From: Denise Suits
To: Chris Seamster
Subject: Road Name Approval
Date: Friday, December 22, 2017 4:03:13 PM
Attachments: DOC122217-12222017164526.pdf

Hey Chris,

Here are the names I approved. Please let me know which ones you will be using when you make the final decision.

Have a Merry Christmas and Happy New Year!

Denise

-----Original Message-----
From: EOC COPIER [mailto:TOSHIBAMFP@CHATHAMNC.ORG]
Sent: Friday, December 22, 2017 4:46 PM
To: Denise Suits
Subject: Send data from MFP11302185 12/22/2017 16:45

Scanned from MFP11302185
Date:12/22/2017 16:45
Pages:1
Resolution:400x400 DPI

Do not reply to this email address.

SUBDIVISION: RYAN'S CROSSING

DIRECTIONS: NORTH ON US 15-501; TURN LEFT ON MANN'S CHAPEL ROAD; CONTINUE APPROX 3.1 MILES AND SUBDIVISION IS ON LEFT JUST PAST TOBACCO ROAD ON RIGHT.

DEVELOPER: MANNS CHAPEL SUBDIVISION LLC **PHONE NUMBER:** _____

Major Development: X **Minor Development:** _____
Development with acreage of 10 acreage of 10 acres or more: _____

Proposed road names	OK to submit	DUPLICATED Do not Submit
LILA DRIVE	✓	
EVANDER WAY	✓	
DELIA LANE	✓	
~~EMELIA LANE~~ AMELIA LANE	✓	
MINTER DRIVE		X

DATE SUBMITTED TO EOC: DECEMBER 21, 2017
SUBMITTED BY: CHRIS SEAMSTER/MCKIM & CREED
EOC OFFICER: Donna Sitts
DATE ROADS APPROVED: 12-22-17
DATE FINAL PLAT RECEIVED: _____
DATE GIVEN TO 911: _____
DATE CONTACT MADE WITH NUMBERS: _____
SURROUNDING COUNTY CONTACTED: _____
PERSON SPOKEN WITH: _____
COMMENTS: _____

[redacted] revised 4/19/02

[redacted]

CHATHAM COUNTY
NORTH CAROLINA

WATERSHED PROTECTION DIVISION
Environmental Quality Department

P.O. Box 548
Pittsboro, NC 27312
PHONE: (919) 545-8394

Fax: (919) 542-2698 ● E-mail: drew.blake@chathamnc.org ● Website: www.chathamnc.org

January 2, 2018

Mr. Eric Andrews
P.O. Box 1400
Pittsboro, NC 27312

Project Name:	Ryan's Crossing (Parcels 1777, 1780, 88505, 88506)
Chatham County Planning Application #:	2017-1982
Location:	Manns Chapel Road, Chatham County
Subject Feature(s):	Two (2) ephemeral streams, four (4) intermittent streams, four (4) perennial streams, nine (9) wetlands
Date of Determination:	January 2, 2018

Explanation: The site visit was completed on January 2, 2018 by Drew Blake with Chatham County Environmental Quality and Dan McCauley of Soil & Environmental Consultants, PA, (S&EC) on four (4) properties identified as Chatham County Parcel numbers 1777, 1780, 88505, 88506 which are located within the Jordan Lake watershed. S&EC personnel completed a previous site visit which resulted in the identification of two (2) potential ephemeral stream segments, four (4) intermittent streams segments, four (4) perennial streams segments, and nine (9) potential wetlands. S&EC submitted a request to Chatham County to complete a formal review to determine if the aforementioned features would be subject to riparian buffers according to Section 304 of the Chatham County Watershed Protection Ordinance. All points of origin and stream type transitions were reviewed and agreed to in the field. All stream and wetland denotations referenced below are based on Figure 3 – Sketch Map dated 11/16/17 and completed by S&EC. Streams E and J were confirmed to be ephemeral streams and will require a 30-ft buffer proceeding landward from the top of bank on both sides of the features. Streams C, D, G, and I were confirmed to be intermittent streams and will require a 50-ft buffer proceeding landward from the top of bank on both sides of the features. Streams A, A, B, and F were confirmed to be perennial streams and will require a 100-ft buffer proceeding landward from the top of bank on both sides of the features.

All wetland boundaries (W1-W9) flagged in the field by S&EC are to be reviewed and confirmed by the US Army Corps of Engineers (USACE). A 50-ft buffer will be required beginning at the flagged boundary and proceeding landward of any of the nine (9) flagged wetlands determined jurisdictional by the USACE. Should a USACE review result in revisions to any features reviewed by Chatham County staff on January 2, 2018, additional reviews and consultation may be required. Please provide all revised maps, sketches, and documentation to Drew Blake following the USACE site visit for inclusion in our records.

CHATHAM COUNTY
NORTH CAROLINA

WATERSHED PROTECTION DIVISION
Environmental Quality Department

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Fax: (919) 542-2698 ● E-mail: drew.blake@chathamnc.org ● Website: www.chathamnc.org

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by Chatham County, on parcels outside of the Jordan Lake watershed, may submit a request for appeal in writing to the Watershed Review Board. A request for a determination by the Watershed Review Board shall be made in accordance with Section 304 of the Chatham County Watershed Protection Ordinance. Landowners or affected parties that dispute a determination made by Chatham County, on parcels inside the Jordan Lake watershed, shall submit a request for appeal in writing to NC DWR, 401 & Buffer Permitting Unit, 1650 Mail Service Center, Raleigh, NC 27669-1650 attention of the Director of the NC Division of Water Quality.

Should this project result in any direct impacts to surface water features (i.e., crossing and/or filling streams or wetlands) additional reviews may be necessary. Additionally, a Section 404/401 Permit may be required. Any inquiries regarding Section 404/401 permitting should be directed to the Division of Water Resources (Central Office) at (919)-807-6364 and the US Army Corp of Engineers (Raleigh Regulatory Field Office) at (919)-554-4884.

Respectfully,

Drew Blake

Drew Blake
Watershed Specialist

Enclosures: Figure 3 – Sketch Map, dated November 16, 2017
Chatham County Riparian Buffer Application Packet (submitted December 13, 2017)

cc: Steven Ball, Soil & Environmental Consultants, PA
Dan McCauley, Soil & Environmental Consultants, PA
Alex Barroso, Seali Development Corporation
Rachael Thorn, Chatham County Watershed Protection Supervisor
Brian Burkhart, Chatham County Director of Environmental Quality
Lynn Richardson, Chatham County Subdivision Administrator
Kimberly Tyson, Chatham County Land Use Administrator
Angela Birchett, Chatham County Zoning Administrator
Jason Sullivan, Chatham County Director of Planning

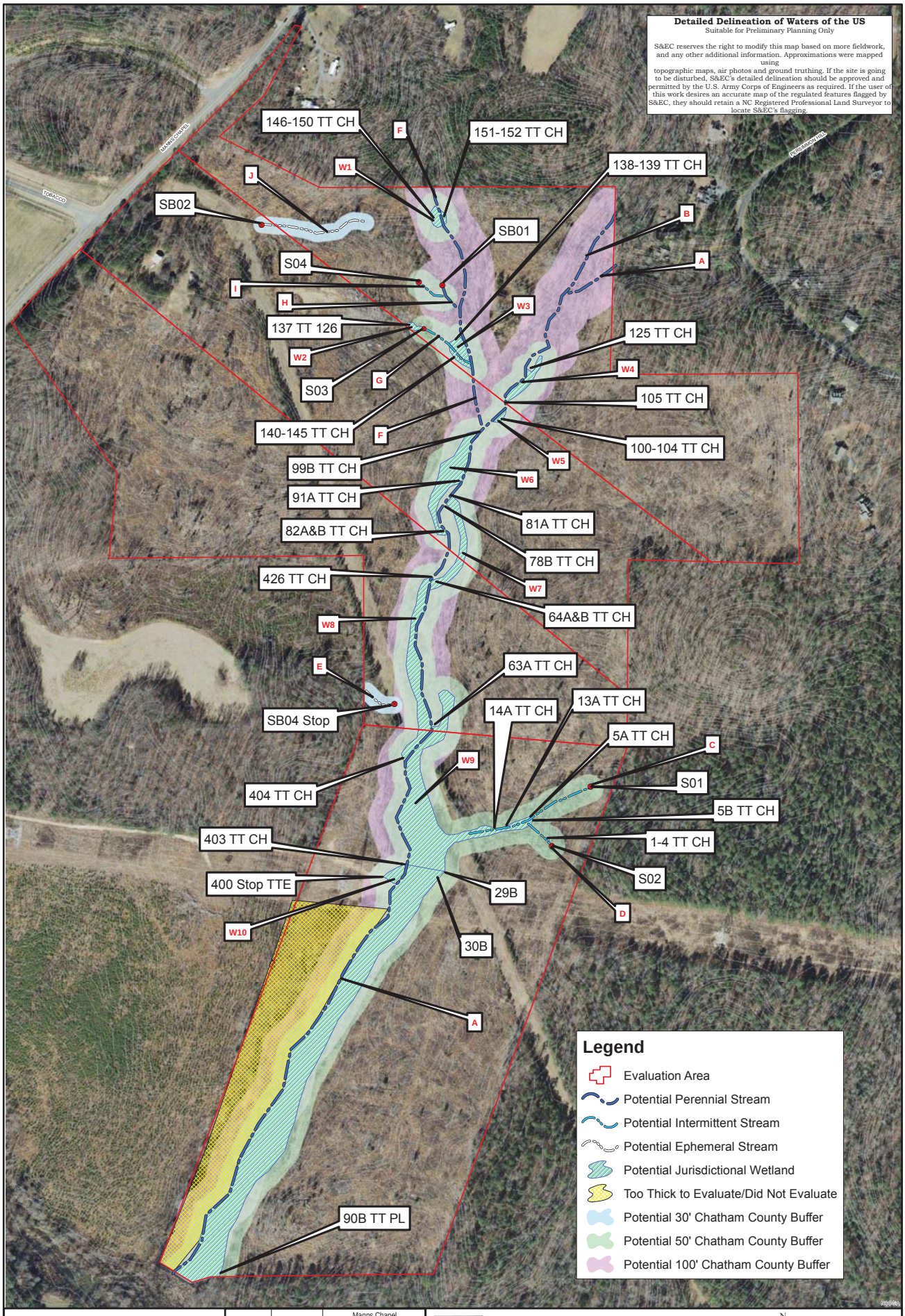

Figure 3 - Sketch Map

Project No.	Scale:	Manns Chapel Chatham County, NC Chatham County GIS NC OneMap
13203	1 = 150'	
Project Mgr.: SB	11/16/17	Prepared by: DM

S&EC Soil & Environmental Consultants, PA
8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467
sandsi.com

N W E S

Watershed Protection Division
Environmental Quality Department
Phone: (919) 545-8394
Website: www.chathamnc.org

CHATHAM COUNTY
NORTH CAROLINA

Riparian Buffer Review Application
Surface Water Identification Request for
Major Subdivisions

Application Date: 12/13/17 Planning Application Number (Office Use Only): 2017-1982

Tract Information

Parcel #: 0088505/0001777 0088506/0001780 Watershed District (and name of creek if known): CAPE FEAR (WS-IV PA)

Property Owner: Dwight C. Ryan

Location/Physical Address of Tract: 2206, 2094, 2062, 2064 Manns Chapel Road

Driving Directions from Pittsboro: _____

Subdivision Name (if applicable): RYAN'S CROSSING

Owner's/Agent Contact Information (Agent: Consultant, Real Estate Agent, Surveyor, Other) Circle one

Name: Eric Andrews

Contact Phone Numbers: (h) _____ (w) 919-542-0523 (c) _____

E-mail: Eric@ericandrewsrealtor.com

Mailing Address: P.O. Box 1400, Pittsboro, NC 27312

Do you wish to be contacted prior to Chatham County staff visiting the property? ☐ Yes ☒ No

How much notice is required prior to arrival onsite? _____

How would you like to receive the completed review letter? (Please check one of the following)

☐ I would like to pick up the completed Riparian Buffer Review at the County Office

☐ I would like the completed Riparian Buffer Review mailed to me

☒ I would like the completed Riparian Buffer Review e-mailed to me

Please include the following items with this request

☐ Completed consultant findings report including the following:

- ☑ GIS generated or hand drawn sketch of surface water features found onsite (Buffer Plan Sheet) No smaller than 1"=60' and paper size 11"x17" or larger
- ☑ NCDWQ Stream Identification Forms, Version 4.11, Wetland Determination Data Form – Eastern Mountains and Piedmont Region, digital photographs, notes, sketches, etc.

Land & Water Resources Division
Environmental Quality Department
Phone: (919) 545-8394
Website: www.chathamnc.org

Riparian Buffer Review Application
Surface Water Identification Request

- ☑ NRCS map with property boundary depicted
- ☑ USGS map with property boundary depicted
- ☐ Statement of Credentials (Training Certificate for NCDWQ/NC State University Surface Waters Classification course, 2 years of jurisdictional wetland delineation according to the Eastern Mountains and Piedmont Regional Supplement to the 1987 US Corps of Engineers Wetland Delineation Manual)
- ☑ Signed Right to Enter Property Form
- ☑ Signed Owner's Agent Designation Form
- ☑ Fee (make checks payable to Chatham County) **$100 per feature confirmed onsite**

***Feature** is defined as any surface water that is subject to Chatham County Riparian Buffers (streams, wetlands, ponds)*

Total Number of Features: 19 Total Paid: $ 1,900.00

I have read and understand the regulations of the Watershed Protection Ordinance, Section 304, and I agree to adhere to these associated policies and guidelines herein.

Owner/Agent Signature: _____ Date: 12-11-17

Applications can be submitted by mail to: Environmental Quality Department, P.O. Box 548, Pittsboro, NC 27312 or by electronic mail to drew.blake@chathamnc.org

For Questions, please contact:
Drew Blake, Watershed Specialist, at (919)-545-8394 or drew.blake@chathamnc.org
Rachael Thorn, Watershed Protection Supervisor, at (919) 545-8343 or rachael.thorn@chathamnc.org

CHATHAM COUNTY
NORTH CAROLINA

LAND & WATER RESOURCES DIVISION
Environmental Quality Department

PHONE: (919) 545-8204

Website: www.chathamnc.org

AUTHORIZED AGENT FOR LEGAL REPRESENTATION FORM

PROPERTY LEGAL DESCRIPTION: 0088505/0001777

LOT NO. 1-4 PARCEL ID (PIN) 0088506/0001780 PARCEL SIZE 122.13 ACRES

STREET ADDRESS: 2206, 2094, 2062, 2064 MANNS CHAPEL ROAD

Please print:
Property Owner: KATHLEEN RYAN

Property Owner: _____

The undersigned, owner(s) of the above described property, do hereby authorize

STEVEN BALL (Contractor/Agent), of SOIL & ENVIRONMENTAL CONSULTANTS P.A. (Name of consulting firm if applicable)

to act on my/our behalf and take all actions, I/we could have taken if present, necessary for the processing, issuance and acceptance of reviews, inspections, or permits and any and all standard and special conditions attached to these approvals. The activities authorized include the following (**initial all that apply**):

- KK Building Permit
- KK Zoning Compliance Permits
- KK Floodplain Determination
- KK Soil Erosion and Sedimentation Control Permit
- KK Permits to install, repair, evaluate, or expand onsite wastewater system(s)
- KK Evaluation/inspection/permitting of a private drinking water well(s)
- KK Riparian Buffer Review pursuant to §304 of the Chatham County Watershed Protection Ordinance
- ___ Other: _____

Property Owner's Address (if different than property above):
3350 HWY. 63 RISON, AR 71665

Owner Telephone: (870) 357-2058 Email: _____

We hereby certify the above information submitted in this application is true and accurate to the best of our knowledge.

DocuSigned by:
Kathleen Ryan
ACFEED623SE04C8...
Owner Authorized Signature

Agent Authorized Signature

Date: 12/6/2017

Date: _____

Applications can be mailed to: Planning Dept., PO Box 54, Pittsboro, NC 27312
For Questions, please contact: Lynn Richardson at 919-542-8207
Revised 3/2014

CHATHAM COUNTY
NORTH CAROLINA

LAND & WATER RESOURCES DIVISION
Environmental Quality Department

PHONE: (919) 545-8394

Website: www.chathamnc.org

Authorization to Enter Property Form

Date: 11/29/17

PARCEL No. (AKPAR) 0088505/0001777/0088506/0001780

I, (print name) KATHLEEN RYAN, as owner of the property described above, or as a representative of the owner(s) do hereby convey permission to Chatham County staff to enter the property at their convenience to conduct a surface water identification (SWID) necessary to determine whether or not water features on my property are subject to the riparian buffer regulations described in Section 304 of the Chatham County Watershed Protection Ordinance. The SWID will be public record and on file at the Planning and Environmental Quality Departments, and may be requested in the future for review by interested parties.

I understand that stream delineations for the property listed above will be made by County staff only once and that if future subdivisions are proposed within this property boundary, it will require a surface water identification by a private consultant at the property owner's expense.

KATHLEEN RYAN	DocuSigned by: Kathleen Ryan	12/6/2017
(Print Owner's Name)	(Signature of Owner)	(Date)
(Print Authorized Agent Name)	(Signature of Authorized Agent)	(Date)

Project Number:	13203.W1
Project Manager:	SB
Scale:	1" = 1000'
Date:	8/15/17

Map Title:

Figure 2 - Soil Survey Map

Manns Chapel
Chatham County, NC

Source: Chatham County Soil Sheet 4

0 1,000 2,000
Feet

N

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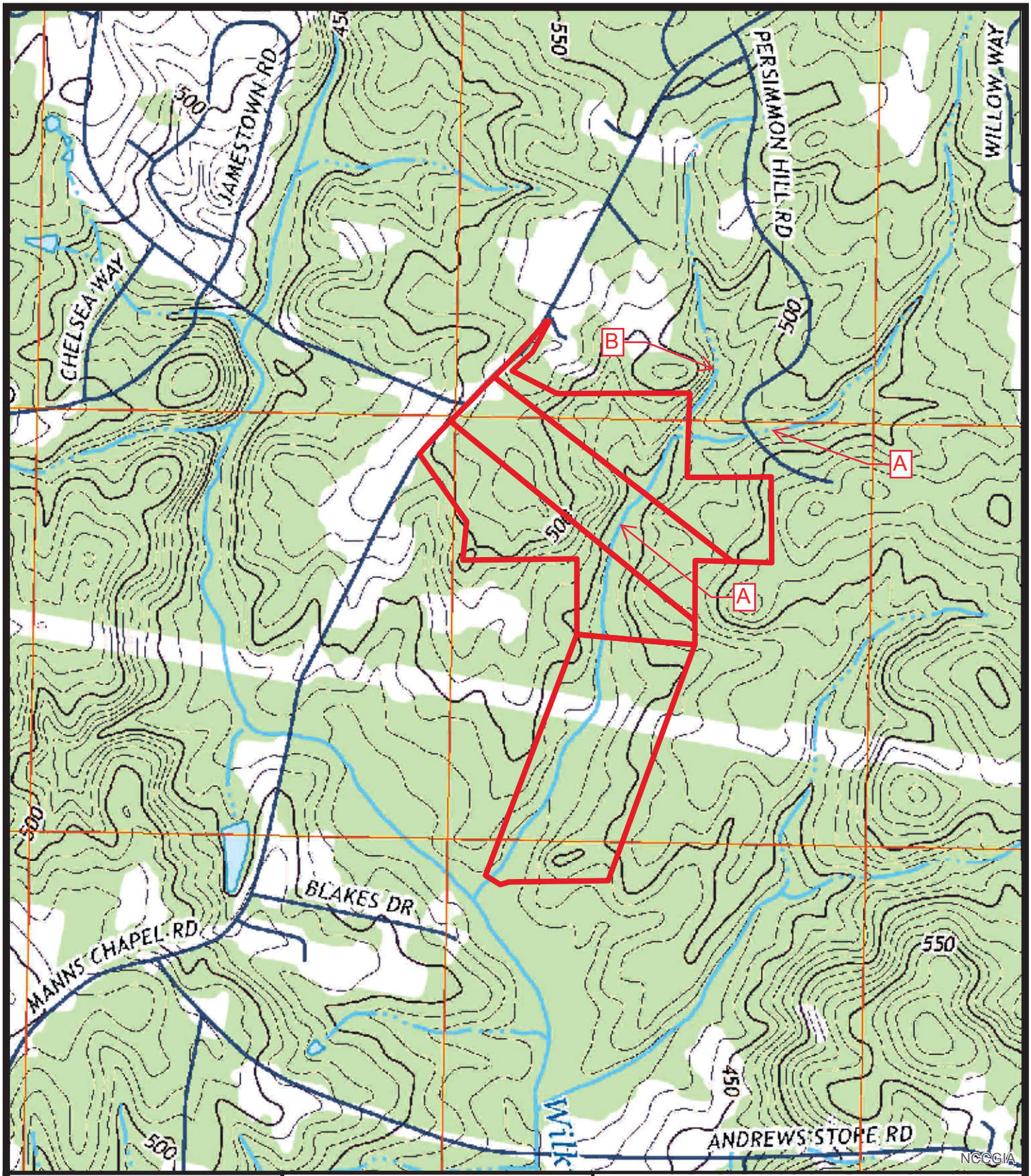
sandec.com



Project Number:	13203.W1
Project Manager:	SB
Scale:	1" = 1000'
Date:	8/15/17

Map Title:

Figure 1 - USGS Map

Manns Chapel
Chatham County, NC

Source: NC USGS Bynum Quadrangle

0 1,000 2,000
Feet

N

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Soil & Environmental Consultants, PA
8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467
sandec.com

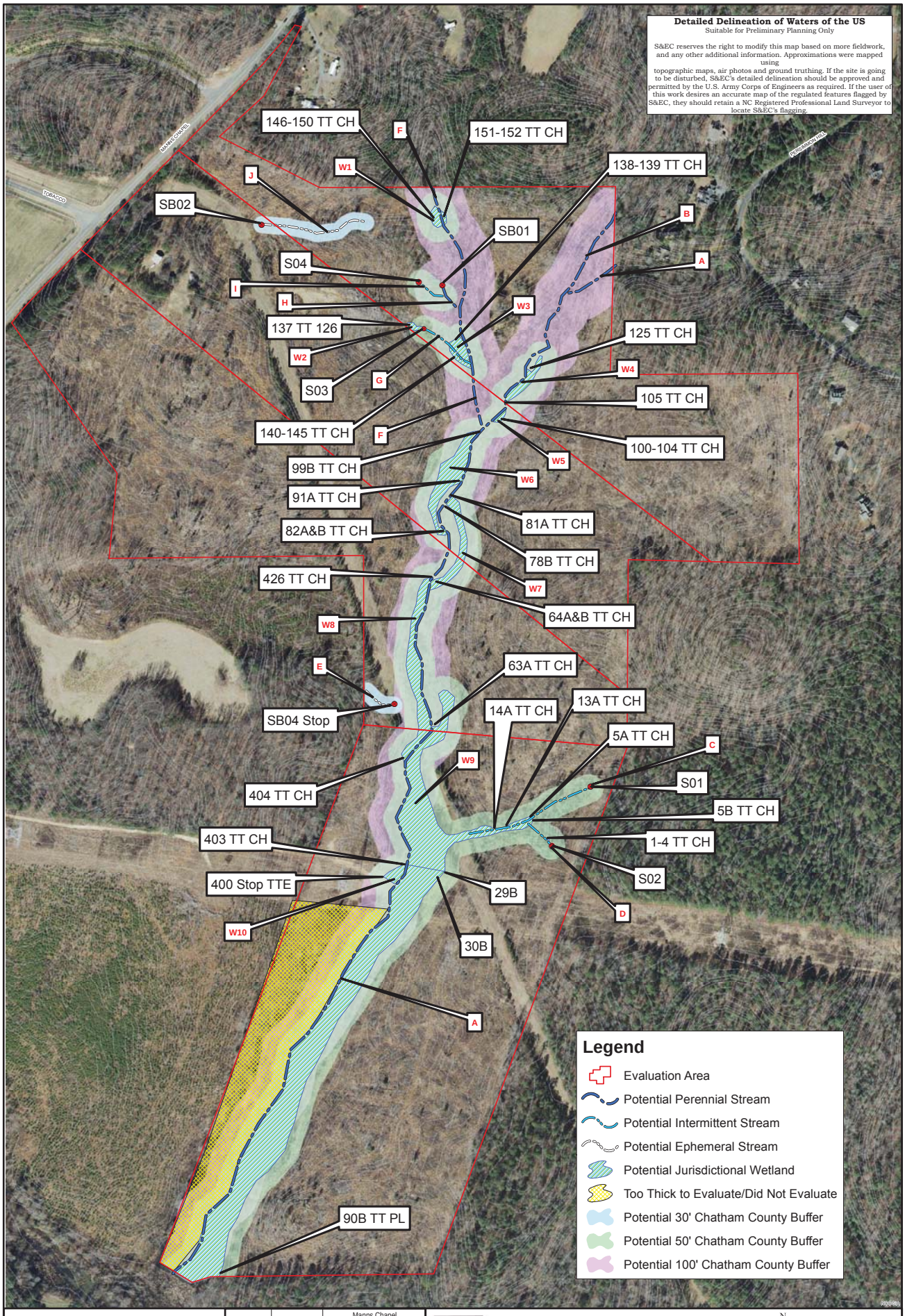

Figure 3 - Sketch Map

Project No.	Scale:	Manns Chapel Chatham County, NC Chatham County GIS NC OneMap
13203	1 = 150'	
Project Mgr.: SB	11/16/17	Prepared by: DM

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sandsi.com

N W E S

Feature A

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.831842
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.134586
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 39.5	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 22)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = (3)	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 7)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	(0.5)	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Feature B

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.1

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.852758
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.134113
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 32.5	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 16.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = (3)	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 7)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Feature C

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.827407
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.134455
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 27.5	Stream Determination (circle one) Ephemeral (Intermittent) Perennial	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 14.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = (3)	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 5)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = (1.5) Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Feature D

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.1

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.826992
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.134648
Total Points: 23.5 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	Stream Determination (circle one) Ephemeral (Intermittent) Perennial	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 11)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 3.5)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Feature E

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.1

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.828277
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.136460
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 10.5	Stream Determination (circle one) (Ephemeral) Intermittent Perennial	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 5.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 2)				
12. Presence of Baseflow	(0)	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = (0)		Yes = 3	

C. Biology (Subtotal = 3)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Feature F

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.1

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.832800
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.135729
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 33	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 17)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = 0		Yes = (3)	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 7)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Feature G

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.1

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.831826
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.135903
Total Points: 22.5 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	Stream Determination (circle one) Ephemeral (Intermittent) Perennial	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 10.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6.5)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 5.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Feature H

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.1

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.832184
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.135781
Total Points: 30.5 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 14.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	(0.5)	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0		Yes = (3)	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 8)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Feature I

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.1

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.832227
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.136009
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 21	Stream Determination (circle one) Ephemeral (Intermittent) Perennial	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 10)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6)				
12. Presence of Baseflow	0	(1)	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Feature J

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.1

NC DWQ Stream Identification Form Version 4.1

Date: 11/14/17	Project/Site: Manns Chapel	Latitude: 35.832798
Evaluator: S&EC – Steven Ball	County: Chatham	Longitude: -79.137504
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 11	Stream Determination (circle one) (Ephemeral) Intermittent Perennial	Other *e.g. Quad Name:* Bynum

A. Geomorphology (Subtotal = 5.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	(0)	1	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	(0.5)	1	1.5
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 1.5)				
12. Presence of Baseflow	(0)	1	2	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = (0)		Yes = 3	

C. Biology (Subtotal = 4)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch: