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 4th Parallel Runway and Taxiway Enhancement (Figure 5). The South Ramp Expansion element is located within HUC 03050103, while the 4th 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 th 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

	. abio 2: Concadio C. initigation ratio					
Ratio	NCSAM/ NCWAM Score	NCWAM Feature				
0.5:1	n/a	Open Water	Wetland			
2:1	High	Wetlands	Wetland			
1.75:1	Medium	Medium Wetlands				
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

[^] PS1-1 = Permanent Stream Impact 1 - Phase 1; PS2-1 = Permanent Stream Impact 2 - Phase 1, etc.

Phase 2 of the project (4th 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 4th 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.

^{*} 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	y or proposed	permanent mik	acts and come	sponding miti	gation ratios for Ph	use z
Impact Number*	Feature	Project	NCWAM/ NCSAM Score	Ratio	Impact Amount (linear feet/acre)	Proposed Credits
			Stream Impac	ts		
			HUC 0305010	3		
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
		oacts/Credits:	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.

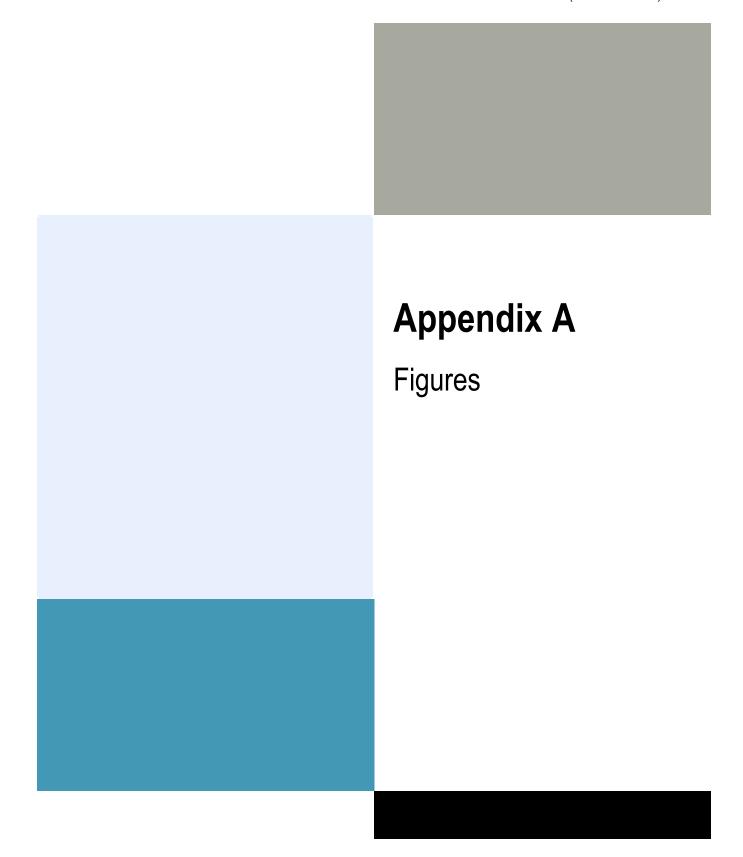
Table 5. Summary of Phase 1 permanent impacts and proposed credits per HUC

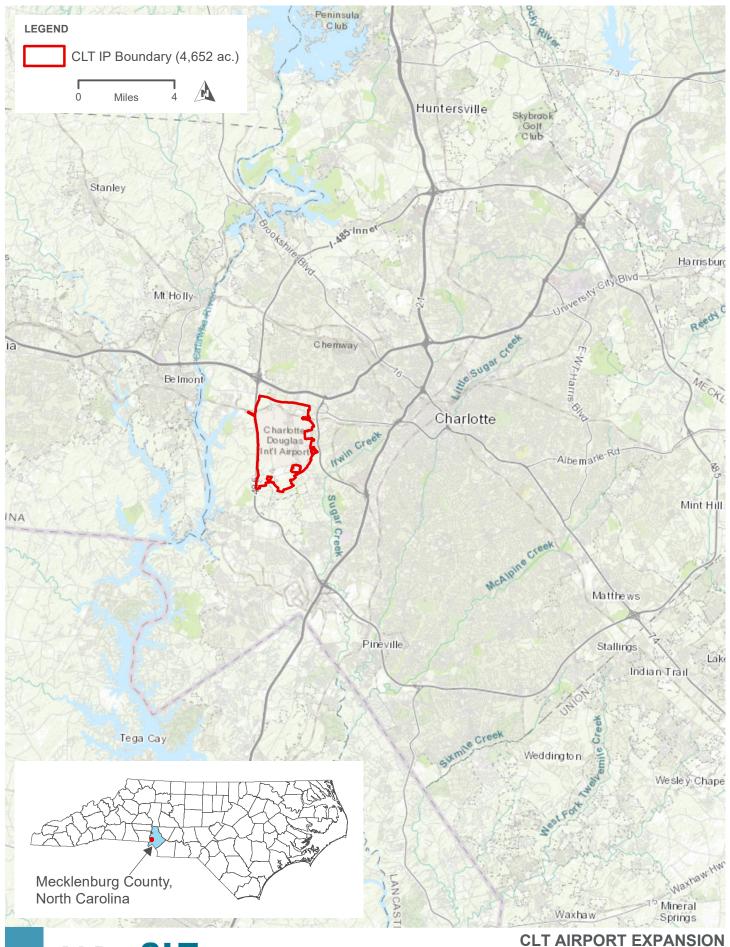
Phase 1						
Project	Feature	Impact Amount (LF/AC)	Proposed Credits			
	HUC 03050101					
NEAT	Streams	1,302 LF	2,604			
	Wetlands	0.68 AC	1.50			
		HUC 03050103				
SCF	Streams	1,982LF*	6,110.5			
	Wetlands	0.14 AC	0.75			

^{*} 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

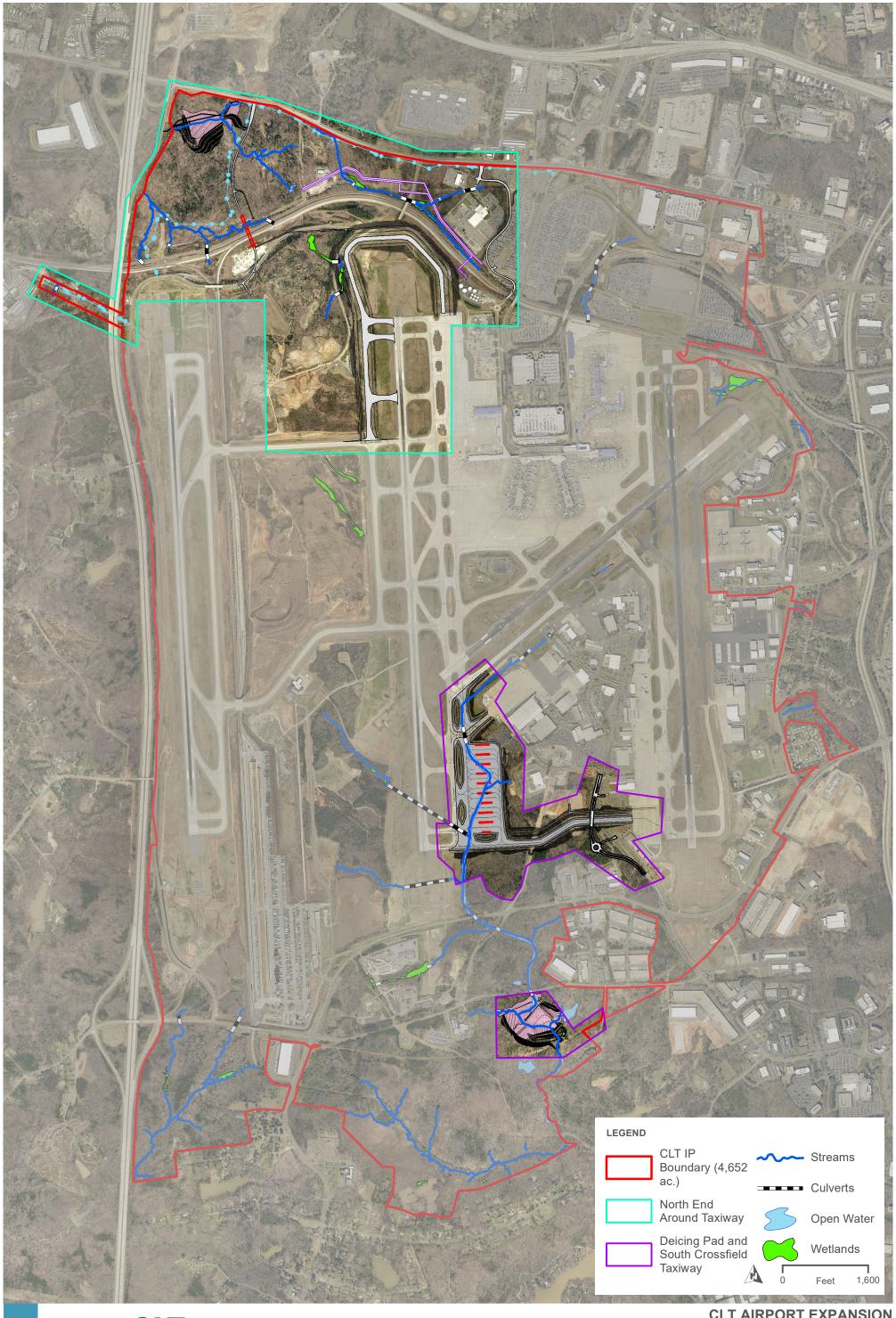




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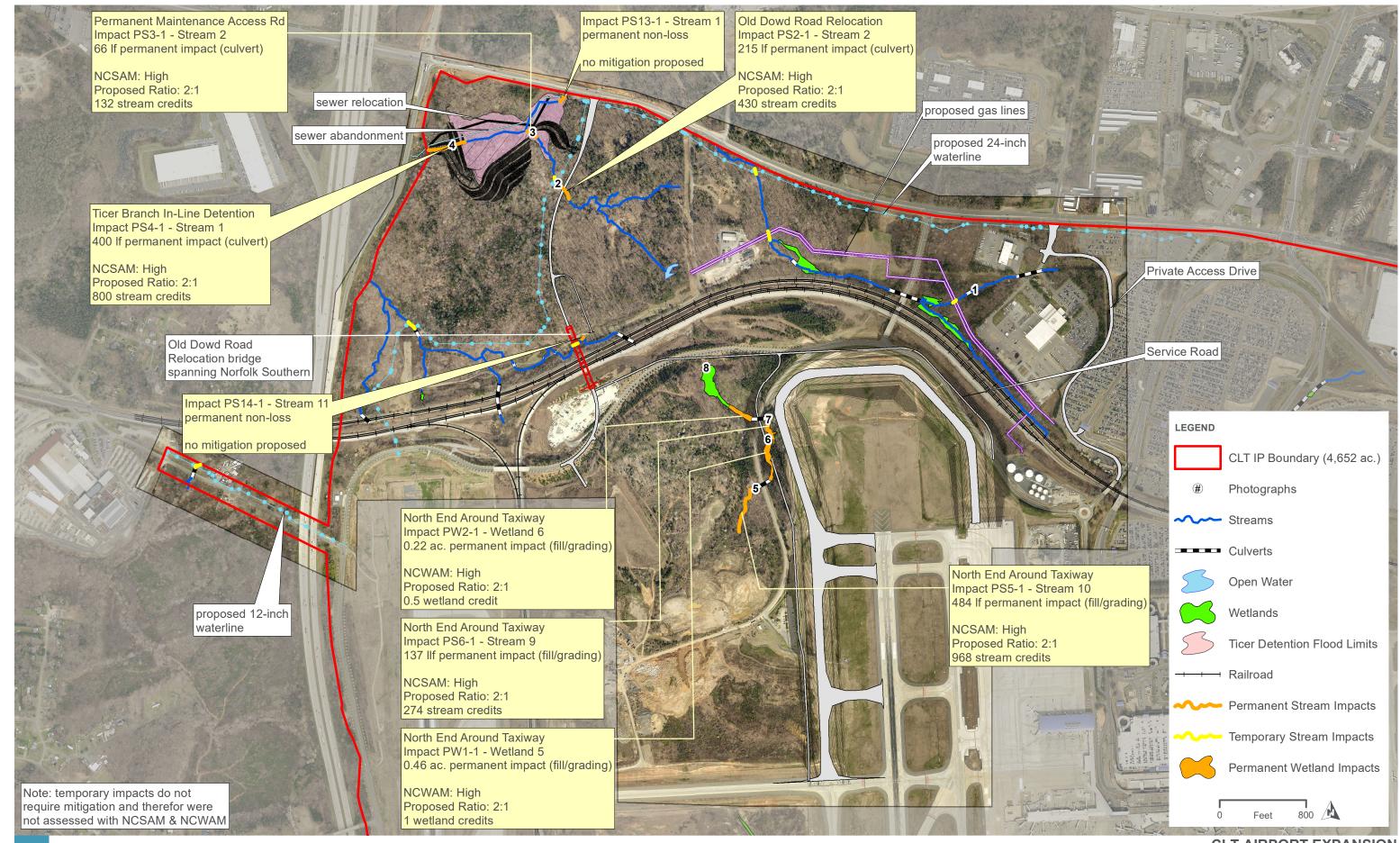
CLT AIRPORT EXPANSION PROJECT VICINITY

FIGURE 1



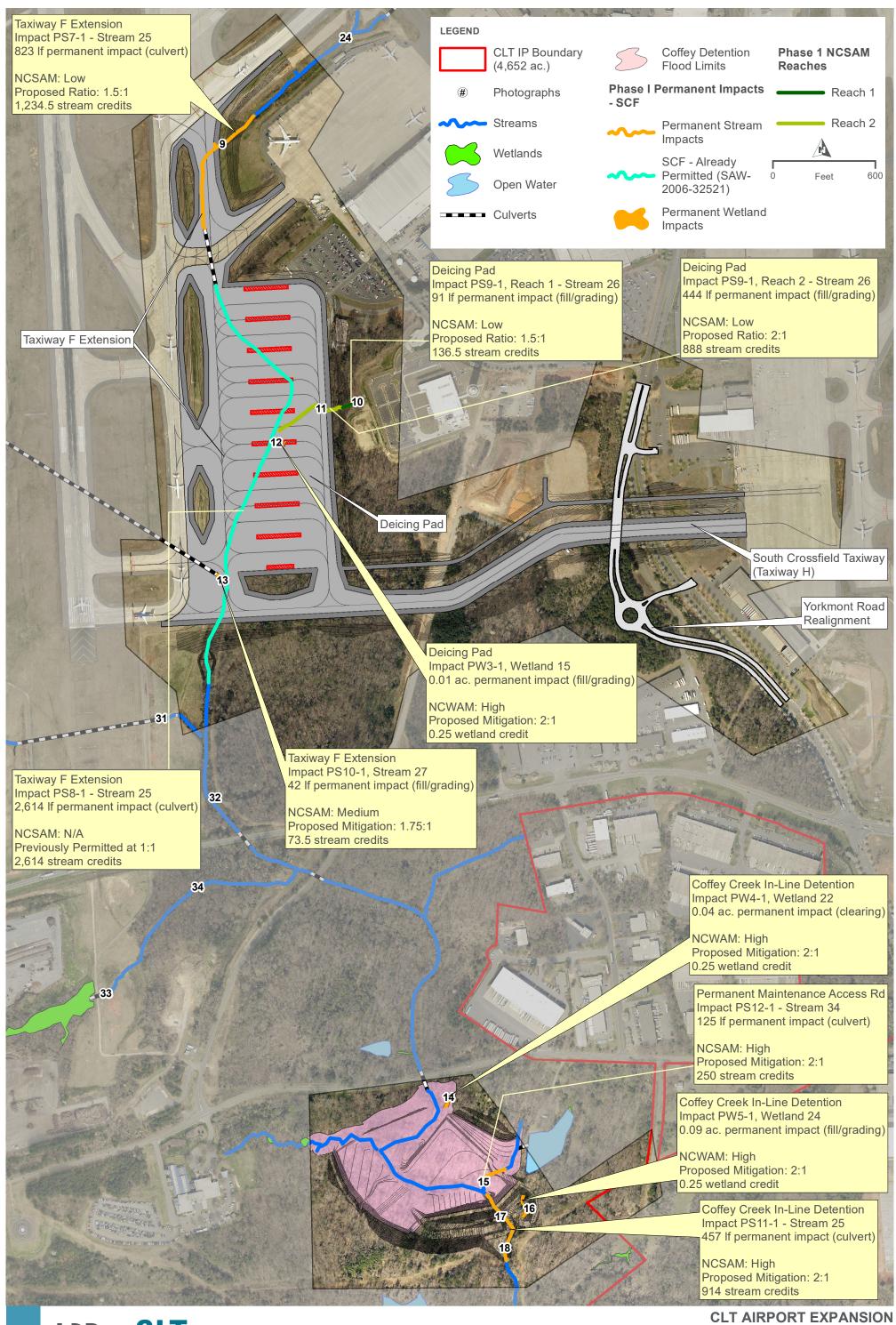
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INTERNATIONAL AIRBORY

CLT AIRPORT EXPANSION
PHASE 1 OF CLT ELEMENTS
FIGURE 2

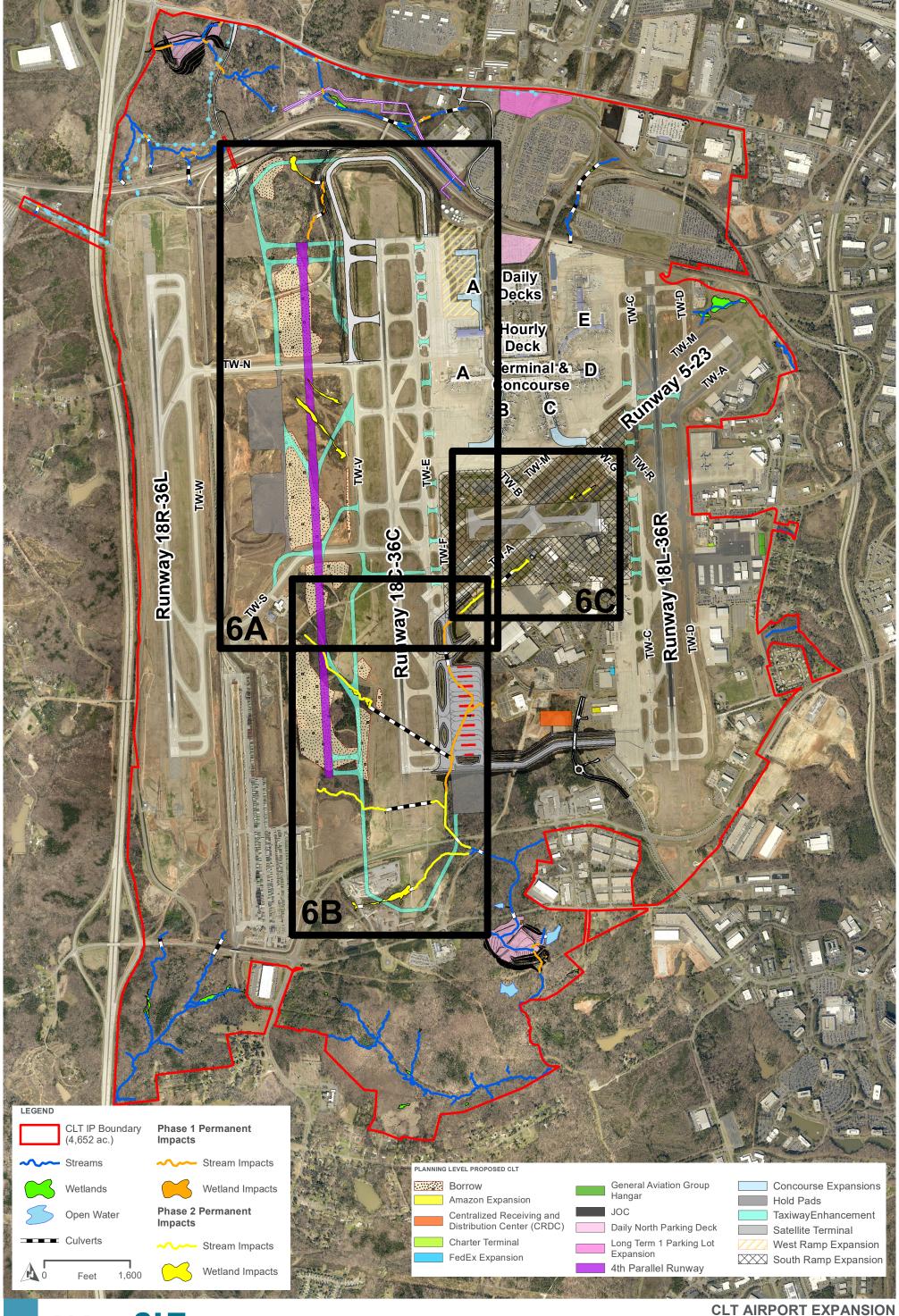


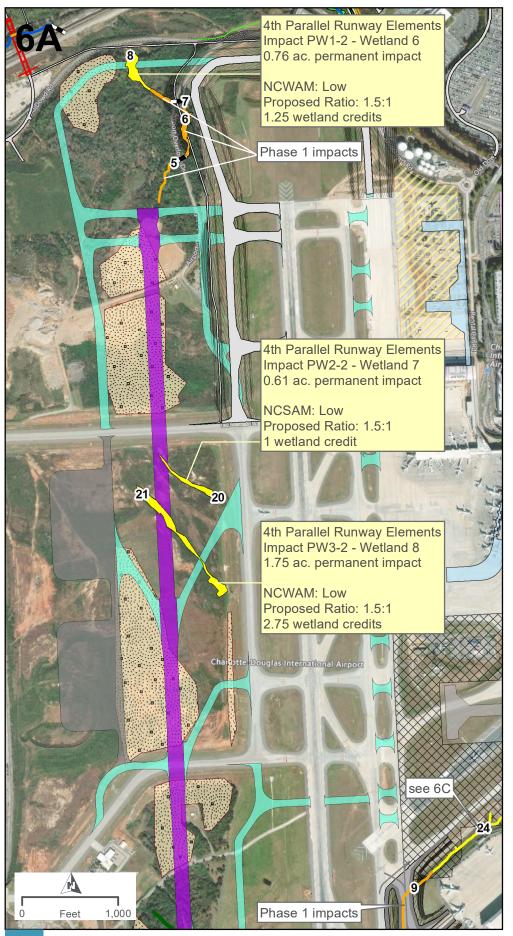
FOR CHARLOTTE DOUGLAS"
INTERNATIONAL AIRPORT

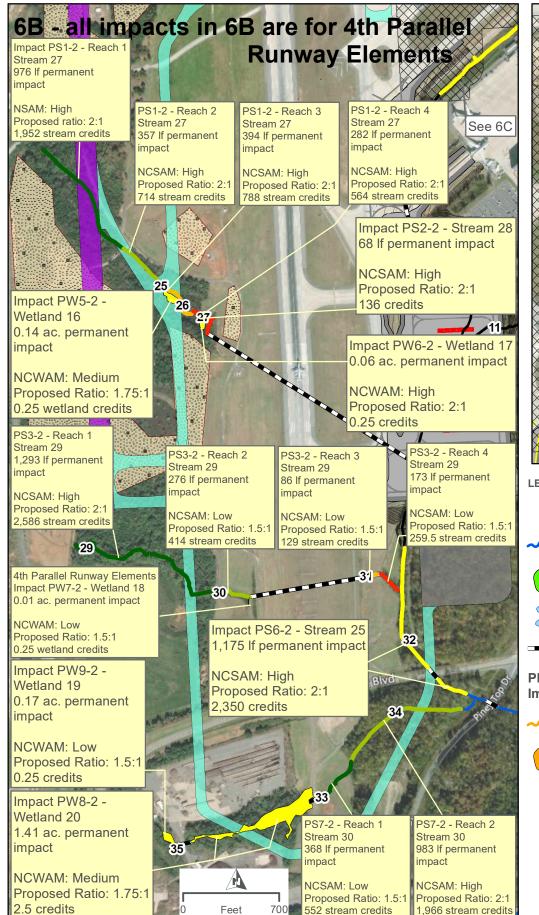
CLT AIRPORT EXPANSION NORTH END AROUND TAXIWAY

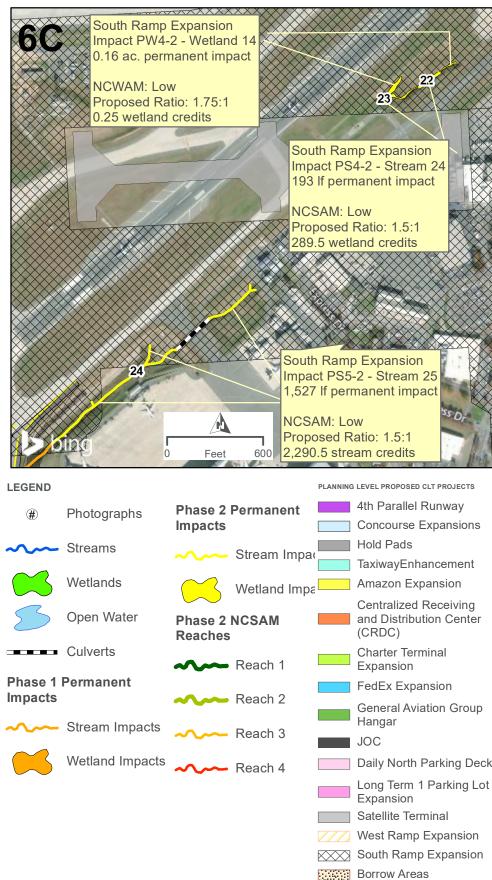


MITIGATION ASSESSMENT











Appendix B

Phase 1: NCSAM and NCSAM Forms, and Photographs

NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

	pro the second of the second o
USACE AID #:	NCDWR #:
	Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
	ion 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
	f requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
	nual for examples of additional measurements that may be relevant.
	OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE IN	
1. Project name (if	· · · · · · · · · · · · · · · · · · ·
3. Applicant/owner	
5. County:	Mecklenburg 6. Nearest named water body
7. River basin:	Catawba on USGS 7.5-minute quad: Ticer Branch
	(decimal degrees, at lower end of assessment reach): 35.233570, -80.950471
	ATION: (depth and width can be approximations) ow on attached map): PS1-1 - Stream 8 10. Length of assessment reach evaluated (feet): 207
	from bed (in riffle, if present) to top of bank (feet): 1 Unable to assess channel depth.
	at top of bank (feet): 3 13. Is assessment reach a swamp steam? Yes No
	No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam: ☐ res ☐ No. is assessment reach a swamp steam.
	DRY INFORMATION:
15. NC SAM Zone:	
2 2 20.10.	
	\ /
40 5 6	
16. Estimated geor valley shape (s	
Tidal Marsh St	
17. Watershed size	
for Tidal Mars	
ADDITIONAL INFO	,
	y considerations evaluated? ⊠Yes □No If Yes, check all that apply to the assessment area.
☐Section 10 w	
☐Essential Fis	sh Habitat
⊠Publicly own	
Anadromous	
	presence of a federal and/or state listed protected species within the assessment area.
List species:	
	Critical Habitat (list species)stream information/supplementary measurements included in "Notes/Sketch" section or attached? ⊠Yes □No
19. Are additional s	stream information/supplementary measurements included in Notes/Sketch Section of attached? Ares Tino
1. Channel Water	- assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)
	throughout assessment reach.
☐B No flo	w, water in pools only.
☐C No wa	ater in assessment reach.
2. Evidence of FI	ow Restriction – assessment reach metric
□A At lea	st 10% of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction <u>or</u> fill to the
point	of obstructing flow <u>or</u> a channel choked with aquatic macrophytes <u>or</u> ponded water <u>or</u> impoundment on flood or ebb withi
	sessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams
	r dams).
⊠B Not A	
	n – assessment reach metric
	ority of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
⊠B Not A	
4. Feature Longit	udinal Profile – assessment reach metric
	ity of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, ove
	ing, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
	pances).
⊠B Not A	
5. Signs of Active	e Instability – assessment reach metric
	current instability, not past events from which the stream has currently recovered. Examples of instability include
	ure, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
=	o of channel unstable 25% of channel unstable
_	of channel unstable
	, e. e

6.				raction -						
	LB	RB	the Left	Dank (LD	B) and the	Right Ba	nk (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	idence of c auseways through st ching]) <u>or</u> 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/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						ie (milky white, n features or inf			er discoloration, oil sheen, stream foam)
	□с	Notic	eable ev	vidence of	pollutant o	discharge				<u>nd</u> causing a water quality problem
	□D □E				ural sulfide collected da		iting degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
		section	on.					,,,,,,,,	,	
	□F □G				to stream c eam or inte					
	□H □I	Degr	aded ma	arsh veget	tation in the	e intertida	Il zone (removal	_	•	nowing, destruction, etc)
	⊠J		to no st			_ (explain	in "Notes/Sketo	cn section	1)	
8.	Rece	nt Weath	ner – wa	tershed n	netric (ski	p for Tida	al Marsh Strea	ms)		
	For S ☐A						sidered a drough Ill 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	`	-		assessme oo large or			f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.			eam Hal □No				ach metric	, of the a	ccoccmo	nt reach (examples of stressors include excessive
	iva.	Птез	Пио	sedime	ntation, m	ining, exc	cavation, in-stream tal Plain stream	eam harde	ening [for	example, rip-rap], recent dredging, and snagging)
	10b.	Check a □A					e of assessmen quatic mosses			ize 4 Coastal Plain streams) 5% oysters or other natural hard bottoms
			(include	e liverwort	ts, lichens,	and algal	mats)	Check for Tidal Marsh Streams Only	□F □G	Submerged aquatic vegetation
		⊠В	Multiple vegeta		nd/or leaf p	packs and	d/or emergent	k for T h Stree Only	□H	Low-tide refugia (pools) Sand bottom
		□c	Multiple	e snags ar	nd logs (inc			Shecl //arsh	□J	5% vertical bank along the marsh
		□D					s and/or roots I perimeter	0 2	□K	Little or no habitat
		□E	Little o	r no habita	at					
****	*****	*****	*****	**REMAIN	IING QUE	STIONS A	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedfe	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 assess	sment read	ch in a na	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.	Bedform ☐A			k the appr (evaluate		oox(es).			
		□в	Pool-gl	lide sectior	n (evaluat e	e 11d)				
		⊠C			,	•	tric 12, Aquatio	•		
	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. Check Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should n	ot excee	ed 100% fo C	or each as: A	sessment P	reach.			
			È	Ď			Bedrock/sapro			
		H	H	H	H	H	Boulder (256 Cobble (64 –		m)	
			፱				Gravel (2 – 64	4 mm)		
		\exists	\exists	님	님	片	Sand (.062 – Silt/clay (< 0.0			
				目			Detritus	•	oto oto \	
	114		□ □N-	∐ Aro ros!	o fillod ···it	_	Artificial (rip-rate)	•	,	otrooms and Tidal March Strooms
	ııu.	□Yes	□No	VIE hook	a micu Will	, seuiillel	11: (avih 101.915	Le + Coas	tai Fidiii 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	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?
		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

	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). 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 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 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
	es/Sketch: /ert 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/HDR	
Notes of Field Asses	ssment Form (Y/N)		YES	
Presence of regulator	ory considerations (Y/N)		NO	
Additional stream inf	ormation/supplementary mea	surements included (Y/N)	YES	
NC SAM feature type	e (perennial, intermittent, Tida	al Marsh Stream)	Perennial	

(poronnial, intermittent, fradi waren etream)			
	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 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 MEDIUM		
(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		
(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		
(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 NA		
(2) Intertidal Zone	NA NA		
Overall	MEDIUM		

NC SAM FIELD ASSESSMENT FORM Accompanies User Manual Version 2.1

	Accompanies oser w	ianuai version z.i	
USACE AID #:		NCDWR #:	
INSTRUCTIONS: Attach a sk	ketch of the assessment area and photogra	phs. 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 atta	ached map, and include a separate form for	r each reach. See the NC SAM U	ser Manual for detailed descriptions
and explanations of requested	d information. Record in the "Notes/Sketch	n" section if supplementary measu	urements were performed. See the
NC SAM User Manual for exa	amples of additional measurements that ma	y be relevant.	
NOTE EVIDENCE OF STRES	SSORS AFFECTING THE ASSESSMENT	AREA (do not need to be within	the assessment area).
PROJECT/SITE INFORMATI		O. Data of avaluations. April 00	40
1. Project name (if any):		2. Date of evaluation: April 20	
3. Applicant/owner name:		4. Assessor name/organization:	KMT, BGB/HDR
5. County:		6. Nearest named water body	
7. River basin:	Catawba	on USGS 7.5-minute quad:	Ticer Branch
8. Site coordinates (decimal c	degrees, at lower end of assessment reach)	35.236184, -80.963544	
	lepth and width can be approximations)		
9. Site number (show on attac		ength of assessment reach evalu	` '
-	in riffle, if present) to top of bank (feet):	-	nable to assess channel depth.
12. Channel width at top of ba		ssessment reach a swamp steam	? ∐Yes ∐No
	al flow ☐Intermittent flow ☐Tidal Marsh S	Stream	
STREAM CATEGORY INFO			
15. NC SAM Zone:) ☐ Inner Coastal Plain (I)	Outer Coastal Plain (O)
		\	,
16. Estimated geomorphic			
valley shape (skip for	\boxtimes A \longrightarrow	□В	
Tidal Marsh Stream):	(more sinuous stream, flatter valley slo	pe) (less sinuous sti	eam, steeper valley slope)
17. Watershed size: (skip	Size 1 (< 0.1 mi²) ☐Size 2 (0.1 to		
for Tidal Marsh Stream)	⊠ 0120 T (\ 0.1 TIII)	5 (0.0 mm)	01111)
ADDITIONAL INFORMATION	N-		
	ations evaluated? ⊠Yes □No If Yes, ch	eck all that apply to the assessme	ent area
Section 10 water	Classified Trout Waters		shed (I II III IV V)
Essential Fish Habitat	☐Primary Nursery Area		s/Outstanding Resource Waters
□ Publicly owned propert			=
☐Anadromous fish	☐303(d) List		onmental Concern (AEC)
	of a federal and/or state listed protected sp		, ,
List species:	эт эт то		
☐Designated Critical Hat	pitat (list species)		
_	rmation/supplementary measurements incl	uded in "Notes/Sketch" section or	attached? ☐Yes ⊠No
1. Channel Water - assess	ment reach metric (skip for Size 1 strear	ns and Tidal Marsh Streams)	
☐A Water throughou	it assessment reach.	•	
□B No flow, water in			
□C No water in asse	essment reach.		
2. Evidence of Flow Restric	ction – assessment reach metric		
	assessment reach in-stream habitat or riffl	e-nool sequence is severely affer	cted by a flow restriction or fill to the
	ing flow or a channel choked with aquatic		
	reach (examples: undersized or perched of		
beaver dams).	` '	,	, 3 , ,
⊠B Not A			
3. Feature Pattern – assess	ement reach metric		
	assessment reach has altered pattern (exa	amples: straightening, modification	a above or below culvert)
⊠B Not A	assessment reach has altered pattern (exc	amples. straightening, modification	rabove of below curverty.
	ofile – assessment reach metric		
	ssment reach has a substantially altered str		
3 .	aggradation, dredging, and excavation w	nere appropriate channel profile	nas not reformed from any of these
disturbances). Not ∧			
⊠B Not A			
5. Signs of Active Instabilit	ty – assessment reach metric		
Consider only current in	nstability, not past events from which the		
active bank failure, active	channel down-cutting (head-cut), active wid		
⊠A < 10% of channe			
☐B 10 to 25% of change			

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 TTOLOG/OROK	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	2222222	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. Check Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
				ed 100% fo				n (1 1) - 2	10 1070, 1	Todominant (i) = 2 7078. Gamalative persontages
		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) 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) 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 $\triangle A \triangle A$
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

		ACC	ompanies oser i	vialiuai veisioli 2. i	
USA	ACE AID #:			NCDWR #:	
					7.5-minute topographic quadrangle,
and o	circle the location of the	stream reach under evalu	uation. If multiple	e stream reaches will be evaluated	d on the same property, identify and
					Iser Manual for detailed descriptions
					urements were performed. See the
		amples of additional meas			
NOT	E EVIDENCE OF STRE	SSORS AFFECTING TH	E ASSESSMENT	AREA (do not need to be withi	n the assessment area).
PRO	JECT/SITE INFORMAT	ION:			
	oject name (if any):	CLT Airport Expansion		2. Date of evaluation: April 20	
-	oplicant/owner name:	CLT		4. Assessor name/organization:	KMT, BGB/HDR
	ounty:	Mecklenburg		Nearest named water body	
	ver basin:	Catawba		on USGS 7.5-minute quad:	Ticer Branch
	•	degrees, at lower end of a		· ————————————————————————————————————	
		depth and width can be			
	te number (show on atta			Length of assessment reach evalu	` '
		(in riffle, if present) to top			Jnable to assess channel depth.
	Channel width at top of b			assessment reach a swamp stean	n? ∐Yes ∐No
		al flow Intermittent flow	w ∐ i idai Marsh	oueam	
_	EAM CATEGORY INFO	_	☑ Diadmant /)	Outer Coastal Plain (O)
15.1	NC SAM Zone:	☐ Mountains (M)	□ Piedmont (Figure 1) □ Piedmont (Figure 2) □ Piedmont (Figure 2) □ Piedmont (Figure 3) □ Piedmont (Figure 4) □ Piedmon	P) Inner Coastal Plain (I)	Outer Coastal Plain (O)
				\ \	,
	Estimated geomorphic	\bowtie_{A}		/ □B →	
	ralley shape (skip for Fidal Marsh Stream):	(more sinuous strear	m flatter valley el		room stooper valley slepe)
	,		=		ream, steeper valley slope)
	Vatershed size: (skip	Size 1 (< 0.1 mi²)	☐Size 2 (0.1	to $< 0.5 \text{ mi}^2$) Size 3 (0.5 to $<$: 5 mi²)
	or Tidal Marsh Stream ITIONAL INFORMATIO	,			
			: Mo If Yes d	neck all that apply to the assessme	ent area
	Section 10 water	Classified T			rshed (I I II III IV V)
	Essential Fish Habitat	-			s/Outstanding Resource Waters
_	 ☑Publicly owned proper	_ ,	parian buffer rule		=
	☐Anadromous fish	303(d) List	'		ronmental Concern (AEC)
	Documented presence	e of a federal and/or state	listed protected s	pecies within the assessment are	a.
	List species:				
	☐Designated Critical Ha				
19. A	Are additional stream info	ormation/supplementary n	neasurements inc	cluded in "Notes/Sketch" section o	r attached?
4 0	Shannal Water	amant raaah matria (akin	. fa., C: 1 atua	ma and Tidal March Streams)	
	JA Water – assess JA Water througho	` .	o for Size 1 Strea	ms and Tidal Marsh Streams)	
	B No flow, water i				
	C No water in ass				
2 =	- Syldenes of Flow Boots	iotion accomment room	ah matria		
		iction – assessment reach in-etre		fla-pool soguence is severely affe	ected by a flow restriction or fill to the
					impoundment on flood or ebb within
					the channel, tidal gates, debris jams,
	beaver dams).	` '	•	•	
Σ	☑B Not A				
3. F	eature Pattern – asses	sment reach metric			
	☐A A majority of the	e assessment reach has a	altered pattern (ex	camples: straightening, modification	n above or below culvert).
\triangleright	☑B Not A		•		,
4. F	eature Longitudinal Pr	ofile – assessment reac	h metric		
	_			tream profile (examples: channel	down-cutting, existing damming, over
_					has not reformed from any of these
	disturbances).			•	·
\triangleright	☑B Not A				
5. S	igns of Active Instabil	ity – assessment reach i	metric		
				the stream has currently recove	ered. Examples of instability include
а	ctive bank failure, active	channel down-cutting (he		idening, and artificial hardening (s	
	A < 10% of chann				
	B 10 to 25% of ch				
- 1	☐C > 25% of chann	iei 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	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 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 منصباط 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.	Large □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			(evaluate ∩ (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. 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	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	\mathbb{R}	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 $\triangle A \triangle A$
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 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 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	

, , , , , , , , , , , , , , , , , , , ,	-	
	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,					
	e stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and				
	ttached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions				
	ed information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the				
	camples of additional measurements that may be relevant.				
NOTE EVIDENCE OF STRI	ESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).				
PROJECT/SITE INFORMAT					
Project name (if any):	CLT Airport Expansion 2. Date of evaluation: April 2019				
3. Applicant/owner 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				
•	degrees, at lower end of assessment reach): 35.236870, -80.967351				
	(depth and width can be approximations)				
9. Site number (show on atta					
12. Channel width at top of I					
-	ial flow Intermittent flow Tidal Marsh Stream				
STREAM CATEGORY INFO					
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)				
10. NO OAN ZONE.					
16. Estimated geomorphic	□B □B				
valley shape (skip for Tidal Marsh Stream):	(more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)				
,	Size 1 (< 0.1 mi²) Size 2 (0.1 to < 0.5 mi²) Size 3 (0.5 to < 5 mi²) Size 4 (≥ 5 mi²)				
 Watershed size: (skip for Tidal Marsh Stream 					
ADDITIONAL INFORMATION	'				
	erations evaluated? Yes No If Yes, check all that apply to the assessment area.				
Section 10 water	☐ Classified Trout Waters ☐ Water Supply Watershed (☐ I ☐ III ☐ 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 H					
19. Are additional stream inf	formation/supplementary measurements included in "Notes/Sketch" section or attached? ☐Yes ☒No				
4 Observat Water assess	amount worsels wrething (allies for Circ 4 atmosphere and Tidal Mounts Cture area)				
	sment reach metric (skip for Size 1 streams and Tidal Marsh Streams) out assessment reach.				
_	sessment reach.				
	riction – assessment reach metric				
	f assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction <u>or</u> fill to the cting flow <u>or</u> a channel choked with aquatic macrophytes <u>or</u> ponded water <u>or</u> impoundment on flood or ebb within				
	it reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,				
beaver dams).					
⊠B Not A					
3. Feature Pattern – asses	ssment reach metric				
	e assessment reach has altered pattern (examples: straightening, modification above or below culvert).				
⊠B Not A ´	,				
4. Feature Longitudinal P	rofile – assessment reach metric				
	essment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over				
	re aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these				
disturbances).	55 , and a second secon				
⊠B Not A					
	lity – 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 chan					
☐B 10 to 25% of cl	nannel unstable				
□C > 25% of chan	nel unstable				

Consider for the Left Bank (LB) and the Right Bank (RB). R	6.					eamside area				
Marcon M				ne Lett	вапк (цв) а	na the Right E	sank (RB).			
C		$\boxtimes A$	$\boxtimes A$	Mod refe	derate evider erence interac	nce of conditior ction (examples	ns (examples: bei s: limited streamsi	rms, levee de area ao	es, down-occess, dis	cutting, aggradation, dredging) that adversely affect ruption of flood flows through streamside area, leaky
Check all that apply. A		□с	□c	Exte [exa of fl mos	ensive evider amples: caus lood flows thro squito ditchin	nce of condition seways with floo ough streamsid ng]) <u>or</u> floodplai	ns that adversely a odplain and chann de area] <u>or</u> too mud	affect refe el constric ch floodpla	rence inte tion, bulkl in/intertid	eraction (little to no floodplain/intertidal zone access neads, retaining walls, fill, stream incision, disruption al zone access [examples: impoundments, intensive
Check all that apply. A	7.	Wate	r Quality	Stresso	ors – assess	ment reach/in	tertidal zone me	tric		
B Excessive sedimentation (burying of stream features or intertidal zone)		Chec	k all that	apply.						
C Noticeable evidence of pollutant discharges entering the assessment reach and causing a water quality problem Odor (not including natural sulfide odors)										r discoloration, oil sheen, stream foam)
□D Odor (not including natural sulfide odors) □E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch section." □F Livestock with access to stream or intertidal zone □G Excessive algae in stream or intertidal zone (removal, burning, regular mowing, destruction, etc) □I Other:		_								nd causing a water quality problem
section. F			Odor	(not inc	luding natura	al sulfide odors))		· <u></u>	
G		∐E			isned or colle	ected data indi	cating degraded v	water quai	ity in the	assessment reach. Cite source in "Notes/Sketch"
H										
Other:								. burnina.	regular m	owing, destruction, etc)
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; for Size 3 or 4 streams, D2 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought; for Size 4 shours A multiple sticks and/or leaf packs and/or emergent vegetation S windered to banks and/or root mats and/or roots in banks extend to the normal wetted perimeter E Little or no habitat S windered a drought; for Size 4 Streams, D2 drought or higher is considered a drought; for Size 3 or 4 streams, D2 drought or higher is considered a drought; for Size 4 shours D2 drought or higher is considered a drought; for Size 4 streams, D2 drought or higher is considered a drought; for Size 4 shours D3 drought or Metric 13 (Streamside Area Ground Surface Condition). Natural In-stream Habitat Types - assessment reach metric D4 metric 13 (Streamside Area Ground Surface Condition). O4 metric 13 (Streamside Area Ground Surface Condition). O5 metric 13 (Streamside Area Ground Surface Condition). O6 metric 13 (Streamside Area Ground Sur			Othe	r:			•		-	<i>5.</i> , ,
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 No drought conditions Large or Dangerous Stream – assessment reach metric Yes No Is stream is too large or dangerous to assess? If Yes, skip to Metric 13 (Streamside Area Ground Surface Condition). 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 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. Check all that occur (occurs if > 5% coverage of assessment reach) (skip for Size 4 Coastal Plain streams) A Multiple aquatic macrophytes and aquatic mosses (include liverworts, lichens, and algal mats) B Multiple sticks and/or leaf packs and/or emergent vegetation C Multiple snags and logs (including lap trees) D 5% undercut banks and/or root mats and/or roots in banks extend to the normal wetted perimeter Little or no habitat **REMAINING QUESTIONS ARE NOT APPLICABLE FOR TIDAL MARSH STREAMS************************************	_									
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. Bedform and 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)		Bedf o 11a. 11b.	orm and □Yes Bedform □A □B □C	Substra No evaluate Riffle-re Pool-gli Natural	Is assessmed. Check the un section (edited section (edited bedform abs	ment reach me ent reach in a r he appropriate valuate 11c) evaluate 11d) sent (skip to M	etric (skip for Siz natural sand-bed s e box(es). letric 12, Aquatic	e 4 Coast stream? (s Life)	al Plain s kip for C	etreams and Tidal Marsh Streams) coastal Plain streams)
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 11b. Bedform evaluated. Check the appropriate box(es). ☐ A Riffle-run section (evaluate 11c) ☐ B Pool-glide section (evaluate 11d) ☐ C Natural bedform absent (skip to Metric 12, Aquatic Life) 11c. In riffle sections, check all that occur below the normal wetted perimeter of the assessment reach – whether or not submerged. Checat least one box in each row (skip for Size 4 Coastal Plain streams and Tidal Marsh Streams). Not Present (NP) = absent, Ran(R) = present but ≤ 10%, Common (C) = > 10-40%, Abundant (A) = > 40-70%, Predominant (P) = > 70%. Cumulative percentage should not exceed 100% for each assessment reach. NP R C A P ☐ Bedrock/saprolite 			\exists	\exists	H	╡			'/	
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12.	-		sessment reach metric (skip for Tidal Marsh Streams)
	12a. ⊠'		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 replies 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)
	Ä		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
12	_		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.		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 po	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 Contri	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	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)
	⊠E □F	Stream	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	Evidend	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)
	□C □D	Evidend	tream (≥ 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 □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
	∟∨	Jucani	snaumy is gone or largery 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 \square A \square A \square A \square A ≥ 100 feet wide \underline{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 From 30 to < 50 feet wide
	□ □ □ □ □ □ □ □ □ From 10 to < 30 feet wide □ 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 ☑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	□E □E Little or no vegetation 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 Row crops □B □B □B □B □B Maintained turf
	□C □C □C □C □C Pasture (no livestock)/commercial horticulture
22	D D D D D Pasture (active livestock use)
ZZ.	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 ☐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.
	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.
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:
larg	e amounts of privet in streamside area

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	eam Site Name CLT Airport Expansion Date of Assessment				
Stream Category	Benjamin Burdette/HDR				
		_			
Notes of Field Asses	sment Form (Y/N)		YES		
Presence of regulator	ory considerations (Y/N)		NO		
Additional stream inf	NO				
NC SAM feature type	IC SAM feature type (perennial, intermittent, Tidal Marsh Stream) Perennial				

(poronnial, intermittent, fradi waren etream)	1 010111110	<u>. </u>
	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	MEDIUM	
(3) Stream Stability	HIGH	
• •	HIGH	
(4) Channel Stability		
(4) Sediment Transport	MEDIUM	
(4) Stream Geomorphology	HIGH	
(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	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	
` ,	HIGH	
(3) Stream-side Habitat (3) Thermoregulation	HIGH	
(3) Mermoregulation (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

USACE AID #:	NCDWR #:					
INSTRUCTIONS: Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,						
	the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and					
	e attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions					
	lested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the					
	r examples of additional measurements that may be relevant.					
	TRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).					
PROJECT/SITE INFORI						
1. Project name (if any):	CLT Airport Expansion 2. Date of evaluation: April 2019					
3. Applicant/owner name						
5. County:	Mecklenburg 6. Nearest named water body					
7. River basin:	Catawba on USGS 7.5-minute quad: Ticer Branch					
-	mal degrees, at lower end of assessment reach): 35.228427, -80.957136					
9. Site number (show on	N: (depth and width can be approximations) attached map): PS5-1 - Stream 10 10. Length of assessment reach evaluated (feet): 484'					
	bed (in riffle, if present) to top of bank (feet): 1 Unable to assess channel depth.					
12. Channel width at top						
-	ennial flow Intermittent flow Tidal Marsh Stream					
STREAM CATEGORY II						
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)					
10.110 0/11/120110.	I Modification (III) I in the code contribution (I)					
16. Estimated geomorph						
valley shape (skip fo Tidal Marsh Stream						
17. Watershed size: (ski						
for Tidal Marsh Stre						
ADDITIONAL INFORMA	,					
	siderations 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 Hab	☐ 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 pres	Documented presence of a federal and/or state listed protected species within the assessment area.					
List species:						
	al Habitat (list species)					
19. Are additional stream	n information/supplementary measurements included in "Notes/Sketch" section or attached? ☐Yes ☒No					
4 Channal Water co	accoment reach metric (akin for Size 4 streems and Tidal March Streems)					
	sessment reach metric (skip for Size 1 streams and Tidal Marsh Streams) ghout assessment reach.					
	ter in pools only.					
	assessment reach.					
	estriction – 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					
	structing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb within					
	nent reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,					
beaver dam	ns).					
⊠B Not A						
3. Feature Pattern – as	ssessment reach metric					
☐A A majority o	of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).					
⊠B Not A	,					
4. Feature Longitudina	al Profile – assessment reach metric					
	assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over					
	ctive aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these					
disturbance						
⊠B Not A						
5. Signs of Active Inst	ability – assessment reach metric					
_	ent instability, not past events from which the stream has currently recovered. Examples of instability include					
	ctive channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).					
	nannel unstable					
<u>=</u>	of channel unstable					
□C > 25% of ch	nannel unstable					

6.				raction – s						
	LB	RB	ne Len	Bank (LB)	and the i	Right Bai	nk (RB).			
	⊠A □B	⊠A □B	Mod refe	derate evid erence inte	lence of co	onditions amples:	limited streamsi	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	Extended Ext	ensive evic amples: ca lood flows t	dence of causeways was the court of the cour	onditions with flood eamside	that adversely plain and chann area] or too muc	affect refe lel constric ch floodpla	rence inte ction, bulk ain/intertion	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								
	∐A ∏B						ie (milky white, i n features or int			er discoloration, oil sheen, stream foam)
	□с	Notic	eable ev	vidence of	pollutant d	lischarge				<u>nd</u> causing a water quality problem
	□D □E			cluding natu ished or co			tina dearaded v	water qua	litv in the	assessment reach. Cite source in "Notes/Sketch"
		section	on.						,	
	□F □G			h access to gae in strea						
	□н	Degr	aded ma	arsh vegeta	ation in the	intertida	l zone (removal	_	•	owing, destruction, etc)
	□l ⊠J		r: to no sti			(explain	in "Notes/Sketo	cn" section	1)	
8.	Rece	nt Weath	er – wa	tershed m	etric (ski	o for Tida	al Marsh Strear	ms)		
										eams, D2 drought or higher is considered a drought.
	□A □B						II not exceeding 1 inch within the			St 46 Hours
	⊠c	No d	rought c	onditions						
9.	Large □Ye	`	-	Stream – a stream is to				f Yes, skip	to Metric	13 (Streamside Area Ground Surface Condition).
10.							ach metric	of the e		t reach (everynles of stressors include everynles
	Tua.	∐Yes	⊠No	sedimer	ntation, mi	ning, exc	at over majority cavation, in-stre tal Plain stream	am 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 n e liverworts			quatic mosses l mats)	Check for Tidal Marsh Streams Only	□F □G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠в	Multiple vegetat		d/or leaf p	acks and	d/or emergent	k for T h Strei Only	□H □I	Low-tide refugia (pools) Sand bottom
		⊠c	Multiple	e snags an				heck farsh	□J	5% vertical bank along the marsh
		□D					s and/or roots I perimeter	0 ≥	□K	Little or no habitat
		□E		r no habita		iai welled	perimeter			
****			****	**DERAAIN	ING OUT	OTIONO /	ADE NOT ADD	ICADI E	COD TID	AL MARQUI OTREAMONIMINA
										AL MARSH STREAMS************************************
		∐Yes					-			streams and Tidal Marsh Streams)
		_		ed. Check				sueam: (3	okip ioi C	oastal Plain streams)
	TID.	⊠A		un section			iox(es).			
		□B □C		lide section			tric 12, Aquatic	l ife)		
	11c.				•	-		•	of the ass	essment reach – whether or not submerged. Check
		at least (R) = pre	one box esent bu	in each re	ow (skip f Common (0	or Size 4 C) = > 10	Coastal Plain -40%, Abundan	streams a	and Tidal	Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		NP	R	<u>C</u>	A	Р				
		\boxtimes	H	H	H		Bedrock/sapro Boulder (256 -		n)	
			×				Cobble (64 – 2	256 mm)	,	
		\exists	片			\exists	Gravel (2 – 64 Sand (.062 – 2			
				×			Silt/clay (< 0.0			
			\boxtimes	\exists		\exists	Detritus Artificial (rip-ra	ap, concre	te, etc.)	
	11d.	∐Yes	□No	Are pools	filled with	sedimen	it? (skip for Siz	e 4 Coast	al 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? 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 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.	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
	LB ⊠A ⊟B ⊟C	RB ⊠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.			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	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.
	□Y ⊠N	□Y ⊠N	Are wetlands present in the streamside area?
16.		II contril Streams Ponds (Obstruc Evidenc Stream	butors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams) butors within the assessment reach or within view of and draining to the assessment reach. c and/or springs (jurisdictional discharges) 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) 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.	Baseflow Check a ☐A	ll that ap	tors – assessment area metric (skip for Tidal Marsh Streams) oply. e of substantial water withdrawals from the assessment reach (includes areas excavated for pump installation)
	□B □C □D □E □F	Obstructure Urban s Evidence Assessr	tion not passing flow during low-flow periods affecting the assessment reach (ex: watertight dam, sediment deposit) tream (≥ 24% impervious surface for watershed) e that the streamside area has been modified resulting in accelerated drainage into the assessment reach ment 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 							
	$\ \ \ \ \ \ \ \ \ \ \ \ \ $							
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							
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 Row crops \[\] B Maintained turf \[\] C Pasture (no livestock)/commercial horticulture \[\] 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 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 □ B □ B □ C □ C □ C □ D □ D							
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.							
	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.							
	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). $\Box A < 46 \qquad \Box B 46 \text{ to} < 67 \qquad \Box C 67 \text{ to} < 79 \qquad \Box D 79 \text{ to} < 230 \qquad \Box E \geq 230$							
Note	es/Sketch:							

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

(perennial, intermittent, ridal Marsh Stream)		<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	NA	
(3) Stream Stability	HIGH	
` ,	HIGH	
(4) Channel Stability		
(4) Sediment Transport	MEDIUM	
(4) Stream Geomorphology	HIGH	
(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	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 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	
(3) Inda Maish In-stream Habitat (2) Intertidal Zone	NA NA	
	NA	
Overall	HIGH	

USACE AID #:	NCDWR #:
	ketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
	stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
	tached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
	ed information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
	amples of additional measurements that may be relevant.
NOTE EVIDENCE OF STRE	SSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE INFORMAT	ION:
 Project name (if any): 	CLT Airport Expansion 2. Date of evaluation: April 2019
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: Ticer Branch
8. Site coordinates (decimal of	degrees, at lower end of assessment reach): 35.230211, -80.956757
	depth and width can be approximations)
9. Site number (show on atta	
	(in riffle, if present) to top of bank (feet): 1 Unable to assess channel depth.
12. Channel width at top of be	
= =	al flow ☐Intermittent flow ☐Tidal Marsh Stream
STREAM CATEGORY INFO	
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
I	\ /
16. Estimated geomorphic	NA □B
valley shape (skip for	_
Tidal Marsh Stream):	(more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)
17. Watershed size: (skip	
for Tidal Marsh Stream)	
ADDITIONAL INFORMATIO	N:
	rations evaluated? Yes No If Yes, check all that apply to the assessment area.
☐Section 10 water	☐ Classified Trout Waters ☐ Water Supply Watershed (☐I ☐II ☐II ☐IV ☐V)
Essential Fish Habitat	
□ Publicly owned property	
☐Anadromous fish	□303(d) List □CAMA Area of Environmental Concern (AEC)
	e of a federal and/or state listed protected species within the assessment area.
List species:	1.9 (4.9 (1.5 (1.5 (1.5 (1.5 (1.5 (1.5 (1.5 (1.5
Designated Critical Ha	
19. Are additional stream into	ormation/supplementary measurements included in "Notes/Sketch" section or attached? ⊠Yes □No
1. Channel Water – assess	sment reach metric (skip for Size 1 streams and Tidal Marsh Streams)
	ut assessment reach.
☐B No flow, water in	
☐C No water in asse	· · · · · · · · · · · · · · · · · · ·
2 Evidence of Flow Bootsi	ction – assessment reach metric
	assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the ting flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb within
	reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver dams).	,
⊠B Not A	
3. Feature Pattern – asses	sment reach metric
	e assessment reach has altered pattern (examples: straightening, modification above or below culvert).
⊠B Not A	, assessment reach has altered pattern (examples, straightening, mounication above or below ediverty.
	ofile – assessment reach metric
	ssment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over
disturbances).	e aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
⊠B Not A	
=	ty – assessment reach metric
	nstability, not past events from which the stream has currently recovered. Examples of instability include channel down cutting (head cut), active widening, and artificial hardening (such as concrete, gabine, rip-rap).
active bank failure, active ⊠A < 10% of channe	channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
☐B 10 to 25% of chair	
☐C > 25% of channel	

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 inter- 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.	Large □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.									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 ² 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	 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.			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 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).
	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 B B B B B B B B B B B B B B B B B
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). $\Box A < 46 \qquad \Box B 46 \text{ to} < 67 \qquad \Box C 67 \text{ to} < 79 \qquad \Box D 79 \text{ to} < 230 \qquad \Box E \geq 230$
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 Pa1 Asse		Assessor Name/Organization	KMT,BGB/HDR				
Notes of Field Asses	sment Form (Y/N)		YES				
Presence of regulator	NO						
Additional stream inf	dditional 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 Olollilla	<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	

		ACC	onipanies Oser i	vialiuai veisioli 2. i	
USAC	E AID #:			NCDWR #:	
INSTR	UCTIONS: Attach a s	ketch of the assessment a	area and photogr	aphs. Attach a copy of the USGS	7.5-minute topographic quadrangle,
and cir	rcle the location of the	stream reach under evalu	uation. If multiple	e stream reaches will be evaluate	d on the same property, identify and
					Jser Manual for detailed descriptions
					surements were performed. See the
		amples of additional meas		•	
NOTE	EVIDENCE OF STRE	SSORS AFFECTING TH	E ASSESSMENT	AREA (do not need to be with	in the assessment area).
	ECT/SITE INFORMAT	-			
-	ect name (if any):	CLT Airport Expansion		2. Date of evaluation: April 2	
	licant/owner name:	CLT		4. Assessor name/organization:	KMT,BGB/HDR
5. Cou	•	Mecklenburg		6. Nearest named water body	
	er basin:	Catawba		on USGS 7.5-minute quad:	Coffey Creek
	•	degrees, at lower end of a			
		depth and width can be			
	number (show on attach			Length of assessment reach eval	` '
		(in riffle, if present) to top			Unable to assess channel depth.
	annel width at top of ba			assessment reach a swamp stear	II! LIYES LINO
		al flow Intermittent flow	v ∐ııdalıMarsh	oueam	
_	AM CATEGORY INFO	-	✓ Diodmant /F)	☐ Outer Coastal Plain (O)
10. NC	SAM Zone:	☐ Mountains (M)	□ Piedmont (Figure 1)	P) Inner Coastal Plain (I)	☐ Outer Coastal Plain (O)
	timated geomorphic		$\overline{}$	✓ ⊠B	
	lley shape (skip for dal Marsh Stream):	(more sinuous strear	m flatter valley sl		tream, steeper valley slope)
	,	•	-		tream, steeper valley slope)
	atershed size: (skip	☐Size 1 (< 0.1 mi²)	∐Size 2 (0.1	to $< 0.5 \text{ mi}^2$) \square Size 3 (0.5 to $<$	< 5 mi²)
	r Tidal Marsh Stream) TIONAL INFORMATIO				
			: □No If Yes ch	neck all that apply to the assessm	ent area
	Section 10 water	Classified Tr			ershed (I II III IV V)
	Essential Fish Habitat	-			rs/Outstanding Resource Waters
_	Publicly owned propert	_ ,	parian buffer rule		<u> </u>
	Anadromous fish	303(d) List			ronmental Concern (AEC)
	Documented presence	of a federal and/or state	listed protected s	pecies within the assessment are	a.
	List species:				
	Designated Critical Ha				
19. Are	e additional stream info	ormation/supplementary m	neasurements inc	cluded in "Notes/Sketch" section o	r attached? ⊠Yes
4 Oh			. f O: 4 -t	and Tidal Manch Otrogona)	
	A Water throughou		o for Size 1 Strea	ms and Tidal Marsh Streams)	
2. Evi		ction – assessment read	ah matria		
2. EVI				fle-nool seguence is severely affe	ected by a flow restriction or fill to the
□ /					r impoundment on flood or ebb within
					t the channel, tidal gates, debris jams,
	beaver dams).		•	•	
⊠E	B Not A				
3. Fea	ature Pattern – assess	sment reach metric			
\boxtimes	A A majority of the	assessment reach has a	altered pattern (ex	camples: straightening, modification	on above or below culvert).
			, ,	, 5	•
4. Fea	ature I ongitudinal Pro	ofile – assessment reac	h metric		
- 7. 1 €0	_			tream profile (examples: channel	down-cutting, existing damming, over
– ,					has not reformed from any of these
	disturbances).				,
⊠E					
5. Sic	ins of Active Instabili	ty – assessment reach r	metric		
				the stream has currently recov	ered. Examples of instability include
					such as concrete, gabion, rip-rap).
\boxtimes	A < 10% of channe	el unstable	•	-	,
	C > 25% of channe	el unstable			

6.				raction – si						
	LB	RB	ne Len i	Bank (LB)	and the r	Kignt Bai	nk (RB).			
	□A □B	□A □B	Mod refe	derate evide rence intera	ence of co	onditions amples:	limited streams	erms, levee side 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 evide amples: cau ood flows th	ence of couseways we have a second of the couse was a second of the couse of the co	onditions with flood eamside	that adversely plain and chani 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	rs – asses	ssment re	each/inte	rtidal zone me	etric		
		k all that								
										er discoloration, oil sheen, stream foam)
	□B □C						n features or in s entering the a			nd causing a water quality problem
	\Box D	Odor	(not incl	luding natui	ral sulfide	odors)	_			
	□E	Curre section		shed or co	llected da	ita 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 Strea	•	0 1 -+-	D2 d
	For S						ll not exceeding			eams, D2 drought or higher is considered a drought. st 48 hours
	В	Droug	ght condi	litions <u>and</u> r			1 inch within the			
•	⊠c		•	onditions						
9.	∐Ye		•	Stream – as tream is too				f Yes, skip	to Metric	13 (Streamside Area Ground Surface Condition).
10.							ach metric	, of the o		st reach (everynles of atreacers include everynise
	iua.	∐Yes	⊠No	sediment	tation, mii	ning, exc	at over majority 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.									ize 4 Coastal Plain streams)
		□A		e aquatic m e liverworts,			uatic mosses 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	loas (inc	luding lar	o trees)	arsh o	□J	Sand bottom 5% vertical bank along the marsh
		ΠĎ	5% und	lercut bank	s and/or i	root mats	and/or roots	ပ် 🖺	□ĸ	Little or no habitat
		□E		s extend to no habitat		al wetted	perimeter			
****	*****	******	*****	*REMAINI	NG QUES	STIONS A	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.	Bedf	orm and	Substrat	te – asses	sment rea	ach metr	ic (skip for Si	ze 4 Coas	tal Plain	streams and Tidal Marsh Streams)
	11a.	∐Yes	⊠No	ls assessr	nent reac	h in a nat	tural sand-bed	stream? (s	skip for C	oastal Plain streams)
	11b.	Bedform ⊠A		ed. Check un section (ox(es).			
		□B		ide section						
		□с	Natural	bedform al	bsent (ski	ip to Met	ric 12, Aquatio	: Life)		
	11c.	at least	one box	in each ro	w (skip fo	or Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. Check Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should no	ot excee	d 100% for	each ass	essment		\ ' 7		(,
		NP ⊠	R □	C	A	P	Bedrock/sapr	olite		
				፱			Boulder (256	– 4096 mr	m)	
					\Box		Cobble (64 – Gravel (2 – 6			
		H					Sand (.062 -	2 mm)		
			\square		\square		Silt/clay (< 0.0	062 mm)		
				\boxtimes	\exists		Artificial (rip-r	ap, concre	ete, etc.)	
	11d.	∐Yes	□No	Are pools	filled with	sedimen	t? (skip for Si	ze 4 Coas	tal Plain :	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? 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		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
	H		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 Íarvae Worms/leeches
13.	Streams	ide Area er 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.
	LB □A	RB □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 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 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)
		II contril	outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.
	□в	Ponds (and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)
	□c ⊠d		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)
	⊠E □F	Stream	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		ply. 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		nent reach relocated to valley edge the above
18.			sment 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	Degrade	ed (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 b to the first break.						
	Vegetated Wooded LB RB LB RB □A □A □A □A □D □D<					
	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 Maintained shrubs E Little or no vegetation					
	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 B A B A B					
	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					
	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 \[\text{A} \text{ \text{\text{\text{\text{\text{B}}}}} The total length of buffer breaks is < 25 percent. \[\text{\tex					
	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 of 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. 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.					
	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a.					
	□A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230					
	s/Sketch:					
Sue	am is located in the middle of an airport airfield,					

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

(poronnial, intornittorit, fradi Maron Stroam)				
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	_	⊠ 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 (skip for	\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: (skip	Size 1 (< 0.1 mi²)	☐ Size 2 (0.1 to	< 0.5 mi ²)	☐ Size 3 (0.5 to < 5	5 mi²) ☐ Size 4 (≥ 5 mi²)
	al Marsh Stream)					
	AL INFORMATION:			1 . 11 41 . 4		
	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
.	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 channel					
⊠c	> 25% of channel					

6.					– stream						
			the Lef	t Bank (I	LB) and th	he Right	Bank (RB).				
	LB RB A 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]) 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, disruption 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 an						leaky ccess iption nsive				
7	18/040	. 0		erstream		4 l- /:-					
7.	Water Quality 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 Odor (not including natural sulfide odors) □ E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section. □ F Livestock with access to stream or intertidal zone						:etch"				
	□G □H				ream or int etation in t			I. burnina	. regular r	nowing, destruction, etc)	
	□i	Othe	r:				n in "Notes/Sketo				
8.					d metric (skin for T	Tidal Marsh Str	eams)			
.		ize 1 or 2 Drou Drou	streams ght cond ght cond	s, D1 dro ditions <u>an</u>	ught or hig nd no rainf nd rainfall e	her is con all or raint		nt; for Size	ithin the la	reams, D2 drought or higher is considered a dro ast 48 hours	ught.
9.	Large ☐ Yes		_				ch metric ous to assess?	f Yes, ski	p to Metric	c 13 (Streamside Area Ground Surface Condition	on).
10.	Natur	al In-str	eam Ha	ıbitat Typ	oes – ass	essment	reach metric				
	10a.	□Yes	□No	sedim	entation, r	mining, ex		am hard	ening [for	nt reach (examples of stressors include exce example, rip-rap], recent dredging, and snag p to Metric 12)	
		Check a A B C C D D	Multiple (includ Multiple vegeta Multiple 5% und in bank	e aquatic le liverwor e sticks a ation e snags a dercut ba	macrophy rts, lichens and/or leaf and logs (i anks and/o I to the noi	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	
****	*****	******	*****	**REMAII	NING QU	ESTIONS	ARE NOT APPL	ICABLE	FOR TID	AL MARSH STREAMS************************************	*
11.	Bedf	orm and	Substr	ate – as	sessment	t reach m	netric (skip for S	Size 4 Co	astal Pla	in streams and Tidal Marsh Streams)	
	11a.	□Yes	⊠No	ls asses	ssment rea	ach in a n	atural sand-bed	stream? (skip for (Coastal Plain streams)	
		Bedform □ A □ B ☑ C	Riffle-r Pool-gl	run sectio Ilide sectio	n (evalua on (evalu a	ite 11c) ate 11d)	e box(es). etric 12, Aquati	c Life)			
		at least (R) = pre	one box esent bu	x in each ut <u><</u> 10%,	row (skip	o for Size (C) = > 1	4 Coastal Plain 0-40%, Abundar	streams at (A) = > colite - 4096 m 256 mm) 4 mm) 2 mm) 062 mm)	and Tida 40-70%, I	sessment reach – whether or not submerged. C I Marsh Streams) . Not Present (NP) = absent, Predominant (P) = > 70%. Cumulative percent	Rare
	11d.	□Yes	□No	Are poo	ols filled wi	th sedime	ent? (skip for Siz	e 4 Coas	stal 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.	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)	
			Left Bank (LB) and the Right Bank (RB). 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.
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). \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 (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):	CLT Airport Expansion		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 (skip for	\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 ²)	☐ 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			- `	,
		ı unstabi c				

ο.				Pank /I D							
	LB	RB	tne Len	вапк (цв) and the	Right E	Bank (RB).				
	⊠a □B	⊠a □B	Mod refe or in	derate evide rence inter ntermittent	ence of co action (exa bulkheads	onditions amples: s, causev	limited stream ways with flood	erms, le side are Iplain co	vees, o a acces nstricti	down- ss, dis on, mi	cutting, aggradation, dredging) that adversely affecting ruption of flood flows through streamside area, leaky nor ditching [including mosquito ditching])
	□с	□с	[exa of fl mos	amples: cau	useways v rrough stre ing]) <u>or</u> flo	vith flood eamside	dplain and char area] <u>or</u> too m	nnel cons uch flood	trictior lplain/i	n, bulk 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 ar
7.	Wate	r Quality	Stress	ors – asse	ssment r	each/in	tertidal zone	metric			
	_	k all that			:	-4:-l-1	/:!!	hler		_14.	andinalanting all the second areas (
	∐A □B □C	Exces Notice	<u>ssive</u> se eable ev	dimentatior	n (burying pollutant d	of stream	m features or	ntertidal	zone)		er discoloration, oil sheen, stream foam) nd causing a water quality problem
	□D □E		nt publi	luding natu shed or co			ating degraded	l water o	uality	in the	assessment reach. Cite source in "Notes/Sketch"
	□F □G			n access to gae in strea							
	□H □I □J	Degra Other	aded ma	rsh vegeta	tion in the	intertida				gular n	nowing, destruction, etc)
8.					netric (sk	in for T	idal Marsh S	reams)			
		B Drought conditions and rainfall exceeding 1 inch within the last 48 hours									
9.	Larg e		-	Stream – a				If Yes, s	skip to	Metric	: 13 (Streamside Area Ground Surface Condition).
10.							reach metric				
	10a.	□Yes	∐No	sedimen	tation, mir	ning, exc	cavation, in-st	ream ha	rdenin	g [for	at reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging) p to Metric 12)
	10b.	Check a □A	Multiple		acrophyte	s and a	quatic mosses		ì ⊑	p for \$]F]G	Size 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠в	Multiple	sticks and			d/or emergent	for Ti Strea	<u></u> ★ □]н	Low-tide refugia (pools)
		⊠c		snags and				hec lars]J	Sand bottom 5% vertical bank along the marsh
		□D	in bank		the norm		s and/or roots d perimeter	0 ≥	L]K	Little or no habitat
****	*****										AL MARSH STREAMS************************************
11.		_					` .				n streams and Tidal Marsh Streams)
		☐Yes	⊠No					d stream	? (SKIP	o tor C	Coastal Plain streams)
	TID.	⊠A □B □C	Riffle-ru Pool-gli	ed. Check un section (ide section	evaluate (evaluate	11c) e 11d)	etric 12, Aqua	tic Life)			
	11c.				•	•	•	•	er of th	ne ass	essment reach – whether or not submerged. Check
		at least of (R) = pre	one box esent but	in each ro	ow (skip f ommon (C	or Size 4 C) = > 10	4 Coastal Plai 0-40%, Abunda	n strean	ns and	l Tidal	Marsh Streams). Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		NP	R □	C \square	A	P	Bedrock/sap	vrolito			
							Boulder (25	6 – 4096			
							Cobble (64 - Gravel (2 -	64 mm)	n)		
					\square		Sand (.062 Silt/clay (< 0		1)		
							Detritus Artificial (rip			etc.)	
	11d.	_	□No	_	_	_	` .	• •		,	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 -	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							
	$\Box c$ $\Box c$	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 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 (skip f			⊠в	
	Tidal Marsh Stream		flatter valley slope)	(less sinuous str	eam, steeper valley slope)
17	7. Watershed size: (sk	ip ⊠ Size 1 (< 0.1 mi²)	☐ Size 2 (0.1 to < 0.5 mi ²)	☐ 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 assessment reach metric	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 altered.	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).
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	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 substantiative 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).
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 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
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 alternal Profile – assessment reach has a substantiactive 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 is the channel profile	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.					- streams						
			the Left	Bank (L	B) and th	e Right I	Bank (RB).				
	LB ⊠A □B	RB □A □B	Mod refe or in Exte [exa of flo mos	derate evi erence intententensive ev amples: cood flows	dence of eraction (extended to bulkhead idence of auseways throughs ching]) or	conditions examples: ds, cause conditions with flood treamside	limited streamsi ways with floodp s that adversely dplain and chann area] or too muc	rms, leve de area a lain consi affect refe el constri ch floodpl	es, down- ccess, dis triction, mi erence inte ction, bulk ain/intertic	steraction cutting, aggradation, dredging) that adversely affectively affectiv	ess ion ive
7.	Wate	r Quality	Stress	ors – ass	essment	t reach/in	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 Odor (not including natural sulfide odors) □ E Current published or collected data indicating degraded water quality in the assessment reach. Cite source in "Notes/Sketch" section.										
	□F □G					or intertid ertidal zor					
	□H ⊠ι □J	Othe					al zone (removal n in "Notes/Sketo			mowing, destruction, etc)	
8.		ize 1 or 2 Drou Drou	streams ght cond ght cond	s, D1 drou litions <u>and</u>	ight or hig d no rainfa	her is con all or rainf	Fidal Marsh Stro sidered a drough all not exceeding 1 inch within the	nt; for Size	ithin the la	reams, D2 drought or higher is considered a droug ast 48 hours	Jht.
9.	Large □Yes		_				ch metric ous to assess? I	f Yes, ski _l	p to Metric	c 13 (Streamside Area Ground Surface Condition)).
10.		al In-str □Yes		Degrad sedime	ded in-stre	eam habit nining, ex	cavation, in-stre	am hard	ening [for	nt reach (examples of stressors include excessi example, rip-rap], recent dredging, and snaggir ip to Metric 12)	
		Check a □ A □ B □ C □ D □ E	Multiple (include Multiple vegetat Multiple 5% und in bank	e aquatic e liverwork e sticks a tion e snags a dercut bar	macrophy ts, lichens nd/or leaf nd logs (ir nks and/o to the nor	rtes and a s, and alga packs an ncluding la r root mat	quatic mosses al mats) ad/or emergent	Check for Tidal an Marsh Streams book	(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)	
		Bedform □ A □ B □ C	evaluate Riffle-ru Pool-gli	ed. Chec un sectior ide sectio	k the ap (evalua n (evalua	propriate te 11c) ate 11d)	e box(es). etric 12, Aquati			,	
		at least (R) = pre	one box esent but	t in each t ≤ 10%,	row (skip Common	for Size	4 Coastal Plain 0-40%, Abundan	streams t (A) = > blite - 4096 m 256 mm) 1 mm) 2 mm) 062 mm)	and Tidal 40-70%, I	sessment reach – whether or not submerged. Che I Marsh Streams) . Not Present (NP) = absent, Ra Predominant (P) = > 70%. Cumulative percentag	are
	11d.	□Yes	□No	Are pool	ls filled wit	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.			 streamside area metric (skip for Tidal Marsh Streams) the Bank (LB) and the Right Bank (RB). Do not consider wetlands outside of the streamside area or within the norma
			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	 streamside area metric (skip for Tidal Marsh Streams) riate boxes for left bank (LB) and right bank (RB). Indicate if listed stressor abuts stream (Abuts), does not abut but is ream (< 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: 🛭 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) anni 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					
C SAM feature type (perennial, intermittent, Tidal Marsh Stream) Perennial Perennial							
	Pb1 sment Form (Y/N) ry considerations (Y/N) ormation/supplementary measu	Pb1 Assessor Name/Organization sment Form (Y/N) ry considerations (Y/N) ormation/supplementary measurements included (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 Z . 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):	CLT Airport Expansion		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 c 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 (skip for	⊠a	$\overline{}$		□в	_
Tidal N	Marsh Stream):	(more sinuous stream	m, flatter valley slo _l	pe)	(less sinuous st	ream, steeper valley slope)
	shed size: (skip	\square Size 1 (< 0.1 mi ²)	☐ Size 2 (0.1 to	o < 0.5 mi ²)	⊠ 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	ent (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 recov	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.	Streamside Area Interaction – streamside area metric									
	Cons LB	sider for th RB	ne Left Bank	k (LB) and th	ne Right I	Bank (RB).				
	□a ⊠B	□a ⊠B	Moderate reference	evidence of interaction (e	conditions examples:	limited streamsi	rms, leve ide area a	es, down- ccess, dis	teraction cutting, aggradation, dredging) that adversely affe sruption of flood flows through streamside area, leak nor ditching [including mosquito ditching])	
	□с	□с	[examples of flood flo	s: causeways ows through s ditching]) <u>or</u>	s with flood treamside	dplain and chann area] <u>or</u> too mud	nel constri ch floodpla	ction, bulk ain/intertic	eraction (little to no floodplain/intertidal zone acces heads, retaining walls, fill, stream incision, disruptio dal zone access [examples: impoundments, intensiv or assessment reach is a man-made feature on a	n ⁄e
7.	Wate	r Quality S	Stressors –	assessmen [.]	t reach/ir	ntertidal zone n	netric			
	□A □B □C	Excess Notice:	ored water in sive sedimen able evidenc	tation (buryir e of pollutant	ng of strea discharge	am features or in	tertidal zo	ne)	er discoloration, oil sheen, stream foam) und causing a water quality problem	
	□D □E			natural sulfic or collected o		ating degraded	water qua	lity in the	assessment reach. Cite source in "Notes/Sketcl	า"
	□F □G	section Livesto	n. ock with acce	ess to stream stream or int	or intertid	lal zone	•	,		
	□H □I ⊠J	Other:				al zone (remova n in "Notes/Sketo			nowing, destruction, etc)	
8.		Size 1 or 2 s Drougl Drougl	treams, D1 d	frought or hig and no rainfa and rainfall e	her is con all or rainf	Fidal Marsh Stro sidered a drough all not exceeding 1 inch within the	nt; for Size g 1 inch w	ithin the la	eams, D2 drought or higher is considered a drough ast 48 hours	ıt.
9.	Larg e			m – assessi is too large o			lf Yes, skip	o to Metric	c 13 (Streamside Area Ground Surface Condition).	
10.		ral In-stre □Yes [⊡No Deg sed	graded in-stre imentation, n	eam habit nining, ex		eam harde	ening [for	nt reach (examples of stressors include excessive example, rip-rap], recent dredging, and snagging to Metric 12)	
	10b.	⊠A 1	Multiple aqua (include liver)	itic macrophy worts, lichens	rtes and a s, and alga	quatic mosses		(skip for □F □G □H	Size 4 Coastal Plain streams) 5% oysters or other natural hard bottoms Submerged aquatic vegetation Low-tide refugia (pools)	
		⊠c i	vegetation Multiple snag 5% undercut	ıs and logs (iı banks and/o	ncluding la	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	
			ittle or no ha	nd to the nor abitat	mai wette	a perimeter				
****	****	*******	**************************************	AINING QUI	ESTIONS	ARE NOT APPL	LICABLE	FOR TID	AL MARSH STREAMS************************************	
11.				assessment	reach m	etric (skip for S	Size 4 Co	astal Plai	in streams and Tidal Marsh Streams)	
							stream? (skip for (Coastal Plain streams)	
	11b.	⊠A I □B I	Riffle-run sec Pool-glide se	heck the ap tion (evalua ction (evalua orm absent (s	te 11c) ate 11d)	e box(es). etric 12, Aquati	c Life)			
	11c.	In riffle sec at least or (R) = pres	ctions, check ne box in ea ent but <u><</u> 10°	all that occur	below the o for Size (C) = > 10	e normal wetted p 4 Coastal Plain 0-40%, Abundan	perimeter streams	and Tidal	essment reach – whether or not submerged. Check I Marsh Streams) . Not Present (NP) = absent, Rail Predominant (P) = > 70%. Cumulative percentage	re
		NP I	R C □	A 	P	Bedrock/sapro Boulder (256		m)		
						Cobble (64 – Gravel (2 – 64	256 mm)	,		
						Sand (.062 -	2 mm)			
						Silt/clay (< 0.0 Detritus Artificial (rip-ra	,	ete, etc.)		
	11d.	□Yes [⊡No Arep	ools filled wit	th sedime		-		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) e that 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								
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 <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								
	✓ 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								
	□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	KMT,BGB/HDR								
Notes of Field Asses		YES							
Presence of regulato	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								

(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		 Nearest named water to on USGS 7.5-minute of 	-	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 (skip for 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	litional 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								
	widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from a							
⊠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						

О.		Consider for the Left Bank (LB) and the Right Bank (RB).									
	LB	RB	tne Let	t Bank (L	.b) and th	e Right E	sank (RB).				
	⊠a □B	⊠a □B	Mo refe or i	derate evi erence inte intermitten	idence of o eraction (e nt bulkhead	conditions xamples: ds, cause	limited streams ways with flood	erms, leve side area plain cons	ees, down- access, dis striction, m	cutting, aggradation, dredging) the cruption of flood flows through stre inor ditching [including mosquito	eamside area, leaky ditching])
	□с	□с	[exa of f	amples: c lood flows	causeways through st ching]) <u>or</u> t	with flood reamside	dplain and chan area] <u>or</u> too mu	nel constr ıch floodp	iction, bulk lain/intertio	eraction (little to no floodplain/into heads, retaining walls, fill, stream dal zone access [examples: impou or assessment reach is a man-n	incision, disruption undments, intensive
7.	Wate	r Quality	Stress	ors – ass	sessment	reach/in	ntertidal zone	metric			
	Check all that apply.										
	□a □B						ne (milky white, im features or ii			er discoloration, oil sheen, strean	n foam)
	\Box C	Notic	eable e	vidence o	f pollutant	discharge				ind causing a water quality proble	em
	□D □E				itural sulfid collected d		ating degraded	water qu	ality in the	assessment reach. Cite source	e in "Notes/Sketch"
		section	on.						,		
	□F □G				to stream or inte						
	□H		aded ma	arsh vege	tation in th	e intertida				nowing, destruction, etc)	
	⊠j			ressors		_ (explair	IIII Notes/Skei	.cn secuc)(1)		
8.							Tidal Marsh St				
	For S ⊠A						sidered a droug all not exceedin			eams, D2 drought or higher is co	nsidered a drought.
	□в	Drou	ght cond	ditions <u>and</u>	<u>d</u> rainfall e		1 inch within th			351 40 110015	
	□с	No di	rought c	conditions							
9.	Large ☐ Yes		-		– assessn too large o			If Yes, sk	ip to Metric	c 13 (Streamside Area Ground Su	urface Condition).
10.							reach metric	of the		at wasse (averagles of attractors	inalija avasasiya
	10a.	□Yes	□INO	sedime	entation, m	nining, exc	cavation, in-str	eam hard	lening [for	nt reach (examples of stressors example, rip-rap], recent dredg p to Metric 12)	
	10b.	Check a ⊠A					ge of assessme quatic mosses		(skip for □F	Size 4 Coastal Plain streams) 5% oysters or other natural had	rd hottoms
			(includ	e liverwor	ts, lichens,	, and alga	al mats)	Tidal	□G	Submerged aquatic vegetation	
		⊠в	Multiple		nd/or leaf	packs an	id/or emergent	Check for Tidal Marsh Streams Only	. □H □I	Low-tide refugia (pools) Sand bottom	
		⊠c ⊠d			and logs (in			Shec Mars	□J □K	5% vertical bank along the mar	rsh
							ts and/or roots d perimeter	0 _ 1	⊔ĸ	Little or no habitat	
		□E	Little o	r no habit	at						
****	*****	** ** ** ** **	*****	*REMAIN	IING QUE	STIONS	ARE NOT APP	LICABLE	FOR TID	AL MARSH STREAMS******	******
11.	Bedf	orm and	Substr	ate – ass	essment	reach me	etric (skip for	Size 4 Co	oastal Pla	in streams and Tidal Marsh St	reams)
	11a.	□Yes	⊠No	ls asses	sment rea	ch in a na	atural sand-bed	stream?	(skip for (Coastal Plain streams)	
	11b.	Bedform			ck the app		box(es).				
		⊠a □B			n (evaluat on (evalua						
		□с	Natura	I bedform	absent (s	kip to Me	etric 12, Aquat	ic Life)			
		at least	one bo	x in each	row (skip	for Size 4	4 Coastal Plair	streams	and Tida	essment reach – whether or not s I Marsh Streams) . Not Present (Predominant (P) = > 70%. Cumu	NP) = absent, Rare
		should no		_	or each as	sessment	t reach.				_
			R □	C □	A		Bedrock/sap	rolite			
			\square	R			Boulder (256 Cobble (64 –				
							Gravel (2 – 6	64 mm) (
					\square		Sand (.062 - Silt/clay (< 0.				
							Detritus				
	11-	⊠ □vos		∐ ^rc ===	ام اللحظ بنظ	 b.ood:	Artificial (rip-	• •	,	otroomo and Tidal March Core	ama)
	пd.	□Yes	□No	Are poo	is illed with	ıı seaimer	are (skip for S	ı∠e 4 ∪oa	otal Plain	streams and Tidal Marsh Stre	a1115)

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)
				pes/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	\Box 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.				streamside area metric (skip for Tidal Marsh Streams) 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 <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?					
		If No, select 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		
Stream Category	Pa1	Assessor Name/Organization	KMT,BGB/HDR		
				,	
Notes of Field Asses	ssment Form (Y/N)		NO		
Presence of regulato	Presence of regulatory considerations (Y/N)				
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

110	SACE AID :	#	Accompanies	NCDWR#	
03		" oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019
٨	۱۲ pplicant/O			Wetland Site Name	PW1-1 - Wetland 5
^		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		Ecoregio		Nearest Named Water Body	Ticer Branch
		River Basi		USGS 8-Digit Catalogue Unit	03050101
	Г	Count		NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.229386; -80.956805
\vdash			•	<u> </u>	55.22666, 66.66666
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 upond storage tanks (USTs), hog lagoons, station stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed? Yes attions - Were regulatory considerations evaluations are regulatory considerations evaluated species or State endangered or thre rian buffer rule in effect ary Nursery Area (PNA)	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 , salt intrusion, etc.)
	N.C Abu Des Abu	c. Division its a strea signated N its a 303(ed property of Coastal Management Area of Environme m with a NCDWQ classification of SA or su CNHP reference community d)-listed stream or a tributary to a 303(d)-lis stream is associated with the wetland, if	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	
			ea's surface water storage capacity or do area experience overbank flooding duri	uration substantially altered by beaver? ing normal rainfall conditions? Yes	☐ Yes
1.			ondition/Vegetation Condition – assessi		
	Check a lassessme area base	box in ea ent area.	ch column. Consider alteration to the grou	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.		_		ype condition metric (skip for all marshe	·
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (W □).
	□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	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	

	Check a box from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature. Make soil observations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regional indicators. 4a. A Sandy soil B Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) C Loamy or clayey soils not exhibiting redoximorphic features D Loamy or clayey gleyed soil Histosol or histic epipedon
	4b. ⊠A Soil ribbon < 1 inch □B Soil ribbon ≥ 1 inch
	4c. ⊠A No peat or muck presence ☐B A peat or muck presence
5.	Discharge into Wetland – opportunity metric Check a box in each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples of sub-surface discharges include presence of nearby septic tank, underground storage tank (UST), etc. Surf Sub A A Little or no evidence of pollutants or discharges entering the assessment area B B Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area C 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) Check all that apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining to assessment area within entire upstream watershed (WS), within 5 miles and within the watershed draining to the assessment area (5M), and within 2 miles and within the watershed draining to the assessment area (2M). WS 5M 2M A A A ≥ 10% impervious surfaces B B B Confined animal operations (or other local, concentrated source of pollutants C C C C ≥ 20% coverage of pasture D D D D D ≥ 20% coverage of agricultural land (regularly plowed land) E E E E E ≥ 20% coverage of maintained grass/herb F F F F F ≥ 20% coverage of clear-cut land G G G G G 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.
7.	Wetland Acting as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
0	 7a. Is assessment area within 50 feet of a tributary or other open water?
8.	Wetland Width at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and Estuarine Woody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest only) Check a box in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and the wetland complex at the assessment area (WC). See User Manual for WT and WC boundaries. WT WC A A ≥ 100 feet B B From 80 to < 100 feet C C From 50 to < 80 feet D D From 40 to < 50 feet E F From 30 to < 40 feet F F F From 15 to < 30 feet G G 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 S 500 acres B B B From 100 to < 500 acres C C C From 50 to < 100 acres D D D D From 25 to < 50 acres E E From 10 to < 25 acres F F F F F F F F F F F F F F F F F F F
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)
	 □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. □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. □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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics).

17	Vege	stative St	ructure —	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 for all marshes only . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation
		structure		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider ace above the assessment area (AA) and the wetland type (WT) separately.
		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
	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	Large Not A		more 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	Majo prese		opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are
	⊠B □C	Majo	rity of can	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.				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.	Vege	etation/O _l	oen 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. Patterned dareas, while solid white areas indicate open water. B C D
		0	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, diversion, er dams, and stream incision. Documentation required if evaluated as B, C, or D.
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.
	□B □C			is severely altered in the assessment area. is severely altered in the assessment area.
	Ho			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	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 is su						
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#	
	Pr	oject Name	CLT Airport Expansion	Date of Evaluation	April 2019
P	Applicant/O	wner Name	e CLT	Wetland Site Name	PW2-1 - Wetland 6
	We	etland Type	Headwater Forest	Assessor Name/Organization	KMT, BGB/HDR
	Level II	I Ecoregion	Piedmont	Nearest Named Water Body	Ticer Branch
		River Basir		USGS 8-Digit Catalogue Unit	03050101
		Count	-	NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.230325, -80.957650
			. realphauer mann to mer		00:20020; 00:00:00
Pi re	ease circle cent past (I	and/or ma for instance drological r face and s ks, underg ns of vege bitat/plant of sment are Considera adromous iderally prot DWR ripar uts 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 valuated? 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
		•	tream is associated with the wetland, i		
ľ		ckwater	tream is associated with the wettand, i	any (Check an that apply)	
×	j bia 1 Bro	wnwater			
] Tid		check one of the following boxes)	unar ☐ Wind ☐ Both	
-	j ild	ai (ii tidai, t	3 , _		
Is	the asses	sment are	a on a coastal island? Yes	No	
	4ba aaaaa		ala accesa accesa atauana accesaito, au d	luration aubatantially altered by beausy?	□ Vaa ⊠ Na
				luration substantially altered by beaver?	☐ Yes ⊠ No
D	oes the as	sessment	area experience overbank flooding dur	ring normal rainfall conditions? Yes	⊠ No
1.	Ground 9	Surface Co	ondition/Vegetation Condition – assess	ment area condition metric	
-	Check a assessme area base	box in eac ent area. C	ch column. Consider alteration to the gro	und surface (GS) in the assessment area are (see User Manual). If a reference is not app	
	∏A ⊠B	⊠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 ea Surf	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)
	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 Pepressions 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 t	hat maximum depth of inundation is great hat maximum depth of inundation is between	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 wit	hin the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regiona
	indicators. 4a. □A	Sandy soil	
	□в	Loamy or cla	yey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres)
	□C ⊠D		yey soils not exhibiting redoximorphic features yey gleyed soil
	□E		stic epipedon
	4b. ⊠A □B	Soil ribbon < Soil ribbon ≥	
	4c. ⊠A □B	No peat or m A peat or mu	uck presence ck presence
5.	Discharge in	to Wetland -	opportunity metric
		e discharges i	mn. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples include presence of nearby septic tank, underground storage tank (UST), etc.
	⊠A ⊠A □B □E	Little or Noticeal	no evidence of pollutants or discharges entering the assessment area pole evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the
	□c □c	Noticeal potentia	nt capacity of the assessment area oble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and oble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and oble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and oble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and oble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and oble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and oble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and oble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and oble evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and oble evidence of pathogen (pathogen, pathogen) and oble evidence of pathogen (pathogen) are discharged (pathogen) and oble evidence of pathogen (pathogen) are discharged (pathogen).
6	Landllag		station, odor)
6.			netric (skip for non-riparian wetlands) ast one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining
	to assessment and within 2 in	nt area within o	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).
	WS 5M □A □A		≥ 10% impervious surfaces
		В □В	Confined animal operations (or other local, concentrated source of pollutants
			≥ 20% coverage of pasture ≥ 20% coverage of agricultural land (regularly plowed land)
	⊠E ⊠E	⊠E	≥ 20% coverage of maintained grass/herb
	⊠F ⊠F □G □C		≥ 20% coverage of clear-cut land 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.	Wetland Act	ing as Vegeta	ted Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
			vithin 50 feet of a tributary or other open water?
	∐Yes Wetlan		Yes, continue to 7b. If No, skip to Metric 8. only be present to some the average width of wetland.
	Record	a note if a poi	rtion 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 d on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
	□A	≥ 50 feet	
	□B □C	From 30 to	
	□D	From 5 to <	15 feet
	☐E 7c. Tributa		ouffer bypassed by ditches tributary is anastomosed, combine widths of channels/braids for a total width.
	_		⇒ 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 m or other ope	en water sheltered or exposed?
			nt open water with width < 2500 feet <u>and</u> no regular boat traffic. nt 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)	in each colu	mn for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and
	the wetland of	omplex at the	assessment area (WC). See User Manual for WT and WC boundaries.
	WT WC		oot.
	□A □ <i>A</i> □B □E		et of the control of
		From 50	to < 80 feet
			to < 50 feet to < 40 feet
		From 15	to < 30 feet
		From 5 t	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). \[\begin{align*} \text{Sediment deposition is not excessive, but at approximately natural levels.} \] \[\begin{align*} \text{Sediment deposition is excessive, but not overwhelming the wetland.} \] \[\begin{align*} \text{Sediment deposition is excessive and is overwhelming the wetland.} \]				
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 MH MH H 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)				
	□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 D From 10 to < 50 acres E C C To descript C C C From 50 to < 100 acres D D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres				
	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)				
	 □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. □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. □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. 				
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)				
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics). 				

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 for all marshes only . 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.	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)	
	□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
		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#	
03		# 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	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.203001, -80.946993
E.	idonoo of	ctroccor	s affecting the assessment area (may no	t be within the accessment area)	
Is Re	ease circle cent past (f	and/or m for instance drological face and s ks, underg ns of vege bitat/plant sment are Considera adromous derally pro	ake note on the last page if evidence of sign within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, but be bub-surface discharges into the wetland (examples upond storage tanks (USTs), hog lagoons, etation stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed? Yes ations - Were regulatory considerations evaluations are upon the content of the content	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 , salt intrusion, etc.)
	Abu Puk N.C Abu Des Abu	uts a Primolicly owner. Division uts a streatignated Nuts a 303(c)	CNHP reference community d)-listed stream or a tributary to a 303(d)-lis	replemental classifications of HQW, ORW, of ted stream	or Trout
W	hat type of	f natural s	stream is associated with the wetland, if	any? (check all that apply)	
		ckwater			
\boxtimes	Bro	wnwater	<u> </u>		
	Tida	at (if tidal,	check one of the following boxes)	ınar 🗌 Wind 🗌 Both	
Is	the assess	sment are	ea on a coastal island? 🔲 Yes 🖂 N	No	
			ea's surface water storage capacity or du		☐ Yes ☒ No
Do	es the as	sessment	area experience overbank flooding duri	ing normal rainfall conditions?	⊠ No
			ondition/Vegetation Condition – assessi		
1.	Check a lassessme area base	box in ea ent area.	ch column. Consider alteration to the grou	and 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	both incre xpected to Sub	ease 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	water only, while a ditch > 1 foot
	□в	□в □С	Water storage capacity or duration are sub-	ot altered. red, but not substantially (typically, not suffic stantially altered (typically, alteration sufficie ion, filling, excessive sedimentation, underg	ent to result in vegetation change)
3.	Water St			ype condition metric (skip for all marshe	
٠.		_		e for the assessment area (AA) and the wetl	·
	AA		Joiann. Golder the appropriate storage	accessment area (700) and the well	
	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	

		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
_		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 A Solo 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 A H A From 0.5 to < 1 acre J D J From 0.01 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 D From 10 to < 50 acres E C C To acres F Wetland type has a poor or no connection to other natural habitats
	12b Evaluate for marches only
	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)
	 ✓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. ✓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. ✓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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 ✓A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). ✓B Vegetation diversity is low or has > 10% to 50% cover of exotics. ✓C Vegetation is dominated by exotic species (> 50 % cover of exotics).

17	Vene	stativo St	ructure —	assessment area/wetland type condition metric
	_		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 for all marshes only . 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. Considerace above the assessment area (AA) and the wetland type (WT) separately.
		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
	Shrub	B □A □B □C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent
	Herb	A D □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	Large Not A		more 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)
	ПА	Majo pres		opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are
	□в ⊠c	Majo Majo	rity of can rity of can	popy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. popy trees are < 6 inches DBH or no trees.
20.				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.	_			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. Patterned dareas, while solid white areas indicate open water. B □C □D
		0	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, diversion, er dams, and stream incision. Documentation required if evaluated as B, C, or D.
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.
	□B □C			is severely altered in the assessment area. is severely altered in the assessment area.
	ΠĎ			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

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110	SACE AID #	ı	Accompanies	NCDWR#	
03		ject Nam	e _CLT Airport Expansion	Date of Evaluation	October 2019
				Wetland Site Name	
A	pplicant/Ow				PW4-1 - Wetland 22
		tland Typ		Assessor Name/Organization	KMT, BGB/HDR
	Level III	_		Nearest Named Water Body	Coffey Creek
	R	liver Basi		USGS 8-Digit Catalogue Unit	03050103
		Count	y Mecklenburg	NCDWR Region	Mooresville
	☐ Yes	s ⊠ N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.192488, -80.943445
Fv	idence of s	stressors	s affecting the assessment area (may no	t he within the assessment area)	
Ple	ease circle a cent past (fo • Hydr • Surfa tanka • Sign • Habi	and/or mor instance rological sace and sace and sace so we say that the role of the role 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 (exaground storage tanks (USTs), hog lagoons, etation 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.) ity, insect damage, disease, storm damage	utants, presence of nearby septic
Ro	aulatory C	onsider	ations - Were regulatory considerations our	aluated? ⊠Yes □No If Yes, check all tha	at annly to the assessment area
		onsiaera dromous		aruateu: 🖂 res 🗀 ino il res, check all tha	a apply to the assessment area.
			tected species or State endangered or thre	atened species	
			rian buffer rule in effect		
			ary Nursery Area (PNA)		
			ed property		
			of Coastal Management Area of Environme		
				applemental classifications of HQW, ORW, or	or Trout
			ICNHP reference community	to distances	
	Abut	is a 303(d	d)-listed stream or a tributary to a 303(d)-lis	tea stream	
W	hat type of	natural s	stream is associated with the wetland, if	any? (check all that apply)	
	Blac	kwater	,		
\boxtimes	Brow	vnwater			
	Tidal	l (if tidal,	check one of the following boxes)	ınar 🗌 Wind 🔲 Both	
Is	the assess	ment are	ea on a coastal island?	No	
			ea's surface water storage capacity or du		☐ Yes ⊠ No
Do	es the ass	essment	area experience overbank flooding duri	ing normal rainfall conditions? 🔲 Yes	⊠ No
1.	Ground Si	urface C	ondition/Vegetation Condition – assessi	ment area condition metric	
			•	and 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.	(000 000) Mariday. If a reference is not app	bildabio, montato me assessifient
		/S			
	⊠A [Not severely altered		
	□B [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		
2.	Surface	nd Sub 9	Surface Storage Capacity and Duration –	assessment area condition metric	
۷.					are an exit, and direction (O. 1)
				acity and duration (Surf) and sub-surface sto	
				1 foot deep is considered to affect surface	
		pectea to Sub	ancorpora sunace and Sub-Sunace Water.	. Consider tidal flooding regime, if applicable	IC.
			Water storage capacity and duration are no	nt altered	
				red, but not substantially (typically, not suffic	cient to change vegetation)
				stantially altered (typically, alteration sufficie	
			(examples: draining, flooding, soil compacti	ion, filling, excessive sedimentation, underg	round utility lines).
3.	Water Ste			ype condition metric (skip for all marshe	
J.		_			·
	AA V		cn column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (w i).
	3a.		Majority of wetland with depressions able to	n nond water > 1 deen	
	Ja.		Majority of wetland with depressions able to		
			Majority of wetland with depressions able to		
			Depressions able to pond water < 3 inches		
	_				
		-vidence		ar man 7 teet	
			that maximum depth of inundation is greater		
	□ВЕ	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	

		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
		E ☐E ≥ 20% coverage of maintained grass/herb
]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_		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 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
	12b Evaluate for marches only
	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)
	 ✓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. ✓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. ✓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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 ☑A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). ☑B Vegetation diversity is low or has > 10% to 50% cover of exotics. ☑C Vegetation is dominated by exotic species (> 50 % cover of exotics).

17	Vene	stativo St	ructure —	assessment area/wetland type condition metric
	_		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 for all marshes only . 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. Considerace above the assessment area (AA) and the wetland type (WT) separately.
		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
	Shrub	B □A □B □C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent
	Herb	A D □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	Large Not A		more 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)
	ПА	Majo pres		opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are
	□в ⊠c	Majo Majo	rity of can rity of can	popy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. popy trees are < 6 inches DBH or no trees.
20.				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.	_			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. Patterned dareas, while solid white areas indicate open water. B □C □D
		0	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, diversion, er dams, and stream incision. Documentation required if evaluated as B, C, or D.
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.
	□B □C			is severely altered in the assessment area. is severely altered in the assessment area.
	ΠĎ			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		# 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.	idonae of	otroposr	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 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, 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 and substractions.	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	utants, presence of nearby septic , salt intrusion, etc.)
	N.C Abu Des Abu	C. Division ats a streasignated Nate ats a 303(d	of Coastal Management Area of Environme	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	
Is	the assess	sment are	ea on a coastal island? 🔲 Yes 🛛 N	No	
ls	the asses	sment are	ea's surface water storage capacity or di	uration substantially altered by heaver?	☐ Yes ⊠ No
				ing normal rainfall conditions?	
DC	Jes tile as	sessilleili	area experience overbank nooding duri	ing normal raiman conditions: Tes	⊠ N0
1.			ondition/Vegetation Condition – assessi		
	assessme area base	ent area. (und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
	⊠A		Not severely altered		
	В	□В	Severely altered over a majority of the assessedimentation, 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	both incre xpected to Sub	ease and decrease in hydrology. A ditch seaffect both surface and sub-surface water.	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
	□в	□B □C	Water storage capacity or duration are sub-	of altered. red, but not substantially (typically, not suffice stantially altered (typically, alteration sufficient sufficience), filling, excessive sedimentation, underg	ent to result in vegetation change)
3.	Water Sto	orage/Sui	face Relief - assessment area/wetland t	ype condition metric (skip for all marshe	es)
		_		e for the assessment area (AA) and the wetl	·
	AA	WT			•
	□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	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	

		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
		E ☐E ≥ 20% coverage of maintained grass/herb
]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_		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 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					
	12b Evaluate for marches only					
	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)					
	 ✓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. ✓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. ✓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. 					
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)					
	 ☑A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). ☑B Vegetation diversity is low or has > 10% to 50% cover of exotics. ☑C Vegetation is dominated by exotic species (> 50 % cover of exotics). 					

17	Vene	stativo St	ructure —	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 for all marshes only . 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. Considerace above the assessment area (AA) and the wetland type (WT) separately.	
		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	
	Shrub	B □A □B □C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent	
	Herb	A D □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	Large Not A		more 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)	
	ПА	Majo pres		opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	□в ⊠c	Majo Majo	rity of can rity of can	popy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. popy trees are < 6 inches DBH or no trees.	
20.				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.	_			r 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 vareas indicate vegetated areas, while solid white areas indicate open water.					
		0	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, diversion, er dams, and stream incision. Documentation required if evaluated as B, C, or D.	
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.	
	□B □C			is severely altered in the assessment area. is severely altered in the assessment area.	
	ΠĎ			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	Wetland 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 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					

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110	SACE AID :	#	Accompanies	NCDWR#	
03		" oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019
٨	۱۲ pplicant/O			Wetland Site Name	PW1-1 - Wetland 5
^		etland Typ		Assessor Name/Organization	KMT, BGB/HDR
		Ecoregio		Nearest Named Water Body	Ticer Branch
		River Basi		USGS 8-Digit Catalogue Unit	03050101
	Г	Count		NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.229386; -80.956805
\vdash			•	<u> </u>	55.22666, 66.66666
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 upond storage tanks (USTs), hog lagoons, station stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed? Yes attions - Were regulatory considerations evaluations are regulatory considerations evaluated species or State endangered or thre rian buffer rule in effect ary Nursery Area (PNA)	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 , salt intrusion, etc.)
	N.C Abu Des Abu	c. Division its a strea signated N its a 303(ed property of Coastal Management Area of Environme m with a NCDWQ classification of SA or su CNHP reference community d)-listed stream or a tributary to a 303(d)-lis stream is associated with the wetland, if	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	
			ea's surface water storage capacity or do area experience overbank flooding duri	uration substantially altered by beaver? ing normal rainfall conditions? Yes	☐ Yes
1.			ondition/Vegetation Condition – assessi		
	Check a lassessme area base	box in ea ent area.	ch column. Consider alteration to the grou	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.		_		ype condition metric (skip for all marshe	·
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (W □).
	□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	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	

	Check a box from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature. Make soil observations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regional indicators. 4a. A Sandy soil B Loamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) C Loamy or clayey soils not exhibiting redoximorphic features D Loamy or clayey gleyed soil Histosol or histic epipedon
	4b. ⊠A Soil ribbon < 1 inch □B Soil ribbon ≥ 1 inch
	4c. ⊠A No peat or muck presence ☐B A peat or muck presence
5.	Discharge into Wetland – opportunity metric Check a box in each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples of sub-surface discharges include presence of nearby septic tank, underground storage tank (UST), etc. Surf Sub A A Little or no evidence of pollutants or discharges entering the assessment area B B Noticeable evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the treatment capacity of the assessment area C 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) Check all that apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining to assessment area within entire upstream watershed (WS), within 5 miles and within the watershed draining to the assessment area (5M), and within 2 miles and within the watershed draining to the assessment area (2M). WS 5M 2M A A A ≥ 10% impervious surfaces B B B Confined animal operations (or other local, concentrated source of pollutants C C C C ≥ 20% coverage of pasture D D D D D ≥ 20% coverage of agricultural land (regularly plowed land) E E E E E ≥ 20% coverage of maintained grass/herb F F F F F ≥ 20% coverage of clear-cut land G G G G G 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.
7.	Wetland Acting as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
0	 7a. Is assessment area within 50 feet of a tributary or other open water?
8.	Wetland Width at the Assessment Area – wetland type/wetland complex condition metric (evaluate WT for all marshes and Estuarine Woody Wetland only; evaluate WC for Bottomland Hardwood Forest, Headwater Forest, and Riverine Swamp Forest only) Check a box in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and the wetland complex at the assessment area (WC). See User Manual for WT and WC boundaries. WT WC A A ≥ 100 feet B B From 80 to < 100 feet C C From 50 to < 80 feet D D From 40 to < 50 feet E F From 30 to < 40 feet F F F From 15 to < 30 feet G G 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 S 500 acres B B B From 100 to < 500 acres C C C From 50 to < 100 acres D D D D From 25 to < 50 acres E E From 10 to < 25 acres F F F F F F F F F F F F F F F F F F F				
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)				
	 □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. □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. □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. 				
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)				
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics). 				

17	Vege	stative St	ructure —	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 for all marshes only . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation	
		structure		each column for each stratum. Evaluate this portion of the metric for non-marsh wetlands. Consider ace above the assessment area (AA) and the wetland type (WT) separately.	
		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	
	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	Large Not A		more 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	Majo prese		opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are	
	⊠B □C	Majo	rity of can	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.				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.	Vege	etation/O _l	oen Wate	r Dispersion – wetland type/open water condition metric (evaluate for Non-Tidal Freshwater Marsh only)	
areas indicate vegetated areas, while solid white areas indicate open water.				est describes the amount of interspersion between vegetation and open water in the growing season. Patterned dareas, while solid white areas indicate open water. B C D	
		0	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, diversion, er dams, and stream incision. Documentation required if evaluated as B, C, or D.	
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.	
	□B □C			is severely altered in the assessment area. is severely altered in the assessment area.	
	Ho			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/Organization KMT, BO					
Notes on Field Assess	ment Form (Y/N)		NO				
Presence of regulatory	considerations (Y/N)		YES				
Wetland is intensively	Vetland is intensively managed (Y/N)						
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#	
	Pr	oject Name	CLT Airport Expansion	Date of Evaluation	April 2019
P	Applicant/O	wner Name	e CLT	Wetland Site Name	PW2-1 - Wetland 6
	We	etland Type	Headwater Forest	Assessor Name/Organization	KMT, BGB/HDR
	Level II	I Ecoregion	Piedmont	Nearest Named Water Body	Ticer Branch
		River Basir		USGS 8-Digit Catalogue Unit	03050101
		Count	-	NCDWR Region	Mooresville
	☐ Ye			Latitude/Longitude (deci-degrees)	35.230325, -80.957650
			. realphauer mann to mer		00:20020; 00:00:00
Pi re	ease circle cent past (I	and/or ma for instance drological r face and s ks, underg ns of vege bitat/plant of sment are Considera adromous iderally prot DWR ripar uts 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 valuated? 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
		•	tream is associated with the wetland, i		
ľ		ckwater	tream is associated with the wettand, i	any (Check an that apply)	
×	j bia 1 Bro	wnwater			
] Tid		check one of the following boxes)	unar ☐ Wind ☐ Both	
-	j ild	ai (ii tidai, t	3 , _		
Is	the asses	sment are	a on a coastal island? Yes	No	
	4ba aaaaa		ala accesa accesa atauana accesaito, au d	luration aubatantially altered by beausy?	□ Vaa ⊠ Na
				luration substantially altered by beaver?	☐ Yes ⊠ No
D	oes the as	sessment	area experience overbank flooding dur	ring normal rainfall conditions? Yes	⊠ No
1.	Ground 9	Surface Co	ondition/Vegetation Condition – assess	ment area condition metric	
-	Check a assessme area base	box in eac ent area. C	ch column. Consider alteration to the gro	und surface (GS) in the assessment area are (see User Manual). If a reference is not app	
	∏A ⊠B	⊠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 ea Surf	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)
	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 Pepressions 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 t	hat maximum depth of inundation is great hat maximum depth of inundation is between	een 1 and 2 feet	

	Make so	oil obse		he three soil property groups below. Dig soil profile in the dominant assessment area landscape feature. n the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regional
	indicator 4a.	S S L C L		
	4b. ⊠A □B		oil ribbon < 1 oil ribbon ≥ 1	
	4c. ⊠A □B	N B A	o peat or muck peat or muck	
5.	Dischar	ge into	Wetland - o	pportunity metric
	of sub-su Surf	urface c Sub		 Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples lude presence of nearby septic tank, underground storage tank (UST), etc.
	⊠a □B	⊠a □B	Noticeable	evidence of pollutants or discharges entering the assessment area evidence of pollutants or discharges entering the wetland and stressing, but not overwhelming the capacity of the assessment area
	□c	□С	Noticeable	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
6.	Land Us	se – op _l	ortunity met	ric (skip for non-riparian wetlands)
	to asses	sment a	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 7	2 10% impervious surfaces Confined animal operations (or other local, concentrated source of pollutants 2 20% coverage of pasture
	□D ⊠E ⊠F	□D ⊠E ⊠F	⊠E ≥	20% coverage of agricultural land (regularly plowed land) 20% coverage of maintained grass/herb 20% coverage of clear-cut land
	□G	□G	□G L t	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.	Wetland	Acting	as Vegetate	d Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
		Yes	⊠No If Ye	nin 50 feet of a tributary or other open water? es, continue to 7b. If No, skip to Metric 8. Ily be present on one side of the water body. Make buffer judgment based on the average width of wetland.
	Re 7b. Ho	ecord a ow much	note if a portion of the first 5	on of the buffer has been removed or disturbed. O feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Make
	bu 	A :	gment based o ≥ 50 feet From 30 to < !	on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.)
		C D	From 15 to < 3 From 5 to < 1	30 feet
	7c. Tri		width. If the tr	ibutary is anastomosed, combine widths of channels/braids for a total width. > 15-feet wide
		Yes	□No	area vegetation extend into the bank of the tributary/open water?
		Shelter	ed – adjacent	water sheltered or exposed? 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.	Estuarin			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
	the wetla	and com		for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and sessment area (WC). See User Manual for WT and WC boundaries.
	WT □A	WC □A	≥ 100 feet	
	□в	□В		o < 100 feet
	□C ⊠D	□C	From 50 to	
	⊠D □E	⊠D □E	From 40 to From 30 to	
	∐F	⊟F	From 15 to	
	Ğ	Ğ	From 5 to	

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 MH MH H 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)
	□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 D From 10 to < 50 acres E C C To descript C C C From 50 to < 100 acres D D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres D C C From 50 to < 100 acres
	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)
	 □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. □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. □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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics).

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 for all marshes only . 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.	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
		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	INIEDIOINI
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

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110	SACE AID :	#	Accompanies	NCDWR#	
03		# 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	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.203001, -80.946993
E.	idonoo of	ctroccor	s affecting the assessment area (may no	t be within the accessment area)	
Is Re	ease circle cent past (f	and/or m for instance drological face and s ks, underg ns of vege bitat/plant sment are Considera adromous derally pro	ake note on the last page if evidence of sign within 10 years). Noteworthy stressors is modifications (examples: ditches, dams, but be bub-surface discharges into the wetland (examples tround storage tanks (USTs), hog lagoons, etation stress (examples: vegetation mortal community alteration (examples: mowing, ea intensively managed? Yes Ations - Were regulatory considerations evaluations are considerations or State endangered or three	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
	Abu Puk N.C Abu Des Abu	uts a Primolicly owner. Division uts a streatignated Nuts a 303(c)	CNHP reference community d)-listed stream or a tributary to a 303(d)-lis	replemental classifications of HQW, ORW, of ted stream	or Trout
W	hat type of	f natural s	stream is associated with the wetland, if	any? (check all that apply)	
		ckwater			
\boxtimes	Bro	wnwater	<u> </u>		
	Tida	at (if tidal,	check one of the following boxes)	ınar 🗌 Wind 🗌 Both	
Is	the assess	sment are	ea on a coastal island? 🔲 Yes 🖂 N	No	
			ea's surface water storage capacity or du		☐ Yes ☒ No
Do	es the as	sessment	area experience overbank flooding duri	ing normal rainfall conditions?	⊠ No
			ondition/Vegetation Condition – assessi		
1.	Check a lassessme area base	box in ea ent area.	ch column. Consider alteration to the grou	and 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 xpected to Sub	ease 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	water only, while a ditch > 1 foot
	□в	□в □С	Water storage capacity or duration are sub-	ot altered. red, but not substantially (typically, not suffic stantially altered (typically, alteration sufficie ion, filling, excessive sedimentation, underg	ent to result in vegetation change)
3.	Water St			ype condition metric (skip for all marshe	
٠.		_		e for the assessment area (AA) and the wetl	·
	AA		Joiann. Goldet the appropriate storage	accessment area (700) and the well	
	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	

		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
		E ☐E ≥ 20% coverage of maintained grass/herb
]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_		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 A Solo 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 A H A From 0.5 to < 1 acre J D J From 0.01 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 D From 10 to < 50 acres E C C To acres F Wetland type has a poor or no connection to other natural habitats
	12b Evaluate for marches only
	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)
	 ✓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. ✓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. ✓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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 ✓A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). ✓B Vegetation diversity is low or has > 10% to 50% cover of exotics. ✓C Vegetation is dominated by exotic species (> 50 % cover of exotics).

17	Vene	stativo St	ructure —	assessment area/wetland type condition metric
	_		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 for all marshes only . 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. Considerace above the assessment area (AA) and the wetland type (WT) separately.
		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
	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	Large Not A		more 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)
	ПА	Majo pres		opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are
	□B ⊠C	Majo Majo	rity of can rity of can	popy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. popy trees are < 6 inches DBH or no trees.
20.				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.	_			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. Patterned dareas, while solid white areas indicate open water. B □C □D
		0	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, diversion, er dams, and stream incision. Documentation required if evaluated as B, C, or D.
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.
	□B □C			is severely altered in the assessment area. is severely altered in the assessment area.
	ΠĎ			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

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110	SACE AID #	ı	Accompanies	NCDWR#	
03		ject Nam	e _CLT Airport Expansion	Date of Evaluation	October 2019
				Wetland Site Name	
A	pplicant/Ow				PW4-1 - Wetland 22
		tland Typ		Assessor Name/Organization	KMT, BGB/HDR
	Level III	_		Nearest Named Water Body	Coffey Creek
	R	liver Basi		USGS 8-Digit Catalogue Unit	03050103
		Count	y Mecklenburg	NCDWR Region	Mooresville
	☐ Yes	s ⊠ N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.192488, -80.943445
Fv	idence of s	stressors	s affecting the assessment area (may no	t he within the assessment area)	
Ple	ease circle a cent past (fo • Hydr • Surfa tanka • Sign • Habi	and/or mor instance rological sace and sace and sace so we say that the role it at the role it a	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 (exaground storage tanks (USTs), hog lagoons, etation 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.) ity, insect damage, disease, storm damage	utants, presence of nearby septic
R.	aulatory C	onsider	ations - Were regulatory considerations our	aluated? ⊠Yes □No If Yes, check all tha	at annly to the assessment area
		onsiaera dromous		aruateu: 🖂 res 🗀 ino il res, check all tha	a apply to the assessment area.
			tected species or State endangered or thre	atened species	
			rian buffer rule in effect		
			ary Nursery Area (PNA)		
			ed property		
			of Coastal Management Area of Environme		
				applemental classifications of HQW, ORW, or	or Trout
			ICNHP reference community	to distances	
	Abut	is a 303(d	d)-listed stream or a tributary to a 303(d)-lis	tea stream	
W	hat type of	natural s	stream is associated with the wetland, if	any? (check all that apply)	
	Blac	kwater	,		
\boxtimes	Brow	vnwater			
	Tidal	l (if tidal,	check one of the following boxes)	ınar 🗌 Wind 🔲 Both	
Is	the assess	ment are	ea on a coastal island?	No	
			ea's surface water storage capacity or du		☐ Yes ⊠ No
Do	es the ass	essment	area experience overbank flooding duri	ing normal rainfall conditions? 🔲 Yes	⊠ No
1.	Ground Si	urface C	ondition/Vegetation Condition – assessi	ment area condition metric	
			•	and 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.	(000 000) Mariday. If a reference is not app	bildabio, montato me assessifient
		/S			
	⊠A [Not severely altered		
	□B [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		
2.	Surface	nd Sub 9	Surface Storage Capacity and Duration –	assessment area condition metric	
۷.					are an exit, and direction (O. 1)
				acity and duration (Surf) and sub-surface sto	
				1 foot deep is considered to affect surface	
		pectea to Sub	ancorpora sunace and Sub-Sunace Water.	. Consider tidal flooding regime, if applicable	IC.
			Water storage capacity and duration are no	nt altered	
				red, but not substantially (typically, not suffic	cient to change vegetation)
				stantially altered (typically, alteration sufficie	
			(examples: draining, flooding, soil compacti	ion, filling, excessive sedimentation, underg	round utility lines).
3.	Water Ste			ype condition metric (skip for all marshe	
J.		_			·
	AA V		cn column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (w i).
	3a.		Majority of wetland with depressions able to	n nond water > 1 deen	
	Ja.		Majority of wetland with depressions able to		
			Majority of wetland with depressions able to		
			Depressions able to pond water < 3 inches		
	_				
		-vidence		ar man 7 teet	
			that maximum depth of inundation is greater		
	□ВЕ	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	

		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
		E ☐E ≥ 20% coverage of maintained grass/herb
]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_		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 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
	12b Evaluate for marches only
	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)
	 ✓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. ✓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. ✓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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 ☑A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). ☑B Vegetation diversity is low or has > 10% to 50% cover of exotics. ☑C Vegetation is dominated by exotic species (> 50 % cover of exotics).

17	Vene	stativo St	ructure —	assessment area/wetland type condition metric
	_		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 for all marshes only . 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. Considerace above the assessment area (AA) and the wetland type (WT) separately.
		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
	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	Large Not A		more 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)
	ПА	Majo pres		opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are
	□B ⊠C	Majo Majo	rity of can rity of can	popy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. popy trees are < 6 inches DBH or no trees.
20.				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.	_			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. Patterned dareas, while solid white areas indicate open water. B □C □D
		0	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, diversion, er dams, and stream incision. Documentation required if evaluated as B, C, or D.
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.
	□B □C			is severely altered in the assessment area. is severely altered in the assessment area.
	ΠĎ			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		# 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.	idonae of	otroposr	offecting the acceptant area (may no	t he within the acceptament area)	
Is Re	ease circle cent past (f	and/or m for instance drological 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, 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 and supplies in the substitution of the su	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	utants, presence of nearby septic
	N.C Abu Des Abu	C. Division ats a streasignated Nate ats a 303(d	of Coastal Management Area of Environme	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	
Is	the assess	sment are	ea on a coastal island? 🔲 Yes 🛛 N	No	
ls	the asses	sment are	ea's surface water storage capacity or di	uration substantially altered by heaver?	☐ Yes ⊠ No
				ing normal rainfall conditions?	
DC	Jes tile as	sessifieri	area experience overbank nooding duri	ing normal raiman conditions: Tes	⊠ N0
1.			ondition/Vegetation Condition – assessi		
	assessme area base	ent area. (und surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
	⊠A		Not severely altered		
	В	□В	Severely altered over a majority of the assessedimentation, 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 xpected to Sub	ease and decrease in hydrology. A ditch seaffect both surface and sub-surface water.	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
	□в	□B □C	Water storage capacity or duration are sub-	of altered. red, but not substantially (typically, not suffice stantially altered (typically, alteration sufficient sufficiency), filling, excessive sedimentation, underg	ent to result in vegetation change)
3.	Water Sto	orage/Sui	face Relief - assessment area/wetland t	ype condition metric (skip for all marshe	es)
		_		e for the assessment area (AA) and the wetl	·
	AA	WT			•
	□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	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	

		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
		E ☐E ≥ 20% coverage of maintained grass/herb
]F
		the watershed or hydrologic alterations that prevent drainage and/or overbank flow from affecting the
_		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 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
	12b Evaluate for marches only
	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)
	 ✓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. ✓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. ✓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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 ☑A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). ☑B Vegetation diversity is low or has > 10% to 50% cover of exotics. ☑C Vegetation is dominated by exotic species (> 50 % cover of exotics).

17	Vene	stativo St	ructure —	assessment area/wetland type condition metric
	_		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 for all marshes only . 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. Considerace above the assessment area (AA) and the wetland type (WT) separately.
		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
	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	Large Not A		more 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)
	ПА	Majo pres		opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are
	□B ⊠C	Majo Majo	rity of can rity of can	popy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. popy trees are < 6 inches DBH or no trees.
20.				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.	_			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. Patterned dareas, while solid white areas indicate open water. B □C □D
		0	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, diversion, er dams, and stream incision. Documentation required if evaluated as B, C, or D.
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.
	□B □C			is severely altered in the assessment area. is severely altered in the assessment area.
	ΠĎ			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 loc	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				



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 oo in panico coo i	nanaar referenzin	
USACE AID #:		NCDWR #:	
	ch of the assessment area and photogra		
	am reach under evaluation. If multiple ed map, and include a separate form fo		
	formation. Record in the "Notes/Sketc		
	les of additional measurements that ma		sille note policinica. God the
	ORS AFFECTING THE ASSESSMENT		the assessment area).
PROJECT/SITE INFORMATION			
	LT Airport Expansion	2. Date of evaluation: April 201	
	LT ecklenburg	4. Assessor name/organization:6. Nearest named water body	KMT,BGB/HDR
	atawba	on USGS 7.5-minute quad:	Coffey Creek
	ees, at lower end of assessment reach	•	Colley Creak
- · · · · · · · · · · · · · · · · · · ·	th and width can be approximations) PS1-2, S27 -	· -	
9. Site number (show on attached		ength of assessment reach evalua	ted (feet): 975'
11. Channel depth from bed (in ri	iffle, if present) to top of bank (feet):	_1Ur	nable to assess channel depth.
12. Channel width at top of bank		assessment reach a swamp steam?	' □Yes □No
	bw □Intermittent flow □Tidal Marsh	Stream	
STREAM CATEGORY INFORMA)	Outer Coastal Plais (O)
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P	nner Coastal Plain (I)	Outer Coastal Plain (O)
16 Estimated geometric			
 Estimated geomorphic valley shape (skip for 	\boxtimes A	□в	
Tidal Marsh Stream):	(more sinuous stream, flatter valley slo	ope) (less sinuous stre	eam, steeper valley slope)
17. Watershed size: (skip for Tidal Marsh Stream)	\square Size 1 (< 0.1 mi ²) \square Size 2 (0.1 t	$co < 0.5 \text{ mi}^2$) Size 3 (0.5 to < 5	5 mi²)
ADDITIONAL INFORMATION:			
18. Were regulatory consideration	ns evaluated? ☐Yes ☐No If Yes, ch	eck all that apply to the assessmer	nt area.
Section 10 water	Classified Trout Waters		hed (I I III IIV V)
☐Essential Fish Habitat	Primary Nursery Area		Outstanding Resource Waters
□ Publicly owned property □ Anadromous fish	□NCDWR Riparian buffer rule i □303(d) List	☐CAMA Area of Enviro	
	a federal and/or state listed protected s		
List species:			
☐Designated Critical Habitat			
19. Are additional stream informa	ation/supplementary measurements inc	luded in "Notes/Sketch" section or a	attached? ∐Yes ⊠No
1. Channel Water – assessmer	nt reach metric (skip for Size 1 strea	ms and Tidal Marsh Streams)	
☑A Water throughout as		•	
B No flow, water in po	•		
☐C No water in assessn	nent reach.		
	n – assessment reach metric		
At least 10% of ass	essment reach in-stream habitat or riff flow or a channel choked with aquatic	nacrophytes or ponded water or i	ted by a flow restriction or fill to the
	ch (examples: undersized or perched		
beaver dams).	·	- -	-
⊠B Not A			
3. Feature Pattern – assessme			
☐A A majority of the ass☑B Not A	sessment reach has altered pattern (ex	amples: straightening, modification	above or below culvert).
	e – assessment reach metric	room profile (everyples), showned d	
	ent reach has a substantially altered st gradation, dredging, and excavation w		
disturbances).	g, a. eaging, and endavation w	appropriate ename promo n	and the state of t
⊠B Not A			
5. Signs of Active Instability –	assessment reach metric		
Consider only current insta	ability, not past events from which t		
	nnel down-cutting (head-cut), active wi	dening, and artificial hardening (su	ch as concrete, gabion, rip-rap).
☐C > 25% of channel ur			

		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	
□c	□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				(0xpiaii	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	∐' _G	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	************ " m and \$ ⊒Yes Bedform	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)	
Bedfor 11a. [11b. E	*************************************	Little or no h ************ Substrate – No Is a evaluated. (Riffle-run se Pool-glide s	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. E [[11c. Ir a	rm and \$ Yes Bedform 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 one 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
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	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 properties) ☐ B Excessive sedimentation (burying of stream features or interstream properties) ☐ C Noticeable evidence of pollutant discharges entering the and condition condition and including natural sulfide odors) ☐ E Current published or collected data indicating degraded resection. ☐ 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) </th <th> □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □</th> <th>☑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:</th> <th>☑A ☑A Little or no evidence of conditions that adversely affect reference interaction</th>	□ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	☑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	KMT,BGB/HDR			
Notes of Field Asses	sment Form (Y/N)		NO	
Presence of regulator	YES			
Additional stream information/supplementary measurements 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	

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	·
USACE AI	
	TONS: Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle
	he location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
	ations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
	ser Manual for examples of additional measurements that may be relevant.
NOTE EVII	DENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/	SITE INFORMATION:
	name (if any): CLT Airport Expansion 2. Date of evaluation: April 2019
	t/owner name: CLT 4. Assessor name/organization: KMT,BGB/HDR
5. County:	Mecklenburg 6. Nearest named water body
7. River bas	
	rdinates (decimal degrees, at lower end of assessment reach): 35.204360, -80.954446 NFORMATION: (depth and width can be approximations)
SIKEAWIII	PS1-2, S27 -
9. Site num	ber (show on attached map): Reach 2 10. Length of assessment reach evaluated (feet): 350'
11. Channe	el depth from bed (in riffle, if present) to top of bank (feet): 1 Unable to assess channel depth.
	el width at top of bank (feet): 3 13. Is assessment reach a swamp steam? Yes No
	e type: Perennial flow Intermittent flow Tidal Marsh Stream
	CATEGORY INFORMATION:
15. NC SAM	M Zone: ☐ Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
40 E.C.	
	ted geomorphic Bhape (skip for
	larsh Stream): (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)
17. Waters	hed size: (skip
	al Marsh Stream)
_	AL INFORMATION:
	egulatory considerations evaluated? Yes No If Yes, check all that apply to the assessment area.
	ion 10 water
	ential Fish Habitat Primary Nursery Area High Quality Waters/Outstanding Resource Waters Indicated Indicate Ind
	dromous fish S303(d) List CAMA Area of Environmental Concern (AEC)
	umented presence of a federal and/or state listed protected species within the assessment area.
	species:
	gnated Critical Habitat (list species)
19. Are add	ditional stream information/supplementary measurements included in "Notes/Sketch" section or attached? ☐Yes ☒No
1. Channe	el Water – assessment reach metric (skip for Size 1 streams and Tidal Marsh Streams)
⊠A	Water throughout assessment reach.
□В	No flow, water in pools only.
□С	No water in assessment reach.
	ce of Flow Restriction – assessment reach metric
□A	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 abstruction flow or a channel shaked with according to the property of the prope
	point of obstructing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb with the assessment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jam
	beaver dams).
⊠B	Not A
3. Feature	Pattern – assessment reach metric
□A	A majority of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
⊠В	Not A
	e Longitudinal Profile – assessment reach metric
□A	Majority of assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, ov
	widening, active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of the disturbances).
⊠в	Not A
_	of Active Instability – assessment reach metric er only current instability, not past events from which the stream has currently recovered. Examples of instability includ
	ank failure, active channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
$\boxtimes A$	< 10% of channel unstable
□B □C	10 to 25% of channel unstable > 25% of channel unstable
	2 20 /0 UI GHAHHEI WHSTADIE

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-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								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 to no habita		nal 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 (evaluate n (evaluat					
		□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. Check Marsh Streams) . 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		-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.	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:

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	tion 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	

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USACE AID #:		NCDWR #:	
	etch of the assessment area and photogra		
	stream reach under evaluation. If multiple ached map, and include a separate form fo		
	I information. Record in the "Notes/Sketc		
NC SAM User Manual for example 10 cm.	mples of additional measurements that massors AFFECTING THE ASSESSMENT	y be relevant.	
PROJECT/SITE INFORMATION		AILA (NO HOL HEEN TO DE WILLIIII	tile assessment alea).
1. Project name (if any):		2. Date of evaluation: April 20	19
3. Applicant/owner name:		4. Assessor name/organization:	KMT,BGB/HDR
5. County:		6. Nearest named water body	
7. River basin:	Catawba	on USGS 7.5-minute quad:	Coffey Creek
·	egrees, at lower end of assessment reach epth and width can be approximations)	•	
•	PS1-2, S27 -		
9. Site number (show on attac		ength of assessment reach evalua	` '
	n riffle, if present) to top of bank (feet):	_1Uı ssessment reach a swamp steam?	nable to assess channel depth.
12. Channel width at top of ba14. Feature type: ☑Perennia	nk (feet): 3 13. Is a I flow □Intermittent flow □Tidal Marsh \$		I Les Lino
STREAM CATEGORY INFOR			
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P	Inner Coastal Plain (I)	☐ Outer Coastal Plain (O)
		\	,
16. Estimated geomorphic	\bowtie_{A}	′ □Β ~	
valley shape (skip for Tidal Marsh Stream):	(more sinuous stream, flatter valley slo		eam, steeper valley slope)
17. Watershed size: (skip	☐Size 1 (< 0.1 mi²) ☐Size 2 (0.1 t		
for Tidal Marsh Stream)		G (0.0 1111) G (0.0 10 ()	0.20 4 (= 0 1111)
ADDITIONAL INFORMATION			
	itions evaluated? Yes No If Yes, ch		
☐Section 10 water ☐Essential Fish Habitat	☐Classified Trout Waters ☐Primary Nursery Area		shed (□I □II □III □IV □V) Outstanding Resource Waters
☐Essential Fish Habitat			<u> </u>
☐Anadromous fish	⊠303(d) List	☐CAMA Area of Enviro	onmental Concern (AEC)
	of a federal and/or state listed protected sp	pecies within the assessment area	
List species: ☐Designated Critical Hab	itat (list species)		
	mation/supplementary measurements incl	uded in "Notes/Sketch" section or	attached? ☐Yes ⊠No
	ment reach metric (skip for Size 1 stream	ns and Tidal Marsh Streams)	
☑A Water throughout☑B No flow, water in	t assessment reach. pools only.		
C No water in asses	•		
2. Evidence of Flow Restric	tion – assessment reach metric		
□A At least 10% of a	assessment reach in-stream habitat or riff	e-pool sequence is severely affect	ted by a flow restriction or fill to the
	ng flow <u>or</u> a channel choked with aquatic		
the assessment r beaver dams).	each (examples: undersized or perched of	curverts, causeways that constrict t	ne channer, tidal gates, debris jams,
⊠B Not A			
3. Feature Pattern – assess	ment reach metric		
☐A A majority of the a	assessment reach has altered pattern (ex	amples: straightening, modification	above or below culvert).
⊠B Not A			
	file – assessment reach metric		
	sment reach has a substantially altered st		
widening, active disturbances).	aggradation, dredging, and excavation w	nere appropriate channel profile r	ias not reformed from any of these
⊠B Not A			
5. Signs of Active Instability	y – assessment reach metric		
Consider only current in	stability, not past events from which t		
	channel down-cutting (head-cut), active wi	dening, and artificial hardening (su	ch as concrete, gabion, rip-rap).
☐C > 25% of channe			

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. Check Marsh Streams) . 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		-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	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									

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	

	7.000 mparinos cos mariaar vorcion 211
USACE AID #:	NCDWR #:
	a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
	the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and eattached 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.
NOTE EVIDENCE OF ST	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: Aprill 2019
3. Applicant/owner name:5. County:	CLT 4. Assessor name/organization: KMT,BGB/HDR Mecklenburg 6. Nearest named water body
7. River basin:	Catawba on USGS 7.5-minute quad: Coffey Creek
8. Site coordinates (decim	nal degrees, at lower end of assessment reach): 35.203366, -80.953215
STREAM INFORMATION	l: (depth and width can be approximations) PS1-2, S27 -
9. Site number (show on a	
	ed (in riffle, if present) to top of bank (feet): 1 Unable to assess channel depth.
12. Channel width at top of	
14. Feature type: ⊠Pere STREAM CATEGORY IN	nnial flow
15. NC SAM Zone:	Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
13. NO 6/ WI ZONC.	I mountains (m) I reamont (r) I mile obastain tain (r)
16. Estimated geomorphic	
valley shape (skip for	□B □B
Tidal Marsh Stream)	
Watershed size: (skip for Tidal Marsh Stream	
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 pro □ Anadromous fish	perty NCDWR Riparian buffer rule in effect Nutrient Sensitive Waters 303(d) List CAMA Area of Environmental Concern (AEC)
	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. Channel Water – ass	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
☐A At least 10%	of assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the ructing flow or a channel choked with aquatic macrophytes or ponded water or impoundment on flood or ebb within
	ent reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver dams	s).
⊠B Not A	
	sessment reach metric
□ A	the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
	Duefile esseement vessly metuic
	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	
_	bility – assessment reach metric
	nt instability, not past events from which the stream has currently recovered. Examples of instability include
	rive channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
☐B 10 to 25% of	channel unstable
□C > 25% of character	annel unstable

6.					streams: 3) and the					
	LB	RB	ie Leit I	Jank (LL	, 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	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.		am Hab ⊠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)		
	a t (F sl	t least o R) = pres nould no	ne box sent but	in each (row (skip	for Size 4 (C) = > 10	4 Coastal Plai 0-40%, Abunda	n streams	and Tidal	sessment reach – whether or not submerged. Check I Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
	N D D C	3			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 contrik 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) to of bank seepage or sweating (iron in water indicates seepage) to 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	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	

	production of the second of th
USACE AID #:	NCDWR #:
	ketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
	stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
	ached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
	d information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
	amples of additional measurements that may be relevant.
NOTE EVIDENCE OF STRE	SSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE INFORMAT	
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
-	degrees, at lower end of assessment reach): 35.203748, -80.953340
	depth and width can be approximations)
9. Site number (show on attack	
	(in riffle, if present) to top of bank (feet):
12. Channel width at top of ba	, ,
= -	al flow Intermittent flow Tidal Marsh Stream
STREAM CATEGORY INFO	
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
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: (skip	Size 1 (< 0.1 mi ²)
for Tidal Marsh Stream)	
ADDITIONAL INFORMATION	
	ations evaluated? Yes No If Yes, check all that apply to the assessment area.
Section 10 water	☐Classified Trout Waters ☐Water Supply Watershed (☐I ☐II ☐III ☐IV ☐V)
☐Essential Fish Habitat	
☑Publicly owned propert	
☐Anadromous fish	☑303(d) List ☐CAMA Area of Environmental Concern (AEC) of a federal and/or state listed protected species within the assessment area.
List species:	of a rederal and/or state listed protected species within the assessment area.
☐Designated Critical Hal	hitat (list species)
	ormation/supplementary measurements included in "Notes/Sketch" section or attached? \Begin{array}{ c c c c c c c c c c c c c c c c c c c
19. Are additional stream fille	Thation/supplementary measurements included in Motes/Okelon Section of attached: Tes Mino
1. Channel Water – assess	ment reach metric (skip for Size 1 streams and Tidal Marsh Streams)
	ut assessment reach.
□B No flow, water ir	
☐C No water in asse	essment reach.
2. Evidence of Flow Restri	ction – assessment reach metric
	assessment reach in-stream habitat or riffle-pool sequence is severely affected by a flow restriction or fill to the
	ting flow \underline{or} a channel choked with aquatic macrophytes \underline{or} ponded water \underline{or} impoundment on flood or ebb within
	reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver dams).	
⊠B Not A	
3. Feature Pattern – assess	sment reach metric
☐A A majority of the	e assessment reach has altered pattern (examples: straightening, modification above or below culvert).
⊠B Not A ´	,
4. Feature Longitudinal Pro	ofila – assassment reach metric
	ofile – assessment reach metric ssment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over
	e aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
disturbances).	agg, a. sagg, aa sacatansors appropriate sharmer promo nac not referred from any or mose
⊠B Not A	
	try accessment reach metric
=	ty – assessment reach metric
	nstability, not past events from which the stream has currently recovered. Examples of instability include channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
⊠A < 10% of channe	
☐B 10 to 25% of cha	
☐C > 25% of channe	

6.				raction -						
	LB	RB	ne Len	Dank (LD	3) and the	Right Ba	ink (RB).			
	⊠A □B	⊠A □B	Mo refe	derate evierence inte	dence of c eraction (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	Ext [exa of fl mos	ensive evi amples: ca lood flows	dence of causeways through strong]) or f	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						ne (milky white, m features or in			er discoloration, oil sheen, stream foam)
	□с	Notic	eable e	vidence of	pollutant of	discharge				<u>nd</u> causing a water quality problem
	□D □E				ural sulfide collected da		ating degraded	water qua	litv in the	assessment reach. Cite source in "Notes/Sketch"
		section	on.					,,,,,,,	,	
	□F □G				o stream o am or inte					
	H	Degr	aded ma	arsh veget	ation in the	e intertida	al zone (remova	_	-	nowing, 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	`	-		assessme oo large or			f Yes, skip	to Metric	: 13 (Streamside Area Ground Surface Condition).
10.		ral In-stre ☐Yes	eam Ha l ⊠No				each metric	, of the a	ccccmor	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			macrophyti 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	Multiple vegeta		nd/or leaf p	packs and	d/or emergent	k for T h Stree Only	□H □I	Low-tide refugia (pools) Sand bottom
		□с	Multiple	e snags ar	nd logs (inc)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? (s	skip for C	oastal Plain streams)
	11b.	Bedform ⊠A			k the appr		oox(es).			
		□в	Pool-gl	lide section	n (evaluat	e 11d)				
		□С			•	•	tric 12, Aquatio	•		
	11c.	at least	one box	in each r	row (skip 1	for Size 4	4 Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. Check Marsh Streams) . Not Present (NP) = absent, Rare Predominant (P) = > 70%. Cumulative percentages
		should n	ot excee	ed 100% fo C	or each as: A	sessment P	reach.			·
		\boxtimes		Ĭ		<u>.</u>	Bedrock/sapr			
			H	H	H	H	Boulder (256 Cobble (64 –		m)	
				፱	Ī		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	• •	,	strooms and Tidal March Officers
	пa.	□Yes	□No	Are poor	s illied with	ı seaimer	it! (Skip for Siz	Le 4 Coas	ıaı Piain 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 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) Managements (alderfly fieldly deboarfly larvae)
	片	\boxtimes	Megaloptera (alderfly, fishfly, dobsonfly larvae) Midges/mosquito larvae Maganita fish (Combanis) ar mud minu yang (Umban maganis)
	H		Mosquito fish (<i>Gambusia</i>) or mud minnows (<i>Umbra pygmaea)</i> Mussels/Clams (not <i>Corbicula</i>) Other fish
	Ä		Salamanders/tadpoles Snails
			Stonefly larvae (P) Tipulid larvae
12	_		Worms/leeches Ground Surface Condition – streamside area metric (skip for Tidal Marsh Streams and B valley types)
13.			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.			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.	Consider wetted pe	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.	Baseflov	– v Contril	outors – assessment reach metric (skip for Size 4 streams and Tidal Marsh Streams)
	Check at ⊠A □B	Streams	utors 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) of bank seepage or sweating (iron in water indicates seepage) bed or bank soil reduced (dig through deposited sediment if present) the above
17.		v Detrac	ors – 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) 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	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
	\square A \square A \square A \square A \square A ≥ 100 feet wide \underline{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 \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 \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
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 \[\Bar{B} \] \[
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 □ B □ B □ C □ C □ C □ D □ D
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.
	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.
	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). $\Box A < 46 \qquad \Box B 46 \text{ to} < 67 \qquad \Box C 67 \text{ to} < 79 \qquad \Box D 79 \text{ to} < 230 \qquad \Box E ≥ 230$
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	C SAM feature type (perennial, intermittent, Tidal Marsh Stream) Perennial								

(perennial, intermittent, ridal Marsh Stream)	- Felelilla	<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	

	7 to to in pained ou	or manaar voroion zir	
USACE AID #:		NCDWR #:	
		ographs. Attach a copy of the USGS	
		iple stream reaches will be evaluated	
		n for each reach. See the NC SAM U	
		ketch" section if supplementary measu	urements were performed. See the
	nples of additional measurements tha	•	the accoment area)
		ENT AREA (do not need to be within	i the assessment area).
PROJECT/SITE INFORMATIO		Date of evaluation: April 20	110
_	CLT Airport Expansion CLT	2. Date of evaluation: April 204. Assessor name/organization:	KMT,BGB/HDR
_	Mecklenburg	6. Nearest named water body	RWII,BGB/HDR
	Catawba	on USGS 7.5-minute quad:	Coffey Creek
	grees, at lower end of assessment re	<u> </u>	- Concy Orcek
,	pth and width can be approximatio	·	
	PS3-2 - S29 -	,	
9. Site number (show on attach	ned map): Reach 1 1	0. Length of assessment reach evalu	ated (feet): 1300'
11. Channel depth from bed (in	riffle, if present) to top of bank (feet):	2 □U	Inable to assess channel depth.
12. Channel width at top of ban	. ,	Is assessment reach a swamp steam	i? ∐Yes ∏No
14. Feature type: ☐Perennial	flow ☐Intermittent flow ☐Tidal Mar	sh Stream	
STREAM CATEGORY INFORM			
15. NC SAM Zone:	☐ Mountains (M) ☐ Piedmon	t (P)	☐ Outer Coastal Plain (O)
		\	,
16. Estimated geomorphic	\bowtie_{A}	\supset \Box B \searrow	
valley shape (skip for	_		room otooper valley alone)
Tidal Marsh Stream):	(more sinuous stream, flatter valley		ream, steeper valley slope)
17. Watershed size: (skip	☐Size 1 (< 0.1 mi²) ☐Size 2 (0	0.1 to $< 0.5 \text{ mi}^2$) Size 3 (0.5 to $<$	5 mi²)
for Tidal Marsh Stream) ADDITIONAL INFORMATION:			
		, check all that apply to the assessme	ent area
Section 10 water	Classified Trout Waters		shed (I I II III IV V)
☐Essential Fish Habitat	☐Primary Nursery Area		s/Outstanding Resource Waters
⊠Publicly owned property	□NCDWR Riparian buffer records	ule in effect Nutrient Sensitive W	/aters
☐Anadromous fish	⊠303(d) List		ronmental Concern (AEC)
1	f a federal and/or state listed protected	ed species within the assessment area	а.
List species:	tot (list angeing)		
Designated Critical Habit	· · · · · · · · · · · · · · · · · · ·	included in "Notes/Sketch" section or	attached2 DVac MNo
19. Are additional stream inform	nation/supplementary measurements	included in Notes/Sketch Section of	attacheu: 1 es 210
1. Channel Water – assessm	ent reach metric (skip for Size 1 st	reams and Tidal Marsh Streams)	
	assessment reach.		
B No flow, water in p			
☐C No water in assess	sment reacn.		
	ion – assessment reach metric		
		riffle-pool sequence is severely affe	
		atic macropnytes <u>or</u> ponded water <u>or</u> ed culverts, causeways that constrict	impoundment on flood or ebb within the channel tidal gates, debris jams
beaver dams).	deri (examples: undersized of peren	ed curverts, cadseways that constrict	the charmer, tradi gates, acons jams,
⊠B Not A			
3. Feature Pattern – assessn	nent reach metric		
		(examples: straightening, modification	n above or below culvert)
⊠B Not A	become readinate andrea pattern	(examples: straightering, meanisation	in above of bolow eartony.
	ile – assessment reach metric		
		d stream profile (examples: channel	down-cutting existing damming over
		n where appropriate channel profile	
disturbances).	55 ,	and the second second second	and the many of mood
⊠B Not A			
5. Signs of Active Instability	- assessment reach metric		
		ch the stream has currently recove	ered. Examples of instability include
active bank failure, active ch	nannel down-cutting (head-cut), active	e widening, and artificial hardening (so	
⊠A < 10% of channel			
B 10 to 25% of chan			
☐C > 25% of channel	นเอเสมเซ		

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.	Large □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	∐' _G	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 (evaluate n (evaluat					
		□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. Check Marsh Streams) . 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 ² 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	ply. 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	IC SAM feature type (perennial, intermittent, Tidal Marsh Stream) Perennial 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 #:
INSTRUCTIONS: 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	m
STREAM CATEGORY INFORMATION:	Diamen Constal Disir (I) Discrete Constal Cons
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: (skip Size 1 (< 0.1 mi²) Size 2 (0.1 to < 0	
for Tidal Marsh Stream)	.5 mi)5ize 5 (0.5 to < 5 mi ⁻)5ize 4 (< 5 mi ⁻)
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)
☑A Water throughout assessment reach.☐B No flow, water in pools only.	
☐C No water in assessment reach.	
 Evidence of Flow Restriction – assessment reach metric A t least 10% of assessment reach in-stream habitat or riffle-po 	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.	Large □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
		⊠В	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 (evaluate n (evaluat					
		□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. Check Marsh Streams). 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		tors – 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). $\Box A < 46 \qquad \Box B 46 \text{ to} < 67 \qquad \Box C 67 \text{ to} < 79 \qquad \Box D 79 \text{ to} < 230 \qquad \Box E \geq 230$
Note	es/Sketch:

Stream Site Name	CLT Airport Expansion	Date of Assessment	September 2019	
Stream Category	Assessor Name/Organization	KMT,BGB/HDR		
Notes of Field Asses	NO			
Presence of regulator	NO			
Additional stream inf	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 LOW	

panioo ocoi mariaa	
	NCDWR #:
INSTRUCTIONS: 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" sect	
NC SAM User Manual for examples of additional measurements that may be r NOTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA	
	t (do not need to be within the assessment area).
PROJECT/SITE INFORMATION: 1. Project name (if any): CLT Airport Expansion 2. Dat	e of evaluation: September 2019
	e of evaluation: September 2019 essor name/organization: KMT,BGB/HDR
	arest named water body
	USGS 7.5-minute quad: Coffey Creek
	35.198606, -80.948979
STREAM INFORMATION: (depth and width can be approximations)	
PS3-2 - S29 -	
	of assessment reach evaluated (feet): 86'
11. Channel depth from bed (in riffle, if present) to top of bank (feet): 2	Unable to assess channel depth.
· · · · · · · · · · · · · · · · · · ·	ment reach a swamp steam? ☐Yes ☐No
14. Feature type: ☐ Perennial flow ☐ Intermittent flow ☐ Tidal Marsh Stream	
STREAM CATEGORY INFORMATION:	Theres Constal Blain (I)
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: (skip ☐ Size 1 (< 0.1 mi²) ☐ Size 2 (0.1 to < 0.5	
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 ☐II ☐IV ☐V)
☐Essential Fish Habitat ☐Primary Nursery Area	☐ High Quality Waters/Outstanding Resource Waters
□ NCDWR Riparian buffer rule in effect	
☐ Anadromous fish ☐ 303(d) List ☐ Decumented processes of a federal and/or state listed protected species	CAMA Area of Environmental Concern (AEC)
Documented presence of a federal and/or state listed protected species List species:	within the assessment area.
☐ Designated Critical Habitat (list species)	
19. Are additional stream information/supplementary measurements included i	n "Notes/Sketch" section or attached? ☐Yes ☒No
<u>,,,,</u>	
1. Channel Water – assessment reach metric (skip for Size 1 streams and	d Tidal Marsh Streams)
□B No flow, water in pools only.□C No water in assessment reach.	
-	
2. Evidence of Flow Restriction – assessment reach metric	coguence is coverely affected by a flow restriction or fill to the
At least 10% of assessment reach in-stream habitat or riffle-pool point of obstructing flow or a channel choked with aquatic macro	
the assessment reach (examples: undersized or perched culvert	
beaver dams).	, ,
⊠B Not A	
3. Feature Pattern – assessment reach metric	
☑A A majority of the assessment reach has altered pattern (examples)	s: 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 p	orofile (examples: channel down-cutting, existing damming, over
widening, active aggradation, dredging, and excavation where a	
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 str	
active bank failure, active channel down-cutting (head-cut), active widening ☐A < 10% of channel unstable	, and artificial hardening (such as concrete, gabion, rip-rap).
☐B 10 to 25% of channel unstable	
©C > 25% of channel unstable	

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.	Large □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			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
		⊠В	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 (evaluate n (evaluat e					
		□с					ric 12, Aquatio	: 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. Check Marsh Streams). Not Present (NP) = absent, Rare
					or each as:			II (A) – > ·	40-7076, 1	Predominant (P) = > 70%. Cumulative percentages
		NP	R □	C	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	· <u> </u>		•		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 inf	NO						
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream) Perennial 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 minimum assessing at a state.
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)
☑A Water throughout assessment reach.☐B No flow, water in pools only.	
☐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 the streams and the stream and the s	
	□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 _l	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 (evaluat	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. Chec Marsh Streams) . 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 inf	NO			
NC SAM feature type	IC SAM feature type (perennial, intermittent, Tidal Marsh Stream) Perennial 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 Manual Version 2.1
U	SACE AID #: NCDWR #:
IN	STRUCTIONS: Attach a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
an	d circle the location of the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
	mber all reaches on the attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
	d explanations of requested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
	C SAM User Manual for examples of additional measurements that may be relevant.
N	OTE EVIDENCE OF STRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
	ROJECT/SITE INFORMATION:
	Project name (if any): CLT Airport Expansion 2. Date of evaluation: April 2019
	Applicant/owner name: CLT 4. Assessor name/organization: KMT,BGB/HDR
	County: Mecklenburg 6. Nearest named water body
	River basin: Catawba on USGS 7.5-minute quad: Coffey Creek
	Site coordinates (decimal degrees, at lower end of assessment reach): 35.214265, -80.940910
	REAM INFORMATION: (depth and width can be approximations)
1	Site number (show on attached map): PS4-2 - Stream 24 10. Length of assessment reach evaluated (feet): 200'
1	. Channel depth from bed (in riffle, if present) to top of bank (feet): 1 Unable to assess channel depth.
	. Channel width at top of bank (feet): 2 13. Is assessment reach a swamp steam? Yes No
	. Feature type: ☐Perennial flow ☑Intermittent flow ☐Tidal Marsh Stream REAM CATEGORY INFORMATION:
_	. NC SAM Zone: ☐ Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
13	. NO SAM ZONE. Modificants (M) Preditional (F) Inner Coastal Flain (I) Otter Coastal Flain (O)
16	Estimated geomorphic
	valley shape (skip for Tidal Marsh Stream): (more sinuous stream, flatter valley slope) (less sinuous stream, steeper valley slope)
17	
17	. Watershed size: (skip 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)
ΔΙ	DDITIONAL INFORMATION:
	. Were regulatory considerations evaluated? ⊠Yes □No If Yes, check all that apply to the assessment area.
	Section 10 water
	☐ 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.	Feature Longitudinal Profile – assessment reach metric
	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).
	⊠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 □C > 25% of channel unstable
	D

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	_		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. Check oastal Plain streams and Tidal Marsh Streams) . 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		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

USACE AID #:	NCDWR #:
	h a sketch of the assessment area and photographs. Attach a copy of the USGS 7.5-minute topographic quadrangle,
	f the stream reach under evaluation. If multiple stream reaches will be evaluated on the same property, identify and
	ne attached map, and include a separate form for each reach. See the NC SAM User Manual for detailed descriptions
	uested information. Record in the "Notes/Sketch" section if supplementary measurements were performed. See the
	or examples of additional measurements that may be relevant.
NOTE EVIDENCE OF S	TRESSORS AFFECTING THE ASSESSMENT AREA (do not need to be within the assessment area).
PROJECT/SITE INFOR	
1. Project name (if any):	
3. Applicant/owner name	
5. County:	Mecklenburg 6. Nearest named water body
7. River basin:	Catawba on USGS 7.5-minute quad: Coffey Creek
=	imal degrees, at lower end of assessment reach): 35.208268, -80.947637
	ON: (depth and width can be approximations)
9. Site number (show or	
	· · · · · · · · · · · · · · · · · · ·
12. Channel width at top	of bank (feet):1213. Is assessment reach a swamp steam?
STREAM CATEGORY I	
15. NC SAM Zone:	Mountains (M) ☐ Piedmont (P) ☐ Inner Coastal Plain (I) ☐ Outer Coastal Plain (O)
10. INO OAWI ZUIIG.	Li modritaino (m) Ra i realment (i) Li illiei coastai i iaili (i) Li cutei coastai Fidili (o)
16. Estimated geomorph	
valley shape (skip fo Tidal Marsh Stream	
17. Watershed size: (ski for Tidal Marsh Str	
ADDITIONAL INFORMA	,
	siderations 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 Ha	
☐ ☐Publicly owned pr	
☐Anadromous fish	□303(d) List □CAMA Area of Environmental Concern (AEC)
□Documented pres	ence of a federal and/or state listed protected species within the assessment area.
List species:	
	al Habitat (list species)
19. Are additional strear	n information/supplementary measurements included in "Notes/Sketch" section or attached? ⊠Yes □No
4 Channal Water as	accoment reach matric (akin for Size 4 atreams and Tidal March Streams)
	sessment reach metric (skip for Size 1 streams and Tidal Marsh Streams) ughout assessment reach.
	agriout assessment reach.
	assessment reach.
2. Evidence of Flow R	estriction – 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
	structing flow <u>or</u> a channel choked with aquatic macrophytes <u>or</u> ponded water <u>or</u> impoundment on flood or ebb within
	ment reach (examples: undersized or perched culverts, causeways that constrict the channel, tidal gates, debris jams,
beaver dan	ns).
⊠B Not A	
3. Feature Pattern – as	ssessment reach metric
⊠A A majority of	of the assessment reach has altered pattern (examples: straightening, modification above or below culvert).
☐B Not A	,
4. Feature Longitudin	al Profile – assessment reach metric
	assessment reach has a substantially altered stream profile (examples: channel down-cutting, existing damming, over
	active aggradation, dredging, and excavation where appropriate channel profile has not reformed from any of these
disturbance	
⊠B Not A	
5. Signs of Active Inst	tability – assessment reach metric
_	ent instability, not past events from which the stream has currently recovered. Examples of instability include
	ctive channel down-cutting (head-cut), active widening, and artificial hardening (such as concrete, gabion, rip-rap).
☐A < 10% of cl	hannel unstable
_	of channel unstable
□C > 25% of cl	hannel unstable

6.					streamsid					
	LB	RB	tne Lett	вапк (св	3) and the	Right Ba	nk (RB).			
	□A □B	□A □B	Mod refe	derate eviderence inte	dence of c eraction (ex	onditions camples:	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 fl mos	ensive evi amples: ca ood flows	dence of causeways through streaming]) or fl	conditions with flood reamside	that adversely lplain and chann area] <u>or</u> too mud	affect refe el constric ch floodpla	rence inte ction, bulk ain/intertion	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	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 inc	luding nati	ural sulfide	e odors)	_			
	ΠE	Curre section		shed or c	ollected da	ata indica	ting degraded v	water qua	lity in the	assessment reach. Cite source in "Notes/Sketch"
	□F			h access t	o stream c	or intertida	al zone			
	□G				am or inte			hmin.m		autima destruction etc)
							i in "Notes/Sketo			nowing, destruction, etc)
	\boxtimes J	Little	to no str	ressors					,	
8.					•	•	al Marsh Stream	•		
	For S ☐A						sidered a drough III not exceeding			eams, D2 drought or higher is considered a drought.
	⊟в						1 inch within the			31 40 110013
	⊠c	No d	rought co	onditions						
9.	Larg e	`	-		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	am 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			macrophyte s, lichens,		quatic mosses I mats)	idal	∐F ∐G	5% oysters or other natural hard bottoms Submerged aquatic vegetation
		⊠B	Multiple	e sticks ar			d/or emergent	Check for Tidal Marsh Streams Only	□н	Low-tide refugia (pools)
		□с	vegetat Multiple		nd logs (inc	cluding la	o trees)	arsh o	□J	Sand bottom 5% vertical bank along the marsh
		ΒĎ	5% und	dercut ban	nks and/or	root mats	s and/or roots	င် 🖁	□κ	Little or no habitat
		□E		s extend t no habita		nal wetted	l perimeter			
****	*****	******	*****	**REMAIN	IING QUE	STIONS	ARE NOT APPI	LICABLE	FOR TID	AL MARSH STREAMS************************************
11.			_							streams and Tidal Marsh Streams)
	11a.	∐Yes	⊠No	ls assess	sment read	ch in a na	tural sand-bed s	stream? (s	kip for C	oastal Plain streams)
	11b.	Bedform ⊠A			k the appr (evaluate		ox(es).			
		□B			n (evaluat e					
		□с	Natural	bedform	absent (sk	ip to Met	tric 12, Aquatic	Life)		
	11c.	at least	one box	in each r	row (skip f	for Size 4	Coastal Plain	streams a	and Tidal	essment reach – whether or not submerged. Check Marsh Streams) . 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		
				፱			Boulder (256 -	– 4096 mr	n)	
		H	님		님	H	Cobble (64 – 2 Gravel (2 – 64			
						H	Sand (.062 – 2	2 mm)		
					日	日	Silt/clay (< 0.0 Detritus)62 mm)		
					H		Artificial (rip-ra	ap, concre	te, etc.)	
	11d.	□Yes	□No	Are pools	s filled with	n sedimen	nt? (skip for Siz	e 4 Coast	al Plain s	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? 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		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					
	H		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 Íarvae Worms/leeches					
13.	Streams Conside	ide Area er 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.					
	LB □A	RB □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 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 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)					
		II contril	outors within the assessment reach or within view of <u>and</u> draining to the assessment reach.					
	□в	Ponds (and/or springs (jurisdictional discharges) nclude wet detention basins; do not include sediment basins or dry detention basins)					
	□c ⊠d		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)					
	⊠E □F	Stream	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		ply. 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		nent reach relocated to valley edge the above					
18.			sment 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	Degrade	ed (example: scattered trees)					
	$\boxtimes C$	Stream	shading is gone or largely absent					

	 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 □D □D<							
	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 Maintained shrubs E Little or no vegetation							
	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 B A B A B							
	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							
	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 \[\text{A} \text{ \text{\text{\text{\text{\text{B}}}}} The total length of buffer breaks is < 25 percent. \[\text{\tex							
	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 of 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. 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.							
	Conductivity – assessment reach metric (skip for all Coastal Plain streams) 25a.							
	□A < 46 □B 46 to < 67 □C 67 to < 79 □D 79 to < 230 □E ≥ 230							
	s/Sketch:							
Sue	am is located in the middle of an airport airfield,							

Stream Site Name	CLT Airport Expansion	Date of Assessment	April 2019				
Stream Category	Pb2	Assessor Name/Organization	KMT,BGB/HDR				
		-					
Notes of Field Asses		YES					
Presence of regulator		NO					
Additional stream inf	YES						
NC SAM feature type	IC SAM feature type (perennial, intermittent, Tidal Marsh Stream)						

e (perennial, intermittent, Tidal Marsh Stream)	Perennial			
Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent		
(1) Hydrology	LOW	mtermittent		
(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			
	MEDIUM			
(3) Stream Stability				
(4) Channel Stability	MEDIUM			
(4) Sediment Transport	MEDIUM			
(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	HIGH			
(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	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 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			
,_, intertion	INA			

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	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:			
 Project name (if any): 	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 =	V		,	
16. Estimated geomorphic valley shape (skip for	\Box A \frown	$\overline{}$	✓B	
Tidal Marsh Stream):	(more sinuous strear	m. flatter vallev slo	ope) (less sinuous st	ream, 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? MYES MNO
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, ϵ	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.	Larg 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. Chec Riffle-run section Pool-glide section Natural bedform	n (evaluate 11 on (evaluate 11	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	Size 4 Coas = > 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? (sk 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 noptiles 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
	H		Dipterans Mayfly larvae (E) Magalosters (alderfly fightly debeaptly 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 $□$ ≥ 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/Organization	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, 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

	ACCO	inpanies Oser Manual V	CI SIOII Z. I	
USACE AID #:		N	CDWR #:	
				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 accessment eres
NOTE EVIDENCE OF STRES		: ASSESSIVIEN I AKEA (uo not need to be Withir	i the assessment area).
PROJECT/SITE INFORMATI	-	0 0-4-	of avaluation:	shor 2010
1. Project name (if any):3. Applicant/owner name:	CLT Airport Expansion CLT		of evaluation: Septemessor name/organization:	ber 2019 KMT,BGB/HDR
5. County:	Mecklenburg		-	RWT,BGB/HDR
7. River basin:	Catawba		est named water body SGS 7.5-minute quad:	Coffey Creek
8. Site coordinates (decimal d			.194846, -80.949510	- Goney Greek
STREAM INFORMATION: (d	•	, <u> </u>		
	PS7-2 - S			
9. Site number (show on attac			assessment reach evalu	ated (feet): 367'
11. Channel depth from bed (in riffle, if present) to top of	of bank (feet): 1		Inable to assess channel depth.
12. Channel width at top of ba			ent reach a swamp steam	? □Yes □No
14. Feature type: ☐Perennia		☐Tidal Marsh Stream		
STREAM CATEGORY INFO				
15. NC SAM Zone:	☐ Mountains (M)	☐ Piedmont (P)	Inner Coastal Plain (I)	Outer Coastal Plain (O)
			1	/
16. Estimated geomorphic			⊠в	
valley shape (skip for	(more circusus etrees	- flotter valley class)		room, etooper valley sleps)
Tidal Marsh Stream):	(more sinuous stream	• • •	·	ream, steeper valley slope)
17. Watershed size: (skip	⊠Size 1 (< 0.1 mi²)	☐Size 2 (0.1 to < 0.5 n	\square Size 3 (0.5 to <	5 mi²)
for Tidal Marsh Stream) ADDITIONAL INFORMATION	J.			
18. Were regulatory considera		□No. If Yes, check all the	nat apply to the assessme	ent area
Section 10 water	Classified Tr			shed (I I II III IV V)
☐Essential Fish Habitat	☐Primary Nurs			s/Outstanding Resource Waters
⊠Publicly owned property		arian buffer rule in effect	☐Nutrient Sensitive W	aters
☐Anadromous fish				onmental Concern (AEC)
☐Documented presence	of a federal and/or state I	isted protected species w	ithin the assessment area	a.
List species:	sitet (liet e=i)			
☐ Designated Critical Hab 19. Are additional stream info		ogguromonto includad in	"Notoe/Skatah" castian a	attached? ☐Yes ⊠No
13. Are additional Stream Into	imation/supplementally M	easurements included in	NOTES/SKETCH SECTION OF	attacrieu: 🔲 res 🔯 INO
1. Channel Water – assess	ment reach metric (skip	for Size 1 streams and	Tidal Marsh Streams)	
☑A Water throughou	t assessment reach.		,	
☐B No flow, water in	. ,			
☐C No water in asset	ssment reach.			
2. Evidence of Flow Restric				
☐A At least 10% of	assessment reach in-stre	am habitat or riffle-pool s	equence is severely affect	cted by a flow restriction or fill to the
				impoundment on flood or ebb within the channel, tidal gates, debris jams,
beaver dams).	reacii (examples, unuers	ized of perched curverts,	causeways mai consinct	the chamber, tidal gates, debits jams,
⊠B Not A				
3. Feature Pattern – assess	ment reach metric			
		tered nattern (evamples:	straightening modification	n above or below culvert).
☐B Not A	accessment reach has al	toroa pattorri (examples.	on arginioning, modification	above of bolow curvery.
	ofila accasament reset	motrio		
4. Feature Longitudinal Pro☐A Majority of asses			file (evamples: channel a	down-cutting, existing damming, over
				has not reformed from any of these
disturbances).	aggradation, droaging, d	JAGGTGEON WHOLG UP	or of the state of	ist islamed from any or those
⊠B Not A				
5. Signs of Active Instabilit	v – assessment reach m	netric		
			m has currently recove	ered. Examples of instability include
				uch as concrete, gabion, rip-rap).
☐A < 10% of channe	el unstable	. 37	3 (
☑B 10 to 25% of cha				
☐C > 25% of channe	ย นารเสมเย			

6.	Streamside Area Interaction – streamside area metric Consider for the Left Bank (LB) and the Right Bank (RB). LB 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					
	⊠A □B □C	Exces Notice	ored water in stream or intertidal zone (milky white, blue, unnatural water discoloration, oil sheen, stream foam) sive sedimentation (burying of stream features or intertidal zone) table 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. Check					
		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	rements included (Y/N)	NO					
NC SAM feature type	NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)						

(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

		Accom	panies Oser Mandai Versi	OII 2. I	
US	SACE AID #:		NCDV	VR #:	
					7.5-minute topographic quadrangle,
					on the same property, identify and
					ser Manual for detailed descriptions
					rements were performed. See the
		r examples of additional measure	,		the
		TRESSORS AFFECTING THE A	ASSESSMENT AREA (do n	iot need to be within	the assessment area).
	ROJECT/SITE INFORI	_	0 Data of a		h 0040
	Project name (if any):	CLT Airport Expansion CLT	2. Date of ev		ber 2019 KMT,BGB/HDR
	Applicant/owner name County:	Mecklenburg		name/organization:	KIVIT, BGB/FIDK
	River basin:	Catawba		amed water body 57.5-minute quad:	Coffey Creek
1		mal degrees, at lower end of ass		5949, -80.946852	Colley Creek
	,	N: (depth and width can be ap	,	70 10, 00.0 10002	
•.	KEAM IN ORMATIO	PS7-2 - S30			
9.	Site number (show on	attached map): Reach 2	10. Length of ass	essment reach evalua	ated (feet): 980'
11	. Channel depth from I	bed (in riffle, if present) to top of	bank (feet): 2		nable to assess channel depth.
	. Channel width at top	. ,		each a swamp steam	? □Yes □No
		ennial flow Intermittent flow [☐Tidal Marsh Stream		
	REAM CATEGORY I		-		
15	. NC SAM Zone:	☐ Mountains (M)	☑ Piedmont (P) ☐ Inne	er Coastal Plain (I)	Outer Coastal Plain (O)
				1	/
16	. Estimated geomorph			⊠B	
	valley shape (skip for Tidal Marsh Stream		flatter valley class)		nam etoppar vallov slope)
4-7		<u>`</u>	• • •	•	eam, steeper valley slope)
17	. Watershed size: (ski for Tidal Marsh Street	-	Size 2 (0.1 to $< 0.5 \text{ mi}^2$)	☐Size 3 (0.5 to <	5 mi²)
ΔΓ	DITIONAL INFORMA	,			
		siderations evaluated? \(\square \) Yes [No If Yes, check all that a	pply to the assessme	nt area.
	☐Section 10 water	☐Classified Trou			shed (I I II III IV V)
	☐Essential Fish Hall	oitat □Primary Nursei	ry Area] High Quality Waters	/Outstanding Resource Waters
	⊠Publicly owned prediction □ Publicly o		ian buffer rule in effect]Nutrient Sensitive Wa	aters
	Anadromous fish	⊠303(d) List			onmental Concern (AEC)
		ence of a federal and/or state list	ed protected species within	the assessment area	
	List species:	Habitat (list species)			
10		information/supplementary mea	asurements included in "Not	es/Sketch" section or	attached? Tyes MNo
13	. Are additional stream	i illomation/supplementary mea	isarements included in 1400	es/okeich section of	attached: 163 2140
1.	Channel Water – as	sessment reach metric (skip fo	or Size 1 streams and Tida	I Marsh Streams)	
		ghout assessment reach.		-	
		ter in pools only.			
	☐C No water in	assessment reach.			
2.	Evidence of Flow Ro	estriction – assessment reach	metric		
					ted by a flow restriction or fill to the
					impoundment on flood or ebb withir he channel, tidal gates, debris jams
	beaver dam	` .	ed or perched curverts, caus	seways mai constitct t	ille charmer, tidal gates, debris jams
	⊠B Not A				
2		esassment reach metric			
3.		sessment reach metric of the assessment reach has alte	red nattern (evamples: etrai	ahtenina modification	above or below culvert)
	☐A A majority c	and addeddinent readir has after	iou pattorii (champies, strai	gritoring, modification	above of bolow outverty.
4		al Profile accessment reach	motrio		
4.		al Profile – assessment reach n assessment reach has a substan		(evamples: channel d	lown-cutting, existing damming, over
					nas not reformed from any of these
	disturbance			and an armon promo i	any or more
	⊠B Not A				
5.	Signs of Active Inst	ability – assessment reach me	tric		
	_	=		as currently recover	red. Examples of instability include
	active bank failure, a	ctive channel down-cutting (head			
		nannel unstable			
		of channel unstable			
	O > ∠3% UI CI	nannel unstable			

		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	∐' _G	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	՝		
	 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)	
************ Bedfor 11a. [11b. B	************ " m and \$ ⊒Yes Bedform	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)	
*********** Bedfor 11a. [11b. B	******************** □Yes Bedform ∈ ☑A □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 stream? (s	al Plain s	streams and Tidal Marsh Streams)	
Bedfor 11a. [11b. B [[11c. Ir a	rm and \$ Yes Bedform B 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 occur 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 occur 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 occur 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 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%, Abundan 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 G H 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 the collected section. ☐C Noticeable evidence of pollutang natural sulfiders. ☐C Noticeable evidence of pollutang natural sulfiders. ☐C Noticeable evidence of pollutang natural sulfiders. ☐E Current published or collected section. ☐F Livestock with access to stream or in least or section. ☐H Degraded marsh vegetation in the least or section of the least or section. ☐H Degraded marsh vegetation in the least or section. ☐H Degraded marsh vegetation in the least or section. ☐A Drought conditions and rainfall or section. ☐A Drought conditions and rainfall or section. ☐C No drought conditions. Large or Dangerous Stream – assessment or section. No drought conditions. Large or Dangerous Stream – assessment or section. No drought conditions. 10b. Check all that occur (occurs if > 5 <td< th=""><th>☑A ☑A Little or no evidence of conditions reference interaction (examples: or intermittent bulkheads, caused or intermittent bulkheads or conditions and or intermittent bulkheads or flood fl</th><th>☑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,</th><th> MA</th><th>☑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:</th><th>☑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."</th></td<>	☑A ☑A Little or no evidence of conditions reference interaction (examples: or intermittent bulkheads, caused or intermittent bulkheads or conditions and or intermittent bulkheads or 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 $\triangle A \triangle A$
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 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 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	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	e (perennial, intermittent, Tidal N	Marsh Stream)	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 II	l Ecoregion	Piedmont	Nearest Named Water Body	Ticer Branch	
		River Basir		USGS 8-Digit Catalogue Unit	03050101	
	'•	County		NCDWR Region	Mooresville	
	☐ Ye			Latitude/Longitude (deci-degrees)	35.231203, -80.958653	
		2 🖂 140	Frecipitation within 40 hrs:	Latitude/Longitude (deci-degrees)	33.231203, -00.930033	
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 strear 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	
W	hat type of	f natural e	tream is associated with the wetland, i	f any? (check all that annly)		
Ī		ckwater	in out in a door old to a line in out a line, in	any (encon an mar appry)		
	l Bro	wnwater				
	Tid:		check one of the following boxes)	unar ☐ Wind ☐ Both		
-	, 110	ai (ii tidai, t	3 , —			
Is	the assess	sment are	a on a coastal island? 🔲 Yes 🛛	No		
	41			land the second of the distance of the second of		
IS	tne asses	sment are	a's surrace 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? Yes	⊠ No	
_	0		w Primary and a Completion of the Completion of	and and a second Philippe and the		
1.	Check a assessment area base	box in eac ent area. C		und surface (GS) in the assessment area are (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		
	Check a l Consider deep is ex Surf	box in eac both increa xpected to Sub	h column. Consider surface storage capase and decrease in hydrology. A ditch	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 □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 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		

4.	Check a box	from each o	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.
	Make soil ob indicators.	servations wit	nin the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regiona
	4a.	Loamy or cla	yey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) yey soils not exhibiting redoximorphic features yey gleyed soil stic epipedon
	4b. ⊠A □B	Soil ribbon < Soil ribbon ≥	
	4c. ⊠A □B	No peat or m A peat or mu	uck presence ck presence
5.	Discharge in	-	opportunity metric
		e discharges i	nn. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples notlude presence of nearby septic tank, underground storage tank (UST), etc.
	⊠A ⊠A □B □E	Little or Noticeal	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 nt capacity of the assessment area
	□c □c	Noticeat potential	ole 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)
	Check all that to assessment	at apply (at lean of area within of miles and within	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).
			≥ 10% impervious surfaces
			Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
		D □D	≥ 20% coverage of agricultural land (regularly plowed land)
	⊠E ⊠E ⊠F ⊠F		≥ 20% coverage of maintained grass/herb ≥ 20% coverage of clear-cut land
	□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.
	_		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
		From 15 to	
	□D □E	From 5 to < < 5 feet <u>or</u> b	uffer bypassed by ditches
	_		tributary is anastomosed, combine widths of channels/braids for a total width.]> 15-feet wide
	7d. Do roo	s of assessme	ent area vegetation extend into the bank of the tributary/open water?
			en water sheltered or exposed?
			nt open water with width < 2500 feet <u>and</u> no regular boat traffic. It open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.			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
	Check a box	omplex at the	nn 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.
	\Box A \Box A	. ≥ 100 fe	
	□B □E		to < 100 feet to < 80 feet
		From 40	to < 50 feet
			to < 40 feet
		From 5 t	to < 30 feet o < 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). \[\begin{align*} \text{A} & Sediment deposition is not excessive, but at approximately natural levels. \[\begin{align*} \text{B} & Sediment deposition is excessive, but not overwhelming the wetland. \[\begin{align*} \text{C} & Sediment deposition is excessive and is overwhelming the wetland. \]
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 From 5 to < 10 acres G G G From 1 to < 5 acres H AH AH AH From 0.5 to < 1 acre I I I From 0.1 to < 0.5 acre K K K K K K C 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
	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 C S C From 50 to < 100 acres Metland 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)
	 □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. □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. □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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics).

Stage Stag	17.	7. Vegetative Structure – assessment area/wetland type condition metric 17a. Is vegetation present?					
A ≥ 25% coverage of vegetation		⊠Y	es □No	If Yes, continue to 17b. If No, skip	to Metric 18.		
structure in airspace above the assessment area (AA) and the wetland type (WT) separately. AA WT AB AB AB Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy sparse to be compared more than natural gaps Canopy sparse or absent		□A	≥ 25% (overage of vegetation	getation for all marshes o r	nly . Skip to 17c for non-marsh wetlan	ds.
A Canopy closed, or nearly closed, with natural gaps associated with natural processes Canopy present, but opened more than natural gaps A Dense mid-story/sapling layer A Dense mid-story/sapling layer Mid-story/sapling layer Mid-story/sapling layer Mid-story/sapling layer Mid-story/sapling layer Mid-story/sapling layer Mid-story/sapling layer sparse or absent A Dense shrub layer Mid-story/sapling layer sparse or absent A Dense shrub layer sparse or absent A Dense shrub layer sparse or absent A Dense shrub layer sparse or absent A Large snags (more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability). Not A Dense shave stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are present. Majority of canopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are present. Majority of canopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. C Majority of canopy trees are < 6 inches DBH or no trees. 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 DBH or no trees. 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 A Coverbank flow is severely altered in the assessment area. Overbank flow is severely altered in the assessment area. Overbank flow is severely altered in the assessment area.		stru A A	cture in airsp				Consider
A		Canopy ⊠□⊠ O B	⊠A □B □C	Canopy present, but opened more	• .	with natural processes	
Sangs - wetland type condition metric (skip for all marshes) A		Mid-Story ⊠ B	□A ⊠B □C	Moderate density mid-story/sapling			
##		Shrub □ B □ C	□A □B ⊠C	Moderate density shrub layer			
A Large snags (more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability). Not A		A ⊟e B ⊠C	□A □B ⊠C	Moderate density herb layer			
Second Part Second Part	18.	Snags - v	vetland type	condition metric (skip for all mars	hes)		
A Majority of canopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are present. B Majority of canopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. Majority of canopy trees are < 6 inches DBH or no trees. A Large Woody Debris - wetland type condition metric (skip for all marshes) Include both natural debris and man-placed natural debris. A Large		⊠B 1	Not A		-	species present and landscape stability)	
present. Majority of canopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. Majority of canopy trees are < 6 inches DBH or no trees. 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 □ B □ □ C □ □ □ 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. □ A □ Overbank and overland flow are not severely altered in the assessment area. □ C ○ Overland flow is severely altered in the assessment area. □ C ○ Overland flow is severely altered in the assessment area.	19.					DI IV many large trace (v. 42 inches DDI	1) 0.50
 		ŗ		lopy trees have stems > 6 inches in	ulameter at breast height (Di	on), many large trees (> 12 inches Don) are
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						12 inch DBH.	
Large logs (more than one) are visible (> 12 inches in diameter, or large relative to species present and landscape stability). 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	20.	Large Wo	ody Debris -	wetland type condition metric (sk	tip for all marshes)		
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		□A L	∟arge logs (m	•	s in diameter, or large relative	e to species present and landscape stab	ility).
areas indicate vegetated areas, while solid white areas indicate open water. A	21.	_	-				
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. A Overbank and overland flow are not severely altered in the assessment area. B Overbank flow is severely altered in the assessment area. C Overland flow is severely altered in the assessment area.		areas indicate vegetated areas, while solid white areas indicate open water.					
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. A Overbank and overland flow are not severely altered in the assessment area. B Overbank flow is severely altered in the assessment area. C Overland flow is severely altered in the assessment area.		0	The second				
man-made berms, beaver dams, and stream incision. Documentation required if evaluated as B, C, or D. ☐A Overbank <u>and</u> overland flow are not severely altered in the assessment area. ☐B Overbank flow is severely altered in the assessment area. ☐C Overland flow is severely altered in the assessment area.	22.			-	•		
		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. \[\text{A} \text{ Overbank \frac{\text{and}}{\text{overbank}}} \text{ overland flow are not severely altered in the assessment area.} \[\text{D} \text{ Overbank flow is severely altered in the assessment area.} \] \[\text{C} \text{ Overland flow is severely altered in the assessment area.} \]					

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 lo	cated within 50 feet of a natural tributary	or other open water (Y/N)	NO			
Assessment area is su	ubstantially altered by beaver (Y/N)		NO			
Assessment area expe	ssessment 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#	-		
08			o CLT Airport Expansion	Date of Evaluation	Sontombor 2010		
		oject Nam			September 2019		
A	pplicant/O			Wetland Site Name	PW2-2 - Wetland 7 KMT, BGB/HDR		
		etland Typ		Assessor Name/Organization			
		Ecoregic		Nearest Named Water Body	Ticer Branch		
	ı	River Bas		USGS 8-Digit Catalogue Unit	03050101		
	Пν.	Coun		NCDWR Region	Mooresville		
-	∐ Ye	s 🛛 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.219133, -80.955870		
Is Re	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						
	Abu Des Abu	its a strea signated N its a 303(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 the asses	ckwater wnwater al (if tidal, sment are	check one of the following boxes)	unar □ Wind □ Both No			
			ea's surface water storage capacity or do area experience overbank flooding duri	uration substantially aftered by beaver? ing normal rainfall conditions? Yes	☐ Yes ⊠ No ☑ No		
1.	Ground S	Surface C	ondition/Vegetation Condition – assessı	ment area condition metric			
	assessme area base	ent area.		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 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 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	WT					
	□c □p	□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 wit	hin the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regional
	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 stic epipedon
	4b. ⊠A	Soil ribbon <	1 inch
	<u>□</u> В 4с. ⊠А	Soil ribbon ≥	
	4c. ⊠A □B	A peat or mu	uck presence ck presence
5.	_		opportunity metric
		e discharges i	mn. 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 ⊠ <i>A</i> □B □E	Noticeal	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 nt capacity of the assessment area
	_c _c	Noticeal potentia	ole evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and lly overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive station, odor)
6.	Land Use -	opportunity n	netric (skip for non-riparian wetlands)
	to assessme	nt area within on the miles and with	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).
			> 10% impervious surfaces
	□B □E		Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
)	≥ 20% coverage of agricultural land (regularly plowed land)
	⊠E ⊠E ⊠F ⊠F		≥ 20% coverage of maintained grass/herb ≥ 20% coverage of clear-cut land
	□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		vithin 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
			rtion 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 <	15 feet ouffer bypassed by ditches
	7c. <u>Tri</u> buta	ry width. If the	e tributary is anastomosed, combine widths of channels/braids for a total width.
			¬> 15-feet wide ☐ Other open water (no tributary present) ant area vegetation extend into the bank of the tributary/open water?
	□Yes	□No	
	_Shel	tered – adjace	en water sheltered or exposed? Int open water with width < 2500 feet <u>and</u> no regular boat traffic. It open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.			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)	-	
		omplex at the	mn 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.
			0 to < 100 feet 0 to < 80 feet
	$\boxtimes D$	From 40	to < 50 feet
			to < 40 feet to < 30 feet
	G 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 Soo acres B B From 100 to < 500 acres C C C From 50 to < 100 acres D D D From 25 to < 50 acres FF From 10 to < 25 acres FF From 5 to < 10 acres G G G From 1 to < 5 acres H A 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.
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 = C 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)
	 □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. □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. □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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics).

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 percent coverage of assessment area vegetation for all marshes only . 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)					
	□A Large snags (more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).□B Not A					
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. 					
	 ☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. ☐C Majority of canopy trees are < 6 inches DBH or no trees. 					
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.					
	 ☑A Overbank and overland flow are not severely altered in the assessment area. ☐B Overbank flow is severely altered in the assessment area. 					
	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	Assessment area is located within 50 feet of a natural tributary or other open water (Y/N)				
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 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#			
03		" oject Nam	e _CLT Airport Expansion	Date of Evaluation	September 2019		
٨	۱۲ pplicant/O			Wetland Site Name	PW3-2 - Wetland 8		
^		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 ₂	Count		NCDWR Region	Mooresville 35.216431, -80.955398		
-	∐ Ye	s 🛛 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.210431, -80.955396		
Is Re	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						
	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 su 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)	unar □ Wind □ Both			
			ea's surface water storage capacity or do	uration substantially altered by beaver? 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			
	⊠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.		Soil Texture/Structure – assessment area condition metric (skip for all marshes) Check a box from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature.						
		servations wit	hin the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regiona					
	☐C Loamy or cl ☐D Loamy or cl		ayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) ayey soils not exhibiting redoximorphic features ayey gleyed soil					
	□E 4b. ⊠A	Soil ribbon <	stosol or histic epipedon oil ribbon < 1 inch					
	B 4= - ⊠A		Soil ribbon ≥ 1 inch					
	4c. ⊠A ⊟B	A peat or mu	uck presence ck presence					
5.	_		opportunity metric					
		e discharges i	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 ⊠ <i>A</i> □B □E	Noticeal	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 nt capacity of the assessment area					
	_c _c	Noticeal potentia	ole evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and lly overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive station, odor)					
6.	Land Use -	opportunity n	netric (skip for non-riparian wetlands)					
	to assessme	nt area within on the miles and with	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).					
			> 10% impervious surfaces					
	□B □E		Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture					
)	≥ 20% coverage of agricultural land (regularly plowed land)					
	⊠E ⊠E ⊠F ⊠F		≥ 20% coverage of maintained grass/herb ≥ 20% coverage of clear-cut land					
	□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		vithin 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 <	15 feet ouffer bypassed by ditches					
	7c. <u>Tri</u> buta	ry width. If the	etributary is anastomosed, combine widths of channels/braids for a total width.					
		 □≤ 15-feet wide □ Other open water (no tributary present) 7d. Do roots of assessment area vegetation extend into the bank of the tributary/open water? 						
	□Yes □No							
	_Shel	tered – adjace	en water sheltered or exposed? nt open water with width < 2500 feet <u>and</u> no regular boat traffic. nt open water with width ≥ 2500 feet <u>or</u> regular boat traffic.					
8.			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)	-						
		omplex at the	nn 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.					
	\Box A \Box A	. ≥ 100 fe						
			to < 100 feet					
	$\boxtimes D$	From 40	to < 50 feet					
			to < 40 feet to < 30 feet					
	G G	From 5	to < 35 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 S 500 acres B B B From 100 to < 500 acres C C C From 50 to < 100 acres D D D D From 25 to < 50 acres E E From 10 to < 25 acres F F F F F F F F F F F F F F F F F F F
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 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)
	 □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. □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. □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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics).

17	Vege	stative St	ructure —	assessment area/wetland type condition metric			
	_	Is vegeta	ation pres ☐No	··			
	4-1		_				
	170.	⊟A ⊟B	≥ 25% c	coverage of assessment area vegetation for all marshes only . 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. Consider ace above the assessment area (AA) and the wetland type (WT) separately.			
		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			
	Shrub	B □A B □C	□A □B ⊠C	Dense shrub layer Moderate density shrub layer Shrub layer sparse or absent			
	Herb	A □A B □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	Large Not A		more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).			
19.	Diam	neter Clas	ss Distrib	oution – wetland type condition metric (skip for all marshes)			
	ПА	Majo pres		nopy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are			
	□в ⊠с	Majo	rity of can	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.	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.						
		(05)					
22.	-	_		ty – assessment area condition metric (evaluate for riparian wetlands and Salt/Brackish Marsh only)			
				nat may severely alter hydrologic connectivity include intensive ditching, fill, sedimentation, channelization, diversion, rer dams, and stream incision. Documentation required if evaluated as B, C, or D.			
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.			
	□B □C			r is severely altered in the assessment area. is severely altered in the assessment area.			
	□Ď			s and overland flow are severely altered in the assessment area.			

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	esence of regulatory considerations (Y/N)						
Wetland is intensively m	nanaged (Y/N)		NO				
Assessment area is loca	ssessment 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)		NO				
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				

110	USACE AID # NCDWR#						
03		# 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		
F.	idonos of	-1	offerting the accomment area (may no	t be 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 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 atened species	utants, presence of nearby septic , salt intrusion, etc.)		
	Abu Des Abu	uts a strea signated N uts a 303(o	CNHP reference community d)-listed stream or a tributary to a 303(d)-lis	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 du area experience overbank flooding duri	uration substantially altered by beaver? ing normal rainfall conditions? Yes	☐ Yes No		
1.	Ground S	Surface C	ondition/Vegetation Condition – assessi	ment area condition metric			
	Check a lassessme area base	box in ea ent area.	ch column. Consider alteration to the grou	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	both incre xpected to Sub ⊠A	ease and decrease in hydrology. A ditch seaffect both surface and sub-surface water. Water storage capacity and duration are no	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	water only, while a ditch > 1 foot le.		
_	⊠C	□с	Water storage capacity or duration are sub- (examples: draining, flooding, soil compacti	stantially altered (typically, alteration sufficiention, filling, excessive sedimentation, undergo	ent to result in vegetation change) round utility lines).		
3.		_		ype condition metric (skip for all marshe	·		
			ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and type (WT).		
	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	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	e soil obs	om each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature rvations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regiona
	4a.	ators. A B C D D D E	Sandy soil oamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) oamy or clayey soils not exhibiting redoximorphic features oamy or clayey gleyed soil listosol or histic epipedon
	4b.	⊠a □B	Soil ribbon < 1 inch Soil ribbon ≥ 1 inch
	4c.	⊠a □B	lo peat or muck presence peat or muck presence
5.	Disc	harge in	Wetland – opportunity metric
		ıb-surface Sub	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 as	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 and within the watershed draining to the assessment area (5M) es and within the watershed draining to the assessment area (2M). 2M
	□A □B □C	□A □B □C	 □A ≥ 10% impervious surfaces □B Confined animal operations (or other local, concentrated source of pollutants □C ≥ 20% coverage of pasture
	□D ⊠E ⊠F	□D ⊠E ⊠F	□D ≥ 20% coverage of agricultural land (regularly plowed land) □E ≥ 20% coverage of maintained grass/herb □F ≥ 20% coverage of clear-cut land
	ĞG	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.	Wetl	and Acti	g as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
	7a.	\boxtimes 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. ouffer 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. h of the first 50 feet from the bank is wetland? (Wetland buffer need only be present on one side of the .water body. Makegment 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.	<u></u> ≤ 15-	width. If the tributary is anastomosed, combine widths of channels/braids for a total width. et wide □ Other open water (no tributary present)
	7d. 7e.	\boxtimes Yes	of assessment area vegetation extend into the bank of the tributary/open water? □No or other open water sheltered or exposed?
		⊠Shelt	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 W	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
	Che	ck a box	each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT) and applex at the assessment area (WC). See User Manual for WT and WC boundaries.
	□A	VVC	≥ 100 feet
	□В	□в	From 80 to < 100 feet
			From 50 to < 80 feet
	□D □E	□D □E	From 40 to < 50 feet From 30 to < 40 feet
	oxtimesF	⊠F	From 15 to < 30 feet
	G	□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 SF 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)
	 □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. □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. □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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics).

17.	_			- assessment area/wetland type condition metric	
	17a.	_	ation pres	sent? If Yes, continue to 17b. If No, skip to Metric 18.	
	17b.	Evaluate □A □B	≥ 25% c	t coverage of assessment area vegetation for all marshes only . Skip to 17c coverage of vegetation coverage of vegetation	for non-marsh wetlands.
		structure		each column for each stratum. Evaluate this portion of the metric for no acce above the assessment area (AA) and the wetland type (WT) separately.	on-marsh wetlands. Consider
	Canopy	AA □A □B ⊠C	WT ⊠A □B □C	Canopy closed, or nearly closed, with natural gaps associated with natural procest Canopy present, but opened more than natural gaps Canopy sparse or absent	sses
	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	Large Not A		more than one) are visible (> 12 inches DBH, or large relative to species present a	nd landscape stability).
19.				oution – wetland type condition metric (skip for all marshes)	
	□A	Majo prese		nopy trees have stems > 6 inches in diameter at breast height (DBH); many large to	rees (> 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.	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 prese	ent and landscape stability).
21.	_	-		er Dispersion – wetland type/open water condition metric (evaluate for Non-Ti	
				est describes the amount of interspersion between vegetation and open water in d areas, while solid white areas indicate open water.	the growing season. Patterned
		0			
22.	-	_		ity – assessment area condition metric (evaluate for riparian wetlands and Sa	
				nat may severely alter hydrologic connectivity include intensive ditching, fill, sedimenter dams, and stream incision. Documentation required if evaluated as B, C, or D.	ntation, channelization, diversion,
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.	
	□B □C			v is severely altered in the assessment area. is severely altered in the assessment area.	
				k <u>and</u> overland flow are severely altered in the assessment area.	

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

USACE	AID#			NCDWR#	
		ect Name	e CLT Airport Expansion	Date of Evaluation	April 2019
Applic		ner Name		Wetland Site Name	PW5-2 - Wetland 16
		and Type		Assessor Name/Organization	KMT, BGB/HDR
Le		coregio		Nearest Named Water Body	Coffey Creek
	Ri	ver Basiı		USGS 8-Digit Catalogue Unit	03050103
] _		Count		NCDWR Region	Mooresville
	Yes	⊠ No	Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.204049, -80.954101
Please recent	circle a past (for Hydro Surfa tanks Signs Habit assessr atory Co Anad Fede NCD Abuts Public N.C.	nd/or marinstance logical r ce and s , underg of vege at/plant of nent are commons rally prot WR ripar s a Prima cly owne Division	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 exist extensively managed? Yes is nected species or State endangered or threst ian buffer rule in effect ary Nursery Area (PNA) d property of Coastal Management Area of Environments.	stressors is apparent. Consider departure frinclude, but are not limited to the following. eaver dams, dikes, berms, ponds, etc.) camples: discharges containing obvious pollut, etc.) ality, insect damage, disease, storm damage, clear-cutting, exotics, etc.) No valuated? Yes No If Yes, check all the eatened species	ntants, presence of nearby septic , salt intrusion, etc.) nt apply to the assessment area.
	Abuts Desig Abuts	a stream nated N a 303(d	m with a NCDWQ classification of SA or s CNHP reference community)-listed stream or a tributary to a 303(d)-li	upplemental classifications of HQW, ORW, o	or Trout
	Black Brow Tidal	water nwater (if tidal,	tream is associated with the wetland, in the check one of the following boxes)	unar 🗌 Wind 🔲 Both	
				luration substantially altered by beaver? ring normal rainfall conditions?	☐ Yes
Che	eck a bo	ox in each t area. Con evide		sment area condition metric und surface (GS) in the assessment area an e (see User Manual). If a reference is not app	
⊠A □B	\ <u> </u>]A	sedimentation, fire-plow lanes, skidder tra	essment area (ground surface alteration exa acks, bedding, fill, soil compaction, obvious ace, herbicides, salt intrusion [where appropri ion)	pollutants) (vegetation structure
Che	eck a bo	x in eac		 assessment area condition metric acity and duration (Surf) and sub-surface sto ≤ 1 foot deep is considered to affect surface 	
	p is exp f S	ected to ub		r. Consider tidal flooding regime, if applicable	
	3 []B \]C \	Vater storage capacity or duration are alte Vater storage capacity or duration are sub	ered, but not substantially (typically, not suffice ostantially altered (typically, alteration sufficiention, filling, excessive sedimentation, underg	ent to result in vegetation change)
3. Wat	ter Stor	age/Sur	face Relief – assessment area/wetland	type condition metric (skip for all marshe	es)
		x in eac		e for the assessment area (AA) and the wetl	•
	□A [□B [□C [□D [□A M □B M □C M ⊠D 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	to pond water 6 inches to 1 foot deep to pond water 3 to 6 inches deep is deep	
3b.	□B E	vidence 1	hat maximum depth of inundation is great hat maximum depth of inundation is betw hat maximum depth of inundation is less	een 1 and 2 feet	

	Make	soil obs	rom each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape feature. rvations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for regiona
		⊒A ⊠B ⊒C	Sandy soil oamy or clayey soils exhibiting redoximorphic features (concentrations, depletions, or rhizospheres) oamy or clayey soils not exhibiting redoximorphic features oamy or clayey gleyed soil listosol or histic epipedon
	4b. [⊠A ⊒B	Soil ribbon < 1 inch
	4c.	⊠A ⊒B	No peat or muck presence A peat or muck presence
5.	Disch	arge in	Wetland – opportunity metric
		surface Sub	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 and 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	 □A ≥ 10% impervious surfaces □B Confined animal operations (or other local, concentrated source of pollutants □C ≥ 20% coverage of pasture
	□D ⊠E □F	□b ⊠E □F	 □D ≥ 20% coverage of agricultural land (regularly plowed land) □E ≥ 20% coverage of maintained grass/herb □F ≥ 20% coverage of clear-cut land
	Ğ	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.	Wetla	ınd Acti	g as Vegetated Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
		⊠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. ouffer 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. h 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	≥ 50 feet From 30 to < 50 feet
		□c ⊠d □e	From 15 to < 30 feet From 5 to < 15 feet < 5 feet or buffer bypassed by ditches
		<u></u> ≤ 15-	width. If the tributary is anastomosed, combine widths of channels/braids for a total width. et wide ⊠> 15-feet wide □ Other open water (no tributary present) of assessment area vegetation extend into the bank of the tributary/open water?
	7e.	☐Yes Is stream	No or other open water sheltered or exposed?
		☐ 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	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 nplex 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	□E	From 30 to < 40 feet
	□F	□F	From 15 to < 30 feet
	□G □H	∏G □µ	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 J J J J J From 0.01 to < 0.1 acre 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)
	 ☑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. ☑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. ☑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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics).

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 for all marshes only . Skip to 17c for non-marsh wetlands. overage of vegetation overage of vegetation	
	17c.			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
		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	
	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.	Larg	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	oen 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		
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, diversions and except include a property of the product of t	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	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	
\\/_t== \O_11=\\\\\	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

110	SACE AID :	#	Accompanies	NCDWR#	
03		" oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019
Δ	۳۱۰ pplicant/O			Wetland Site Name	PW6-2 - Wetland 17
^`		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)	35.203572, -80.953350
		-1		4 h	
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 and supplies in the substitution of the su	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 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	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	
			ea's surface water storage capacity or du		☐ Yes No
Do	es the ass	sessment	area experience overbank flooding duri	ing normal rainfall conditions? Yes	⊠ No
1.	Check a lassessme area base	box in ea ent area. ed on evid		ment area condition metric and surface (GS) in the assessment area ar (see User Manual). If a reference is not app	
	\boxtimes A	□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-	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.	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 sufficiency, filling, excessive sedimentation, undergover condition metric (skip for all marshe	round utility lines).
3.		_		ype condition metric (skip for all marshe	·
			cn column. Select the appropriate storage	e for the assessment area (AA) and the wetl	ana 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	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	

		ox from each of the three soil property groups below. Dig soil profile in the dominant assessment area landscape fe observations within the top 12 inches. Use most recent National Technical Committee for Hydric Soils guidance for re	
	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-sur Surf	bx in each column. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Exalace discharges include presence of nearby septic tank, underground storage tank (UST), etc.	ımples
	□B [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 a potentially overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive sedimentation, odor)	ind
6.	Land Use	– opportunity metric (skip for non-riparian wetlands)	
	to assessr and within	that apply (at least one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources dr nent area within entire upstream watershed (WS), within 5 miles <u>and</u> within the watershed draining to the assessment area 2 miles and within the watershed draining to the assessment area (2M). M 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 □D ≥ 20% coverage of agricultural land (regularly plowed land)	
		☑E ☑E ≥ 20% coverage of maintained grass/herb ☑F ☑F ≥ 20% coverage of clear-cut land	
		Little or no opportunity to improve water quality. Lack of opportunity may result from little or no disturban the watershed <u>or</u> hydrologic alterations that prevent drainage <u>and/or</u> overbank flow from affecting the assessment area.	nce in
7.	Wetland /	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?	
	⊠Y Wet	es ∏No If Yes, continue to 7b. If No, skip to Metric 8. and buffer need only be present on one side of the water body. Make buffer judgment based on the average width of we	etland
	Rec	ord 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. r 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	,
	□B □C	From 30 to < 50 feet From 15 to < 30 feet	
	□D	From 5 to < 15 feet	
	⊠E 7c. Trib	< 5 feet <u>or</u> buffer bypassed by ditches tary width. If the tributary is anastomosed, combine widths of channels/braids for a total width.	
	□≤	15-feet wide	
	7d. Dor □Y	oots of assessment area vegetation extend into the bank of the tributary/open water? es ⊠No	
		eam or other open water sheltered or exposed?	
		neltered – adjacent open water with width < 2500 feet <u>and</u> no regular boat traffic. sposed – 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 F	Forest
	Check a b	ox in each column for riverine wetlands only. Select the average width for the wetland type at the assessment area (WT d complex at the assessment area (WC). See User Manual for WT and WC boundaries.	T) and
]A ≥ 100 feet	
		B From 80 to < 100 feet	
	□E [E From 30 to < 40 feet	
		From 15 to < 30 feet	
		G From 5 to < 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) 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). □ 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 XJ XJ XJ From 0.01 to < 0.1 acre 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 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)
	 ☑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. ☑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. ☑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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics).

17	Vene	stativo St	ructure —	assessment area/wetland type condition metric
17.	_		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 for all marshes only . 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. Consider ace above the assessment area (AA) and the wetland type (WT) separately.
		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
	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	Large Not A		more 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)
	ПА	Majo pres		opy trees have stems > 6 inches in diameter at breast height (DBH); many large trees (> 12 inches DBH) are
	□в ⊠c	Majo	rity of can	popy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. The popy trees are < 6 inches DBH or no trees.
20.				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.	_			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. Patterned dareas, while solid white areas indicate open water. B □C □D
		0		
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, diversion, er dams, and stream incision. Documentation required if evaluated as B, C, or D.
	$\boxtimes A$	Over	bank <u>and</u>	overland flow are not severely altered in the assessment area.
	□B □C			is severely altered in the assessment area. is severely altered in the assessment area.
	HĎ			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

110	SACE AID	#	Accompanies	NCDWR#	-
08		# oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019
				Wetland Site Name	
I A	oplicant/O				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
	П v.	Count		NCDWR Region	Mooresville
-	∐ Ye	s 🛭 N	o Precipitation within 48 hrs?	Latitude/Longitude (deci-degrees)	35.198073, -80.952080
Ple red	ease circle tent past (for the past) Sur tand Sig Hat the assess gulatory (And Fed NC Abu Put	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	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 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
	Abı Des Abı	uts a strea signated N uts a 303(d	m with a NCDWQ classification of SA or su CNHP 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) Use on a coastal island? Yes	unar □ Wind □ Both	
			a's surface water storage capacity or do area experience overbank flooding duri	uration substantially altered by beaver? ing normal rainfall conditions? Yes	☐ Yes ⊠ No ☑ No
1.	Ground 9	Surface C	ondition/Vegetation Condition – assessi	ment area condition metric	
	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 xpected 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).
2			(examples: draining, flooding, soil compacti	stantially altered (typically, alteration sufficiency, filling, excessive sedimentation, undergoverne condition matrix (akin for all marches)	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 ⊠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	

		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	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 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	 □B Confined animal operations (or other local, concentrated source of pollutants □C ≥ 20% coverage of pasture
	□D	\Box D	□D ≥ 20% coverage of agricultural land (regularly plowed land)
		⊠E ⊠F	
		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) 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). □ 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 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 From 0.1 to < 0.5 acre X K X X K X 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 B 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 \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)
	 □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. □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. □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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 □A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). □B Vegetation diversity is low or has > 10% to 50% cover of exotics. □C Vegetation is dominated by exotic species (> 50 % cover of exotics).

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 for all marshes only . 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)
	□A Large snags (more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).□B Not A
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.
	☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH.☐C Majority of canopy trees are < 6 inches DBH or no trees.
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.
	 ☑A Overbank <u>and</u> overland flow are not severely altered in the assessment area. ☐B Overbank flow is severely altered in the assessment area.
	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	r diriogen change	Condition/Opportunity	HIGH
		Opportunity Presence (Y/N)	NO
	Particulate Change	Condition	LOW
	. a. ii ca ato Chango	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

110	SACE AID :	#	Accompanies	NCDWR#	
03		" oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019
^	۱۲ pplicant/O			Wetland Site Name	
^		wher Nam etland Typ		Assessor Name/Organization	PW8-2 - Wetland 20 KMT, BGB/HDR
				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, but	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	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 Environment	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 X	unar □ 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 dur	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	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 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).
3			(examples: draining, flooding, soil compact	ion, filling, excessive sedimentation, underg	round utility lines).
3.		_		type condition metric (skip for all marshe	·
	Check a I		ch column. Select the appropriate storage	e for the assessment area (AA) and the wetl	and 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	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	

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 wit	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 stic epipedon
	4b. ⊠A □B	Soil ribbon < Soil ribbon ≥	
	4c. ⊠A □B	No peat or m A peat or mu	uck presence ck presence
5.	Discharge in	-	opportunity metric
		e discharges i	nn. Consider surface pollutants or discharges (Surf) and sub-surface pollutants or discharges (Sub). Examples notlude presence of nearby septic tank, underground storage tank (UST), etc.
	□A ⊠A ⊠B □E	Little or Noticeal	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 nt capacity of the assessment area
	□c □c	Noticeat potential	ole 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)
	Check all that to assessmen	at apply (at lean of area within of miles and within	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).
			≥ 10% impervious surfaces
	□B □E		Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
		D □D	≥ 20% coverage of agricultural land (regularly plowed land)
	⊠E ⊠E ⊠F ⊠F		≥ 20% coverage of maintained grass/herb ≥ 20% coverage of clear-cut land
	□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.
	_		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
		From 15 to	
	□D □E	From 5 to < < 5 feet <u>or</u> b	uffer bypassed by ditches
	_	ry width. If the	tributary is anastomosed, combine widths of channels/braids for a total width. > 15-feet wide
			ent area vegetation extend into the bank of the tributary/open water?
	7e. Is stream	m or other ope	en water sheltered or exposed?
			nt open water with width < 2500 feet <u>and</u> no regular boat traffic. It open water with width ≥ 2500 feet <u>or</u> regular boat traffic.
8.			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
	Check a box	omplex at the	nn 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.
	\Box A \Box A	. ≥ 100 fe	
	□B □E		to < 100 feet to < 80 feet
		From 40	to < 50 feet
			to < 40 feet
		From 5 t	to < 30 feet o < 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 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)
	□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 B D From 10 to < 50 acres C C C From 10 to < 50 acres C C C From 10 to < 50 acres
	13b. Evaluate for marshes only .
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)
	 ✓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. ✓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. ✓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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 ☑A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). ☐B Vegetation diversity is low or has > 10% to 50% cover of exotics. ☐C Vegetation is dominated by exotic species (> 50 % cover of exotics).

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 for all marshes only . 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)
	□ A Large snags (more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).□ B Not A
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.
	 ☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH. ☐C Majority of canopy trees are < 6 inches DBH or no trees.
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.
	 ☑A Overbank and overland flow are not severely altered in the assessment area. ☐B Overbank 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.
	De Both Overbank and Overland new 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)			
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 expe	experiences 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	

110	SACE AID :	#	Accompanies	NCDWR#	
03		" oject Nam	e _CLT Airport Expansion	Date of Evaluation	April 2019
٨	۱۲ 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>M</u> N	o i recipitation within 40 m3:	Editidae/Eorigitade (deel degrees)	33.133200, 00.333333
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 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	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	upplemental classifications of HQW, ORW, of ted stream	or Trout
	Blac 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
				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 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	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	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.	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).
	□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	soil obs		the three soil property groups below. 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 regiona
		⊒A ⊠B ⊒C		
	4b.	⊠A ⊒B	Soil ribbon < 1 Soil ribbon ≥ 1	inch
	4c.	⊠A ⊒B	No peat or muc A peat or muc	
5.	Disch	arge in	to Wetland – d	ppportunity metric
	of sub-surface discharges include presence of nearby septic tank, underground storage tank (US Surf Sub		discharges in	
	∏A ⊠B	⊠a ⊟B	Noticeabl	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	□c	potentially	e evidence of pollutants or discharges (pathogen, particulate, or soluble) entering the assessment area and y overwhelming the treatment capacity of the wetland (water discoloration, dead vegetation, excessive ation, odor)
6.	Land	Use – o	pportunity me	etric (skip for non-riparian wetlands)
	to ass	sessmen	t area within ei	st one box in each column). Evaluation involves a GIS effort with field adjustment. Consider sources draining to the assessment area (5M) the watershed draining to the assessment area (5M) the watershed draining to the assessment area (2M).
	□A □B □C	□A □B □C	<u>□</u> в □С	≥ 10% impervious surfaces Confined animal operations (or other local, concentrated source of pollutants ≥ 20% coverage of pasture
	□D ⊠E ⊠F	□D ⊠E ⊠F	⊠E	 ≥ 20% coverage of agricultural land (regularly plowed land) ≥ 20% coverage of maintained grass/herb ≥ 20% coverage of clear-cut land
	□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.	Wetla	ınd Acti	ng as Vegetat	ed Buffer – assessment area/wetland complex condition metric (skip for non-riparian wetlands)
		□Yes	⊠No If Y	thin 50 feet of a tributary or other open water? es, continue to 7b. If No, skip to Metric 8.
	7b.	Record How mu	a note if a port ch of the first !	nly be present on one side of the water body. Make buffer judgment based on the average width of wetland ion 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 ju □A □B	dgment based ≥ 50 feet From 30 to <	on the average width of wetland. Record a note if a portion of the buffer has been removed or disturbed.) 50 feet
		□C □D □E	From 15 to < From 5 to < 1	30 feet
	7c.	Tributar	y width. If the	tributary is anastomosed, combine widths of channels/braids for a total width. > 15-feet wide
	7d.			t area vegetation extend into the bank of the tributary/open water?
		Shelt	ered – 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.	Wetla Estua	nd Wid	th at the Asse	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 Fores
only) Check a box in each column for riverine wetlands only. Select the average width for the wetland type at the the wetland complex at the assessment area (WC). See User Manual for WT and WC boundaries.				
	WT	WC	≥ 100 fee	at the state of th
	□a ⊠B	∏A ⊠B		er to < 100 feet
	□С	□c	From 50	to < 80 feet
	□D □E	□D □E		to < 50 feet to < 40 feet
	□F	□F		to < 30 feet
	∐G □	□G	From 5 to	< 15 feet
	1 IH	Пн	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). \[\begin{align*} \text{Sediment deposition is not excessive, but at approximately natural levels.} \] \[\begin{align*} \text{Sediment deposition is excessive, but not overwhelming the wetland.} \] \[\begin{align*} \text{Sediment deposition is excessive and is overwhelming the wetland.} \]
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 A ≥ 500 acres B B B From 100 to < 500 acres C C C From 50 to < 100 acres D D D D From 25 to < 50 acres E E F From 10 to < 25 acres F 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 S I S I From 0.1 to < 0.5 acre I S I S I From 0.01 to < 0.05 acre K 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)
	□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 E E < 10 acres MF 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.
11	Edge Effect – wetland type condition metric (skip for all marshes and Estuarine Woody Wetland)
14.	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)
	 ✓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. ✓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. ✓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.
16.	Vegetative Diversity – assessment area condition metric (evaluate for Non-tidal Freshwater Marsh only)
	 ☑A Vegetation diversity is high and is composed primarily of native species (< 10% cover of exotics). ☑B Vegetation diversity is low or has > 10% to 50% cover of exotics. ☑C Vegetation is dominated by exotic species (> 50 % cover of exotics).

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 for all marshes only . 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
	☐ A ☐ Dense mid-story/sapling layer ☐ ☐ ☐ Moderate density mid-story/sapling layer ☐ ☐ ☐ ☐ Mid-story/sapling layer sparse or absent
	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
	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)
	□A Large snags (more than one) are visible (> 12 inches DBH, or large relative to species present and landscape stability).□B Not A
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.
	☐B Majority of canopy trees have stems between 6 and 12 inches DBH, few are > 12 inch DBH.☐C Majority of canopy trees are < 6 inches DBH or no trees.
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.
	 ☑A Overbank and overland flow are not severely altered in the assessment area. ☐B Overbank flow is severely altered in the assessment area.
	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	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 expe	riences overbank flooding during norm	al 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

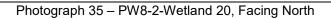


Photograph 32 – PS6-2-Stream 25, Facing Downstream



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 http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx 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.

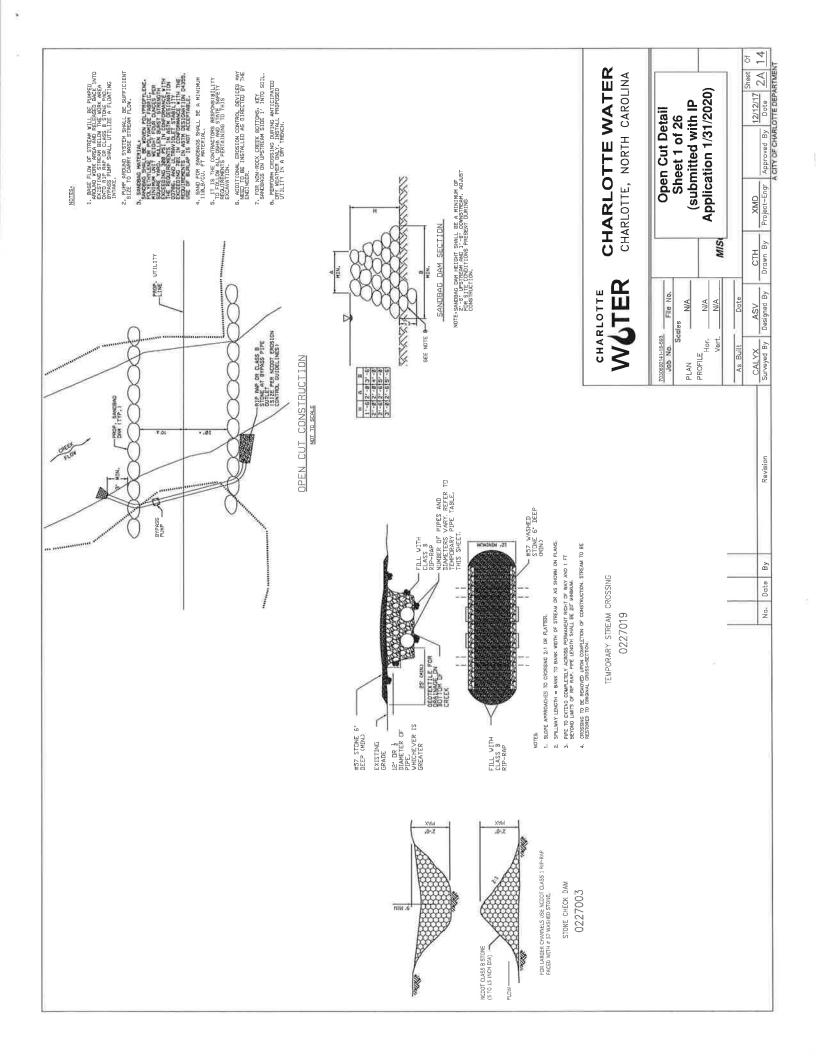
Special Condition 18: Prior to the commencement of construction in waters on any airport element, the Permittee shall submit a Finding of No Significant Impact and/or Record of Decision issued by the FAA for that project element.

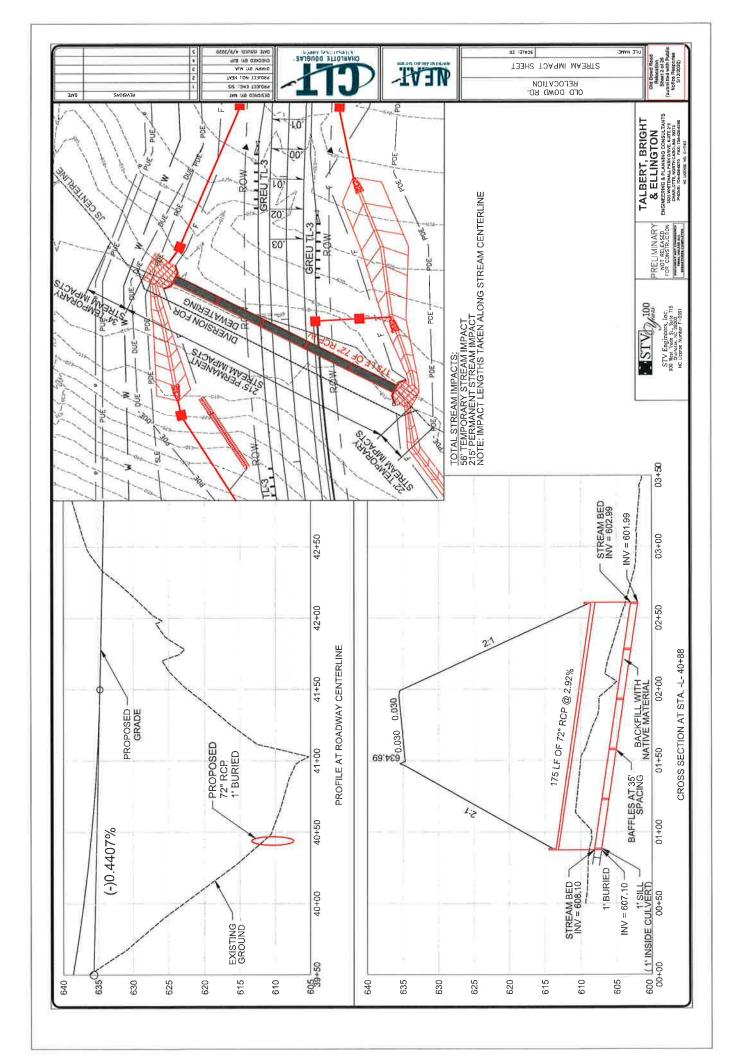
Rationale: This condition is neccesary to since these documents must be included in the Corps adminstrative record.

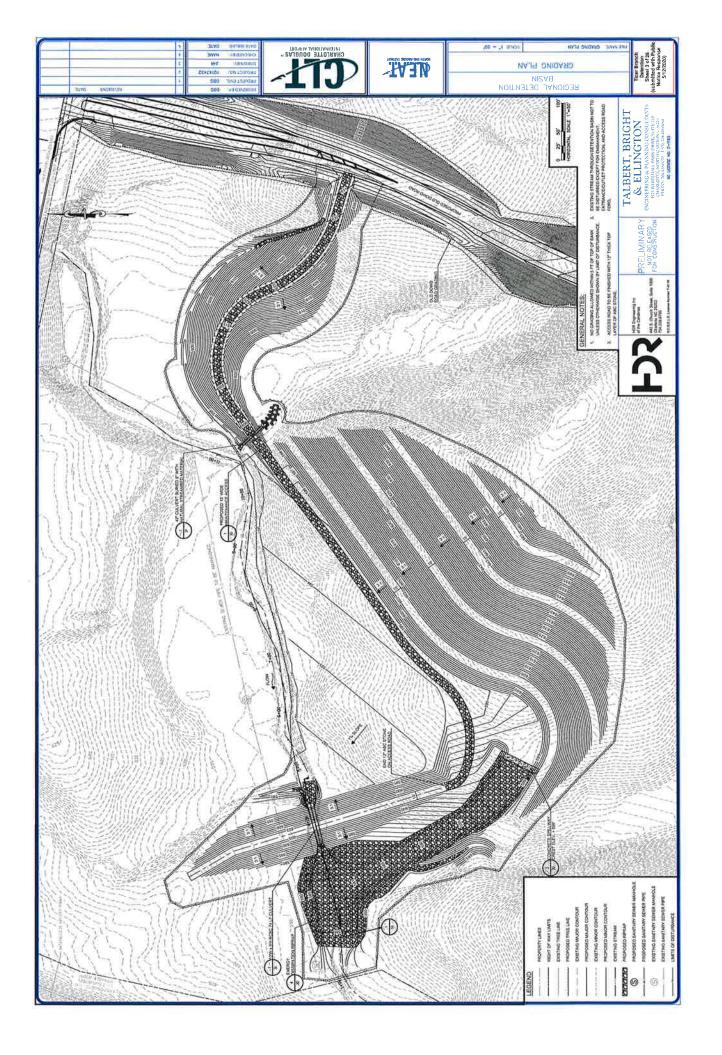
Special Condition 19: Streams within the project limits that would experience flooding from the Ticer Branch and Coffey Creek in-line detention basins, as well as the stream below each detention basin, shall be monitored by the Permittee to establish any loss of aquatic function. Monitoring shall be 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.







CHARLOTTE DOUGLAS " 307 UR 02923-0 307 UR NEWS 2012103 "01 15310H REGIONAL DETENTION
BASIN
EMBANKMENT & CULVERT
DETAIL TARIA DE SETUDO

590

PLOW

PLACE T WATHING STREAMBECHATERING ACROSS SOTTOM OF CALVINT A.TW. + SP. CPENING WITH P. NATIONAL GTHEAMBED WATERBA

ELEV. OUT

STEELS STEELS

280

280

610

900

900

280

2+00





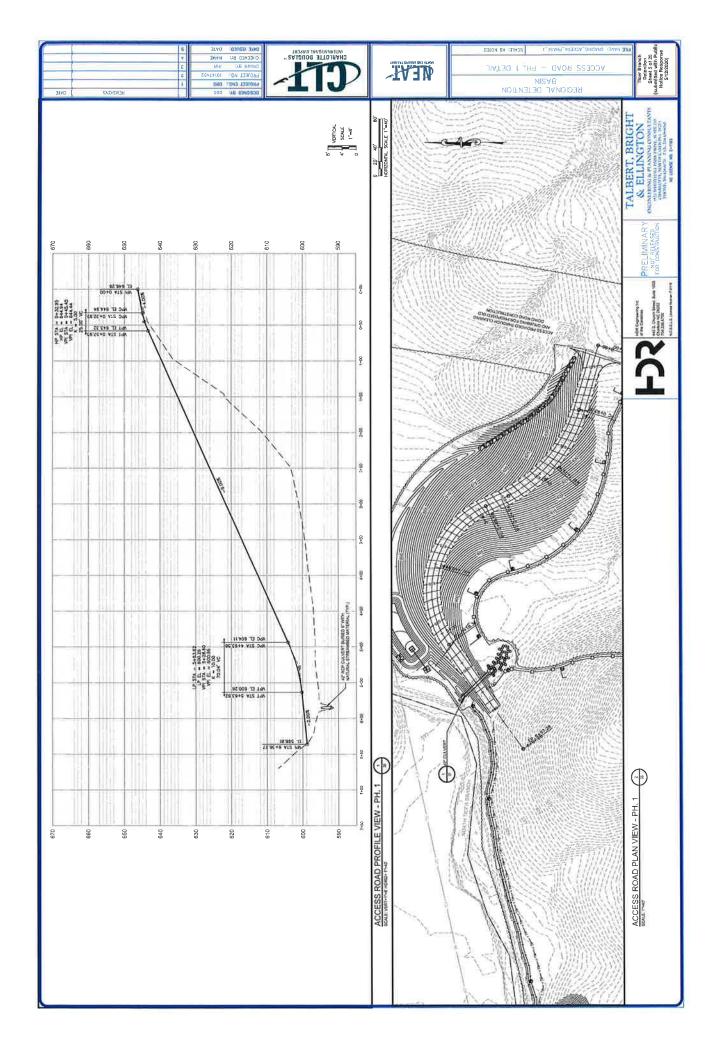


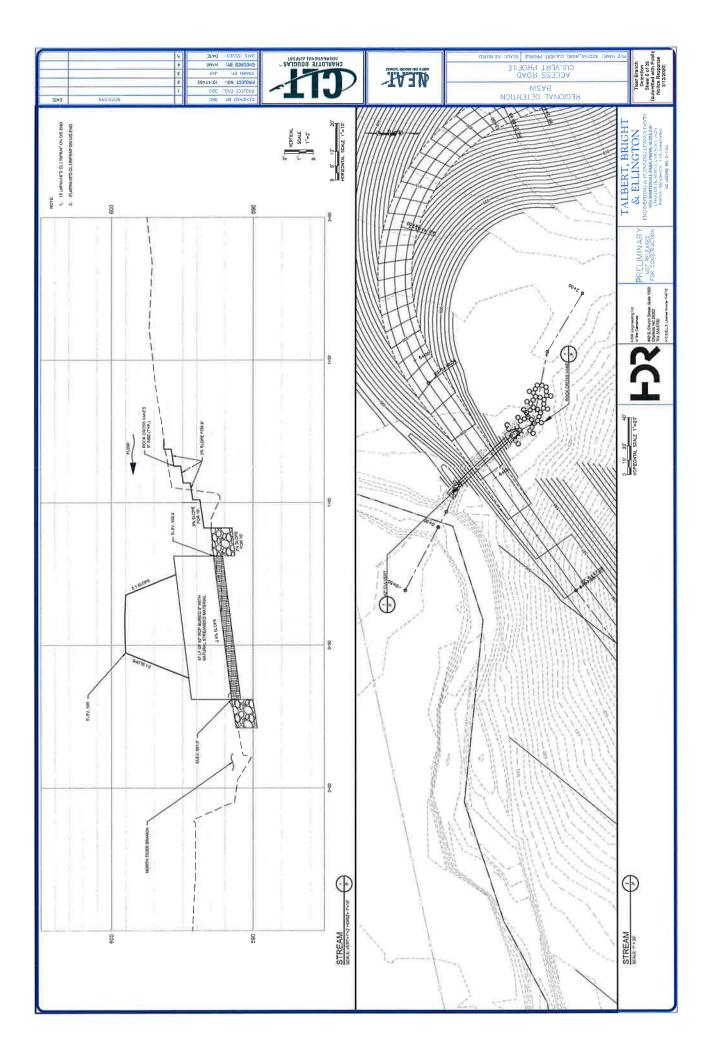
TALBERT, BRIGHT
& ELLINGTON

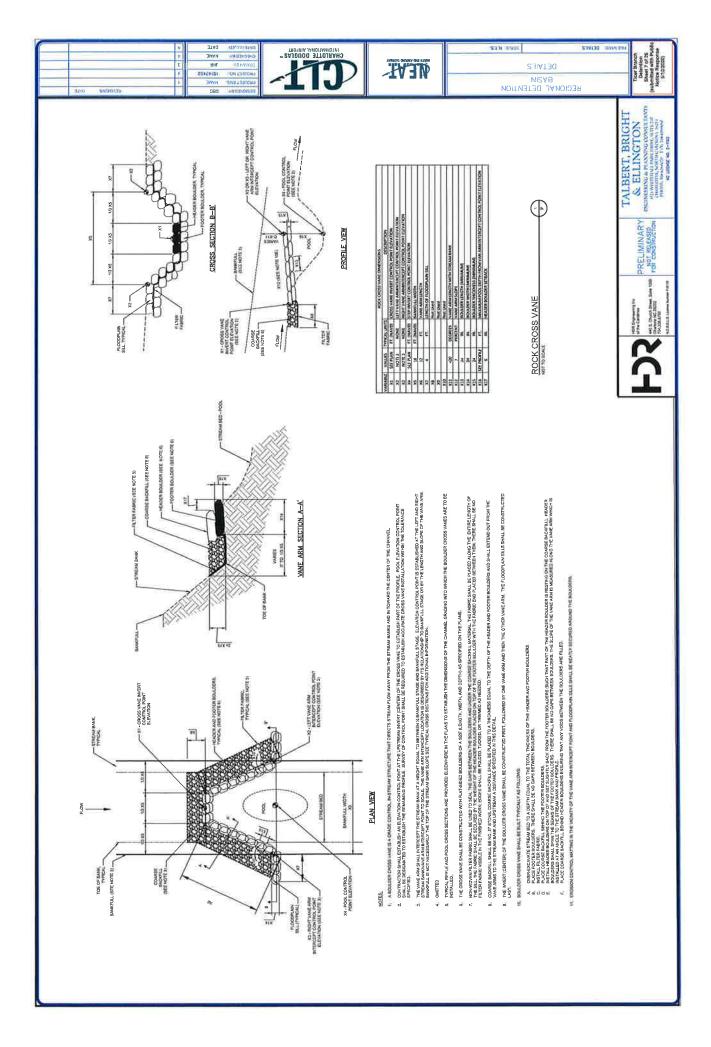
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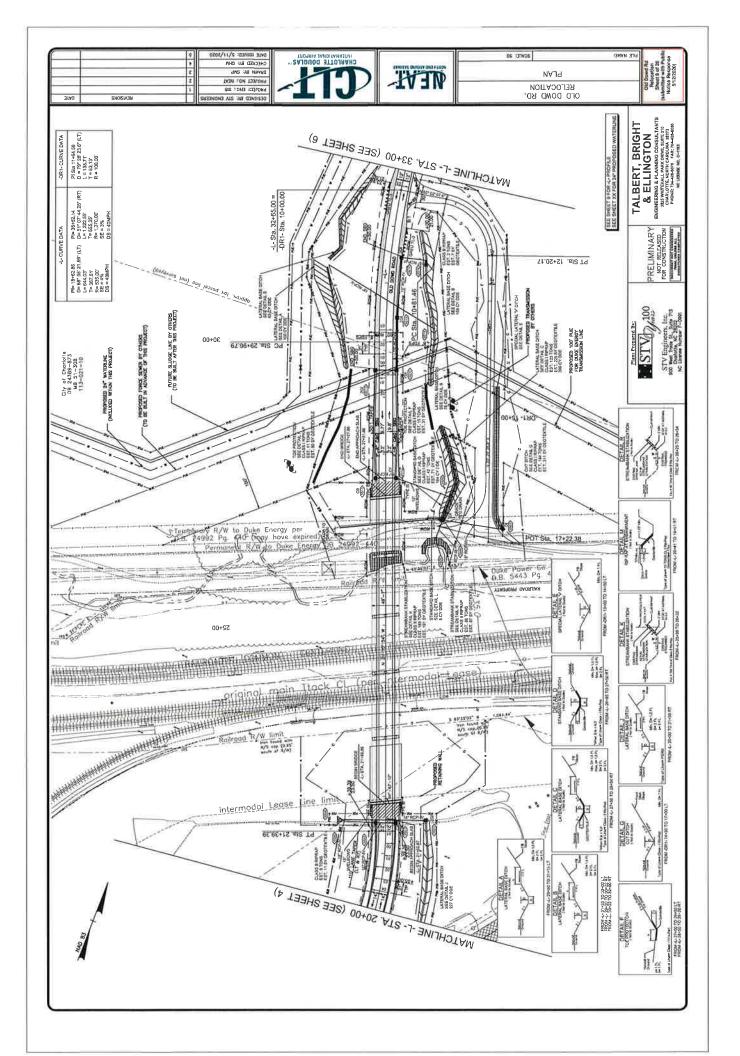
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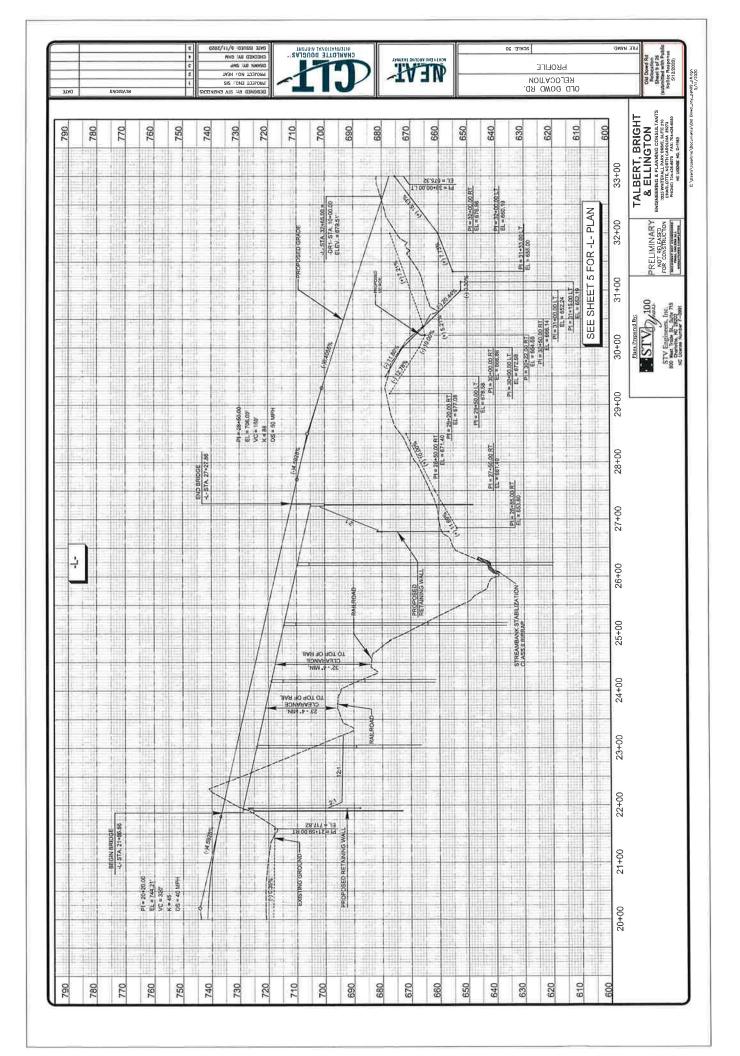
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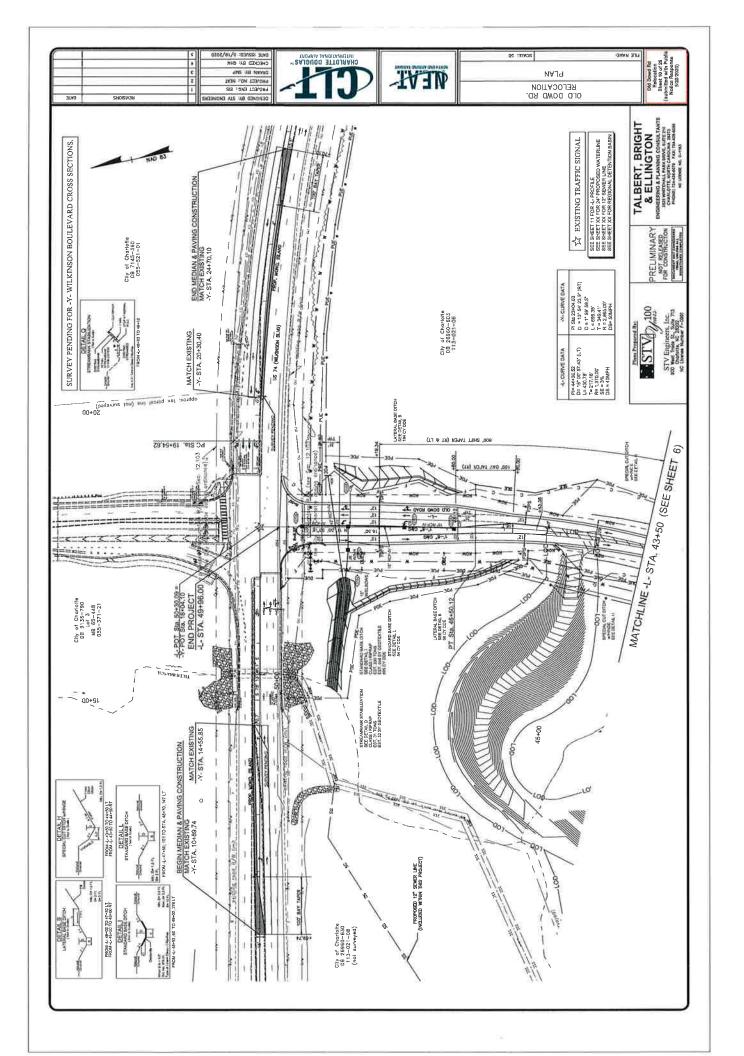


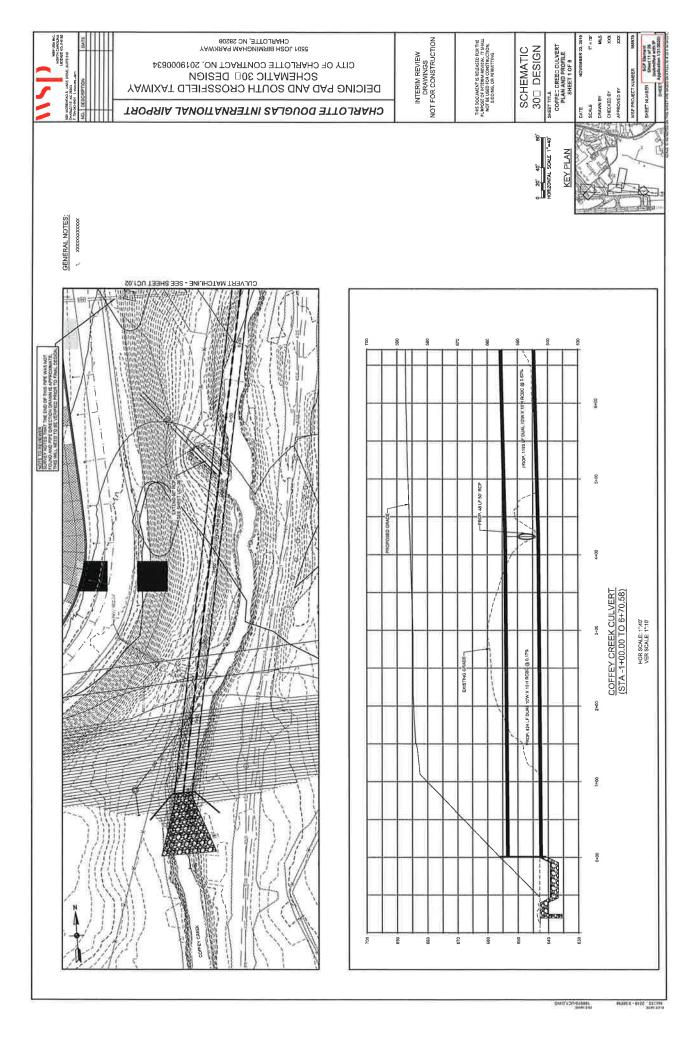










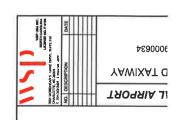


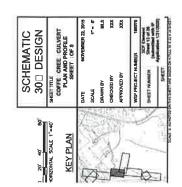


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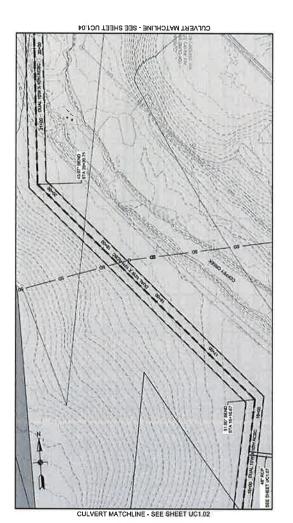
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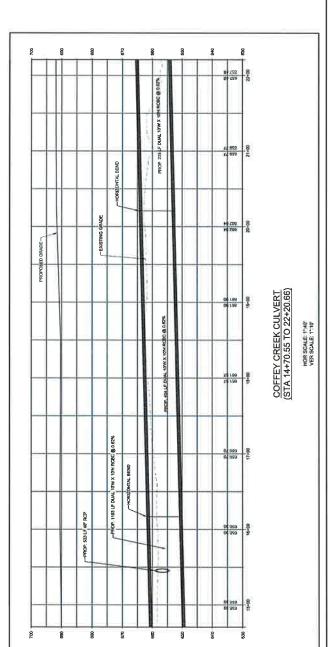
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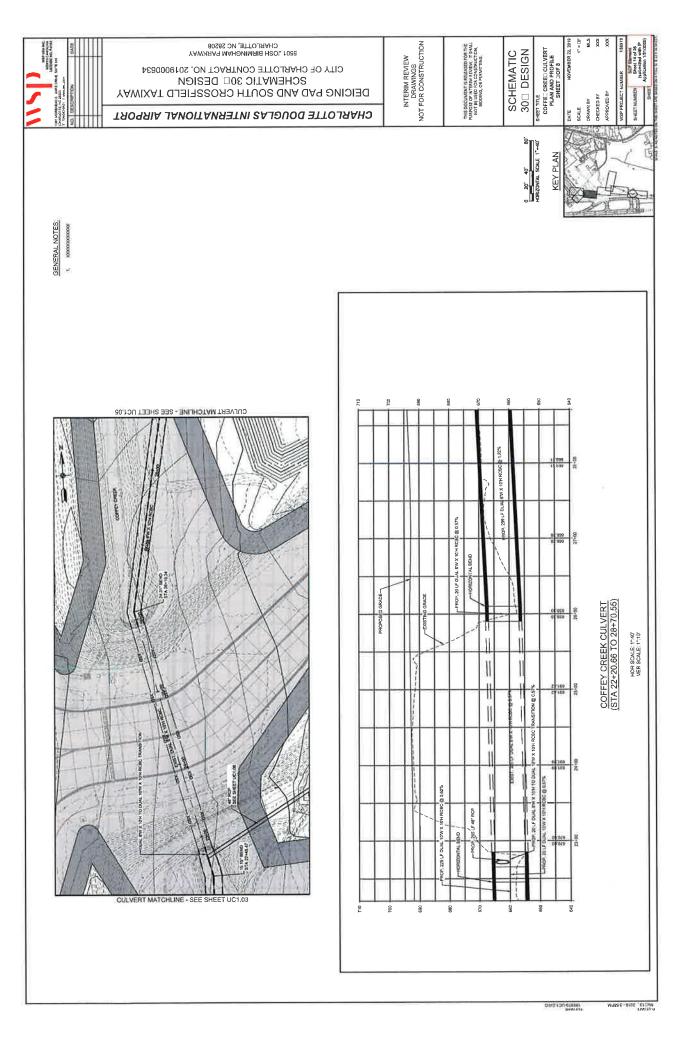


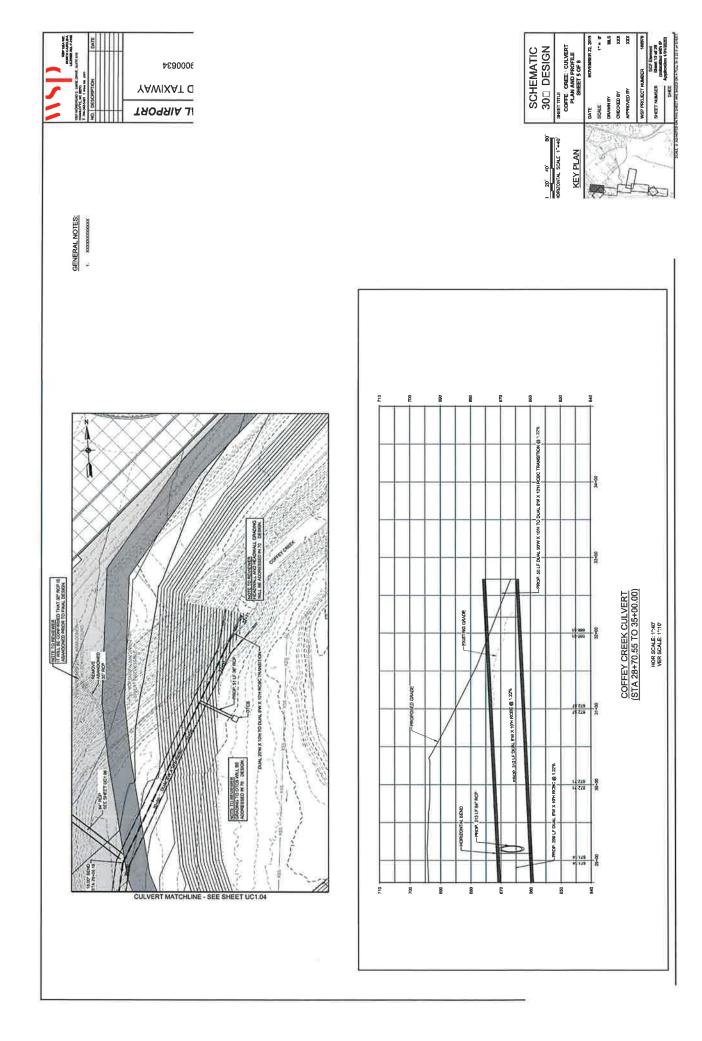


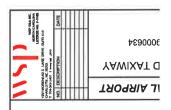
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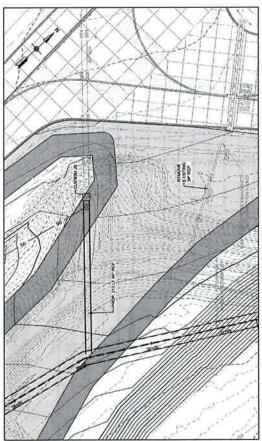
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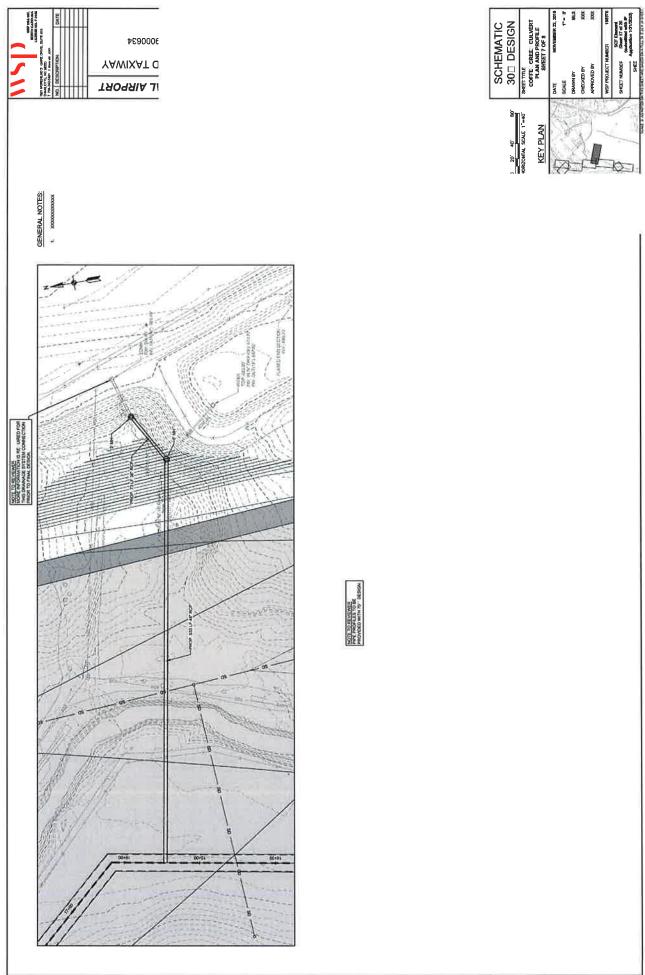
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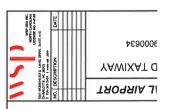
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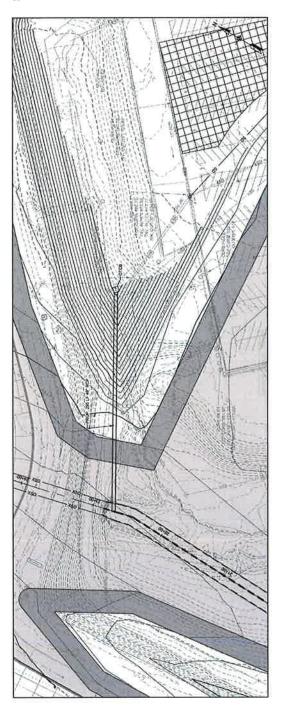
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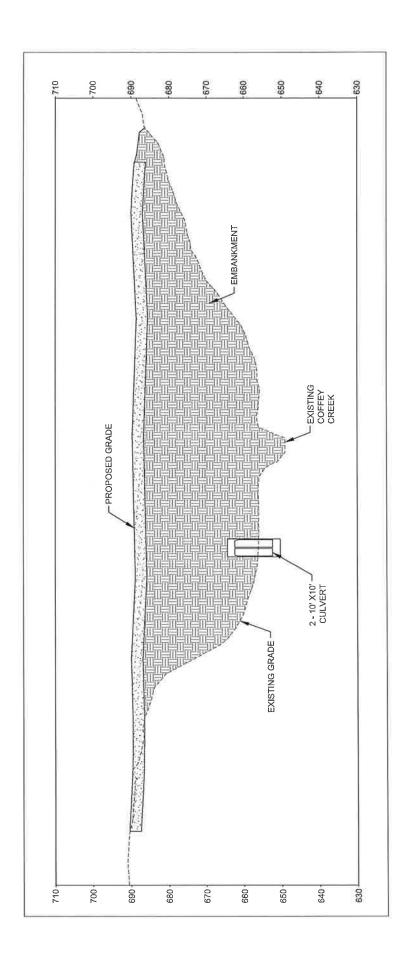
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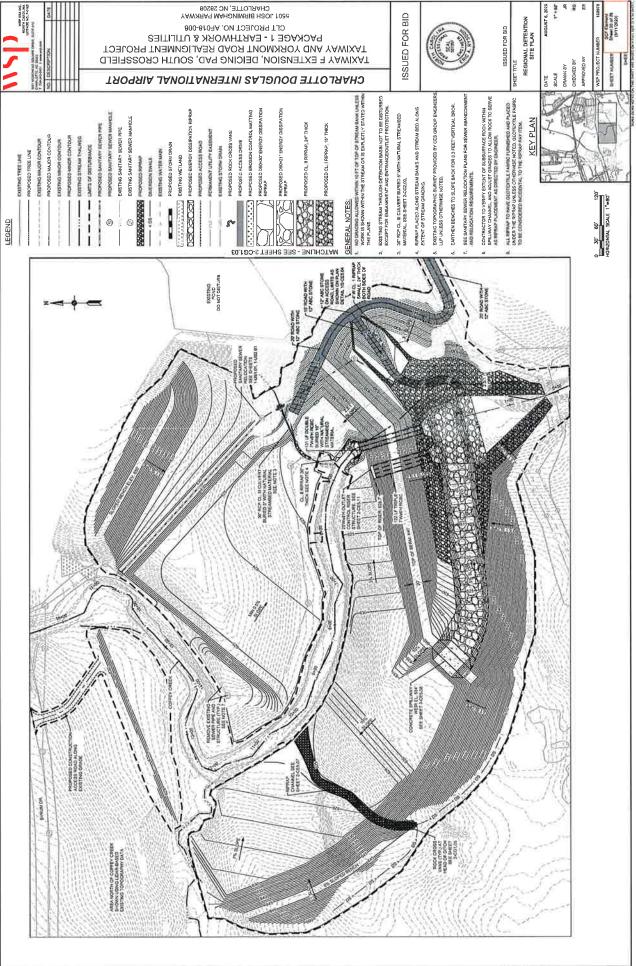
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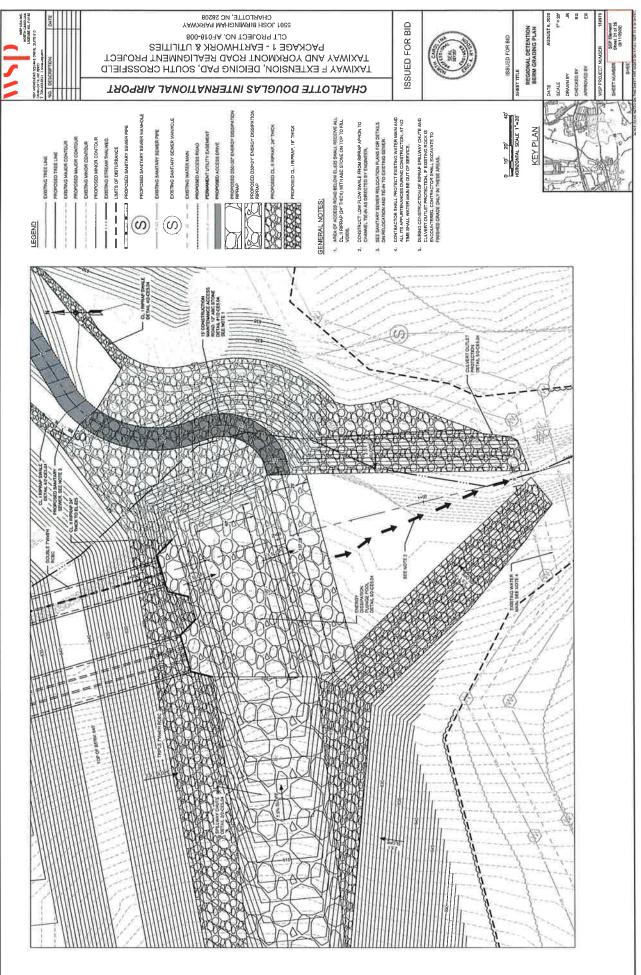
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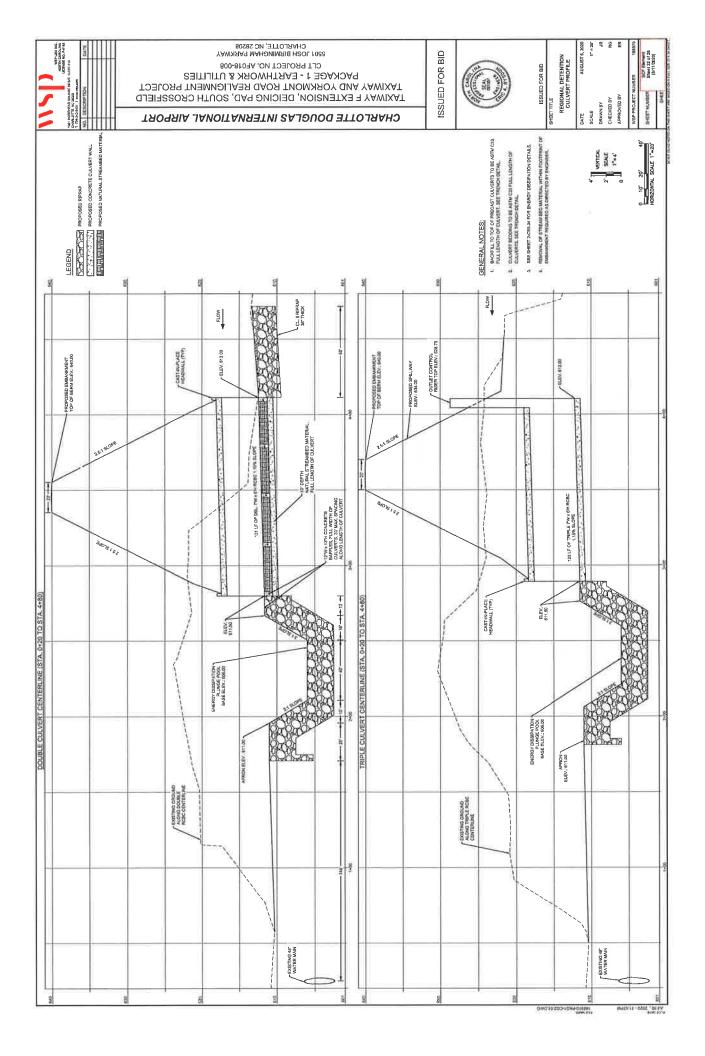


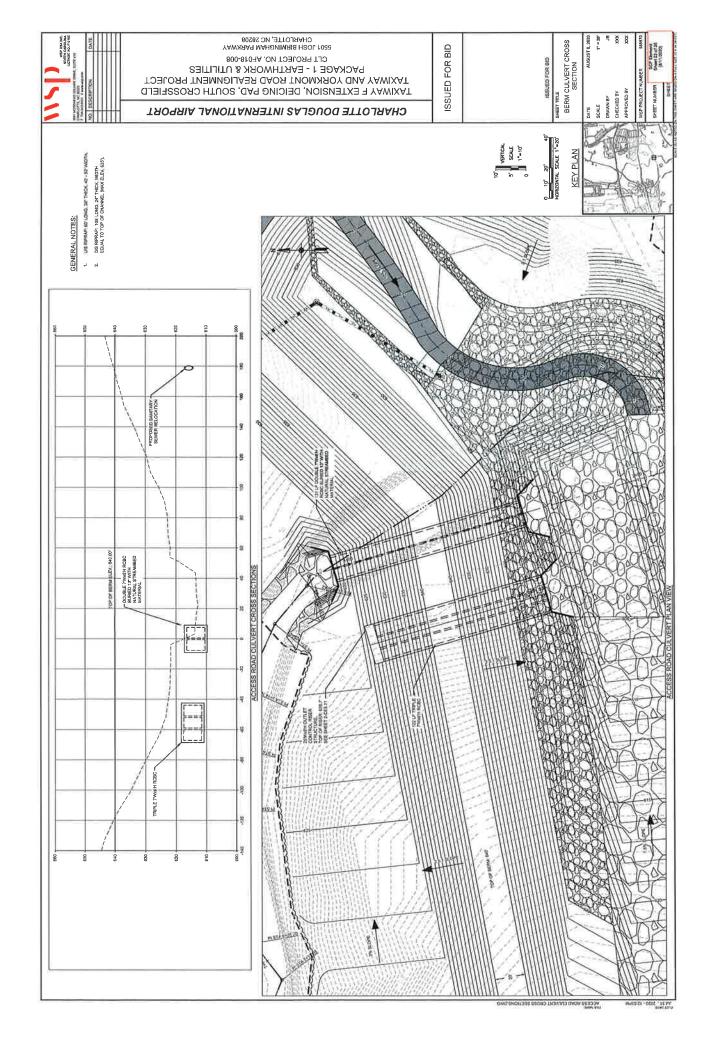
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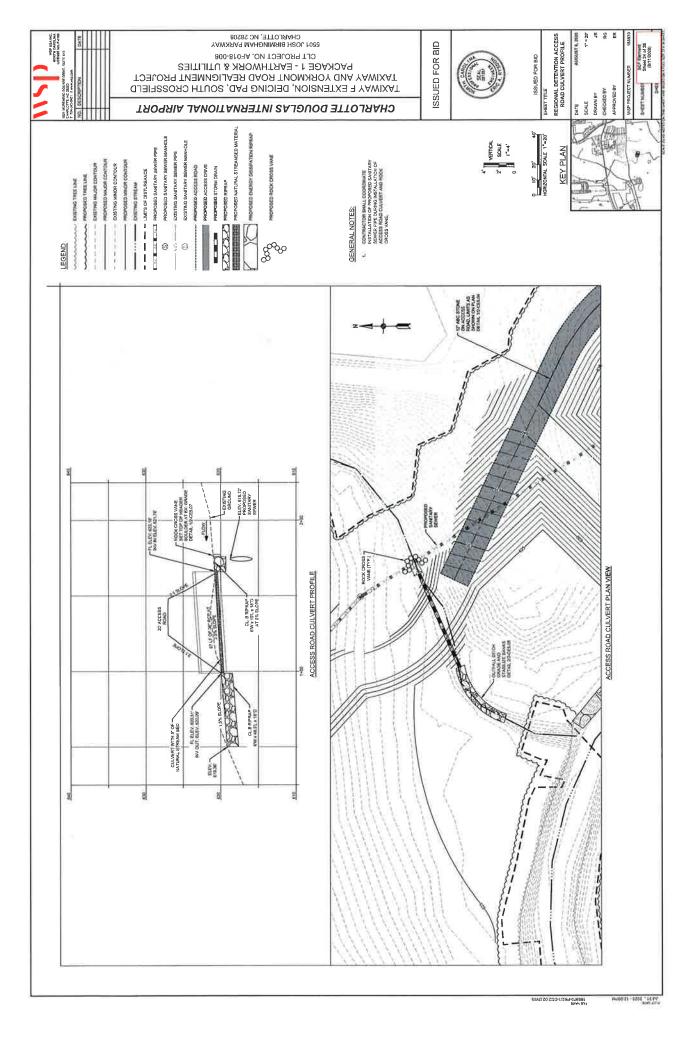














CHARLOTTE DOUGLAS INTERNATIONAL AIRPORT

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

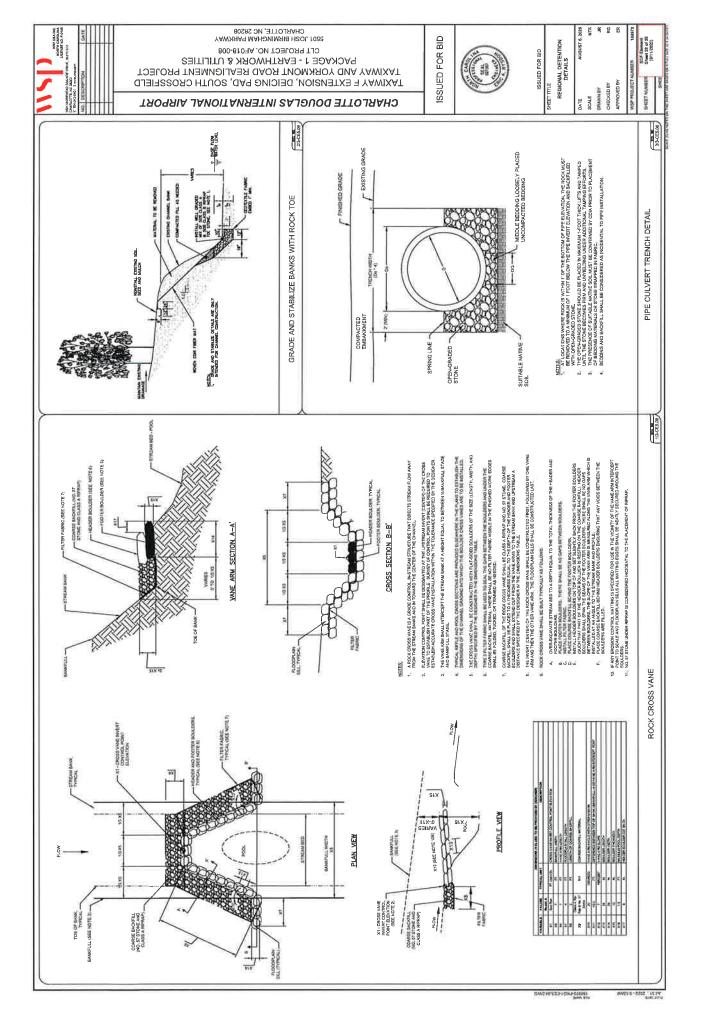
ISSUED FOR BID

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 http://www.ncoah.com/ 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 sue.homewood@ncdenr.gov 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				

^{*}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 http://ribits.usace.army.mil

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			

^{*}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

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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.
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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

SHAEFFER.DAVID.LEIGH.12

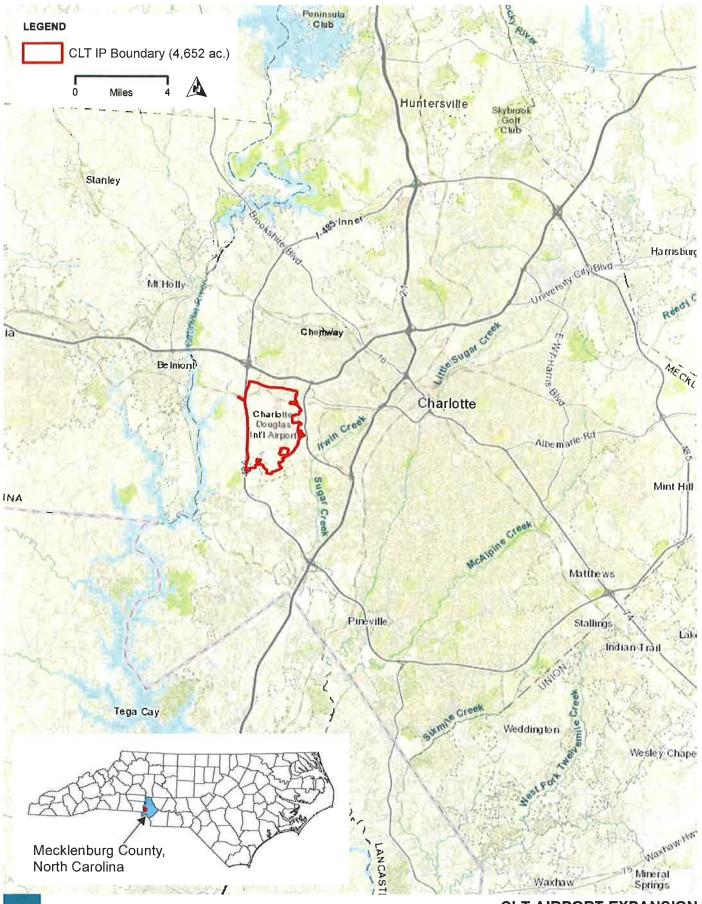
60750573

USACE Project Manager Signature

12/14/2020

Date of Signature

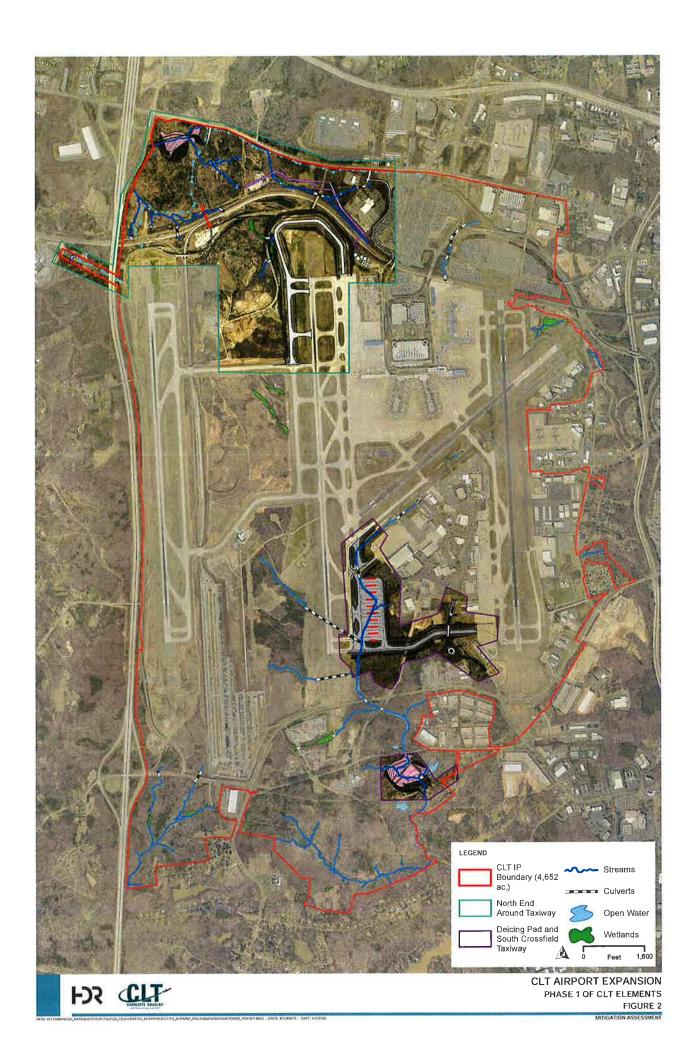
Current Wilmington District mitigation guidance, including information on mitigation ratios, functional assessments, and mitigation bank location and availability, and credit classifications (including stream temperature and wetland groupings) is available at http://ribits.usace.army.mil





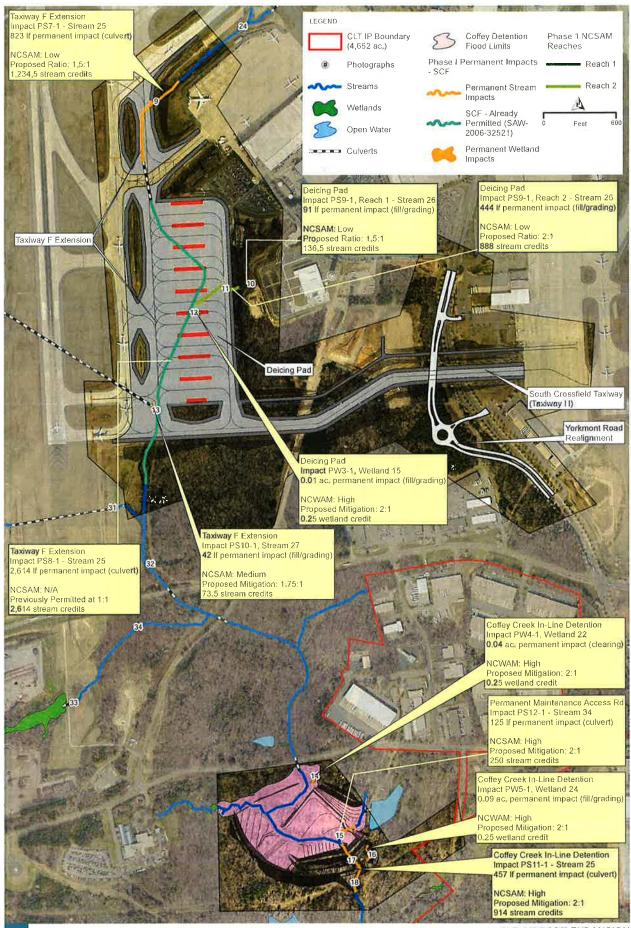
CLT AIRPORT EXPANSION PROJECT VICINITY

FIGURE 1

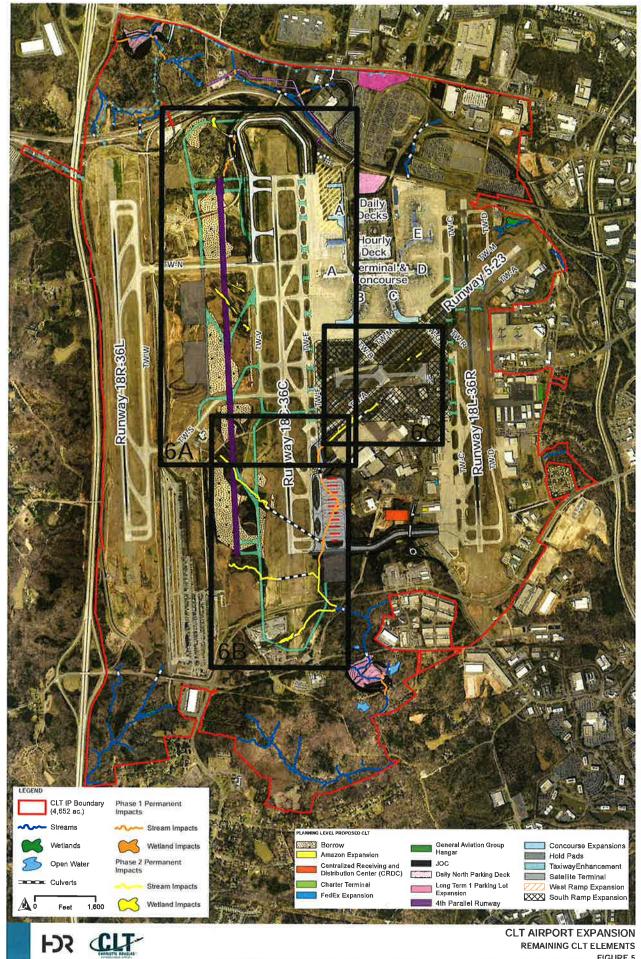




CLT AIRPORT EXPANSION NORTH END AROUND TAXIWAY



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