDIUM	
	Landscape Patch Structure	Condition	LOW	
	Vegetation Composition	Condition	MEDIUM	
Function Rating Sumn	narv			
Function	···· <i>j</i>	Metrics	Rating	
Hydrology		Condition	HIGH	
Water Quality		Condition	HIGH	
		Condition/Opportunity	HIGH	
		Opportunity Presence (Y/N)	YES	
Habitat		Condition	LOW	

### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

			Accompanies	User Manual Version 5.0	
U:	SACE AID			NCDWR#	
	Pre	oject Name	e CLT Airport Expansion	Date of Evaluation	April 2019
Α.	Applicant/O	wner Name	CLT	Wetland Site Name	PW2-1 - Wetland 6
	We	etland Type	Headwater Forest	Assessor Name/Organization	KMT, BGB/HDR
		l Ecoregior		Nearest Named Water Body	Ticer Branch
		River Basir		USGS 8-Digit Catalogue Unit	03050101
	•	County		NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.230325, -80.957650
-		.5 🔼 140	7 Tecipitation within 40 his:	Eatitude/Editigitude (deel degrees)	33.230323, 00.337 030
PI re	ease circle cent past (I	and/or ma for instance drological r face and s ks, underg ns of veger bitat/plant of sment are Considera adromous f derally prot DWR ripar ats a Prima blicly owne	e, within 10 years). Noteworthy stressors nodifications (examples: ditches, dams, bub-surface discharges into the wetland (exround storage tanks (USTs), hog lagoons, action stress (examples: vegetation mortate community alteration (examples: mowing, a intensively managed? Yes Stions - Were regulatory considerations evish ected species or State endangered or threst an buffer rule in effect ry Nursery Area (PNA)	estressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) camples: discharges containing obvious pollutec.)  lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No  raluated?  Yes  No If Yes, check all the eatened species	utants, presence of nearby septic , salt intrusion, etc.)
	] Des	uts a strear signated N		upplemental classifications of HQW, ORW,	or Trout
W	hat type of	f natural e	tream is associated with the wetland, i	f any? (check all that apply)	
ΙË		ckwater	incum io accordated with the wettand, i	any: (oncor an that apply)	
$\boxtimes$	] Bro	wnwater			
Ē	Tid:		check one of the following boxes)	unar 🗌 Wind 🔲 Both	
	_	` .	<b>3</b> , —		
Is	the asses	sment are	a on a coastal island? 🔲 Yes 🛛	No	
Ic	the acces	cmont ara	a's surface water storage capacity or d	uration substantially altered by beaver?	☐ Yes ☒ No
				-	
D	oes the as	sessment	area experience overbank flooding dur	ring normal rainfall conditions? UYes	⊠ No
1.	Ground S	Surface Co	ondition/Vegetation Condition – assess	ment area condition metric	
•	Check a assessment area base	box in eac ent area. C	h column. Consider alteration to the gro	und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
	$\square$ A	⊠B S	edimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ice, herbicides, salt intrusion [where appropron)	s pollutants) (vegetation structure
2.	Surface a	and Sub-S	urface Storage Capacity and Duration -	- assessment area condition metric	
	Consider deep is ex Surf	both increace to Sub	ase and decrease in hydrology. A ditch s	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface c. Consider tidal flooding regime, if applicab	water only, while a ditch > 1 foot
	□в	□B V ⊠C V	Vater storage capacity or duration are sub	ot altered. ered, but not substantially (typically, not sufficent estantially altered (typically, alteration sufficientially, alteration, undergostion, filling, excessive sedimentation, undergostion, indergostically	ent to result in vegetation change)
3.	Water St	orage/Sur	ace Relief - assessment area/wetland	type condition metric (skip for all marshe	es)
	Check a	box in eac	h column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	AA	WT	• • • • • • • • • • • • • • • • • • • •	• •	
	3a.	□A M □B M □C M	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Pepressions able to pond water < 3 inchest	o pond water 6 inches to 1 foot deep o pond water 3 to 6 inches deep	
	⊠B	Evidence t	hat maximum depth of inundation is great hat maximum depth of inundation is between	een 1 and 2 feet	

	Make s	soil obs		t <b>he three soil property groups below.</b> Dig soil profile in the dominant assessment area landscape feature. In the top 12 inches.  Use most recent National Technical Committee for Hydric Soils guidance for regional
		]A ]B ]C ]D		
	4b. ⊠		Soil ribbon < 1 Soil ribbon ≥ 1	
	4c. ⊠	]A ]B	No peat or muck A peat or muck	
5.	Discha	arge int	o Wetland – o	pportunity metric
	of sub- Surf	-surface Sub		<ul> <li>n. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples clude presence of nearby septic tank, underground storage tank (UST), etc.</li> </ul>
	⊠a □B	⊠a ⊟B	Noticeable	o evidence of pollutants or discharges entering the assessment area e evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the capacity of the assessment area
	□C	□c	Noticeable potentially	e evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive attion, odor)
6.	Land l	Use – o	pportunity me	tric (skip for non-riparian wetlands)
	to asse	essment	t area within en	t one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining tire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M), the watershed draining to the assessment area (2M).
	□A □B □C	□A □B □C	□В Ū	≥ 10% impervious surfaces Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
	□D ⊠E ⊠F	□D ⊠E ⊠F	□D ≥	≥ 20% coverage of agricultural land (regularly plowed land) ≥ 20% coverage of maintained grass/herb ≥ 20% coverage of clear-cut land
	ĞG	∐G	∏G I	Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturbance in the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the assessment area.
7.	Wetlar	nd Actir	ng as Vegetate	ed Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
		Yes	⊠No If Ye	hin 50 feet of a tributary or other open water? es, continue to 7b. If No, skip to Metric 8. nly be present on one side of the water body. Make buffer judgment based on the average width of wetland.
	7b. H	Record a How mu	a note if a portion of the first 5	on of the buffer has been removed or disturbed.  0 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Make on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	<u>[</u>	⊐A □B □C	≥ 50 feet From 30 to <	50 feet
	Ī	□D □E	From 15 to < From 5 to < 1 < 5 feet <u>or</u> but	
		≤ 15-f	eet wide ::	ributary is anastomosed, combine widths of channels/braids for a total width.  > 15-feet wide
	7e. I	☐Yes s strean	□No n or other open	water sheltered or exposed?
	Ī	Expos	sed – adjacent	open water with width < 2500 feet <u>and</u> no regular boat traffic.  open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
В.				sment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest
				n for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and assessment area (WC). See User Manual for WT and WC boundaries.
	□A	□A	≥ 100 fee	
	В	В		o < 100 feet
	□C ⊠D	□C ⊠D		o < 80 feet o < 50 feet
	□E	□E	From 30 to	o < 40 feet
	□F	□F □G		o < 30 feet
	□G □H	□G	From 5 to	× 10 100t

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A A S 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  E E From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G From 1 to < 5 acres  H H H From 0.5 to < 1 acre  I I I From 0.1 to < 0.5 acre  J J J J From 0.01 to < 0.1 acre  K < 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
13	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C From 50 to < 100 acres D D From 10 to < 50 acres E = E < 10 acres F F Wetland type has a poor or no connection to other natural habitats  13b. Evaluate for marshes only.
	Yes No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>□A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>□B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>□C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Veae	etative St	ructure –	- assessment area/wetland type condition metric	
	_	Is vegeta	ation pres ☐No	· · · · · · · · · · · · · · · · · · ·	
	17b.	Evaluate □A □B	≥ 25% c	t coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. coverage of vegetation coverage of vegetation	
		structur		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Constact above the assessment area (AA) and the wetland type (WT) separately.	sider
		À □A □B □C	⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A □B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	dinds.	B □A □B □C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	H G	a □A E □B ⊠C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	gs – wetla	and type o	condition metric (skip for all marshes)	
	□a ⊠B	Large Not A		more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.				pution – wetland type condition metric (skip for all marshes)	
	□A	pres	ent.	nopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	⊟в ⊠с			nopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. nopy trees are < 6 inches DBH or no trees.	
20.	Larg	e Woody	Debris -	- wetland type condition metric (skip for all marshes)	
	Inclu □A ⊠B		e logs (mo	oris and man-placed natural debris. ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	_			er Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only	
				est describes the amount of interspersion between vegetation and open water in the growing season. Patte d areas, while solid white areas indicate open water.	erned
		0			
22.	-	_		ity – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	roica
	man-	made bei Over Over Over	rms, beave bank <u>and</u> bank flow land flow	nat may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diver yer dams, and stream incision. Documentation required if evaluated as B, C, or D. I overland flow are not severely altered in the assessment area. I is severely altered in the assessment area. I is severely altered in the assessment area. I is and overland flow are severely altered in the assessment area.	sion,
	Шυ	Don	Overbank	varie overland new are severely altered in the assessment area.	

wetland created by road construction and culvert downstream. Canopy trees dead.

Wetland Site Name _	PW2-1 - Wetland 6	Date of Assessment April 2	2019
Wetland Type _	Headwater Forest A	ssessor Name/Organization KMT,	BGB/HDR
Notes on Field Assess	ment Form (Y/N)		YES
Presence of regulatory	• •		YES
Wetland is intensively	·		NO
Assessment area is lo	cated within 50 feet of a natural tributary	or other open water (Y/N)	NO
Assessment area is su	bstantially altered by beaver (Y/N)		NO
Assessment area expe	eriences overbank flooding during norma	al rainfall conditions (Y/N)	NO
Assessment area is or	a coastal island (Y/N)		NO
Sub-function Rating S	ummary		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	LOW
,	Sub-surface Storage and		
W ( 0 !"	Retention	Condition	LOW
Water Quality	Pathogen Change	Condition	LOW
		Condition/Opportunity	LOW
	<b>-</b>	Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	LOW
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
	· · · · · ·	Opportunity Presence (Y/N)	NO NO
	Physical Change	Condition	LOW
		Condition/Opportunity	LOW
	- w w	Opportunity Presence (Y/N)	YES
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
11.19.7	DI : 10: 1	Opportunity Presence (Y/N)	NA NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	LOW MEDIUM
	Vegetation Composition	Condition	MEDIUM
unction Rating Sumn	nary		
Function		Metrics	Rating
Hydrology		Condition	LOW
Water Quality		Condition	LOW
		Condition/Opportunity	LOW
		Opportunity Presence (Y/N)	YES
Habitat		Condition	LOW

### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID :	#	Accompanies	NCDWR#	1
03		<del>#</del> oject Nam	e _CLT Airport Expansion	Date of Evaluation	Sentember 2010
^				Wetland Site Name	September 2019
A	pplicant/O				PW3-1 - Wetland 15
		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		l Ecoregio		Nearest Named Water Body	Coffey Creek
	ı	River Basi		USGS 8-Digit Catalogue Unit	03050103
		Count	y Mecklenburg	NCDWR Region	Mooresville
L	☐ Ye	s 🛛 N	Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.203001, -80.946993
E.	idonoo of	ctroccore	affecting the assessment area (may no	t he within the accessment area)	
Is Re	ease circle cent past (f	and/or m for instance drological in face and sicks, undergons of vege bitat/plant sment are Consideral adromous derally prof DWR ripal	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, but but but surface discharges into the wetland (examples into stress (examples: vegetation mortal community alteration (examples: mowing, the intensively managed? Yes wittings - Were regulatory considerations ever fish the ected species or State endangered or three iran buffer rule in effect	tressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the	utants, presence of nearby septic, salt intrusion, etc.)
	Pub N.C Abu Des Abu	olicly owner  Division  Streat  Division  Streat  Signated N  Streat  Signated N  Streat  Signated N	CNHP reference community I)-listed stream or a tributary to a 303(d)-lis	upplemental classifications of HQW, ORW, of ted stream	or Trout
	Bla Bro	ckwater wnwater	etream is associated with the wetland, if check one of the following boxes)		
IS	the assess	sment are	ea on a coastal island? 🔲 Yes 🖂 🏻	No	
				uration substantially altered by beaver? ing normal rainfall conditions?   Yes	☐ Yes       No
					Z 140
1.	Check a lassessme area base	box in eacent area. (		ment area condition metric  und surface (GS) in the assessment area ar  (see User Manual). If a reference is not app	
	$\boxtimes A$	⊠A I □B S	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exa icks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropr on)	pollutants) (vegetation structure
2.	Surface a	and Sub-S	Surface Storage Capacity and Duration -	- assessment area condition metric	
	Consider deep is ex Surf	both incre xpected to Sub	ase and decrease in hydrology. A ditch ≤	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicable of altered.	water only, while a ditch > 1 foot
	□в	□B '	Nater storage capacity or duration are alte Nater storage capacity or duration are sub	red, but not substantially (typically, not suffic stantially altered (typically, alteration suffici- tion, filling, excessive sedimentation, underg	ent to result in vegetation change)
3.	Water Sto	orage/Sur	face Relief - assessment area/wetland t	ype condition metric (skip for all marshe	es)
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	_ AA				
	□c ⊠d	□B □C 図D	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	o pond water 6 inches to 1 foot deep o pond water 3 to 6 inches deep deep	
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less t	een 1 and 2 feet	

		by from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature observations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for region of the three soil property groups below.
	4a. □A □B □C □D □E	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon
	4b. ⊠A □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch
	4c. ⊠A □B	No peat or muck presence A peat or muck presence
5.	Discharge	into Wetland – opportunity metric
	of sub-surf Surf S	ex in each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Example ace discharges include presence of nearby septic tank, underground storage tank (UST), etc.
	□В □	A Little or no evidence of pollutants or discharges entering the assessment area  Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area
	□c [	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)
6.	Land Use	- opportunity metric (skip for non-riparian wetlands)
	to assessm	hat apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources drainin ent area within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M 2 miles and within the watershed draining to the assessment area (2M).
	□A □	A □A ≥ 10% impervious surfaces
		B ☐B Confined animal operations (or other local, concentrated source of pollutants C ☐C ≥ 20% coverage of pasture
		D □D ≥ 20% coverage of agricultural land (regularly plowed land)
		E ☐E ≥ 20% coverage of maintained grass/herb
		]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_	147 41 1 4	assessment area.
7.		cting as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands) sessment area within 50 feet of a tributary or other open water?
	7a. is as ⊠Ye	
		and buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetland
	7b. How	rd a note if a portion of the buffer has been removed or disturbed. much of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mak · judgment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	□A	≥ 50 feet From 30 to < 50 feet
	□B □C	From 15 to < 30 feet
	⊠p	From 5 to < 15 feet
	☐E 7c. Tribu	< 5 feet <u>or</u> buffer bypassed by ditches arry width. If the tributary is anastomosed, combine widths of channels/braids for a total width.
	<u></u> ≤	5-feet wide
	7d. Do ro □Ye	ots of assessment area vegetation extend into the bank of the tributary/open water? s     ⊠No
	7e. Is str	eam or other open water sheltered or exposed?
		eltered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. posed – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.		idth at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and Woody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Fores
	Check a be	ex in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) are complex at the assessment area (WC). See User Manual for WT and WC boundaries.  C
	□A	]A ≥ 100 feet
		B From 80 to < 100 feet
		C From 50 to < 80 feet D From 40 to < 50 feet
		E From 30 to < 40 feet
		From 15 to < 30 feet  G From 5 to < 15 feet
		G Floir Stock 13 leet

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column. WT WC FW (if applicable) $\Box$ A $\Box$ A $\Box$ A $\geq$ 500 acres $\Box$ B $\Box$ B $\Box$ B From 100 to < 500 acres $\Box$ C $\Box$ C $\Box$ C $\Box$ C From 50 to < 100 acres $\Box$ D $\Box$ D $\Box$ D $\Box$ D $\Box$ D From 25 to < 50 acres $\Box$ E $\Box$ E $\Box$ E From 10 to < 25 acres $\Box$ F $\Box$ F $\Box$ F From 5 to < 10 acres $\Box$ G $\Box$ G $\Box$ G $\Box$ G From 1 to < 5 acres $\Box$ H $\Box$ H $\Box$ H $\Box$ H From 0.5 to < 1 acre $\Box$ I
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
12	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C From 50 to < 100 acres D From 10 to < 50 acres E E = E < 10 acres F Wetland type has a poor or no connection to other natural habitats  13b. Evaluate for marshes only.
	Yes No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>☑A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>☑B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>☑C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>☑A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>☐B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>☐C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vege	tative St	ructure –	assessment area/wetland type condition metric	
	17a.		ation pres		
		⊠Yes	∐No	If Yes, continue to 17b. If No, skip to Metric 18.	
	17b.	Evaluate □A □B	≥ 25% c	coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation	
	17c.	structure		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider above the assessment area (AA) and the wetland type (WT) separately.	de
		AA ⊠A □B □C	WI ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A ⊠B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	Shrub	B B ⊠C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	Herb	A □B □C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	ıs – wetla	and type	condition metric (skip for all marshes)	
	□a ⊠B		e snags (r	nore than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.	Diam	neter Clas	ss Distrib	ution – wetland type condition metric (skip for all marshes)	
	□A			opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	□B ⊠C		rity of car	opy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. opy trees are < 6 inches DBH or no trees.	
20.	Large	e Woody	Debris -	wetland type condition metric (skip for all marshes)	
	Includ □A ⊠B		e logs (mo	ris and man-placed natural debris.  ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	Vege	tation/O	pen Wate	r Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)	
		-		est describes the amount of interspersion between vegetation and open water in the growing season. Pattern I areas, while solid white areas indicate open water.  □B □C □D	nec
		0	S. S.		
22.	-	_		ty – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	
				at may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversi	ion
	man- ⊠A			er dams, and stream incision. Documentation required if evaluated as B, C, or D. overland flow are not severely altered in the assessment area.	
	□в	Over	bank flow	is severely altered in the assessment area.	
				is severely altered in the assessment area.  and overland flow are severely altered in the assessment area.	

Wetland Site Name P	W3-1 - Wetland 15	Date of Assessment Septe	ember 2019
Wetland Type B	ottomland Hardwood Forest As	sessor Name/Organization KMT,	BGB/HDR
Notes on Field Assessm	ent Form (Y/N)		NO
Presence of regulatory of			YES
Wetland is intensively m	, ,		NO
•	ited within 50 feet of a natural tributary	or other open water (Y/N)	YES
	stantially altered by beaver (Y/N)	, ,	NO
Assessment area experi	ences overbank flooding during normal	rainfall conditions (Y/N)	NO
Assessment area is on a	a coastal island (Y/N)		NO
Sub-function Poting Su	mmory.		
Sub-function Rating Sur Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	HIGH
Trydrology	Sub-surface Storage and	Condition	
_	Retention	Condition	MEDIUM
Water Quality	Pathogen Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Soluble Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	MEDIUM
	Vegetation Composition	Condition	HIGH
Function Rating Summa	ıry		
Function		Metrics	Rating
Hydrology		Condition	HIGH
Water Quality		Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
Habitat		Condition	MEDIUM

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID #	4	Accompanies	NCDWR#	
03		<del>/</del> oject Nam	e CLT Airport Expansion	Date of Evaluation	October 2019
				Wetland Site Name	
A	pplicant/Ov				PW4-1 - Wetland 22
		tland Typ		Assessor Name/Organization	KMT, BGB/HDR
		Ecoregic		Nearest Named Water Body	Coffey Creek
	F	River Bas	<u> </u>	USGS 8-Digit Catalogue Unit	03050103
		Coun	ty Mecklenburg	NCDWR Region	Mooresville
L	☐ Ye	s 🛛 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.192488, -80.943445
Fv	idence of	etrassar	s affecting the assessment area (may no	t he within the assessment area)	
Ple	ease circle cent past (for Hyd Surf tank Sigr Hab	and/or mor instance in the control of the control o	ake note on the last page if evidence of size, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, be sub-surface discharges into the wetland (examples) at the work of the wetland (examples) at the stress (examples: vegetation mortal community alteration (examples: mowing,	tressors is apparent. Consider departure f nclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious pollu etc.) lity, insect damage, disease, storm damage	utants, presence of nearby septic
D.	aulotom. C	`anaidar	otiona Wara regulatory considerations av	alusted? Myon DNo If You shook all the	at apply to the accomment area
_		<b>Consider</b> Idromous		aluated? $oxtimes$ Yes $oxtimes$ No If Yes, check all tha	at apply to the assessment area.
			tected species or State endangered or thre	atened species	
			rian buffer rule in effect	a.cca oposioo	
			ary Nursery Area (PNA)		
	Pub	licly own	ed property		
			of Coastal Management Area of Environme		
$  \square$				upplemental classifications of HQW, ORW, or	or Trout
			ICNHP reference community		
	Abu	its a 303(	d)-listed stream or a tributary to a 303(d)-lis	ted stream	
W	hat type of	natural	stream is associated with the wetland, if	any? (check all that apply)	
		ckwater		- \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
$\boxtimes$	Brov	wnwater			
	Tida	al (if tidal,	check one of the following boxes)	ınar 🗌 Wind 🔲 Both	
le	the assess	sment ar	ea on a coastal island?	No	
			ea's surface water storage capacity or du		☐ Yes ⊠ No
Do	es the ass	sessmen	area experience overbank flooding duri	ing normal rainfall conditions?   Yes	⊠ No
1.	Ground S	Surface C	ondition/Vegetation Condition - assessi	ment area condition metric	
			<u> </u>	und surface (GS) in the assessment area ar	nd vegetation structure (VS) in the
				(see User Manual). If a reference is not app	
			ence an effect.	(333 330) Mariaary. It a reference to flot app	onedoto, their rate the assessment
	GS '	VS	<del> </del>		
	⊠A [		Not severely altered		
	⊟B i			essment area (ground surface alteration exa	amples: vehicle tracks, excessive
				cks, bedding, fill, soil compaction, obvious	
			alteration examples: mechanical disturband	ce, herbicides, salt intrusion [where appropr	
			diversity [if appropriate], hydrologic alteration	on)	
2.	Surface a	nd Sub-	Surface Storage Capacity and Duration -	- assessment area condition metric	
					orago capacity and duration (Sub)
				acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface	
				. Consider tidal flooding regime, if applicable	
		specied it Sub	ander both surface and sub-surface Water.	. Consider tidal hooding regime, if applicable	ic.
			Water storage capacity and duration are no	ot altered.	
				red, but not substantially (typically, not suffic	cient to change vegetation).
				stantially altered (typically, alteration sufficient	
		_	(examples: draining, flooding, soil compacti	ion, filling, excessive sedimentation, underg	round utility lines).
3.	Water Sto			ype condition metric (skip for all marshe	
٥.		_			·
	AA \		on column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (vv i ).
	3a.		Majority of wetland with depressions able to	pond water > 1 deep	
	□ B		Majority of wetland with depressions able to		
	□c		Majority of wetland with depressions able to		
			Depressions able to pond water < 3 inches		
	_				
			that maximum depth of inundation is greate that maximum depth of inundation is betwee		
	⊠cı	Evidence	that maximum depth of inundation is less that	nan 1 foot	

		by from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature observations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for region of the three soil property groups below.
	4a. □A □B □C □D □E	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon
	4b. ⊠A □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch
	4c. ⊠A □B	No peat or muck presence A peat or muck presence
5.	Discharge	into Wetland – opportunity metric
	of sub-surf Surf S	ex in each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Example ace discharges include presence of nearby septic tank, underground storage tank (UST), etc.
	□В □	A Little or no evidence of pollutants or discharges entering the assessment area  Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area
	□c [	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)
6.	Land Use	- opportunity metric (skip for non-riparian wetlands)
	to assessm	hat apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources drainin ent area within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M 2 miles and within the watershed draining to the assessment area (2M).
	□A □	A □A ≥ 10% impervious surfaces
		B ☐B Confined animal operations (or other local, concentrated source of pollutants C ☐C ≥ 20% coverage of pasture
		D □D ≥ 20% coverage of agricultural land (regularly plowed land)
		E ☐E ≥ 20% coverage of maintained grass/herb
		]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_	147 41 1 4	assessment area.
7.		cting as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands) sessment area within 50 feet of a tributary or other open water?
	7a. is as ⊠Ye	
		and buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetland
	7b. How	rd a note if a portion of the buffer has been removed or disturbed. much of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mak · judgment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	□A	≥ 50 feet From 30 to < 50 feet
	□B □C	From 15 to < 30 feet
	⊠p	From 5 to < 15 feet
	☐E 7c. Tribu	< 5 feet <u>or</u> buffer bypassed by ditches arry width. If the tributary is anastomosed, combine widths of channels/braids for a total width.
	<u></u> ≤	5-feet wide
	7d. Do ro □Ye	ots of assessment area vegetation extend into the bank of the tributary/open water? s     ⊠No
	7e. Is str	eam or other open water sheltered or exposed?
		eltered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. posed – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.		idth at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and Woody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Fores
	Check a be	ex in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) are complex at the assessment area (WC). See User Manual for WT and WC boundaries.  C
	□A	]A ≥ 100 feet
		B From 80 to < 100 feet
		C From 50 to < 80 feet D From 40 to < 50 feet
		E From 30 to < 40 feet
		From 15 to < 30 feet  G From 5 to < 15 feet
		G Floir Stock 13 leet

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  □ A Evidence of short-duration inundation (< 7 consecutive days)  □ B Evidence of saturation, without evidence of inundation  □ C Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ Sediment deposition is not excessive, but at approximately natural levels.  □ Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  F F F From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G G From 1 to < 5 acres  H H H H From 0.5 to < 1 acre  XI XI From 0.1 to < 0.5 acre
	□K □K < 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
13.	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C C From 50 to < 100 acres D D From 10 to < 50 acres E C C To acres F Wetland type has a poor or no connection to other natural habitats
	13b. <b>Evaluate for marshes only</b> .  ☐Yes ☐No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)
	May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas $\geq$ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C." $\square$ A 0 $\square$ B 1 to 4 $\square$ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>✓A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>✓B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>✓C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>☑A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>☑B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>☑C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vege	tative St	ructure –	assessment area/wetland type condition metric	
	17a.		ation pres		
		⊠Yes	∐No	If Yes, continue to 17b. If No, skip to Metric 18.	
	17b.	Evaluate □A □B	≥ 25% c	coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation	
	17c.	structure		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider above the assessment area (AA) and the wetland type (WT) separately.	de
		AA ⊠A □B □C	WI ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A ⊠B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	Shrub	B B ⊠C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	Herb	A □B □C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	ıs – wetla	and type	condition metric (skip for all marshes)	
	□a ⊠B		e snags (r	nore than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.	Diam	neter Clas	ss Distrib	ution – wetland type condition metric (skip for all marshes)	
	□A			opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	□B ⊠C		rity of car	opy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. opy trees are < 6 inches DBH or no trees.	
20.	Large	e Woody	Debris -	wetland type condition metric (skip for all marshes)	
	Includ □A ⊠B		e logs (mo	ris and man-placed natural debris.  ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	Vege	tation/O	pen Wate	r Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)	
		-		est describes the amount of interspersion between vegetation and open water in the growing season. Pattern I areas, while solid white areas indicate open water.  □B □C □D	nec
		0	S. S.		
22.	-	_		ty – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	
				at may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversi	ion
	man- ⊠A			er dams, and stream incision. Documentation required if evaluated as B, C, or D. overland flow are not severely altered in the assessment area.	
	□в	Over	bank flow	is severely altered in the assessment area.	
				is severely altered in the assessment area.  and overland flow are severely altered in the assessment area.	

Date of Assessment October 2019

Wetland Site Name PW4-1 - Wetland 22

Welland Sile Name _	FVV4-1 - VVEIIanu ZZ	Date of Assessment Octob	DEI 2019
Wetland Type _	Bottomland Hardwood Forest	Assessor Name/Organization KMT,	BGB/HDR
Notes on Field Assess	sment Form (Y/N)		NO
	considerations (Y/N)		YES
Wetland is intensively			NO
•	cated within 50 feet of a natural tributar	y or other open water (Y/N)	YES
Assessment area is su	ubstantially altered by beaver (Y/N)		NO
Assessment area expo	eriences overbank flooding during norm	al rainfall conditions (Y/N)	NO
•	n a coastal island (Y/N)	, ,	NO
Sub-function Rating S	Summary		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention Sub-surface Storage and	Condition	HIGH
	Retention	Condition	MEDIUM
Water Quality	Pathogen Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Soluble Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	LOW
	Vegetation Composition	Condition	HIGH
Function Rating Sumr	mary		
Function		Metrics	Rating
Hydrology		Condition	HIGH
Water Quality		Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
Habitat		Condition	LOW

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID :	#	Accompanies	NCDWR#	
03		<del>#</del> oject Nam	e _CLT Airport Expansion	Date of Evaluation	October 2019
^					
A	pplicant/O			Wetland Site Name	PW5-1 - Wetland 24
		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		l Ecoregio		Nearest Named Water Body	Coffey Creek
	ı	River Basi		USGS 8-Digit Catalogue Unit	03050103
		Count	y Mecklenburg	NCDWR Region	Mooresville
L	☐ Ye	s 🛛 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.190762, -80.941877
E.	idonoo of	otrocoor	offecting the acceptant area (may no	t he within the acceptment area)	
Is Re	ease circle cent past (f	and/or m for instance drological of face and s ks, undergens of vege bitat/plant sment are Considera adromous derally pro DWR ripa uts a Prima	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, but be sub-surface discharges into the wetland (expround storage tanks (USTs), hog lagoons, station stress (examples: vegetation mortal community alteration (examples: mowing, the a intensively managed?   Yes   Attions - Were regulatory considerations evaluations.	tressors is apparent. Consider departure f nclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all that	utants, presence of nearby septic, salt intrusion, etc.)
	Des Abu	C. Division uts a strea signated Nuts a 303(d	of Coastal Management Area of Environment with a NCDWQ classification of SA or such the CNHP reference community d)-listed stream or a tributary to a 303(d)-listed stream or a tributary tributary to a 303(d)-listed stream or a tributary	upplemental classifications of HQW, ORW, of ted stream	or Trout
	Blad Bro Tida	ckwater wnwater al (if tidal,	check one of the following boxes)	unar □ Wind □ Both	
			ea's surface water storage capacity or do		☐ Yes ☒ No ☐
DC	es the as	sessment	area experience overbank flooding dur	ing normal rainfall conditions?   Yes	⊠ No
1.	Check a lassessme	box in eacent area. (		ment area condition metric und surface (GS) in the assessment area an (see User Manual). If a reference is not app	
	GS ⊠A	VS ⊠A □B	Not severely altered Severely altered over a majority of the asse sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obviousce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure
2.	Surface	and Sub-9	Surface Storage Capacity and Duration -	assessment area condition metric	
	Check a l Consider deep is ex Surf ⊠A □B	box in ead both incre xpected to Sub ⊠A □B	ch column. Consider surface storage capa- hase and decrease in hydrology. A ditch ≤ affect both surface and sub-surface water Water storage capacity and duration are no Water storage capacity or duration are alter	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicable	water only, while a ditch > 1 foot le.  cient to change vegetation).
	_	_	(examples: draining, flooding, soil compact	ion, filling, excessive sedimentation, underg	round utility lines).
3.	Water Ste	orage/Sur	face Relief – assessment area/wetland t	ype condition metric (skip for all marshe	es)
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	□c ⊠d	□A □B □C ⊠D	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	o pond water 6 inches to 1 foot deep o pond water 3 to 6 inches deep deep	
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less t	een 1 and 2 feet	

		by from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature observations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for region of the three soil property groups below.
	4a. □A □B □C □D □E	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon
	4b. ⊠A □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch
	4c. ⊠A □B	No peat or muck presence A peat or muck presence
5.	Discharge	into Wetland – opportunity metric
	of sub-surf Surf S	ex in each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Example ace discharges include presence of nearby septic tank, underground storage tank (UST), etc.
	□В □	A Little or no evidence of pollutants or discharges entering the assessment area  Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area
	□c [	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)
6.	Land Use	- opportunity metric (skip for non-riparian wetlands)
	to assessm	hat apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources drainin ent area within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M 2 miles and within the watershed draining to the assessment area (2M).
	□A □	A □A ≥ 10% impervious surfaces
		B ☐B Confined animal operations (or other local, concentrated source of pollutants C ☐C ≥ 20% coverage of pasture
		D □D ≥ 20% coverage of agricultural land (regularly plowed land)
		E ☐E ≥ 20% coverage of maintained grass/herb
		]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_	147 41 1 4	assessment area.
7.		cting as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands) sessment area within 50 feet of a tributary or other open water?
	7a. is as ⊠Ye	
		and buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetland
	7b. How	rd a note if a portion of the buffer has been removed or disturbed. much of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mak · judgment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	□A	≥ 50 feet From 30 to < 50 feet
	□B □C	From 15 to < 30 feet
	⊠p	From 5 to < 15 feet
	☐E 7c. Tribu	< 5 feet <u>or</u> buffer bypassed by ditches arry width. If the tributary is anastomosed, combine widths of channels/braids for a total width.
	<u></u> ≤	5-feet wide
	7d. Do ro □Ye	ots of assessment area vegetation extend into the bank of the tributary/open water? s     ⊠No
	7e. Is str	eam or other open water sheltered or exposed?
		eltered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. posed – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.		idth at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and Woody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Fores
	Check a be	ex in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) are complex at the assessment area (WC). See User Manual for WT and WC boundaries.  C
	□A	]A ≥ 100 feet
		B From 80 to < 100 feet
		C From 50 to < 80 feet D From 40 to < 50 feet
		E From 30 to < 40 feet
		From 15 to < 30 feet  G From 5 to < 15 feet
		G Floir Stock 13 leet

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)					
	Answer for assessment area dominant landform.  □ A Evidence of short-duration inundation (< 7 consecutive days)  □ B Evidence of saturation, without evidence of inundation  □ C Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)					
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)					
	Consider recent deposition only (no plant growth since deposition).  □ Sediment deposition is not excessive, but at approximately natural levels.  □ Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.					
11.	Wetland Size – wetland type/wetland complex condition metric					
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  F F F From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G G From 1 to < 5 acres  H H H H From 0.5 to < 1 acre  XI XI From 0.1 to < 0.5 acre					
	□K □K < 0.01 acre or assessment area is clear-cut					
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)					
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.					
13.	Connectivity to Other Natural Areas – landscape condition metric					
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C C From 50 to < 100 acres D D From 10 to < 50 acres E C C To acres F Wetland type has a poor or no connection to other natural habitats					
	13b. <b>Evaluate for marshes only</b> .  ☐Yes ☐No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.					
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)					
	May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas $\geq$ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C." $\square$ A 0 $\square$ B 1 to 4 $\square$ C 5 to 8					
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)					
	<ul> <li>✓A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>✓B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>✓C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>					
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)					
	<ul> <li>☑A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>☑B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>☑C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>					

17.	7. Vegetative Structure – assessment area/wetland type condition metric				
17a. Is vegetation present?					
		⊠Yes	∐No	If Yes, continue to 17b. If No, skip to Metric 18.	
	17b.	Evaluate □A □B	≥ 25% c	coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation	
	17c.	structure		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider above the assessment area (AA) and the wetland type (WT) separately.	de
		AA ⊠A □B □C	WI ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A ⊠B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	Shrub	B B ⊠C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	Herb	A □B □C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	ıs – wetla	and type	condition metric (skip for all marshes)	
	□a ⊠B		e snags (r	nore than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.	Diam	neter Clas	ss Distrib	ution – wetland type condition metric (skip for all marshes)	
	□A			opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	□B ⊠C		rity of car	opy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. opy trees are < 6 inches DBH or no trees.	
20.	Large	e Woody	Debris -	wetland type condition metric (skip for all marshes)	
	Includ □A ⊠B		e logs (mo	ris and man-placed natural debris.  ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	Vege	tation/O	pen Wate	r Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)	
		-		est describes the amount of interspersion between vegetation and open water in the growing season. Pattern I areas, while solid white areas indicate open water.  □B □C □D	nec
		0	S. S.		
22.	-	_		ty – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	
				at may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversi	ion
	man- ⊠A			er dams, and stream incision. Documentation required if evaluated as B, C, or D. overland flow are not severely altered in the assessment area.	
	□в	Over	bank flow	is severely altered in the assessment area.	
□C Overland flow is severely altered in the assessment area. □D Both overbank and overland flow are severely altered in the assessment area.					

	PW5-1 - Wetland 24		er 2019			
Wetland Type _E	Bottomland Hardwood Forest A	Assessor Name/Organization KMT,	BGB/HDR			
Notes on Field Assessn	nent Form (Y/N)		NO			
Presence of regulatory	considerations (Y/N)		YES			
Wetland is intensively n	nanaged (Y/N)		NO			
Assessment area is located within 50 feet of a natural tributary or other open water (Y/N)						
Assessment area is sub	ostantially altered by beaver (Y/N)		NO			
Assessment area exper	riences overbank flooding during norm	al rainfall conditions (Y/N)	NO			
Assessment area is on	a coastal island (Y/N)		NO			
Sub-function Rating Su	ımmarv					
Function	Sub-function	Metrics	Rating			
Hydrology	Surface Storage and Retention	Condition	HIGH			
, 0,	Sub-surface Storage and	0 111	MEDUIM			
N/	Retention	Condition	MEDIUM			
Water Quality	Pathogen Change	Condition	HIGH			
		Condition/Opportunity	HIGH			
	Dortion late Change	Opportunity Presence (Y/N)	NO			
	Particulate Change	Condition/Opportunity	HIGH			
		Condition/Opportunity	NO			
	Salubla Changa	Opportunity Presence (Y/N) Condition	HIGH			
	Soluble Change	Condition/Opportunity	HIGH			
		Opportunity Presence (Y/N)	NO			
	Physical Change	Condition	MEDIUM			
	i nysicai onange	Condition/Opportunity	MEDIUM			
		Opportunity Presence (Y/N)	NO			
	Pollution Change	Condition (1714)	NA NA			
	. Ghanen Ghange	Condition/Opportunity	NA			
		Opportunity Presence (Y/N)	NA			
Habitat	Physical Structure	Condition	LOW			
	Landscape Patch Structure	Condition	LOW			
	Vegetation Composition	Condition	HIGH			
iunation Bating Summ	orv.					
Function Rating Summ Function	ан у	Metrics	Rating			
Hydrology		Condition	HIGH			
Water Quality		Condition	HIGH			
vvaler Quality		Condition/Opportunity	HIGH			
		Opportunity Presence (Y/N)	NO			
Habitat		Condition	LOW			

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

			Accompanies	User Manual Version 5.0	
U:	SACE AID			NCDWR#	
	Pr	oject Name	e CLT Airport Expansion	Date of Evaluation	April 2019
Α.	pplicant/O	wner Name	CLT	Wetland Site Name	PW1-1 - Wetland 5
	We	etland Type	Headwater Forest	Assessor Name/Organization	KMT, BGB/HDR
		l Ecoregior		Nearest Named Water Body	Ticer Branch
		River Basir		USGS 8-Digit Catalogue Unit	03050101
	·	County	-	NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.229386; -80.956805
		.5 🔼 140	7 Teophaion within 40 me.	Editiddo/Editigitado (addi dogredo)	00.220000, 00.000000
PI re	ease circle cent past (I	and/or ma for instance drological r face and s ks, underg ns of veger bitat/plant of sment are Considera adromous f derally prot DWR ripar ats a Prima blicly owne	e, within 10 years). Noteworthy stressors nodifications (examples: ditches, dams, bub-surface discharges into the wetland (exround storage tanks (USTs), hog lagoons, tation stress (examples: vegetation mortate community alteration (examples: mowing, a intensively managed? Yes tions - Were regulatory considerations evish ected species or State endangered or threst ian buffer rule in effect ary Nursery Area (PNA)	stressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) camples: discharges containing obvious pollu, etc.) ality, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No raluated?  Yes  No If Yes, check all the eatened species	utants, presence of nearby septic , salt intrusion, etc.)
	Des	uts a strear signated N		upplemental classifications of HQW, ORW,	or Trout
w	hat type o	f natural s	tream is associated with the wetland, i	f any? (check all that apply)	
ΙË		ckwater		and the formation and appropriate	
	Bro	wnwater			
	Tid	al (if tidal.	check one of the following boxes)	unar ☐ Wind ☐ Both	
		` .	<b>3</b> , _		
Is	the asses	sment are	a on a coastal island?   Yes	No	
le	the acces	smont aro	a's surface water storage canacity or d	luration substantially altered by beaver?	☐ Yes ☒ No
D	bes the as	sessment	area experience overbank flooding dur	ring normal rainfall conditions? U Yes	⊠ No
1.	Ground S	Surface Co	ondition/Vegetation Condition – assess	ment area condition metric	
	assessme area base	ent area. C		und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
		⊠A N □B S s	edimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ice, herbicides, salt intrusion [where appropron)	s pollutants) (vegetation structure
2.	Surface a	and Sub-S	urface Storage Capacity and Duration	- assessment area condition metric	
	Consider deep is es	both increace to Sub	ase and decrease in hydrology. A ditch s	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface r. Consider tidal flooding regime, if applicab	water only, while a ditch > 1 foot
	□в	□B V	Vater storage capacity or duration are sub	ot altered. ered, but not substantially (typically, not suffice estantially altered (typically, alteration sufficiention, inderg	ent to result in vegetation change)
3.	Water St	orage/Sur	face Relief – assessment area/wetland	type condition metric (skip for all marshe	es)
	Check a	box in eac	h column. Select the appropriate storage	e for the assessment area (AA) and the wetl	land type (WT).
	AA			, ,	· · · ·
	3a.	□A M □B M □C M	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to pond water < 3 inches	to pond water 6 inches to 1 foot deep to pond water 3 to 6 inches deep	
	□В	Evidence t	hat maximum depth of inundation is great hat maximum depth of inundation is between	een 1 and 2 feet	

	Make soil ob	t <b>from each of the three soil property groups below.</b> Dig soil profile in the dominant assessment area landscape featur servations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for region	
	indicators.  4a. □A □B □C □D □D	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon	
	4b. ⊠A □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch	
	4c. ⊠A □B	No peat or muck presence A peat or muck presence	
5.	Discharge in	nto Wetland – opportunity metric	
			ЭS
	□B □E	Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area	
	□c □c	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)	
6.	Land Use -	opportunity metric (skip for non-riparian wetlands)	
	to assessme	at apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining to the assessment area within entire upstream watershed (WS), within 5 miles and within the watershed draining to the assessment area (5M miles and within the watershed draining to the assessment area (2M).  2M	
	$\square A \qquad \square A$	A ☐A ≥ 10% impervious surfaces	
	⊠E ⊠E	E ⊠E ≥ 20% coverage of maintained grass/herb	
			n
		the watershed <u>or</u> hydrologic alterations that prevent drainage <u>and/or</u> overbank flow from affecting the assessment area.	
7.	Wetland Act	ing as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)	
	_	ssment area within 50 feet of a tributary or other open water?	
	⊠Yes Wetlan	No If Yes, continue to 7b. If No, skip to Metric 8. d buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetlan	ıd.
	Record	a note if a portion of the buffer has been removed or disturbed.	
		uch of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mal udgment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.) ≥ 50 feet	кe
	□B □C □D	From 30 to < 50 feet From 15 to < 30 feet From 5 to < 15 feet	
	⊠E	< 5 feet or buffer bypassed by ditches	
		ry width. If the tributary is anastomosed, combine widths of channels/braids for a total width.  -feet wide	
		-feet wide	
	☐Yes	⊠No	
		ım or other open water sheltered or exposed? tered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic.	
		osed – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.	
8.		Ith at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and loody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Fore	st
		in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) are complex at the assessment area (WC). See User Manual for WT and WC boundaries.	nd
	$\Box A \qquad \Box A$	A ≥ 100 feet	
	⊠B ⊠E		
		From 30 to < 40 feet	

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)				
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)				
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)				
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.				
11.	Wetland Size – wetland type/wetland complex condition metric				
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column. WT WC FW (if applicable) $ \begin{array}{cccccccccccccccccccccccccccccccccc$				
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)				
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.				
12	Connectivity to Other Natural Areas – landscape condition metric				
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C From 50 to < 100 acres D D From 10 to < 50 acres E = E < 10 acres F F Wetland type has a poor or no connection to other natural habitats  13b. Evaluate for marshes only.				
	Yes No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.				
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8				
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)				
	<ul> <li>□A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>□B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>□C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>				
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)				
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>				

17.	7. Vegetative Structure – assessment area/wetland type condition metric				
17a. Is vegetation present?					
		⊠Yes	∐No	If Yes, continue to 17b. If No, skip to Metric 18.	
	17b.	Evaluate □A □B	≥ 25% c	coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation	
		structur		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Considered above the assessment area (AA) and the wetland type (WT) separately.	de
		À ⊠A □B □C	WI ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A □B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	Shrub	B □A B □C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	Herb	A ⊠B □C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	gs – wetla	and type	condition metric (skip for all marshes)	
	□A ⊠B	-	e snags (r	nore than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.	Diam	neter Clas	ss Distrib	ution – wetland type condition metric (skip for all marshes)	
	□A			opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	⊠B □C		rity of car	opy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. opy trees are < 6 inches DBH or no trees.	
20.	Large	e Woody	Debris -	wetland type condition metric (skip for all marshes)	
	Includ □A ⊠B		e logs (mo	ris and man-placed natural debris.  ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	Vege	etation/O <sub>l</sub>	pen Wate	r Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)	
		-		est describes the amount of interspersion between vegetation and open water in the growing season. Patterr I areas, while solid white areas indicate open water.  □B □C □D	nec
		0	3		
22.	-	_		ty – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	
				at may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversity	on
	man- ⊠A			er dams, and stream incision. Documentation required if evaluated as B, C, or D. overland flow are not severely altered in the assessment area.	
	□в	Over	bank flow	is severely altered in the assessment area.	
□C Overland flow is severely altered in the assessment area. □D Both overbank and overland flow are severely altered in the assessment area.					

Wetland Site Name _		Date of Assessment April 2	
Wetland Type _	Headwater Forest A	ssessor Name/Organization KMT,	BGB/HDR
Notes on Field Assess	ment Form (Y/N)		NO
Presence of regulatory	considerations (Y/N)		YES
Wetland is intensively	managed (Y/N)		NO
Assessment area is loc	cated within 50 feet of a natural tributary	or other open water (Y/N)	YES
Assessment area is su	bstantially altered by beaver (Y/N)		NO
Assessment area expe	riences overbank flooding during norma	al rainfall conditions (Y/N)	NO
Assessment area is on	a coastal island (Y/N)		NO
Sub-function Rating S	ummarv		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	HIGH
	Sub-surface Storage and	Condition	ШСП
Motor Quality	Retention  Rethogon Change	Condition  Condition	HIGH
Water Quality	Pathogen Change		HIGH
		Condition/Opportunity	HIGH NO
	Particulate Change	Opportunity Presence (Y/N) Condition	HIGH
	Faiticulate Change	Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA NA
	Soluble Change	Condition	MEDIUM
	Colubie Change	Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	LOW
	. Hydioa. Chango	Condition/Opportunity	LOW
		Opportunity Presence (Y/N)	YES
	Pollution Change	Condition	NA
	Š	Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	MEDIUM
	Landscape Patch Structure	Condition	LOW
	Vegetation Composition	Condition	MEDIUM
Function Rating Sumn	narv		
Function	···· <i>j</i>	Metrics	Rating
Hydrology		Condition	HIGH
Water Quality		Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	YES
Habitat		Condition	LOW

### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

			Accompanies	User Manual Version 5.0	
U:	SACE AID			NCDWR#	
	Pre	oject Name	e CLT Airport Expansion	Date of Evaluation	April 2019
Α.	Applicant/O	wner Name	CLT	Wetland Site Name	PW2-1 - Wetland 6
	We	etland Type	Headwater Forest	Assessor Name/Organization	KMT, BGB/HDR
		l Ecoregior		Nearest Named Water Body	Ticer Branch
		River Basir		USGS 8-Digit Catalogue Unit	03050101
	•	County		NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.230325, -80.957650
-		.5 🔼 140	7 Tecipitation within 40 his:	Eatitude/Editigitude (deel degrees)	33.230323, 00.337 030
PI re	ease circle cent past (I	and/or ma for instance drological r face and s ks, underg ns of veger bitat/plant of sment are Considera adromous f derally prot DWR ripar ats a Prima blicly owne	e, within 10 years). Noteworthy stressors nodifications (examples: ditches, dams, bub-surface discharges into the wetland (exround storage tanks (USTs), hog lagoons, action stress (examples: vegetation mortate community alteration (examples: mowing, a intensively managed? Yes Stions - Were regulatory considerations evish ected species or State endangered or threst an buffer rule in effect ry Nursery Area (PNA)	estressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) camples: discharges containing obvious pollutec.)  lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No  raluated?  Yes  No If Yes, check all the eatened species	utants, presence of nearby septic , salt intrusion, etc.)
	] Des	uts a strear signated N		upplemental classifications of HQW, ORW,	or Trout
W	hat type of	f natural e	tream is associated with the wetland, i	f any? (check all that apply)	
ΙË		ckwater	incum io accordated with the wettand, i	any: (oncor an that apply)	
$\boxtimes$	] Bro	wnwater			
Ē	Tid:		check one of the following boxes)	unar 🗌 Wind 🔲 Both	
	_	` .	<b>3</b> , —		
Is	the asses	sment are	a on a coastal island? 🔲 Yes 🛛	No	
Ic	the acces	cmont ara	a's surface water storage capacity or d	uration substantially altered by beaver?	☐ Yes ☒ No
				-	
D	oes the as	sessment	area experience overbank flooding dur	ring normal rainfall conditions? UYes	⊠ No
1.	Ground S	Surface Co	ondition/Vegetation Condition – assess	ment area condition metric	
•	Check a assessment area base	box in eac ent area. C	h column. Consider alteration to the gro	und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
	$\square$ A	⊠B S	edimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ice, herbicides, salt intrusion [where appropron)	s pollutants) (vegetation structure
2.	Surface a	and Sub-S	urface Storage Capacity and Duration -	- assessment area condition metric	
	Consider deep is ex Surf	both increace to Sub	ase and decrease in hydrology. A ditch s	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface c. Consider tidal flooding regime, if applicab	water only, while a ditch > 1 foot
	□в	□B V ⊠C V	Vater storage capacity or duration are sub	ot altered. ered, but not substantially (typically, not sufficent estantially altered (typically, alteration sufficientially, alteration, undergostion, filling, excessive sedimentation, undergostion, indergostically	ent to result in vegetation change)
3.	Water St	orage/Sur	ace Relief - assessment area/wetland	type condition metric (skip for all marshe	es)
	Check a	box in eac	h column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	AA	WT	• • • • • • • • • • • • • • • • • • • •	• •	
	3a.	□A M □B M □C M	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Pepressions able to pond water < 3 inchest	o pond water 6 inches to 1 foot deep o pond water 3 to 6 inches deep	
	⊠B	Evidence t	hat maximum depth of inundation is great hat maximum depth of inundation is between	een 1 and 2 feet	

	Make s	soil obs		t <b>he three soil property groups below.</b> Dig soil profile in the dominant assessment area landscape feature. In the top 12 inches.  Use most recent National Technical Committee for Hydric Soils guidance for regional
		]A ]B ]C ]D		
	4b. ⊠		Soil ribbon < 1 Soil ribbon ≥ 1	
	4c. ⊠	]A ]B	No peat or muck A peat or muck	
5.	Discha	arge int	o Wetland – o	pportunity metric
	of sub- Surf	-surface Sub		<ul> <li>n. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples clude presence of nearby septic tank, underground storage tank (UST), etc.</li> </ul>
	⊠a □B	⊠a ⊟B	Noticeable	o evidence of pollutants or discharges entering the assessment area e evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the capacity of the assessment area
	□C	□c	Noticeable potentially	e evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive attion, odor)
6.	Land l	Use – o	pportunity me	tric (skip for non-riparian wetlands)
	to asse	essment	t area within en	t one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining tire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M), the watershed draining to the assessment area (2M).
	□A □B □C	□A □B □C	□В Ū	≥ 10% impervious surfaces Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
	□D ⊠E ⊠F	□D ⊠E ⊠F	□D ≥	≥ 20% coverage of agricultural land (regularly plowed land) ≥ 20% coverage of maintained grass/herb ≥ 20% coverage of clear-cut land
	ĞG	∐G	∏G I	Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturbance in the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the assessment area.
7.	Wetlar	nd Actir	ng as Vegetate	ed Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
		Yes	⊠No If Ye	hin 50 feet of a tributary or other open water? es, continue to 7b. If No, skip to Metric 8. nly be present on one side of the water body. Make buffer judgment based on the average width of wetland.
	7b. H	Record a How mu	a note if a portion of the first 5	on of the buffer has been removed or disturbed.  0 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Make on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	<u>[</u>	⊐A □B □C	≥ 50 feet From 30 to <	50 feet
	Ī	□D □E	From 15 to < From 5 to < 1 < 5 feet <u>or</u> but	
		≤ 15-f	eet wide ::	ributary is anastomosed, combine widths of channels/braids for a total width.  > 15-feet wide
	7e. I	☐Yes s strean	□No n or other open	water sheltered or exposed?
	Ī	Expos	sed – adjacent	open water with width < 2500 feet <u>and</u> no regular boat traffic.  open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
В.				sment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest
				n for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and assessment area (WC). See User Manual for WT and WC boundaries.
	□A	□A	≥ 100 fee	
	В	В		o < 100 feet
	□C ⊠D	□C ⊠D		o < 80 feet o < 50 feet
	□E	□E	From 30 to	o < 40 feet
	□F	□F □G		o < 30 feet
	□G □H	□G	From 5 to	× 10 100t

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A A S 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  E E From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G From 1 to < 5 acres  H H H From 0.5 to < 1 acre  I I I From 0.1 to < 0.5 acre  J J J J From 0.01 to < 0.1 acre  K < 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
13	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C From 50 to < 100 acres D D From 10 to < 50 acres E = E < 10 acres F F Wetland type has a poor or no connection to other natural habitats  13b. Evaluate for marshes only.
	Yes No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>□A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>□B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>□C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Veae	etative St	ructure –	- assessment area/wetland type condition metric	
	_	Is vegeta	ation pres ☐No	· · · · · · · · · · · · · · · · · · ·	
	17b.	Evaluate □A □B	≥ 25% c	t coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. coverage of vegetation coverage of vegetation	
		structur		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Constact above the assessment area (AA) and the wetland type (WT) separately.	sider
		À □A □B □C	⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A □B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	Shirt dirid	B □A □B □C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	H G	a □A E □B ⊠C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	gs – wetla	and type o	condition metric (skip for all marshes)	
	□a ⊠B	Large Not A		more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.				pution – wetland type condition metric (skip for all marshes)	
		pres	ent.	nopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	⊟в ⊠с			nopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. nopy trees are < 6 inches DBH or no trees.	
20.	Larg	e Woody	Debris -	- wetland type condition metric (skip for all marshes)	
	Inclu □A ⊠B		e logs (mo	oris and man-placed natural debris. ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	_			er Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only	
				est describes the amount of interspersion between vegetation and open water in the growing season. Patte d areas, while solid white areas indicate open water.	erned
		0			
22.	-	_		ity – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	roica
	man-	made bei Over Over Over	rms, beave bank <u>and</u> bank flow land flow	nat may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diver yer dams, and stream incision. Documentation required if evaluated as B, C, or D. I overland flow are not severely altered in the assessment area. I is severely altered in the assessment area. I is severely altered in the assessment area. I is and overland flow are severely altered in the assessment area.	sion,
	Шυ	Don	Overbank	varie overland new are severely altered in the assessment area.	

wetland created by road construction and culvert downstream. Canopy trees dead.

Wetland Site Name _	PW2-1 - Wetland 6	Date of Assessment April 2	2019
Wetland Type _	Headwater Forest A	ssessor Name/Organization KMT,	BGB/HDR
Notes on Field Assess	ment Form (Y/N)		YES
Presence of regulatory	• •		YES
Wetland is intensively	·		NO
Assessment area is lo	cated within 50 feet of a natural tributary	or other open water (Y/N)	NO
Assessment area is su	bstantially altered by beaver (Y/N)		NO
Assessment area expe	eriences overbank flooding during norma	al rainfall conditions (Y/N)	NO
Assessment area is or	a coastal island (Y/N)		NO
Sub-function Rating S	ummary		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	LOW
,	Sub-surface Storage and		
W ( 0 !"	Retention	Condition	LOW
Water Quality	Pathogen Change	Condition	LOW
		Condition/Opportunity	LOW
	<b>-</b>	Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	LOW
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
	· · · · · ·	Opportunity Presence (Y/N)	NO NO
	Physical Change	Condition	LOW
		Condition/Opportunity	LOW
	- w w	Opportunity Presence (Y/N)	YES
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
11.19.7	DI : 10: 1	Opportunity Presence (Y/N)	NA NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	LOW MEDIUM
	Vegetation Composition	Condition	MEDIUM
unction Rating Sumn	nary		
Function		Metrics	Rating
Hydrology		Condition	LOW
Water Quality		Condition	LOW
		Condition/Opportunity	LOW
		Opportunity Presence (Y/N)	YES
Habitat		Condition	LOW

## NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID :	#	Accompanies	NCDWR#	1
03		<del>#</del> oject Nam	e _CLT Airport Expansion	Date of Evaluation	Sentember 2010
^				Wetland Site Name	September 2019
A	pplicant/O				PW3-1 - Wetland 15
		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		l Ecoregio		Nearest Named Water Body	Coffey Creek
	ı	River Basi		USGS 8-Digit Catalogue Unit	03050103
		Count	y Mecklenburg	NCDWR Region	Mooresville
L	☐ Ye	s 🛛 N	Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.203001, -80.946993
E.	idonoo of	ctroccore	affecting the assessment area (may no	t he within the accessment area)	
Is Re	ease circle cent past (f	and/or m for instance drological in face and sicks, undergons of vege bitat/plant sment are Consideral adromous derally prof DWR ripal	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, but but but surface discharges into the wetland (examples into stress (examples: vegetation mortal community alteration (examples: mowing, the intensively managed? Yes wittings - Were regulatory considerations ever fish the ected species or State endangered or three iran buffer rule in effect	tressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the	utants, presence of nearby septic, salt intrusion, etc.)
	Pub N.C Abu Des Abu	olicly owners. Division outs a streat signated Nats a 303(c	CNHP reference community I)-listed stream or a tributary to a 303(d)-lis	upplemental classifications of HQW, ORW, of ted stream	or Trout
	Bla Bro	ckwater wnwater	etream is associated with the wetland, if check one of the following boxes)		
IS	the assess	sment are	ea on a coastal island? 🔲 Yes 🖂 🏻	No	
				uration substantially altered by beaver? ing normal rainfall conditions?   Yes	☐ Yes       No
					Z 140
1.	Check a lassessme area base	box in eacent area. (		ment area condition metric  und surface (GS) in the assessment area ar  (see User Manual). If a reference is not app	
	$\boxtimes A$	⊠A I □B S	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exa icks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropr on)	pollutants) (vegetation structure
2.	Surface a	and Sub-S	Surface Storage Capacity and Duration -	- assessment area condition metric	
	Consider deep is ex Surf	both incre xpected to Sub	ase and decrease in hydrology. A ditch ≤	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicable of altered.	water only, while a ditch > 1 foot
	□в	□B '	Nater storage capacity or duration are alte Nater storage capacity or duration are sub	red, but not substantially (typically, not suffic stantially altered (typically, alteration suffici- tion, filling, excessive sedimentation, underg	ent to result in vegetation change)
3.	Water Sto	orage/Sur	face Relief - assessment area/wetland t	ype condition metric (skip for all marshe	es)
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	_ AA				
	□c ⊠d	□B □C 図D	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	o pond water 6 inches to 1 foot deep o pond water 3 to 6 inches deep deep	
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less t	een 1 and 2 feet	

		by from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature observations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for region of the three soil property groups below.
	4a. □A □B □C □D □E	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon
	4b. ⊠A □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch
	4c. ⊠A □B	No peat or muck presence A peat or muck presence
5.	Discharge	into Wetland – opportunity metric
	of sub-surf Surf S	ex in each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Example ace discharges include presence of nearby septic tank, underground storage tank (UST), etc.
	□В □	A Little or no evidence of pollutants or discharges entering the assessment area  Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area
	□c [	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)
6.	Land Use	- opportunity metric (skip for non-riparian wetlands)
	to assessm	hat apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources drainin ent area within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M 2 miles and within the watershed draining to the assessment area (2M).
	□A [	A □A ≥ 10% impervious surfaces
		B ☐B Confined animal operations (or other local, concentrated source of pollutants C ☐C ≥ 20% coverage of pasture
		D □D ≥ 20% coverage of agricultural land (regularly plowed land)
		E ☐E ≥ 20% coverage of maintained grass/herb
		]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_	147 41 1 4	assessment area.
7.		cting as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands) sessment area within 50 feet of a tributary or other open water?
	7a. is as ⊠Ye	
		and buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetland
	7b. How	rd a note if a portion of the buffer has been removed or disturbed. much of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mak · judgment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	□A	≥ 50 feet From 30 to < 50 feet
	□B □C	From 15 to < 30 feet
	⊠p	From 5 to < 15 feet
	☐E 7c. Tribu	< 5 feet <u>or</u> buffer bypassed by ditches arry width. If the tributary is anastomosed, combine widths of channels/braids for a total width.
	<u></u> ≤	5-feet wide
	7d. Do ro □Ye	ots of assessment area vegetation extend into the bank of the tributary/open water? s     ⊠No
	7e. Is str	eam or other open water sheltered or exposed?
		eltered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. posed – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.		idth at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and Woody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Fores
	Check a be	ex in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) are complex at the assessment area (WC). See User Manual for WT and WC boundaries.  C
	□A	]A ≥ 100 feet
		B From 80 to < 100 feet
		C From 50 to < 80 feet D From 40 to < 50 feet
		E From 30 to < 40 feet
		From 15 to < 30 feet  G From 5 to < 15 feet
		G Floir Stock 13 leet

4. Soil Texture/Structure – assessment area condition metric (skip for all marshes)

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  □ A Evidence of short-duration inundation (< 7 consecutive days)  □ B Evidence of saturation, without evidence of inundation  □ C Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ Sediment deposition is not excessive, but at approximately natural levels.  □ Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  F F F From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G G From 1 to < 5 acres  H M H M From 0.5 to < 1 acre  I I I From 0.1 to < 0.5 acre
	□K □K < 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	<ul><li>□A Pocosin is the full extent (≥ 90%) of its natural landscape size.</li><li>□B Pocosin type is &lt; 90% of the full extent of its natural landscape size.</li></ul>
13.	Connectivity to Other Natural Areas – landscape condition metric
	This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C From 50 to < 100 acres D D From 10 to < 50 acres E S D WD From 10 to < 50 acres F Wetland type has a poor or no connection to other natural habitats
	13b. Evaluate for marshes only.
	Yes No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>✓A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>✓B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>✓C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>☑A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>☑B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>☑C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vege	tative St	ructure –	assessment area/wetland type condition metric	
	17a.		ation pres		
		⊠Yes	∐No	If Yes, continue to 17b. If No, skip to Metric 18.	
	17b.	Evaluate □A □B	≥ 25% c	coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation	
	17c.	structure		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider above the assessment area (AA) and the wetland type (WT) separately.	de
		AA ⊠A □B □C	WI ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A ⊠B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	Shrub	B B ⊠C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	Herb	A □B □C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	ıs – wetla	and type	condition metric (skip for all marshes)	
	□a ⊠B		e snags (r	nore than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.	Diam	neter Clas	ss Distrib	ution – wetland type condition metric (skip for all marshes)	
	□A			opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	□B ⊠C		rity of car	opy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. opy trees are < 6 inches DBH or no trees.	
20.	Large	e Woody	Debris -	wetland type condition metric (skip for all marshes)	
	Includ □A ⊠B		e logs (mo	ris and man-placed natural debris.  ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	Vege	tation/O	pen Wate	r Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)	
		-		est describes the amount of interspersion between vegetation and open water in the growing season. Pattern I areas, while solid white areas indicate open water.  □B □C □D	nec
		0	S. S.		
22.	-	_		ty – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	
				at may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversi	ion
	man- ⊠A			er dams, and stream incision. Documentation required if evaluated as B, C, or D. overland flow are not severely altered in the assessment area.	
	□в	Over	bank flow	is severely altered in the assessment area.	
				is severely altered in the assessment area.  and overland flow are severely altered in the assessment area.	

Wetland Site Name P	W3-1 - Wetland 15	Date of Assessment Septe	ember 2019
Wetland Type B	ottomland Hardwood Forest As	sessor Name/Organization KMT,	BGB/HDR
Notes on Field Assessm	ent Form (Y/N)		NO
Presence of regulatory of			YES
Wetland is intensively m	, ,		NO
•	ited within 50 feet of a natural tributary	or other open water (Y/N)	YES
	stantially altered by beaver (Y/N)	, ,	NO
Assessment area experi	ences overbank flooding during normal	rainfall conditions (Y/N)	NO
Assessment area is on a	a coastal island (Y/N)		NO
Sub-function Poting Su	mmory.		
Sub-function Rating Sur Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	HIGH
Trydrology	Sub-surface Storage and	Condition	
_	Retention	Condition	MEDIUM
Water Quality	Pathogen Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Soluble Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	MEDIUM
	Vegetation Composition	Condition	HIGH
Function Rating Summa	ıry		
Function		Metrics	Rating
Hydrology		Condition	HIGH
Water Quality		Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
Habitat		Condition	MEDIUM

### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID #	4	Accompanies	NCDWR#	
03		<del>/</del> oject Nam	e CLT Airport Expansion	Date of Evaluation	October 2019
				Wetland Site Name	
A	pplicant/Ov				PW4-1 - Wetland 22
		tland Typ		Assessor Name/Organization	KMT, BGB/HDR
		Ecoregic		Nearest Named Water Body	Coffey Creek
	F	River Bas	<u> </u>	USGS 8-Digit Catalogue Unit	03050103
		Coun	ty Mecklenburg	NCDWR Region	Mooresville
L	☐ Ye	s 🛛 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.192488, -80.943445
Fv	idence of	etrassar	s affecting the assessment area (may no	t he within the assessment area)	
Ple	ease circle cent past (for Hyd Surf tank Sigr Hab	and/or mor instance in the control of the control o	ake note on the last page if evidence of size, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, be sub-surface discharges into the wetland (examples) at the work of the wetland (examples) at the stress (examples: vegetation mortal community alteration (examples: mowing,	tressors is apparent. Consider departure f nclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious pollu etc.) lity, insect damage, disease, storm damage	utants, presence of nearby septic
D.	aulotom. C	`anaidar	otiona Wara regulatory considerations av	alusted? Myon DNo If You shook all the	at apply to the accomment area
_		<b>Consider</b> Idromous		aluated? $oxtimes$ Yes $oxtimes$ No If Yes, check all tha	at apply to the assessment area.
			tected species or State endangered or thre	atened species	
			rian buffer rule in effect	a.cca oposioo	
			ary Nursery Area (PNA)		
	Pub	licly own	ed property		
			of Coastal Management Area of Environme		
$  \square$				upplemental classifications of HQW, ORW, or	or Trout
			ICNHP reference community		
	Abu	its a 303(	d)-listed stream or a tributary to a 303(d)-lis	ted stream	
W	hat type of	natural	stream is associated with the wetland, if	any? (check all that apply)	
		ckwater		- \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
$\boxtimes$	Brov	wnwater			
	Tida	al (if tidal,	check one of the following boxes)	ınar 🗌 Wind 🔲 Both	
le	the assess	sment ar	ea on a coastal island?	No	
			ea's surface water storage capacity or du		☐ Yes ⊠ No
Do	es the ass	sessmen	area experience overbank flooding duri	ing normal rainfall conditions?   Yes	⊠ No
1.	Ground S	Surface C	ondition/Vegetation Condition - assessi	ment area condition metric	
			<u> </u>	und surface (GS) in the assessment area ar	nd vegetation structure (VS) in the
				(see User Manual). If a reference is not app	
			ence an effect.	(333 330) Mariaary. It a reference to flot app	onedoto, their rate the assessment
	GS '	VS	<del> </del>		
	⊠A [		Not severely altered		
	⊟B i			essment area (ground surface alteration exa	amples: vehicle tracks, excessive
				cks, bedding, fill, soil compaction, obvious	
			alteration examples: mechanical disturband	ce, herbicides, salt intrusion [where appropr	
			diversity [if appropriate], hydrologic alteration	on)	
2.	Surface a	nd Sub-	Surface Storage Capacity and Duration -	- assessment area condition metric	
					orago capacity and duration (Sub)
				acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface	
				. Consider tidal flooding regime, if applicable	
		specied it Sub	ander both surface and sub-surface Water.	. Consider tidal hooding regime, if applicable	ic.
			Water storage capacity and duration are no	ot altered.	
				red, but not substantially (typically, not suffic	cient to change vegetation).
				stantially altered (typically, alteration sufficient	
		_	(examples: draining, flooding, soil compacti	ion, filling, excessive sedimentation, underg	round utility lines).
3.	Water Sto			ype condition metric (skip for all marshe	
٥.		_			·
	AA \		on column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (vv i ).
	3a.		Majority of wetland with depressions able to	pond water > 1 deep	
	□ B		Majority of wetland with depressions able to		
	□c		Majority of wetland with depressions able to		
			Depressions able to pond water < 3 inches		
	_				
			that maximum depth of inundation is greate that maximum depth of inundation is betwee		
	⊠cı	Evidence	that maximum depth of inundation is less that	nan 1 foot	

		by from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature observations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for region of the three soil property groups below.
	4a. □A □B □C □D □E	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon
	4b. ⊠A □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch
	4c. ⊠A □B	No peat or muck presence A peat or muck presence
5.	Discharge	into Wetland – opportunity metric
	of sub-surf Surf S	ex in each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Example ace discharges include presence of nearby septic tank, underground storage tank (UST), etc.
	□В □	A Little or no evidence of pollutants or discharges entering the assessment area  Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area
	□c [	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)
6.	Land Use	- opportunity metric (skip for non-riparian wetlands)
	to assessm	hat apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources drainin ent area within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M 2 miles and within the watershed draining to the assessment area (2M).
	□A [	A □A ≥ 10% impervious surfaces
		B ☐B Confined animal operations (or other local, concentrated source of pollutants C ☐C ≥ 20% coverage of pasture
		D □D ≥ 20% coverage of agricultural land (regularly plowed land)
		E ☐E ≥ 20% coverage of maintained grass/herb
		]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_	147 41 1 4	assessment area.
7.		cting as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands) sessment area within 50 feet of a tributary or other open water?
	7a. is as ⊠Ye	
		and buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetland
	7b. How	rd a note if a portion of the buffer has been removed or disturbed. much of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mak · judgment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	□A	≥ 50 feet From 30 to < 50 feet
	□B □C	From 15 to < 30 feet
	⊠p	From 5 to < 15 feet
	☐E 7c. Tribu	< 5 feet <u>or</u> buffer bypassed by ditches arry width. If the tributary is anastomosed, combine widths of channels/braids for a total width.
	<u></u> ≤	5-feet wide
	7d. Do ro □Ye	ots of assessment area vegetation extend into the bank of the tributary/open water? s     ⊠No
	7e. Is str	eam or other open water sheltered or exposed?
		eltered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. posed – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.		idth at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and Woody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Fores
	Check a be	ex in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) are complex at the assessment area (WC). See User Manual for WT and WC boundaries.  C
	□A	]A ≥ 100 feet
		B From 80 to < 100 feet
		C From 50 to < 80 feet D From 40 to < 50 feet
		E From 30 to < 40 feet
		From 15 to < 30 feet  G From 5 to < 15 feet
		G Floir Stock 13 leet

4. Soil Texture/Structure – assessment area condition metric (skip for all marshes)

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  □ A Evidence of short-duration inundation (< 7 consecutive days)  □ B Evidence of saturation, without evidence of inundation  □ C Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ Sediment deposition is not excessive, but at approximately natural levels.  □ Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  F F F From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G G From 1 to < 5 acres  H H H H From 0.5 to < 1 acre  XI XI From 0.1 to < 0.5 acre
	□K □K < 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
13.	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C C From 50 to < 100 acres D D From 10 to < 50 acres E C C To acres F Wetland type has a poor or no connection to other natural habitats
	13b. <b>Evaluate for marshes only</b> .  ☐Yes ☐No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)
	May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas $\geq$ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C." $\square$ A 0 $\square$ B 1 to 4 $\square$ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>✓A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>✓B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>✓C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>☑A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>☑B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>☑C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vege	tative St	ructure –	assessment area/wetland type condition metric	
	17a.		ation pres		
		⊠Yes	∐No	If Yes, continue to 17b. If No, skip to Metric 18.	
	17b.	Evaluate □A □B	≥ 25% c	coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation	
	17c.	structure		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider above the assessment area (AA) and the wetland type (WT) separately.	de
		AA ⊠A □B □C	WI ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A ⊠B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	Shrub	B B ⊠C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	Herb	A □B □C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	ıs – wetla	and type	condition metric (skip for all marshes)	
	□a ⊠B		e snags (r	nore than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.	Diam	neter Clas	ss Distrib	ution – wetland type condition metric (skip for all marshes)	
	□A			opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	□B ⊠C		rity of car	opy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. opy trees are < 6 inches DBH or no trees.	
20.	Large	e Woody	Debris -	wetland type condition metric (skip for all marshes)	
	Includ □A ⊠B		e logs (mo	ris and man-placed natural debris.  ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	Vege	tation/O	pen Wate	r Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)	
		-		est describes the amount of interspersion between vegetation and open water in the growing season. Pattern I areas, while solid white areas indicate open water.  □B □C □D	nec
		0	S. S.		
22.	-	_		ty – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	
				at may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversi	ion
	man- ⊠A			er dams, and stream incision. Documentation required if evaluated as B, C, or D. overland flow are not severely altered in the assessment area.	
	□в	Over	bank flow	is severely altered in the assessment area.	
				is severely altered in the assessment area.  and overland flow are severely altered in the assessment area.	

Date of Assessment October 2019

Wetland Site Name PW4-1 - Wetland 22

Welland Sile Name _	FVV4-1 - VVEIIanu ZZ	Date of Assessment Octob	DEI 2019
Wetland Type _	Bottomland Hardwood Forest	Assessor Name/Organization KMT,	BGB/HDR
Notes on Field Assess	sment Form (Y/N)		NO
	considerations (Y/N)		YES
Wetland is intensively			NO
•	cated within 50 feet of a natural tributar	y or other open water (Y/N)	YES
Assessment area is su	ubstantially altered by beaver (Y/N)		NO
Assessment area expo	eriences overbank flooding during norm	al rainfall conditions (Y/N)	NO
•	n a coastal island (Y/N)	, ,	NO
Sub-function Rating S	Summary		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention Sub-surface Storage and	Condition	HIGH
	Retention	Condition	MEDIUM
Water Quality	Pathogen Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Soluble Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	LOW
	Vegetation Composition	Condition	HIGH
Function Rating Sumr	mary		
Function		Metrics	Rating
Hydrology		Condition	HIGH
Water Quality		Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
Habitat		Condition	LOW

### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID :	#	Accompanies	NCDWR#	
03		<del>#</del> oject Nam	e _CLT Airport Expansion	Date of Evaluation	October 2019
^					
A	pplicant/O			Wetland Site Name	PW5-1 - Wetland 24
		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		l Ecoregio		Nearest Named Water Body	Coffey Creek
	ı	River Basi		USGS 8-Digit Catalogue Unit	03050103
		Count	y Mecklenburg	NCDWR Region	Mooresville
L	☐ Ye	s 🛛 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.190762, -80.941877
E.	idonoo of	otrocoor	offecting the acceptant area (may no	t he within the acceptment area)	
Is Re	ease circle cent past (f	and/or m for instance drological of face and s ks, underg ns of vege bitat/plant sment are Considera adromous derally pro DWR ripa uts a Prima	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, but be sub-surface discharges into the wetland (expround storage tanks (USTs), hog lagoons, station stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed?   Yes   Attions - Were regulatory considerations evaluations.	tressors is apparent. Consider departure f nclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all that	utants, presence of nearby septic, salt intrusion, etc.)
	Des Abu	C. Division uts a strea signated Nuts a 303(d	of Coastal Management Area of Environment with a NCDWQ classification of SA or sul CNHP reference community d)-listed stream or a tributary to a 303(d)-listed	upplemental classifications of HQW, ORW, of ted stream	or Trout
	Blad Bro Tida	ckwater wnwater al (if tidal,	check one of the following boxes)	unar □ Wind □ Both	
			ea's surface water storage capacity or do		☐ Yes ☒ No ☐
DC	es the as	sessment	area experience overbank flooding dur	ing normal rainfall conditions?   Yes	⊠ No
1.	Check a lassessme	box in eacent area. (		ment area condition metric und surface (GS) in the assessment area an (see User Manual). If a reference is not app	
	GS ⊠A	VS ⊠A □B	Not severely altered Severely altered over a majority of the asse sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obviousce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure
2.	Surface	and Sub-9	Surface Storage Capacity and Duration -	assessment area condition metric	
	Check a l Consider deep is ex Surf ⊠A □B	box in each both increspected to Sub	ch column. Consider surface storage capa- hase and decrease in hydrology. A ditch ≤ affect both surface and sub-surface water Water storage capacity and duration are no Water storage capacity or duration are alter	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicable	water only, while a ditch > 1 foot le.  cient to change vegetation).
	_	_	(examples: draining, flooding, soil compact	ion, filling, excessive sedimentation, underg	round utility lines).
3.	Water Ste	orage/Sur	face Relief – assessment area/wetland t	ype condition metric (skip for all marshe	es)
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	□c ⊠d	□A □B □C ⊠D	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	o pond water 6 inches to 1 foot deep o pond water 3 to 6 inches deep deep	
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less t	een 1 and 2 feet	

		by from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature observations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for region of the three soil property groups below.
	4a. □A □B □C □D □E	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon
	4b. ⊠A □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch
	4c. ⊠A □B	No peat or muck presence A peat or muck presence
5.	Discharge	into Wetland – opportunity metric
	of sub-surf Surf S	ex in each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Example ace discharges include presence of nearby septic tank, underground storage tank (UST), etc.
	□В □	A Little or no evidence of pollutants or discharges entering the assessment area  Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area
	□c [	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)
6.	Land Use	- opportunity metric (skip for non-riparian wetlands)
	to assessm	hat apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources drainin ent area within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M 2 miles and within the watershed draining to the assessment area (2M).
	□A [	A □A ≥ 10% impervious surfaces
		B ☐B Confined animal operations (or other local, concentrated source of pollutants C ☐C ≥ 20% coverage of pasture
		D □D ≥ 20% coverage of agricultural land (regularly plowed land)
		E ☐E ≥ 20% coverage of maintained grass/herb
		]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_	147 41 1 4	assessment area.
7.		cting as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands) sessment area within 50 feet of a tributary or other open water?
	7a. is as ⊠Ye	
		and buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetland
	7b. How	rd a note if a portion of the buffer has been removed or disturbed. much of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mak · judgment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	□A	≥ 50 feet From 30 to < 50 feet
	□B □C	From 15 to < 30 feet
	⊠p	From 5 to < 15 feet
	☐E 7c. Tribu	< 5 feet <u>or</u> buffer bypassed by ditches arry width. If the tributary is anastomosed, combine widths of channels/braids for a total width.
	<u></u> ≤	5-feet wide
	7d. Do ro □Ye	ots of assessment area vegetation extend into the bank of the tributary/open water? s     ⊠No
	7e. Is str	eam or other open water sheltered or exposed?
		eltered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. posed – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.		idth at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and Woody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Fores
	Check a be	ex in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) are complex at the assessment area (WC). See User Manual for WT and WC boundaries.  C
	□A	]A ≥ 100 feet
		B From 80 to < 100 feet
		C From 50 to < 80 feet D From 40 to < 50 feet
		E From 30 to < 40 feet
		From 15 to < 30 feet  G From 5 to < 15 feet
		G Floir Stock 13 leet

4. Soil Texture/Structure – assessment area condition metric (skip for all marshes)

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  □ A Evidence of short-duration inundation (< 7 consecutive days)  □ B Evidence of saturation, without evidence of inundation  □ C Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ Sediment deposition is not excessive, but at approximately natural levels.  □ Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  F F F From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G G From 1 to < 5 acres  H H H H From 0.5 to < 1 acre  XI XI From 0.1 to < 0.5 acre
	□K □K < 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
13.	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C C From 50 to < 100 acres D D From 10 to < 50 acres E C C To acres F Wetland type has a poor or no connection to other natural habitats
	13b. <b>Evaluate for marshes only</b> .  ☐Yes ☐No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)
	May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas $\geq$ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C." $\square$ A 0 $\square$ B 1 to 4 $\square$ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>✓A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>✓B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>✓C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>☑A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>☑B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>☑C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vege	/egetative Structure – assessment area/wetland type condition metric								
	17a.		ation pres							
		⊠Yes	∐No	If Yes, continue to 17b. If No, skip to Metric 18.						
	17b.	Evaluate □A □B	≥ 25% c	coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation						
	17c.	structure		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider above the assessment area (AA) and the wetland type (WT) separately.	de					
		AA ⊠A □B □C	WI ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent						
	Mid-Story	□A ⊠B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent						
	Shrub	B B ⊠C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent						
	Herb	A □B □C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent						
18.	Snag	ıs – wetla	and type	condition metric (skip for all marshes)						
	□a ⊠B		e snags (r	nore than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).						
19.	Diam	neter Clas	ss Distrib	ution – wetland type condition metric (skip for all marshes)						
	□A			opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are						
	□B ⊠C		rity of car	opy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. opy trees are < 6 inches DBH or no trees.						
20.	Large	e Woody	Debris -	wetland type condition metric (skip for all marshes)						
	Includ □A ⊠B		e logs (mo	ris and man-placed natural debris.  ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).						
21.	Vege	tation/O	pen Wate	r Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)						
		-		est describes the amount of interspersion between vegetation and open water in the growing season. Pattern I areas, while solid white areas indicate open water.  □B □C □D	nec					
		0	S. S.							
22.	-	_		ty – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)						
				at may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversi	ion					
	man- ⊠A			er dams, and stream incision. Documentation required if evaluated as B, C, or D. overland flow are not severely altered in the assessment area.						
	□в	Over	bank flow	is severely altered in the assessment area.						
				is severely altered in the assessment area.  and overland flow are severely altered in the assessment area.						

	PW5-1 - Wetland 24		October 2019					
Wetland Type _E	Bottomland Hardwood Forest A	Assessor Name/Organization KMT,	BGB/HDR					
Notes on Field Assessn	nent Form (Y/N)		NO					
Presence of regulatory	Presence of regulatory considerations (Y/N)							
Vetland is intensively managed (Y/N)								
Assessment area is loc	ated within 50 feet of a natural tributar	y or other open water (Y/N)	YES					
Assessment area is substantially altered by beaver (Y/N)								
Assessment area exper	riences overbank flooding during norm	al rainfall conditions (Y/N)	NO					
Assessment area is on	a coastal island (Y/N)		NO					
Sub-function Rating Su	ımmarv							
Function	Sub-function	Metrics	Rating					
Hydrology	Surface Storage and Retention	Condition	HIGH					
, 0,	Sub-surface Storage and	0 111	MEDUIM					
N/	Retention	Condition	MEDIUM					
Water Quality	Pathogen Change	Condition	HIGH					
		Condition/Opportunity	HIGH					
	Dortion late Change	Opportunity Presence (Y/N)	NO					
	Particulate Change	Condition/Opportunity	HIGH					
		Condition/Opportunity	NO					
	Salubla Changa	Opportunity Presence (Y/N) Condition	HIGH					
	Soluble Change	Condition/Opportunity	HIGH					
		Opportunity Presence (Y/N)	NO					
	Physical Change	Condition	MEDIUM					
	i nysicai onange	Condition/Opportunity	MEDIUM					
		Opportunity Presence (Y/N)	NO					
	Pollution Change	Condition (1714)	NA NA					
	. Ghanen Ghange	Condition/Opportunity	NA					
		Opportunity Presence (Y/N)	NA					
Habitat	Physical Structure	Condition	LOW					
	Landscape Patch Structure	Condition	LOW					
	Vegetation Composition	Condition	HIGH					
iunation Bating Summ	orv.							
Function Rating Summ Function	ан у	Metrics	Rating					
Hydrology		Condition	HIGH					
Water Quality		Condition	HIGH					
vvaler Quality		Condition/Opportunity	HIGH					
		Opportunity Presence (Y/N)	NO					
Habitat		Condition	LOW					



Photograph 1 – PS1-1-Stream 8, Facing Upstream



Photograph 3 – PS3-1-Stream 2, Facing Downstream



Photograph 2 – PS2-1-Stream 2, Facing Upstream



Photograph 4 – PS4-1-Stream 1, Facing Upsream



Photograph 5 – PS5-1-Stream 10, Facing Upstream



Photograph 7 – PS6-1-Stream 10, Facing Upstream



Photograph 6 – PW1-1-Wetland 5, Facing South



Photograph 8 – PW2-1-Wetland 6, Facing South



Photograph 9 – PS7-1-Stream 25, Facing Downstream



Photograph 11 – PS9-1-Stream 26-Reach 2, Facing Upstream



Photograph 10 – PS9-1-Stream 26-Reach 1, Facing Downstream



Photograph 12 – PW3-1-Wetland 15, acing Northwest



Photograph 15 – PS12-1-Stream 34, Facing Upstream

Photograph 16 – PW5-1-Wetland 24, Facing South







Photograph 18 –PS11-1-Stream 25, Facing Downstream

# **Appendix C**

Phase 2: NCSAM and NCSAM Forms, and Photographs

## NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

	7 to confipantico cool i	manaar voroioni ziri	
USACE AID #:		NCDWR #:	
	tch of the assessment area and photogr		
	ream reach under evaluation. If multiple thed map, and include a separate form for		
	information. Record in the "Notes/Sketo		
NC SAM User Manual for exam	ples of additional measurements that m	ay be relevant.	
NOTE EVIDENCE OF STRESS	SORS AFFECTING THE ASSESSMENT	AREA (do not need to be within	the assessment area).
PROJECT/SITE INFORMATIO		2. Date of evaluation: April 20°	10
	CLT Airport Expansion CLT	<ul><li>2. Date of evaluation: April 20°</li><li>4. Assessor name/organization:</li></ul>	KMT,BGB/HDR
	Mecklenburg	Nearest named water body	KWII,BOB/HBIX
	Catawba	on USGS 7.5-minute quad:	Coffey Creek
8. Site coordinates (decimal dec	grees, at lower end of assessment reach	•	
STREAM INFORMATION: (dep	pth and width can be approximations PS1-2, S27 -		
9. Site number (show on attache		Length of assessment reach evalua	
	riffle, if present) to top of bank (feet):		nable to assess channel depth.
12. Channel width at top of ban		assessment reach a swamp steam?	? □Yes □No
	flow Intermittent flow Tidal Marsh	Stream	
STREAM CATEGORY INFORM 15. NC SAM Zone:		)	Outer Coastal Plais (O)
13. NO SAIVI ZONE:	☐ Mountains (M) ☐ Piedmont (F	P) Inner Coastal Plain (I)	Outer Coastal Plain (O)
16. Estimated geomorphic	•		
valley shape ( <b>skip for</b>	⊠A	✓ □B	
Tidal Marsh Stream):	(more sinuous stream, flatter valley sl	ope) (less sinuous stre	eam, steeper valley slope)
17. Watershed size: (skip for Tidal Marsh Stream)	$\square$ Size 1 (< 0.1 mi <sup>2</sup> ) $\square$ Size 2 (0.1	to < 0.5 mi <sup>2</sup> ) $\square$ Size 3 (0.5 to < 5	5 mi²)
ADDITIONAL INFORMATION:			
	ions evaluated?  ☐Yes  ☐No If Yes, cl	neck all that apply to the assessme	nt area.
Section 10 water	Classified Trout Waters		shed ( I II III IV V)
☐Essential Fish Habitat	Primary Nursery Area		Outstanding Resource Waters
	□NCDWR Riparian buffer rule □303(d) List		onmental Concern (AEC)
<del>_</del>	f a federal and/or state listed protected s		
List species:	·	•	
☐Designated Critical Habit	-		
19. Are additional stream inform	nation/supplementary measurements inc	luded in "Notes/Sketch" section or	attached? ☐Yes ⊠No
1. Channel Water – assessm	ent reach metric (skip for Size 1 strea	ms and Tidal Marsh Streams)	
	assessment reach.	,	
B No flow, water in p			
☐C No water in assess	sment reach.		
	ion – assessment reach metric		
☐A At least 10% of as	ssessment reach in-stream habitat or rif g flow <u>or</u> a channel choked with aquatio	fle-pool sequence is severely affect macrophytes or ponded water or i	ted by a flow restriction or fill to the
	each (examples: undersized or perched		
beaver dams).	, ,	•	
⊠B Not A			
<ol> <li>Feature Pattern – assessm</li> </ol>			
	ssessment reach has altered pattern (ex	amples: straightening, modification	above or below culvert).
⊠B Not A	_		
	ile – assessment reach metric	waam mafila (ayaradaa aharrada	and author aviation describe
	ment reach has a substantially altered saggradation, dredging, and excavation v		
disturbances).	gg. addition, arouging, and excavation v	appropriate orialine profile i	ac not foldinica from any of these
⊠B Not A			
5. Signs of Active Instability	- assessment reach metric		
Consider only current ins	tability, not past events from which		
active bank failure, active ch	nannel down-cutting (head-cut), active w		
☐C > 25% of channel			

		ne Left Ban	k (LB) and th	e Right Ba	ank (RB).				
LB ⊠A ⊡B	RB ⊠A □B	Moderat referenc	te evidence of ce interaction (	conditions examples:	s (examples: be limited streams	erms, levee ide area a	es, down- ccess, dis	cutting, aggradation, dredging) that adversely afferruption of flood flows through streamside area, lea	
С	□с	[example of flood f mosquite	es: causeway flows through: o ditching]) <u>or</u>	s with flood streamside	dplain and chann area] <u>or</u> too mu	nel constric ch floodpla	tion, bulk iin/intertid	heads, retaining walls, fill, stream incision, disruptional salution access [examples: impoundments, intensi	on ve
Water	Quality	Stressors -	- assessment	reach/inte	ertidal zone me	tric			
	-								
ΠA								er discoloration, oil sheen, stream foam)	
								nd causing a water quality problem	
$\Box$ D					io critering the a	00000111011	. 100011 <u>ai</u>	ta valor quality problem	
□E			d or collected	data indica	ating degraded	water qua	ity in the	assessment reach. Cite source in "Notes/Sketo	:h"
∏F			cess to stream	or intertid	al zone				
□G									
								nowing, destruction, etc)	
⊠j				(0xpidii	Till 140100/OKOK	311 0001101	,		
Recent	t Weath	er – watersł	hed metric (s	kip for Tid	lal Marsh Strea	ms)			
									ht.
								st 48 hours	
⊠c				<i>5</i> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		, 1401 10 11			
Large	or Dang	erous Strea	am – assessn	nent reach	n metric				
□Yes	⊠No	Is strear	n is too large	or dangero	us to assess? If	f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).	
						, of the e		at reach (everyples of atraggers include everyples	
10а	_] res	se	edimentation,	mining, ex	cavation, in-stre	eam harde	ning [for	example, rip-rap], recent dredging, and snagging	ve ig)
L	7/A					idal	∐' <sub>G</sub>	Submerged aquatic vegetation	
			ks and/or lea	f packs an	d/or emergent	for Stre		Low-tide refugia (pools)	
			ags and logs (i	ncluding la	ap trees)	heck arsh	∐'j	5% vertical bank along the marsh	
						ပ ≥	□K	Little or no habitat	
Г				ımaı weller					
_	_E	In banks exi Little or no h			a perimeter				
_	_]E				а репіпетег				
*****	*****	Little or no h	habitat EMAINING QU	ESTIONS	ARE NOT APPI			AL MARSH STREAMS************************************	
*****	*****	Little or no h	habitat EMAINING QU	ESTIONS	ARE NOT APPI			AL MARSH STREAMS************************************	
*****	******** rm and \$	Little or no h ***********RE Substrate –	habitat MAINING QU assessment	ESTIONS reach met	ARE NOT APPI	ze 4 Coas	al Plain s		
Bedfor 11a. [	**************************************	Little or no h  ***********RE  Substrate –  No Is a  evaluated.	EMAINING QU  assessment assessment re Check the ap	ESTIONS reach met ach in a na propriate I	ARE NOT APPI tric (skip for Siz atural sand-bed s	ze 4 Coas	al Plain s	streams and Tidal Marsh Streams)	
Bedfor 11a. [ 11b. E	************ " <b>m and \$</b> ⊒Yes Bedform ⊴A	Little or no h  ***********  Substrate –  No Is a  evaluated. (  Riffle-run se	habitat  MAINING QU  assessment  assessment re	ESTIONS reach met ach in a na propriate I te 11c)	ARE NOT APPI tric (skip for Siz atural sand-bed s	ze 4 Coas	al Plain s	streams and Tidal Marsh Streams)	
************ <b>Bedfor</b> 11a. [  11b. E	******************** □Yes Bedform ∈ ☑A □B	Little or no h  ************  Substrate –  No Is a  evaluated. (  Riffle-run se  Pool-glide s	EMAINING QU  assessment assessment re Check the ap action (evalua acction (evalua	reach met ach in a na propriate I te 11c) ate 11d)	ARE NOT APPI tric (skip for Siz atural sand-bed s	ze 4 Coast	al Plain s	streams and Tidal Marsh Streams)	
Bedfor  11a. [  11b. E  [  [  11c. Ir  a	rm and \$  Yes  Bedform A B C C n riffle se	Little or no h  ********************************  Gubstrate –  No Is a  evaluated. ( Riffle-run se  Pool-glide s  Natural bed  ctions, chec  one box in e	EMAINING QU assessment assessment re Check the ap ection (evalua section (evalua form absent (sek all that occupach row (skip	reach met ach in a na propriate I te 11c) ate 11d) skip to Me r below the	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain	ze 4 Coasi stream? (s : Life) perimeter streams a	al Plain s kip for C  of the ass and Tidal	essment reach – whether or not submerged. Chec Marsh Streams). Not Present (NP) = absent, Ra	are
Bedfor  11a. [  11b. E  [  11c. Ir  a  (I  s	rm and \$  Yes  Bedform B C C riffle se t least c R) = pre hould no	Little or no h  *********************************  Substrate —  No Is a  evaluated. ( Riffle-run se Pool-glide s Natural bed ctions, chec ine box in e sent but ≤ 1  t exceed 10	EMAINING QU assessment re assessment re Check the ap ection (evalua- section (evalua- form absent (so kall that occu- each row (skip 0%, Common 10% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me r below the o for Size 4 (C) = > 10 assessment	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundan	ze 4 Coasi stream? (s : Life) perimeter streams a	al Plain s kip for C  of the ass and Tidal	streams and Tidal Marsh Streams)  coastal Plain streams)  essment reach – whether or not submerged. Chec	are
######################################	rm and \$  Yes  Bedform B C C n riffle se t least c R) = pre- hould no	Little or no h  *********************************  Substrate —  ⊠No Is a  evaluated. ( Riffle-run se Pool-glide s Natural bed ctions, chec one box in e sent but ≤ 1	EMAINING QU assessment re assessment re Check the ap ection (evalua- section (evalua- form absent (so kall that occu- each row (skip 0%, Common 10% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me or below the ofor Size 4 (C) = > 10 sssessment	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar it reach.	ze 4 Coast stream? (s : Life) perimeter streams a at (A) = > 4	al Plain s kip for C  of the ass and Tidal	essment reach – whether or not submerged. Chec Marsh Streams). Not Present (NP) = absent, Ra	are
######################################	rm and \$  Yes  Bedform B C C n riffle se t least c R) = pre- hould no	Little or no h  *********************************  Substrate —  No Is a  evaluated. ( Riffle-run se Pool-glide s Natural bed ctions, chec ine box in e sent but ≤ 1  t exceed 10	EMAINING QU assessment re assessment re Check the ap ection (evalua- section (evalua- form absent (so kall that occu- each row (skip 0%, Common 10% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me r below the o for Size 4 (C) = > 10 assessment	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar at reach.	ze 4 Coast stream? (s : Life) perimeter of streams a ant (A) = > 4 olite - 4096 mr	al Plain s kip for C of the ass and Tidal 40-70%, F	essment reach – whether or not submerged. Chec Marsh Streams). Not Present (NP) = absent, Ra	are
######################################	rm and \$  Yes  Bedform B C C n riffle se t least c R) = pre- hould no	Little or no h  *********************************  Substrate —  No Is a  evaluated. ( Riffle-run se Pool-glide s Natural bed ctions, chec one box in e sent but ≤ 1 tt exceed 10 R C Π Π Π Π Π Π Π Π Π Π Π Π Π Π Π Π Π Π	EMAINING QU  assessment assessment re  Check the ap ection (evalua section (evalua form absent (sex all that occur each row (skip 0%, Common 00% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me or below the ofor Size 4 (C) = > 10 sssessment	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar at reach. Bedrock/sapro Boulder (256 Cobble (64 –	ze 4 Coasi stream? (s : Life) perimeter streams a th (A) = > 4 olite - 4096 mr 256 mm)	al Plain s kip for C of the ass and Tidal 40-70%, F	essment reach – whether or not submerged. Chec Marsh Streams). Not Present (NP) = absent, Ra	are
######################################	rm and \$  Yes  Bedform B C C n riffle se t least c R) = pre- hould no	Little or no h  *********************************  Substrate —  No Is a  evaluated. ( Riffle-run se Pool-glide s Natural bed ctions, chec ine box in e sent but ≤ 1  t exceed 10	EMAINING QU  assessment assessment re  Check the ap ection (evalua section (evalua form absent (sex all that occur each row (skip 0%, Common 00% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me or below the ofor Size 4 (C) = > 10 sssessment	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar at reach.	ze 4 Coast stream? (s : Life) perimeter streams a th (A) = > 4 olite - 4096 mr 256 mm) 4 mm)	al Plain s kip for C of the ass and Tidal 40-70%, F	essment reach – whether or not submerged. Chec Marsh Streams). Not Present (NP) = absent, Ra	are
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######################################	rm and \$  Yes  Bedform B C n riffle se t least c R) = pre hould no	Little or no h  *********************************  Substrate —  No Is a  evaluated. ( Riffle-run se Pool-glide s Natural bed ctions, chec one box in e sent but ≤ 1 tt exceed 10 R C Π Π Π Π Π Π Π Π Π Π Π Π Π Π Π Π Π Π	EMAINING QU assessment assessment re Check the ap ection (evalua section (evalua section (sevalua section (evalua section (eva	reach met ach in a na propriate I te 11c) ate 11d) skip to Me or below the ofor Size 4 (C) = > 10 sssessment	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar it reach. Bedrock/sapre Boulder (256 Cobble (64 – 2 Gravel (2 – 64 Sand (.062 – 2	ce 4 Coasistream? (see Life)  perimeter streams and (A) = > 4  olite    - 4096 mm  256 mm)  4 mm)  2 mm)  062 mm)	kip for Coof the assund Tidal	essment reach – whether or not submerged. Chec Marsh Streams). Not Present (NP) = absent, Ra	are
	Water Check  A B C C B C C C C C C C C C C C C C C	Water Quality: Check all that: A Discol B Excess C Notice D Odor Sectio F Livest G Excess H Degra I Other: J Little t  Recent Weather For Size 1 or 2: A Droug B Droug C No dro Large or Dang Yes No Natural In-stree 10a. Yes  10b. Check all A B B C D D	A	☑A       ☑A       Little or no evidence of reference interaction (or intermittent bulkhead or intermittent bulkhead or intermittent bulkhead of flood flows through substituting interstream divide         Water Quality Stressors – assessment Check all that apply.       ☑A       Discolored water in stream or interestream divide         Water Quality Stressors – assessment Check all that apply.       ☑A       Discolored water in stream or interestream	☑A       ☑A       Little or no evidence of conditions reference interaction (examples: or intermittent bulkheads, caused or intermitent or intermitent or flood flows through streams defined on flood flows through streams defined on flood flows through streams defined on flood f	☑A         ☑A         Little or no evidence of conditions that adversely reference interaction (examples: limited streams or intermittent bulkheads, causeways with floodplood or intermittent bulkheads, causeways with floodplood or intermittent bulkheads, causeways with floodplood or intermittent bulkheads, causeways with floodplain and chann of flood flows through streamside area] or too mure mosquito ditching]) or floodplain/intertidal zone interstream divide           Water Quality Stressors – assessment reach/intertidal zone method interstream divide         ☑ floodplain/intertidal zone method interstream divide           Water Quality Stressors – assessment reach/intertidal zone method interstream divide         ☑ Discolored water in stream or intertidal zone (milky white, interstream divide)           ☐ A         Discolored water in stream or intertidal zone (milky white, interstream example)           ☐ B         Excessive sedimentation (burying of stream features or interstream features or interstream properties of pollutant discharges entering the and continuous of conditions of collected data indicating degraded section.           ☐ C         Current published or collected data indicating degraded section.           ☐ F         Livestock with access to stream or intertidal zone (removal other)           ☐ G         Excessive algae in stream or intertidal zone (removal other)           ☐ D         Other           ☐ D         Other           ☐ D         Other           ☐ C         Excessive algae in stream or intertidal zone (removal other)           ☐ D	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	☑A         ☑A         Little or no evidence of conditions (examples: berms, levees, down-reference interaction (examples: limited streamside area access, disor intermittent bulkheads, causeways with floodplain constriction, milexamples: causeways with floodplain constriction, milexamples: causeways with floodplain and channel constriction, bulk of flood flows through streamside area] or too much floodplain/intertic mosquito ditching]) or floodplain/intertidal zone unnaturally absent interstream divide           Water Quality Stressors – assessment reach/intertidal zone metric           Check all that apply.         A Discolored water in stream or intertidal zone (milky white, blue, unnatural wate interstream divide           □ A Discolored water in stream or intertidal zone (milky white, blue, unnatural wate intersidable evidence of pollutant discharges entering the assessment reach and Odor (not including natural sulfide odors)           □ C Current published or collected data indicating degraded water quality in the section.           □ F Livestock with access to stream or intertidal zone           □ G Excessive algae in stream or intertidal zone           □ H Degraded marsh vegetation in the intertidal zone (removal, burning, regular mother:	☑A         ☑A         Little or no evidence of conditions that adversely affect reference interaction

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 ⊠ □		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles Caddisfly larvae (T)
			Asian clam ( <i>Corbicula</i> ) Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )
			Mussels/Clams (not <i>Corbicula</i> ) Other fish Salamanders/tadpoles
			Snails Stonefly larvae (P) Tipulid larvae
13.	Streams	ide Area	Worms/leeches  Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	LB ⊠A ⊟B	RB ⊠A ⊟B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	□c	□c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	□Y ⊠N	□Y □N	Are wetlands present in the streamside area?
16.		II contrib Streams	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) outors within the assessment reach or within view of and draining to the assessment reach. and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C □D □E □F	Obstruc Evidenc Stream	ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) of bank seepage or sweating (iron in water indicates seepage) oed or bank soil reduced (dig through deposited sediment if present) the above
17.	Check a	ll that ap	
	□A □B □C □D	Obstructure Urban s	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed) that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E ⊠F	Assessr	nent reach relocated to valley edge the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠a □B □C	Stream : Degrade	shading is appropriate for stream category (may include gaps associated with natural processes)  Id (example: scattered trees)  Is shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB $\triangle A \triangle A$
20.	□ E □ E □ E □ C 10 feet wide or no trees  Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  LB RB □ A □ A Mature forest □ B □ B Non-mature woody vegetation or modified vegetation structure □ C □ C Herbaceous vegetation with or without a strip of trees < 10 feet wide □ D □ D Maintained shrubs
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB  □ A □ A □ A □ A □ A □ A □ A Row crops □ B □ B □ B □ B □ B □ B Maintained turf □ C □ C □ C □ C □ C □ C □ C Pasture (no livestock)/commercial horticulture □ D □ D □ D □ D □ D □ D □ D □ D Pasture (active livestock use)
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density  B B B Low stem density  C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         △A       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       B       Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  ☐ Yes ☐ No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐ No Water ☐ Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230
Note	es/Sketch:

# Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

Stream Site Name	CL1 Airport Expansion	Date of Assessment	April 2019	
Stream Category	Pa1	Assessor Name/Organization	KMT,BGB/HDR	
Notes of Field Asses	sment Form (Y/N)		NO	
Presence of regulatory considerations (Y/N)  YES				
Additional stream inf	ormation/supplementary measu	rements included (Y/N)	NO	
NC SAM feature type	e (perennial, intermittent, Tidal N	/larsh Stream)	Perennial	

(poronnial, intornittorit, fradi waron ctroam)	1 Olollina	<u>.                                    </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	HIGH	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA NA	
(2) Longitudinal Tidal Flow	NA NA	
· · · -		
(2) Tidal Marsh Stream Stability (3) Tidal Marsh Channel Stability	NA NA	
	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	HIGH	

### NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

			Accompanies User i	Wallual Velsic	JII Z. I	
US	SACE AID #:			NCDW	R #:	
IN:	STRUCTIONS: At	ach a sketch of the assessi	nent area and photogr	aphs. Attach a	a copy of the USGS 7	.5-minute topographic quadrangle,
an	d circle the location	n of the stream reach under	evaluation. If multiple	e stream reach	nes will be evaluated	on the same property, identify and
nu	mber all reaches or	n the attached map, and inc	ude a separate form fo	or each reach.	See the NC SAM Us	er Manual for detailed descriptions
an	d explanations of r	equested information. Rec	ord in the "Notes/Sketo	ch" section if s	upplementary measur	rements were performed. See the
NC	C SAM User Manua	I for examples of additional	measurements that m	ay be relevant		
NC	OTE EVIDENCE OF	STRESSORS AFFECTIN	G THE ASSESSMENT	Γ AREA (do no	ot need to be within	the assessment area).
PF	ROJECT/SITE INFO	ORMATION:				
1.	Project name (if an	y): CLT Airport Expa	nsion	2. Date of eva	aluation: April 201	9
3.	Applicant/owner na	me: CLT		4. Assessor r	name/organization:	KMT,BGB/HDR
	County:	Mecklenburg			amed water body	
7.	River basin:	Catawba			7.5-minute quad:	Coffey Creek
8.	Site coordinates (d	ecimal degrees, at lower er	d of assessment reach		360, -80.954446	•
	,	TION: (depth and width ca	n be approximations	·	·	
	0.1		I-2, S27 -			( ) ( ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (
				-	essment reach evalua	
		m bed (in riffle, if present) t				hable to assess channel depth.
	. Channel width at				each a swamp steam?	' ∐Yes ∐No
		Perennial flow Intermitte	nt flow ∐Tidal Marsh	Stream		
		Y INFORMATION:	_	_		_
15	. NC SAM Zone:	☐ Mountains (	VI) ☐ Piedmont (F	P) 🗌 Inne	r Coastal Plain (I)	Outer Coastal Plain (O)
					1	1
16	. Estimated geomo	rphic —		,	_	
'	valley shape ( <b>ski</b> )		$\overline{}$	6	□В	
	Tidal Marsh Stre		stream, flatter valley sl	ope)	(less sinuous stre	eam, steeper valley slope)
17	. Watershed size: (	<b>skip</b> ⊠Size 1 (< 0.1	mi <sup>2</sup> )	$to < 0.5 \text{ mi}^2$	☐Size 3 (0.5 to < 5	5 mi²)
	for Tidal Marsh S	- '	/ 🗀 = = (***	,		
A	DITIONAL INFOR	,				
		onsiderations evaluated? [	☐Yes ☐No If Yes, ch	heck all that ap	oply to the assessmer	nt area.
	☐Section 10 wat		ied Trout Waters			hed (□I □II □III □IV □V)
	Essential Fish	Habitat ⊟Primar	y Nursery Area			Outstanding Resource Waters
	⊠Publicly owned		R Riparian buffer rule	in effect	Nutrient Sensitive Wa	aters
	☐Anadromous fis	sh ⊠303(d)	List		CAMA Area of Enviro	nmental Concern (AEC)
	□Documented p	resence of a federal and/or	state listed protected s	species within t	the assessment area.	
	List species:					
	□Designated Cri	tical Habitat (list species)				
19	. Are additional stre	eam information/supplemen	ary measurements inc	cluded in "Note	s/Sketch" section or a	attached? ☐Yes ⊠No
1.		assessment reach metric		ıms and Tidal	Marsh Streams)	
		roughout assessment reach	l.			
		water in pools only.				
	□C No wate	r in assessment reach.				
2.	Evidence of Flow	Restriction – assessmen	t reach metric			
	□A At least	10% of assessment reach	n-stream habitat or rif	fle-pool seque	ence is severely affect	ted by a flow restriction or fill to the
						mpoundment on flood or ebb within
		` •	ndersized or perched	culverts, cause	eways that constrict th	ne channel, tidal gates, debris jams
	beaver o	lams).				
	⊠B Not A					
3.	Feature Pattern -	assessment reach metric	<b>:</b>			
	□ A Majori	ty of the assessment reach	has altered pattern (ex	kamples: straig	htening, modification	above or below culvert).
	⊠B Not A		. ,		. •	,
4.	Feature Longitus	linal Profile – assessment	reach metric			
₹.				tream profile (	evamples, channel de	own-cutting, existing damming, over
						as not reformed from any of these
	disturba		mg, and choavalion v	οιο αρριορί	iato orialinoi pionie li	as not reformed from any or these
	⊠B Not A	/-				
_						
5.	_	nstability – assessment re		41		
						ed. Examples of instability include
			ig (nead-cut), active w	riuening, and a	runciai nardening (sud	ch as concrete, gabion, rip-rap).
		f channel unstable % of channel unstable				
		% of channel unstable				

6.					streamsic					
			the Left	Bank (LE	3) and the	Right Ba	nk (RB).			
	LB ⊠A □B	RB ⊠A ⊟B	Mod refe	derate evi erence inte	dence of ceraction (ex	conditions xamples:	limited streams	erms, leve ide area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	□c	□c	[exa of flo mos	amples: c ood flows	auseways through st ching]) <u>or</u> f	with flood reamside	lplain and chanr area] <u>or</u> too mu	nel constri ch floodpla	ction, bulk ain/intertic	eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	ertidal zone me	tric		
		k all that								
	ΠĀ									er discoloration, oil sheen, stream foam)
	□B □C						m features or inf			nd causing a water quality problem
	∐ŏ				tural sulfide		o ontorning the e	0000011101	10 100011 <u>al</u>	ta valor quality problem
	□E			shed or c	collected d	ata indica	iting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F	section Lives		h access t	to stream o	or intertida	al zone			
	□G				eam or inte					
							al zone (remova a in "Notes/Sketa			nowing, destruction, etc)
	⊠j		to no str			_ (0xpiaii)	III TVOLCO, CROC	011 0001101	'/	
8.	Rece	nt Weath	ner – wat	tershed n	netric (ski	p for Tida	al Marsh Strea	ms)		
										eams, D2 drought or higher is considered a drought.
	□A □B						ıll not exceeding 1 inch within the			st 48 hours
	⊠c			onditions	<u>.</u>				0 0.0	
9.	Large	e or Dang	gerous S	Stream –	assessme	ent reach	metric			
	□Ye	s ⊠No	) Is st	tream is to	oo large or	dangerou	us to assess? I	f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							each metric	, of the o	2222mar	at reach (examples of atreasers include examples
	iua.	∐Yes	⊠No	sedime	ntation, m	ining, exc	cavation, in-stre tal Plain strear	eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.	Check a ⊠A								ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms
		MA			ts, lichens,		quatic mosses I mats)	Check for Tidal Marsh Streams Only	□F □G	Submerged aquatic vegetation
		⊠в			nd/or leaf	packs and	d/or emergent	k for T h Stre Only	∏H.	Low-tide refugia (pools) Sand bottom
		□с	vegetat Multiple		nd logs (in	cluding la	p trees)	heck arsh	□J	5% vertical bank along the marsh
		□D	5% unc	dercut bar	nks and/or	root mats	s and/or roots	ਹਂ≥ਂ	□ĸ	Little or no habitat
		□E		s extend t no habita		nai wetted	d perimeter			
****	******	*******	******	**REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	te – asse	ssment re	each meti	ric (skip for Siz	ze 4 Coas	tal Plain	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is asses	sment read	ch in a na	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.	Bedform ⊠A			k the app		oox(es).			
		□B			n <b>(evaluate</b> n <b>(evaluat</b>					
		□с	Natural	bedform	absent (sk	cip to Met	tric 12, Aquatio	: Life)		
	11c.	at least	one box	in each i	row (skip i	for Size 4	Coastal Plain	streams	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should n	ot excee	ed 100% fo	or each as	sessment		()	,	ger
		NP ⊠	R □	C □	A	P	Bedrock/sapr	olite		
							Boulder (256		m)	
							Cobble (64 –			
		H	H			H	Gravel (2 – 64 Sand (.062 –			
			፱		₫		Silt/clay (< 0.0	,		
			H			$\mathbb{R}$	Detritus Artificial (rip-ra	an concre	ete etc)	
	11d	□Yes	□No	Are pool	s filled with			-		streams and Tidal Marsh Streams)
			,	, o pool	- mod will	. Journal	(S.up 101 012	<del></del>	-a. , idili (	and man man on our dailid

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? cone of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛛	Yes [	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles Caddisfly larvae (T)
			Asian clam ( <i>Corbicula</i> ) Crustacean (isopod/amphipod/crayfish/shrimp)
			Damselfly and dragonfly larvae Dipterans Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea)</i> Mussels/Clams (not <i>Corbicula</i> ) Other fish
			Salamanders/tadpoles  Snails  Stonefly larvae (P)
			Tipulid larvae  Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	⊠a □B	⊠a □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	□C	□с	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.	Conside LB	r for the RB	Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	ee – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma of assessment reach.
	□Y ⊠N	∐Y ⊠N	Are wetlands present in the streamside area?
16.	Check a ☐A	II contril Streams	butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) butors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)
	□B □C □D ⊠E □F	Obstruct Evidence Stream	nclude wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present) the above
17.		w Detrac	tors – assessment area metric (skip for Tidal Marsh Streams)
	□A □B □C □D	Obstructure Urban s	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (> 24% impervious surface for watershed) to the the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E ⊠F	Assessr	the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠A □B □C	Stream Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) ed (example: scattered trees) shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB $A A A A A A A A A A A A A A A A A A A$								
20.	□ E       □ E								
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  □ A □ A □ A □ A □ A □ A □ A □ A □ A □								
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density B B B Low stem density C C C No wooded riparian buffer or predominantly herbaceous species or bare ground								
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.								
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         △A       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       B       Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.								
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  ☐ Yes ☐ No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐ No Water ☐ Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230								
Note	es/Sketch:								

# Draft NC SAM Stream Rating Sheet Accompanies User Manual Version 2.1

Stream Site Name	CL1 Airport Expansion	Date of Assessment	April 2019					
Stream Category	Pa1	Assessor Name/Organization	anization KMT,BGB/HDR					
Notes of Field Asses		NO						
Presence of regulator	YES							
Additional stream information/supplementary measurements included (Y/N) NO								
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial								

(poronnial, intornittorit, fradi waron ctroam)	1 010111110	<u>-</u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	HIGH	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA NA	
· · · -		
(2) Tidal Marsh Stream Stability (3) Tidal Marsh Channel Stability	NA NA	
	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	HIGH	

## NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

	oo ooo manaa vorolon zii									
USACE AID #:	NCDWR #:									
	d photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,									
	If multiple stream reaches will be evaluated on the same property, identify and									
	te form for each reach. See the NC SAM User Manual for detailed descriptions of test section if supplementary measurements were performed. See the									
NC SAM User Manual for examples of additional measuremen										
	SSMENT AREA (do not need to be within the assessment area).									
PROJECT/SITE INFORMATION:										
1. Project name (if any): CLT Airport Expansion	2. Date of evaluation: April 2019									
3. Applicant/owner name: CLT	4. Assessor name/organization: KMT,BGB/HDR									
5. County: Mecklenburg 7. River basin: Catawba	6. Nearest named water body on USGS 7.5-minute quad: Coffey Creek									
Site coordinates (decimal degrees, at lower end of assessment)										
STREAM INFORMATION: (depth and width can be approxi										
9. Site number (show on attached map): PS1-2, S27 - Reach 3	10. Length of assessment reach evaluated (feet): 400'									
11. Channel depth from bed (in riffle, if present) to top of bank										
12. Channel width at top of bank (feet): 3	13. Is assessment reach a swamp steam? ☐Yes ☐No									
14. Feature type: ⊠Perennial flow ☐Intermittent flow ☐Tid.										
STREAM CATEGORY INFORMATION:										
15. NC SAM Zone: ☐ Mountains (M) ☐ Pie	edmont (P)									
	\ /									
16. Estimated geomorphic										
valley shape (skip for Tidal Marsh Stream): (more sinuous stream, flatter										
	ze 2 (0.1 to < 0.5 mi²)									
for Tidal Marsh Stream)	, _ , _ , _ , , , , , , , , , , , , , , , , , ,									
ADDITIONAL INFORMATION:										
18. Were regulatory considerations evaluated?     Yes   No										
☐ Section 10 water ☐ Classified Trout War ☐ Essential Fish Habitat ☐ Primary Nursery Are										
Publicly owned property □NCDWR Riparian be										
☐Anadromous fish ☐303(d) List	☐CAMA Area of Environmental Concern (AEC)									
☐Documented presence of a federal and/or state listed pr	rotected species within the assessment area.									
List species:										
Designated Critical Habitat (list species)	ments included in "Notes/Sketch" section or attached? ☐Yes ☒No									
10.7110 additional stream information/supplementary measure	THORIGORING HOLDON TO A SECTION OF STREET HER MIND									
Channel Water – assessment reach metric (skip for Siz	e 1 streams and Tidal Marsh Streams)									
<ul><li>□B No flow, water in pools only.</li><li>□C No water in assessment reach.</li></ul>										
	io									
<ol> <li>Evidence of Flow Restriction – assessment reach metr</li> <li>A At least 10% of assessment reach in-stream hab</li> </ol>	<b>ic</b> bitat or riffle-pool sequence is severely affected by a flow restriction <u>or</u> fill to the									
point of obstructing flow or a channel choked wit	th aquatic macrophytes or ponded water or impoundment on flood or ebb within									
the assessment reach (examples: undersized or	perched culverts, causeways that constrict the channel, tidal gates, debris jams,									
beaver dams). ⊠B Not A										
3. Feature Pattern – assessment reach metric	attorn (avamples: straightening, modification above or helaw sulvert)									
<ul><li>☐A A majority of the assessment reach has altered p</li><li>☐B Not A</li></ul>	attern (examples: straightening, modification above or below culvert).									
4. Feature Longitudinal Profile – assessment reach metric	•									
☐A Majority of assessment reach has a substantially altered stream profile (examples: channel down-cutting, exit										
	avation where appropriate channel profile has not reformed from any of these									
disturbances).	disturbances).									
⊠B Not A										
5. Signs of Active Instability – assessment reach metric										
	n which the stream has currently recovered. Examples of instability include									
active bank failure, active channel down-cutting (head-cut), $\triangle A$ < 10% of channel unstable	, active widening, and artificial hardening (such as concrete, gabion, rip-rap).									
☐B 10 to 25% of channel unstable										
C > 25% of channel unstable										

6.					streamsic					
			he Left	Bank (LB	) and the	Right Ba	nk (RB).			
	LB ⊠A □B	RB ⊠A □B	Mod refe	derate eviderence inte	dence of c raction (ex	conditions xamples:	limited streams	rms, leve ide area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	□c	□c	[exa of flo mos	amples: ca	auseways through st hing]) <u>or</u> f	with flood reamside	plain and chanr area] <u>or</u> too mu	nel constric ch floodpla	ction, bulk ain/intertic	eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	rtidal zone me	tric		
		k all that								
	ΠA									er discoloration, oil sheen, stream foam)
	□B						n features or int			nd causing a water quality problem
	∐ŏ				ural sulfide		s critering the d	0000011101	10 100011 <u>01</u>	ta valor quality problem
	□E			shed or c	ollected da	ata indica	ting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F	section Lives		h access t	o stream o	or intertida	al zone			
	□G				am or inte					
							il zone (removal in "Notes/Sketo			nowing, destruction, etc)
	⊠j		to no str			_ (0/10/11	III 140100/CROK	511 0000101	'/	
8.	Rece	nt Weath	er – wat	tershed m	netric (ski	p for Tida	al Marsh Strea	ms)		
										eams, D2 drought or higher is considered a drought.
	□A □B						II not exceeding 1 inch within the			st 48 hours
	⊠c			onditions		to o o um . g			0 0.0	
9.	Large	e or Dang	gerous S	Stream – a	assessme	ent reach	metric			
	□Ye	s 🖾 No	) Is st	tream is to	oo large or	dangerou	us to assess? I	f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							ach metric	, of the o	2222222	at reach (examples of etropoers include examples
	iua.	∐Yes	⊠No	sedime	ntation, m	ining, exc		eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.	Check a ⊠A								ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms
					s, lichens,		quatic mosses I mats)	Check for Tidal Marsh Streams Only	□F □G	Submerged aquatic vegetation
		⊠В			nd/or leaf p	packs and	d/or emergent	k for T h Stre Only	□H □I	Low-tide refugia (pools) Sand bottom
		□с	vegetat Multiple		nd logs (inc	cluding lap	p trees)	heck arsh	∐'j	5% vertical bank along the marsh
		$\overline{\boxtimes}$ D	5% unc	dercut ban	ks and/or	root mats	s and/or roots	บี≥ี	□κ	Little or no habitat
		□E		s extend t no habita		nai wetted	l perimeter			
		_								
****	*****	*******	******	**REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	te – asse	ssment re	each metr	ric (skip for Siz	ze 4 Coas	tal Plain :	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is assess	sment read	ch in a na	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.	Bedform ⊠A			k the appi		oox(es).			
		□B			evaluate) (evaluat					
		□с					ric 12, Aquatio	: Life)		
	11c.	at least	one box	in each r	ow (skip 1	for Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should n		ed 100% fo	or each as			(/ //	.0 .070, .	Tourisment (i. ) Freyer Camaratro personages
		NP ⊠	R □	C	A	P	Bedrock/sapr	olite		
			$\exists$	H	H	Ħ	Boulder (256		m)	
							Cobble (64 –			
		H	H	$\square$		H	Gravel (2 – 64 Sand (.062 –			
					☒		Silt/clay (< 0.0	,		
			H		R	$\mathbb{R}$	Detritus Artificial (rip-ra	an concre	ete etc)	
	114	□Yes	□No	Are noole	니 s filled with			•		streams and Tidal Marsh Streams)
			,0	, o pool	ou will	. Journal	(5.66 101 012	<del></del>	-aa	and man man on outlis

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. ⊠	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles Caddisfly larvae (T)
			Asian clam ( <i>Corbicula</i> ) Crustacean (isopod/amphipod/crayfish/shrimp)
			Damselfly and dragonfly larvae Dipterans Mayfly larvae (E)
		$\boxtimes$	Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )
			Mussels/Clams (not <i>Corbicula</i> ) Other fish
			Salamanders/tadpoles Snails Stonefly larvae (P)
	_		Tipulid larvae Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	⊠a □B □C	⊠a □B □C	Little or no alteration to water storage capacity over a majority of the streamside area  Moderate alteration to water storage capacity over a majority of the streamside area  Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction,
14.	Conside	r for the	livestock disturbance, buildings, man-made levees, drainage pipes)  Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types)  Left Bank (LB) and the Right Bank (RB) of the streamside area.
	LB □A □B ⊠C	RB □A ⊠B □C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted po	r for the erimeter	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma of assessment reach.
	LB □Y ⊠N	RB ⊠Y □N	Are wetlands present in the streamside area?
16.		II contrib Streams	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) outors within the assessment reach or within view of and draining to the assessment reach. and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C □D □E □F	Obstruc Evidenc Stream	ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present) the above
17.			ors – assessment area metric (skip for Tidal Marsh Streams) ply.
	□A □B □C □D	Evidenc Obstruc Urban s	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (> 24% impervious surface for watershed) that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E ⊠F	Assessr	nent reach relocated to valley edge the above
18.	_		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠a □B □C	Stream : Degrade	shading is appropriate for stream category (may include gaps associated with natural processes)  Id (example: scattered trees)  Is shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB $A A A A A A A A A A A A A A A A A A A$
20.	□E □E □E < 10 feet wide or no trees  Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  □B □E □E < 10 feet wide or no trees  LB □E < 10 feet wide or no trees
	⊠A       Mature forest         □B       □B       Non-mature woody vegetation or modified vegetation structure         □C       □C       Herbaceous vegetation with or without a strip of trees < 10 feet wide         □D       □D       Maintained shrubs         □E       □E       Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	□C □C □C □C □C Pasture (no livestock)/commercial horticulture □D □D □D □D □D Pasture (active livestock use)  Stem Density – streamside area metric (skip for Tidal Marsh Streams)
	Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density  B DB Low stem density  C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         □A       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       B       Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a. □Yes □No Was conductivity measurement recorded?  If No, select one of the following reasons. □No Water □Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).
Note	□A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230 ′ es/Sketch:

Stream Site Name	CL1 Airport Expansion	Date of Assessment	April 2019					
Stream Category	Pa2	Assessor Name/Organization	KMT,BGB/HD	R				
Notes of Field Asses		NO						
Presence of regulator	YES							
Additional stream inf	rements included (Y/N)	NO						
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial								

e (perennial, intermittent, Tidal Marsh Stream)	Perennia	<u>l</u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	- Intermitted
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	LOW	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA NA	
(2) Longitudinal Tidal Flow	NA NA	
(2) Tidal Marsh Stream Stability	NA NA	
(3) Tidal Marsh Channel Stability	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	HIGH	
(2) In-stream Habitat	MEDIUM	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	HIGH	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA NA	
Overall	HIGH	

	7 to oo in parillo o o oo i	ianaa Tororon 211	
USACE AID #:		NCDWR #:	
	h of the assessment area and photogra		
	am reach under evaluation. If multiple ed map, and include a separate form for		
	formation. Record in the "Notes/Sketc		
NC SAM User Manual for example	les of additional measurements that ma	ay be relevant.	
NOTE EVIDENCE OF STRESSO	ORS AFFECTING THE ASSESSMENT	AREA (do not need to be within	the assessment area).
PROJECT/SITE INFORMATION		2. Data of avaluation: April 00	10
	LT Airport Expansion  LT	<ul><li>2. Date of evaluation: Aprill 20</li><li>4. Assessor name/organization:</li></ul>	19 KMT,BGB/HDR
	ecklenburg	6. Nearest named water body	KWIT,BGB/TIBIK
	atawba	on USGS 7.5-minute quad:	Coffey Creek
8. Site coordinates (decimal degr	ees, at lower end of assessment reach	): 35.203366, -80.953215	
STREAM INFORMATION: (dept	h and width can be approximations) PS1-2, S27 -		
9. Site number (show on attached		ength of assessment reach evalua	
	ffle, if present) to top of bank (feet):		nable to assess channel depth.
12. Channel width at top of bank	(feet): 3 13. Is a ow  ☐Intermittent flow ☐Tidal Marsh :	assessment reach a swamp steam?	Y LIYES LINO
STREAM CATEGORY INFORMA		Jugaill	
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P	) Inner Coastal Plain (I)	☐ Outer Coastal Plain (O)
	—		,
16. Estimated geomorphic	NA V	/ □B ~	
valley shape (skip for Tidal Marsh Stream):	(more sinuous stream, flatter valley sle		eam, steeper valley slope)
17. Watershed size: <b>(skip</b>	Size 1 (< 0.1 mi <sup>2</sup> ) $\boxtimes$ Size 2 (0.1 t		
for Tidal Marsh Stream)			3 mi )3i2e 4 (2 3 mi )
ADDITIONAL INFORMATION:			
	ns evaluated?  Yes  No If Yes, ch		
Section 10 water	Classified Trout Waters		hed (   I   II   III   IV   V)
☐Essential Fish Habitat ☐ Publicly owned property	☐ Primary Nursery Area ☐ NCDWR Riparian buffer rule		Outstanding Resource Waters
☐ Anadromous fish	⊠303(d) List		onmental Concern (AEC)
	a federal and/or state listed protected s		
List species:	(list appaiss)		
☐ Designated Critical Habitat	: (IIST species) ition/supplementary measurements inc	luded in "Notes/Sketch" section or	attached? □Yes ⊠No
10.7110 additional stream informa	months income in the superior	industrial 140009/OROLOH SCOTION OF	andoniou. [] 100 [MI10]
	nt reach metric (skip for Size 1 strea	ms and Tidal Marsh Streams)	
<ul><li>☑A Water throughout as</li><li>☑B No flow, water in poor</li></ul>			
☐C No water in assessn			
	n – assessment reach metric		
☐A At least 10% of asset	essment reach in-stream habitat or riff	le-pool sequence is severely affec	ted by a flow restriction or fill to the
point of obstructing	flow or a channel choked with aquatic	macrophytes or ponded water or i	mpoundment on flood or ebb within
the assessment read beaver dams).	ch (examples: undersized or perched	cuiverts, causeways that constrict t	ne cnannel, tidal gates, debris jams,
⊠B Not A			
	ent reach metric		
	sessment reach has altered pattern (ex	amples: straightening, modification	above or below culvert).
⊠B Not A		<b>2 3</b> ,	•
4. Feature Longitudinal Profile	e – assessment reach metric		
☐A Majority of assessm	ent reach has a substantially altered st		
	gradation, dredging, and excavation w	here appropriate channel profile h	has not reformed from any of these
disturbances). ⊠B Not A			
5. Signs of Active Instability –	assessment reach metric		
,	assessment reach metric bility, not past events from which t	he stream has currently recover	ed. Examples of instability include
active bank failure, active cha	nnel down-cutting (head-cut), active wi		
☐B 10 to 25% of channel ur			

6.	Consider for the Left Bank (LB) and the Right Bank (RB).											
	LB	RB	ie Leit I	Jank (EE	, and the	i Kigiit De	ilik (IVD).					
	⊠A □B	⊠A □B	Mod refer or in	erate evi rence inte termitten	dence of eraction (enter the desired the d	conditions examples: ds, cause	limited stream ways with flood	erms, leve side area a Iplain cons	es, down- access, dis triction, m	eraction cutting, aggradation, dredging) that adversely affect sruption of flood flows through streamside area, leaky inor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone access		
			[exa of flo mos	mples: c	auseways through s ching]) <u>or</u>	with flood treamside	dplain and char area] <u>or</u> too m	nnel constri uch floodpl	ction, bulk ain/intertio	cheads, retaining walls, fill, stream incision, disruption dal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an		
7.		-		rs – ass	essment	reach/inte	ertidal zone m	etric				
	□A □B □C □D	Exces Notice Odor (	ored wa sive sec able evi (not incl	dimentation idence of uding nat	on (buryin f pollutant tural sulfid	g of stread discharge le odors)	m features or i es entering the	ntertidal zo assessme	ne) nt reach <u>a</u>	er discoloration, oil sheen, stream foam)  nd causing a water quality problem		
	□E	Currei sectio		shed or c	ollected o	data indica	ating degraded	l water qua	ality in the	e assessment reach. Cite source in "Notes/Sketch"		
	□F □G □H	Livest Exces Degra	ock with sive algaded ded mai	ae in stre rsh veget		ertidal zon ne intertida	ne al zone (remov			nowing, destruction, etc)		
	∐I ⊠J	Other: Little t	o no stre			_ (explair	n in "Notes/Ske	etch" sectio	n)			
8.	For Size	e 1 or 2 s	streams,	, D1 drou	ght or higl	her is con		ght; for Size		reams, D2 drought or higher is considered a drought.		
	□A □B ⊠C	Droug	ht condi				all not exceedir 1 inch within th			st 48 nours		
9.	Large o	or Dango ⊠No			assessmoo large o			If Yes, ski	o to Metric	c 13 (Streamside Area Ground Surface Condition).		
10.	Natural 10a.		<b>am Hab</b> ⊠No	Degrad sedime	led in-stre	eam habit nining, ex		ream hard	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)		
	<u> </u>	∄A ∄B ]C ∄D	Multiple (include Multiple vegetati Multiple 5% und	aquatic liverwork sticks ar on snags ar ercut bar	macrophy ts, lichens nd/or leaf nd logs (ir nks and/o	tes and ad , and alga packs an ncluding la r root mat	quatic mosses Il mats) d/or emergent	idal	skip for S   F   G   H   I   J   K	Size 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools) Sand bottom 5% vertical bank along the marsh Little or no habitat		
				no habita		nai wotto	a porimicior					
****	*****	*****	*****	*RFMAIN	NING OUI	STIONS	ARF NOT AP	PI ICABI F	FOR TID	AL MARSH STREAMS************************************		
11.										streams and Tidal Marsh Streams)		
	11a. [	]Yes	⊠No	Is asses	sment rea	ich in a na	atural sand-bed	l stream? (	skip for C	Coastal Plain streams)		
		]A ]B	Riffle-ru Pool-glid	n section de sectio	k the app (evaluate n (evalua absent (s	e 11c) te 11d)	box(es). tric 12, Aquat	ic Life)				
	<b>a</b> t (F sl	t <b>least o</b> R) = pres nould no	ne box sent but	in each (	row (skip	for Size 4 (C) = > 10	<b>4 Coastal Plai</b> 0-40%, Abunda	n streams	and Tidal	sessment reach – whether or not submerged. <b>Check I Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages		
	N D D C	3	R 		A □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	P	Bedrock/sap Boulder (256 Cobble (64 - Gravel (2 - 6 Sand (.062 -	6 – 4096 m - 256 mm) 64 mm) - 2 mm)	m)			
							Silt/clay (< 0 Detritus Artificial (rip-		ete, etc.)			
	11d. [	]Yes	□No	Are pool	s filled wit	th sedime	nt? (skip for S	ize 4 Coas	tal Plain	streams and Tidal Marsh Streams)		

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes 🗆	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles Caddisfly larvae (T)
			Asian clam ( <i>Corbicula</i> )  Crustacean (isopod/amphipod/crayfish/shrimp)
	H		Damselfly and dragonfly larvae Dipterans Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> ) Mussels/Clams (not <i>Corbicula</i> ) Other fish
			Salamanders/tadpoles  Snails  Stonefly larvae (P)
			Tipulid larvae   Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types) Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	⊠a □B	⊠a □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	□C	С	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.	Conside LB	r for the RB	Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the erimeter	te – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma of assessment reach.
	LB □Y ⊠N	RB ⊠Y □N	Are wetlands present in the streamside area?
16.	Check a ☐A	II contrib Streams	putors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.  and/or springs (jurisdictional discharges)
	□B □C 図D 図E □F	Obstruc Evidenc Stream	nclude wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) te of bank seepage or sweating (iron in water indicates seepage) toed or bank soil reduced (dig through deposited sediment if present) the above
17.			tors – assessment area metric (skip for Tidal Marsh Streams) ply.
	□A □B □C □D	Evidenc Obstruc Urban s	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed) that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E □F	Assessr	nent reach relocated to valley edge the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠A □B □C	Stream Degrade	shading is appropriate for stream category (may include gaps associated with natural processes)  d (example: scattered trees)  shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB $A A A A A A A A A A A A A A A A A A A$
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  B RB  A Mature forest B B Non-mature woody vegetation or modified vegetation structure C C Herbaceous vegetation with or without a strip of trees < 10 feet wide D Maintained shrubs E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density B B B Low stem density C C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         □A       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       □B       Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  ☐ Yes ☐ No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐ No Water ☐ Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230
Note	es/Sketch:

Stream Site Name	CL1 Airport Expansion	Date of Assessment	Aprili 2019					
Stream Category	Pa2	Assessor Name/Organization	KMT,BGB/HDF	(				
Notes of Field Asses	NO							
Presence of regulator	YES							
Additional stream inf	NO							
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial								

Aporoninal, intornittorit, Tradi Maron Ctrodiny	T OTOTINA	<u>-</u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	LOW	
· · · · · · · · · · · · · · · · · · ·	HIGH	
(3) Stream Stability		
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	HIGH	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	HIGH	
(2) In-stream Habitat	MEDIUM	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	HIGH	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA NA	
	NA NA	
(3) Flow Restriction		
(3) Tidal Marsh Stream Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA	
Overall	HIGH	

USACE AID #:	NCDWR #:
	sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
	e stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
	attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
	sted information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
	examples of additional measurements that may be relevant.
	ESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE INFORMA	
1. Project name (if any):	CLT Airport Expansion 2. Date of evaluation: April 2019
3. Applicant/owner name:	CLT 4. Assessor name/organization: KMT,BGB/HDR
5. County:	Mecklenburg 6. Nearest named water body
7. River basin:	Catawba on USGS 7.5-minute quad: Coffey Creek
•	al degrees, at lower end of assessment reach): 35.203748, -80.953340
9. Site number (show on at	(depth and width can be approximations) tached map): PS2-2 - Stream 28 10. Length of assessment reach evaluated (feet): 67'
	d (in riffle, if present) to top of bank (feet):  1 Unable to assess channel depth.
12. Channel width at top of	
•	nial flow Intermittent flow Tidal Marsh Stream
STREAM CATEGORY INF	
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
	I Modificanto (M)
16. Estimated geomorphic	$\boxtimes_{A}$
valley shape (skip for Tidal Marsh Stream):	(more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)
17. Watershed size: <b>(skip</b>	Size 1 (< 0.1 mi²)
for Tidal Marsh Strear	
ADDITIONAL INFORMATI	<i>'</i>
	erations evaluated?  Yes No If Yes, check all that apply to the assessment area.
☐Section 10 water	□Classified Trout Waters □Water Supply Watershed (□I □II □IV □V)
☐Essential Fish Habita	
— ⊠Publicly owned prope	
☐Anadromous fish	☐ Sand (d) List ☐ CAMA Area of Environmental Concern (AEC)
☐Documented presen	ce of a federal and/or state listed protected species within the assessment area.
List species:	
☐Designated Critical F	
19. Are additional stream in	nformation/supplementary measurements included in "Notes/Sketch" section or attached? ☐Yes ☒No
4 Channel Water cook	coment reach metric (akin for Size 4 etreems and Tidal March Streems)
	ssment reach metric (skip for Size 1 streams and Tidal Marsh Streams) rout assessment reach.
☐B No flow, water	
	esessment reach.
2. Evidence of Flow Rest	triction – assessment reach metric
	of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction <u>or</u> fill to the
	acting flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb within
	nt reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver dams).	
⊠B Not A	
3. Feature Pattern – asse	essment reach metric
☐A A majority of t	he assessment reach has altered pattern (examples: straightening, modification above or below culvert).
⊠B Not A	,
4. Feature Longitudinal F	Profile – assessment reach metric
	sessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over
	ve aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
disturbances).	
⊠B Not A	
5. Signs of Active Instab	ility – assessment reach metric
_	inty – assessment reach metric: instability, not past events from which the stream has currently recovered. Examples of instability include:
	/e channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
⊠A < 10% of char	nnel unstable
<u> </u>	channel unstable
□C > 25% of char	nnel unstable

6.				raction -									
	LB	RB	ne Leit	Bank (LB	) and the	Right Ba	ink (RB).						
	⊠A □B	⊠A □B	Moo refe	derate eviderence inte	dence of c eraction (ex	conditions xamples:	limited streams	erms, levee ide area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])			
	□c	□c	Ext [exa of fl mos	ensive evi amples: ca lood flows	dence of causeways through standard	conditions with flood reamside	s that adversely Iplain and chanr area] <u>or</u> too mu	affect refe nel constric ch floodpla	erence inte ction, bulk ain/intertic	eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an			
7.	Wate	r Quality	Stress	ors – asse	essment r	each/inte	ertidal zone me	tric					
		k all that											
	∐A ∏B									er discoloration, oil sheen, stream foam)			
	□с	<u>Excessive</u> sedimentation (burying of stream features or intertidal zone)  Noticeable evidence of pollutant discharges entering the assessment reach <u>and</u> causing a water quality problem  Odor (not including natural sulfide odors)											
	□D □E						ating degraded	water qua	litv in the	assessment reach. Cite source in "Notes/Sketch"			
		section	on.					,,,,,,,	,				
	□F □G			h access t gae in stre									
	H	Degr	aded ma	arsh veget	ation in the	e intertida	al zone (remova	_	-	owing, destruction, etc)			
	⊠j		to no st			_ (explain	n in "Notes/Sket	ch section	1)				
8.	Rece	nt Weath	er – wa	tershed n	netric (ski	p for Tida	al Marsh Strea	ms)					
	For S ☐A						sidered a drougl all not exceeding			eams, D2 drought or higher is considered a drought.			
	⊟в	Drou	ght cond	ditions and			1 inch within the			ot 40 floure			
	⊠c		•	onditions									
9.	Large ∐Ye	`	-	Stream – a stream is to				f Yes, skip	to Metric	13 (Streamside Area Ground Surface Condition).			
10.		ral In-stre ☐Yes	<b>eam Hal</b> ⊠No				each metric	of the a	ccacemar	nt reach (examples of stressors include excessive			
	iva.	□163		sedime	ntation, m	ining, exc	cavation, in-stre tal Plain strear	eam harde	ening [for	example, rip-rap], recent dredging, and snagging)			
	10b.									ize 4 Coastal Plain streams)			
		□A		e aquatic r e liverwort			quatic mosses I mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation			
		⊠В	Multiple vegeta		nd/or leaf <sub>l</sub>	packs and	d/or emergent	k for T h Stree Only	□H □I	Low-tide refugia (pools) Sand bottom			
		□с	Multiple	e snags ar				)heck //arsh	□J	5% vertical bank along the marsh			
		□D					s and/or roots d perimeter	0 2	□K	Little or no habitat			
		□E		r no habita			•						
****	*****	*****	*****	**REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************			
										streams and Tidal Marsh Streams)			
	11a.	∐Yes	⊠No	Is assess	sment read	ch in a na	tural sand-bed	stream? <b>(s</b>	skip for C	oastal Plain streams)			
	11b.	Bedform ⊠A		ed. <b>Checl</b> un section			oox(es).						
		□в	Pool-gl	lide sectior	n <b>(evaluat</b>	e 11d)							
		□С			•	•	tric 12, Aquatio	•					
	11c.	at least	one box	c in each r	ow (skip 1	for Size 4	4 Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages			
		should no	ot excee R	ed 100% fo C	or each as: A	sessment P	t reach.						
		$\boxtimes$		Ĭ			Bedrock/sapr						
			H	H	H	H	Boulder (256 Cobble (64 –		m)				
				፱			Gravel (2 – 64	4 mm)					
		$\forall$	H	님	$\boxtimes$	H	Sand (.062 – Silt/clay (< 0.0						
			Ħ				Detritus	•	.4a -4: \				
	44.1			<u> </u>	_		Artificial (rip-r	• •	,	atura and Tidal Mariah Officers			
	пa.	□Yes	□No	Are pools	s illiea with	ı seaimer	it! (Skip for Siz	Le 4 Coas	ıaı Piain s	streams and Tidal Marsh Streams)			

12.			ssessment reach metric (skip for Tidal Marsh Streams)	
	12a. ⊠ If N	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? t one of the following reasons and skip to Metric 13. ☐No Water ☐Other:	
	12b. 🛚	Yes [	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check apply. If No, skip to Metric 13.	all that
	1   <u> </u>		]Adult frogs	
			Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)	
			]Beetles ]Caddisfly larvae (T)	
			]Asian clam ( <i>Corbicula</i> ) ]Crustacean (isopod/amphipod/crayfish/shrimp)	
			Damselfly and dragonfly larvae	
			]Dipterans ]Mayfly larvae (E)	
			]Megaloptera (alderfly, fishfly, dobsonfly larvae) ]Midges/mosquito larvae	
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )	
		Ī	]Mussels/Clams (not <i>Corbicula</i> ) ]Other fish	
			]Salamanders/tadpoles ]Snails	
			Stonefly Iarvae (P) Tipulid Iarvae	
			]Worms/leeches	
13.			a Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland	runoff
	$\boxtimes$ A	⊠A	Little or no alteration to water storage capacity over a majority of the streamside area	
	□в □C	□С □С	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil comp livestock disturbance, buildings, man-made levees, drainage pipes)	action
14.			a Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.	
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep	
15.	Conside wetted p	er for the erimeter	ce – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the of assessment reach.	norma
	LB □Y ⊠N	RB ⊠Y □N	Are wetlands present in the streamside area?	
16.		_	butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)	
	Check a ⊠A		butors within the assessment reach or within view of <u>and</u> draining to the assessment reach. s and/or springs (jurisdictional discharges)	
	□в	Ponds	include wet detention basins; do not include sediment basins or dry detention basins)	:-
	□C ⊠D	Eviden	tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam se of bank seepage or sweating (iron in water indicates seepage)	i, weir)
	⊠E □F		bed or bank soil reduced (dig through deposited sediment if present) the above	
17.			tors – assessment area metric (skip for Tidal Marsh Streams)	
	Check a □A		pply. e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)	
	□B □C		tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit∣ tream (≥ 24% impervious surface for watershed)	)
	$\Box$ D	Eviden	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach	
	□E ⊠F		ment reach relocated to valley edge the above	
18.			Sement reach metric (skip for Tidal Marsh Streams)	
	$\boxtimes$ A	Stream	Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)	
	□B □C		ed (example: scattered trees) shading is gone or largely absent	

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded
	LB RB LB RB
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).
	LB RB  □ A Mature forest □ B □ B Non-mature woody vegetation or modified vegetation structure □ C □ C Herbaceous vegetation with or without a strip of trees < 10 feet wide □ D □ D Maintained shrubs □ E □ E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet
	LB RB LB RB LB RB  A A A A A A A A A A Row crops B B B B B B B Maintained turf C C C C C C C Pasture (no livestock)/commercial horticulture D D D D D D D Pasture (active livestock use)
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).
	LB RB  ⊠A
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  □A □A The total length of buffer breaks is < 25 percent.
	<ul> <li>□B □B The total length of buffer breaks is between 25 and 50 percent.</li> <li>□C □C The total length of buffer breaks is &gt; 50 percent.</li> </ul>
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.  LB RB
	☑A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.
	□B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.
	UC Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). $\Box A < 46$ $\Box B = 46$ to < 67 $\Box C = 67$ to < 79 $\Box D = 79$ to < 230 $\Box E = 230$
Note	es/Sketch:

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019						
Stream Category	Pa1	KMT,BGB/HD	R						
Notes of Field Asses		NO							
Presence of regulator		YES							
Additional stream inf	rements included (Y/N)	NO							
NC SAM feature type	IC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial								

(perennial, intermittent, ridal Marsh Stream)	FEIEIIIIIa	<u> </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
. ,	HIGH	
(4) Microtopography	HIGH	
(3) Stream Stability		
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	MEDIUM	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	HIGH	
•	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation (2) Tidal Marsh In-stream Habitat		
. ,	NA NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Stream Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	HIGH	

USACE AID #:	NCDWR #:
INSTRUCTIONS: Attach a sketch of the assessment area and photogra	
and circle the location of the stream reach under evaluation. If multiple	
number all reaches on the attached map, and include a separate form fo	
and explanations of requested information. Record in the "Notes/Sketc NC SAM User Manual for examples of additional measurements that materials and explanations of the second in the "Notes Sketc" and explanations of requested information.	
NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT	•
	AREA (NO HOURIOUS TO BE WITHIN THE GOODSHIPHIE GIVES).
PROJECT/SITE INFORMATION:  1. Project name (if any): CLT Airport Expansion	2. Date of evaluation: April 2019
	4. Assessor name/organization: KMT,BGB/HDR
	6. Nearest named water body
7. River basin: Catawba	on USGS 7.5-minute quad: Coffey Creek
8. Site coordinates (decimal degrees, at lower end of assessment reach	
STREAM INFORMATION: (depth and width can be approximations) PS3-2 - S29 -	
9. Site number (show on attached map): Reach 1 10. L	ength of assessment reach evaluated (feet): 1300'
11. Channel depth from bed (in riffle, if present) to top of bank (feet):	2 Unable to assess channel depth.
· · · · · · · · · · · · · · · · · · ·	ssessment reach a swamp steam?
14. Feature type: ⊠Perennial flow ☐Intermittent flow ☐Tidal Marsh \$	Stream
STREAM CATEGORY INFORMATION:	
15. NC SAM Zone: ☐ Mountains (M) ☐ Piedmont (P	)
	\ /
	. \
16. Estimated geomorphic	
valley shape (skip for Tidal Marsh Stream): (more sinuous stream, flatter valley slo	
17. Watershed size: (skip ☐ Size 1 (< 0.1 mi²) ☐ Size 2 (0.1 t for Tidal Marsh Stream)	o < 0.5 mi²)
ADDITIONAL INFORMATION:	
18. Were regulatory considerations evaluated? ☐Yes ☐No If Yes, ch	eck all that apply to the assessment area.
☐Section 10 water ☐Classified Trout Waters	☐Water Supply Watershed (☐I ☐II ☐III ☐IV ☐V)
☐Essential Fish Habitat ☐Primary Nursery Area	☐ High Quality Waters/Outstanding Resource Waters
□ Publicly owned property □ NCDWR Riparian buffer rule i	
☐ Anadromous fish ☐ 303(d) List ☐ Decumented presence of a foderal and/or state listed pretected of	CAMA Area of Environmental Concern (AEC)
Documented presence of a federal and/or state listed protected s List species:	DECIES WILLIII LITE ASSESSITETIL ATEA.
☐ Designated Critical Habitat (list species)	
19. Are additional stream information/supplementary measurements inc	luded in "Notes/Sketch" section or attached?
1. Channel Water – assessment reach metric (skip for Size 1 stream	ms and Tidal Marsh Streams)
<ul><li>☑A Water throughout assessment reach.</li><li>☐B No flow, water in pools only.</li></ul>	
☐C No water in assessment reach.	
2. Evidence of Flow Restriction – assessment reach metric	
	le-pool sequence is severely affected by a flow restriction or fill to the
	macrophytes or ponded water or impoundment on flood or ebb within
the assessment reach (examples: undersized or perched or	culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver dams).	
⊠B Not A	
3. Feature Pattern – assessment reach metric	
	amples: straightening, modification above or below culvert).
⊠B Not A	
4. Feature Longitudinal Profile – assessment reach metric	
	ream profile (examples: channel down-cutting, existing damming, over
widening, active aggradation, dredging, and excavation w disturbances).	here appropriate channel profile has not reformed from any of these
B Not A	
5. Signs of Active Instability – assessment reach metric  Consider only current instability, not past events from which t	he stream has currently recovered. Examples of instability include
active bank failure, active channel down-cutting (head-cut), active wi	
	5, 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
☐B 10 to 25% of channel unstable	
□C > 25% of channel unstable	

6.					streamsic					
			he Left	Bank (LE	3) and the	Right Ba	nk (RB).			
	LB ⊠A □B	RB ⊠A ∐B	Mod refe	derate evi erence inte	dence of ceraction (ex	conditions xamples:	limited streams	erms, leve ide area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	□c	□c	Exte [exa of fl mos	ensive evi amples: c ood flows	idence of o auseways through st ching]) <u>or</u> f	conditions with flood reamside	that adversely Iplain and chanr area] <u>or</u> too mu	affect refe nel constri ch floodpla	erence inte ction, bulk ain/intertic	eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	ertidal zone me	tric		
		k all that								
										er discoloration, oil sheen, stream foam)
	□B □C						m features or int is entering the a			nd causing a water quality problem
	$\Box$ D	Odor	(not inc	luding nat	ural sulfide	e odors)	_			
	□E	Curre		shed or c	ollected d	ata indica	iting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F			h access t	to stream o	or intertida	al zone			
	□G				eam or inte			ممنوسيط ا		touring doctruction ato)
							i zone (remova i in "Notes/Sket			nowing, destruction, etc)
	⊠J		to no str			_ (-   -			,	
8.					•	•	al Marsh Strea	•		
	For S ☐A									eams, D2 drought or higher is considered a drought.
	⊟B						ıll not exceeding 1 inch within the			ist 46 flours
	$\boxtimes C$			onditions	-	J				
9.	<b>Large</b> □Ye		-		assessme oo large or			f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							each metric			
	10a.	∐Yes	⊠No	sedime	ntation, m	ining, exc	at over majority cavation, in-stre tal Plain strean	eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.	Check a  ☐A					e of assessmen quatic mosses		skip for S □F	ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms
					ts, lichens,			Check for Tidal Marsh Streams Only	∐' <sub>G</sub>	Submerged aquatic vegetation
		⊠В	Multiple vegetat		nd/or leaf	packs and	d/or emergent	k for T h Stre Only	□H □I	Low-tide refugia (pools) Sand bottom
		□с			nd logs (in	cluding la	p trees)	heck larsh	∐'j	5% vertical bank along the marsh
		$\boxtimes$ D					s and/or roots	ი ≥	□ĸ	Little or no habitat
		□E		r no habita		nai welled	d perimeter			
****	*****	*******	******	**REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	ite – asse	ssment re	each meti	ric (skip for Siz	ze 4 Coas	tal Plain	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is asses	sment read	ch in a na	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.				k the app		oox(es).			
		⊠A □B			n <b>(evaluate</b> n <b>(evaluat</b>					
		□с					tric 12, Aquatio	: Life)		
	11c.	at least	one box	in each i	row (skip i	for Size 4	Coastal Plain	streams	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams)</b> . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
					or each as			II (A) - >	40-7076, 1	redominant (F) = > 70%. Cumulative percentages
		NP ⊠	R	С	A	P □	Podrook/oopr	olito		
		$\boxtimes$	H	H	H	H	Bedrock/sapre Boulder (256		m)	
		$\boxtimes$					Cobble (64 –	256 mm)	,	
			H	$\square$		H	Gravel (2 – 6 <sup>2</sup> Sand (.062 –			
				፱	Ĭ	Ĭ	Silt/clay (< 0.0	,		
			$\square$	님	R	$\exists$	Detritus Artificial (rip-ra	ap, concre	ete, etc )	
	11d.	□Yes	□No	Are pool	s filled with			-		streams and Tidal Marsh Streams)
							, .			-,

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes 🗆	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
		$\boxtimes$	Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> )
		$\boxtimes$	Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> ) Mussels/Clams (not <i>Corbicula</i> )
			Other fish Salamanders/tadpoles
			Snails Stonefly larvae (P)
			Tipulid larvae Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	⊠a □B	⊠a □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	□c	□c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	□Y ⊠N	∏Y ⊠N	Are wetlands present in the streamside area?
16.		w Contril	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	$\square$ A	Streams	and/or springs (jurisdictional discharges)
	□B □C □D ⊠E	Obstruc Evidenc Stream	nclude wet detention basins; do not include sediment basins or dry detention basins) ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) ped or bank soil reduced (dig through deposited sediment if present)
17.	☐F Baseflov		the above ors – assessment area metric (skip for Tidal Marsh Streams)
	Check a ☐A ☐B	Evidenc	<b>ply.</b> e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)  ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)
	□C □D	Urban s	ream (≥ 24% impervious surface for watershed) e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E ⊠F	Assessr	nent reach relocated to valley edge the above
18.	Shading		sment reach metric (skip for Tidal Marsh Streams)
	⊠A □B	Stream	Consider "leaf-on" condition.  shading is appropriate for stream category (may include gaps associated with natural processes)  id (example: scattered trees)
	∐c		shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB $A A A A A A A A A A A A A A A A A A A$
20.	□E □E □E < 10 feet wide or no trees  Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  □B □E □E < 10 feet wide or no trees  LB □E < 10 feet wide or no trees
	⊠A       Mature forest         □B       □B       Non-mature woody vegetation or modified vegetation structure         □C       □C       Herbaceous vegetation with or without a strip of trees < 10 feet wide         □D       □D       Maintained shrubs         □E       □E       Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	□C □C □C □C □C Pasture (no livestock)/commercial horticulture □D □D □D □D □D Pasture (active livestock use)  Stem Density – streamside area metric (skip for Tidal Marsh Streams)
	Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density  B DB Low stem density  C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         □A       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       B       Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a. □Yes □No Was conductivity measurement recorded?  If No, select one of the following reasons. □No Water □Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).
Note	□A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230 ′ es/Sketch:

Stream Site Name	CL1 Airport Expansion	Date of Assessment	April 2019						
Stream Category	Pa2	KMT,BGB/HD	R						
Notes of Field Asses		NO							
Presence of regulator		YES							
Additional stream information/supplementary measurements included (Y/N) NO									
NC SAM feature type	NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial								

(perennial, intermittent, ridal Marsh Stream)	Ferennia	<u> </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	HIGH	
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	LOW	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
` ,		
(2) Longitudinal Tidal Flow	NA NA	
(2) Tidal Marsh Stream Stability	NA NA	
(3) Tidal Marsh Channel Stability	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	MEDIUM	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	HIGH	

pulled Cool Illustration	
USACE AID #:	NCDWR #:
<b>INSTRUCTIONS:</b> Attach a sketch of the assessment area and photographs.	
and circle the location of the stream reach under evaluation. If multiple stream	
number all reaches on the attached map, and include a separate form for each	
and explanations of requested information. Record in the "Notes/Sketch" se	
NC SAM User Manual for examples of additional measurements that may be NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT ARE	
	A (uo not need to be within the assessment area).
PROJECT/SITE INFORMATION:  1. Project name (if any): CLT Airport Expansion 2. Date of the control of the contro	ate of evaluation: September 2019
	ate of evaluation: September 2019 ssessor name/organization: KMT,BGB/HDR
	earest named water body
	n USGS 7.5-minute quad: Coffey Creek
Site coordinates (decimal degrees, at lower end of assessment reach):	35.198109, -80.952064
STREAM INFORMATION: (depth and width can be approximations)	·
PS3-2 - S29 -	
	h of assessment reach evaluated (feet): 275'
11. Channel depth from bed (in riffle, if present) to top of bank (feet): 2	☐Unable to assess channel depth.
· · · · · · · · · · · · · · · · · · ·	sment reach a swamp steam? ☐Yes ☐No
14. Feature type:   ☐ Perennial flow ☐ Intermittent flow ☐ Tidal Marsh Stream  ☐ Tidal	m
STREAM CATEGORY INFORMATION:	Diamen Constal Disir (I) Discrete Constal Discrete Consta
15. NC SAM Zone: ☐ Mountains (M) ☐ Piedmont (P)	☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
16. Estimated geomorphic	
valley shape (skip for Tidal Marsh Stream): (more sinuous stream, flatter valley slope)	(less sinuous stream, steeper valley slope)
17. Watershed size: <b>(skip</b> Size 1 (< 0.1 mi²) Size 2 (0.1 to < 0	
for Tidal Marsh Stream)	.5 mi )5ize 5 (0.5 to < 5 mi <sup>-</sup> )5ize 4 (< 5 mi <sup>-</sup> )
ADDITIONAL INFORMATION:	
18. Were regulatory considerations evaluated? ☐Yes ☐No If Yes, check a	all that apply to the assessment area.
☐Section 10 water ☐Classified Trout Waters	☐Water Supply Watershed (☐I ☐II ☐III ☐IV ☐V)
☐Essential Fish Habitat ☐Primary Nursery Area	High Quality Waters/Outstanding Resource Waters
□ NCDWR Riparian buffer rule in effe	
□ Anadromous fish □ 303(d) List □ Decumented presence of a federal and/or state listed protected specie	CAMA Area of Environmental Concern (AEC)
Documented presence of a federal and/or state listed protected specie List species:	o within the assessment alea.
☐ Designated Critical Habitat (list species)	
19. Are additional stream information/supplementary measurements included	I in "Notes/Sketch" section or attached? ☐Yes ☒No
1. Channel Water – assessment reach metric (skip for Size 1 streams at	nd Tidal Marsh Streams)
<ul><li>☑A Water throughout assessment reach.</li><li>☐B No flow, water in pools only.</li></ul>	
☐C No water in assessment reach.	
<ol> <li>Evidence of Flow Restriction – assessment reach metric</li> <li>A t least 10% of assessment reach in-stream habitat or riffle-po</li> </ol>	ol sequence is severely affected by a flow restriction or fill to the
	rophytes or ponded water or impoundment on flood or ebb within
the assessment reach (examples: undersized or perched culver	rts, causeways that constrict the channel, tidal gates, debris jams,
beaver dams).	·
⊠B Not A	
3. Feature Pattern – assessment reach metric	
A majority of the assessment reach has altered pattern (example	es: straightening, modification above or below culvert).
☐B Not A	
4. Feature Longitudinal Profile – assessment reach metric	
☐A Majority of assessment reach has a substantially altered stream	profile (examples: channel down-cutting, existing damming, over
widening, active aggradation, dredging, and excavation where	appropriate channel profile has not reformed from any of these
disturbances).  ☑ P Not A	
⊠B Not A	
5. Signs of Active Instability – assessment reach metric	
Consider only current instability, not past events from which the st	
active bank failure, active channel down-cutting (head-cut), active widenin   ☐A < 10% of channel unstable	ng, and artificial hardening (such as concrete, gabion, rip-rap).
☐B 10 to 25% of channel unstable	

6.					streamsic					
	Cons LB	ider for t RB	he Left	Bank (LE	3) and the	Right Ba	nk (RB).			
	□A □B	□A □B	Mod refe	derate evi rence inte	dence of ceraction (ex	conditions xamples:	limited streams	rms, leve ide area a	es, down- ccess, dis	cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky
	⊠C	⊠c	Exte [exa of flo mos	ensive evi amples: c ood flows	idence of o auseways through st ching]) <u>or</u> f	conditions with flood reamside	that adversely plain and chanr area] <u>or</u> too mu	affect refe nel constric ch floodpla	erence inte ction, bulk ain/intertic	nor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asso	essment r	each/inte	ertidal zone me	tric		
		k all that								
										er discoloration, oil sheen, stream foam)
	□B □C						n features or int s entering the a			nd causing a water quality problem
	$\Box$ D	Odor	(not incl	luding nat	ural sulfide	e odors)	_			
	□E	Curre section		shed or c	ollected d	ata indica	ting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F			n access t	to stream o	or intertida	al zone			
	□G				eam or inte			Lhurning	rogular m	couring destruction etc)
							i in "Notes/Sket			nowing, destruction, etc)
	$\overline{\boxtimes}$ J		to no str			- 、 .			,	
8.					•	•	al Marsh Strea	•		
	For S						sidered a drough Ill not exceeding			eams, D2 drought or higher is considered a drought.
	⊟в						1 inch within the			31 40 Hours
	⊠c	No di	rought co	onditions						
9.	<b>Large</b> □Ye		•		assessme oo large or			f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							ach metric			
	10a.	∐Yes	⊠No	sedime	ntation, m	ining, exc	at over majority cavation, in-stre tal Plain strean	eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.									ize 4 Coastal Plain streams)
		□A			macropnyt ts, lichens,		quatic mosses I mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠B	Multiple	sticks a			d/or emergent	k for T h Stree Only	□!·	Low-tide refugia (pools)
		□с	vegetat Multiple		nd logs (in	cluding la	p trees)	arsh C	□J	Sand bottom 5% vertical bank along the marsh
		□D	5% und	dercut bar	nks and/or	root mats	s and/or roots	ວັ ≥ຶ	□κ	Little or no habitat
		□E		s extend to no habita		nal wetted	d perimeter			
		_								
****	*****	******	******	**REMAIN	ING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	te – asse	ssment re	each meti	ric (skip for Siz	ze 4 Coas	tal Plain	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is asses	sment read	ch in a na	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.				k the app		oox(es).			
		⊠A □B			n <b>(evaluate</b> n <b>(evaluat</b>					
		□с					tric 12, Aquatic	: Life)		
	11c.	at least	one box	in each	row (skip i	for Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams).</b> Not Present (NP) = absent, Rare
					or each as			II (A) – > ·	40-7076, 1	Predominant (P) = > 70%. Cumulative percentages
		NP	R □	C	A	P	De dreek/ees	مانده		
		$\boxtimes$	H				Bedrock/sapro Boulder (256		m)	
							Cobble (64 –	256 mm)	,	
				H	H	H	Gravel (2 – 64 Sand (.062 – 1			
				፱	Ĭ	Ĭ	Silt/clay (< 0.0	,		
		H	$\square$	H		H	Detritus Artificial (rip-ra	ap, concre	ete, etc )	
	11d.	□ □Yes	□No	Are pool				•		streams and Tidal Marsh Streams)
				- 12001			,			

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
		$\boxtimes$	Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> )
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E)
		$\boxtimes$	Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> ) Mussels/Clams (not <i>Corbicula</i> ) Other fish
	Ħ		Salamanders/tadpoles Snails
	Ä		Stonefly larvae (P) Tipulid larvae
40			Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	□A □B	□A □B	Little or no alteration to water storage capacity over a majority of the streamside area  Moderate alteration to water storage capacity over a majority of the streamside area
	⊠c	⊠c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma of assessment reach.
	□Y ⊠N	∏Y ⊠N	Are wetlands present in the streamside area?
16.		w Contril	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	□A □B	Streams	outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.  and/or springs (jurisdictional discharges)  nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C □D	Obstruc	ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F		ped or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov Check a		ors – assessment area metric (skip for Tidal Marsh Streams) ply.
	□A □B	Evidenc Obstruc	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)
	□C □D	Evidenc	ream (≥ 24% impervious surface for watershed) e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E ⊠F		nent reach relocated to valley edge the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	□A □B	Stream : Degrade	shading is appropriate for stream category (may include gaps associated with natural processes)  d (example: scattered trees)
	$\boxtimes C$	Stream	shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB  △A △A △A △A △A △A ○A
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  LB RB  A A Mature forest B B Non-mature woody vegetation or modified vegetation structure C C C Herbaceous vegetation with or without a strip of trees < 10 feet wide
	□D □D Maintained shrubs □E □E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).
	LB RB  □A □A Medium to high stem density □B □B Low stem density □C □C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.  LB RB  □A □A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species,
	with non-native invasive species absent or sparse.  Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.  Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted
25.	stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.  Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.   Yes   No Was conductivity measurement recorded?  If No, select one of the following reasons.   No Water   Other:
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). $\Box A < 46  \Box B  46 \text{ to} < 67  \Box C  67 \text{ to} < 79  \Box D  79 \text{ to} < 230  \Box E \geq 230$
Note	es/Sketch:

Stream Site Name	CLT Airport Expansion	Date of Assessment	September 2019	
Stream Category	KMT,BGB/HDR			
Notes of Field Asses	ssment Form (Y/N)		NO	
Presence of regulator	NO			
Additional stream inf	formation/supplementary measi	urements included (Y/N)	NO	
NC SAM feature typ	Perennial			

(perennial, intermittent, Tidal Marsh Stream)	Perennia	<u> </u>
	USACE/	NCDWR
Function Class Rating Summary	All Streams	Intermittent
(1) Hydrology	LOW	
(2) Baseflow	HIGH	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	LOW	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	LOW	
(3) Stream Stability	LOW	
(4) Channel Stability	LOW	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	MEDIUM	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	LOW	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	LOW	
(3) Upland Pollutant Filtration	LOW	
(3) Thermoregulation	LOW	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	LOW	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	LOW	
(2) Tidal Marsh In-stream Habitat	NA NA	
(3) Flow Restriction	NA NA	
(3) Tidal Marsh Stream Stability	NA NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat (2) Intertidal Zone Overall	NA NA <b>LOW</b>	

	/ tooompanioo ecer i	nanaar vereien zir	
USACE AID #:		NCDWR #:	
	cetch of the assessment area and photogra		
	stream reach under evaluation. If multiple		
	ached map, and include a separate form fo		
	d information. Record in the "Notes/Sketo		rements were performed. See the
	imples of additional measurements that massers AFFECTING THE ASSESSMENT		the accessment area
		ANLA (do not need to be within	tile assessificiti dieaj.
PROJECT/SITE INFORMATI  1. Project name (if any):	ON: CLT Airport Expansion	Date of evaluation: Septem	hor 2010
3. Applicant/owner name:	CLT	4. Assessor name/organization:	ber 2019 KMT,BGB/HDR
5. County:	Mecklenburg	6. Nearest named water body	RIVIT, BGB/TTDR
7. River basin:	Catawba	on USGS 7.5-minute quad:	Coffey Creek
	legrees, at lower end of assessment reach	•	Concy Crock
,	epth and width can be approximations)	·	
	PS3-2 - S29 -	•	
9. Site number (show on attac	ched map): Reach 3 10. I	Length of assessment reach evalua	ated (feet): 86'
11. Channel depth from bed (	in riffle, if present) to top of bank (feet):	2 □Ui	nable to assess channel depth.
12. Channel width at top of ba	` ,	assessment reach a swamp steam	? □Yes □No
7. —	al flow Intermittent flow Tidal Marsh	Stream	
STREAM CATEGORY INFO		_	_
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (F	P) Inner Coastal Plain (I)	Outer Coastal Plain (O)
		\	/
16. Estimated geomorphic	⊠A		
valley shape (skip for	<del>_</del>		
Tidal Marsh Stream):	(more sinuous stream, flatter valley sle	• •	eam, steeper valley slope)
17. Watershed size: (skip	$\square$ Size 1 (< 0.1 mi <sup>2</sup> ) $\square$ Size 2 (0.1 the	to < 0.5 mi <sup>2</sup> ) $\square$ Size 3 (0.5 to <	5 mi²)
for Tidal Marsh Stream)			
ADDITIONAL INFORMATION		analy all that analy to the	nt oron
18. Were regulatory considera  ☐ Section 10 water	ations evaluated? ☐Yes ☐No If Yes, ch ☐Classified Trout Waters		nt area. shed (□I □II □III □IV □V)
☐ Essential Fish Habitat	☐ Classified Trout Waters ☐ Primary Nursery Area		/Outstanding Resource Waters
☐ Essential Fish Habitat ☐ Publicly owned property			•
Anadromous fish	⊠303(d) List		onmental Concern (AEC)
_	of a federal and/or state listed protected s		
List species:			
☐Designated Critical Hab	· · · · · · · · · · · · · · · · · · ·		
19. Are additional stream info	rmation/supplementary measurements inc	luded in "Notes/Sketch" section or	attached? ☐Yes ⊠No
4 Ohannal Martin	mant massle matric (all'a fac Class)	man and Tidal Marris Officers	
	ment reach metric (skip for Size 1 strea	ms and Tidal Marsh Streams)	
B No flow, water in	it assessment reach.  pools only.		
C No water in asse	•		
	ction – assessment reach metric assessment reach in-stream habitat or rifl	fle-nool sequence is severely affor	ted by a flow restriction or fill to the
	ing flow <u>or</u> a channel choked with aquatic		
	reach (examples: undersized or perched		
beaver dams).	•	-	,
⊠B Not A			
3. Feature Pattern – assess	sment reach metric		
	assessment reach has altered pattern (ex	amples: straightening, modification	above or below culvert).
☐B Not A	. ,		•
4. Feature Longitudinal Pro	ofile – assessment reach metric		
	ssment reach has a substantially altered st	tream profile (examples: channel d	lown-cutting, existing damming, over
	aggradation, dredging, and excavation w		
disturbances).		•	-
⊠B Not A			
5. Signs of Active Instabilit	y – assessment reach metric		
Consider only current in	nstability, not past events from which t		
active bank failure, active	channel down-cutting (head-cut), active w		
☐A < 10% of channe			
<ul><li>☐B 10 to 25% of change</li><li>☐C &gt; 25% of change</li></ul>			
	n anotable		

6.					streamsid					
	Cons LB	ider for t RB	he Left	Bank (LB	3) and the	Right Ba	nk (RB).			
	□A □B	□A □B	Mod refe	derate evi	dence of ceraction (ex	conditions xamples:	limited streams	rms, leve ide area a	es, down- ccess, dis	cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky
	⊠C	⊠c	Exte [exa of flo mos	ensive evi amples: ca ood flows	idence of causeways through strong]) or f	conditions with flood reamside	that adversely plain and chanr area] or too mu	affect refe nel constric ch floodpla	erence inte ction, bulk ain/intertic	nor ditching [including mosquito ditching]) eraction (little to no floodplain/intertidal zone access heads, retaining walls, fill, stream incision, disruption lal zone access [examples: impoundments, intensive or assessment reach is a man-made feature on an
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	rtidal zone me	tric		
		k all that								
										er discoloration, oil sheen, stream foam)
	□B □C						n features or int s entering the a			nd causing a water quality problem
	$\Box$ D	Odor	(not incl	luding nat	ural sulfide	e odors)	_			
	□E	Curre section		shed or c	ollected da	ata indica	ting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F			n access t	to stream o	or intertida	al zone			
	□G				eam or inte			Lhurning	rogular m	couring destruction etc)
							in "Notes/Sketo			nowing, destruction, etc)
	$\overline{\boxtimes}$ J		to no str			- 、 .			,	
8.					•	•	al Marsh Strea	•		
	For S						sidered a drough Il not exceeding			eams, D2 drought or higher is considered a drought.
	⊟в						1 inch within the			31 40 Hours
	⊠c	No di	rought co	onditions						
9.	<b>Large</b> □Ye		•		<b>assessme</b> oo large or			f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.							ach metric			
	10a.	∐Yes	⊠No	sedime	ntation, m	ining, exc	at over majority cavation, in-stre tal Plain strean	eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) to Metric 12)
	10b.									ize 4 Coastal Plain streams)
		□A			macrophyti ts, lichens,		quatic mosses I mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠B	Multiple	sticks ar			d/or emergent	k for T h Stree Only	□!·	Low-tide refugia (pools)
		□с	vegetat Multiple		nd logs (ind	cluding la	p trees)	arsh C	□J	Sand bottom 5% vertical bank along the marsh
		□D	5% und	dercut bar	nks and/or	root mats	s and/or roots	ວັ ≥ຶ	□κ	Little or no habitat
		□E		s extend t no habita		nal wetted	l perimeter			
****	*****	******	******	**REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substra	te – asse	ssment re	each meti	ic (skip for Siz	ze 4 Coas	tal Plain	streams and Tidal Marsh Streams)
	11a.	□Yes	⊠No	Is asses	sment read	ch in a na	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.				k the appr		ox(es).			
		⊠A □B			ı <b>(evaluate</b> n <b>(evaluat</b> e					
		□с					ric 12, Aquatic	: Life)		
	11c.	at least	one box	in each r	row (skip 1	for Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. <b>Check Marsh Streams).</b> Not Present (NP) = absent, Rare
					or each as:			II (A) – > ·	40-7076, 1	Predominant (P) = > 70%. Cumulative percentages
		NP	R □	С	A	P	De dre els/e en r	مانده		
		$\boxtimes$	$\exists$	H	H		Bedrock/sapro Boulder (256		m)	
							Cobble (64 –	256 mm)	,	
				片	H	片	Gravel (2 – 64 Sand (.062 – 1			
				Ĭ		Ĭ	Silt/clay (< 0.0	,		
		H	$\square$	H	H		Detritus Artificial (rip-ra	ap, concre	ete, etc )	
	11d.	□ □Yes	□No	Are pool	s filled with			•		streams and Tidal Marsh Streams)
				- 12001			,			

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
		$\boxtimes$	Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam (Corbicula)
	H		Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae Dipterans
	Ä		Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
		$\boxtimes$	Midges/mosquito larvae Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )
			Mussels/Clams (not <i>Corbicula</i> ) Other fish
			Salamanders/tadpoles Snails
			Stonefly larvae (P) Tipulid larvae Worms/leeches
13.	Streams		Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	□A □B	□A □B	Little or no alteration to water storage capacity over a majority of the streamside area  Moderate alteration to water storage capacity over a majority of the streamside area
	⊠c	⊠c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	e – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB □Y ⊠N	∏Υ ⊠N	Are wetlands present in the streamside area?
16.			outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) outors within the assessment reach or within view of and draining to the assessment reach.
	□A □B	Streams	and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C □D ⊠E □F	Obstruc Evidenc Stream	tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov	w Detrac	tors – assessment area metric (skip for Tidal Marsh Streams)
	Check a  ☐A ☐B ☐C	Evidenc Obstruc	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	□D □E ⊠F	Evidenc Assessr	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	□A □B	Stream Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) ed (example: scattered trees)
	⊠c	Suegin	shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB $\square$ A $\square$ A $\square$ A $\square$ A $\square$ 100 feet wide or extends to the edge of the watershed $\square$ B $\square$ B $\square$ B $\square$ B $\square$ B From 50 to < 100 feet wide $\square$ C $\square$ C $\square$ C $\square$ C $\square$ C From 30 to < 50 feet wide $\square$ D $\square$ D $\square$ D $\square$ D $\square$ D From 10 to < 30 feet wide $\square$ E < 10 feet wide or no trees
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  LB RB  A Mature forest  B Non-mature woody vegetation or modified vegetation structure  C C Herbaceous vegetation with or without a strip of trees < 10 feet wide  D D Maintained shrubs  E E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  BRB BRB BRB BRB BRB BRB BRB BRB BRB BR
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A A Medium to high stem density B B B Low stem density  C C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.  LB RB  A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.  B B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.  C C C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  ☐ Yes ☐ No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐ No Water ☐ Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230
Note	es/Sketch:

Stream Site Name	CL1 Airport Expansion	Date of Assessment	September 2019				
Stream Category	KMT,BGB/HDR						
Notes of Field Asses	NO						
Presence of regulator	YES						
Additional stream information/supplementary measurements included (Y/N) NO							
NC SAM feature type	IC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial						

(poroninal, intermitterit, ridal Maron Groam)	1 010111110	<u>.                                    </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	LOW	
(2) Baseflow	HIGH	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	LOW	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	LOW	
(3) Stream Stability	LOW	
(4) Channel Stability	LOW	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	MEDIUM	
(2) Stream/Intertidal Zone Interaction	NA NA	
(2) Longitudinal Tidal Flow	NA NA	
(2) Edigitudinal Indal Flow (2) Tidal Marsh Stream Stability	NA NA	
(3) Tidal Marsh Channel Stability	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA LOW	
(1) Water Quality	LOW HIGH	
(2) Baseflow		
(2) Streamside Area Vegetation	LOW	
(3) Upland Pollutant Filtration	LOW	
(3) Thermoregulation	LOW	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	LOW	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	LOW	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	LOW	

. isotimpames con	
USACE AID #:	NCDWR #:
	graphs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
	ole stream reaches will be evaluated on the same property, identify and
	for each reach. See the NC SAM User Manual for detailed descriptions
and explanations of requested information. Record in the "Notes/Ske NC SAM User Manual for examples of additional measurements that	tch" section if supplementary measurements were performed. See the
NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMEN	•
	The state of the state of the minimization of the state o
PROJECT/SITE INFORMATION:  1. Project name (if any): CLT Airport Expansion	Date of evaluation: September 2019
3. Applicant/owner name: CLT	4. Assessor name/organization: KMT,BGB/HDR
5. County: Mecklenburg	6. Nearest named water body
7. River basin: Catawba	on USGS 7.5-minute quad: Coffey Creek
8. Site coordinates (decimal degrees, at lower end of assessment rea	· ·
STREAM INFORMATION: (depth and width can be approximation PS3-2 - S29 -	
	. Length of assessment reach evaluated (feet): 173'
11. Channel depth from bed (in riffle, if present) to top of bank (feet):	2 Unable to assess channel depth.
· · · · · · · · · · · · · · · · · · ·	s assessment reach a swamp steam?
14. Feature type: ⊠Perennial flow ☐Intermittent flow ☐Tidal Mars	h Stream
STREAM CATEGORY INFORMATION:	
15. NC SAM Zone: ☐ Mountains (M) ☐ Piedmont	(P)
	\ /
16. Estimated geomorphic	
valley shape (skip for Tidal Marsh Stream): (more sinuous stream, flatter valley	
17. Watershed size: (skip ☐ Size 1 (< 0.1 mi²) ☐ Size 2 (0.1 for Tidal Marsh Stream)	1 to < 0.5 mi²)
ADDITIONAL INFORMATION:	
18. Were regulatory considerations evaluated? ☐Yes ☐No If Yes,	check all that apply to the assessment area.
Section 10 water Classified Trout Waters	
☐Essential Fish Habitat ☐Primary Nursery Area	☐ High Quality Waters/Outstanding Resource Waters
□ Publicly owned property □ NCDWR Riparian buffer rul	
☐ Anadromous fish ☐ 303(d) List ☐ Decumented prospected	CAMA Area of Environmental Concern (AEC)
Documented presence of a federal and/or state listed protected List species:	סףפטופס אונוווו נוופ מסספססוופווג מופמ.
☐ Designated Critical Habitat (list species)	
19. Are additional stream information/supplementary measurements in	ncluded in "Notes/Sketch" section or attached?
1. Channel Water – assessment reach metric (skip for Size 1 stre	eams and Tidal Marsh Streams)
<ul><li>☑A Water throughout assessment reach.</li><li>☐B No flow, water in pools only.</li></ul>	
☐C No water in assessment reach.	
Evidence of Flow Restriction – assessment reach metric	
	iffle-pool sequence is severely affected by a flow restriction or fill to the
	ic macrophytes or ponded water or impoundment on flood or ebb within
the assessment reach (examples: undersized or perche	d culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver dams).	
⊠B Not A	
3. Feature Pattern – assessment reach metric	
	examples: straightening, modification above or below culvert).
☐B Not A	
4. Feature Longitudinal Profile – assessment reach metric	
	stream profile (examples: channel down-cutting, existing damming, over
widening, active aggradation, dreaging, and excavation disturbances).	where appropriate channel profile has not reformed from any of these
⊠B Not A	
· ·	the stream has currently recovered. Examples of instability include
	widening, and artificial hardening (such as concrete, gabion, rip-rap).
☐A < 10% of channel unstable	5. 5. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
B 10 to 25% of channel unstable	
□C > 25% of channel unstable	

6.					streamsic						
	Cons LB	ider for t RB	he Left	Bank (LB	) and the	Right Ba	nk (RB).				
	□A ⊠B	∏A ⊠B	Mod refe	derate evi	dence of certaction (ex	conditions xamples:	limited streams	rms, leve ide area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adversely affectively affectively affectively affectively affectively and a sea, leaktively and the properties of the properties of the properties and the properties and a security and the properties are as a security and the properties are a secur	
	□c	□c	Exte [exa of flo mos	ensive evi amples: ca ood flows	dence of causeways through staing]) or f	conditions with flood reamside	that adversely plain and chanr area] <u>or</u> too mu	affect refe nel constric ch floodpla	erence inte ction, bulk ain/intertic	eraction (little to no floodplain/intertidal zone acces heads, retaining walls, fill, stream incision, disruptio lal zone access [examples: impoundments, intensivor assessment reach is a man-made feature on a	n e
7.	Wate	r Quality	Stresso	ors – asse	essment r	each/inte	ertidal zone me	tric			
	Chec	k all that	apply.								
	∐A ∏B									er discoloration, oil sheen, stream foam)	
	۵c						n features or int s entering the a			nd causing a water quality problem	
	$\Box$ D	Odor	(not incl	luding nat	ural sulfide	e odors)	_				
	□E	Curre		shed or c	ollected d	ata indica	iting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch	l"
	□F	Lives	stock with		o stream o						
	□G □H				am or inte			Lhurning	regular m	nowing, destruction, etc)	
							in "Notes/Sket			lowing, destruction, etc)	
	$\boxtimes$ J	Little	to no str	ressors							
8.					•	•	al Marsh Stream	•	0 4		
							ill not exceeding			eams, D2 drought or higher is considered a drough est 48 hours	ι.
	В	Drou	ght cond	litions and			1 inch within the				
_	⊠c		•	onditions							
9.	Large ☐Ye		•		assessme oo large or			f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).	
10.							ach metric	. of the o		at reach (everyles of atrespore include every	_
	10a.	∐Yes	⊠No	sedime	ntation, m	ining, exc		eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging to Metric 12)	
	10b.	Check a □A					e of assessmen quatic mosses		skip for S □F	ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms	
			(include	e liverwort	s, lichens,	and algal	l mats)	Check for Tidal Marsh Streams Only	□G	Submerged aquatic vegetation	
		⊠в	Multiple vegetat		nd/or leaf <sub>l</sub>	packs and	d/or emergent	k for T h Stre Only	□H □I	Low-tide refugia (pools) Sand bottom	
		□с			nd logs (in	cluding lap	p trees)	heck larsh	□J	5% vertical bank along the marsh	
		□D					s and/or roots d perimeter	0 ≥	□K	Little or no habitat	
		□Е		no habita		nai welled	peninetei				
										AL MARSH STREAMS************************************	
11.			_							streams and Tidal Marsh Streams)	
		□Yes						stream? (s	SKIP FOR C	oastal Plain streams)	
	11b.	⊠A ⊠A			k the appi (evaluate)		ox(es).				
		□в	Pool-gli	ide sectio	n <b>(evaluat</b>	e 11d)		1.16-3			
		C			,	•	tric 12, Aquatio	,			
	11c.	at least	one box	in each r	ow (skip	for Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. <b>Chec Marsh Streams)</b> . Not Present (NP) = absent, Rar Predominant (P) = > 70%. Cumulative percentage	е
		should no	_		or each as	_	reach.				
		$\boxtimes$	R □	C	A	P	Bedrock/sapro	olite			
							Boulder (256		m)		
				$\exists$	H	$\exists$	Cobble (64 – Gravel (2 – 64				
							Sand (.062 -	2 mm)			
		$\exists$	$\exists$	$\boxtimes$		H	Silt/clay (< 0.0 Detritus	o∠ mm)			
			$\boxtimes$				Artificial (rip-ra	ap, concre	ete, etc.)		
	11d.	□Yes	□No	Are pool	s filled with	h sedimen	t? (skip for Siz	e 4 Coas	tal Plain :	streams and Tidal Marsh Streams)	

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes 🗆	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
		$\boxtimes$	Aquatic reptiles Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> )
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
			Dipterans Mayfly larvae (E)
		$\boxtimes$	Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> ) Mussels/Clams (not <i>Corbicula</i> ) Other fish
	Ħ		Salamanders/tadpoles Snails
	Ä		Stonefly larvae (P) Tipulid larvae
40			Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	□A ⊠B	∏A ⊠B	Little or no alteration to water storage capacity over a majority of the streamside area  Moderate alteration to water storage capacity over a majority of the streamside area
	□с	□c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma of assessment reach.
	□Y ⊠N	∏Y ⊠N	Are wetlands present in the streamside area?
16.		w Contril	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	□A □B	Streams	outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.  and/or springs (jurisdictional discharges)  nclude wet detention basins; do not include sediment basins or dry detention basins)
		Obstruc	ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage)
	⊠E □F	Stream	ped or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov Check a		ors – assessment area metric (skip for Tidal Marsh Streams) ply.
	□A □B	Evidenc Obstruc	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit)
	□C □D	Evidenc	ream (≥ 24% impervious surface for watershed) e that the streamside area has been modified resulting in accelerated drainage into the assessment reach
	□E ⊠F		nent reach relocated to valley edge the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	□A ⊠B	Stream Degrade	shading is appropriate for stream category (may include gaps associated with natural processes)  d (example: scattered trees)
	□C	Stream	shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB  △A △A △A △A → ≥ 100 feet wide or extends to the edge of the watershed  □B □B □B □B □B From 50 to < 100 feet wide
	□ C       □ C       From 30 to < 50 feet wide         □ D       <
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  LB RB  A Mature forest  B Non-mature woody vegetation or modified vegetation structure  C C C Herbaceous vegetation with or without a strip of trees < 10 feet wide
	□D □D Maintained shrubs □E □E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A A Medium to high stem density  B B B Low stem density  C C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         □A       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       □B       Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities
25.	with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.  Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  ☐ Yes ☐ No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐ No Water ☐ Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  ☐ A < 46 ☐ B 46 to < 67 ☐ C 67 to < 79 ☐ D 79 to < 230 ☐ E ≥ 230
Note	es/Sketch:

Stream Site Name	CLT Airport Expansion	Date of Assessment	September 20	)19
Stream Category	Pa2	Assessor Name/Organization	KMT,BGB/HD	R
Notes of Field Asses	NO			
Presence of regulator	YES			
Additional stream information/supplementary measurements included (Y/N)			NO	
NC SAM feature type	IC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial			

(poroninal, intermittent, ridal Maron Gream)	1 010111110	<u>.                                    </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	LOW	
(2) Baseflow	HIGH	
(2) Flood Flow	LOW	
(3) Streamside Area Attenuation	LOW	
(4) Floodplain Access	MEDIUM	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	LOW	
(3) Stream Stability	LOW	
(4) Channel Stability	MEDIUM	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	MEDIUM	
	-	
(2) Stream/Intertidal Zone Interaction	NA NA	
(2) Longitudinal Tidal Flow	NA NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	MEDIUM	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	MEDIUM	
(3) Upland Pollutant Filtration	MEDIUM	
(3) Thermoregulation	MEDIUM	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	MEDIUM	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	MEDIUM	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	MEDIUM	
(3) Stream-side Habitat	MEDIUM	
(3) Thermoregulation	MEDIUM	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	LOW	

Accompanies Oser Mandai Version 2.1
USACE AID #: NCDWR #:
INSTRUCTIONS: Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
and circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
number all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
and explanations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
NC SAM User Manual for examples of additional measurements that may be relevant.
NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE INFORMATION:
1. Project name (if any): CLT Airport Expansion 2. Date of evaluation: April 2019
3. Applicant/owner name: CLT 4. Assessor name/organization: KMT,BGB/HDR
5. County: Mecklenburg 6. Nearest named water body
7. River basin: Catawba on USGS 7.5-minute quad: Coffey Creek
8. Site coordinates (decimal degrees, at lower end of assessment reach): 35.214265, -80.940910
STREAM INFORMATION: (depth and width can be approximations)
9. Site number (show on attached map): PS4-2 - Stream 24 10. Length of assessment reach evaluated (feet): 200'
11. Channel depth from bed (in riffle, if present) to top of bank (feet):  1 Unable to assess channel depth.
12. Channel width at top of bank (feet): 2 13. Is assessment reach a swamp steam?   Yes  No
14. Feature type: ☐Perennial flow ☐Intermittent flow ☐Tidal Marsh Stream
STREAM CATEGORY INFORMATION:
15. NC SAM Zone: ☐ Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
\ /
16. Estimated geomorphic
valley shape (skip for
Tidal Marsh Stream): (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)
17. Watershed size: <b>(skip</b> ⊠Size 1 (< 0.1 mi²) □Size 2 (0.1 to < 0.5 mi²) □Size 3 (0.5 to < 5 mi²) □Size 4 (≥ 5 mi²)
for Tidal Marsh Stream)
ADDITIONAL INFORMATION:
18. Were regulatory considerations evaluated? ⊠Yes □No If Yes, check all that apply to the assessment area.
□ Section 10 water □ Classified Trout Waters □ Water Supply Watershed (□I □II □IV □V)
☐ Essential Fish Habitat ☐ Primary Nursery Area ☐ High Quality Waters/Outstanding Resource Waters
Publicly owned property NCDWR Riparian buffer rule in effect Nutrient Sensitive Waters
Anadromous fish 303(d) List CAMA Area of Environmental Concern (AEC)
Documented presence of a federal and/or state listed protected species within the assessment area.
List species:
☐ Designated Critical Habitat (list species)
19. Are additional stream information/supplementary measurements included in "Notes/Sketch" section or attached? ☐ Yes ☐ No
1. Channel Water – assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)
☑A Water throughout assessment reach.
☐B No flow, water in pools only.
☐C No water in assessment reach.
2. Evidence of Flow Restriction – assessment reach metric
At least 10% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the
point of obstructing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb within
the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams
beaver dams).
⊠B Not A
3. Feature Pattern – assessment reach metric
A majority of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
B Not A
4 Facture Lawritudinal Buckle accessment reach matric
4. Feature Longitudinal Profile – assessment reach metric
A Majority of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, ove widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
disturbances).
□ Siturbances).  □ B Not A
5. Signs of Active Instability – assessment reach metric
Consider only current instability, not past events from which the stream has currently recovered. Examples of instability include
active bank failure, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
☐A < 10% of channel unstable
☐B 10 to 25% of channel unstable

6.		Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB). LB RB		
	□A □B	□A □B	Moderate evidence of conditions (e reference interaction (examples: lim	nat adversely affect reference interaction xamples: berms, levees, down-cutting, aggradation, dredging) that adversely affect nited streamside area access, disruption of flood flows through streamside area, leaky with floodplain constriction, minor ditching [including mosquito ditching])
	⊠C	⊠c	Extensive evidence of conditions the [examples: causeways with floodplate of flood flows through streamside are	at adversely affect reference interaction (little to no floodplain/intertidal zone access ain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption ea] or too much floodplain/intertidal zone access [examples: impoundments, intensive ertidal zone unnaturally absent or assessment reach is a man-made feature on an
7.		-	essors – assessment reach/interti	dal zone metric
	□A □B □C	Excess	ed water in stream or intertidal zone or sedimentation (burying of stream f	(milky white, blue, unnatural water discoloration, oil sheen, stream foam) eatures or intertidal zone) entering the assessment reach and causing a water quality problem
	□D □E	Odor (r	ot including natural sulfide odors)	g degraded water quality in the assessment reach. Cite source in "Notes/Sketch"
	_ □F	section	' k with access to stream or intertidal z	
	G H	Degrad		one (removal, burning, regular mowing, destruction, etc)
	⊠J □I		(explain in no stressors	"Notes/Sketch" section)
8.		ize 1 or 2 st Drough Drough		ered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought. not exceeding 1 inch within the last 48 hours
9.			ous Stream – assessment reach m	etric
40	□Ye	<del>_</del>		to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).
10.			sedimentation, mining, excav	n metric over majority of the assessment reach (examples of stressors include excessive ration, in-stream hardening [for example, rip-rap], recent dredging, and snagging) Plain streams only, then skip to Metric 12)
	10b.	⊠A M (i ⊠B M	ultiple aquatic macrophytes and aqua clude liverworts, lichens, and algal m ultiple sticks and/or leaf packs and/o	ats)
		□C N □D 5 ir	getation  Iltiple snags and logs (including lap to the snags and logs (including lap to the undercut banks and/or root mats at the part of the normal wetted potter or no habitat	· —
		□E L	lie of no nabitat	
				E NOT APPLICABLE FOR TIDAL MARSH STREAMS************************************
11.				(skip for Size 4 Coastal Plain streams and Tidal Marsh Streams) al sand-bed stream? (skip for Coastal Plain streams)
			aluated. Check the appropriate box	
		□A R	ffle-run section (evaluate 11c) ol-glide section (evaluate 11d) atural bedform absent (skip to Metric	
	11c.	at least on	box in each row (skip for Size 4 C	ormal wetted perimeter of the assessment reach – whether or not submerged. <b>Check oastal Plain streams and Tidal Marsh Streams)</b> . Not Present (NP) = absent, Rare 0%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages
			xceed 100% for each assessment re	
				Bedrock/saprolite Boulder (256 – 4096 mm)
				Cobble (64 – 256 mm) Gravel (2 – 64 mm)
				Sand (.062 – 2 mm) Silt/clay (< 0.062 mm)
				Detritus Artificial (rip-rap, concrete, etc.)
	11d.	□ Yes [		(skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛛	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> ) Crustacean (isopod/amphipod/crayfish/shrimp)
	H		Damselfly and dragonfly larvae Dipterans
			Mayfly larvae (E) Megaloptera (alderfly, fishfly, dobsonfly larvae)
			Midges/mosquito larvae  Mosquito fish (Gambusia) or mud minnows (Umbra pygmaea)
	H		Mussels/Clams (not <i>Corbicula</i> ) Other fish Salamanders/tadpoles
			Snails Stonefly larvae (P)
			Tipulid larvae Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	□A □B	□a □B	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area
	⊠c	⊠c	Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.	Conside LB	r for the RB	Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the erimeter	te – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB ⊠Y □N	RB ⊠Y □N	Are wetlands present in the streamside area?
16.			outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) outors within the assessment reach or within view of and draining to the assessment reach.
	⊠A □B	Streams Ponds (i	and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C 図D 図E □F	Evidenc Stream	tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present) the above
17.	Baseflov Check a		tors – assessment area metric (skip for Tidal Marsh Streams)
	□A □B ⊠C	Evidenc Obstruc	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	□D □E □F	Evidenc Assessr	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge the above
18.	Shading		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	□A □B	Stream : Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) ed (example: scattered trees)
	$\boxtimes C$	Stream	shading is gone or largely absent

19.	Suffer Width – streamside area metric (skip for Tidal Marsh Streams) Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out of the first break.  /egetated Wooded  BRBLBRB  AABABBBBBBBFrom 50 to < 100 feet wide  BBBBBBBFrom 50 to < 100 feet wide  CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □
20.	Suffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  B RB  A A Mature forest B B Non-mature woody vegetation or modified vegetation structure C AC Herbaceous vegetation with or without a strip of trees < 10 feet wide D D Maintained shrubs E ☐ Little or no vegetation
21.	Suffer Stressors – streamside area metric (skip for Tidal Marsh Streams) Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Shouts < 30 feet 30-50 feet  B RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  B RB  A Medium to high stem density  B B Low stem density  C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  B RB  A Na The total length of buffer breaks is < 25 percent.  B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.  B RB  A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.  Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.  Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  □Yes □No Was conductivity measurement recorded?  If No, select one of the following reasons. □No Water □Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  □A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230
	/Sketch: m is located in the middle of an airport airfield,

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019	
Stream Category	Pa1	Assessor Name/Organization	KMT,BGB	/HDR
		_		
Notes of Field Asses	ssment Form (Y/N)		YES	
Presence of regulate	ory considerations (Y/N)		NO	
Additional stream inf	formation/supplementary measi	urements included (Y/N)	YES	
NC SAM feature typ	e (perennial, intermittent, Tidal	Marsh Stream)	Intermitter	nt
		_	USACE/	NCDWR
	Function Class Rating Sum	mary A	II Streams	Intermittent
	(1) Hydrology		LOW	LOW
	(2) Baseflow		MEDIUM	MEDIUM
	(2) Flood Flow		LOW	LOW
	(3) Streamside A	rea Attenuation	LOW	LOW
	(4) Floodpl	ain Access	LOW	LOW
	(4) Woode	d Riparian Buffer	LOW	LOW
	(4) Microto	pography	LOW	LOW
	(3) Stream Stabil	ity	MEDIUM	MEDIUM
	(4) Channe	el Stability	HIGH	HIGH
		ent Transport	LOW	LOW
		Geomorphology	MEDIUM	MEDIUM
		dal Zone Interaction	NA	NA
	(2) Longitudinal Ti	<del></del>	NA	NA
	(2) Tidal Marsh St		NA	NA
	* *	arsh Channel Stability	NA	NA NA
		arsh Stream Geomorphology	NA	NA NA
	(1) Water Quality	arsh Stream Geomorphology	LOW	LOW
	(2) Baseflow		MEDIUM	MEDIUM
			LOW	LOW
	(2) Streamside Area Ve	· ·		
	(3) Upland Pollut		LOW	LOW
	(3) Thermoregula		LOW	LOW
	(2) Indicators of Stresso		NO	NO
	(2) Aquatic Life Toleran		LOW	NA
	(2) Intertidal Zone Filtrati	on	NA	NA
	(1) Habitat		LOW	LOW
	(2) In-stream Habitat	<u> </u>	LOW	MEDIUM
	(3) Baseflow		MEDIUM	MEDIUM
	(3) Substrate		LOW	LOW
	(3) Stream Stabil	ity	HIGH	HIGH
	(3) In-stream Hab	oitat	MEDIUM	HIGH
	(2) Stream-side Habitat	<u></u>	LOW	LOW
	(3) Stream-side H		LOW	LOW
	(3) Thermoregula	ation	LOW	LOW
	(2) Tidal Marsh In-stream	n Habitat	NA	NA
	(3) Flow Restriction	on	NA	NA
	(3) Tidal Marsh St	ream Stability	NA	NA
		arsh Channel Stability	NA	NA
		arsh Stream Geomorphology	NA	NA
	(3) Tidal Marsh In-	· · · · · · · · · · · · · · · · · · ·	NA	NA
	(2) Intertidal Zone		NA	NA
	Overall		LOW	LOW

#### NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

		ACC	umpames user w	iailuai veisioli 2. i	
USACE AI	D #:			NCDWR #:	
					7.5-minute topographic quadrangle,
					d on the same property, identify and
					Iser Manual for detailed descriptions
					urements were performed. See the
		mples of additional meas			
			E ASSESSMENT	AREA (do not need to be within	n the assessment area).
	SITE INFORMATI				240
-	name (if any):	CLT Airport Expansion		2. Date of evaluation: April 20	
	nt/owner name:	CLT		4. Assessor name/organization:	KMT,BGB/HDR
5. County:		Mecklenburg		6. Nearest named water body	0 " 0 1
7. River ba		Catawba		on USGS 7.5-minute quad:	Coffey Creek
	· ·	legrees, at lower end of a	•	35.208268, -80.947637	
		epth and width can be a		anoth of accomment reach avalu	usted (feet): 1500'
	nber (show on attac			ength of assessment reach evalu	
		in riffle, if present) to top ank (feet): 12		-	Jnable to assess channel depth.
	el width at top of ba	ank (reet) al flow □Intermittent flow		ssessment reach a swamp steam	I! Lifes Lino
	CATEGORY INFO		v Linual Maisil S	nicalli	
15. NC SA		☐ Mountains (M)	☑ Piedmont (P)	☐ Inner Coastal Plain (I)	☐ Outer Coastal Plain (O)
13. NC 3A	IVI ZUITE.				Utter Coastal Flail (O)
			O.	,	
	ted geomorphic shape ( <b>skip for</b>		$\overline{}$	⊠B	
	nape ( <b>skip for</b> //arsh Stream):	(more sinuous stream	m flatter valley slo	ne) (less sinuous st	ream, steeper valley slope)
	•	☐Size 1 (< 0.1 mi²)			
	hed size: (skip al Marsh Stream)		⊠312e 2 (0.1 to		
	AL INFORMATION	<b>1</b> •			
			: □No If Yes ch	eck all that apply to the assessme	ent area
	tion 10 water	Classified Tr			rshed ( I I II III IV V
	ential Fish Habitat	☐Primary Nur			s/Outstanding Resource Waters
_	icly owned property		oarian buffer rule i		=
	dromous fish	303(d) List			ronmental Concern (AEC)
□Doci	umented presence	of a federal and/or state	listed protected sp	pecies within the assessment area	a.
	species:				
	ignated Critical Hab	· · · · —			<u>_</u>
19. Are add	ditional stream info	rmation/supplementary m	neasurements incl	uded in "Notes/Sketch" section or	r attached? ⊠Yes ∐No
1. Channe	al Water – assess	ment reach metric (ekin	o for Size 1 stream	ns and Tidal Marsh Streams)	
		it assessment reach.	Tor Size I Stream	ns and ridar marsh offeams,	
□B	No flow, water in				
□c	No water in asse				
2. Eviden	ce of Flow Restric	ction – assessment read	ch metric		
				e-nool sequence is severely affe	ected by a flow restriction or fill to the
٠,٠					impoundment on flood or ebb within
					the channel, tidal gates, debris jams,
_	beaver dams).		•	•	
⊠в	Not A				
3. Feature	e Pattern – assess	sment reach metric			
$\boxtimes$ A	A majority of the	assessment reach has a	ltered pattern (exa	amples: straightening, modificatio	n above or below culvert).
□В	Not A				,
4. Feature	e Longitudinal Pro	ofile – assessment reacl	h metric		
□A	•			eam profile (examples: channel	down-cutting, existing damming, over
٠,٠					has not reformed from any of these
	disturbances).				•
⊠B	Not A				
5. Signs o	of Active Instabilit	y – assessment reach r	metric		
				ne stream has currently recove	ered. Examples of instability include
active b	ank failure, active	channel down-cutting (he	ead-cut), active wi	dening, and artificial hardening (s	uch as concrete, gabion, rip-rap).
□A	< 10% of channe	el unstable	•	-	
⊠B	10 to 25% of cha				
□c	> 25% of channe	el unstable			

6.				- streamside a						
	LB	RB	e Leit Dalik (L	.B) and the Rig	giil balik (Kb).	•				
	□A □B	□A □B	Moderate e reference ir	iteraction (exan	ditions (exampl nples: limited s	les: ber treamsio	ms, levee de area a	es, down- ccess, dis	eraction cutting, aggradation, dredging) that adv ruption of flood flows through streamsid nor ditching [including mosquito ditchin	le area, leaky
	⊠c	⊠c	Extensive e [examples: of flood flow	evidence of con causeways wit as through strea (tching]) or floo	ditions that adv h floodplain and mside area] <u>or</u>	ersely and channed too muc	affect refe el constric h floodpla	rence inte tion, bulk in/intertic	eraction (little to no floodplain/intertidal heads, retaining walls, fill, stream incisional zone access [examples: impoundme or assessment reach is a man-made f	zone access on, disruption nts, intensive
7.	Wate	er Quality S	tressors – as	sessment read	ch/intertidal zo	one met	ric			
	Chec	Excess	ored water in s sive sedimenta	tion (burying of	stream feature	es or inte	ertidal zor	ne)	er discoloration, oil sheen, stream foam	)
	□D □E	Odor (r	not including n t published or	atural sulfide o	dors)	_			assessment reach. Cite source in "N	lotes/Sketch"
	□F □G □H	Livesto Excess	ck with accessive algae in st		lal zone itertidal zone (r				nowing, destruction, etc)	
	∐I ∏I		no stressors	(6	explain in "Note	s/Sketcl	h" section	1)		
8.		Size 1 or 2 st Drough Drough	treams, D1 dro It conditions <u>a</u>	<u>nd</u> no rainfall or <u>nd</u> rainfall exce	is considered a rainfall not exc	drought	t; for Size 1 inch wit	thin the la	eams, D2 drought or higher is consider st 48 hours	ed a drought.
9.	<b>Larg</b> □Ye			- assessment too large or da		sess? If	Yes, skip	to Metric	: 13 (Streamside Area Ground Surface	Condition).
10.			⊠No Degra sedin	oes – assessmaded in-stream nentation, minir uate for Size 4	habitat over r ng, excavation,	majority in-strea	am harde	ning [for	nt reach (examples of stressors included example, rip-rap], recent dredging, are to Metric 12)	de excessive nd snagging)
	10b.	⊠A M (i ⊠B M	/lultiple aquation include liverwo /lultiple sticks	ccurs if > 5% co c macrophytes orts, lichens, an and/or leaf pac	and aquatic modal algal mats)	osses	Check for Tidal as Marsh Streams (4 Only	□F □G □H	ize 4 Coastal Plain streams) 5% oysters or other natural hard botto Submerged aquatic vegetation Low-tide refugia (pools)	oms
			% undercut b	and logs (includents and logs	ot mats and/or		Check Marsh	□I □J □K	Sand bottom 5% vertical bank along the marsh Little or no habitat	
****	*****	******	********REMA	INING QUEST	IONS ARE NO	T APPL	ICABLE	FOR TID	AL MARSH STREAMS************	*****
11.	Bedf	orm and Su	ubstrate – ass	sessment reac	h metric (skip	for Size	e 4 Coast	al Plain	streams and Tidal Marsh Streams)	
	11a.	☐Yes ☐	⊠No Is asse	essment reach i	in a natural san	nd-bed st	tream? <b>(s</b>	kip for C	oastal Plain streams)	
	11b.	⊠A F	Riffle-run section Pool-glide sect	eck the approp on (evaluate 11 ion (evaluate 1 n absent (skip	lc) 1d)	Aquatic	Life)			
	<b>11c.</b>	In riffle sec at least on (R) = prese should not NP F	tions, check a le box in each ent but < 10% exceed 100%	Il that occur bel	sw the normal v Size 4 Coasta = > 10-40%, A sment reach.  Bedroc Boulde Cobble Gravel Sand ( Silt/cla Detritu	wetted p I Plain s bundant ck/sapro er (256 – e (64 – 2 (2 – 64 .062 – 2 y (< 0.06	erimeter 6 streams 2 (A) = > 4 lite 4096 mr 56 mm) mm) mm)	<b>and Tidal</b> 40-70%, I	essment reach – whether or not subme <b>Marsh Streams)</b> . Not Present (NP) = Predominant (P) = > 70%. Cumulative	absent, Rare
	11d.	☐Yes [							streams and Tidal Marsh Streams)	

12.	-	Aquatic Life – assessment reach metric (skip for Tidal Marsh Streams)					
	12a. ⊠ If I	_	No Was an in-stream aquatic life assessment performed as described in the User Manual? t one of the following reasons and skip to Metric 13.  □No Water □Other:				
	12b. ⊠	Yes [	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all tha apply. If No, skip to Metric 13.				
	1		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams. Adult frogs Aquatic reptiles				
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)				
		$ar{ar{ar{ar{ar{ar{ar{ar{ar{ar{$	Beetles Caddisfly larvae (T)				
			Asian clam ( <i>Corbicula</i> )  Crustacean (isopod/amphipod/crayfish/shrimp)				
			Damselfly and dragonfly larvae Dipterans				
			Mayfly larvae (E)				
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae				
		$\triangleright$	Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )				
			Mussels/Clams (not <i>Corbicula</i> ) Other fish				
			Salamanders/tadpoles  Snails				
			Stonefly larvae (P) Tipulid larvae				
	$\boxtimes$		Worms/leeches				
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff				
	□A	□A	Little or no alteration to water storage capacity over a majority of the streamside area				
	□B ⊠C	∐в ⊠с	Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction livestock disturbance, buildings, man-made levees, drainage pipes)				
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.				
	□a □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep				
15.	Conside wetted p	er for the erimeter	ce – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma of assessment reach.				
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?				
16.	Baseflo	w Contri	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)				
	Check a  ☐A		outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.  and/or springs (jurisdictional discharges)				
	□B □C	Ponds (	include wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir)				
	$\overline{\boxtimes}$ D	Evidend	e of bank seepage or sweating (iron in water indicates seepage)				
	⊠E □F		bed or bank soil reduced (dig through deposited sediment if present) the above				
17.			tors – assessment area metric (skip for Tidal Marsh Streams)				
	Check a ☐A	Evidend	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)				
	⊟в ⊠с		tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)				
	□D □E	Evidend	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach				
	□F		nent reach relocated to valley edge the above				
18.	_		sment reach metric (skip for Tidal Marsh Streams)				
	$\square$ A	Stream	Consider "leaf-on" condition. shading is appropriate for stream category (may include gaps associated with natural processes)				
	∏в ⊠С		ed (example: scattered trees) shading is gone or largely absent				

19.	<ol> <li>Buffer Width – streamside area metric (skip for Tidal Marsh Streams)</li> <li>Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.</li> </ol>						
	LB RB LB  ⊠A ⊠A □A  □B □B □E  □C □C □C	A					
20.		– streamside area metric (skip for Tidal Marsh Streams) bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).					
	LB RB  □ A □ A  □ B □ B  □ C □ C  □ D □ D  □ E □ E	Mature forest Non-mature woody vegetation or modified vegetation structure Herbaceous vegetation with or without a strip of trees < 10 feet wide Maintained shrubs Little or no vegetation					
21.	Check all approp within 30 feet of st	- streamside area metric (skip for Tidal Marsh Streams)  viate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is tream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  lowing stressors occurs on either bank, check here and skip to Metric 22:   □					
	Abuts < 30 LB RB LB □A □A □A □B □B □E □C □C □C	0 feet 30-50 feet					
22.	Stem Density - s	treamside area metric (skip for Tidal Marsh Streams)					
	LB RB □A □A □B □B	bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  Medium to high stem density  Low stem density					
23.	<ul><li></li></ul>	No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground getated Buffer – streamside area metric (skip for Tidal Marsh Streams)					
	LB RB	vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.					
	⊠A ⊠A □B □B □C □C	The total length of buffer breaks is < 25 percent.  The total length of buffer breaks is between 25 and 50 percent.  The total length of buffer breaks is > 50 percent.					
24.	Evaluate the domi	position – streamside area metric (skip for Tidal Marsh Streams) inant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to a habitat.					
	LB RB □A □A	Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.					
	□в □в	Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.					
	⊠c ⊠c	Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.					
25.	25a. □Yes ⊠	ssessment reach metric (skip for all Coastal Plain streams)  No Was conductivity measurement recorded? one of the following reasons.   No Water  Other:					
	25b. Check the b ☐A < 46	ox corresponding to the conductivity measurement (units of microsiemens per centimeter).  ☐B 46 to < 67 ☐C 67 to < 79 ☐D 79 to < 230 ☐E ≥ 230					
	es/Sketch: am is located in the	e middle of an airport airfield,					
	a io iodatod iii tiik						

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019			
Stream Category	Pb2	Assessor Name/Organization	KMT,BGB/HD	R		
Notes of Field Asses	sment Form (Y/N)		YES			
Presence of regulator		NO				
Additional stream inf	rements included (Y/N)	YES				
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial						

(perennial, intermittent, Tidal Marsh Stream)	Perennial		
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent	
(1) Hydrology	LOW		
(2) Baseflow	HIGH		
(2) Flood Flow	LOW		
(3) Streamside Area Attenuation	LOW		
(4) Floodplain Access	LOW		
(4) Wooded Riparian Buffer	LOW		
(4) Microtopography	NA		
(3) Stream Stability	MEDIUM		
(4) Channel Stability	MEDIUM		
(4) Sediment Transport	MEDIUM		
(4) Stream Geomorphology	MEDIUM		
(2) Stream/Intertidal Zone Interaction	NA NA		
(2) Longitudinal Tidal Flow	NA NA		
(2) Tidal Marsh Stream Stability	NA NA		
(3) Tidal Marsh Channel Stability	NA NA		
(3) Tidal Marsh Stream Geomorphology	NA NA		
(1) Water Quality	HIGH		
. ,	HIGH		
(2) Baseflow			
(2) Streamside Area Vegetation	LOW		
(3) Upland Pollutant Filtration	MEDIUM		
(3) Thermoregulation	LOW		
(2) Indicators of Stressors	NO		
(2) Aquatic Life Tolerance	HIGH		
(2) Intertidal Zone Filtration	NA		
(1) Habitat	LOW		
(2) In-stream Habitat	MEDIUM		
(3) Baseflow	HIGH		
(3) Substrate	MEDIUM		
(3) Stream Stability	MEDIUM		
(3) In-stream Habitat	MEDIUM		
(2) Stream-side Habitat	LOW		
(3) Stream-side Habitat	LOW		
(3) Thermoregulation	LOW		
(2) Tidal Marsh In-stream Habitat	NA		
(3) Flow Restriction	NA		
(3) Tidal Marsh Stream Stability	NA		
(4) Tidal Marsh Channel Stability	NA		
(4) Tidal Marsh Stream Geomorphology	NA		
(3) Tidal Marsh In-stream Habitat	NA		
(2) Intertidal Zone	NA		
Overall	LOW		

### NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

	71001	····pu····co coo:		
USACE AID #:			NCDWR #:	
INSTRUCTIONS: Attach a sk	etch of the assessment a	area and photogra	aphs. Attach a copy of the USGS	7.5-minute topographic quadrangle,
and circle the location of the	stream reach under evalu	uation. If multiple	stream reaches will be evaluated	on the same property, identify and
number all reaches on the atta	ached map, and include a	a separate form fo	r each reach. See the NC SAM U	ser Manual for detailed descriptions
				urements were performed. See the
NC SAM User Manual for exa				
NOTE EVIDENCE OF STRES	SSORS AFFECTING TH	E ASSESSMENT	AREA (do not need to be within	n the assessment area).
PROJECT/SITE INFORMATI	ON:			
<ol> <li>Project name (if any):</li> </ol>	CLT Airport Expansion			nber 2019
3. Applicant/owner name:	CLT		4. Assessor name/organization:	KMT,BGB/HDR
5. County:	Mecklenburg		6. Nearest named water body	
7. River basin:	Catawba		on USGS 7.5-minute quad:	Coffey Creek
8. Site coordinates (decimal d	legrees, at lower end of a	assessment reach	): <u>35.196253, -80.946737</u>	
STREAM INFORMATION: (d				200.51
9. Site number (show on attac			Length of assessment reach evalu	
11. Channel depth from bed (				Inable to assess channel depth.
12. Channel width at top of ba			assessment reach a swamp steam	i? Lifes Lino
14. Feature type: ⊠Perennia STREAM CATEGORY INFO		v ∐ Hdariviarsh ;	Stream	
15. NC SAM Zone:	Mountains (M)	□ Piedmont (P	) Inner Coastal Plain (I)	☐ Outer Coastal Plain (O)
15. NC SAIVI Zorie.		△ Fleumont (F	)	U Outer Coastal Flain (O)
40 =	<b>V</b>		,	
16. Estimated geomorphic valley shape ( <b>skip for</b>	$\Box$ A $\frown$	$\overline{}$	✓B	
Tidal Marsh Stream):	(more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope			
17. Watershed size: (skip	☐Size 1 (< 0.1 mi²)		. ,	
for Tidal Marsh Stream)			O < 0.5 IIII )	0126 + (= 01111)
ADDITIONAL INFORMATION	N:			
		s ⊟No If Yes, ch	eck all that apply to the assessme	ent area.
☐Section 10 water	☐Classified T			rshed (□I □II □III □IV □V)
☐Essential Fish Habitat	☐Primary Nur	sery Area	☐ High Quality Waters	s/Outstanding Resource Waters
⊠Publicly owned property	y □NCDWR Rip	oarian buffer rule i	in effect Nutrient Sensitive W	/aters
☐Anadromous fish	☐303(d) List			ronmental Concern (AEC)
-	of a federal and/or state	listed protected s	pecies within the assessment area	а.
List species:				
☐Designated Critical Hab				,, , , , , , , , , , , , , , , , , , ,
19. Are additional stream info	rmation/supplementary m	neasurements inc	luded in "Notes/Sketch" section or	attached? <a href="MYES">MYES</a> <a href="MYES">MNO</a>
1. Channel Water – assessi	ment reach metric (skin	for Size 1 strea	ms and Tidal Marsh Streams)	
	it assessment reach.	7.0. 0.20 . 000	mo ana maa maren en eane,	
☐B No flow, water in				
□C No water in asse	essment reach.			
2. Evidence of Flow Restric	ction – assessment read	ch metric		
			le-pool sequence is severely affe	cted by a flow restriction or fill to the
point of obstruct	ing flow <u>or</u> a channel cho	oked with aquatic	macrophytes or ponded water or	impoundment on flood or ebb within
	reach (examples: unders	sized or perched of	culverts, causeways that constrict	the channel, tidal gates, debris jams,
beaver dams).				
⊠B Not A				
3. Feature Pattern – assess	sment reach metric			
	assessment reach has a	ıltered pattern (ex	amples: straightening, modificatio	n above or below culvert).
☐B Not A				
4. Feature Longitudinal Pro	ofile – assessment reac	h metric		
				down-cutting, existing damming, over
	aggradation, dredging, a	and excavation w	here appropriate channel profile	has not reformed from any of these
disturbances).				
☐B Not A				
5. Signs of Active Instabilit	y – assessment reach r	metric		
				ered. Examples of instability include
		ead-cut), active wi	dening, and artificial hardening (s	uch as concrete, gabion, rip-rap).
☐B 10 to 25% of channe				

6.		Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB). LB RB								
	⊠a □B	□A ⊠B	Moderate ev reference into	eraction (exam	litions (exam ples: limited	ples: ber I streamsid	ms, leve de area a	es, down- ccess, dis	cutting, aggradation, ruption of flood flows	dredging) that adversely affect through streamside area, leaky g mosquito ditching])
	□C	□c	Extensive ev [examples: of flood flows	vidence of conc causeways with s through strear ching]) or flood	ditions that a n floodplain a mside area] <u>c</u>	dversely a and channe or too muc	affect refe el constric h floodpla	erence inte ction, bulk ain/intertic	eraction (little to no fl heads, retaining wall lal zone access [exar	oodplain/intertidal zone access s, fill, stream incision, disruption nples: impoundments, intensive n is a man-made feature on an
7.		-	Stressors – ass	essment reac	h/intertidal	zone met	ric			
	□A □B □C	Exces Notice	ored water in str sive sedimentati able evidence o	ion (burying of f pollutant disc	stream featu harges enter	ires or inte	ertidal zor	ne)	er discoloration, oil sl nd causing a water q	
	□D □E	Currer				egraded w	vater qua	lity in the	assessment reach.	Cite source in "Notes/Sketch'
	□F	section Livesto	n. ock with access	to stream or in	tertidal zone					
	□H □□ □J	Degra	sive algae in stre ded marsh vege o no stressors	tation in the int					nowing, destruction, $\epsilon$	etc)
8.			er – watershed i	metric (skip fo	or Tidal Mars	sh Strean	ns)			
		ize 1 or 2 s Droug Droug		ught or higher is <u>d</u> no rainfall or	s considered rainfall not e	l a drough	t; for Size 1 inch wi	thin the la		higher is considered a drought.
9.	<b>Larg</b> e		erous Stream – Is stream is t				Yes, skip	to Metric	: 13 (Streamside Are	a Ground Surface Condition).
10.				ded in-stream	habitat over	majority				of stressors include excessive
				ate for Size 4						ecent dredging, and snagging)
	10b.	⊠A I	that occur (occ Multiple aquatic (include liverwor Multiple sticks a	macrophytes a	and aquatic r d algal mats)	nosses	Fidal	skip for S	ize 4 Coastal Plain 5% oysters or othe Submerged aquatic Low-tide refugia (p	r natural hard bottoms c vegetation
		,	vegetation Multiple snags a	-		_	eck for rsh Stre		Sand bottom "	,
		□D :	Multiple snags a 5% undercut ba in banks extend Little or no habit	nks and/or roo to the normal v	t mats and/o	or roots	Che Mai	□K	5% vertical bank al Little or no habitat	ong the marsh
****	*****	*****	*********D = NA A II	NINC OUEST	ONE ADE N	OT ADDI	ICABI E	EOD TID	AL MADELLETDEAL	MS*******
									streams and Tidal N	
	11a.	□Yes	⊠No Is asses	ssment reach in	n a natural sa	and-bed s	tream? (s	kip for C	oastal Plain stream	s)
	11b.	⊠A □B	evaluated. <b>Chec</b> Riffle-run section Pool-glide section Natural bedform	n <b>(evaluate 11</b> on <b>(evaluate 1</b> 1	c) Id)	,	l ifa)			
	11c.					-	-	of the ass	essment reach – whe	ether or not submerged. Check
		at least of (R) = pres should no	ne box in each sent but $\leq$ 10%, t exceed 100% f	row (skip for a Common (C) = for each asses	<b>Size 4 Coas</b> = > 10-40%,	tal Plain s Abundant	streams a	and Tidal	Marsh Streams). N	lot Present (NP) = absent, Rare 70%. Cumulative percentages
			R C ⊠ □	A P		ock/sapro				
					Cobb	der (256 – ole (64 – 2	256 mm)	n)		
						rel (2 – 64 d (.062 – 2				
						lay (< 0.00				
	44.1					cial (rip-ra	•	,	-t	lanah Otmanisa
	Ha.	□Yes	□No Are poo	is illied with se	uiment? ( <b>sk</b> i	IN TOT SIZE	# 4 Coas	ıaı Piain 9	streams and Tidal N	iaisn Streams)

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? one of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛛	Yes	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
		$\boxtimes$	Aquatic nacrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> )
			Crustacean (isopod/amphipod/crayfish/shrimp) Damselfly and dragonfly larvae
	H		Dipterans Mayfly larvae (E) Magaloptors (aldorfly fightly debeapfly larvae)
	Ë	$\boxtimes$	Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )
	Ä		Mussels/Clams (not <i>Corbicula</i> ) Other fish
			Salamanders/tadpoles Snails
			Stonefly larvae (P) Tipulid larvae
13.	Streams	ide Area	Worms/leeches  Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)
	LB	RB □A	Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.  Little or no alteration to water storage capacity over a majority of the streamside area
	□C	⊠B □C	Moderate alteration to water storage capacity over a majority of the streamside area  Severe alteration to water storage capacity over a majority of the streamside area  Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction, livestock disturbance, buildings, man-made levees, drainage pipes)
14.			Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A ⊠B □C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted po	r for the erimeter	e – streamside area metric (skip for Tidal Marsh Streams) Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	LB □Y ⊠N	RB □Y ⊠N	Are wetlands present in the streamside area?
16.		w Contril	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	⊠A □B	Streams	outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.  and/or springs (jurisdictional discharges)  nclude wet detention basins; do not include sediment basins or dry detention basins)
	□C ⊠D ⊠E	Obstruc Evidenc Stream	ion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present)
17.		w Detrac	the above tors – assessment area metric (skip for Tidal Marsh Streams)
	Check a  ☐ A ☐ B ☐ C	Evidenc Obstruc	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) ion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) ream (> 24% impervious surface for watershed)
	□D □E □F	Assessr	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠A □B □C	Stream : Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) Id (example: scattered trees) Is shading is gone or largely absent
		Justin	singuing to going at tally about

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded
	LB RB LB RB $□$ A $□$ A $□$ A $□$ A $□$ A $□$ A $□$ 2 100 feet wide $\underline{or}$ extends to the edge of the watershed $□$ B $□$ B $□$ B $□$ B $□$ B From 50 to < 100 feet wide $□$ C $□$ C $□$ C $□$ C $□$ C From 30 to < 50 feet wide $□$ D From 10 to < 30 feet wide $□$ E $□$ E $□$ E $□$ E $□$ E $□$ C 10 feet wide $\underline{or}$ no trees
20.	Buffer Structure – streamside area metric (skip for Tidal Marsh Streams) Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).
	LB RB  □ A Mature forest □ B □ B Non-mature woody vegetation or modified vegetation structure □ C □ C Herbaceous vegetation with or without a strip of trees < 10 feet wide □ D □ D Maintained shrubs □ E □ E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A B A B A B A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A A Medium to high stem density  B B Low stem density  C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  ☑A ☐A The total length of buffer breaks is < 25 percent.
	□B □B The total length of buffer breaks is between 25 and 50 percent. □C □C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.  LB RB  ☑A ☐A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.
	Use Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.
	□C Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent <u>or</u> communities with non-native invasive species dominant over a large portion of expected strata <u>or</u> communities composed of planted stands of non-characteristic species <u>or</u> communities inappropriately composed of a single species <u>or</u> no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter). $\Box A < 46 \qquad \Box B  46 \text{ to} < 67 \qquad \Box C  67 \text{ to} < 79 \qquad \Box D  79 \text{ to} < 230 \qquad \Box E \geq 230$
	es/Sketch: aam is located in the middle of an airport airfield,

Stream Site Name	CL1 Airport Expansion	Date of Assessment	September 201	9		
Stream Category Pb3 Assessor Name/Or			tion KMT,BGB/HDR			
Notes of Field Asses	YES					
Presence of regulator	NO					
Additional stream inf	YES					
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)  Perennial						

(poronnial, intermitted it, ridal waron etream)			
	USACE/	NCDWR	
Function Class Rating Summary	All Streams	Intermittent	
(1) Hydrology	HIGH		
(2) Baseflow	HIGH		
(2) Flood Flow	HIGH		
(3) Streamside Area Attenuation	HIGH		
(4) Floodplain Access	HIGH		
(4) Wooded Riparian Buffer	MEDIUM		
(4) Microtopography	NA		
(3) Stream Stability	MEDIUM		
(4) Channel Stability	HIGH		
(4) Sediment Transport	HIGH		
(4) Stream Geomorphology	LOW		
(2) Stream/Intertidal Zone Interaction	NA NA		
•			
(2) Longitudinal Tidal Flow	NA NA		
(2) Tidal Marsh Stream Stability	NA		
(3) Tidal Marsh Channel Stability	NA NA		
(3) Tidal Marsh Stream Geomorphology	NA		
(1) Water Quality	HIGH		
(2) Baseflow	HIGH		
(2) Streamside Area Vegetation	MEDIUM		
(3) Upland Pollutant Filtration	MEDIUM		
(3) Thermoregulation	HIGH		
(2) Indicators of Stressors	NO		
(2) Aquatic Life Tolerance	HIGH		
(2) Intertidal Zone Filtration	NA		
(1) Habitat	HIGH		
(2) In-stream Habitat	HIGH		
(3) Baseflow	HIGH		
(3) Substrate	HIGH		
(3) Stream Stability	MEDIUM		
(3) In-stream Habitat	HIGH		
(2) Stream-side Habitat	HIGH		
(3) Stream-side Habitat	HIGH		
(3) Thermoregulation	HIGH		
(2) Tidal Marsh In-stream Habitat	NA		
(3) Flow Restriction	NA		
(3) Tidal Marsh Stream Stability	NA		
(4) Tidal Marsh Channel Stability	NA NA		
(4) Tidal Marsh Stream Geomorphology	NA NA		
(3) Tidal Marsh In-stream Habitat	NA NA		
(2) Intertidal Zone	NA NA		
(-) Mortida 2010	HIGH		

### NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

USACE AID #:	NCDWR #:
INSTRUCTIONS: Attach a sketch of the assessment area and photogram	
and circle the location of the stream reach under evaluation. If multiple	
number all reaches on the attached map, and include a separate form for	
and explanations of requested information. Record in the "Notes/Skete	
NC SAM User Manual for examples of additional measurements that m NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMEN	,
	TANLA (up not need to be within the assessment area).
PROJECT/SITE INFORMATION:  1. Project name (if any): CLT Airport Expansion	Date of evaluation: September 2019
1. Project name (if any): CLT Airport Expansion  3. Applicant/owner name: CLT	Date of evaluation: September 2019     Assessor name/organization: KMT,BGB/HDR
5. County: Mecklenburg	6. Nearest named water body
7. River basin: Catawba	on USGS 7.5-minute quad: Coffey Creek
Site coordinates (decimal degrees, at lower end of assessment reaches)	
STREAM INFORMATION: (depth and width can be approximations	
PS7-2 - S30,	,
	Length of assessment reach evaluated (feet): 367'
11. Channel depth from bed (in riffle, if present) to top of bank (feet):	1 ☐Unable to assess channel depth.
	assessment reach a swamp steam? ☐Yes ☐No
14. Feature type:   ☐ Perennial flow ☐ Intermittent flow ☐ Tidal Marsh	Stream
STREAM CATEGORY INFORMATION:	
15. NC SAM Zone: ☐ Mountains (M) ☐ Piedmont (I	P)
	\ /
16. Estimated geomorphic	) ⊠B
valley shape (skip for Tidal Marsh Stream): (more sinuous stream, flatter valley si	
, , , , , , , , , , , , , , , , , , , ,	
17. Watershed size: (skip ⊠Size 1 (< 0.1 mi²) □Size 2 (0.1 for Tidal Marsh Stream)	to < 0.5 mi²)
ADDITIONAL INFORMATION:	
18. Were regulatory considerations evaluated? ☐Yes ☐No If Yes, c	heck all that apply to the assessment area.
Section 10 water Classified Trout Waters	□Water Supply Watershed (□I □II □III □IV □V)
☐Essential Fish Habitat ☐Primary Nursery Area	☐ High Quality Waters/Outstanding Resource Waters
☐Anadromous fish ☐303(d) List	CAMA Area of Environmental Concern (AEC)
Documented presence of a federal and/or state listed protected s	species within the assessment area.
List species:  Designated Critical Habitat (list species)	
19. Are additional stream information/supplementary measurements incompared to the control of the control	Studed in "Notes/Sketch" section or attached? TVes MNo
10.740 additional stream information/supplementary incastrements inc	Produced III 1401009 OUGIOIT SCOTIOIT OF ALIGORIEGE   162 MI40
1. Channel Water – assessment reach metric (skip for Size 1 stream	ams and Tidal Marsh Streams)
	·
B No flow, water in pools only.	
☐C No water in assessment reach.	
2. Evidence of Flow Restriction – assessment reach metric	
	ffle-pool sequence is severely affected by a flow restriction or fill to the
	c macrophytes <u>or</u> ponded water <u>or</u> impoundment on flood or ebb within
the assessment reach (examples: undersized or perched beaver dams).	culverts, causeways that constrict the channel, tidal gates, debris jams,
B Not A	
<ol> <li>Feature Pattern – assessment reach metric</li> <li>A majority of the assessment reach has altered pattern (expectation)</li> </ol>	xamples: straightening, modification above or below culvert).
☐B Not A	Admiples. Straightening, modification above of below curverty.
4. Feature Longitudinal Profile – assessment reach metric	tream profile (examples: channel down outting existing damning ever
	tream profile (examples: channel down-cutting, existing damming, over where appropriate channel profile has not reformed from any of these
disturbances).	mioro appropriate originale profite flat flot reformed from any of these
⊠B Not A	
5. Signs of Active Instability – assessment reach metric	
	the stream has currently recovered. Examples of instability include
active bank failure, active channel down-cutting (head-cut), active w	
☐A < 10% of channel unstable	
B 10 to 25% of channel unstable	
□C > 25% of channel unstable	

6.			ea Interaction – streamside area metric ne Left Bank (LB) and the Right Bank (RB).			
	⊠A □B	⊠A □B	Little or no evidence of conditions that adversely affect reference interaction  Moderate evidence of conditions (examples: berms, levees, down-cutting, aggradation, dredging) that adversely affect reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, leaky or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])			
	□C	□c	Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access [examples: causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruptior of flood flows through streamside area] or too much floodplain/intertidal zone access [examples: impoundments, intensive mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature on ar interstream divide			
7.		-	Stressors – assessment reach/intertidal zone metric			
	Check all that apply.  □ A Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) □ B Excessive sedimentation (burying of stream features or intertidal zone) □ C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem					
	□D □E		(not including natural sulfide odors) nt published or collected data indicating degraded water quality in the assessment reach.  Cite source in "Notes/Sketch"			
	□F	section Livesto	n. ock with access to stream or intertidal zone			
	G H D	Degra	sive algae in stream or intertidal zone ded marsh vegetation in the intertidal zone (removal, burning, regular mowing, destruction, etc) (explain in "Notes/Sketch" section)			
8.			o no stressors er – watershed metric (skip for Tidal Marsh Streams)			
o.		Size 1 or 2 s Droug Droug	streams, D1 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought ht conditions and no rainfall or rainfall not exceeding 1 inch within the last 48 hours ht conditions and rainfall exceeding 1 inch within the last 48 hours bught conditions			
9.		e or Dange	erous Stream – assessment reach metric Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition).			
10.			am Habitat Types – assessment reach metric			
	10a.	∐Yes	No Degraded in-stream habitat over majority of the assessment reach (examples of stressors include excessive sedimentation, mining, excavation, in-stream hardening [for example, rip-rap], recent dredging, and snagging (evaluate for Size 4 Coastal Plain streams only, then skip to Metric 12)			
	10b.	□A I	that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams)  Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats)  Multiple sticks and/or leaf packs and/or emergent vegetation  Multiple snags and logs (including lap trees)  Multiple snags and logs (including lap trees)			
			Multiple sticks and/or leaf packs and/or emergent			
			Multiple snags and logs (including lap trees)			
		i	in banks extend to the normal wetted perimeter  Little or no habitat			
****	*****	******	*********REMAINING QUESTIONS ARE NOT APPLICABLE FOR TIDAL MARSH STREAMS************************************			
11.	Bedf	orm and S	Substrate – assessment reach metric (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)			
	11a.	□Yes	⊠No Is assessment reach in a natural sand-bed stream? (skip for Coastal Plain streams)			
	11b.	⊠A □B	evaluated. Check the appropriate box(es). Riffle-run section (evaluate 11c) Pool-glide section (evaluate 11d) Natural bedform absent (skip to Metric 12, Aquatic Life)			
	11c.		ctions, check all that occur below the normal wetted perimeter of the assessment reach – whether or not submerged. <b>Check</b>			
		at least of (R) = pres	ne box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Rare sent but $\leq 10\%$ , Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentages t exceed 100% for each assessment reach.			
		NP I	R C A P □ □ □ Bedrock/saprolite			
			□ □ □ Boulder (256 – 4096 mm) □ □ □ □ Cobble (64 – 256 mm)			
			□ □ □ □ Gravel (2 − 64 mm) □ □ □ □ Sand (.062 − 2 mm) □ □ □ □ □ Silt/clay (< 0.062 mm)			
			Silt/clay (< 0.062 mm)			
			Detritus  Artificial (rip-rap, concrete, etc.)			
	11d.	□Yes	□No Are pools filled with sediment? (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams)			

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? cone of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛚	Yes 🗆	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 ⊠ □		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles
			Caddisfly larvae (T) Asian clam ( <i>Corbicula</i> ) Crustacean (isopod/amphipod/crayfish/shrimp)
			Damselfly and dragonfly larvae Dipterans Mayfly larvae (E)
			Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae
			Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea)</i> Mussels/Clams (not <i>Corbicula</i> ) Other fish
			Salamanders/tadpoles Snails
			Stonefly larvae (P)  Tipulid larvae  Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	□A □B ⊠C	□A □B ⊠C	Little or no alteration to water storage capacity over a majority of the streamside area  Moderate alteration to water storage capacity over a majority of the streamside area  Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction,
			livestock disturbance, buildings, man-made levees, drainage pipes)
14.	Conside LB	r for the RB	Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	ee – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma of assessment reach.
	□Y ⊠N	∏Y ⊠N	Are wetlands present in the streamside area?
16.	Check a ☐A	II contrib Streams	putors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) putors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges)
	□B □C □D ⊠E □F	Obstruc Evidenc Stream	nclude wet detention basins; do not include sediment basins or dry detention basins) tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present) the above
17.		w Detrac	tors – assessment area metric (skip for Tidal Marsh Streams)
	□A □B □C □D	Evidenc Obstruc Urban s	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	□E □E □F	Assessr	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	□A □B □C	Stream Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) ed (example: scattered trees) shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB  △A △A □A ≥ 100 feet wide or extends to the edge of the watershed  □B □B □B □B From 50 to < 100 feet wide  □C □C □C □C □C From 30 to < 50 feet wide  □D □D □D □D □D From 10 to < 30 feet wide
20.	□E □E □E □E □E □ < 10 feet wide or no trees  Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  LB RB □A □A Mature forest □B □B Non-mature woody vegetation or modified vegetation structure □C □C Herbaceous vegetation with or without a strip of trees < 10 feet wide
	□D □D Maintained shrubs □E □E Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	Stem Density – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density  B B Low stem density
22	☑C ☑C No wooded riparian buffer <u>or</u> predominantly herbaceous species <u>or</u> bare ground  Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)
23.	Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB
	A
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)  Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.  LB RB
	☐A Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species with non-native invasive species absent or sparse.
	B Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata of
	communities missing understory but retaining canopy trees.  Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.
	25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).  □A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230
	s/Sketch:
walt	r appeared black, receives stormwater runoff from recycling center/composting center

Stream Site Name	CLT Airport Expansion	Date of Assessment	September 2019	
Stream Category Pb1 Assessor Name/Organization		KMT,BGB/HDR		
Notes of Field Asses		YES		
Presence of regulator	YES			
Additional stream inf	NO			
NC SAM feature type	/larsh Stream)	Perennial		

(perennial, intermittent, ridal Marsh Stream)	referrina	<u> </u>
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	MEDIUM	- Intornation
(2) Baseflow	HIGH	
(2) Flood Flow	MEDIUM	
(3) Streamside Area Attenuation	MEDIUM	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	LOW	
(4) Microtopography	NA NA	
	MEDIUM	
(3) Stream Stability	MEDIUM	
(4) Channel Stability		
(4) Sediment Transport	MEDIUM	
(4) Stream Geomorphology	MEDIUM	
(2) Stream/Intertidal Zone Interaction	NA NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	LOW	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	LOW	
(3) Upland Pollutant Filtration	LOW	
(3) Thermoregulation	LOW	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	LOW	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	LOW	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	MEDIUM	
(3) Stream Stability	MEDIUM	
(3) In-stream Habitat	LOW	
(2) Stream-side Habitat	LOW	
(3) Stream-side Habitat	LOW	
(3) Thermoregulation	LOW	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA NA	
(4) Tidal Marsh Stream Geomorphology	NA NA	
(3) Tidal Marsh In-stream Habitat	NA NA	
(2) Intertidal Zone	NA NA	
Overall	LOW	

### NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

		ompamee eee m	anda voicien zin	
USACE AID #:			NCDWR #:	
				7.5-minute topographic quadrangle,
				on the same property, identify and
				ser Manual for detailed descriptions
				urements were performed. See the
NC SAM User Manual for exa				the secondary area)
		E ASSESSIVIENT	AREA (do not need to be withir	i the assessment area).
PROJECT/SITE INFORMATI	_	,		1 0040
1. Project name (if any):	CLT Airport Expansion			ber 2019
3. Applicant/owner name:	CLT		4. Assessor name/organization:	KMT,BGB/HDR
5. County: 7. River basin:	Mecklenburg Catawba		6. Nearest named water body on USGS 7.5-minute quad:	Coffey Creek
8. Site coordinates (decimal of		esessment reach)	•	Colley Cleek
STREAM INFORMATION: (c	•	,	33.193949, -00.940032	
STREAM IN ORMATION. (C	PS7-2 - S			
9. Site number (show on attack	ched map): Reach 2	10. Le	ength of assessment reach evaluation	ated (feet): 980'
11. Channel depth from bed (	in riffle, if present) to top	of bank (feet):	2 □U	nable to assess channel depth.
12. Channel width at top of ba			ssessment reach a swamp steam	? ∐Yes ∐No
14. Feature type: ⊠Perennia	al flow Intermittent flow	v □Tidal Marsh S	tream	
STREAM CATEGORY INFO	-			
15. NC SAM Zone:	☐ Mountains (M)	□ Piedmont (P)	☐ Inner Coastal Plain (I)	Outer Coastal Plain (O)
			<b>\</b>	,
16. Estimated geomorphic		. ——	⊠в	
valley shape (skip for	<del></del>			
Tidal Marsh Stream):	(more sinuous stream	•	,	ream, steeper valley slope)
17. Watershed size: (skip	$\boxtimes$ Size 1 (< 0.1 mi <sup>2</sup> )	∐Size 2 (0.1 to	$0 < 0.5 \text{ mi}^2$ ) Size 3 (0.5 to <	5 mi²)
for Tidal Marsh Stream) ADDITIONAL INFORMATION				
		. □No If Yes che	eck all that apply to the assessme	ent area
Section 10 water	☐Classified Tr			shed ( I II III IV V)
☐Essential Fish Habitat	<del></del>			s/Outstanding Resource Waters
⊠Publicly owned propert		oarian buffer rule ir	n effect Nutrient Sensitive W	aters
☐Anadromous fish	⊠303(d) List			onmental Concern (AEC)
-	of a federal and/or state	listed protected sp	ecies within the assessment area	l.
List species:				
Designated Critical Hal			La Lia «Nata do los al libras di casa	
19. Are additional stream info	rmation/supplementary m	neasurements inclu	uded in "Notes/Sketch" section or	attached? LYes KNo
1. Channel Water – assess	ment reach metric (skir	for Size 1 stream	ns and Tidal Marsh Streams)	
	ut assessment reach.	0.20 . 00	iio ana mai mai on on oamo,	
☐B No flow, water ir				
☐C No water in asset	essment reach.			
2. Evidence of Flow Restric	ction – assessment read	ch metric		
			e-pool sequence is severely affect	cted by a flow restriction or fill to the
point of obstruct	ting flow <u>or</u> a channel cho	oked with aquatic i	macrophytes or ponded water or	impoundment on flood or ebb within
	reach (examples: unders	sized or perched c	ulverts, causeways that constrict	the channel, tidal gates, debris jams,
beaver dams). ⊠B Not A				
⊠B NOLA				
3. Feature Pattern – assess				
	assessment reach has a	lltered pattern (exa	imples: straightening, modification	n above or below culvert).
⊠B Not A				
4. Feature Longitudinal Pro				
				down-cutting, existing damming, over
	aggradation, dredging, a	and excavation wh	nere appropriate channel profile	has not reformed from any of these
disturbances). ⊠B Not A				
5. Signs of Active Instability	=		a strange has some of the second	and Evennels of Section 1997 (1997)
			ne stream has currently recove dening, and artificial hardening (su	red. Examples of instability include
⊠A < 10% of channe		au-out, active wit	ioning, and armicial hardening (St	aon ao conorete, gabion, np-rap).
☐B 10 to 25% of cha				
☐C > 25% of channe				

		ne Lett Bar	nk (LB) and th	e Right Ba	ank (RB).				
LB ⊠A □B	RB ⊠A □B	Modera referen	ite evidence of ce interaction (	conditions examples:	s (examples: be limited streams	erms, levee ide area a	es, down- ccess, dis	cutting, aggradation, dredging) that adversely afficulation of flood flows through streamside area, le	
□C	□с	[examp of flood mosqui	les: causeway flows through to ditching]) <u>or</u>	s with flood streamside	dplain and chann area] <u>or</u> too mu	nel constric ch floodpla	tion, bulk iin/intertid	heads, retaining walls, fill, stream incision, disrupt lal zone access [examples: impoundments, intens	tion sive
Water	Quality	Stressors -	- assessment	reach/inte	ertidal zone me	tric			
	-								
ΠA								er discoloration, oil sheen, stream foam)	
								nd causing a water quality problem	
□Ď					io ontornig trio a	00000111011	. 100011 <u>ai</u>	ta vator quality problem	
□E			d or collected	data indica	ating degraded	water qua	ity in the	assessment reach. Cite source in "Notes/Sket	tch"
∏F			cess to stream	or intertid	al zone				
□G									
								lowing, destruction, etc)	
⊠j				(0xpiaii	Till 140100/OKOK	311 0001101	,		
Recent	t Weath	er – waters	hed metric (s	kip for Tid	lal Marsh Strea	ms)			
									ght.
								st 48 hours	
⊠c				57.000am.g		, 1401 10 11			
Large o	or Dang	erous Stre	am – assessn	nent reach	ı metric				
□Yes	⊠No	Is strea	m is too large	or dangero	us to assess? If	f Yes, skip	to Metric	13 (Streamside Area Ground Surface Condition)	1).
_						. of the o		t reach (exemples of attractors include execu-	a.ia
тоа	_] res	S	edimentation,	mining, ex	cavation, in-stre	eam harde	ning [for	example, rip-rap], recent dredging, and snaggi	ing)
L	^					idal	∐' <sub>G</sub>	Submerged aquatic vegetation	
			cks and/or lea	f packs an	d/or emergent	for Stre		Low-tide refugia (pools)	
			ags and logs (	ncluding la	ap trees)	heck arsh	՝		
	<b></b> D	5% underc	ut banks and/	or root mat	ts and/or roots	ਹ≥	□K	Little or no habitat	
г				rmal wetter					
	ΞE	in banks ex Little or no			a perimeter				
L	]E				u perimetei				
		Little or no	habitat		•	LICABLE	FOR TID	AL MARSH STREAMS************************************	
******	*****	Little or no ************************************	habitat EMAINING QU	ESTIONS	ARE NOT APPI			AL MARSH STREAMS************************************	
******	******** rm and \$	Little or no  *********RE  Gubstrate -	habitat  EMAINING QU  - assessment	ESTIONS reach met	ARE NOT APPI	ze 4 Coas	al Plain s		
**************************************	**************************************	Little or no  ***********RE  Substrate -  No Is a  evaluated.	habitat  EMAINING QU - assessment assessment re Check the ap	ESTIONS reach met ach in a na propriate l	ARE NOT APPI tric (skip for Siz atural sand-bed s	ze 4 Coas	al Plain s	streams and Tidal Marsh Streams)	
*********** <b>Bedfor</b> 11a. [  11b. B	************ " <b>m and \$</b> ⊒Yes Bedform ⊴A	Little or no  ***********************************	habitat  EMAINING QU - assessment assessment re	ESTIONS reach met ach in a na propriate I te 11c)	ARE NOT APPI tric (skip for Siz atural sand-bed s	ze 4 Coas	al Plain s	streams and Tidal Marsh Streams)	
*********** <b>Bedfor</b> 11a. [  11b. B	*************************************	Little or no  ***********************************	EMAINING QU - assessment assessment re Check the ap ection (evalua section (evalua	reach met ach in a na propriate I te 11c) ate 11d)	ARE NOT APPI tric (skip for Siz atural sand-bed s	ze 4 Coast	al Plain s	streams and Tidal Marsh Streams)	
Bedfor  11a. [  11b. B  [  [  11c. Ir  a	rm and \$  Yes  Bedform B C C n riffle se	Little or no  ***********************************	EMAINING QU - assessment assessment re Check the appection (evalual section (evalual dform absent (section absent (section))	reach met ach in a na propriate I te 11c) ate 11d) skip to Me r below the	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain	ze 4 Coasi stream? (s : Life) perimeter streams a	al Plain s kip for C  of the ass and Tidal	essment reach – whether or not submerged. Che Marsh Streams). Not Present (NP) = absent, R	Rare
Bedfor  11a. [  11b. B  [  11c. Ir  a  (I  s	rm and \$  Yes  Bedform B C C riffle se t least c R) = pre hould no	Little or no  ***********************************	EMAINING QU - assessment assessment re Check the ap ection (evalua deform absent (see all that occue each row (skip 10%, Common 00% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me r below the o for Size 4 (C) = > 10 assessmen	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundan	ze 4 Coasi stream? (s : Life) perimeter streams a	al Plain s kip for C  of the ass and Tidal	streams and Tidal Marsh Streams)  coastal Plain streams)  essment reach – whether or not submerged. Che	Rare
######################################	rm and \$  Yes  Bedform B C C n riffle se t least c R) = pre- hould no	Little or no  ***********************************	EMAINING QU - assessment assessment re Check the ap ection (evalua deform absent (see all that occue each row (skip 10%, Common 00% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me or below the ofor Size 4 (C) = > 10 ssessmen P	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar it reach.	ze 4 Coast stream? (s : Life) perimeter streams a at (A) = > 4	al Plain s kip for C  of the ass and Tidal	essment reach – whether or not submerged. Che Marsh Streams). Not Present (NP) = absent, R	Rare
**************************************	rm and \$  Yes  Bedform B C C n riffle se t least o R) = pre- hould no	Little or no  ***********************************	EMAINING QU - assessment assessment re Check the ap ection (evalua deform absent (see all that occue each row (skip 10%, Common 00% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me r below the o for Size 4 (C) = > 10 assessmen	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar at reach.	ze 4 Coast stream? (s : Life) perimeter of streams a ant (A) = > 4 olite - 4096 mr	al Plain s kip for C of the ass and Tidal 40-70%, F	essment reach – whether or not submerged. Che Marsh Streams). Not Present (NP) = absent, R	Rare
**************************************	rm and \$  Yes  Bedform B C C n riffle se t least o R) = pre- hould no	Little or no  ***********************************	EMAINING QU - assessment assessment re Check the ap ection (evalua section (evalua dform absent (se ck all that occue each row (skip 10%, Common 00% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me or below the ofor Size 4 (C) = > 10 ssessmen P	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar at reach. Bedrock/sapro Boulder (256 Cobble (64 –	ze 4 Coasi stream? (s : Life) perimeter streams a th (A) = > 4 olite - 4096 mr 256 mm)	al Plain s kip for C of the ass and Tidal 40-70%, F	essment reach – whether or not submerged. Che Marsh Streams). Not Present (NP) = absent, R	Rare
**************************************	rm and \$  Yes  Bedform B C C n riffle se t least c R) = pre- hould no	Little or no  ***********************************	EMAINING QU - assessment assessment re Check the ap ection (evalua section (evalua dform absent (se ck all that occue each row (skip 10%, Common 00% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me or below the ofor Size 4 (C) = > 10 ssessmen P	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar at reach.	ze 4 Coast stream? (s : Life) perimeter streams a th (A) = > 4 olite - 4096 mr 256 mm) 4 mm)	al Plain s kip for C of the ass and Tidal 40-70%, F	essment reach – whether or not submerged. Che Marsh Streams). Not Present (NP) = absent, R	Rare
**************************************	rm and \$  Yes  Bedform B C n riffle se t least c R) = pre hould no	Little or no  ***********************************	EMAINING QU - assessment assessment re Check the ap ection (evalua section (evalua dform absent (se ck all that occue each row (skip 10%, Common 00% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me or below the ofor Size 4 (C) = > 10 ssessmen P	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar it reach. Bedrock/sapre Boulder (256 Cobble (64 – 2 Gravel (2 – 64 Sand (.062 – 2 Silt/clay (< 0.0	ze 4 Coasi stream? (s : Life) perimeter streams a th (A) = > 4 olite - 4096 mr 256 mm) 4 mm) 2 mm)	al Plain s kip for C of the ass and Tidal 40-70%, F	essment reach – whether or not submerged. Che Marsh Streams). Not Present (NP) = absent, R	Rare
**************************************	rm and \$  Yes  Bedform B C riffle se t least c R) = pre hould no	Little or no  ***********************************	EMAINING QU - assessment assessment re Check the ap ection (evalua section (evalua dform absent (se ck all that occue each row (skip 10%, Common 00% for each a	reach met ach in a na propriate I te 11c) ate 11d) skip to Me or below the ofor Size 4 (C) = > 10 ssessmen P	ARE NOT APPI tric (skip for Siz atural sand-bed s box(es). etric 12, Aquatic e normal wetted p 4 Coastal Plain 0-40%, Abundar it reach. Bedrock/sapre Boulder (256 Cobble (64 – 2 Gravel (2 – 64 Sand (.062 – 2	ce 4 Coasistream? (see Life)  perimeter streams and (A) = > 4  olite    - 4096 mm  256 mm)  4 mm)  2 mm)  062 mm)	kip for Coof the assund Tidal	essment reach – whether or not submerged. Che Marsh Streams). Not Present (NP) = absent, R	Rare
	Water Check  A B C C D F G H G G G G G G G G G G G G G G G G G	Water Quality: Check all that: A Discol B Excess C Notice D Odor Sectio F Livest G Excess H Degra I Other: J Little t  Recent Weather For Size 1 or 2: A Droug B Droug C No dro Large or Dang Yes No Natural In-stree 10a. Yes  10b. Check all B B C D D		☑A       ☑A       Little or no evidence of reference interaction (or intermittent bulkhead or intermittent bulkhead or intermittent bulkhead of flood flows through of mosquito ditching]) or interstream divide         Water Quality Stressors – assessment Check all that apply.       ☐A       Discolored water in stream or in stream or in stream or in least of collected section.         ☐B       Excessive sedimentation (burying section).         ☐C       Noticeable evidence of pollutang natural sulfider.         ☐D       Odor (not including natural sulfider.         ☐E       Current published or collected section.         ☐F       Livestock with access to stream or in least of section.         ☐H       Degraded marsh vegetation in the period of section of the section.         ☐H       Degraded marsh vegetation in the period of section of the section.         ☐H       Degraded marsh vegetation in the period of section.         ☐H       Degraded marsh vegetation in the period of section.         ☐H       Degraded marsh vegetation in the period of section.         ☐A       Drought conditions and rainfall of sections.         ☐A       Drought conditions and rainfall of sections.         ☐C       No drought conditions.         Large or Dangerous Stream – assessment assessment of section.       No drought conditions.         Large or Dangerous Stream – assessment of section.       No drought conditions.     <	☑A       ☑A       Little or no evidence of conditions reference interaction (examples: or intermittent bulkheads, caused or intermitent bulkheads, caused or intermitent bulkheads, caused or intermitent bulkheads or flood flows through streams divide         Water Quality Stressors – assessment reach/intermitent bulkheads       ■ flood fl	☑A         ☑A         Little or no evidence of conditions that adversely reference interaction (examples: limited streams or intermittent bulkheads, causeways with floodploop intermittent bulkheads, causeways with floodplain. Intermittent bulkheads,	MA	☑A         ☑A         Little or no evidence of conditions that adversely affect reference into Moderate evidence of conditions (examples: berms, levees, down-reference interaction (examples: limited streamside area access, disor intermittent bulkheads, causeways with floodplain constriction, midexamples: causeways with floodplain and channel constriction, bulk of flood flows through streamside areal or much floodplain/intertic mosquito ditching]) or floodplain/intertidal zone unnaturally absent interstream divide           Water Quality Stressors – assessment reach/intertidal zone metric           Check all that apply.         A Discolored water in stream or intertidal zone (milky white, blue, unnatural wate excessive) sedimentation (burying of stream features or intertidal zone)           ☐ D Ador (not including natural sulfide dodors)         Excessive sedimentation (burying of stream features or intertidal zone)           ☐ D Codor (not including natural sulfide dodors)         Current published or collected data indicating degraded water quality in the section.           ☐ F Livestock with access to stream or intertidal zone         Excessive algae in stream or intertidal zone           ☐ G Excessive algae in stream or intertidal zone (removal, burning, regular mother:	☑A         ☑A         Little or no evidence of conditions (examples: berns, levees, down-cutting, aggradation, dredging) that adversely at reference interaction (examples: limited streamside area access, disruption of flood flows through streamside area, le or intermittent bulkheads, causeways with floodplain constriction, minor ditching [including mosquito ditching])         Extensive evidence of conditions that adversely affect reference interaction (little to no floodplain/intertidal zone access, disruption of flood flows through streamside area, le or intermittent bulkheads, causeways with floodplain and channel constriction, bulkheads, retaining walls, fill, stream incision, disruption of flood flows through streamside area and prot to much floodplain/intertidal zone cacess [examples: impoundments, inten mosquito ditching]) or floodplain/intertidal zone unnaturally absent or assessment reach is a man-made feature or interstream divide           Water Quality Stressors – assessment reach/intertidal zone metric         Check all that apply.           ☐ Discolored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)         Stressive algae in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam)           ☐ Excessive algae evidence of pollutant discharges entering the assessment reach and causing a water quality problem         Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Ske section."           ☐ Excessive algae in stream or intertidal zone         Livestock with access to stream or intertidal zone         Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Ske section."

12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠ If N		No Was an in-stream aquatic life assessment performed as described in the User Manual? cone of the following reasons and skip to Metric 13. ☐No Water ☐Other:
	12b. 🛛	Yes 🗆	No Are aquatic organisms present in the assessment reach (look in riffles, pools, then snags)? If Yes, check all that apply. If No, skip to Metric 13.
	1 		Numbers over columns refer to "individuals" for Size 1 and 2 streams and "taxa" for Size 3 and 4 streams.  Adult frogs  Aquatic reptiles
			Aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) Beetles Caddisfly larvae (T)
			Asian clam ( <i>Corbicula</i> )  Crustacean (isopod/amphipod/crayfish/shrimp)
			Damselfly and dragonfly larvae Dipterans Mayfly larvae (E)
		$\boxtimes$	Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae Mosquito fish ( <i>Gambusia</i> ) or mud minnows ( <i>Umbra pygmaea</i> )
			Mussels/Clams (not <i>Corbicula</i> ) Other fish Salamanders/tadpoles
			Snails Stonefly larvae (P)
			Tipulid larvae Worms/leeches
13.			Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)  Left Bank (LB) and the Right Bank (RB). Consider storage capacity with regard to both overbank flow and upland runoff.
	⊠A □B □C	⊠A □B □C	Little or no alteration to water storage capacity over a majority of the streamside area Moderate alteration to water storage capacity over a majority of the streamside area Severe alteration to water storage capacity over a majority of the streamside area (examples: ditches, fill, soil compaction,
4.4			livestock disturbance, buildings, man-made levees, drainage pipes)
14.	Conside LB	r for the RB	Water Storage – streamside area metric (skip for Size 1 streams, Tidal Marsh Streams, and B valley types) Left Bank (LB) and the Right Bank (RB) of the streamside area.
	□A □B ⊠C	□A □B ⊠C	Majority of streamside area with depressions able to pond water ≥ 6 inches deep Majority of streamside area with depressions able to pond water 3 to 6 inches deep Majority of streamside area with depressions able to pond water < 3 inches deep
15.	Conside wetted p	r for the	ee – streamside area metric (skip for Tidal Marsh Streams)  Left Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the normal of assessment reach.
	□Y ⊠N	□Y ⊠N	Are wetlands present in the streamside area?
16.	Check a ☐A	II contrib Streams	putors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) putors within the assessment reach or within view of <u>and</u> draining to the assessment reach. and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)
	□B □C □D ⊠E □F	Obstruc Evidenc Stream	tion passing flow during low-flow periods within the assessment area (beaver dam, leaky dam, bottom-release dam, weir) e of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present) the above
17.			tors – assessment area metric (skip for Tidal Marsh Streams) ply.
	□A □B □C □D	Evidence Obstructure Urban s	e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation) tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed)
	□E □F	Assessr	e that the streamside area has been modified resulting in accelerated drainage into the assessment reach nent reach relocated to valley edge the above
18.	-		sment reach metric (skip for Tidal Marsh Streams) Consider "leaf-on" condition.
	⊠A □B □C	Stream Degrade	shading is appropriate for stream category (may include gaps associated with natural processes) ed (example: scattered trees) shading is gone or largely absent

19.	Buffer Width – streamside area metric (skip for Tidal Marsh Streams)  Consider "vegetated buffer" and "wooded buffer" separately for left bank (LB) and right bank (RB) starting at the top of bank out to the first break.  Vegetated Wooded  LB RB LB RB $A A A A A A A A A A A A A A A A A A A$
20.	□E □E □E < 10 feet wide or no trees  Buffer Structure – streamside area metric (skip for Tidal Marsh Streams)  Consider for left bank (LB) and right bank (RB) for Metric 19 ("Vegetated" Buffer Width).  □B □E □E < 10 feet wide or no trees  LB □E < 10 feet wide or no trees
	⊠A       Mature forest         □B       □B       Non-mature woody vegetation or modified vegetation structure         □C       □C       Herbaceous vegetation with or without a strip of trees < 10 feet wide         □D       □D       Maintained shrubs         □E       □E       Little or no vegetation
21.	Buffer Stressors – streamside area metric (skip for Tidal Marsh Streams)  Check all appropriate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is within 30 feet of stream (< 30 feet), or is between 30 to 50 feet of stream (30-50 feet).  If none of the following stressors occurs on either bank, check here and skip to Metric 22:  Abuts < 30 feet 30-50 feet  LB RB LB RB LB RB  A A A A A A A A A A A A A A A A A A A
22.	□C □C □C □C □C Pasture (no livestock)/commercial horticulture □D □D □D □D □D Pasture (active livestock use)  Stem Density – streamside area metric (skip for Tidal Marsh Streams)
	Consider for left bank (LB) and right bank (RB) for Metric 19 ("Wooded" Buffer Width).  LB RB  A Medium to high stem density  B DB Low stem density  C C No wooded riparian buffer or predominantly herbaceous species or bare ground
23.	Continuity of Vegetated Buffer – streamside area metric (skip for Tidal Marsh Streams)  Consider whether vegetated buffer is continuous along stream (parallel). Breaks are areas lacking vegetation > 10 feet wide.  LB RB  A The total length of buffer breaks is < 25 percent.  B B B The total length of buffer breaks is between 25 and 50 percent.  C C The total length of buffer breaks is > 50 percent.
24.	Vegetative Composition – streamside area metric (skip for Tidal Marsh Streams)         Evaluate the dominant vegetation within 100 feet of each bank or to the edge of the watershed (whichever comes first) as it contributes to assessment reach habitat.         LB       RB         ☑A       Vegetation is close to undisturbed in species present and their proportions. Lower strata composed of native species, with non-native invasive species absent or sparse.         □B       B       Vegetation indicates disturbance in terms of species diversity or proportions, but is still largely composed of native species. This may include communities of weedy native species that develop after clear-cutting or clearing or communities with non-native invasive species present, but not dominant, over a large portion of the expected strata or communities missing understory but retaining canopy trees.         □C       □C       Vegetation is severely disturbed in terms of species diversity or proportions. Mature canopy is absent or communities with non-native invasive species dominant over a large portion of expected strata or communities composed of planted stands of non-characteristic species or communities inappropriately composed of a single species or no vegetation.
25.	Conductivity – assessment reach metric (skip for all Coastal Plain streams)  25a.  ☐ Yes ☐ No Was conductivity measurement recorded?  If No, select one of the following reasons. ☐ No Water ☐ Other:  25b. Check the box corresponding to the conductivity measurement (units of microsiemens per centimeter).
Note	□A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230 ′ es/Sketch:

Stream Site Name	CL1 Airport Expansion	Date of Assessment	September 20	19
Stream Category Pb1 Assessor Name/Organization		KMT,BGB/HD	R	
Notes of Field Asses		NO		
Presence of regulator	YES			
Additional stream inf	rements included (Y/N)	NO		
NC SAM feature type	Perennial			

(perennial, intermittent, Tidal Marsh Stream)	Perennia	<u> </u>
Function Class Bating Summany	USACE/	NCDWR
Function Class Rating Summary	All Streams HIGH	Intermittent
(1) Hydrology		
(2) Baseflow	HIGH	
(2) Flood Flow	HIGH	
(3) Streamside Area Attenuation	HIGH	
(4) Floodplain Access	HIGH	
(4) Wooded Riparian Buffer	HIGH	
(4) Microtopography	NA	
(3) Stream Stability	HIGH	
(4) Channel Stability	HIGH	
(4) Sediment Transport	LOW	
(4) Stream Geomorphology	HIGH	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	HIGH	
(2) Baseflow	HIGH	
(2) Streamside Area Vegetation	HIGH	
(3) Upland Pollutant Filtration	HIGH	
(3) Thermoregulation	HIGH	
(2) Indicators of Stressors	NO	
(2) Aquatic Life Tolerance	MEDIUM	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	MEDIUM	
(2) In-stream Habitat	LOW	
(3) Baseflow	HIGH	
(3) Substrate	LOW	
(3) Stream Stability	HIGH	
(3) In-stream Habitat	MEDIUM	
(2) Stream-side Habitat	HIGH	
(3) Stream-side Habitat	HIGH	
(3) Thermoregulation	HIGH	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA NA	
	NA NA	
(3) Tidal Marsh Stream Stability (4) Tidal Marsh Channel Stability	NA NA	
· · · · · · · · · · · · · · · · · · ·		
(4) Tidal Marsh Stream Geomorphology (3) Tidal Marsh In-stream Habitat	NA NA	
	NA NA	
(2) Intertidal Zone		

### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

			Accompanies	User Manual Version 5.0		
U	SACE AID :			NCDWR#		
	Pro	oject Name	e CLT Airport Expansion	Date of Evaluation	April 2019	
Α	pplicant/O	wner Name	CLT	Wetland Site Name	PW1-2 - Wetland 6	
	We	etland Type	Headwater Forest	Assessor Name/Organization	KMT, BGB/HDR	
	Level III	l Ecoregion	Piedmont	Nearest Named Water Body	Ticer Branch	
		River Basii		USGS 8-Digit Catalogue Unit	03050101	
		Count	-	NCDWR Region	Mooresville	
	☐ Ye			Latitude/Longitude (deci-degrees)	35.231203, -80.958653	
-		.5 🔼 14	7 Teophaion within 40 me.	Editidad/Editigitade (addi adgireds)	00.201200, 00.000000	
Is R	Evidence of stressors affecting the assessment area (may not be within the assessment area)  Please circle and/or make note on the last page if evidence of stressors is apparent. Consider departure from reference, if appropriate, in recent past (for instance, within 10 years). Noteworthy stressors include, but are not limited to the following.  • Hydrological modifications (examples: ditches, dams, beaver dams, dikes, berms, ponds, etc.)  • Surface and sub-surface discharges into the wetland (examples: discharges containing obvious pollutants, presence of nearby septic tanks, underground storage tanks (USTs), hog lagoons, etc.)  • Signs of vegetation stress (examples: vegetation mortality, insect damage, disease, storm damage, salt intrusion, etc.)  • Habitat/plant community alteration (examples: mowing, clear-cutting, exotics, etc.)  Is the assessment area intensively managed? ☐ Yes ☐ No  Regulatory Considerations - Were regulatory considerations evaluated? ☐ Yes ☐ No If Yes, check all that apply to the assessment area.  ☐ Anadromous fish  ☐ Federally protected species or State endangered or threatened species  ☐ NCDWR riparian buffer rule in effect  Abuts a Primary Nursery Area (PNA)					
	Des	uts a streai signated N	of Coastal Management Area of Environm n with a NCDWQ classification of SA or so CNHP reference community )-listed stream or a tributary to a 303(d)-lis	upplemental classifications of HQW, ORW,	or Trout	
۱۸/	hat type of	f natural e	tream is associated with the wetland, i	f any? (check all that annly)		
ΙË		ckwater	tream is associated with the wettand, i	any: (Greek an that appry)		
	l Bro	wnwater				
	Tid:		check one of the following boxes)	unar ☐ Wind ☐ Both		
			<b>3</b> , _			
Is	the assess	sment are	a on a coastal island? 🔲 Yes 🛛	No		
le.	the acces	cmont ara	a's surface water storage capacity or d	luration substantially altered by beaver?	☐ Yes ☒ No	
D	pes the ass	sessment	area experience overbank flooding dur	ring normal rainfall conditions? U Yes	⊠ No	
1.	Ground S	Surface Co	ondition/Vegetation Condition – assess	ment area condition metric		
	Check a lassessment area base	box in ead ent area. C	ch column. Consider alteration to the gro	und surface (GS) in the assessment area ar (see User Manual). If a reference is not app		
	$\square A$	⊠B \$	edimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious nce, herbicides, salt intrusion [where approprion)	s pollutants) (vegetation structure	
2.	Surface a	and Sub-S	urface Storage Capacity and Duration	- assessment area condition metric		
	Consider deep is ex	both incre xpected to Sub	ase and decrease in hydrology. A ditch s	acity and duration (Surf) and sub-surface sto ≤ 1 foot deep is considered to affect surface r. Consider tidal flooding regime, if applicab	water only, while a ditch > 1 foot	
	□В	□B \ ⊠C \	Vater storage capacity or duration are sub	ot altered. ered, but not substantially (typically, not suffice ostantially altered (typically, alteration sufficiention, filling, excessive sedimentation, underg	ent to result in vegetation change)	
3.	Water St	orage/Sur	face Relief - assessment area/wetland	type condition metric (skip for all marshe	es)	
			h column. Select the appropriate storage	e for the assessment area (AA) and the wet	and type (WT).	
	AA					
	3a. ⊠A □B □C □D	□B N	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inchest	to pond water 6 inches to 1 foot deep to pond water 3 to 6 inches deep		
	⊠B	Evidence 1	hat maximum depth of inundation is great hat maximum depth of inundation is between	een 1 and 2 feet		

	Make	soil obs	<b>rom each of the three soil property groups below.</b> Dig soil profile in the dominant assessment area landscape feature prvations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regiona
	[	□A □B □C	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon
	4b. [	⊠a □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch
	4c. [	⊠a □B	No peat or muck presence A peat or muck presence
5.	Disch	harge in	Wetland – opportunity metric
		b-surface Sub	n each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples discharges include presence of nearby septic tank, underground storage tank (UST), etc.
	⊠A □B	⊠a ⊟B	Little or no evidence of pollutants or discharges entering the assessment area  Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area
	□c	□C	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)
6.			portunity metric (skip for non-riparian wetlands)
	to ass	sessmen	apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining area within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M) les and within the watershed draining to the assessment area (2M). 2M
	□A □B □C	□A □B □C	<ul> <li>□A ≥ 10% impervious surfaces</li> <li>□B Confined animal operations (or other local, concentrated source of pollutants</li> <li>□C ≥ 20% coverage of pasture</li> </ul>
	□D ⊠E ⊠F	□D ⊠E ⊠F	<ul> <li>□D ≥ 20% coverage of agricultural land (regularly plowed land)</li> <li>□E ≥ 20% coverage of maintained grass/herb</li> <li>□F ≥ 20% coverage of clear-cut land</li> </ul>
	ĞG	ĞĠ	Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturbance in the watershed <u>or</u> hydrologic alterations that prevent drainage <u>and/or</u> overbank flow from affecting the assessment area.
7.	Wetla	and Acti	g as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
	7a.	□Yes	ment area within 50 feet of a tributary or other open water? ⊠No If Yes, continue to 7b. If No, skip to Metric 8. buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetland
	7b.	Record How mu	note if a portion of the buffer has been removed or disturbed.  th of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Make gment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
		□A □B □C	≥ 50 feet From 30 to < 50 feet
		□D □E	From 15 to < 30 feet From 5 to < 15 feet < 5 feet or buffer bypassed by ditches
	7c. 7d.	<u></u> ≤ 15-	width. If the tributary is anastomosed, combine widths of channels/braids for a total width.  eet wide
		☐Yes Is strear	□No or other open water sheltered or exposed?
	Math	□Expo	red – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. ed – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.		arine Wo	n at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and ody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest
			n each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and mplex at the assessment area (WC). See User Manual for WT and WC boundaries.
	$\square A$	□A	≥ 100 feet
	□B	□B	From 80 to < 100 feet
	⊠C □D	⊠c □D	From 50 to < 80 feet From 40 to < 50 feet
	□E	ΞĒ	From 30 to < 40 feet
	□F	□F	From 15 to < 30 feet
	□G	□G	From 5 to < 15 feet

4. Soil Texture/Structure – assessment area condition metric (skip for all marshes)

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)				
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)				
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)				
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.				
11.	Wetland Size – wetland type/wetland complex condition metric				
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  F F F From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G G From 1 to < 5 acres  MH MH MH From 0.5 to < 1 acre  I I I From 0.1 to < 0.5 acre				
	□K □K < 0.01 acre or assessment area is clear-cut				
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)				
	<ul><li>□A Pocosin is the full extent (≥ 90%) of its natural landscape size.</li><li>□B Pocosin type is &lt; 90% of the full extent of its natural landscape size.</li></ul>				
13.	Connectivity to Other Natural Areas – landscape condition metric				
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C From 50 to < 100 acres D D From 10 to < 50 acres E E < 10 acres F Wetland type has a poor or no connection to other natural habitats				
	13b. Evaluate for marshes only.				
	Yes No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.				
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)				
	May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8				
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)				
	<ul> <li>□A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>□B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>□C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>				
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)				
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>				

17.	Vegetative Structure – assessment area/wetland type condition metric  17a. Is vegetation present?				
	17a.	_	INo □No	If Yes, continue to 17b. If No, skip to Metric 18.	
	17b.	Evaluat □A □B	≥ 25% c	t coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. coverage of vegetation coverage of vegetation	
		structur		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consace above the assessment area (AA) and the wetland type (WT) separately.	idei
	Canopy	AA □A □B ⊠C	WT ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A □B ⊠C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	Shrub	□A □B ⊠C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	Herb	□A □B ⊠C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	s – wetla	and type	condition metric (skip for all marshes)	
	□a ⊠B	Larg Not <i>i</i>		more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.	Diam	eter Clas	ss Distrik	oution – wetland type condition metric (skip for all marshes)	
	□A	-	-	nopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	□в ⊠с		rity of car	nopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. nopy trees are < 6 inches DBH or no trees.	
20.	Large	Woody	Debris -	wetland type condition metric (skip for all marshes)	
	Includ □A ⊠B		e logs (m	oris and man-placed natural debris. ore than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	Veget	tation/O	pen Wate	er Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only	)
				est describes the amount of interspersion between vegetation and open water in the growing season. Patter d areas, while solid white areas indicate open water.   □B □C □D	rnec
	(	0	3		
22.	-	_		ity – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	
		nade bei Over Over Over	rms, beave bank <u>and</u> bank flow land flow	nat may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversiver dams, and stream incision. Documentation required if evaluated as B, C, or D. I overland flow are not severely altered in the assessment area. It is and overland flow are severely altered in the assessment area.	sion,

Notes

wetland created by road construction and culvert downstream. Canopy trees dead.

## NC WAM Wetland Rating Sheet Accompanies User Manual Version 5.0

_	PW1-2 - Wetland 6	Date of Assessment April 2						
Wetland Type _	Headwater Forest A	ssessor Name/Organization KMT,	BGB/HDR					
Notes on Field Assess	ment Form (Y/N)		YES					
Presence of regulatory	considerations (Y/N)		YES					
Wetland is intensively	etland is intensively managed (Y/N)							
Assessment area is located within 50 feet of a natural tributary or other open water (Y/N)								
Assessment area is su	Assessment area is substantially altered by beaver (Y/N)							
Assessment area experiences overbank flooding during normal rainfall conditions (Y/N)								
Assessment area is or	n a coastal island (Y/N)		NO					
Sub-function Rating S	ummary							
Function	Sub-function	Metrics	Rating					
Hydrology	Surface Storage and Retention Sub-surface Storage and	Condition	LOW					
	Retention	Condition	LOW					
Water Quality	Pathogen Change	Condition	LOW					
		Condition/Opportunity	LOW					
		Opportunity Presence (Y/N)	NO					
	Particulate Change	Condition	LOW					
		Condition/Opportunity	NA					
		Opportunity Presence (Y/N)	NA					
	Soluble Change	Condition	MEDIUM					
		Condition/Opportunity	MEDIUM					
		Opportunity Presence (Y/N)	NO					
	Physical Change	Condition	LOW					
		Condition/Opportunity	LOW					
		Opportunity Presence (Y/N)	YES					
	Pollution Change	Condition	NA					
		Condition/Opportunity	NA					
		Opportunity Presence (Y/N)	NA					
Habitat	Physical Structure	Condition	LOW					
	Landscape Patch Structure	Condition	LOW					
	Vegetation Composition	Condition	MEDIUM					
Function Rating Sumn	narv							
Function		Metrics	Rating					
Hydrology		Condition	LOW					
Water Quality		Condition	LOW					
		Condition/Opportunity	LOW					
		Opportunity Presence (Y/N)	YES					
Habitat		Condition	LOW					

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID :	#	Accompanies	NCDWR#	-
03		<del>"</del> oject Nam	e _CLT Airport Expansion	Date of Evaluation	September 2019
٨	۱۲ pplicant/O			Wetland Site Name	PW2-2 - Wetland 7
^		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		, ,		Nearest Named Water Body	
		l Ecoregio River Basi		USGS 8-Digit Catalogue Unit	Ticer Branch 03050101
	ı				
	□ V <sub>2</sub>	Count		NCDWR Region	Mooresville 35.219133, -80.955870
	∐ Ye	s 🛛 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.219133, -80.933870
Is Re	ease circle cent past (f	and/or more instance of instance and seeks, undergons of vege obtat/plant sment are adromous derally pro DWR ripa ats a Primolicly owners.	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, be sub-surface discharges into the wetland (examples tround storage tanks (USTs), hog lagoons, station stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed? Yes Attions - Were regulatory considerations evaluations - Were regulatory considerations evaluations are required to the tected species or State endangered or thre rian buffer rule in effect ary Nursery Area (PNA) and property	tressors is apparent. Consider departure f nclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the atened species	utants, presence of nearby septic , salt intrusion, etc.)
	Abu Des Abu	its a strea signated N its a 303(o	of Coastal Management Area of Environment with a NCDWQ classification of SA or sul CNHP reference community d)-listed stream or a tributary to a 303(d)-listeram is associated with the wetland, if	upplemental classifications of HQW, ORW, of ted stream	or Trout
	Blad Bro Tida	ckwater wnwater al (if tidal,	check one of the following boxes)    ca on a coastal island?    Yes    N	unar □ Wind □ Both	
			ea's surface water storage capacity or do area experience overbank flooding duri	uration substantially altered by beaver? ing normal rainfall conditions?   Yes	☐ Yes
			ondition/Vegetation Condition – assessi		
1.	Check a lassessment area base GS	box in ea ent area. ed on evid VS	ch column. Consider alteration to the grou	und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
	⊠A □B	⊠в	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure
2.	Surface a	and Sub-S	Surface Storage Capacity and Duration -	- assessment area condition metric	
	Consider deep is ex Surf	both incre cpected to Sub ⊠A □B	ease and decrease in hydrology. A ditch see affect both surface and sub-surface water. Water storage capacity and duration are now water storage capacity or duration are alternation.	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicable at altered. red, but not substantially (typically, not suffice stantially altered (typically, alteration sufficie	water only, while a ditch > 1 foot le.  cient to change vegetation).
•			(examples: draining, flooding, soil compacti	ion, filling, excessive sedimentation, underg	round utility lines).
3.		_		type condition metric (skip for all marshe	·
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	□c □p	□A □B □C ⊠D	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	o pond water 6 inches to 1 foot deep o pond water 3 to 6 inches deep deep	
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less tl	een 1 and 2 feet	

4.			ssessment area condition metric (skip for all marshes)  f the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature.
		servations with	nin the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regiona
	indicators.  4a. □A □B □C □D □D	Loamy or cla	yey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) yey soils not exhibiting redoximorphic features yey gleyed soil
	4b. ⊠A □B	Soil ribbon < Soil ribbon ≥	1 inch
	4c. ⊠A	No peat or m	uck presence
_	B	A peat or mu	
5.	Check a box	i <b>n each colur</b> e discharges ir	opportunity metric nn. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples nclude presence of nearby septic tank, underground storage tank (UST), etc.
	⊠A ⊠A □B □E	Little or i Noticeat	no evidence of pollutants or discharges entering the assessment area ble evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the at capacity of the assessment area
	□c □(	potential	ble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and ly overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive tation, odor)
6.	Land Use -	opportunity m	etric (skip for non-riparian wetlands)
	to assessme and within 2 WS 5M	nt area within e miles and withi 2M	ast one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M), in the watershed draining to the assessment area (2M).
	□A □ <i>A</i>		> 10% impervious surfaces
		C □C	Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
			≥ 20% coverage of agricultural land (regularly plowed land) ≥ 20% coverage of maintained grass/herb
	⊠F ⊠F		≥ 20% coverage of clear-cut land
	□G □(	G □G	Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturbance in the watershed <u>or</u> hydrologic alterations that prevent drainage <u>and/or</u> overbank flow from affecting the assessment area.
7.	Wetland Act	ing as Vegeta	ted Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
	7a. Is asse		rithin 50 feet of a tributary or other open water? Yes, continue to 7b. If No, skip to Metric 8.
	Wetlan	d buffer need	only be present on one side of the water body. Make buffer judgment based on the average width of wetland
			tion of the buffer has been removed or disturbed. 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Make
	buffer j	udgment base	d on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	□A □B	≥ 50 feet From 30 to •	< 50 feet
	□c	From 15 to	< 30 feet
	□D □E	From 5 to < < 5 feet or b	15 feet uffer bypassed by ditches
	7c. <u>Tri</u> buta	ry width. If the	tributary is anastomosed, combine widths of channels/braids for a total width.
	7d. Do roo	ts o <u>f</u> assessme	]> 15-feet wide ☐ Other open water (no tributary present) ent area vegetation extend into the bank of the tributary/open water?
	☐Yes 7e. Is strea	□No am or other ope	en water sheltered or exposed?
			nt open water with width < 2500 feet <u>and</u> no regular boat traffic. t open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.	Estuarine W		essment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and d only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest
	only) Check a box	in each colur	nn for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and
	the wetland of	complex at the	assessment area (WC). See User Manual for WT and WC boundaries.
	WT WC		et
		3 From 80	to < 100 feet
			to < 80 feet to < 50 feet
		From 30	to < 40 feet
			to < 30 feet o < 15 feet
		. E foot	

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A A S 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  E E From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G From 1 to < 5 acres  H A H A From 0.5 to < 1 acre  I I From 0.1 to < 0.5 acre  J J J J From 0.01 to < 0.1 acre  K < 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
12	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C From 50 to < 100 acres D D From 10 to < 50 acres E SF Wetland type has a poor or no connection to other natural habitats
	13b. <b>Evaluate for marshes only</b> .  ☐Yes ☐No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>□A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>□B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>□C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vegetative Structure – assessment area/wetland type condition metric
	17a. Is vegetation present?  ☐ Yes ☐ No If Yes, continue to 17b. If No, skip to Metric 18.
	17b. Evaluate percent coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands.  □A ≥ 25% coverage of vegetation □B < 25% coverage of vegetation
	17c. Check a box in each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider structure in airspace above the assessment area (AA) and the wetland type (WT) separately. AA WT
	☐ ☐ A ☐ Canopy closed, or nearly closed, with natural gaps associated with natural processes ☐ ☐ B ☐ Canopy present, but opened more than natural gaps ☐ ☐ Canopy sparse or absent
	☐ A ☐ Dense mid-story/sapling layer ☐ ☐ ☐ Moderate density mid-story/sapling layer ☐ ☐ ☐ ☐ Mid-story/sapling layer sparse or absent
	☐ ☐ ☐ ☐ ☐ Dense shrub layer ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
	후 □A □A Dense herb layer 후 図B □B Moderate density herb layer □C 図C Herb layer sparse or absent
18.	Snags – wetland type condition metric (skip for all marshes)
	<ul><li>□A Large snags (more than one) are visible (&gt; 12 inches DBH, or large relative to species present and landscape stability).</li><li>□B Not A</li></ul>
19.	Diameter Class Distribution – wetland type condition metric (skip for all marshes)
	<ul> <li>Majority of canopy trees have stems &gt; 6 inches in diameter at breast height (DBH); many large trees (&gt; 12 inches DBH) are present.</li> </ul>
	<ul> <li>☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are &gt; 12 inch DBH.</li> <li>☐C Majority of canopy trees are &lt; 6 inches DBH or no trees.</li> </ul>
20.	Large Woody Debris – wetland type condition metric (skip for all marshes)
	Include both natural debris and man-placed natural debris.  ☐A Large logs (more than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).  ☐B Not A
21.	Vegetation/Open Water Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)
	Select the figure that best describes the amount of interspersion between vegetation and open water in the growing season. Patterned areas indicate vegetated areas, while solid white areas indicate open water.
	A DB DC DD
22.	Hydrologic Connectivity – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)
	Examples of activities that may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversion, man-made berms, beaver dams, and stream incision. Documentation required if evaluated as B, C, or D.
	<ul> <li>☑A Overbank and overland flow are not severely altered in the assessment area.</li> <li>☐B Overbank flow is severely altered in the assessment area.</li> </ul>
	Overland flow is severely altered in the assessment area.
	D Both overbank <u>and</u> overland flow are severely altered in the assessment area.

Notes

wetland located in topographic crenulation in an airfield - canpy is intensely managed to do FAA regulations

## NC WAM Wetland Rating Sheet Accompanies User Manual Version 5.0

Wetland Site Name P		Date of Assessment Septe				
Wetland Type H	eadwater Forest	Assessor Name/Organization KMT,	BGB/HDR			
Notes on Field Assessm	ent Form (Y/N)		YES			
Presence of regulatory of	considerations (Y/N)		YES			
Wetland is intensively m	anaged (Y/N)		NO			
Assessment area is loca	ted within 50 feet of a natural tributa	ry or other open water (Y/N)	NO			
Assessment area is sub	stantially altered by beaver (Y/N)		NO			
Assessment area experiences overbank flooding during normal rainfall conditions (Y/N)						
Assessment area is on a	a coastal island (Y/N)		NO			
Sub-function Rating Sur	nmarv					
Function	Sub-function	Metrics	Rating			
Hydrology	Surface Storage and Retention Sub-surface Storage and	Condition	LOW			
	Retention	Condition	HIGH			
Water Quality	Pathogen Change	Condition	LOW			
		Condition/Opportunity	LOW			
		Opportunity Presence (Y/N)	NO			
	Particulate Change	Condition	HIGH			
		Condition/Opportunity	NA			
		Opportunity Presence (Y/N)	NA			
	Soluble Change	Condition	MEDIUM			
		Condition/Opportunity	MEDIUM			
		Opportunity Presence (Y/N)	NO			
	Physical Change	Condition	LOW			
		Condition/Opportunity	LOW			
		Opportunity Presence (Y/N)	YES			
	Pollution Change	Condition	NA			
		Condition/Opportunity	NA			
		Opportunity Presence (Y/N)	NA			
Habitat	Physical Structure	Condition	LOW			
	Landscape Patch Structure	Condition	LOW			
	Vegetation Composition	Condition	LOW			
unction Rating Summa	ırv					
Function	•	Metrics	Rating			
Hydrology		Condition	MEDIUM			
Water Quality		Condition	LOW			
•		Condition/Opportunity	LOW			
		Opportunity Presence (Y/N)	YES			
Habitat		Condition	LOW			

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID :	#	Accompanies	NCDWR#	-
08			o CLT Airport Expansion	Date of Evaluation	Sontombor 2010
^		oject Nam			September 2019
A	pplicant/O			Wetland Site Name	PW3-2 - Wetland 8
		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		Ecoregio		Nearest Named Water Body	Ticer Branch
		River Basi		USGS 8-Digit Catalogue Unit	03050101
	Пν.	Count		NCDWR Region	Mooresville
-	∐ Ye	s 🛛 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.216431, -80.955398
Is Re	ease circle cent past (f	and/or more instance of instance and seeks, undergons of vege obtat/plant sment are adromous derally pro DWR ripa ats a Primolicly owners.	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, be sub-surface discharges into the wetland (examples tround storage tanks (USTs), hog lagoons, station stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed? Yes Attions - Were regulatory considerations evaluations - Were regulatory considerations evaluations are required to the tected species or State endangered or thre rian buffer rule in effect ary Nursery Area (PNA) and property	tressors is apparent. Consider departure f nclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the atened species	utants, presence of nearby septic , salt intrusion, etc.)
	Abu Des Abu	its a strea signated N its a 303(o	of Coastal Management Area of Environment with a NCDWQ classification of SA or sul CNHP reference community d)-listed stream or a tributary to a 303(d)-listeram is associated with the wetland, if	upplemental classifications of HQW, ORW, of ted stream	or Trout
□ □ Is	Bro Tida		check one of the following boxes)		
			ea's surface water storage capacity or di		☐ Yes   ☑ No
DC	es the as	sessmen	area experience overbank flooding duri	ing normal rainfall conditions?   Yes	⊠ No
1.	Check a lassessment area base GS	box in ea ent area. ed on evid VS		ment area condition metric und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
	⊠A □B	⊠в	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure
2.	Surface a	and Sub-S	Surface Storage Capacity and Duration -	- assessment area condition metric	
	Consider deep is ex Surf	both incre cpected to Sub ⊠A □B □C	ease and decrease in hydrology. A ditch saffect both surface and sub-surface water.  Water storage capacity and duration are now water storage capacity or duration are alter. Water storage capacity or duration are subsequently.	red, but not substantially (typically, not suffice stantially altered (typically, alteration sufficients)	water only, while a ditch > 1 foot le.  cient to change vegetation).  ent to result in vegetation change)
				ion, filling, excessive sedimentation, underg	
3.	Water St	orage/Su	face Relief – assessment area/wetland t	ype condition metric (skip for all marshe	es)
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	AA 3a. □A ⊠B □C	□A □B	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to	pond water 6 inches to 1 foot deep	
	□Ď		Depressions able to pond water < 3 inches		
	3b.	Evidence Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less th	er than 2 feet een 1 and 2 feet	

4.			ssessment area condition metric (skip for all marshes)  f the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature.
		servations with	nin the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regiona
	indicators.  4a. □A  □B □C □D □D	Loamy or cla	yey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) yey soils not exhibiting redoximorphic features yey gleyed soil
	4b. ⊠A □B	Soil ribbon < Soil ribbon ≥	1 inch
	4c. ⊠A	No peat or m	uck presence
_	B	A peat or mu	
5.	Check a box	i <b>n each colur</b> e discharges ir	opportunity metric nn. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples nclude presence of nearby septic tank, underground storage tank (UST), etc.
	⊠A ⊠A □B □E	Little or i Noticeat	no evidence of pollutants or discharges entering the assessment area ble evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the at capacity of the assessment area
	□c □c	potential	ble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and ly overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive tation, odor)
6.	Land Use -	opportunity m	etric (skip for non-riparian wetlands)
	to assessment and within 2 I WS 5M	nt area within e miles and withi 2M	ast one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M), in the watershed draining to the assessment area (2M).
	□A □ <i>A</i> □B □E		> 10% impervious surfaces
		C □C	Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
			≥ 20% coverage of agricultural land (regularly plowed land) ≥ 20% coverage of maintained grass/herb
	⊠F ⊠F		≥ 20% coverage of clear-cut land
	_G _(	G □G	Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturbance in the watershed <u>or</u> hydrologic alterations that prevent drainage <u>and/or</u> overbank flow from affecting the assessment area.
7.	Wetland Act	ing as Vegeta	ted Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
	7a. Is asse ☐Yes		rithin 50 feet of a tributary or other open water? Yes, continue to 7b. If No, skip to Metric 8.
	Wetlan	d buffer need	only be present on one side of the water body. Make buffer judgment based on the average width of wetland
			tion of the buffer has been removed or disturbed. 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Make
	buffer j	udgment base	d on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	□A □B	≥ 50 feet From 30 to •	< 50 feet
	□c	From 15 to	< 30 feet
	□D □E	From 5 to < < 5 feet or b	15 feet uffer bypassed by ditches
	7c. <u>Tri</u> buta	ry width. If the	tributary is anastomosed, combine widths of channels/braids for a total width.
	7d. Do roo	ts o <u>f</u> assessme	]> 15-feet wide ☐ Other open water (no tributary present) ent area vegetation extend into the bank of the tributary/open water?
	☐Yes 7e. Is strea	□No am or other ope	en water sheltered or exposed?
			nt open water with width < 2500 feet <u>and</u> no regular boat traffic. t open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.	Estuarine W		essment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and d only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest
	only) Check a box	in each colur	nn for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and
	the wetland of	complex at the	assessment area (WC). See User Manual for WT and WC boundaries.
	WT WC		et
		3 From 80	to < 100 feet
			to < 80 feet to < 50 feet
		From 30	to < 40 feet
			to < 30 feet o < 15 feet
		. E foot	

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column. WT WC FW (if applicable) $\square$ A $\square$ A $\supseteq$ 500 acres $\square$ B $\square$ B $\square$ B From 100 to < 500 acres $\square$ C $\square$ C $\square$ C From 50 to < 100 acres $\square$ D $\square$ D $\square$ D $\square$ D From 25 to < 50 acres $\square$ E $\square$ E $\square$ E From 10 to < 25 acres $\square$ F $\square$ F $\square$ F From 5 to < 10 acres $\square$ G $\square$ G $\square$ G From 1 to < 5 acres $\square$ H $\square$ H $\square$ H From 0.5 to < 1 acre $\square$ I $\square$ I $\square$ I From 0.1 to < 0.5 acre $\square$ J $\square$ J $\square$ J $\square$ J $\square$ J From 0.01 to < 0.1 acre $\square$ K $\square$ K $\square$ K $\square$ K $\square$ C 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
12	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C From 50 to < 100 acres D D From 10 to < 50 acres E SF Wetland type has a poor or no connection to other natural habitats
	13b. <b>Evaluate for marshes only</b> .  ☐Yes ☐No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>□A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>□B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>□C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vegetative Structure – assessment area/wetland type condition metric							
	17a. Is vegetation present?  ☐ Yes ☐ No If Yes, continue to 17b. If No, skip to Metric 18.							
	17b. Evaluate percent coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands.  □A ≥ 25% coverage of vegetation □B < 25% coverage of vegetation							
	17c. Check a box in each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider structure in airspace above the assessment area (AA) and the wetland type (WT) separately. AA WT							
	© □ A □ Canopy closed, or nearly closed, with natural gaps associated with natural processes □ B □ B □ Canopy present, but opened more than natural gaps □ Canopy sparse or absent							
	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐							
	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐							
	p ☐A ☐A Dense herb layer p ☑B ☐B Moderate density herb layer ☐C ☑C Herb layer sparse or absent							
18.	Snags – wetland type condition metric (skip for all marshes)							
	<ul><li>□A Large snags (more than one) are visible (&gt; 12 inches DBH, or large relative to species present and landscape stability).</li><li>□B Not A</li></ul>							
19.	Diameter Class Distribution – wetland type condition metric (skip for all marshes)							
	Majority of canopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are present.							
	<ul> <li>☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are &gt; 12 inch DBH.</li> <li>☐C Majority of canopy trees are &lt; 6 inches DBH or no trees.</li> </ul>							
20.	Large Woody Debris – wetland type condition metric (skip for all marshes)							
	Include both natural debris and man-placed natural debris.  ☐A Large logs (more than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).  ☐ Not A							
21.	Vegetation/Open Water Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)							
	Select the figure that best describes the amount of interspersion between vegetation and open water in the growing season. Patterned areas indicate vegetated areas, while solid white areas indicate open water.							
	A DB DC DD							
22.	Hydrologic Connectivity – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)  Examples of activities that may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversion,							
	man-made berms, beaver dams, and stream incision. Documentation required if evaluated as B, C, or D.							
	<ul> <li>Overbank <u>and</u> overland flow are not severely altered in the assessment area.</li> <li>Overbank flow is severely altered in the assessment area.</li> </ul>							
	<ul> <li>□C Overland flow is severely altered in the assessment area.</li> <li>□D Both overbank and overland flow are severely altered in the assessment area.</li> </ul>							
	== === ==== ==========================							

Notes

wetland located in topographic crenulation in an airfield - canopy is intensely managed to do FAA regulations

## NC WAM Wetland Rating Sheet Accompanies User Manual Version 5.0

Wetland Site Name P		Date of Assessment Sept								
Wetland Type _H	leadwater Forest A	ssessor Name/Organization KMT	, bGb/nDR							
Notes on Field Assessm	nent Form (Y/N)		YES							
Presence of regulatory	considerations (Y/N)		YES							
Wetland is intensively m	Vetland is intensively managed (Y/N)									
Assessment area is located within 50 feet of a natural tributary or other open water (Y/N) Assessment area is substantially altered by beaver (Y/N) Assessment area experiences overbank flooding during normal rainfall conditions (Y/N) Assessment area is on a coastal island (Y/N)										
							sub-function Rating Su	mmary		
							Function	Sub-function	Metrics	Rating
							Hydrology	Surface Storage and Retention Sub-surface Storage and	Condition	LOW
	Retention	Condition	HIGH							
Water Quality	Pathogen Change	Condition	LOW							
		Condition/Opportunity	LOW							
		Opportunity Presence (Y/N)	NO							
	Particulate Change	Condition	HIGH							
		Condition/Opportunity	NA							
		Opportunity Presence (Y/N)	NA							
	Soluble Change	Condition	MEDIUM							
		Condition/Opportunity	MEDIUM							
		Opportunity Presence (Y/N)	NO							
	Physical Change	Condition	LOW							
		Condition/Opportunity	LOW							
		Opportunity Presence (Y/N)	YES							
	Pollution Change	Condition	NA							
		Condition/Opportunity	NA							
		Opportunity Presence (Y/N)	NA							
Habitat	Physical Structure	Condition	LOW							
	Landscape Patch Structure	Condition	LOW							
	Vegetation Composition	Condition	LOW							
unction Rating Summa	arv									
Function	<u>y</u>	Metrics	Rating							
Hydrology		Condition	MEDIUM							
Water Quality		Condition	LOW							
		Condition/Opportunity	LOW							
		Opportunity Presence (Y/N)	YES							
Habitat		Condition	LOW							

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	USACE AID # NCDWR#						
100		<del>#</del> oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019		
Δ	۲۱۰ pplicant/O۱			Wetland Site Name	PW4-2 - Wetland 14		
'		etland Typ		Assessor Name/Organization	KMT, BGB/HDR		
		l Ecoregio		Nearest Named Water Body	Coffey Creek		
		River Basi		USGS 8-Digit Catalogue Unit	03050103		
	•	Count		NCDWR Region	Mooresville		
	☐ Ye			Latitude/Longitude (deci-degrees)	35.214516, -80.940643		
E.,	idonoo of	otropoor,	affecting the acceptament area (may no	t he within the acceptment area)			
Is Re	ease circle cent past (f	and/or moder instance of the consideration of the c	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, be sub-surface discharges into the wetland (examples tround storage tanks (USTs), hog lagoons, station stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed? Yes Attions - Were regulatory considerations evaluations - Were regulatory considerations evaluations are required to the tected species or State endangered or thre rian buffer rule in effect ary Nursery Area (PNA) and property	tressors is apparent. Consider departure f nclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the atened species	utants, presence of nearby septic		
	N.C Abu Des Abu	C. Division ats a streasignated Nate a 303(c)	of Coastal Management Area of Environment of SA or sum with a NCDWQ classification of SA or sum CNHP reference community of the stream or a tributary to a 303(d)-listed stream or a tributary tributary to a 303(d)-listed stream or a tributary	upplemental classifications of HQW, ORW, of ted stream	or Trout		
	Blad Bro Tida	ckwater wnwater al (if tidal,	check one of the following boxes)	unar □ Wind □ Both			
			ea's surface water storage capacity or di		☐ Yes      No		
Do	es the as	sessment	area experience overbank flooding duri	ing normal rainfall conditions?   Yes	⊠ No		
1.	Check a lassessme area base	box in ea ent area.		ment area condition metric und surface (GS) in the assessment area ar (see User Manual). If a reference is not app			
	$\square$ A	∏A ⊠B	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure		
2.	Surface a	and Sub-	Surface Storage Capacity and Duration -	- assessment area condition metric			
	Consider deep is ex Surf	both incre xpected to Sub ⊠A □B	ease and decrease in hydrology. A ditch see affect both surface and sub-surface water. Water storage capacity and duration are now water storage capacity or duration are alternation.	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicable at altered. red, but not substantially (typically, not suffice stantially altered (typically, alteration sufficie	water only, while a ditch > 1 foot le.  cient to change vegetation).		
•			(examples: draining, flooding, soil compacti	ion, filling, excessive sedimentation, underg	round utility lines).		
3.		_		type condition metric (skip for all marshe	·		
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (W □).		
	AA 3a. □A □B □C □D	□A □B □C ⊠D	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	o pond water 6 inches to 1 foot deep o pond water 3 to 6 inches deep deep			
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less tl	een 1 and 2 feet			

	Make so	oil obse		<b>the three soil property groups below.</b> Dig soil profile in the dominant assessment area landscape feature. In the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regional
	indicator 4a. □ A □ C □ C □ C	A S B L C L D L	oamy or clay	ey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) ey soils not exhibiting redoximorphic features ey gleyed soil tic epipedon
	4b. ⊠ <i>A</i>		soil ribbon < 1 soil ribbon ≥ 1	
	4c. ⊠ <i>F</i>	A N 3 A	lo peat or mu	
5.	Dischar	ge into	Wetland - o	pportunity metric
	of sub-s Surf	urface o		<ul> <li>n. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples clude presence of nearby septic tank, underground storage tank (UST), etc.</li> </ul>
	⊠A □B	⊠A □B	Noticeable	o evidence of pollutants or discharges entering the assessment area e evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the capacity of the assessment area
	С	□с	potentially	e evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and of overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive ation, odor)
6.	Land Us	se – op	portunity me	etric (skip for non-riparian wetlands)
	to asses	sment	area within er	st one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining tire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M), the watershed draining to the assessment area (2M).
	□A □B □C	□A □B □C	□В	≥ 10% impervious surfaces Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
	□D ⊠E ⊠F	□D ⊠E ⊠F	□D ⊠E	≥ 20% coverage of agricultural land (regularly plowed land) ≥ 20% coverage of maintained grass/herb ≥ 20% coverage of clear-cut land
	Ğ	ĞG	□G	Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturbance in the watershed <u>or</u> hydrologic alterations that prevent drainage <u>and/or</u> overbank flow from affecting the assessment area.
7.	Wetland	d Acting	g as Vegetate	ed Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
	$\boxtimes$	Yes	□No If Y	thin 50 feet of a tributary or other open water? es, continue to 7b. If No, skip to Metric 8. nly be present on one side of the water body. Make buffer judgment based on the average width of wetland.
	7b. Ho	ecord a	note if a porti h of the first 5	on of the buffer has been removed or disturbed.  The following the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Make on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
		]A ]B	≥ 50 feet From 30 to < From 15 to <	50 feet
	_	D	From 5 to < 1	
	7c. Tr	ibutary	width. If the t	ributary is anastomosed, combine widths of channels/braids for a total width.  > 15-feet wide
	$\boxtimes$	Yes	□No	nt area vegetation extend into the bank of the tributary/open water?
	$\boxtimes$	Shelter	ed – adjacen	n water sheltered or exposed? t open water with width < 2500 feet <u>and</u> no regular boat traffic. open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.	Estuarii			ssment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest
	the wetla	and con		<b>n for riverine wetlands only</b> . Select the average width for the wetland type at the assessment area (WT) and ssessment area (WC). See User Manual for WT and WC boundaries.
	WT □A	WC □A	≥ 100 fee	et
	□в	□В		o < 100 feet
				0 < 80 feet
	□D □E	□D □E		o < 50 feet o < 40 feet
	⊠F	⊠F		o < 30 feet
	□G □H	Ğ		< 15 feet

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)				
	Answer for assessment area dominant landform.  A Evidence of short-duration inundation (< 7 consecutive days)  B Evidence of saturation, without evidence of inundation  C Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)				
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)				
	Consider recent deposition only (no plant growth since deposition).  □ Sediment deposition is not excessive, but at approximately natural levels.  □ Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.				
11.	Wetland Size – wetland type/wetland complex condition metric				
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A A Soo acres B B B From 100 to < 500 acres C C C From 50 to < 100 acres D D D From 25 to < 50 acres E E From 10 to < 25 acres F F From 5 to < 10 acres G G G From 1 to < 5 acres H H H From 0.5 to < 1 acre I From 0.1 to < 0.5 acre J D J From 0.01 to < 0.1 acre K K K K K C N.01 acre or assessment area is clear-cut				
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)				
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.				
12	Connectivity to Other Natural Areas – landscape condition metric				
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C From 50 to < 100 acres D D From 10 to < 50 acres E S Wetland type has a poor or no connection to other natural habitats				
	13b. Evaluate for marshes only.  ☐Yes ☐No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.				
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8				
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)				
	<ul> <li>□A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>□B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>□C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>				
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)				
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>				

17.	_		- assessment area/wetland typ	e condition metric		
	17a. Is vege ⊠Yes		sent?  If Yes, continue to 17b. If No,	skip to Metric 18.		
	17b. Evalua □A □B	≥ 25%	nt coverage of assessment area coverage of vegetation coverage of vegetation	vegetation for all marshes o	nly. Skip to 17c for non-marsh wetland	S.
	structi		n each column for each strat pace above the assessment are		the metric <b>for non-marsh wetlands</b> . (WT) separately.	Conside
	Canopy □⊠ B O∏	WT ⊠A □B □C	Canopy closed, or nearly close Canopy present, but opened m Canopy sparse or absent	d, with natural gaps associated ore than natural gaps	with natural processes	
	Mid-Story ⊠ B D	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sap Mid-story/sapling layer sparse			
	Shrub □ B P	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent			
	e □A B ⊠C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent			
18.	Snags - we	tland type	condition metric (skip for all n	narshes)		
		rge snags t A	(more than one) are visible (> 12	inches DBH, or large relative to	species present and landscape stability).	
19.			bution – wetland type condition			
		ijority of ca esent.	anopy trees have stems > 6 inche	s in diameter at breast height (D	BH); many large trees (> 12 inches DBH)	are
			anopy trees have stems between on anopy trees are < 6 inches DBH o		12 inch DBH.	
20.	Large Wood	dy Debris	<ul> <li>wetland type condition metric</li> </ul>	(skip for all marshes)		
		rge logs (m	ebris and man-placed natural debr nore than one) are visible (> 12 in		ve to species present and landscape stabili	ity).
21.	_	-		· · · · · · · · · · · · · · · · · · ·	valuate for Non-Tidal Freshwater Marsh	
			pest describes the amount of inte ed areas, while solid white areas i		and open water in the growing season. F	<sup>2</sup> atterned
	6			C		
22.			-		wetlands and Salt/Brackish Marsh only	
			that may severely alter hydrologic ver dams, and stream incision. D		tching, fill, sedimentation, channelization, or ted as B, C, or D.	diversion,
	⊠A Ov	erbank <u>an</u>	d overland flow are not severely a	altered in the assessment area.		
	□C Ov		w is severely altered in the asses v is severely altered in the assess			
			k and overland flow are severely			

wetland located in topographic crenulation in an airfield - canopy is intensely managed to do FAA regulations; evidence of regulary mowing and maintenance

Wetland Site Name P		Date of Assessment April 2	
Wetland Type He	eadwater Forest	Assessor Name/Organization KMT,	BGB/HDR
Notes on Field Assessm	ent Form (Y/N)		YES
Presence of regulatory of	considerations (Y/N)		YES
Wetland is intensively m	anaged (Y/N)		NO
Assessment area is loca	ted within 50 feet of a natural tributa	ry or other open water (Y/N)	YES
Assessment area is subs	stantially altered by beaver (Y/N)		NO
Assessment area experi	ences overbank flooding during norn	nal rainfall conditions (Y/N)	NO
Assessment area is on a	a coastal island (Y/N)		NO
Sub-function Rating Sur	mmarv		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	LOW
	Sub-surface Storage and	Condition	шеп
Water Quality	Retention Pathogen Change	Condition Condition	HIGH LOW
vvalei Quality	r autogen Change	Condition/Opportunity	LOW
		Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	LOW
	r articulate Griange	Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA NA
	Soluble Change	Condition	MEDIUM
	Colubio Change	Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	HIGH
	Ç	Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	YES
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	LOW
	Vegetation Composition	Condition	LOW
unction Rating Summa	ırv		
Function	•	Metrics	Rating
Hydrology		Condition	MEDIUM
Water Quality		Condition	LOW
•		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	YES
Habitat		Condition	LOW

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	USACE AID # NCDWR#						
03		<del>#</del> oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019		
Δ	۳۱۰ pplicant/O			Wetland Site Name	PW5-2 - Wetland 16		
^`		etland Typ		Assessor Name/Organization	KMT, BGB/HDR		
		l Ecoregio		Nearest Named Water Body	Coffey Creek		
		River Basi		USGS 8-Digit Catalogue Unit	03050103		
	•	Count		NCDWR Region	Mooresville		
	☐ Ye			Latitude/Longitude (deci-degrees)	35.204049, -80.954101		
	idonoo of	-1	official the concernant area (may no	t he within the acceptment area)			
Is Re	ease circle cent past (f	and/or moder instance of the consideration of the c	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, but be sub-surface discharges into the wetland (expround storage tanks (USTs), hog lagoons, station stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed? Yes Attions - Were regulatory considerations evaluations where the state of the stat	tressors is apparent. Consider departure f nclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the atened species	utants, presence of nearby septic		
	N.C Abu Des Abu	C. Division ats a streasignated Nate a 303(c)	of Coastal Management Area of Environment with a NCDWQ classification of SA or such the CNHP reference community d)-listed stream or a tributary to a 303(d)-listed stream or a tributary tributary to a 303(d)-listed stream or a tributary	upplemental classifications of HQW, ORW, of ted stream	or Trout		
	Blac Bro Tida	ckwater wnwater al (if tidal,	check one of the following boxes) Lues on a coastal island? Yes	unar □ Wind □ Both			
Is	the assess	sment are	ea's surface water storage capacity or d	uration substantially altered by beaver?	☐ Yes ☒ No		
				ing normal rainfall conditions?   Yes			
1.	Check a lassessment area base GS	box in ea ent area. ed on evid VS		ment area condition metric  und surface (GS) in the assessment area ar  (see User Manual). If a reference is not app			
	$\boxtimes$ A	⊠A □B	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure		
2.	Surface a	and Sub-	Surface Storage Capacity and Duration -	- assessment area condition metric			
	Consider deep is ex Surf	both incre xpected to Sub ⊠A □B	ease and decrease in hydrology. A ditch see affect both surface and sub-surface water.  Water storage capacity and duration are now water storage capacity or duration are altered.	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicable at altered. red, but not substantially (typically, not suffice stantially altered (typically, alteration sufficie	water only, while a ditch > 1 foot le.  cient to change vegetation).		
			(examples: draining, flooding, soil compact	ion, filling, excessive sedimentation, underg	round utility lines).		
3.	Water Sto	orage/Su	face Relief – assessment area/wetland t	ype condition metric (skip for all marshe	es)		
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).		
	AA ∃A ∃A ∃B ⊒C ⊒D	□A □B □C	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	p pond water 6 inches to 1 foot deep pond water 3 to 6 inches deep			
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less t	een 1 and 2 feet			

	Make so	oil obse	<b>om each of the three soil property groups below.</b> Dig soil profile in the dominant assessment area landscape feature. vations within the top 12 inches.  Use most recent National Technical Committee for Hydric Soils guidance for regional
	indicator 4a. □A □C □C □C □C	A S B L C L	amy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) amy or clayey soils not exhibiting redoximorphic features amy or clayey gleyed soil stosol or histic epipedon
	4b. ⊠ <i>A</i>		oil ribbon < 1 inch oil ribbon ≥ 1 inch
	4c. ⊠ <i>A</i> □E	A N B A	peat or muck presence peat or muck presence
5.	Dischar	ge into	Wetland – opportunity metric
			each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples scharges include presence of nearby septic tank, underground storage tank (UST), etc.
	⊠A □B	⊠a □B	Little or no evidence of pollutants or discharges entering the assessment area  Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area
	□с	□с	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)
6.	Land Us	se – op	ortunity metric (skip for non-riparian wetlands)
	to asses	sment a	pply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining rea within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area (5M), s and within the watershed draining to the assessment area (2M). 2M
	□A □B □C	□A □B □C	<ul> <li>□A ≥ 10% impervious surfaces</li> <li>□B Confined animal operations (or other local, concentrated source of pollutants</li> <li>□C ≥ 20% coverage of pasture</li> </ul>
	□D ⊠E	□D ⊠E	<ul><li>□D ≥ 20% coverage of agricultural land (regularly plowed land)</li><li>□E ≥ 20% coverage of maintained grass/herb</li></ul>
	□F □G	□F □G	<ul> <li>☐F ≥ 20% coverage of clear-cut land</li> <li>☐G Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturbance in the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the assessment area.</li> </ul>
7.	Wetland	l Acting	as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
	$\boxtimes$	Yes	nent area within 50 feet of a tributary or other open water? ]No
	Re 7b. Ho	ecord a ow muc	ote if a portion of the buffer has been removed or disturbed. of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Makement based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
		A B	50 feet from 30 to < 50 feet from 15 to < 30 feet
		D	from 5 to < 15 feet  5 feet or buffer bypassed by ditches
			ridth. If the tributary is anastomosed, combine widths of channels/braids for a total width.
		Yes	f assessment area vegetation extend into the bank of the tributary/open water?  No
	$\boxtimes$	Shelter	or other open water sheltered or exposed? od – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. of – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.	Estuarir		at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and By Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest
			each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and other at the assessment area (WC). See User Manual for WT and WC boundaries.
	W I □A	□A	≥ 100 feet
	□в	□В	From 80 to < 100 feet
	⊠c	⊠c	From 50 to < 80 feet From 40 to < 50 feet
	□D □E	□D □E	From 30 to < 40 feet
	□F	□F	From 15 to < 30 feet
	□G □H	□G	From 5 to < 15 feet

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)				
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)				
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)				
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.				
11.	Wetland Size – wetland type/wetland complex condition metric				
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  F From 10 to < 25 acres  F From 5 to < 10 acres  G G G From 1 to < 5 acres  H H H From 0.5 to < 1 acre  I I I From 0.1 to < 0.5 acre  K K K K K K C C 0.01 acre or assessment area is clear-cut				
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)				
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.				
12	Connectivity to Other Natural Areas – landscape condition metric				
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C From 50 to < 100 acres D D From 10 to < 50 acres E B E < 10 acres F Wetland type has a poor or no connection to other natural habitats				
	13b. Evaluate for marshes only.  ☐ Yes ☐ No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.				
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8				
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)				
	<ul> <li>☑A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>☑B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>☑C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>				
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)				
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>				

17.	Vegetative Structure – assessment area/wetland type condition metric							
	17a. Is vegetation present?  ☐ Yes ☐ No If Yes, continue to 17b. If No, skip to Metric 18.							
	17b. Evaluate percent coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands.  □ A ≥ 25% coverage of vegetation □ B < 25% coverage of vegetation							
	17c. Check a box in each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider structure in airspace above the assessment area (AA) and the wetland type (WT) separately. AA WT							
	☐ A							
	☐ A ☐ Dense mid-story/sapling layer ☐ ☐ ☐ ☐ ☐ Mid-story/sapling layer ☐ ☐ ☐ ☐ ☐ Mid-story/sapling layer sparse or absent							
	용							
	Q □A       □A       Dense herb layer         P □B       □B       Moderate density herb layer         □C       □C       Herb layer sparse or absent							
18.	Snags – wetland type condition metric (skip for all marshes)							
	<ul><li>□A Large snags (more than one) are visible (&gt; 12 inches DBH, or large relative to species present and landscape stability).</li><li>□B Not A</li></ul>							
19.	Diameter Class Distribution – wetland type condition metric (skip for all marshes)							
	Majority of canopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are present.							
	<ul> <li>☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are &gt; 12 inch DBH.</li> <li>☐C Majority of canopy trees are &lt; 6 inches DBH or no trees.</li> </ul>							
20.	Large Woody Debris – wetland type condition metric (skip for all marshes)							
	Include both natural debris and man-placed natural debris.  ☐ A Large logs (more than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).  ☐ B Not A							
21.	Vegetation/Open Water Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)							
	Select the figure that best describes the amount of interspersion between vegetation and open water in the growing season. Patterned areas indicate vegetated areas, while solid white areas indicate open water.							
22.	Hydrologic Connectivity – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)							
	Examples of activities that may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversion, man-made berms, beaver dams, and stream incision. Documentation required if evaluated as B, C, or D.							
	<ul><li>□B Overbank flow is severely altered in the assessment area.</li><li>□C Overland flow is severely altered in the assessment area.</li></ul>							
	□D Both overbank and overland flow are severely altered in the assessment area.							

Wetland Site Name		Date of Assessment April 2	
Wetland Type	Headwater Forest A	ssessor Name/Organization KMT,	BGB/HDR
Notes on Field Assess	ment Form (Y/N)		NO
Presence of regulatory	considerations (Y/N)		YES
Wetland is intensively i	managed (Y/N)		NO
Assessment area is loc	cated within 50 feet of a natural tributary	or other open water (Y/N)	YES
Assessment area is su	bstantially altered by beaver (Y/N)		NO
Assessment area expe	riences overbank flooding during norma	al rainfall conditions (Y/N)	NO
Assessment area is on	a coastal island (Y/N)		NO
Sub-function Rating S	ummary		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	MEDIUM
, 0,	Sub-surface Storage and	0 10	
\M_+t-= O=!it-:	Retention	Condition	HIGH
Water Quality	Pathogen Change	Condition	LOW
		Condition/Opportunity	LOW
	Dominulate Change	Opportunity Presence (Y/N)	NO HIGH
	Particulate Change	Condition/Opportunity	NA
		Condition/Opportunity	NA NA
	Salubla Changa	Opportunity Presence (Y/N) Condition	MEDIUM
	Soluble Change	Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	MEDIUM
	1 Hysical Change	Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	YES
	Pollution Change	Condition	NA
	. enamen enamge	Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	MEDIUM
	Vegetation Composition	Condition	HIGH
unction Rating Sumn	nary.		
Function	iai y	Metrics	Rating
Hydrology		Condition	HIGH
Water Quality		Condition	MEDIUM
Quanty		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	YES
Habitat		Condition	MEDIUM

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	USACE AID # NCDWR#						
08		<del>#</del> oject Nam	o CLT Airport Expansion		April 2010		
				Date of Evaluation Wetland Site Name	April 2019		
A	pplicant/O				PW6-2 - Wetland 17		
		etland Typ		Assessor Name/Organization	KMT, BGB/HDR		
		Ecoregio		Nearest Named Water Body	Coffey Creek		
	ŀ	River Basi		USGS 8-Digit Catalogue Unit	03050103		
	Пν.	Count		NCDWR Region	Mooresville		
-	∐ Ye	s 🛛 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.203572, -80.953350		
Is Re	ease circle cent past (f	and/or more instance of the control	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, be sub-surface discharges into the wetland (examples tround storage tanks (USTs), hog lagoons, station stress (examples: vegetation mortal community alteration (examples: mowing, the intensively managed?   Yes   Attions - Were regulatory considerations evaluations.	tressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) ity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the	utants, presence of nearby septic		
	N.C Abu Des Abu	c. Division its a strea signated N its a 303(d	of Coastal Management Area of Environme	replemental classifications of HQW, ORW, of ted stream	or Trout		
	Blac Bro Tida	ckwater wnwater al (if tidal,	check one of the following boxes)	ınar 🗌 Wind 🔲 Both			
ls	the assess	sment are	ea's surface water storage capacity or di	uration substantially altered by heaver?	☐ Yes ☒ No		
				ing normal rainfall conditions?			
					<u> </u>		
1.	Check a lassessme area base	box in ea		ment area condition metric und surface (GS) in the assessment area ar (see User Manual). If a reference is not app			
	$\boxtimes$ A	⊠A □B	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure		
2.			Surface Storage Capacity and Duration -				
	Consider deep is ex Surf	both incre cpected to Sub ⊠A □B	ase and decrease in hydrology. A ditch ≤ affect both surface and sub-surface water.  Water storage capacity and duration are now  Water storage capacity or duration are alter	red, but not substantially (typically, not suffice	water only, while a ditch > 1 foot le.  cient to change vegetation).		
3.	_		(examples: draining, flooding, soil compacti	stantially altered (typically, alteration sufficiention, indergion, filling, excessive sedimentation, undergiver condition metric (skip for all marsher	round utility lines).		
J.		_			·		
	AA		or column. Select the appropriate storage	e for the assessment area (AA) and the wetl	anu type (w I).		
	3a.	□A □B □C ⊠D	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	p pond water 6 inches to 1 foot deep p pond water 3 to 6 inches deep deep			
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less tl	en 1 and 2 feet			

	Make s	oil obse	<b>m each of the three soil property groups below.</b> Dig soil profile in the dominant assessment area landsca <sub>l</sub> rations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for	
	indicato 4a.	A S B L C L D L	ndy soil amy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) amy or clayey soils not exhibiting redoximorphic features amy or clayey gleyed soil stosol or histic epipedon	
	4b. ⊠		il ribbon < 1 inch il ribbon ≥ 1 inch	
	4c. ⊠.	A M	peat or muck presence peat or muck presence	
5.	Discha	rge into	Vetland – opportunity metric	
		surface Sub	each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). scharges include presence of nearby septic tank, underground storage tank (UST), etc.	Examples
	⊠a ⊟B	⊠a □B	Little or no evidence of pollutants or discharges entering the assessment area Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area	;
	□C	□c	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment at potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)	
6.	Land U	se – op	ortunity metric (skip for non-riparian wetlands)	
	to asses	ssment	oply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider source ea within entire upstream watershed (WS), within 5 miles and within the watershed draining to the assessment and within the watershed draining to the assessment area (2M). 2M	es draining area (5M)
	□A □B □C	□A □B □C	<ul> <li>□A ≥ 10% impervious surfaces</li> <li>□B Confined animal operations (or other local, concentrated source of pollutants</li> <li>□C ≥ 20% coverage of pasture</li> </ul>	
	□D ⊠E □F	□D ⊠E □F	<ul> <li>□D ≥ 20% coverage of agricultural land (regularly plowed land)</li> <li>□E ≥ 20% coverage of maintained grass/herb</li> <li>□F ≥ 20% coverage of clear-cut land</li> </ul>	
	∐G	∏G	Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturble watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the assessment area.	
7.	Wetlan	d Actin	as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetland	(st
	$\triangleright$	Yes	ent area within 50 feet of a tributary or other open water? ]No If Yes, continue to 7b. If No, skip to Metric 8. Iffer need only be present on one side of the water body. Make buffer judgment based on the average width o	of wetland
	R 7b. H	ecord a	ote if a portion of the buffer has been removed or disturbed. of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water bo	ody. Make
		]A ]B	ment based on the average width of wetland. Record a note if a portion of the buffer has been removed or distu 50 feet rom 30 to < 50 feet	iibea.)
		]C ]D ]E	rom 15 to < 30 feet rom 5 to < 15 feet 5 feet <u>or</u> buffer bypassed by ditches	
		]≤ 15-fe	idth. If the tributary is anastomosed, combine widths of channels/braids for a total width.  twide ⊠> 15-feet wide □ Other open water (no tributary present)  assessment area vegetation extend into the bank of the tributary/open water?	
	7e. Is	]Yes stream	No rother open water sheltered or exposed? d – adjacent open water with width < 2500 feet and no regular boat traffic.	
8.		]Expos	il – adjacent open water with width < 2500 feet <u>or</u> regular boat traffic. I – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic. It the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes a	and
	Estuari only)	ne Wo	y Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swar	mp Forest
			each column for riverine wetlands only. Select the average width for the wetland type at the assessment area olex at the assessment area (WC). See User Manual for WT and WC boundaries.	a (WT) and
	ΠA	ΠA	≥ 100 feet	
	□в ⊠c	⊟в ⊠с	From 80 to < 100 feet From 50 to < 80 feet	
	$\Box$ D	$\Box$ D	From 40 to < 50 feet	
	□E	□E	From 30 to < 40 feet	
	□F □G	∐F □G	From 15 to < 30 feet From 5 to < 15 feet	
	□G □H	님	5 foot	

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  E E From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G From 1 to < 5 acres  H H H From 0.5 to < 1 acre  I From 0.1 to < 0.5 acre  J J J J J From 0.01 to < 0.1 acre  K K K K K K K C K C 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
12	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C From 50 to < 100 acres D From 10 to < 50 acres F F Wetland type has a poor or no connection to other natural habitats  13b. Evaluate for marshes only.
	Yes No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>☑A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>☑B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>☑C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vege	tative St	ructure –	assessment area/wetland type condition metric	
	17a.		ation pres		
		⊠Yes	∐No	If Yes, continue to 17b. If No, skip to Metric 18.	
	17b.	Evaluate □A □B	≥ 25% c	coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation	
	17c.	structure		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Considere above the assessment area (AA) and the wetland type (WT) separately.	de
		AA □A □B □C	WI ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps Canopy sparse or absent	
	Mid-Story	□A ⊠B □C	□A ⊠B □C	Dense mid-story/sapling layer Moderate density mid-story/sapling layer Mid-story/sapling layer sparse or absent	
	Shrub	B □A B □C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	Herb	A ⊠B □C	□A □B ⊠C	Dense herb layer Moderate density herb layer Herb layer sparse or absent	
18.	Snag	ıs – wetla	and type	condition metric (skip for all marshes)	
	□A ⊠B		e snags (r	nore than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).	
19.	Diam	neter Clas	ss Distrib	ution – wetland type condition metric (skip for all marshes)	
	□A			opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	□в ⊠с		rity of car	opy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. opy trees are < 6 inches DBH or no trees.	
20.	Large	e Woody	Debris -	wetland type condition metric (skip for all marshes)	
	Inclue □A ⊠B		e logs (mo	ris and man-placed natural debris. re than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).	
21.	Vege	tation/O	oen Wate	Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)	
		-		st describes the amount of interspersion between vegetation and open water in the growing season. Pattern areas, while solid white areas indicate open water.   □B □C □D	nec
		0	S		
22.	-	_		y – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)	
				at may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversi	on
	man- ⊠A			er dams, and stream incision. Documentation required if evaluated as B, C, or D. overland flow are not severely altered in the assessment area.	
	□в	Over	bank flow	is severely altered in the assessment area.	
				s severely altered in the assessment area. and overland flow are severely altered in the assessment area.	

Wetland Site Name P		Date of Assessment April 2	
Wetland Type <u>H</u>	eadwater Forest	Assessor Name/Organization KMT,	BGB/HDR
Notes on Field Assessm	ent Form (Y/N)		NO
Presence of regulatory of	considerations (Y/N)		YES
Wetland is intensively m	anaged (Y/N)		NO
Assessment area is loca	ated within 50 feet of a natural tributa	ry or other open water (Y/N)	YES
Assessment area is sub	stantially altered by beaver (Y/N)		NO
Assessment area experi	ences overbank flooding during norm	nal rainfall conditions (Y/N)	NO
Assessment area is on a	a coastal island (Y/N)		NO
Sub-function Rating Su	mmary		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention Sub-surface Storage and	Condition	MEDIUM
	Retention	Condition	HIGH
Water Quality	Pathogen Change	Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	HIGH
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	YES
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	MEDIUM
	Vegetation Composition	Condition	HIGH
unction Rating Summa	ary		
Function		Metrics	Rating
Hydrology		Condition	HIGH
Water Quality		Condition	HIGH
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	YES
Habitat		Condition	MEDIUM

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID	#	Accompanies	NCDWR#	
100		# oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019
	۱۱۰ pplicant/O			Wetland Site Name	PW7-2 - Wetland 18
^		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		l Ecoregio		Nearest Named Water Body	Coffey Creek
		River Basi		USGS 8-Digit Catalogue Unit	03050103
		Count		NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.198073, -80.952080
		3 <u>                                     </u>	o Trecipitation within 40 ms:	Latitude/Longitude (deci-degrees)	33.190073, -00.932000
Is Re	ease circle cent past (I	and/or m for instance drological face and s ks, underg ns of vege bitat/plant sment are Consideral adromous derally pro DWR ripa uts a Prim blicly owne	ne, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, be sub-surface discharges into the wetland (examples: ditches, dams, be sub-surface discharges into the wetland (examples) attainstress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed? Yes Attions - Were regulatory considerations evaluations - Were regulatory considerations evaluations where the sub-time of time of the sub-time of time of time of the sub-time of time of	tressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) lity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the atened species	utants, presence of nearby septic
	Abı Des Abı	uts a strea signated N uts a 303(d	ICNHP reference community d)-listed stream or a tributary to a 303(d)-lis	upplemental classifications of HQW, ORW, of ted stream	or Trout
	Bla Bro Tida	ckwater wnwater al (if tidal,	check one of the following boxes) Lues a on a coastal island? Yes	unar □ Wind □ Both	
			ea's surface water storage capacity or di	uration substantially altered by beaver? ing normal rainfall conditions?	☐ Yes
					⊠ No
1.	Check a lassessme area base	box in ea ent area.		ment area condition metric  und surface (GS) in the assessment area ar  (see User Manual). If a reference is not app	
	$\square$ A	∏A ⊠B	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure
2.	Surface a	and Sub-	Surface Storage Capacity and Duration -	- assessment area condition metric	
	Consider deep is ex Surf	both incre xpected to Sub □A □B	ease and decrease in hydrology. A ditch so affect both surface and sub-surface water. Water storage capacity and duration are now water storage capacity or duration are alternation.	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicab at altered. red, but not substantially (typically, not suffice stantially altered (typically, alteration sufficient	water only, while a ditch > 1 foot le.  cient to change vegetation).
•			(examples: draining, flooding, soil compacti	ion, filling, excessive sedimentation, underg	round utility lines).
3.		_		type condition metric (skip for all marshe	·
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wet	and type (WT).
	□c ⊠d	□A □B □C ⊠D	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	o pond water 6 inches to 1 foot deep o pond water 3 to 6 inches deep deep	
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less th	een 1 and 2 feet	

		l observ	m each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature rations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Technical Committee for Hydric Soils guidance for regional recent National Recent Recent National Recent R
	4a. □A ⊠B □C □D	Sa Lo Lo Lo	ndy soil amy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) amy or clayey soils not exhibiting redoximorphic features amy or clayey gleyed soil stosol or histic epipedon
	4b. ⊠A □B		il ribbon < 1 inch il ribbon ≥ 1 inch
	4c. ⊠A □B		peat or muck presence peat or muck presence
5.	Discharg	je into \	Vetland – opportunity metric
	of sub-su Surf	rface di Sub	each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Example scharges include presence of nearby septic tank, underground storage tank (UST), etc.
	□В	⊠a □B	Little or no evidence of pollutants or discharges entering the assessment area  Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area
	□c	□C	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)
6.	Land Use	e – opp	ortunity metric (skip for non-riparian wetlands)
	to assess and withir	ment a	oply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining ea within entire upstream watershed (WS), within 5 miles and within the watershed draining to the assessment area (5M) and within the watershed draining to the assessment area (2M). 2M
	$\square$ A	□A	□A ≥ 10% impervious surfaces
		□в □c	<ul> <li>□B Confined animal operations (or other local, concentrated source of pollutants</li> <li>□C ≥ 20% coverage of pasture</li> </ul>
	□D	$\Box$ D	□D ≥ 20% coverage of agricultural land (regularly plowed land)
		⊠E ⊠F	<ul><li></li></ul>
		Ğ	Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturbance in the watershed <u>or</u> hydrologic alterations that prevent drainage <u>and/or</u> overbank flow from affecting the assessment area.
7.	Wetland	Acting	as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
	_		ent area within 50 feet of a tributary or other open water?
	⊠Y We:		]No If Yes, continue to 7b. If No, skip to Metric 8. Iffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetlanc
	Red	cord a n	ote if a portion of the buffer has been removed or disturbed.
			of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mak- nent based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
		4 ≥	50 feet
			rom 30 to < 50 feet rom 15 to < 30 feet
			rom 5 to < 15 feet
	⊠E Zo Trib		5 feet <u>or</u> buffer bypassed by ditches idth. If the tributary is anastomosed, combine widths of channels/braids for a total width.
		outary w ≤ 15-fee	
			assessment area vegetation extend into the bank of the tributary/open water?
	☐Y 7e. Is s		Ino rother open water sheltered or exposed?
			d – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. I – adjacent open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.			nt the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and by Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Fores
	Check a l the wetlar		each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and olex at the assessment area (WC). See User Manual for WT and WC boundaries.
	□A	□A	≥ 100 feet
		В	From 80 to < 100 feet
	_	□C □D	From 50 to < 80 feet From 40 to < 50 feet
	□E	□E	From 30 to < 40 feet
		□F ⊠G	From 15 to < 30 feet From 5 to < 15 feet
	⊠G		- Floor

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  A Evidence of short-duration inundation (< 7 consecutive days)  B Evidence of saturation, without evidence of inundation  C Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ Sediment deposition is not excessive, but at approximately natural levels.  □ Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A A S 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  E E From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G From 1 to < 5 acres  H H H From 0.5 to < 1 acre  I From 0.1 to < 0.5 acre  J J J From 0.01 to < 0.1 acre  K K K K K K K K C 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
12	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C From 50 to < 100 acres D D From 10 to < 50 acres E E = < 10 acres Wetland type has a poor or no connection to other natural habitats
	13b. Evaluate for marshes only.  ☐ Yes ☐ No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)  May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>□A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>□B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>□C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>□A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>□B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>□C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vegetative Structure – assessment area/wetland type condition metric
	17a. Is vegetation present?  ☑Yes ☐No If Yes, continue to 17b. If No, skip to Metric 18.
	17b. Evaluate percent coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands.  □A ≥ 25% coverage of vegetation □B < 25% coverage of vegetation
	17c. Check a box in each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider structure in airspace above the assessment area (AA) and the wetland type (WT) separately. AA WT
	© □A □A Canopy closed, or nearly closed, with natural gaps associated with natural processes □B □B Canopy present, but opened more than natural gaps □C □C Canopy sparse or absent
	Dense mid-story/sapling layer
	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
	e □A □A Dense herb layer □B □B Moderate density herb layer □C □C Herb layer sparse or absent
18.	Snags – wetland type condition metric (skip for all marshes)
	<ul><li>□A Large snags (more than one) are visible (&gt; 12 inches DBH, or large relative to species present and landscape stability).</li><li>□B Not A</li></ul>
19.	Diameter Class Distribution – wetland type condition metric (skip for all marshes)  ☐A Majority of canopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are
	present.
	<ul><li>☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are &gt; 12 inch DBH.</li><li>☐C Majority of canopy trees are &lt; 6 inches DBH or no trees.</li></ul>
20.	Large Woody Debris – wetland type condition metric (skip for all marshes)
	Include both natural debris and man-placed natural debris.  A Large logs (more than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).  Not A
21.	Vegetation/Open Water Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)
	Select the figure that best describes the amount of interspersion between vegetation and open water in the growing season. Patterned areas indicate vegetated areas, while solid white areas indicate open water.
22.	Hydrologic Connectivity – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)
	Examples of activities that may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversion, man-made berms, beaver dams, and stream incision. Documentation required if evaluated as B, C, or D.
	<ul> <li>☑A Overbank <u>and</u> overland flow are not severely altered in the assessment area.</li> <li>☐B Overbank flow is severely altered in the assessment area.</li> </ul>
	Overland flow is severely altered in the assessment area.
	D Both overbank and overland flow are severely altered in the assessment area.

wetland is created by stormwater drainage in regularly mowed area within CLT airfield

Wetland Site Name P		Date of Assessment April 2	
Wetland Type H	eadwater Forest	Assessor Name/Organization KMT,	BGB/HDR
Notes on Field Assessm	ent Form (Y/N)		YES
Presence of regulatory of	considerations (Y/N)		YES
Wetland is intensively m	anaged (Y/N)		NO
Assessment area is loca	ated within 50 feet of a natural tributa	ry or other open water (Y/N)	YES
Assessment area is sub	stantially altered by beaver (Y/N)		NO
Assessment area experi	ences overbank flooding during norn	nal rainfall conditions (Y/N)	NO
Assessment area is on a	a coastal island (Y/N)		NO
Sub-function Rating Su	mmarv		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	LOW
	Sub-surface Storage and Retention	Condition	LOW
Water Quality	Pathogen Change	Condition	HIGH
ator adding	i amogon onango	Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	LOW
	. a. ii ca ato C. a. i.g.	Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	MEDIUM
	Ç	Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	YES
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	LOW
	Vegetation Composition	Condition	LOW
unction Rating Summa	ary		
Function		Metrics	Rating
Hydrology		Condition	LOW
Water Quality		Condition	MEDIUM
		Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	YES
Habitat		Condition	LOW

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	SACE AID :	#	Accompanies	NCDWR#	
03		<del>"</del> oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019
	۱۲ pplicant/O			Wetland Site Name	
^				Assessor Name/Organization	PW8-2 - Wetland 20 KMT, BGB/HDR
		etland Typ		Nearest Named Water Body	
		l Ecoregio River Basi		USGS 8-Digit Catalogue Unit	Coffey Creek 03050103
	Г				
	☐ Ye	Count s 🛛 N		NCDWR Region Latitude/Longitude (deci-degrees)	Mooresville 35.193787, -80.951252
-		5 🔼 IV	o Fredipitation within 46 hrs?	Latitude/Longitude (deci-degrees)	35.193767, -80.931232
Is Re	ease circle cent past (f	and/or more instance of the control	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, be sub-surface discharges into the wetland (examples into stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed?   Yes   Attions - Were regulatory considerations evaluations.	tressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) ity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the	utants, presence of nearby septic
	N.C Abu Des Abu	c. Division its a strea signated N its a 303(d	of Coastal Management Area of Environme	replemental classifications of HQW, ORW, of ted stream	or Trout
	Blac Bro Tida	ckwater wnwater al (if tidal,	check one of the following boxes)	ınar 🗌 Wind 🔲 Both	
					□ V □ N-
			ea's surface water storage capacity or di	ing normal rainfall conditions?   Yes	☐ Yes       No
DC	es the as	sessinein	area experience overbank nooding duri	ing normal raiman conditions? res	
1.	Check a lassessme area base	box in ea		ment area condition metric und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
	$\boxtimes$ A	⊠A □B	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure
2.	Surface a	and Sub-S	Surface Storage Capacity and Duration -	- assessment area condition metric	
	Consider deep is ex Surf	both incre cpected to Sub ⊠A □B	ease and decrease in hydrology. A ditch see affect both surface and sub-surface water. Water storage capacity and duration are now water storage capacity or duration are alternation.	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicable at altered. red, but not substantially (typically, not suffice stantially altered (typically, alteration sufficient	water only, while a ditch > 1 foot le.  cient to change vegetation).
			(examples: draining, flooding, soil compacti	ion, filling, excessive sedimentation, underg	round utility lines).
3.	Water Sto	orage/Sui	face Relief – assessment area/wetland t	ype condition metric (skip for all marshe	es)
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	AA 🗆		Markey of the second of the second	and the state of t	
	□c ⊠D	□B □C ⊠D	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	p pond water 6 inches to 1 foot deep p pond water 3 to 6 inches deep deep	
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less th	en 1 and 2 feet	

	Make soil ob	t <b>from each of the three soil property groups below.</b> Dig soil profile in the dominant assessment area landscape fea servations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for reg	
	indicators.  4a. □A □B □C □D □D	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon	
	4b. ⊠A □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch	
	4c. ⊠A □B	No peat or muck presence A peat or muck presence	
5.	Discharge in	nto Wetland – opportunity metric	
	of sub-surfact Surf Sul		ıples
	□A ⊠A ⊠B □E	Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area	
	□c □(	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area an potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)	.d
6.	Land Use -	opportunity metric (skip for non-riparian wetlands)	
	to assessme	at apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources dra nt area within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area ( miles and within the watershed draining to the assessment area (2M). 2M	
	_B _E	B Confined animal operations (or other local, concentrated source of pollutants	
	⊠E ⊠E	E ⊠E ≥ 20% coverage of maintained grass/herb	
			o in
	□G □(	G	em
7.	Wetland Act	ing as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)	
	—.	ssment area within 50 feet of a tributary or other open water?	
	∐Yes Wetlan	No If Yes, continue to 7b. If No, skip to Metric 8. d buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wet	land.
	Record	a note if a portion of the buffer has been removed or disturbed.	
		uch of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mudgment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.) ≥ 50 feet	
	□B □C □D	From 30 to < 50 feet From 15 to < 30 feet From 5 to < 15 feet	
	□E	< 5 feet or buffer bypassed by ditches	
		ry width. If the tributary is anastomosed, combine widths of channels/braids for a total width.	
		-feet wide	
	□Yes	□No	
		ım or other open water sheltered or exposed? tered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic.	
		osed – adjacent open water with width ≥ 2500 feet or regular boat traffic.	
8.		Ith at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and loody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Fo	rest
	Check a box	in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) complex at the assessment area (WC). See User Manual for WT and WC boundaries.	and
	□A □/		
	_B _E	B From 80 to < 100 feet	
	FF	From 15 to < 30 feet	

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  □ A Sediment deposition is not excessive, but at approximately natural levels.  □ B Sediment deposition is excessive, but not overwhelming the wetland.  □ C Sediment deposition is excessive and is overwhelming the wetland.
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  E E From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G From 1 to < 5 acres  H H H From 0.5 to < 1 acre  I From 0.1 to < 0.5 acre  J J J From 0.01 to < 0.1 acre  K K K K K < 0.01 acre or assessment area is clear-cut
	—
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	<ul><li>□A Pocosin is the full extent (≥ 90%) of its natural landscape size.</li><li>□B Pocosin type is &lt; 90% of the full extent of its natural landscape size.</li></ul>
13.	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C From 50 to < 100 acres B D From 10 to < 50 acres C C C From 10 to < 50 acres C C C From 10 to < 50 acres
	13b. <b>Evaluate for marshes only</b> .  ☐Yes ☐No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14.	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)
	May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas $\geq$ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C." $\square$ A 0 $\square$ B 1 to 4 $\square$ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>✓A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>✓B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>✓C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>☑A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>☑B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>☑C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vegetative Structure – assessment area/wetland type condition metric
	17a. Is vegetation present?  ☐ Yes ☐ No If Yes, continue to 17b. If No, skip to Metric 18.
	17b. Evaluate percent coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands.  □A ≥ 25% coverage of vegetation □B < 25% coverage of vegetation
	17c. Check a box in each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider structure in airspace above the assessment area (AA) and the wetland type (WT) separately. AA WT
	© ☑A ☑A Canopy closed, or nearly closed, with natural gaps associated with natural processes ☐B ☐B Canopy present, but opened more than natural gaps ☐ ☐ Canopy sparse or absent
	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
	G □ A       □ A       Dense shrub layer         □ B       □ B       Moderate density shrub layer         O □ C       □ C       Shrub layer sparse or absent
	p ☐A ☐A Dense herb layer p ☑B ☐B Moderate density herb layer ☐C ☑C Herb layer sparse or absent
18.	Snags – wetland type condition metric (skip for all marshes)
	<ul><li>□ A Large snags (more than one) are visible (&gt; 12 inches DBH, or large relative to species present and landscape stability).</li><li>□ B Not A</li></ul>
19.	Diameter Class Distribution – wetland type condition metric (skip for all marshes)  ☐ A Majority of canopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are
	present.
	<ul> <li>☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are &gt; 12 inch DBH.</li> <li>☐C Majority of canopy trees are &lt; 6 inches DBH or no trees.</li> </ul>
20.	Large Woody Debris – wetland type condition metric (skip for all marshes)
	Include both natural debris and man-placed natural debris.  A Large logs (more than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).  Not A
21.	Vegetation/Open Water Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)
	Select the figure that best describes the amount of interspersion between vegetation and open water in the growing season. Patterned areas indicate vegetated areas, while solid white areas indicate open water.
	DA DB DC DD
22.	Hydrologic Connectivity – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)
	Examples of activities that may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversion, man-made berms, beaver dams, and stream incision. Documentation required if evaluated as B, C, or D.
	<ul> <li>☑A Overbank and overland flow are not severely altered in the assessment area.</li> <li>☐B Overbank flow is severely altered in the assessment area.</li> </ul>
	□ C Overland flow is severely altered in the assessment area. □ D Both overbank and overland flow are severely altered in the assessment area.
	De Boar overbank and overland now are severely altered in the assessment area.

wetland is created by stormwater drainage in regularly mowed area within CLT airfield

Wetland Site Name		Date of Assessment April 2	
Wetland Type	Headwater Forest A	ssessor Name/Organization KMT,	BGB/HDR
Notes on Field Assess	ment Form (Y/N)		YES
Presence of regulatory	considerations (Y/N)		YES
Wetland is intensively	/etland is intensively managed (Y/N) ssessment area is located within 50 feet of a natural tributary or other open water (Y/N)		
Assessment area is loc			
ssessment area is substantially altered by beaver (Y/N)			NO
Assessment area expe	periences overbank flooding during normal rainfall conditions (Y/N)		NO
Assessment area is on	a coastal island (Y/N)		NO
Sub-function Rating S	ummary		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	HIGH
	Sub-surface Storage and Retention	Condition	HIGH
Water Quality	Pathogen Change	Condition	LOW
•		Condition/Opportunity	LOW
		Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	HIGH
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	MEDIUM
		Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	LOW
		Condition/Opportunity	LOW
		Opportunity Presence (Y/N)	YES
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	HIGH
	Vegetation Composition	Condition	HIGH
Function Rating Summ	nary		
Function		Metrics	Rating
Hydrology		Condition	HIGH
Water Quality		Condition	LOW
		Condition/Opportunity	LOW
		Opportunity Presence (Y/N)	YES
Habitat		Condition	MEDIUM

#### NC WAM FIELD ASSESSMENT RESULTS Accompanies User Manual Version 5.0

110	USACE AID # NCDWR#				
03		<del>"</del> oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019
٨	۱۳ pplicant/O			Wetland Site Name	PW9-2 - Wetland 19
^		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		Ecoregio		Nearest Named Water Body	Coffey Creek
		River Basi		USGS 8-Digit Catalogue Unit	03050103
	'	Count		NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.193268, -80.953933
		3 <u>N</u> N	o i recipitation within 40 ms:	Latitude/Longitude (deci-degrees)	33.193200, -00.933933
Is Re	ease circle cent past (f	and/or more instance of the control	e, within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, be sub-surface discharges into the wetland (examples into stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed?   Yes   Attions - Were regulatory considerations evaluations.	tressors is apparent. Consider departure finclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) amples: discharges containing obvious polluetc.) ity, insect damage, disease, storm damage clear-cutting, exotics, etc.)  No aluated?   Yes  No If Yes, check all the	utants, presence of nearby septic
	N.C Abu Des Abu	c. Division its a strea signated N its a 303(	of Coastal Management Area of Environme	replemental classifications of HQW, ORW, of ted stream	or Trout
	Blad Bro Tida	ckwater wnwater al (if tidal,	check one of the following boxes)	ınar 🗌 Wind 🔲 Both	
			ea's surface water storage capacity or di	ing normal rainfall conditions?   Yes	☐ Yes       No
DC	es the as:	sessinein	area experience overbank nooding duri	ing normal raiman conditions: res	
1.	Check a lassessme area base	box in ea ent area.		ment area condition metric und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
	$\boxtimes$ A	⊠A □B	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exacks, bedding, fill, soil compaction, obvious ce, herbicides, salt intrusion [where appropron)	pollutants) (vegetation structure
2.			Surface Storage Capacity and Duration -		
	Consider deep is ex Surf ⊠A □B	both incre cpected to Sub ⊠A □B	ease and decrease in hydrology. A ditch see affect both surface and sub-surface water. Water storage capacity and duration are now water storage capacity or duration are alternation.	acity and duration (Surf) and sub-surface sto 1 foot deep is considered to affect surface . Consider tidal flooding regime, if applicable at altered. red, but not substantially (typically, not suffice stantially altered (typically, alteration sufficient	water only, while a ditch > 1 foot le.  cient to change vegetation).
		_ =	(examples: draining, flooding, soil compacti	ion, filling, excessive sedimentation, underg	round utility lines).
3.	Water Sto	orage/Su	face Relief - assessment area/wetland t	ype condition metric (skip for all marshe	es)
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).
	AA ∃A ∃A ∃B ⊒C ⊠D	□A □B □C	Majority of wetland with depressions able to Majority of wetland with depressions able to Majority of wetland with depressions able to Depressions able to pond water < 3 inches	pond water 6 inches to 1 foot deep pond water 3 to 6 inches deep	
	□В	Evidence	that maximum depth of inundation is greate that maximum depth of inundation is betwe that maximum depth of inundation is less tl	en 1 and 2 feet	

	Make soil ob	t <b>from each of the three soil property groups below.</b> Dig soil profile in the dominant assessment area landscape featt servations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regio	
	indicators.  4a. □A □B □C □D □D	Sandy soil Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) Loamy or clayey soils not exhibiting redoximorphic features Loamy or clayey gleyed soil Histosol or histic epipedon	
	4b. ⊠A □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch	
	4c. ⊠A □B	No peat or muck presence A peat or muck presence	
5.	Discharge in	nto Wetland – opportunity metric	
	of sub-surfact Surf Sul		oles
	□A ⊠/ ⊠B □E	Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area	
	□c □	Noticeable evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)	i
6.	Land Use -	opportunity metric (skip for non-riparian wetlands)	
	to assessme	at apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources drain area within entire upstream watershed (WS), within 5 miles and within the watershed draining to the assessment area (5 miles and within the watershed draining to the assessment area (2M).  2M	
	$\square A \square A$	A ☐A ≥ 10% impervious surfaces	
		B Confined animal operations (or other local, concentrated source of pollutants	
	⊠E ⊠E	E ⊠E ≥ 20% coverage of maintained grass/herb	
			in 4
		the watershed <u>or</u> hydrologic alterations that prevent drainage <u>and/or</u> overbank flow from affecting the assessment area.	,
7.	Wetland Act	ing as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)	
	—	ssment area within 50 feet of a tributary or other open water?	
	∐Yes Wetlar	No If Yes, continue to 7b. If No, skip to Metric 8. d buffer need only be present on one side of the water body. Make buffer judgment based on the average width of wetla	and.
	Record	l a note if a portion of the buffer has been removed or disturbed.	
		uch of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Mudgment based on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.) ≥ 50 feet	аке
	□B □C □D	From 30 to < 50 feet From 15 to < 30 feet	
		From 5 to < 15 feet < 5 feet or buffer bypassed by ditches	
		ry width. If the tributary is anastomosed, combine widths of channels/braids for a total width.	
		-feet wide	
	□Yes	□No	
		ım or other open water sheltered or exposed? tered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic.	
		osed – adjacent open water with width ≥ 2500 feet or regular boat traffic.	
8.		Ith at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and foody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp For	rest
	Check a box	in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) complex at the assessment area (WC). See User Manual for WT and WC boundaries.	and
	⊠B ⊠E	B From 80 to < 100 feet	
		From 15 to < 30 feet	

9.	Inundation Duration – assessment area condition metric (skip for non-riparian wetlands)
	Answer for assessment area dominant landform.  Answer for assessment area dominant landform.  Evidence of short-duration inundation (< 7 consecutive days)  Evidence of saturation, without evidence of inundation  Evidence of long-duration inundation or very long-duration inundation (7 to 30 consecutive days or more)
10.	Indicators of Deposition – assessment area condition metric (skip for non-riparian wetlands and all marshes)
	Consider recent deposition only (no plant growth since deposition).  \[ \begin{align*} \text{Sediment deposition is not excessive, but at approximately natural levels.} \]  \[ \begin{align*} \text{Sediment deposition is excessive, but not overwhelming the wetland.} \]  \[ \begin{align*} \text{Sediment deposition is excessive and is overwhelming the wetland.} \]
11.	Wetland Size – wetland type/wetland complex condition metric
	Check a box in each column. Involves a GIS effort with field adjustment. This metric evaluates three aspects of the wetland area: the size of the wetland type (WT), the size of the wetland complex (WC), and the size of the forested wetland (FW) (if applicable, see User Manual). See the User Manual for boundaries of these evaluation areas. If assessment area is clear-cut, select "K" for the FW column.  WT WC FW (if applicable)  A A ≥ 500 acres  B B B From 100 to < 500 acres  C C C From 50 to < 100 acres  D D D From 25 to < 50 acres  F F F From 10 to < 25 acres  F F F From 5 to < 10 acres  G G G G From 1 to < 5 acres  H H H H From 0.5 to < 1 acre  XI XI From 0.1 to < 0.5 acre
	□K □K < 0.01 acre or assessment area is clear-cut
12.	Wetland Intactness – wetland type condition metric (evaluate for Pocosins only)
	□A Pocosin is the full extent (≥ 90%) of its natural landscape size. □B Pocosin type is < 90% of the full extent of its natural landscape size.
13.	Connectivity to Other Natural Areas – landscape condition metric
	13a. Check appropriate box(es) (a box may be checked in each column). Involves a GIS effort with field adjustment. This metric evaluates whether the wetland is well connected (Well) and/or loosely connected (Loosely) to the landscape patch, the contiguous naturally vegetated area and open water (if appropriate). Boundaries are formed by four-lane roads, regularly maintained utility line corridors the width of a four-lane road or wider, urban landscapes, maintained fields (pasture and agriculture), or open water > 300 feet wide.  Well Loosely  A A ≥ 500 acres B B From 100 to < 500 acres C C From 50 to < 100 acres D MD From 10 to < 50 acres E C C Wetland type has a poor or no connection to other natural habitats
	13b. <b>Evaluate for marshes only</b> .  ☐Yes ☐No Wetland type has a surface hydrology connection to open waters/stream or tidal wetlands.
14	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)
	May involve a GIS effort with field adjustment. Estimate distance from wetland type boundary to artificial edges. Artificial edges include non-forested areas ≥ 40 feet wide such as fields, development, roads, regularly maintained utility line corridors, and clear-cuts. Consider the eight main points of the compass. Artificial edge occurs within 150 feet in how many directions? If the assessment area is clear cut, select option "C."  □ A 0 □ B 1 to 4 □ C 5 to 8
15.	Vegetative Composition – assessment area condition metric (skip for all marshes and Pine Flat)
	<ul> <li>✓A Vegetation is close to reference condition in species present and their proportions. Lower strata composed of appropriate species, with exotic plants absent or sparse within the assessment area.</li> <li>✓B Vegetation is different from reference condition in species diversity or proportions, but still largely composed of native species characteristic of the wetland type. This may include communities of weedy native species that develop after clearcutting or clearing. It also includes communities with exotics present, but not dominant, over a large portion of the expected strata.</li> <li>✓C Vegetation severely altered from reference in composition, or expected species are unnaturally absent (planted stands of non-characteristic species or at least one stratum inappropriately composed of a single species), or exotic species are dominant in at least one stratum.</li> </ul>
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	<ul> <li>☑A Vegetation diversity is high and is composed primarily of native species (&lt; 10% cover of exotics).</li> <li>☑B Vegetation diversity is low or has &gt; 10% to 50% cover of exotics.</li> <li>☑C Vegetation is dominated by exotic species (&gt; 50 % cover of exotics).</li> </ul>

17.	Vegetative Structure – assessment area/wetland type condition metric					
	17a. Is vegetation present?  ☐ Yes ☐ No If Yes, continue to 17b. If No, skip to Metric 18.					
	17b. Evaluate percent coverage of assessment area vegetation <b>for all marshes only</b> . Skip to 17c for non-marsh wetlands.  □A ≥ 25% coverage of vegetation □B < 25% coverage of vegetation					
	17c. Check a box in each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider structure in airspace above the assessment area (AA) and the wetland type (WT) separately. AA WT					
	☐ ☐ ☐ Canopy closed, or nearly closed, with natural gaps associated with natural processes ☐ ☐ ☐ Canopy present, but opened more than natural gaps ☐ ☐ ☐ Canopy sparse or absent					
	Dense mid-story/sapling layer					
	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐					
	후 □A □A Dense herb layer 후 図B □B Moderate density herb layer □C 図C Herb layer sparse or absent					
18.	Snags – wetland type condition metric (skip for all marshes)					
	<ul><li>□A Large snags (more than one) are visible (&gt; 12 inches DBH, or large relative to species present and landscape stability).</li><li>□B Not A</li></ul>					
19.	Diameter Class Distribution – wetland type condition metric (skip for all marshes)  A Majority of canopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are					
	present.					
	<ul> <li>☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are &gt; 12 inch DBH.</li> <li>☐C Majority of canopy trees are &lt; 6 inches DBH or no trees.</li> </ul>					
20.	Large Woody Debris – wetland type condition metric (skip for all marshes)					
	Include both natural debris and man-placed natural debris.  ☐A Large logs (more than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability).  ☐B Not A					
21.	Vegetation/Open Water Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)					
	Select the figure that best describes the amount of interspersion between vegetation and open water in the growing season. Patterned areas indicate vegetated areas, while solid white areas indicate open water.					
	DA DB DC DD					
22.	Hydrologic Connectivity – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)					
	Examples of activities that may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversion, man-made berms, beaver dams, and stream incision. Documentation required if evaluated as B, C, or D.					
	<ul> <li>☑A Overbank and overland flow are not severely altered in the assessment area.</li> <li>☐B Overbank flow is severely altered in the assessment area.</li> </ul>					
	Overland flow is severely altered in the assessment area.					
	D Both overbank <u>and</u> overland flow are severely altered in the assessment area.					

wetland is created by stormwater drainage in regularly mowed area within CLT airfield

Wetland Site Name	PW9-2 - Wetland 19	Date of Assessment April 2	2019
Wetland Typel	Headwater Forest A	ssessor Name/Organization KMT,	BGB/HDR
Notes on Field Assessi	ment Form (Y/N)		YES
Presence of regulatory	considerations (Y/N)		YES
Wetland is intensively i	Vetland is intensively managed (Y/N)		
Assessment area is loc	ssessment area is located within 50 feet of a natural tributary or other open water (Y/N) ssessment area is substantially altered by beaver (Y/N)		
Assessment area is su			
Assessment area expe	eriences overbank flooding during normal rainfall conditions (Y/N)		NO
Assessment area is on	a coastal island (Y/N)		NO
Sub-function Rating S	ımmarv		
Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	MEDIUM
, 0,	Sub-surface Storage and	0 111	
Matan Ossalita	Retention	Condition	HIGH
Water Quality	Pathogen Change	Condition	LOW
		Condition/Opportunity	LOW
	Dominulata Changa	Opportunity Presence (Y/N)	NO HIGH
	Particulate Change	Condition	
		Condition/Opportunity	NA NA
	Salubla Changa	Opportunity Presence (Y/N) Condition	NA MEDIUM
	Soluble Change	Condition/Opportunity	MEDIUM
		Opportunity Presence (Y/N)	NO
	Physical Change	Condition	LOW
	1 Hysical Change	Condition/Opportunity	LOW
		Opportunity Presence (Y/N)	YES
	Pollution Change	Condition	NA
	. enamen enamge	Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	LOW
	Landscape Patch Structure	Condition	LOW
	Vegetation Composition	Condition	HIGH
unction Rating Summ	narv		
Function	iai y	Metrics	Rating
Hydrology		Condition	HIGH
Water Quality		Condition	LOW
y		Condition/Opportunity	LOW
		Opportunity Presence (Y/N)	YES
Habitat		Condition	LOW



Photograph 19 – PW1-2-Wetland 6, Facing South



Photograph 21 – PW3-2-Wetland 8, Facing Southeast



Photograph 20 – PW2-2-Wetland 7, Facing Northwest



Photograph 22 – PW4-2-Wetland 14, Facing Northeast



Photograph 23 – PS4-2-Stream 24, Facing Downstream



Photograph 25 – PW5-2-Wetland 16, Facing Southeast



Photograph 24 – PS5-2-Stream 25, Facing Upstream



Photograph 26 – PS1-2-Stream 27, Reach 2, Facing Downstream



Photograph 27 – PS2-2-Stream 28, Facing Upstream



Photograph 29 - PS3-2-Stream 29, Reach 1, Facing Downstream



Photograph 28 – PW6-2-Wetland 17, Facing North



Photograph 30 – PS3-2-Stream 29, Reach 2, Facing Downstream



Photograph 31 – PS3-2-Stream 29, Reach 3, Facing Downstream



Photograph 33 – PS7-2-Stream 30, Reach1, Facing Downstream

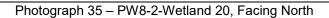


Photograph 32 – PS6-2-Stream 25, Facing Downstream



Photograph 34 – PS7-2-Stream 30, Reach2, Facing Upstream







Photograph 36 – PW9-2-Wetland 19, Facing East



# DEPARTMENT OF THE ARMY WILMINGTON DISTRICT, CORPS OF ENGINEERS 151 PATTON AVENUE ROOM 208 ASHEVILLE, NORTH CAROLINA 28801-5006

December 15, 2020

Regulatory Division

Action ID: SAW-2018-01071

Ms. Haley Gentry
City of Charlotte
Aviation Department
5601 Wilkinson Boulevard
Charlotte, North Carolina 28208

Dear Ms. Gentry:

Enclosed is a Department of the Army permit to place fill material in 12,057 linear feet of stream and 5.89 acres of wetlands to facilitate the expansion and improvement of Charlotte Douglas International Airport. The Corps is issuing this permit in response to your written request of January 29, 2020, and the ensuing administrative record.

Any deviation in the authorized work will likely require modification of this permit. If a change in the authorized work is necessary, you should promptly submit revised plans to the Corps showing the proposed changes. You may not undertake the proposed changes until the Corps notifies you that your permit has been modified.

Carefully read your permit. The general and special conditions are important. Your failure to comply with these conditions could result in a violation of Federal law. Certain significant conditions require that:

- a. You must complete construction before December 31, 2033.
- b. You must notify this office in advance as to when you intend to commence and complete work.
- c. You must allow representatives from this office to make periodic visits to your worksite as deemed necessary to assure compliance with permit plans and conditions.
- d. In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined in the U.S. Army Corps of Engineers, Wilmington District, Compensatory Mitigation Responsibility Transfer

Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization.

You should address all questions regarding this authorization to David L. Shaeffer at the Charlotte Regulatory Field Office, telephone (704) 510-1437.

### FOR THE COMMANDER

Scott Jones, PWS

Chief

Asheville/Charlotte Regulatory Field Office

### **Enclosures**

cc (with enclosures):

Ms. Kelly Thames
404 South Church Street
Suite 900
Charlotte, North Carolina 28202

NOAA/National Ocean Service 1315 East-West Highway Rm 7316 Silver Spring, Maryland 20910-3282

U.S. Fish and Wildlife Service 160 Zillicoa Street Asheville, North Carolina 28801

Mr. Fritz Rohde National Marine Fisheries Service Habitat Conservation Division 101 Pivers Island Road Beaufort, North Carolina 28516

Mr. Todd Bowers U.S. Environmental Protection Agency Region IV Wetlands Protection Section 61 Forsyth Street, SW Atlanta, Georgia 30303 Mr. Jonathan Howell Division of Coastal Management N.C. Department of Environmental Quality 400 Commerce Avenue Morehead City, North Carolina 28557

Dr. Pace Wilber National Marine Fisheries Service 219 Fort Johnson Road Charleston, South Carolina 29412-9110

cc (via email):

NC DENR - Division of Water Resources

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL						
Applicant:	File Number:	File Number:				
City of Charlotte - Aviation Department	SAW-2018-01071		<u>12/15/2020</u>			
Attached is:		See Section below				
INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A				
PROFFERED PERMIT (Standard Permit or Letter of permission)		В				
PERMIT DENIAL		С				
APPROVED JURISDICTIONAL DETERMINATION		D				
PRELIMINARY JURISDICTIONAL DETERMINATION		E				

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision.

Additional information may be found at or <a href="http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx">http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx</a> or the Corps regulations at 33 CFR Part 331.

#### A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final
  authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your
  signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all
  rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the
  permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

### B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final
  authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your
  signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all
  rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the
  permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.
- C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

# **D: APPROVED JURISDICTIONAL DETERMINATION:** You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the district engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.					
SECTION II - REQUEST FOR APPEAL or OBJECTIONS	TO AN INITIAL PROFESSED	DEDMIT			
REASONS FOR APPEAL OR OBJECTIONS: (Describe y proffered permit in clear concise statements. You may attac objections are addressed in the administrative record.)	our reasons for appealing the de-	cision or your objections to an initial			
ADDITIONAL INFORMATION: The appeal is limited to a record of the appeal conference or meeting, and any suppler clarify the administrative record. Neither the appellant nor the However, you may provide additional information to clarify	nental information that the review he Corps may add new informat	w officer has determined is needed to ion or analyses to the record.			
record.					
POINT OF CONTACT FOR QUESTIONS OR INFORMA	TION:	THE PERSON NAMED IN			
		arding the appeal process you may			
POINT OF CONTACT FOR QUESTIONS OR INFORMA  If you have questions regarding this decision and/or the	If you only have questions rega also contact:	arding the appeal process you may strative Appeal Review Officer			
POINT OF CONTACT FOR QUESTIONS OR INFORMA If you have questions regarding this decision and/or the appeal process you may contact:  District Engineer, Wilmington Regulatory Division	If you only have questions rega also contact: Mr. Phillip Shannin, Adminis	strative Appeal Review Officer			
POINT OF CONTACT FOR QUESTIONS OR INFORMA If you have questions regarding this decision and/or the appeal process you may contact:  District Engineer, Wilmington Regulatory Division Attn: David L. Shaeffer Asheville Regulatory Office U.S Army Corps of Engineers	If you only have questions regardless contact:  Mr. Phillip Shannin, Adminis CESAD-PDO U.S. Army Corps of Engineer 60 Forsyth Street, Room 10M	strative Appeal Review Officer			
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POINT OF CONTACT FOR QUESTIONS OR INFORMA If you have questions regarding this decision and/or the appeal process you may contact:  District Engineer, Wilmington Regulatory Division Attn: David L. Shaeffer Asheville Regulatory Office U.S Army Corps of Engineers 151 Patton Avenue, Room 208 Asheville, North Carolina 28801  RIGHT OF ENTRY: Your signature below grants the right	If you only have questions regardless contact:  Mr. Phillip Shannin, Administ CESAD-PDO U.S. Army Corps of Engineer 60 Forsyth Street, Room 10M Atlanta, Georgia 30303-8801 Phone: (404) 562-5137  of entry to Corps of Engineers programming the course of the appeal process.	estrative Appeal Review Officer rs, South Atlantic Division 115 rersonnel, and any government ess. You will be provided a 15 day			
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For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: David L. Shaeffer , 69 Darlington Avenue, Wilmington, North Carolina 28403

For Permit denials, Proffered Permits and Approved Jurisdictional Determinations send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Phillip Shannin, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

# SPECIAL CONDITIONS Action ID: SAW-2018-01071

**Special condition 1:** All work authorized by this permit shall be performed in strict compliance with the attached impact maps plans Figures 1-6 dated October 26, 2019 and the detailed design plans Sheets 1-26 dated January 31, 2020 for Phase I of the project, which are a part of this permit. The Permittee shall submit detailed design plans for the conceptual phases of the project and receive written approval from the Corps prior to commencement of the work. The Permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any modification to the attached permit plans must be approved by the U.S. Army Corps of Engineers (Corps) prior to any active construction in waters or wetlands.

**Rationale:** This condition ties the permittee's project plans to the permit.

**Special condition 2:** Except as authorized by this permit or any Corps-approved modification to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area. This prohibition applies to all borrow and fill activities connected with this project.

**Rationale:** This condition clarify that only the impacts to waters of the US specified by the project plans are approved by this permit.

**Special condition 3:** Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters and/or wetlands.

**Rationale:** This condition clarify that the project cannnot impound waters or reduce the reach of waters without being specifically authorized by the permit.

**Special condition 4:** All mechanized equipment shall be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the Permittee shall immediately report it to the N.C. Division of Water Resources at (919) 733-3300 or (800) 858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act shall be followed.

**Rationale:** This condition addresses potential indirect impacts to waters of the U.S. from mechanized equipment fluids.

**Special condition 5:** The Permittee shall implement all necessary measures to ensure the authorized activity does not kill, injure, capture, harass, or otherwise harm any federally-listed threatened or endangered species. While accomplishing the authorized work, if the Permittee discovers or observes an injured or dead threatened or endangered species, the U.S. Army Corps of Engineers, Wilmington District, Charlotte Field Office, will be immediately notified to initiate the required Federal coordination.

**Rationale:** This special condition ensures continued compliance with the Endangered Species Act.

**Special condition 6:** The Permittee shall notify the U.S. Army Corps of Engineers in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.

**Rationale:** This condition facilitates timely inspections for Section 404 CWA compliance.

Special Condition 7: The Permittee shall conduct an onsite preconstruction meeting between its representatives, the contractor's representatives and the appropriate U.S. Army Corps of Engineers Project Manager prior to undertaking any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all terms and conditions contained within the Department of the Army permit. The Permittee shall schedule the preconstruction meeting for a time frame when the Corps and NCDWR Project Managers can attend. The Permittee shall invite the Corps and NCDWR Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting. The thirty (30) day requirement can be waived with the concurrence of the Corps.

Rationale: This condition gives the Corps and agencies the opportunity to meet with the contractors and applicant to dicuss permit conditions and to answer questions.

Special condition 8: The Permittee shall use only clean fill material for this project. The fill material shall be free of items such as trash, construction debris, metal and plastic products, and concrete block with exposed metal reinforcement bars. Soils used for fill shall not be contaminated with any toxic substance in concentrations governed by Section 307 of the Clean Water Act. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source.

**Rationale:** This condition addresses potential indirect impacts to waters of the U.S. from contaminated fill material.

**Special condition 9:** The Permittee shall take measures necessary to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with any water in or entering into waters of the United States. Water inside coffer dams or

casings that has been in contact with concrete shall only be returned to waters of the United States when it no longer poses a threat to aquatic organisms (concrete is set and cured).

**Rationale:** This condition addresses potential indirect impacts to waters of the U.S. from live concrete.

**Special condition 10:** The Permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions and drawings shall be available at the project site during construction and maintenance of this project.

**Rationale:** This condition specifies that the permittee is responsible for discharges of dredged or fill material in waters of the United States done by their contractors.

### Special condition 11:

- 1) During the clearing phase of the project, heavy equipment shall not be operated in surface waters or stream channels. Temporary stream crossings will be used to access the opposite sides of stream channels. All temporary diversion channels and stream crossings will be constructed of non-erodible materials. Grubbing of riparian vegetation will not occur until immediately before construction begins on a given segment of stream channel.
- 2) No fill or excavation impacts for the purposes of sedimentation and erosion control shall occur within jurisdictional waters, including wetlands, unless the impacts are included on the plan drawings and specifically authorized by this permit. This includes, but is not limited to, sediment control fences and other barriers intended to catch sediment losses.
- 3) The Permittee shall remove all sediment and erosion control measures placed in waters and/or wetlands, and shall restore natural grades on those areas, prior to project completion.
- 4) The Permittee shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the "North Carolina Sediment and Erosion Control Planning and Design Manual" to ensure compliance with the appropriate turbidity water quality standard. Erosion and sediment control practices shall be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to ensure compliance with the appropriate turbidity water quality standards. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the

project shall remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4). Adequate sedimentation and erosion control measures shall be implemented prior to any ground disturbing activities to minimize impacts to downstream aquatic resources. These measures shall be inspected and maintained regularly, especially following rainfall events. All fill material shall be adequately stabilized at the earliest practicable date to prevent sediment from entering into adjacent waters or wetlands.

**Rationale:** This condition documents the permittees responsibility to employ appropriate sediment and erosion control practices to avoid potential indirect impacts to jurisdicitonal waters.

**Special condition 12:** The Permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

Rationale: This condition documents the permittee's responsibility to restore permitted impacts to their pre-project condition.

**Special condition 13:** Violation of these permit conditions or violation of Section 404 of the Clean Water Act shall be reported to the Corps in writing and by telephone at: 828-271-7980 within 24 hours of the Permittee's discovery of the violation.

Rationale: This condition specify compliance reporting contacts and requirements.

**Special condition 14:** In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form for each phase of the project. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit.

**Rationale:** This permit condition was added to document compensatory mitigation requirements for the project, to ensure compliance with the 404(b)(1) guidelines, and to ensure that project impacts were not more than minimal.

**Special Condition 15:** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area. All discharges of dredged or fill material within waters of the United States shall be designed and constructed to maintain low flows to sustain the movement of aquatic species.

**Rationale:** This condition addresses potential issues associated with the installation of improperly designed and/or installed culverts.

### **Special Condition 16:**

- 1) Measures shall be included in the culvert construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a culvert or pipe shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.
- 2) The Permittee shall implement all reasonable and practicable measures to ensure that equipment, structures, fill pads, work, and operations associated with this project do not adversely affect upstream and/or downstream reaches. Adverse effects include, but are not limited to, channel instability, flooding, and/or stream bank erosion. The Permittee shall routinely monitor for these effects, cease all work when detected, take initial corrective measures to correct actively eroding areas, and notify this office immediately. Permanent corrective measures may require additional authorization by the U.S. Army Corps of Engineers.
- 3) Culverts placed within wetlands must be installed in a manner that does not restrict the flows and circulation patterns of waters of the United States. Culverts placed across wetland fills purely for the purposes of equalizing surface water shall not be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

**Rationale:** This condition documents the permittee's responsibility as it relates to the installation of culverts.

**Special Condition 17:** If previously undiscovered cultural resources are encountered while condcuting grading within the project area, the Corps shall be immediately notified in writing and by telephone at: 704-510-1439within 24 hours of the Permittee's discovery of the resources so that coordination can be initiated with the North Carolina State Historic Preservation Office.

**Rationale:** This is to address the North Carolina State Historic Preservation Office regarding the potential for the discovery of cultural resources during the grading operations.

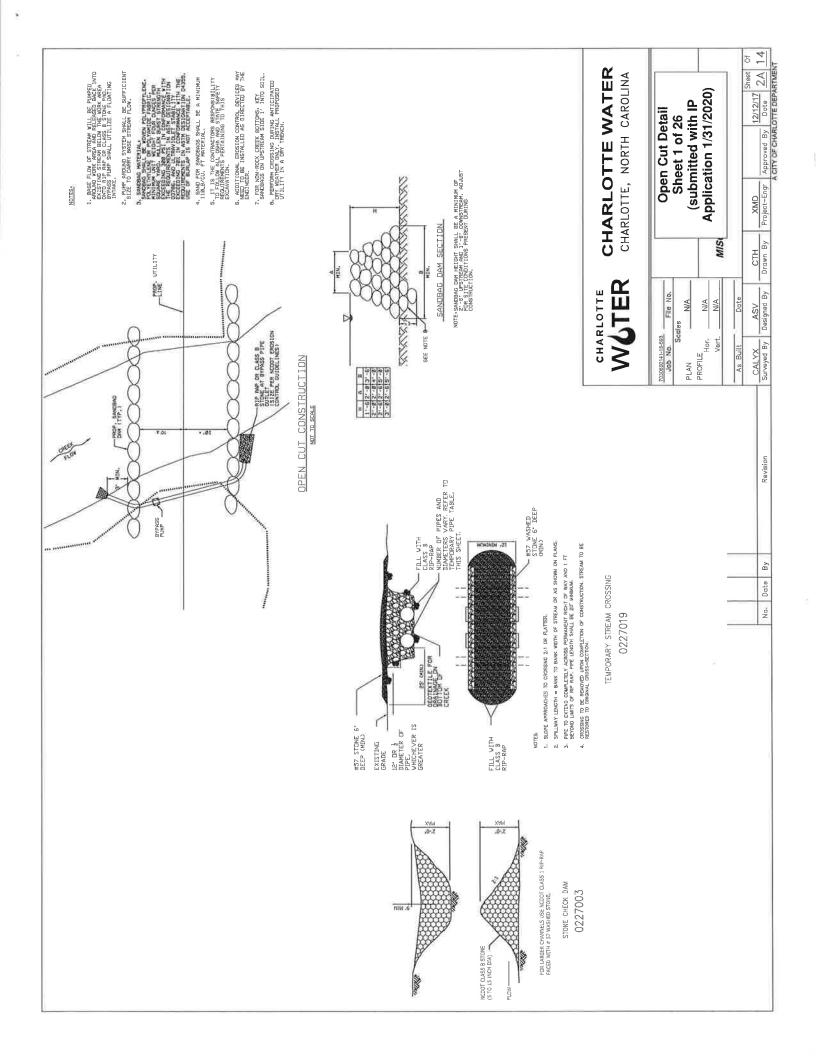
**Special Condition 18:** Prior to the commencement of construction in waters on any airport element, the Permittee shall submit a Finding of No Significant Impact and/or Record of Decision issued by the FAA for that project element.

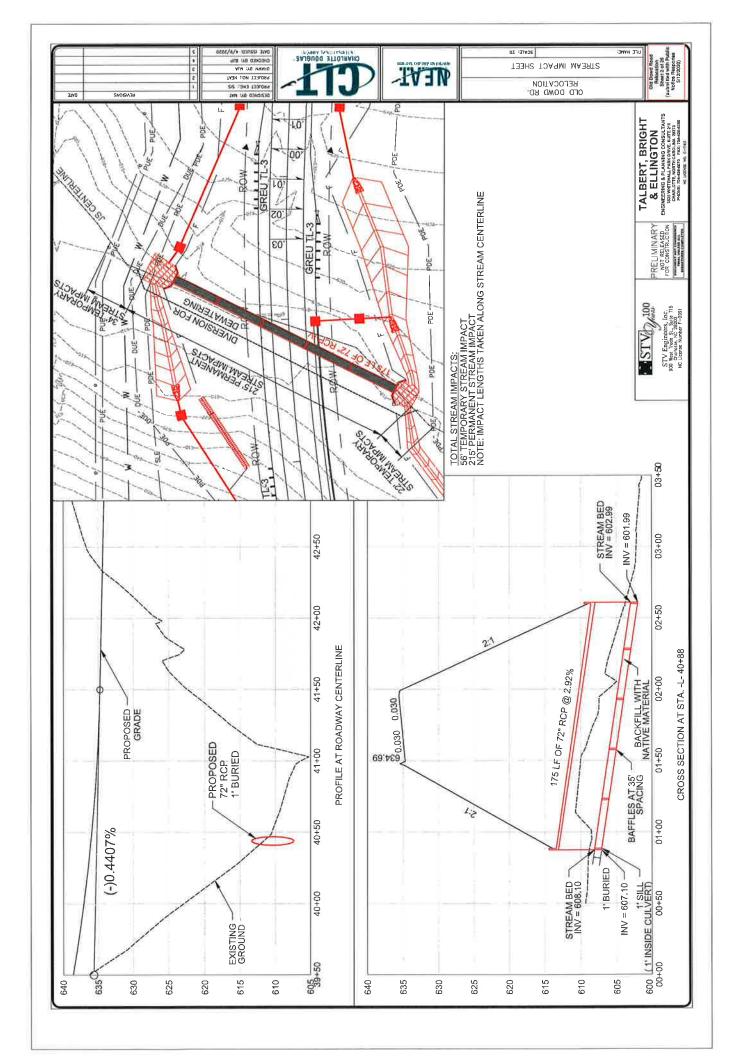
**Rationale:** This condition is neccesary to since these documents must be included in the Corps adminstrative record.

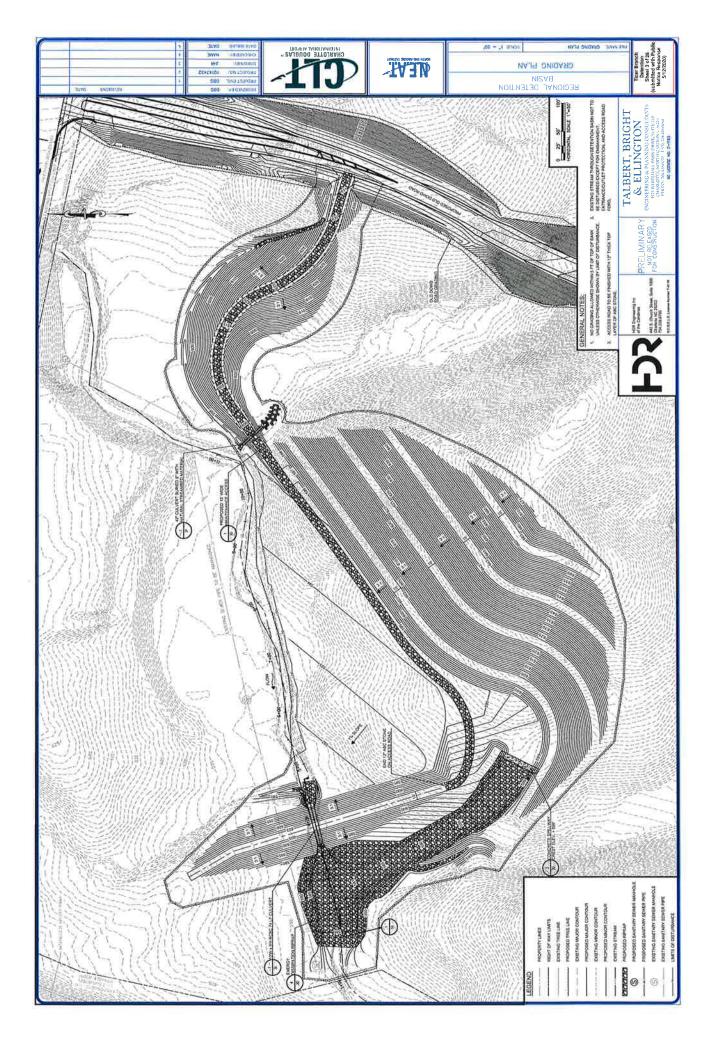
**Special Condition 19:** Streams within the project limits that would experience flooding from the Ticer Branch and Coffey Creek in-line detention basins, as well as the stream below each detention basin, shall be monitored by the Permittee to establish any loss of aquatic function. Monitoring shall be done in accordance with the Proposed Monitoring Plan dated August 4, 2020. Proposed monitoring locations shall be submitted to the Corps for approval at least 60 days prior to commencement of construction of each detention basin. Any modifications to the Proposed Monitoring Plan must be submitted to the Corps for approval. Annual reports of monitoring shall be submitted to the Corps and the North Carolina Division of Water Resources Division on June 1 of each year which commences June 2021 with a report that details results collected by that date at that time.

If monitoring indicates changes in geomorphology or a degradation of function as indicated in the Monitoring Report, the Permittee shall notify the Corps and provide a detailed analysis of the situation. Additional monitoring and/or remedial actions may be required by the Corps. If the Corps determines that there has been a loss of function that cannot be remedied to the Corps' satisfaction within any of the monitored streams, the Permittee shall submit a corrective action plan plan to the Corps for review and approval.

Rationale: This condition is necessary to address any potential indirect effects associated with the large in-line detention structure since they are unique and not widley used at this scale.







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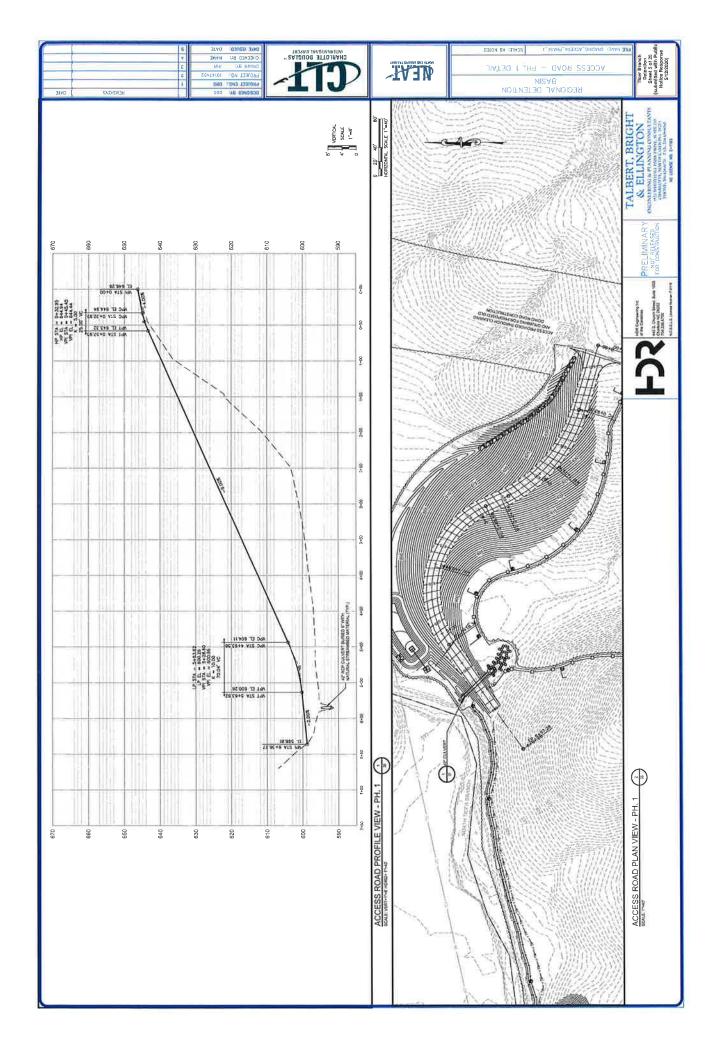


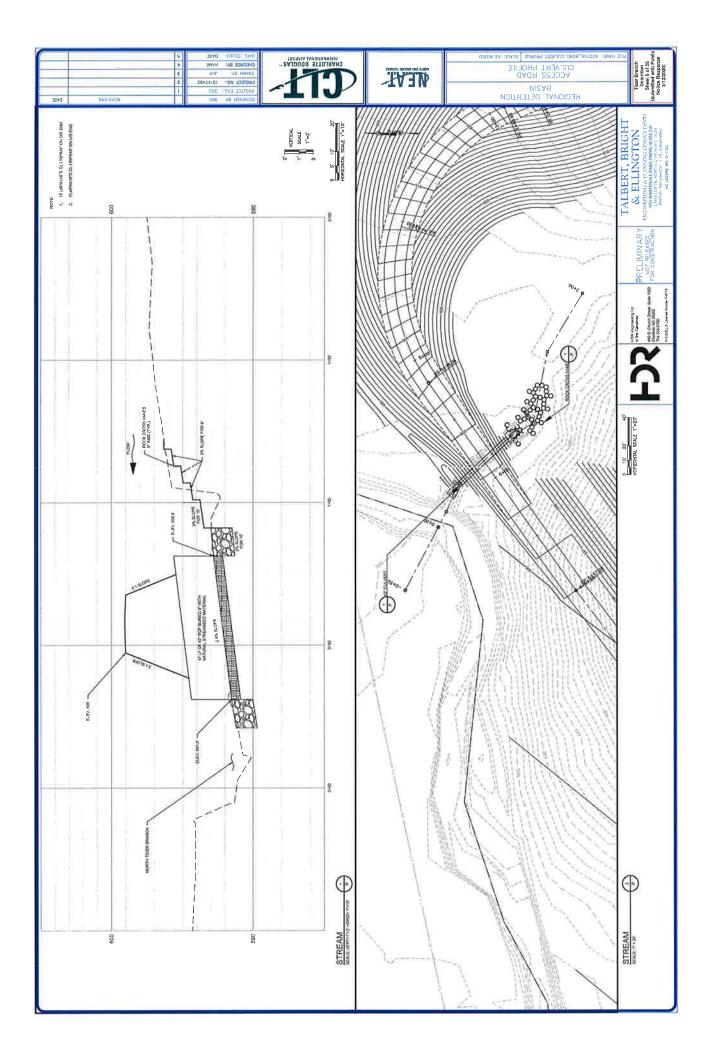
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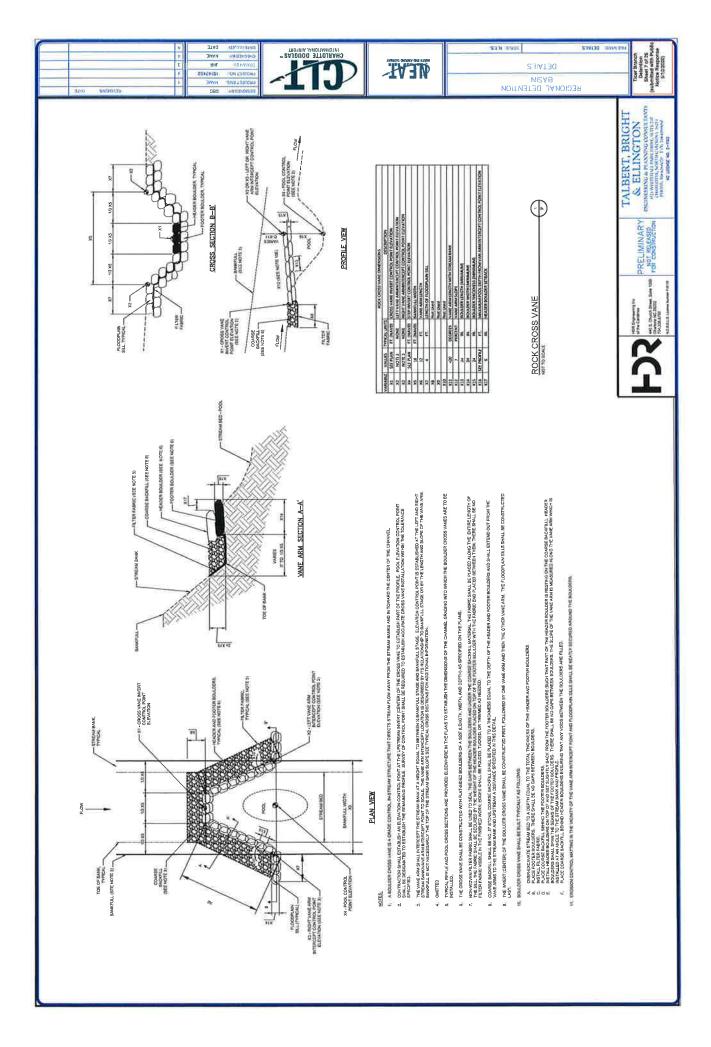
ENGINEERING FORWARD CONSULTANTS

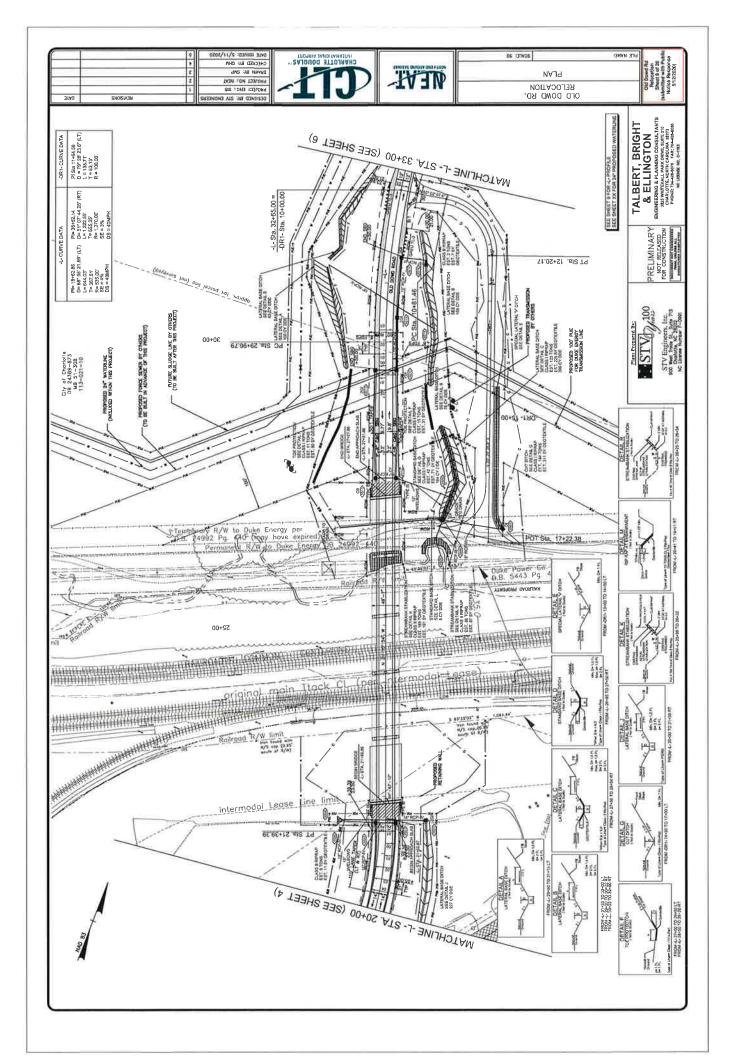
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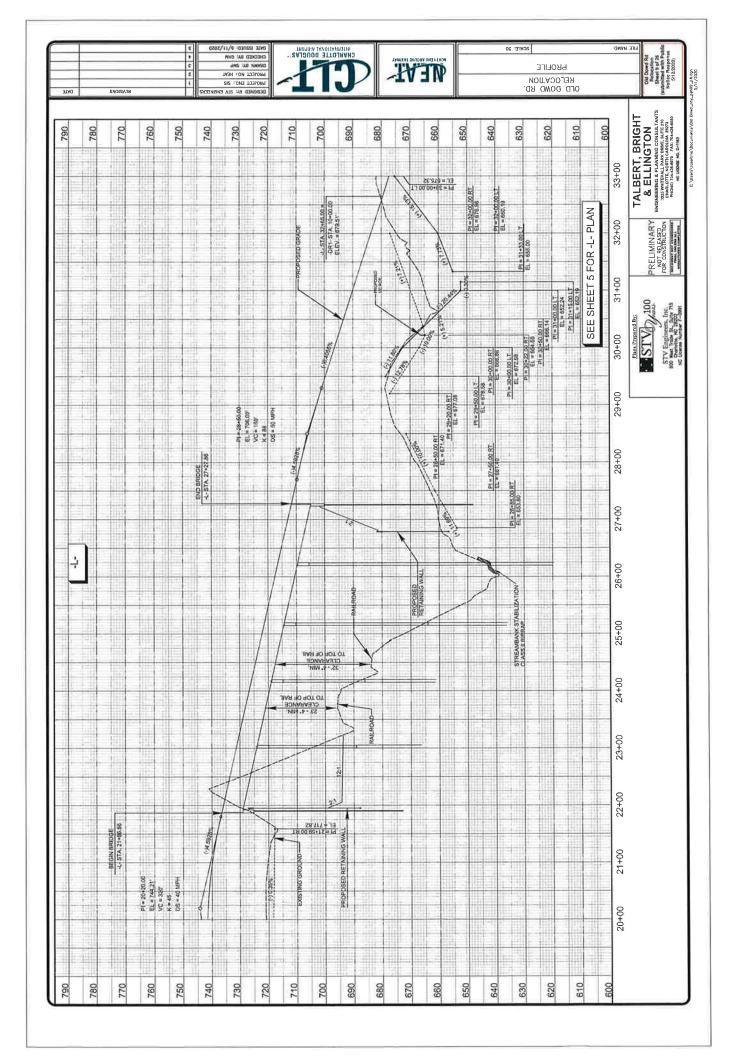
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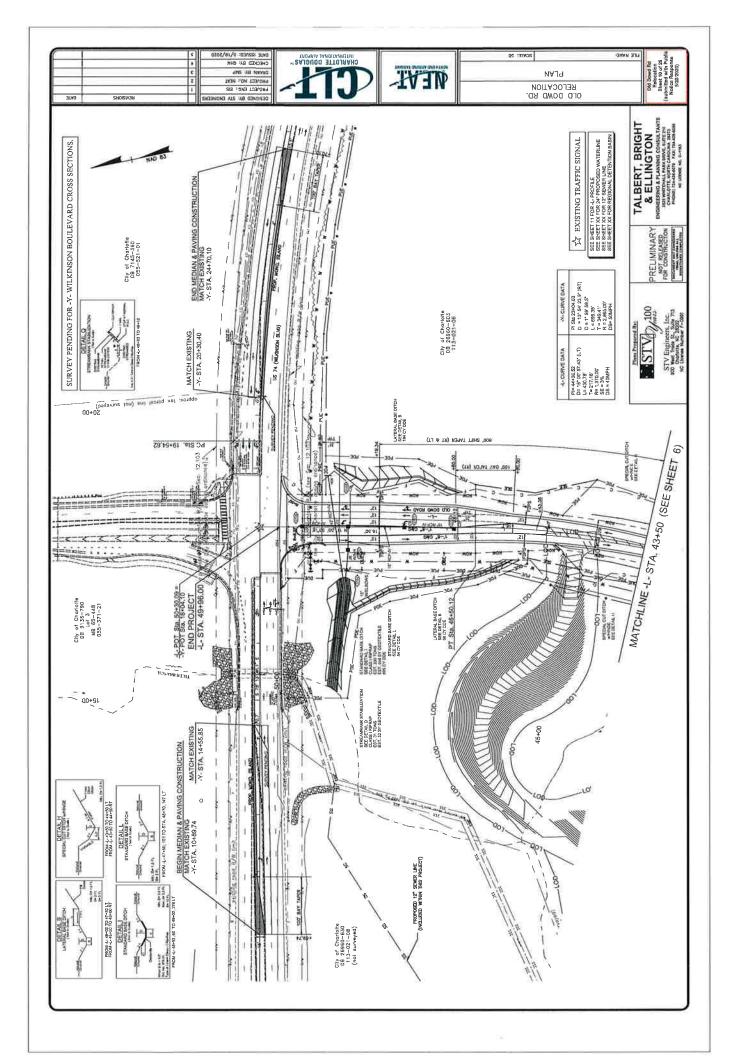


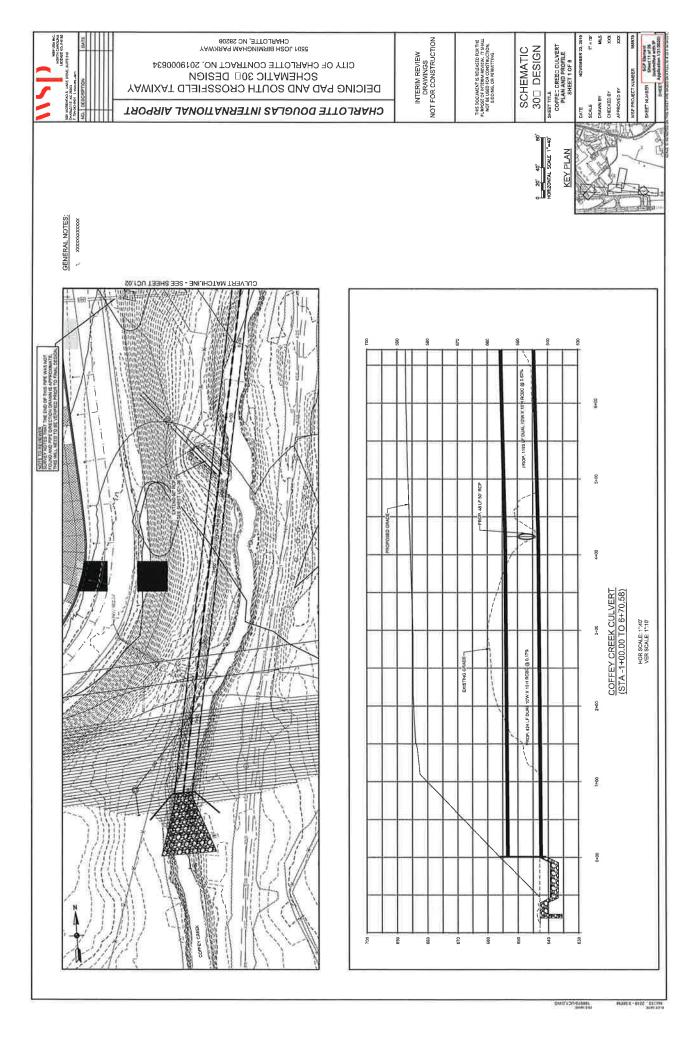










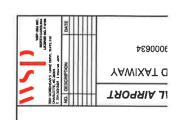


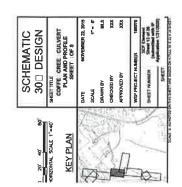


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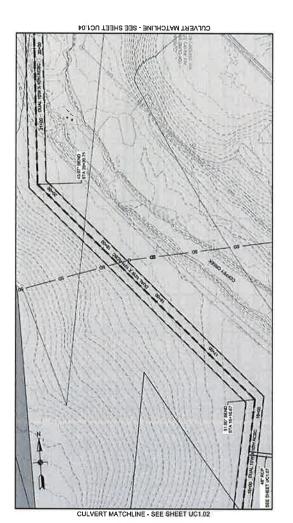
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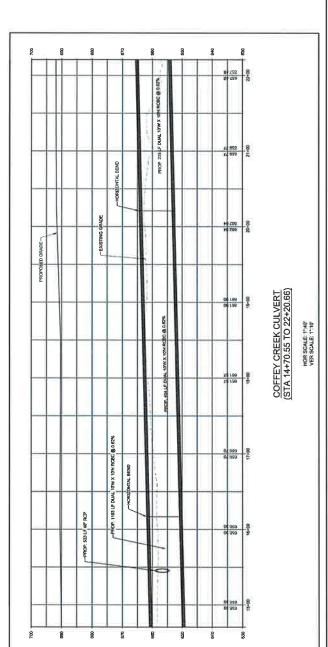
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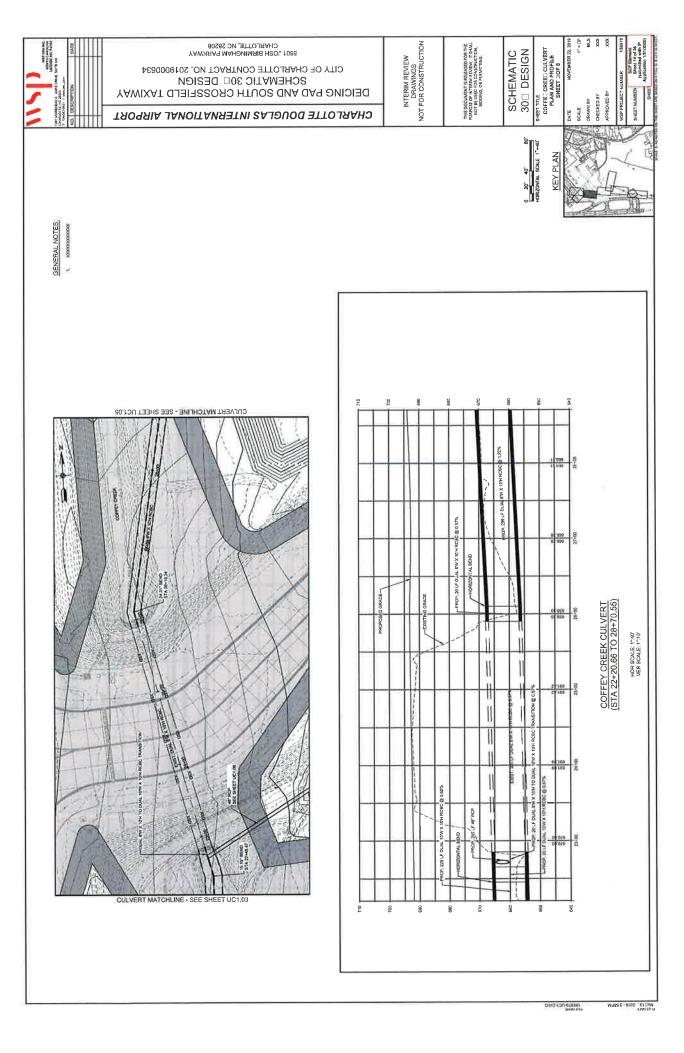


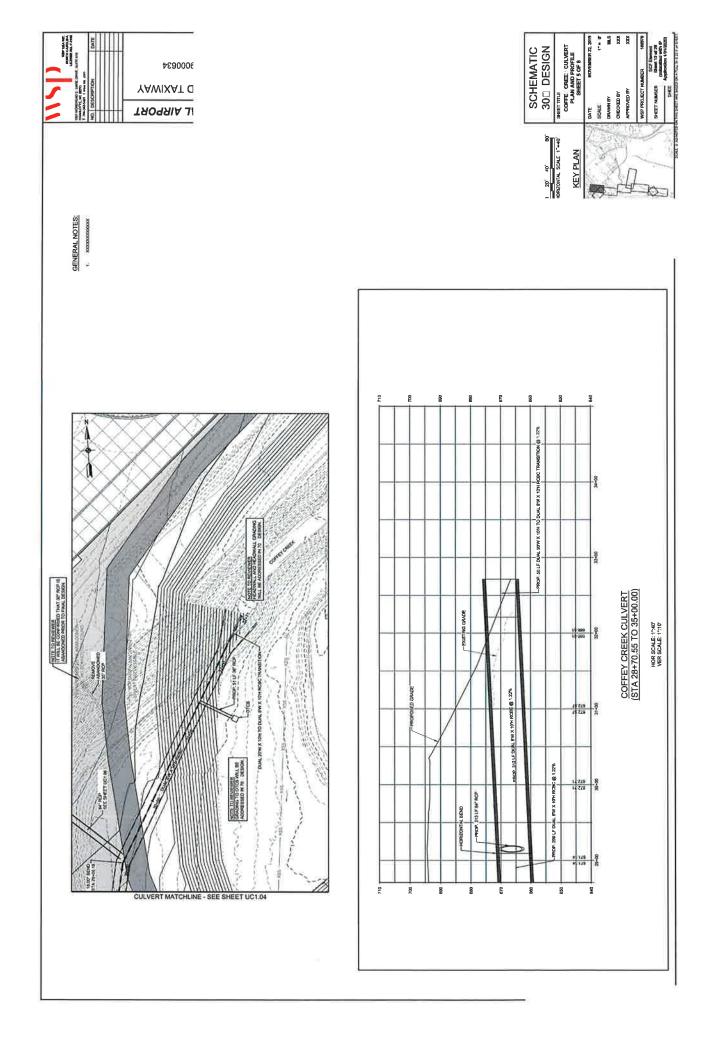


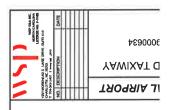
GENERAL NOTES:











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30 DESIGN

SEETING

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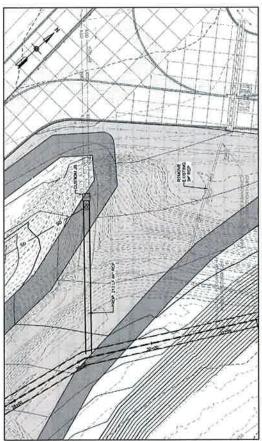
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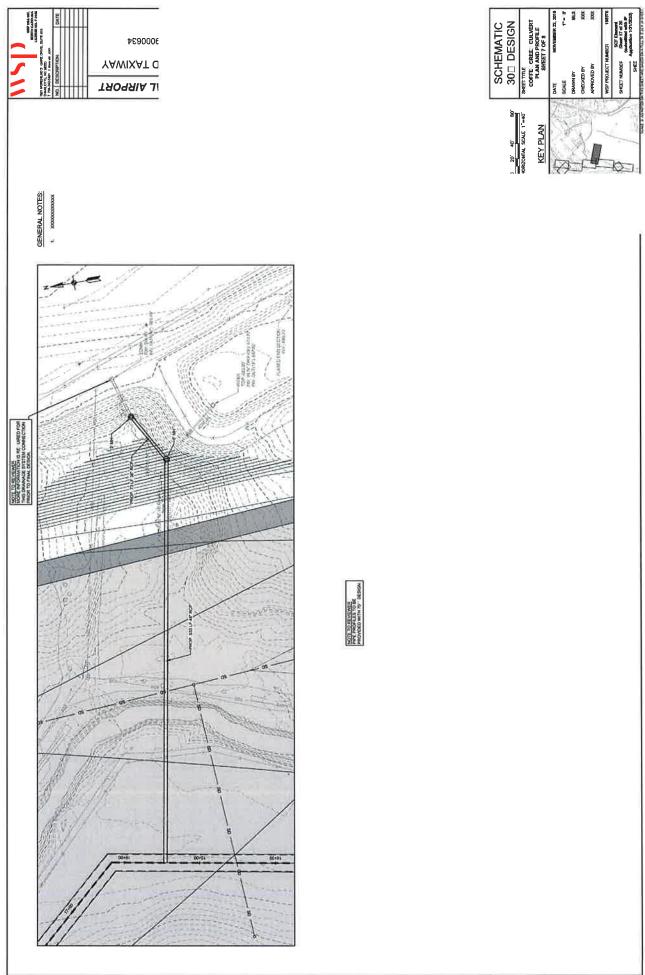
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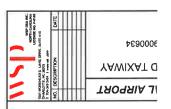
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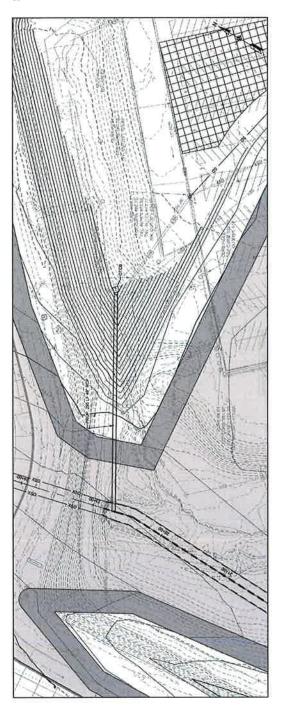
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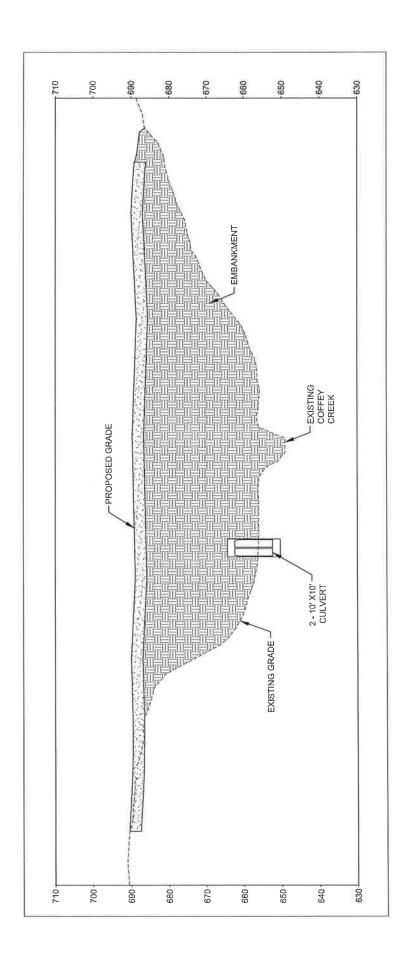
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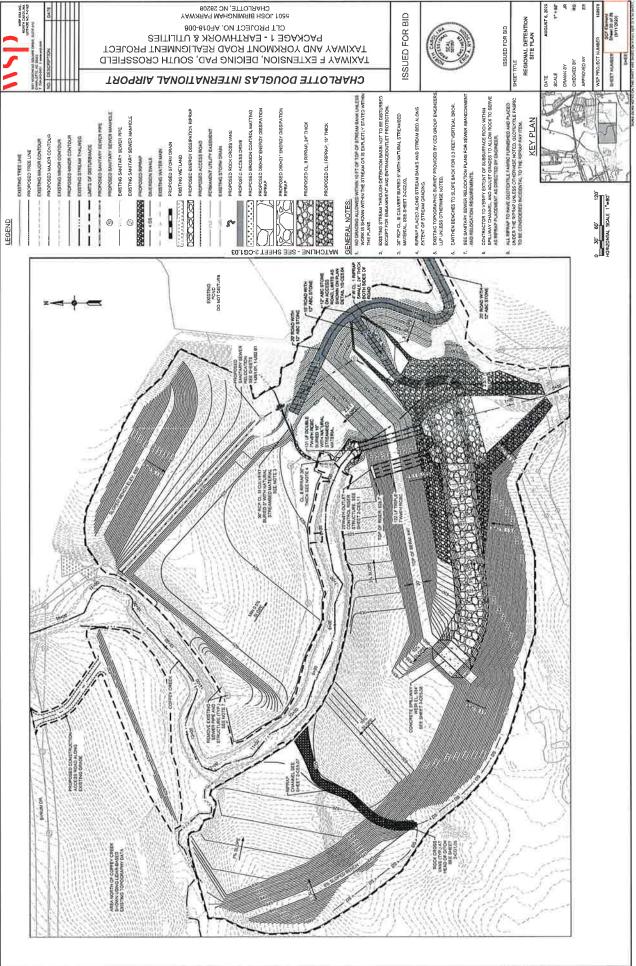
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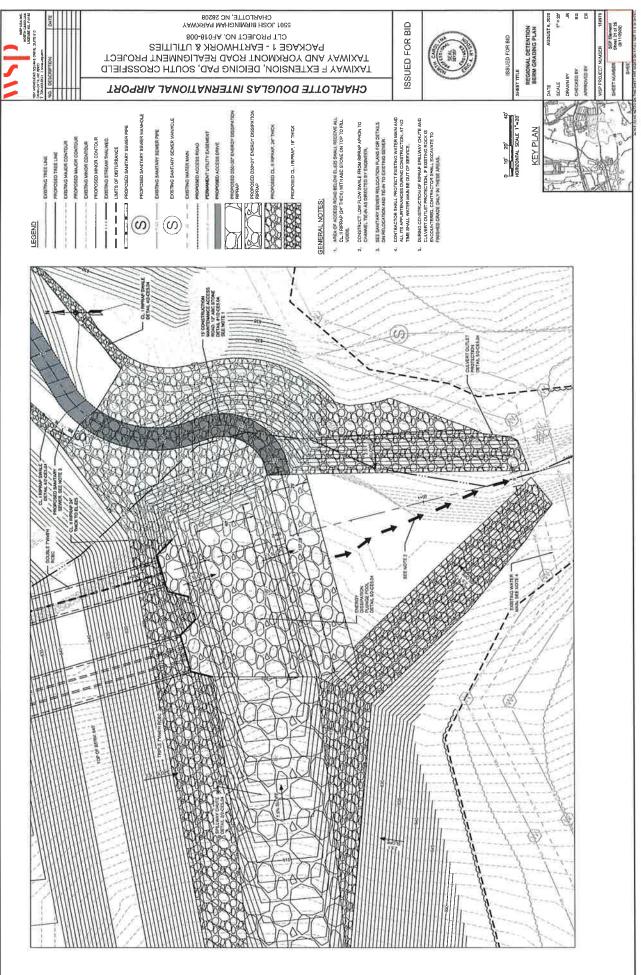
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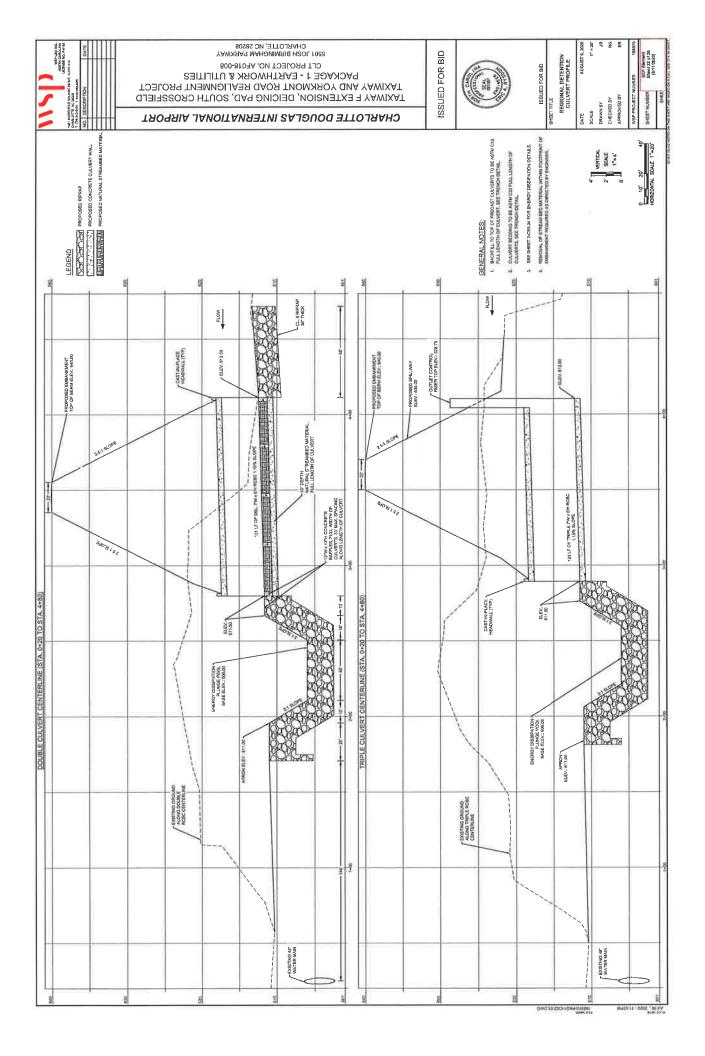


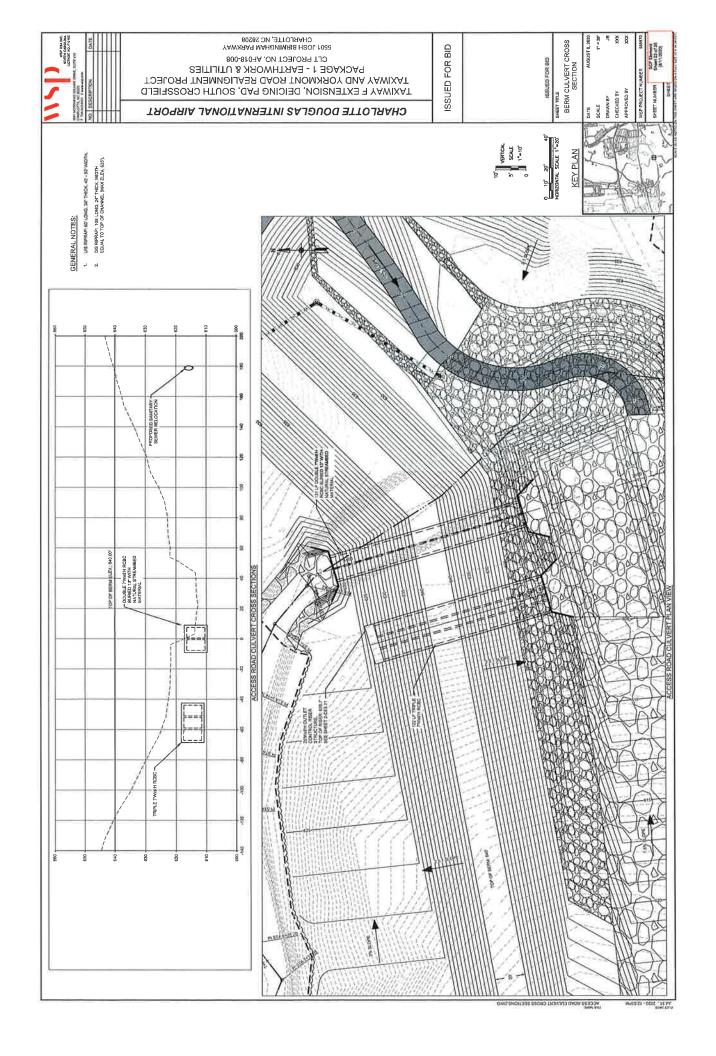
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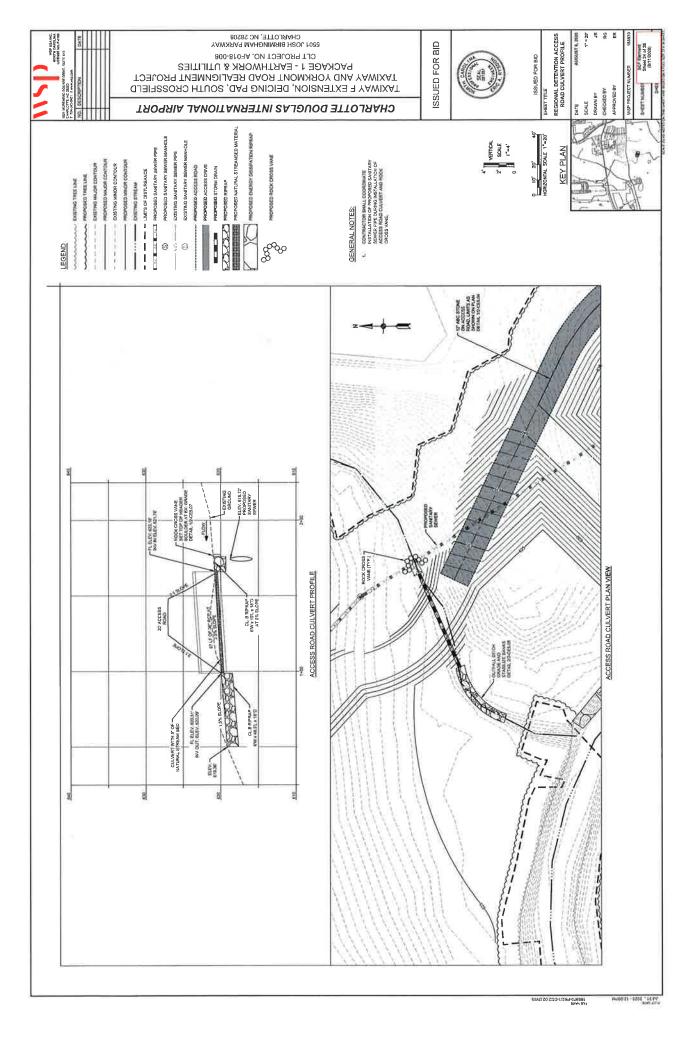














## CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT

TAXIWAY F EXTENSION, DEICING PAD, SOUTH CROSSFIELD
TAXIWAY AND YORKMONT ROAD REALIGNMENT PROJECT
CLT PROJECT NO. AFO18-008
CLT PROJECT NO. AFO18-008

SERON TO SELVENT NO. AFO18-008

TO SELVENT NO. AFO18-008

TO SELVENT NO. AFO18-008

5501 JOSH BIRMINGHAM PARKWAY
CHARLOTTE, NC 26208

ISSUED FOR BID

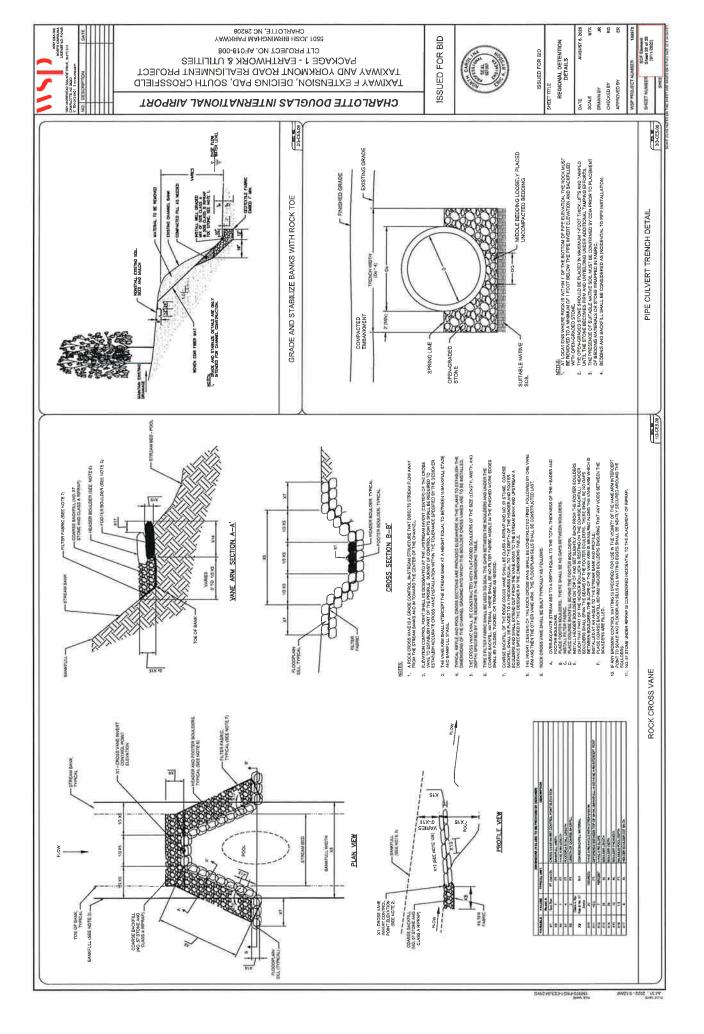
ISSUED FOR BID

0 10' 20' 40' HORIZONTAL SCALE 1"-20'

KEY PLAN

S' SCALE

ACCESS ROAD CULVERT CROSS SECTION



ROY COOPER Governor MICHAEL S. REGAN Secretary S. DANIEL SMITH Director



August 21, 2020

DWR # 20001195 Ver 17 Mecklenburg County

City of Charlotte – Aviation Department Attn: Mr. Brent Cagle 5601 Wilkinson Blvd Charlotte NC 28208

Subject: Approval of Individual 401 Water Quality Certification with Additional Conditions

**CLT Airport Expansion** 

USACE Action ID. No. SAW-2018-01071

Dear Mr. Cagle:

Attached hereto is a copy of Certification No. #WQC004233 issued to Mr. Brent Cagle and City of Charlotte – Aviation Department, dated August 21, 2020. Please note that you should get any other federal, state or local permits before proceeding with the subject project, including those required by (but not limited to) Sediment and Erosion Control, Non-Discharge, and Water Supply Watershed regulations.

This approval and its conditions are final and binding unless contested. This Certification can be contested as provided in Articles 3 and 4 of General Statute 150B by filing a written petition for an administrative hearing to the Office of Administrative Hearings (hereby known as OAH) within sixty (60) calendar days.

A petition form may be obtained from the OAH at <a href="http://www.ncoah.com/">http://www.ncoah.com/</a> or by calling the OAH Clerk's Office at (919) 431-3000 for information. A petition is considered filed when the original and one (1) copy along with any applicable OAH filing fee is received in the OAH during normal office hours (Monday through Friday between 8:00am and 5:00pm, excluding official state holidays).

The petition may be faxed to the OAH at (919) 431-3100, provided the original and one copy of the petition along with any applicable OAH filing fee is received by the OAH within five (5) business days following the faxed transmission.

Mailing address for the OAH:



City of Charlotte – Aviation Department DWR Project #20001195 V17 Individual Certification #WQC004233 Page 2 of 9

If sending via US Postal Service:

If sending via delivery service (UPS, FedEx, etc):

Office of Administrative Hearings 6714 Mail Service Center

Office of Administrative Hearings 1711 New Hope Church Road

Raleigh, NC 27699-6714

Raleigh, NC 27609-6285

One (1) copy of the petition must also be served to DEQ:

William F. Lane, General Counsel Department of Environmental Quality 1601 Mail Service Center Raleigh, NC 27699-1601

Unless such a petition is filed, this Certification shall be final and binding.

This Certification completes the review of the Division under section 401 of the Clean Water Act and 15A NCAC 02H .0500. Contact Sue Homewood at 336-776-9693 or <a href="mailto:sue.homewood@ncdenr.gov">sue.homewood@ncdenr.gov</a> if you have any questions or concerns.

Sincerely,

-DocuSigned by:

Paul Wojoski

----949D91BA53EF4E0...

Paul Wojoski, Supervisor 401 & Buffer Permitting Branch

cc: Kelly Thames, HDR (via email)

**USACE Charlotte Regulatory Field Office (via email)** 

Olivia Munzer, NC WRC (via email)

Todd Bowers, EPA, (via email)

DWR MRO 401 file

DWR 401 & Buffer Permitting Branch file

Filename: 001195v17CLTExpansion(Mecklengburg) 401\_IC

## NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

**CERTIFICATION** #WQC004233 is issued in conformity with the requirements of Section 401, Public Laws 92-500 and 95-217 of the United States and subject to North Carolina's Regulations in 15 NCAC 02H .0500, to Mr. Brent Cagle and City of Charlotte – Aviation Department, who have authorization for the impacts listed below, as described within your application received by the N.C. Division of Water Resources (Division) on February 4, 2020 and subsequent information on June 3, 2020, July 23, 2020 and August 10, 2020, and by Public Notice issued by the U. S. Army Corps of Engineers on February 18, 2020.

The State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of the Public Laws 92-500 and PL 95-217 if conducted in accordance with the application, the supporting documentation, and conditions hereinafter set forth.

This approval requires you to follow the conditions listed in the Certification below.

#### **Conditions of Certification:**

1. The following phased impacts are hereby approved. No other impacts are approved, including incidental impacts. [15A NCAC 02H .0506(b)]

Phase 1

Type of Impact	Amount Approved (units) Permanent	Amount Approved (units) Temporary
Stream		
Perennial streams	3,159 (linear feet) – permanent loss of waters  174 (linear feet) – non- loss of waters	246 (linear feet)
Intermittent streams	125 (linear feet) – permanent loss of waters 30 (linear feet) – non-loss of waters	0 (linear feet)
404/401 Wetlands	0.82 (acres)	0 (acres)

Phase 2

Type of Impact	Amount Approved (units) Permanent	Amount Approved (units) Temporary
Stream		
Perennial streams	7,958 (linear feet)	0 (linear feet)
Intermittent streams	193 (linear feet)	0 (linear feet)
404/401 Wetlands	5.07 (acres)	0 (acres)

2. Mitigation must be provided for the proposed impacts as specified in the table below. Mitigation for each Phase will be provided prior to commencing construction on any impact areas within that Phase. The Division has received an acceptance letter from the City of Charlotte Umbrella Stream and Wetland Mitigation Bank to meet this mitigation requirement. Until the City of Charlotte Umbrella Stream and Wetland Mitigation Bank receives and clears your payment, and proof of payment has been provided to this Office, no impacts specified in this Authorization Certificate shall occur. For accounting purposes, this Authorization Certificate authorizes payment to the City of Charlotte Umbrella Stream and Wetland Mitigation Bank to meet the following compensatory mitigation requirement [15A NCAC 02H .0506 (c)]:

	Compensatory Mitigation Required	River and Sub-basin Number
Stream	Phase 1a (NEAT) – 1,302 (credits)	Catawba
	Phase 1b (SCF) – 1,857 (credits)	03050101 and 03050103
	Phase 2 – 7,958 (credits)	
Wetland	Phase 1a (NEAT) – 0.68 (credits)	Catawba
	Phase 1b (SCF) – 0.14 (credits)	03050101 and 03050103
	Phase 2 – 5.07 (credits)	

- 3. This approval is for the purpose and design described in your application and as described in the Public Notice. The plans and specifications for this project are incorporated by reference and are an enforceable part of the Certification. When final design plans are developed for a Phase II activities, they shall be submitted to the Division for review to determine if modification to this 401 Water Quality Certification is required. If a modification is required, an application shall be submitted to the Division with the appropriate fee. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, and other surface waters, and buffers. No construction activities that impact any wetlands or streams within Phase II shall begin until after the Permittee applies for, and receives, either a notification from the Division that a modification to the 401 is not required, or a modified 401 Water Quality Certification from the Division. [15A NCAC 02H .0501 and .0502]
- 4. You are required to secure an approved Stormwater Management Plan (SMP) from the City of Charlotte for water quality treatment of stormwater from new built upon areas created from this project before *any* impacts authorized in this certification occur. After it is approved, the SMP may not be modified without prior written authorization from City of Charlotte. [15A NCAC 02H .0506(b)(1)]
- 5. No waste, spoil, solids, or fill of any kind shall occur in wetlands or waters beyond the footprint of the impacts (including temporary impacts) as authorized under this Certification. [15A NCAC 02H .0501 and .0502]
- The Permittee shall contact the Division Mooresville Regional Office within 10 days of the commencement of construction on each detention basin. [15A NCAC 02H .0507 (c) and 15A NCAC 02H .0502 (e)]
- Streams within the project limits that will experience flooding from the Ticer Branch and Coffey
  Creek in-line detention basins, as well as the stream channel immediately below each detention

basin, shall be monitored by the Permittee to establish any loss of function per required in North Carolina Administrative Code 15A NCAC 2B .0201. Monitoring shall be done in accordance with the Proposed Monitoring Plan dated August 4, 2020. Proposed monitoring locations shall be submitted to the Division for approval at least 60 days prior to commencement of construction of each detention basin. Any modifications to the Proposed Monitoring Plan must be submitted to the Division for approval. Annual reports of monitoring shall be submitted to the Division on June 1 of each year which commences June 2021 with a report that details results collected by that date at that time.

If monitoring indicates a significant change in geomorphology or a degradation of function as indicated in the Proposed Monitoring Report, the Permittee shall notify the Division and provide a detailed analysis of the situation. Additional monitoring and/or remedial actions may be required by the Division. If the Division determines that there has been a loss of function that cannot be remedied to the Division's satisfaction within any of the monitored streams, the Permittee shall submit a mitigation plan to the Division.

- 8. All construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sediment and Pollution Control Act of 1973).
- Sediment and erosion control measures shall not be placed in wetlands or waters except within the footprint of temporary or permanent impacts authorized under this Certification. [15A NCAC 02H .0501 and .0502]
- 10. All wetlands, streams, surface waters, and riparian buffers located within 50 feet of each construction area on the project site shall be clearly marked (example- orange fabric fencing) prior to any land disturbing activities and must be maintained on the property until the project phase is completed. [15A NCAC 02H .0506 (b)(2) and (c)(2) and 15A NCAC 02H .0507 (c)]
- 11. Erosion control matting that incorporates plastic mesh and/or plastic twine shall not be used along streambanks or within wetlands. [15A NCAC 02B .0201]
- 12. An NPDES Construction Stormwater Permit (NCG010000) is required for construction projects that disturb one (1) or more acres of land. The NCG010000 Permit allows stormwater to be discharged during land disturbing construction activities as stipulated in the conditions of the permit. If the project is covered by this permit, full compliance with permit conditions including the erosion & sedimentation control plan, inspections and maintenance, self-monitoring, record keeping and reporting requirements is required. [15A NCAC 02H .0506(b)(5) and (c)(5)]
- 13. All work in or adjacent to streams shall be conducted so that the flowing stream does not come in contact with the disturbed area. Approved best management practices from the most current version of the NC Sediment and Erosion Control Manual, or the NC DOT Construction and Maintenance Activities Manual, such as sandbags, rock berms, cofferdams, and other diversion structures shall be used to minimize excavation in flowing water. [15A NCAC 02H .0506(b)(3) and (c)(3)]

City of Charlotte – Aviation Department DWR Project #20001195 V17 Individual Certification #WQC004233 Page 6 of 9

14. Culverts shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed culvert shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. [15A NCAC 02H .0506(b)(2) and (c)(2)].

If multiple pipes or barrels are required, they shall be designed to mimic the existing stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel shall be avoided.

Installation of culverts in wetlands shall ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. When roadways, causeways, or other fill projects are constructed across FEMA-designated floodways or wetlands, openings such as culverts or bridges shall be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.

The establishment of native woody vegetation and other soft stream bank stabilization techniques shall be used where practicable instead of riprap or other bank hardening methods.

- 15. Application of fertilizer to establish planted/seeded vegetation within disturbed riparian areas and/or wetlands shall be conducted at agronomic rates and shall comply with all other Federal, State and Local regulations. Fertilizer application shall be accomplished in a manner that minimizes the risk of contact between the fertilizer and surface waters. [15A NCAC 02B .0200 and 15A NCAC 02B .0231]
- 16. If concrete is used during construction, then all necessary measures shall be taken to prevent direct contact between uncured or curing concrete and waters of the state. Water that inadvertently contacts uncured concrete shall not be discharged to waters of the state. [15A NCAC 02B .0200]
- 17. No temporary impacts are allowed beyond those included in this Certification. All temporary fill and culverts shall be removed, and the impacted area shall be returned to natural conditions within 60 calendar days after the temporary impact is no longer necessary. The impacted areas shall be restored to original grade, including each stream's original cross sectional dimensions, planform pattern, and longitudinal bed profile. All temporarily impacted sites shall be restored and stabilized with native vegetation. [15A NCAC 02H .0506(b)(2) and (c)(2)]
- 18. All proposed and approved temporary pipes/culverts/riprap pads etc. in streams shall be installed as outlined in the most recent edition of the North Carolina Sediment and Erosion Control Planning and Design Manual or the North Carolina Surface Mining Manual or the North Carolina Department of Transportation Best Management Practices for Construction and Maintenance Activities so as not to restrict stream flow or cause dis-equilibrium during use of this Certification. [15A NCAC 02H .0506(b)(2) and (c)(2)]

- 19. Any riprap required for proper culvert placement, stream stabilization, or restoration of temporarily disturbed areas shall be restricted to the area directly impacted by the approved construction activity. All riprap shall be buried and/or "keyed in" such that the original stream elevation and streambank contours are restored and maintained. Placement of riprap or other approved materials shall not result in de-stabilization of the stream bed or banks upstream or downstream of the area. [15A NCAC 02H .0506(b)(2)]
- 20. Any riprap used for stream stabilization shall be of a size and density to prevent movement by wave, current action, or stream flows and shall consist of clean rock or masonry material free of debris or toxic pollutants. Riprap shall not be installed in the streambed except in specific areas required for velocity control and to ensure structural integrity of bank stabilization measures. [15A NCAC 02H .0506(b)(2)]
- 21. This Certification does not relieve the applicant of the responsibility to obtain all other required Federal, State, or Local approvals before proceeding with the project, including those required by, but not limited to Sediment and Erosion Control, Non-Discharge, Water Supply Watershed, and Trout Buffer regulations.
- 22. All mechanized equipment operated near surface waters shall be inspected and maintained regularly to prevent contamination of surface waters from fuels, lubricants, hydraulic fluids, or other toxic materials. Construction shall be staged in order to minimize the exposure of equipment to surface waters to the maximum extent practicable. Fueling, lubrication and general equipment maintenance shall not take place within 50 feet of a waterbody or wetlands to prevent contamination by fuels and oils. [15A NCAC 02H .0506(b)(3) and (c)(3) and 15A NCAC 02B .0211 (12)]
- 23. Heavy equipment working in wetlands shall be placed on mats or other measures shall be taken to minimize soil disturbance. [15A NCAC 02H .0506(b)(3) and (c)(3)]
- 24. In accordance with 143-215.85(b), the Permittee shall report to the Mooresville Regional Office at 704-663-1699 (after hours and on weekends call 800-858-0368) any petroleum spill of 25 gallons or more; any spill regardless of amount that causes a sheen on surface waters; any petroleum spill regardless of amount occurring within 100 feet of surface waters; and any petroleum spill less than 25 gallons that cannot be cleaned up within 24 hours.

City of Charlotte – Aviation Department DWR Project #20001195 V17 Individual Certification #WQC004233 Page 8 of 9

- 25. Mr. Brent Cagle and City of Charlotte Aviation Department shall conduct construction activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with section 303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. [15A NCAC 02B .0200] If the Division determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the Division may reevaluate and modify this Certification. Before modifying the Certification, the Division shall notify Mr. Brent Cagle and City of Charlotte Aviation Department and the U.S. Army Corps of Engineers, provide public notice in accordance with 15A NCAC 02H .0503 and provide opportunity for public hearing in accordance with 15A NCAC 02H .0504. Any new or revised conditions shall be provided to Mr. Brent Cagle and City of Charlotte Aviation Department in writing, shall be provided to the U.S. Army Corps of Engineers for reference in any Permit issued pursuant to Section 404 of the Clean Water Act, and shall also become conditions of the 404 Permit for the project.
- 26. Upon completion of all permitted impacts included within the approval and any subsequent modifications, the applicant shall be required to return a certificate of completion (available on the DWR website https://edocs.deg.nc.gov/Forms/Certificate-of-Completion). [15A NCAC 02H .0502(f)]
- 27. If the property or project is sold or transferred, the new Permittee shall be given a copy of this Certification (and written authorization if applicable) and is responsible for complying with all conditions. [15A NCAC 02H .0501 and .0502]
- 28. This Certification neither grants nor affirms any property right, license, or privilege in any waters, or any right of use in any waters. This Certification does not authorize any person to interfere with the riparian rights, littoral rights, or water use rights of any other person and this Certification does not create any prescriptive right or any right of priority regarding any usage of water. This Certification shall not be interposed as a defense in any action respecting the determination of riparian or littoral rights or other rights to water use. No consumptive user is deemed by virtue of this Certification to possess any prescriptive or other right of priority with respect to any other consumptive user regardless of the quantity of the withdrawal or the date on which the withdrawal was initiated or expanded.
- 29. This Certification grants permission to the director, an authorized representative of the Director, or DEQ staff, upon the presentation of proper credentials, to enter the property during normal business hours. [15A NCAC 02H .0502(e)]
- 30. Non-compliance with or violation of the conditions herein set forth by a specific project may result in revocation of this Certification for the project and may also result in criminal and/or civil penalties.

31. The permittee shall report to the Mooresville Regional Office at 704-663-1699 any noncompliance with this Certification, any violation of stream or wetland standards [15A NCAC 02B .0200] including but not limited to sediment impacts, and any violation of state regulated riparian buffer rules [15A NCAC 02B .0200]. Information shall be provided orally within 24 hours (or the next business day if a weekend or holiday) from the time the applicant became aware of the circumstances. A written submission shall also be provided within 5 business days of the time the applicant becomes aware of the circumstances. The written submission shall contain a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, if the noncompliance has not been corrected, the anticipated time compliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Division may waive the written submission requirement on a case-by-case basis.

This approval to proceed with your proposed impacts or to conduct impacts to waters as depicted in your application shall expire upon expiration of the 404 Permit. The conditions in effect on the date of issuance shall remain in effect for the life of the project, regardless of the expiration date of this Certification. [15A NCAC 02H .0507(d)(2) and 15A NCAC 02H .0506]

This the 21st day of August 2020

-DocuSigned by:

Paul Wojoski —949D91BA53EF4E0...

Paul Wojoski, Supervisor 401 & Buffer Permitting Branch

SLH

WQC004233

# **Compensatory Mitigation Responsibility Transfer Form**

Permittee: City of Charlotte – Aviation Department, Haley Gentry

Action ID: SAW-2018-01071

Project Name: Charlotte Douglas International Airport Expansion (Phase 1 Only) County: Mecklenburg

Instructions to Permittee: The Permittee must provide a copy of this form to the Mitigation Sponsor, either an approved Mitigation Bank or the North Carolina Division of Mitigation Services (NCDMS), who will then sign the form to verify the transfer of the mitigation responsibility. Once the Sponsor has signed this form, it is the Permittee's responsibility to ensure that to the U.S. Army Corps of Engineers (USACE) Project Manager identified on page two is in receipt of a signed copy of this form before conducting authorized impacts, unless otherwise specified below. If more than one mitigation Sponsor will be used to provide the mitigation associated with the permit, or if the impacts and/or the mitigation will occur in more than one 8-digit Hydrologic Unit Code (HUC), multiple forms will be attached to the permit, and the separate forms for each Sponsor and/or HUC must be provided to the appropriate mitigation Sponsors.

Instructions to Sponsor: The Sponsor must verify that the mitigation requirements (credits) shown below are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether or not they have received payment from the Permittee. Once the form is signed, the Sponsor must update the bank ledger and provide a copy of the signed form and the updated bank ledger to the Permittee, the USACE Project Manager, and the Wilmington District Mitigation Office (see contact information on page 2). The Sponsor must also comply with all reporting requirements established in their authorizing instrument.

#### **Permitted Impacts and Compensatory Mitigation Requirements:**

Permitted Impacts Requiring Mitigation\* 8-digit HUC and Basin: 03050101, Catawba River Basin

	I CI IIIILLCU IIII	1 ci mitted impacts requiring varigation			o digit live and Dasin. coccert, catalina inter same			
Stream Impacts (linear feet)		Wetland Impacts (acres)						
	Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal	
į	1,302			0.68				

<sup>\*</sup>If more than one mitigation sponsor will be used for the permit, only include impacts to be mitigated by this sponsor.

Compensatory Mitigation Requirements: 8-digit HUC and Basin: 03050101, Catawba River Basin

Stream Mitigation (credits)		Wetland Mitigation (credits)				
Warm	Cool	Cold	Riparian Riverine	Riparian Non- Riverine	Non-Riparian	Coastal
2,604			1.25			

Mitigation Site Debited: Charlotte Mecklenburg Stormwater Services – Allenbrook Tributary and Torrence Creek
(List the name of the bank to be debited. For umbrella banks, also list the specific site. For NCDMS, list NCDMS. If the NCDMS acceptance letter identifies a specific site, also list the specific site to be debited).

# Section to be completed by the Mitigation Sponsor

Statement of Mitigation Liability Acceptance: I, the undersigned, verify that I am authorized to approve mitigation transactions for the Mitigation Sponsor shown below, and I certify that the Sponsor agrees to accept full responsibility for providing the mitigation identified in this document (see the table above), associated with the USACE Permittee and Action ID number shown. I also verify that released credits (and/or advance credits for NCDMS), as approved by the USACE, are currently available at the mitigation site identified above. Further, I understand that if the Sponsor fails to provide the required compensatory mitigation, the USACE Wilmington District Engineer may pursue measures against the Sponsor to ensure compliance associated with the mitigation requirements.

Signature of Sponsor's Authorized Representative	Date of Signature
Name of Sponsor's Authorized Representative:	
Mitigation Sponsor Name:	
ensure compliance associated with the mitigation requirements.	

#### **Conditions for Transfer of Compensatory Mitigation Credit:**

- Once this document has been signed by the Mitigation Sponsor and the USACE is in receipt of the signed form, the
  Permittee is no longer responsible for providing the mitigation identified in this form, though the Permittee remains
  responsible for any other mitigation requirements stated in the permit conditions.
- Construction within jurisdictional areas authorized by the permit identified on page one of this form can begin only after the USACE is in receipt of a copy of this document signed by the Sponsor, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein. For authorized impacts conducted by the North Carolina Department of Transportation (NCDOT), construction within jurisdictional areas may proceed upon permit issuance; however, a copy of this form signed by the Sponsor must be provided to the USACE within 30 days of permit issuance. NCDOT remains fully responsible for the mitigation until the USACE has received this form, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein.
- Signed copies of this document must be retained by the Permittee, Mitigation Sponsor, and in the USACE administrative records for both the permit and the Bank/ILF Instrument. It is the Permittee's responsibility to ensure that the USACE Project Manager (address below) is provided with a signed copy of this form.
- If changes are proposed to the type, amount, or location of mitigation after this form has been signed and returned to the USACE, the Sponsor must obtain case-by-case approval from the USACE Project Manager and/or North Carolina Interagency Review Team (NCIRT). If approved, higher mitigation ratios may be applied, as per current District guidance and a new version of this form must be completed and included in the USACE administrative records for both the permit and the Bank/ILF Instrument.

Comments/Additional Conditions: A letter from Charlotte Mecklenburg Stormwater Services, confirming their willing and able to accept the applicants compensatory mitigation responsibility, dated 5/15/2020was included with the preconstruction notification.

This form is not valid unless signed below by the USACE Project Manager and by the Mitigation Sponsor on Page 1. Once signed, the Sponsor should provide copies of this form along with an updated bank ledger to: 1) the Permittee, 2) the USACE Project Manager at the address below, and 3) the Wilmington District Mitigation Office, Attn: Todd Tugwell, 11405 Falls of Neuse Road, Wake Forest, NC 27587 (email: todd.tugwell@usace.army.mil). Questions regarding this form or any of the permit conditions may be directed to the USACE Project Manager below.

**USACE Project Manager:** 

David L. Shaeffer

**USACE Field Office:** 

Asheville Regulatory Office US Army Corps of Engineers 151 Patton Avenue, Room 208 Asheville, North Carolina 28801

Email:

david.l.shaeffer@usace.army.mil
Digitally signed by

SHAEFFER.DAVID.LEIGH.12

60750573

12/14/2020

**USACE Project Manager Signature** 

**Date of Signature** 

Current Wilmington District mitigation guidance, including information on mitigation ratios, functional assessments, and mitigation bank location and availability, and credit classifications (including stream temperature and wetland groupings) is available at <a href="http://ribits.usace.army.mil">http://ribits.usace.army.mil</a>

# **Compensatory Mitigation Responsibility Transfer Form**

Permittee: City of Charlotte – Aviation Department, Haley Gentry

Project Name: Charlotte Douglas International Airport Expansion (Phase 1 Only)

County: Mecklenburg

Instructions to Permittee: The Permittee must provide a copy of this form to the Mitigation Sponsor, either an approved Mitigation Bank or the North Carolina Division of Mitigation Services (NCDMS), who will then sign the form to verify the transfer of the mitigation responsibility. Once the Sponsor has signed this form, it is the Permittee's responsibility to ensure that to the U.S. Army Corps of Engineers (USACE) Project Manager identified on page two is in receipt of a signed copy of this form before conducting authorized impacts, unless otherwise specified below. If more than one mitigation Sponsor will be used to provide the mitigation associated with the permit, or if the impacts and/or the mitigation will occur in more than one 8-digit Hydrologic Unit Code (HUC), multiple forms will be attached to the permit, and the separate forms for each Sponsor and/or HUC must be provided to the appropriate mitigation Sponsors.

Instructions to Sponsor: The Sponsor must verify that the mitigation requirements (credits) shown below are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether or not they have received payment from the Permittee. Once the form is signed, the Sponsor must update the bank ledger and provide a copy of the signed form and the updated bank ledger to the Permittee, the USACE Project Manager, and the Wilmington District Mitigation Office (see contact information on page 2). The Sponsor must also comply with all reporting requirements established in their authorizing instrument.

### Permitted Impacts and Compensatory Mitigation Requirements:

Permitted Impacts Requiring Mitigation\* 8-digit HUC and Basin: 03050103, Catawba River Basin

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Stream Impacts (linear feet)			Wetland Impacts (ac	cres)		
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
1,982			0.14			

<sup>\*</sup>If more than one mitigation sponsor will be used for the permit, only include impacts to be mitigated by this sponsor.

Compensatory Mitigation Requirements: 8-digit HUC and Basin: 03050103, Catawba River Basin

Stream Mitigation (credits)		Wetland Mitigation (credits)				
Warm	Cool	Cold	Riparian Riverine	Riparian Non- Riverine	Non-Riparian	Coastal
3,496.5			0.28			

Mitigation Site Debited: <u>Charlotte Mecklenburg Stormwater Services – Sedgefield Park-Dairy Branch, Edwards Branch Ph III, and Muddy Creek.</u> (List the name of the bank to be debited. For umbrella banks, also list the specific site. For NCDMS, list NCDMS. If the NCDMS acceptance letter identifies a specific site, also list the specific site to be debited).

## Section to be completed by the Mitigation Sponsor

Statement of Mitigation Liability Acceptance: I, the undersigned, verify that I am authorized to approve mitigation transactions for the Mitigation Sponsor shown below, and I certify that the Sponsor agrees to accept full responsibility for providing the mitigation identified in this document (see the table above), associated with the USACE Permittee and Action ID number shown. I also verify that released credits (and/or advance credits for NCDMS), as approved by the USACE, are currently available at the mitigation site identified above. Further, I understand that if the Sponsor fails to provide the required compensatory mitigation, the USACE Wilmington District Engineer may pursue measures against the Sponsor to ensure compliance associated with the mitigation requirements.

Signature of Sponsor's Authorized Representative	Date of Signature	
Name of Sponsor's Authorized Representative:		
Mitigation Sponsor Name:		•
ensure compliance associated with the mitigation requirements.		

#### **Conditions for Transfer of Compensatory Mitigation Credit:**

- Once this document has been signed by the Mitigation Sponsor and the USACE is in receipt of the signed form, the Permittee is no longer responsible for providing the mitigation identified in this form, though the Permittee remains responsible for any other mitigation requirements stated in the permit conditions.
- Construction within jurisdictional areas authorized by the permit identified on page one of this form can begin only after the USACE is in receipt of a copy of this document signed by the Sponsor, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein. For authorized impacts conducted by the North Carolina Department of Transportation (NCDOT), construction within jurisdictional areas may proceed upon permit issuance; however, a copy of this form signed by the Sponsor must be provided to the USACE within 30 days of permit issuance. NCDOT remains fully responsible for the mitigation until the USACE has received this form, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein.
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**USACE Project Manager:** David L. Shaeffer

**USACE Field Office:** Asheville Regulatory Office

US Army Corps of Engineers 151 Patton Avenue, Room 208 Asheville, North Carolina 28801

Email: david.l.shaeffer@usace.army.mil

Digitally signed by

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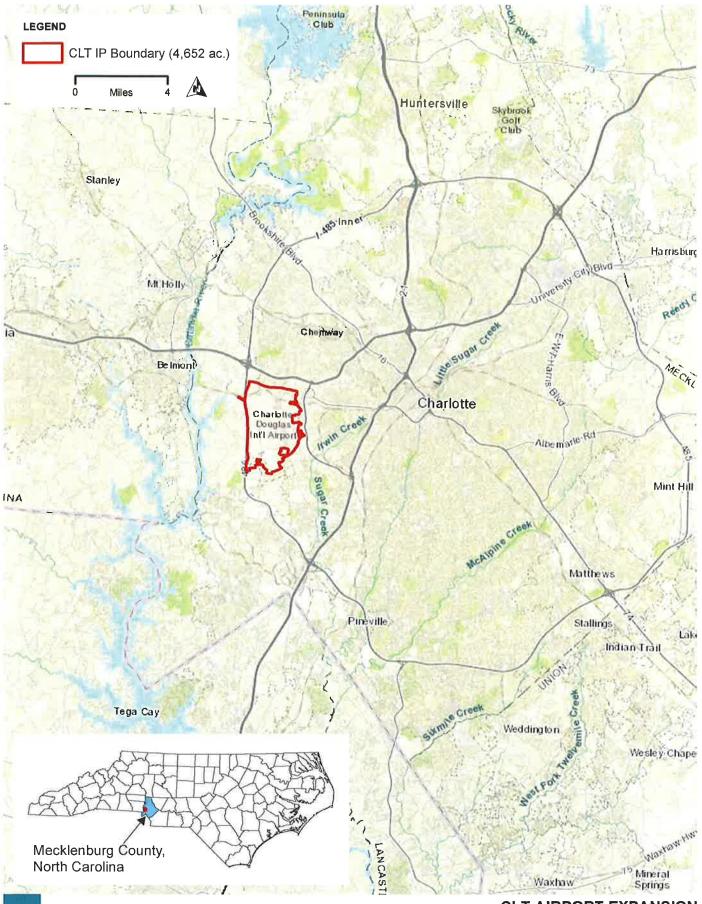
60750573

**USACE Project Manager Signature** 

12/14/2020

**Date of Signature** 

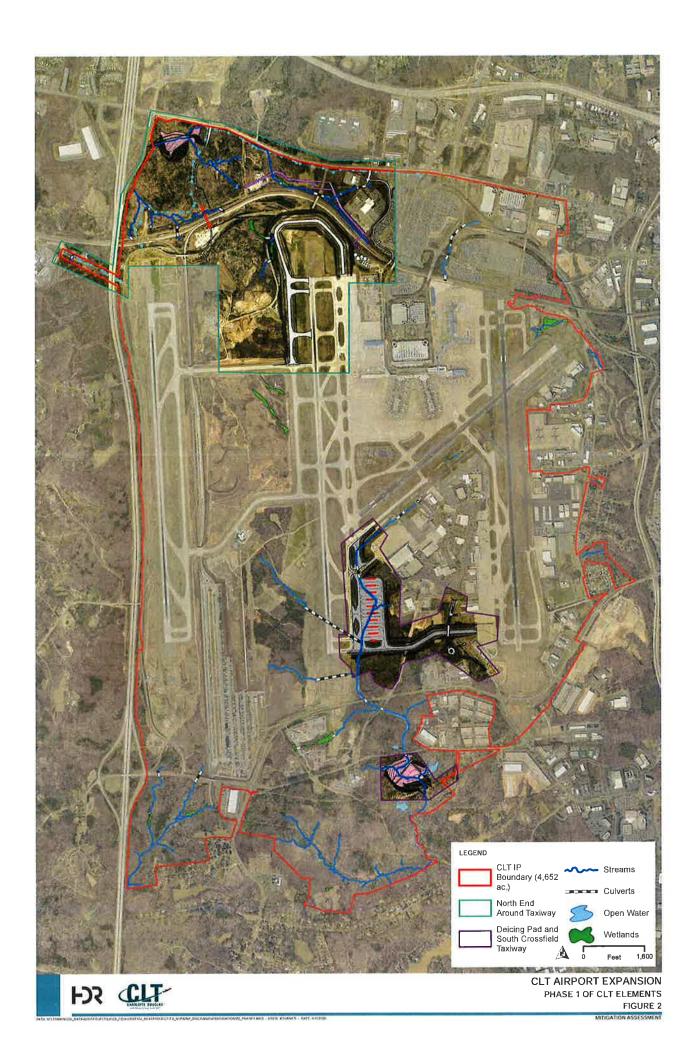
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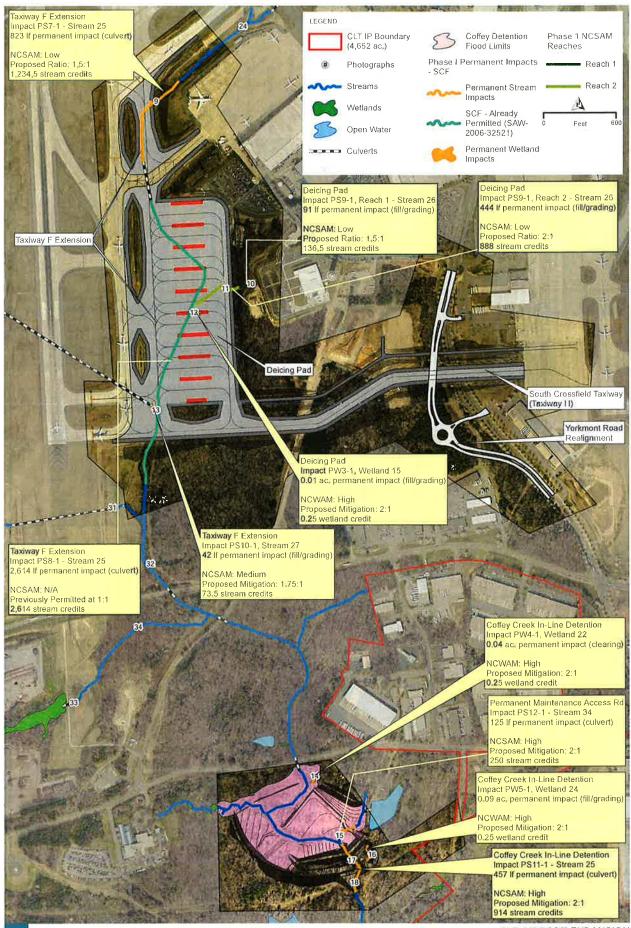
CLT AIRPORT EXPANSION PROJECT VICINITY

FIGURE 1

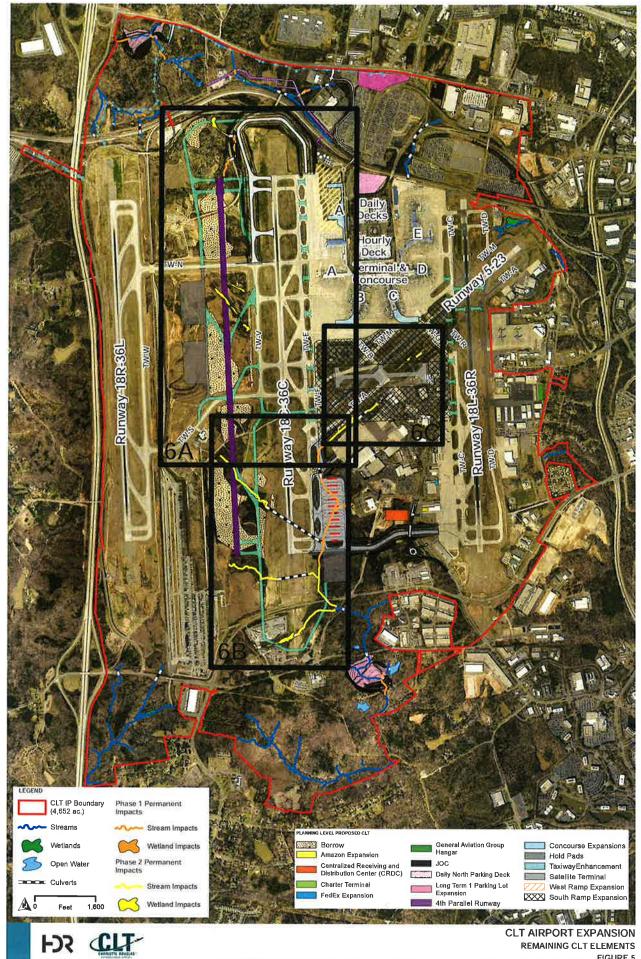




CLT AIRPORT EXPANSION NORTH END AROUND TAXIWAY



HOR CLIT







**Photographs** 

Wetlands Streams

Open Water

Phase 2 NCSAM

Reaches

Centralized Receiving and Distribution Center (CRDC)

Charter Terminal Expansion FedEx Expansion

> Reach 1 Reach 2

TaxiwayEnhancement

Hold Pads

Stream Impac Wetland Impe

Amazon Expansion

Phase 1 Permanent

Stream Impacts

Wetland Impacts Areach 4

Reach 3

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General Aviation Group

Long Term 1 Parking Lot Expansion Daily North Parking Deck

West Ramp Expansion Satellite Terminal 1

South Ramp Expansion Borrow Areas  **CLT AIRPORT EXPANSION** REMAINING CLT ELEMENTS