

Major Subdivision Preliminary Plat Submittal

Briar Chapel – Phase 9

Date: November 8, 2013





Major Subdivision
Preliminary Plat Submittal
Briar Chapel -
Phase 9

Date: November 8, 2013

Prepared for:
Chatham County Planning Department
80-A East Street
Pittsboro, NC 27312

Prepared by:
McKim & Creed, Inc.
1730 Varsity Drive
Suite 500
Raleigh, NC 27606
License #F-1222

McKim & Creed Project #02735-0096



1730 VARSITY DRIVE, SUITE 500, RALEIGH, NC 27606
 TEL (919) 233-8091 • FAX (919) 233-8031

LETTER OF TRANSMITTAL

ADDRESS:	80-A East Street Pittsboro, NC 27312-0130
ATTENTION:	Lynn Richardson Chatham County Planning

DATE:	November 8, 2013	
PROJECT #:	2735-0092	TASK #:
RE:	Briar Chapel Phase 9 Preliminary Plat Submittal	
TRANSMITTAL #:	PAGE 1	OF 1

WE ARE SENDING: Originals Prints Shop Drawings Samples
 Specifications Calculations Other –

Quantity	Drawing No.	Rev.	Description	Status
1	Set		Construction Plans – 24" x 36"	G
20	C1.0		Site Plans – 24" x 36" (folded)	G
1			Application and checklist	G
1			CUP Stipulation Response Letter	G
1			Supporting permit approval documentation	G
1			CD with digital copies of submittal documents in PDF format	G

Issue Status Code: A. Preliminary B. Fabrication Only C. For Information D. Bid
 E. Construction F. For Review & Comments G. For Approval H. See Remarks

Action Status Code: 1. No Exceptions Taken 2. Make Corrections Noted 3. Other
 4. Amend & Resubmit 5. Rejected - See Remarks

REMARKS:

Lynn,

Enclosed please find the above documents for our Briar Chapel-Phase 9 preliminary plat submittal. Please let me know if you have any questions. Thank you.

CC:

McKIM & CREED, INC.

Signed 
 Chris Seamster, RLA



Briar Chapel - Phase 9

Index to Documents

TRC Pre-Submittal Meeting Maps (7/17/2013)	1
Overall Site Plan (Sheet C1.0)	2
Major Subdivision Preliminary Plat Checklist/Application/Adjacent Landowners	3
Road Name Approval Email (3/18/2013)	4
NCDOT Roadway Approval (11/08/2013)	5
Chatham County Erosion Control Approval –Section 1 & 2 (11/05/2013)	6
USACOE 404 Permit (8/21/2009)	7
NCDENR Water Quality 401 Permit (8/31/2009)	8
Historical Structures Statement (from CUP response letter)	9
NCDENR DWQ Wastewater Collection System Extension Permit (9/17/2013)	10
NCDENR DWQ Wastewater Treatment/Reclaimed Water/Spray Irrigation System(5/18/2009)	11
NCDENR DWQ Wastewater Pump Station and Force Main Permit (10/14/2009)	12
Chatham County Public Works Water Plan Approval (10/07/2013)	13
NCDENR Water Main Extension Permit (10/28/2013)	14
NCDENR Authorization to Construct/Water System Permit (10/29/2013)	15
Impervious Surface Summary (11/08/2013)	16
Conditional Use Permit Stipulation Response Letter (11/08/2013)	17
Updated T-zone tracking table	18
Stormwater Management Plan/Calculations	19
Stormwater Management Plan Approval (10/21/2013)	20

CHATHAM COUNTY

Phase: Phase 9

Section: _____

MAJOR SUBDIVISION

Review For: Preliminary Plat

Submittal Date: 11/08/2013

REVIEW CHECKLIST – BRIAR CHAPEL

Attach all supporting documentation regarding these approvals.

#	PRELIMINARY PLAT	APPROVAL DATE
1	<input checked="" type="checkbox"/> Date of TRC Pre-Submittal Meeting (Per Condition 18 of 2012 CUP Revision)	10/17/2012
2	<input checked="" type="checkbox"/> 20 Copies of Plat/Detailed Site Plan (folded) <i>Sheet C1.1 and C1.2</i>
3	<input checked="" type="checkbox"/> Application
4	<input checked="" type="checkbox"/> Road name approval(s)	3/18/2013
5	<input checked="" type="checkbox"/> NCDOT Road Plan approval (if public roads)	7/8/2013
	[N/A] NCDOT Commercial Driveway Permit (if applicable)
6	<input checked="" type="checkbox"/> Erosion Control Plan approval	2/28/2013
7	<input checked="" type="checkbox"/> U. S. Army Corps of Engineers 404 Permit (if applicable)	8/21/2009
8	<input checked="" type="checkbox"/> NCDENR Water Quality 401 Permit (if applicable)	8/31/2009
9	<input checked="" type="checkbox"/> Statement regarding historical structures and/or features <i>See CUP Response letter, item 16.</i>	11/08/2013
10	<input checked="" type="checkbox"/> NCDENR DWQ Wastewater Collection System Extension	9/17/2013
11	<input checked="" type="checkbox"/> NCDENR DWQ Wastewater Treatment/Reclaimed Water/Spray Irrigation Permit	5/18/2009
12	<input checked="" type="checkbox"/> Chatham County Water Plan Approval & Fees Paid per Condition 13A of 2012 CUP Revision. <i>(\$3,500 per lot fee paid on 6/6/2013)</i>	5/31/2013
13	<input checked="" type="checkbox"/> NCDENR Water Main Extension	6/27/2013
14	<input checked="" type="checkbox"/> NCDENR Authorization to Construct / Water System	6/27/2013
15	<input checked="" type="checkbox"/> Updated impervious surface calculations sheet for phase of development	7/11/2013
16	<input checked="" type="checkbox"/> Conditional Use Permit Stipulations Response & Master Plan updates: Per Condition 18 of 2012 CUP revision: (1 electronic copy and 1 hard copy of each) <input checked="" type="checkbox"/> Updated T-zone tracking table <input checked="" type="checkbox"/> Grading Plan <i>(See construction drawing set included with submittal)</i> <input checked="" type="checkbox"/> Utility Plan in compliance with Condition #7 of 2012 CUP Revision <i>(See construction drawing set included with submittal)</i>	
17	<input checked="" type="checkbox"/> Stormwater Management Plan with detailed Hydraulic calculations and final construction drawings per Condition 4 and 18 <i>(See construction drawing set and calculations included with submittal)</i>	
18	<input checked="" type="checkbox"/> Any other permits or approval letters necessary to obtain Prelim Plat approval <i>Approval of Stormwater Management Plan (6/27/2013)</i> [N/A] Preliminary plat fees (\$45.00 per residential lot) Paid <u>\$5,130.00</u> Date 9/27/2013 { X } 1 electronic copy of all items above (see Digital Document Requirements)	
	Comments:	

Date Complete Application Rec'd: _____ / _____ / _____ By: _____

P.O. Box 54
Pittsboro, NC 27312
Tel: (919) 542-8204
Fax: (919) 542-2698

Preliminary
 Final

BRIAR CHAPEL MAJOR SUBDIVISION APPLICATION

Phase / Section : Phase 9

Subdivision Applicant:

Name: Lee Bowman, Project Manager
Address: 16 Windy Knoll Circle
Chapel Hill, NC 27516
Phone:(W) (919) 951-0712
Phone:(H) _____ Fax: (919) 951-0701
E-Mail lbowman@newlandco.com

Township: Baldwin Zoning: CUD-CC
Flood Map # 3710976500J Zone: AE
Watershed: WS-IV PA

Total Project Acreage: 1,586.26 ac
Total Acreage of Phase/Section: 33.54 ac

Subdivision Owner:

Name: NNP Briar Chapel LLC
Address: 16 Windy Knoll Circle
Chapel Hill, NC 27516
Phone:(W) (919) 951-0712
Phone:(H) _____ Fax: (919) 951-0701
E-Mail lbowman@newlandco.com



P. I. N. # 9765-64-6065.000, 9765-53-2812
Parcel # 87090 & 89827 (AKPAR)
Existing Access Road: S.R. #1528/1526
S.R. road name Andrews Store / Parker Herndon

Total # of Lots: Overall 2,389
Total # of Lots: 114

Name and date of contact with Chatham County Historical Association: 10/17/2013

Type of new road: Private/ Length: 1013 LF Public/ Length: 3,905 LF
Road Surface: _____ Water System: _____ Sewer System: _____
 paved Public System Public Utility
Chatham County On-Site WWTP

List other facilities in Phase/Section: commercial, recreation, etc., and the approximate acreage or square footage:

 Date 11/5/13  Date 11/5/13
Signature of Applicant Signature of Owner

For Office Use Only:

Notes: _____

Approved by County Commissioners: CUP/Sketc Feb. 15, 2005

Fee Paid: _____ Date: _____

Preliminary Plan _____
Final Plat _____

ADJACENT LAND OWNERS (Property owners across a road, easement, or waterway are considered adjacent land owners):
Legal notices are mailed to these owners, please **type or write neatly, and include zip codes.**

1. JOHNNY NEWTON CARPENTER 1412 ANDREWS STORE ROAD PITTSBORO, NC 27312	11.
2. BRIAR CHAPEL COMMUNITY ASSOC INC. 50101 GOVERNORS DRIVE, SUITE 100 CHAPEL HILL, NC 27517	12.
3. CHARLES SLEDD & ANN BORDEN THOMAS 220 ROCK RIDGE ROAD PITTSBORO, NC 27312	13.
4. KIM ALAN WILLIAMS PO BOX 1725 PITTSBORO, NC 27312	14.
5. MARGARET POLLARD SCHOOL PO BOX 1809 PITTSBORO, NC 27312	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

FOR OFFICE USE ONLY

Date's Adjacent Owner Letters were mailed out

Preliminary	/ /	/ /
-------------	-----	-----

Dates and Actions of Planning Board Meetings

Preliminary	/ /	<input type="checkbox"/> Appv'd	<input type="checkbox"/> Denied	<input type="checkbox"/> Tabled
Final	/ /	<input type="checkbox"/> Appv'd	<input type="checkbox"/> Denied	<input type="checkbox"/> Tabled

Dates and Actions of Board of Commissioners Meetings

CC/CUP/ Sketch	2 /15 05/	<input checked="" type="checkbox"/> Appv'd	<input type="checkbox"/> Denied	<input type="checkbox"/> Tabled
Preliminary	/ /	<input type="checkbox"/> Appv'd	<input type="checkbox"/> Denied	<input type="checkbox"/> Tabled
Final	/ /	<input type="checkbox"/> Appv'd	<input type="checkbox"/> Denied	<input type="checkbox"/> Tabled

Conditions stipulated by Planning Board or Board of Commissioners (label as sketch, preliminary or final):

See A RESOLUTION APPROVING AN APPLICATION FOR A CONDITIONAL USE PERMIT FOR A REQUEST BY MITCH BARRON ON BEHALF OF NEWLAND COMMUNITIES FOR BRIAR CHAPEL PLANNED RESIDENTIAL DEVELOPMENT dated February 15, 2005 for list of Conditional Use Permit and subdivision sketch design stipulations and conditions.

Financial Guarantee (if applicable):

Submitted by: _____
 Guarantee Type: _____
 Amount: \$ _____
 Acceptance Date: ___/___/___
 Expiration Date: ___/___/___
 Release Date: ___/___/___
 Release Payable to: _____

_____ / /
Planning Department

Date

Chris Seamster

From: Lee Bowman <lbowman@newlandco.com>
Sent: Wednesday, April 10, 2013 3:24 PM
To: Chris Seamster
Subject: FW: Proposed New Street Names for Future Briar Chapel Phase(s)
Attachments: BC South - street name submittal - 3-13-13LBRev.docx

From: Denise Suits [<mailto:denise.suits@chathamnc.org>]
Sent: Monday, March 18, 2013 3:29 PM
To: Lee Bowman
Subject: RE: Proposed New Street Names for Future Briar Chapel Phase(s)

Hey Lee,

Sorry took so long but I had to check our roads and Orange County roads against this list. I have attached the ones that can be approved. Let me know which ones you decide to use and I'll approve them for Lynn.

Thanks,
Denise

From: Lee Bowman [<mailto:lbowman@newlandco.com>]
Sent: Thursday, March 14, 2013 10:04 AM
To: Lesa Chavis; Denise Suits
Subject: Re: Proposed New Street Names for Future Briar Chapel Phase(s)

My apologies, thanks.
Lee Bowman
Project Manager
Newland Communities
16 Windy Knoll Circle
Chapel Hill, NC 27516
T. 919.951.0712
C. 919.697.1323
F. 919.951.0711
lbowman@newlandco.com
www.newlandco.com
NEWLAND®

CONFIDENTIALITY NOTICE: This e-mail may contain confidential or privileged material which is intended for the sole use of the intended recipient(s). Any review, use, distribution or disclosure by others is strictly prohibited. If you have received this e-mail in error, please notify the sender immediately and delete the message and any attachments from your computer.

From: Lesa Chavis [<mailto:lesa.chavis@chathamnc.org>]
Sent: Thursday, March 14, 2013 06:50 AM
To: Denise Suits <denise.suits@chathamnc.org>
Cc: Lee Bowman

Subject: FW: Proposed New Street Names for Future Briar Chapel Phase(s)

I am forwarding this email to Denise Suits. Denise is responsible for approving road names.

Thanks,

Lesa Chavis, E-911 Specialist
Chatham County Emergency Operations

From: Lee Bowman [<mailto:lbowman@newlandco.com>]
Sent: Thursday, March 14, 2013 9:08 AM
To: Lesa Chavis
Subject: Proposed New Street Names for Future Briar Chapel Phase(s)

Lesa,

Attached is the list of potential street names for some upcoming phases at Briar Chapel. In all, we need forty-one (41) new street names.

I realize this list may seem overwhelming, but past history being any indication of current, usually half the ones that I submit are already used. At any rate, feel free to give me a call to discuss further.

I would hope to have this list approved by April 1st in order to get into the Planning Dept. Thanks.

Lee Bowman
Project Manager
Newland Communities
16 Windy Knoll Circle
Chapel Hill, NC 27516
T. 919.951.0712
C. 919.697.1323
F. 919.951.0711
lbowman@newlandco.com
www.newlandco.com
NEWLAND®

CONFIDENTIALITY NOTICE: This e-mail may contain confidential or privileged material which is intended for the sole use of the intended recipient(s). Any review, use, distribution or disclosure by others is strictly prohibited. If you have received this e-mail in error, please notify the sender immediately and delete the message and any attachments from your computer.

_____ Information from ESET NOD32 Antivirus, version of virus signature database 8115 (20130314)

The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

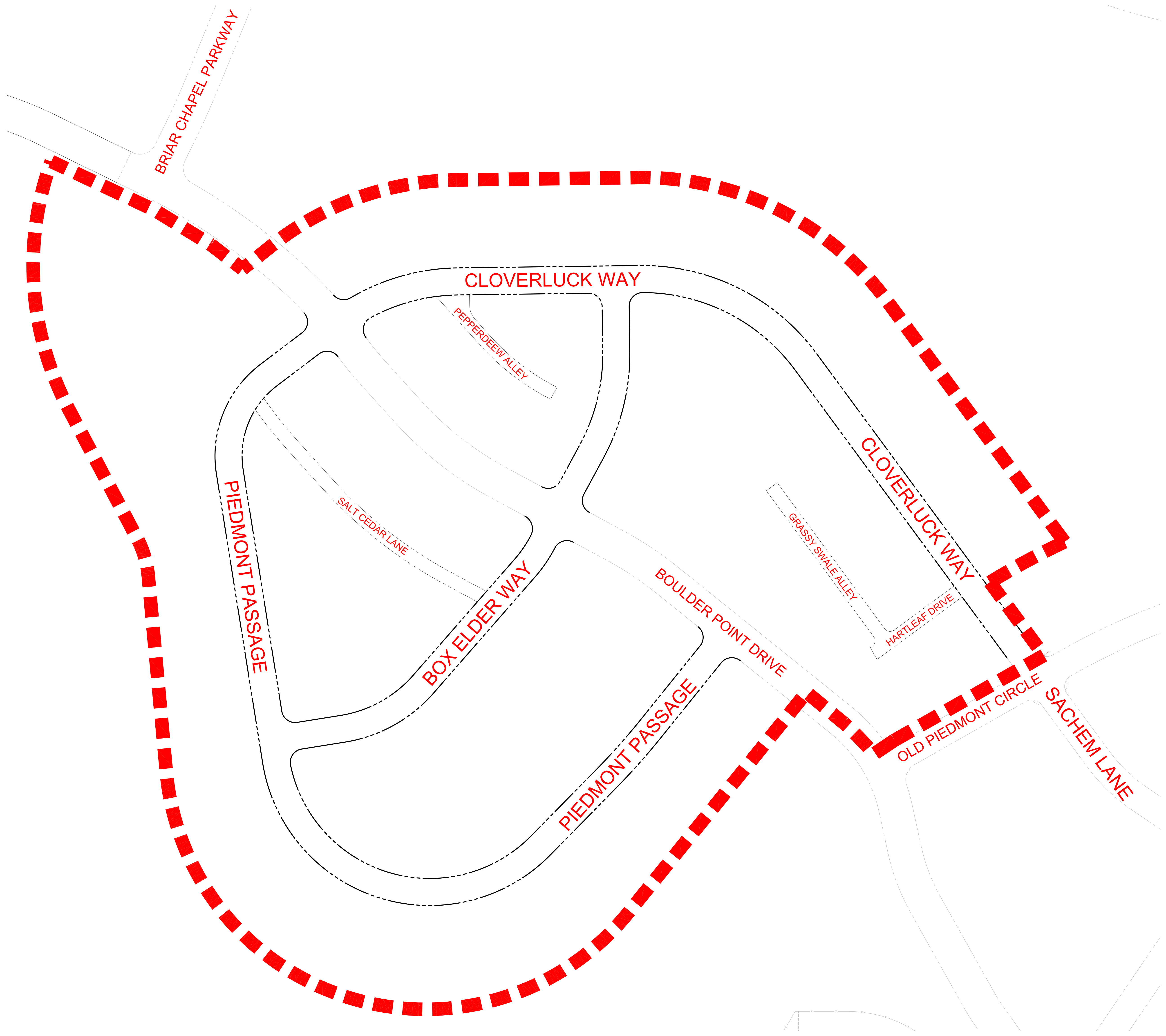
_____ Information from ESET NOD32 Antivirus, version of virus signature database 8130 (20130318)

Briar Chapel Street Name Submittal

- 1) Juneberry Drive
- 2) Merry Mountain Trail
- 3) Salamander Way
- 4) Walking Stick Trail
- 5) Rabbit Warren Road
- 6) Kuralt View
- 7) Murrow Manor
- 8) Brinkley Dell
- 9) Cosell Corner
- 10) Griffith Glen
- 11) Bavier Crest
- 12) Scuppernong Street
- 13) Phacelia Point
- 14) Harperella Landing
- 15) Dion Skipper Vista
- 16) Bachman Sparrow Glade
- 17) Chinquapin Path
- 18) Yaupon Highlands
- 19) Cherokee Clay Patch
- 20) Mattamuskett View
- 21) Artillery Punch Place
- 22) Tin Pan Alley
- 23) Gumbo Alley
- 24) Rally Alley
- 25) Gameland Circle
- 26) Old Piedmont Circle
- 27) Box Elder Way
- 28) Hop Hornbeam Road
- 29) Overcup Trail
- 30) Slippery Elm Drive
- 31) Turkey Oak Trail
- 32) Yellow Buckeye Drive
- 33) Salt Cedar Lane
- 34) Sawtooth Road
- 35) Reedy Fork Trail
- 36) Nancy Branch Drive
- 37) Leopard Branch Bend
- 38) Haven Creek Road
- 39) South Fork Avenue
- 40) Little Yellow Lane
- 41) American Copper Bend
- 42) Brown Elfin Vista
- 43) Silvery Blue Road
- 44) Pearl Crescent Court
- 45) Monarch Trail
- 46) Cloudywing Drive
- 47) Skipperling Street
- 48) Glassywing Grove
- 49) Crystal Skipper Avenue

Briar Chapel Street Name Submittal

- 50) Long Dash Dell
- 51) Whirlabout Way
- 52) Sachem Lane
- 53) Longtail Court
- 54) Tawny Crescent Road
- 55) Sleepy Orange Drive
- 56) Loon Landing
- 57) Golden Eagle Way
- 58) Peregrine Place
- 59) Puffin Street
- 60) Snowy Owl Court
- 61) Nighthawk Trail
- 62) Purple Martin Avenue
- 63) Barn Swallow Bend
- 64) Carolina Wren Way
- 65) Snowbunting Street
- 66) Indigo Bunting Court
- 67) Condoret Corner
- 68) McIver Landing
- 69) LaGrange Lane
- 70) Valena Drive
- 71) Chewacla Lane
- 72) Piedmont Passage
- 73) Cloverluck Way
- 74) Cara Way
- 75) Pepperdew Alley
- 76) Grassy Swale
- 77) Chapelton Court
- 78) Beaverbuilt Passage
- 79) Boulder Field Landing
- 80) Heartleaf Drive
- 81) Artifact Alley





CHATHAM COUNTY
NORTH CAROLINA

Certificate of Sedimentation and Erosion Control Plan Approval and
Land-Disturbing Permit

For
Briar Chapel Phase 9 – Section 1

Project Name and Location

2013-026
Permit Number

The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by Chatham County, North Carolina in accordance with North Carolina General Statute 113A-57 (4) and 113A-54 (d)(4), the North Carolina Administrative Code, Title 15A, Chapter 4B.0007 (c) and as per applicable sections of the Chatham County Soil Erosion and Sedimentation Control Ordinance. This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent ground cover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0027 (b) and as per Chatham County's Erosion and Sediment Control Ordinance, Section 5 (i).

Responsible Person: Laurie Ford **Phone:** (919) 951-0714

This plan was approved with "modifications" Yes No and / or
"performance reservations" Yes No.

Reviewer: Rachael Thom

Date: 11/5/13

**THE ORDINANCE REQUIRES THAT A COPY OF
THE EROSION CONTROL PLAN
MUST BE KEPT AVAILABLE AT THE JOB SITE
AT ALL TIMES FOR INSPECTION**



**Environmental Quality Department
Land and Water Resources Division
Soil Erosion & Sedimentation Control Program**

LETTER OF APPROVAL WITH MODIFICATIONS

November 5, 2013

NNP- Briar Chapel, LLC
Attn: Lee Bowman
16 Windy Knoll Circle
Chapel Hill, NC 27516

RE: Project Name: Briar Chapel Phase 9 Section 1
Project Number: 2013-026
Acres approved: 12.97
Total Acres: 176.76
Submitted By: McKim & Creed, Inc.
Date Received: 11-1-13

Dear Sir:

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable with modifications and hereby issue this letter of Approval With Modifications. The Modifications Required for Approval are listed on the attached page. This plan approval shall expire two (2) years following the date of approval, if no land-disturbing activity has been undertaken.

Please be advised that Section 6 (I) of the Chatham County Sedimentation and Erosion Control Ordinance requires that a copy of the approved erosion control plan be on file at the job site. Also, you should consider this letter to give the Notice required by G.S. 113A-61.1(a) of our right of periodic inspection to insure compliance with the approved plan.

North Carolina's Sedimentation Pollution Control Program is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project,

it is determined that the erosion and sedimentation control plan is inadequate to meet the requirements of the Chatham County Sedimentation and Erosion Control Ordinance, this office may require revisions to the plan and implementation of the revisions to insure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please be aware that your project will be covered by the enclosed NPDES General Stormwater Permit NCGO1000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form, which you have provided. You are requested to file an amended form if there is any change in the information included on the form. Please notify us when you would like to schedule a preconstruction conference. Notification shall be given at least 7 days prior to initiation of activity.

Your cooperation is appreciated.

Sincerely,

A handwritten signature in black ink that reads "Rachael Thorn". The signature is fluid and cursive, with the first name "Rachael" written in a larger, more prominent script than the last name "Thorn".

Rachael Thorn
Lead Sedimentation and Erosion Control Officer
Chatham County Environmental Quality Department

Enclosures: Certificate of Approval
NPDES Permit

MODIFICATIONS REQUIRED FOR APPROVAL

1. Issuance of Preliminary Plat Approval by the Chatham County Board of Commissioners is required before the installation/construction of permanent structures and infrastructure. Any modifications to the plan as required by the Board must be submitted to this office as a revision to the current approved plan. Please notify staff with the Chatham County Environmental Quality Department once Preliminary Plat Approval is granted.



NPDES Stormwater Discharge Permit for Construction Activities



Cover Sheet for NCG010000

Revised August 2, 2011

What is this permit?

This is your **General Stormwater Permit for Construction Activities**, developed to meet federal National Pollutant Discharge Elimination System (NPDES) requirements. It is separate from your Erosion and Sedimentation Control (E&SC) Plan, which has been a North Carolina requirement for over 35 years.

Federal regulations adopted by the U.S. Environmental Protection Agency (EPA) and North Carolina Division of Water Quality (DWQ) require an NPDES permit for your project. The EPA has delegated DWQ authority to administer the NPDES program in North Carolina. Two divisions of the Department of Environment and Natural Resources are responsible for different parts of the federal permitting requirements.

The E&SC plan approved by the Division of Land Resources (or a delegated local program) contains the core erosion control requirements for your project. The NPDES General Permit issued by DWQ contains additional requirements related to a broader range of water quality issues. **These permits are related, but separate. Both contain conditions your project site must meet.**

Are there new requirements in this permit?

This General Permit reflects changes made in the federal regulations effective February 1, 2010, that regulate discharges from construction sites. The federal regulations resulted from litigation decisions that mandated construction activities over a certain size must contain additional specifications to reduce the amount of wastes and sediment loading that reach the nation's waters.

The Division of Water Quality and the Division of Land Resources established the Construction General Permit Technical Advisory Group (CTAG) to guide the development of this NPDES permit. A draft permit was available for public review in May 2011, and the final permit became effective on August 3, 2011.

The most notable change in the new permit is a requirement that ground stabilization, such as wheat straw application, be applied within 14 days from the last land-disturbing activity. For steep slopes, that area must be stabilized within 7 days. Please see page 2 of this document for details.

What does this permit require me to do?

You should read and become familiar with the provisions of this permit. Below is a list of the major requirements, with indications where those differ from the previous Construction General Permit.

EROSION AND SEDIMENT CONTROL PLAN

You must implement the Erosion and Sedimentation Control Plan approved for your project by the Division of Land Resources or by an approved local program. Adherence to that E&SC Plan is an enforceable component of the Stormwater Permit.

Your E&SC plan will identify areas where the more stringent 7 and 14 day ground stabilization requirements apply. See "New Ground Stabilization Requirements" on page 2.

MONITORING & INSPECTIONS

- ▶ You must keep a rain gauge on site.
- ▶ Dedicated demolition and other waste areas and earthen material stockpiles must be located at least 50' from storm drains or streams unless no alternative is feasible (new requirement)

▶ You must inspect all E&SC measures **at least once a week and within 24 hours after any storm event greater than a half inch (during a 24-hour period).** You must take immediate corrective action for any device failure.

▶ You must inspect all outlets where stormwater runoff leaves your site and evaluate the effect on nearby streams or wetlands. Corrective action must be taken if sediment is deposited off site or into a stream or wetland, or causes a visible increase in turbidity (cloudiness) of any waterbody

(continued on reverse side)

Permit Requirements (continued)

▶ You must keep records of these inspections and any corrective actions taken.

OPERATION & MAINTENANCE

You must provide the operation and maintenance necessary to maintain optimal performance of stormwater controls. This means **take corrective action** if erosion and sediment control facilities are not operating properly! Operation and maintenance includes, but is not limited to:

- Regularly cleaning out sedimentation basins.
- Stabilizing eroded banks or spillway structures.
- Repairing/clearing out inlets and outlets.
- Repairing piping, seepage and mechanical damage.
- Repairing silt fence damage.

REPORTING

Regular inspections are a chance to check impacts to nearby waters. If you observe sediment that has deposited in a stream or wetland, you must notify the **Division of Water Quality regional office** within 24 hours and provide **written notice within 5 days** (see # 3 on page 6 of the General Permit). Please send a copy of this correspondence to the Division of Land Resources (DLR).

NON-COMPLIANCE & FINES

Take compliance seriously! Projects that violate Stormwater Permit conditions and/or have unauthorized water quality impacts are subject to fines. **Civil penalties of up to \$25,000.00 per day for each violation may be assessed.**


Who inspects me for what?

DWQ coordinates with DLR's Land Quality Section to ensure compliance with state rules and regulations governing construction activities. That means your project is subject to enforcement by both divisions. In general, Land Quality staff will inspect your site on a regular basis. DWQ staff may also do inspections. The inspections may be routine in nature, or, the result of public complaints.

Do I need to submit a Notice of Intent to have coverage under this permit?

No. Once your E&SC Plan is approved, your site is automatically covered under this permit. You do not need to submit a Notice of Intent for a Certificate of Coverage.

NEW STABILIZATION TIMEFRAMES

Site Area Description	Stabilization	Timeframe Exceptions
 Perimeter dikes, swales, ditches and slopes	7 days	None
 High Quality Water (HQW) Zones	7 days	None
 Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
 Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
 All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

Do you need more information?



- NC Stormwater Permitting <http://portal.ncdenr.org/web/wq/ws/su>
- NCG01 Permit Information <http://portal.ncdenr.org/web/wq/ws/su/construction>
- Map of Regional Offices <http://portal.ncdenr.org/web/wq/home>

Still have questions? Call the DWQ Regional Office nearest your project's location:

Asheville Office	(828) 296-4500	Washington Office	(252) 946-6481
Fayetteville Office	(910) 433-3300	Wilmington Office	(910) 798-7215
Mooresville Office	(704) 663-1699	Winston-Salem Office	(336) 771-5000
Raleigh Office	(919) 791-4200	Central Office	(919) 807-6300

Major Elements of DWQ Construction General Permit

This document contains the major elements of the recently-revised North Carolina Division of Water Quality (DWQ) Construction General Permit (NCG01) with emphasis placed on those elements that differ from the previous permit (expiration on August 2, 2011). Since the summary list below cannot contain details of every change, the complete Permit should be used to assure full implementation. See: <http://portal.ncderr.org/web/wq/ws/su/construction>

The major change in the Permit from the previous one is the shorter times to apply ground stabilization such as mulch, wheat straw, or grasses. The NC laws and rules relating to the Sediment Act require, in most places, ground stabilization within 21 days. Based on the new EPA requirements and 9-months' work with a permit advisory group, CTAG, the Division and EPA-developed permit, now contains requirements for ground cover within 14, and in some places, 7 days.

1) Ground Stabilization*		
Site Area Description	Stabilization Time Frame	Stabilization Frame Exceptions
<ul style="list-style-type: none"> Perimeter dikes, swales, ditches and slopes 	7 days	None
<ul style="list-style-type: none"> High Quality Water (HQW) Zones 	7 days	None
<ul style="list-style-type: none"> Slopes steeper than 3:1 	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
<ul style="list-style-type: none"> Slopes 3:1 or flatter 	14 days	7-days for slopes greater than 50 feet in length
<ul style="list-style-type: none"> All other areas with slopes flatter than 4:1 	14 days	None (except for perimeters and HQW Zones)

* "Extensions of time may be approved by the permitting authority based on weather or other site-specific conditions that make compliance impracticable." (Section II.B(2)(b))

2) Building Wastes Handling	
<ul style="list-style-type: none"> No paint or liquid wastes in stream or storm drains 	
<ul style="list-style-type: none"> Dedicated areas for demolition, construction and other wastes must be located 50' from storm drains and streams unless no reasonable alternatives available. 	
<ul style="list-style-type: none"> Earthen-material stockpiles must be located 50' from storm drains and streams unless no reasonable alternatives available. 	
<ul style="list-style-type: none"> Concrete materials must be controlled to avoid contact with surface waters, wetlands, or buffers. 	

3) Discharges to Federally-listed Waters	
<ul style="list-style-type: none"> Requirements are the same as in previous permit. 	
<ul style="list-style-type: none"> The permit allows reduction from the 20 acre minimum if the Director of DWQ determines that other BMPs provide equivalent protection. 	

Major Elements of DWQ Construction General Permit- Continued

4) Inspections
<ul style="list-style-type: none"> • Same weekly inspection requirements • Same rain gauge & inspections after 0.5" rain event • Inspections are only required during "normal business hours" • Inspection reports must be available on-site during business hours unless a site-specific exemption is approved. • Records must be kept for 3 years and available upon request. • Electronically-available records may be substituted under certain conditions.
5) Implementation of New Permit Conditions
<ul style="list-style-type: none"> • Projects permitted under the previous permit can continue to follow the previously-permitted conditions. • Complete applications received prior to August 3, 2011 can follow conditions of approved application. • Applications received after August 2, 2011 must comply with new permit conditions.

6) Conditions in Erosion & Sedimentation Control Plans*
Designation on the plans where the 7 and 14-day ground stabilization requirements of the NPDES permit apply
Designation on the plans where basins that comply with the surface-withdrawal requirements of the NPDES permit are located.
7) Building Wastes Handling
<ul style="list-style-type: none"> • No paint or liquid wastes in stream or storm drains • Dedicated areas for demolition, construction and other wastes located 50' from storm drains and streams unless no reasonable alternatives are available. • Earthen-material stockpiles located 50' from storm drains unless no reasonable alternatives available. • Concrete materials must be controlled to avoid contact with surface waters, wetlands, or buffers.
8) Sediment Basins
<ul style="list-style-type: none"> • Outlet structures must withdraw from basin surface unless drainage area is less than 1 acre. • Use only DWQ-approved flocculants.

* In order for the E&SC Plan to satisfy the conditions of the Construction General permit, it must identify areas where the ground stabilization requirements apply and the location of the basins where the surface-withdrawal requirements apply.

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER QUALITY
GENERAL PERMIT – NCG 010000
TO DISCHARGE STORMWATER UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
for
CONSTRUCTION ACTIVITIES

In compliance with the provision of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by North Carolina Environmental Management Commission and the Federal Water Pollution Control Act as amended:

All owners or operators of stormwater point source discharges associated with construction activities including clearing, grading or excavation activities resulting in the disturbance of land greater than or equal to one acre, or that are part of a common plan of development of that size, are hereby authorized to discharge stormwater to the surface waters of North Carolina or to a separate storm sewer system conveying stormwater to the surface waters in accordance with the terms and conditions set forth herein. Failure to receive coverage under this permit or violations of any of the conditions listed may result in assessment of state or federal civil or criminal penalties for each day of violation.

The General Permit shall become effective on August 3, 2011.
The General Permit shall expire at midnight on July 31, 2016.

Signed this day July 28th, 2011



Coleen H. Sullins, Director
Division of Water Quality

By the Authority of the Environmental Management Commission

TABLE OF CONTENTS

	Page
SECTION I - COVERAGE UNDER THE GENERAL PERMIT	3
SECTION II - STORMWATER POLLUTION PREVENTION REQUIREMENTS ...	4
Section II.A. - Stormwater Pollution Prevention Requirements in the E&SC Plan	4
Section II.B. - Stormwater Pollution Prevention Requirements in the Construction GP	5
Section II.B.1. - Construction Site Pollutants	5
Section II.B.2 - Ground Stabilization	6
Section II.B.3 - Self Inspection and Reporting Requirements	6
Section II.B.4. - Sediment Basins	8
Section II.B.5. -Discharges to Special or Threatened Waters	8
SECTION III - FRAMEWORK OF PERMIT COVERAGE	8
SECTION IV - OPERATION AND MAINTENANCE OF POLLUTION CONTROLS .	10
SECTION V - PERMIT ADMINISTRATION AND COMPLIANCE ISSUES	11
SECTION VI - DISCHARGE MONITORING AND TURBIDITY LIMITATIONS	15
SECTION VII - DEFINITIONS	15
SECTION VIII - DIVISION OF WATER QUALITY CONTACTS	16

SECTION I
COVERAGE UNDER THE GENERAL PERMIT

Until this State of North Carolina General Permit expires or is modified or revoked, the permittee is authorized to discharge stormwater in accordance with the terms and conditions of this permit and in accordance with an approved Erosion and Sedimentation Control Plan by the North Carolina Division of Land Resources, Land Quality Section, or a delegated local program under the provisions and requirements of North Carolina General Statutes in Article 4 of Chapter 113A to the surface waters of North Carolina or to a separate storm sewer system. The permit, along with state statutes (N.C.G.S. 143-215.1) and rules (NCAC 2H .0100) relating to stormwater permitting are designed to work together to assure compliance with the NPDES requirements of the Clean Water Act. Furthermore, North Carolina rules in Title 15A NCAC 2H .0126 adopt by reference the federal stormwater permitting requirements.

Any other point source discharge to surface waters of the state is prohibited unless covered by another permit, authorization or approval. The discharges allowed by this General Permit shall not cause or contribute to violations of North Carolina Water Quality Standards for surface waters and wetlands (15A NCAC 2B .0200). Discharges allowed by this permit must meet all applicable water quality certification or permit requirements as outlined in 15A NCAC 2H .0500 and 2H .1300. This permit does not relieve the permittee from responsibility for compliance with any other applicable federal, state, or local law, rule, standard, ordinance, order, judgment, or decree.

This General Permit is applicable to point source discharges from construction activities disturbing one or more acres of land. The application to the Division of Land Resources or a delegated local program for approval of a local Erosion and Sedimentation Control Plan (E&SC Plan) shall be considered to take the place of a Notice of Intent for coverage under this General Permit for those projects requiring this Permit coverage. Coverage under this General Permit shall become effective upon issuance of an approval for the E&SC Plan by the Division of Land Resources or delegated local program that includes the following:

- a. Designation on the plans where the specific ground stabilization requirements apply as per Section II.B.2 of this permit.
- b. Designs of basins with surface withdrawal as per Section II.B.4 of this permit.

Prior to the commencement of construction and land disturbing activities, approval of the E&SC Plan shall be obtained.

This General Permit revision reflects changes made in the federal regulations effective February 1, 2010. The federal regulations were a result of litigation that mandated that construction activities over a certain size must contain additional specifications that would result in reduced wastes and sediment loading reaching the nation's waters. The Division of Water Quality and the Division of Land Resources established a Construction General Permit Technical Advisory Group (CTAG) to provide them guidance in developing the permit. The CTAG was comprised of 14 members who represented a broad range of environmental, regulatory, government and development interests. A Draft Construction General Permit was prepared and made available for review on May 13, 2011. A public meeting was held on June 7th. This permit reflects the input received during the twelve- month development process.

Any owner or operator not wishing to be covered or limited by this General Permit may apply for an individual NPDES permit in accordance with NPDES procedures in 15A NCAC 2H .0100, stating the reasons supporting the request. Any application for an individual permit should be made at least 180 days prior to the time the permit is needed unless waived, by the Director.

This General Permit does not cover activities or discharges covered by an individual NPDES permit until the individual permit has expired or has been rescinded. Any person conducting an activity covered by an

individual permit but which could be covered by this General Permit may request that the individual permit be rescinded and coverage under this General Permit be provided.

The Division of Water Quality partners with the Division of Land Resources to implement a complete program for construction site coverage that includes state sedimentation control and NPDES stormwater control. The Division of Land Resources implements their control programs through an Erosion and Sedimentation Control Plan (E&SC Plan) issued for each construction site in the state disturbing one or more acres of land. An E&SC Plan is required for each site by the Division of Land Resources or a delegated local government program. The NPDES Construction Stormwater permit (NCG010000) is attached to Erosion and Sedimentation Control Plan approvals. The permittee is responsible for abiding by the conditions of both of these documents.

The Sedimentation Pollution Control Act of 1973 places a duty upon the Sedimentation Control Commission to "develop recommended methods of control of sedimentation and prepare and make available for distribution publications and other materials dealing with sedimentation control techniques appropriate for use by persons engaged in land-disturbing activities." The Sedimentation Control Commission and the Division of Land Resources have adopted the North Carolina Erosion and Sediment Control Planning and Design Manual as the document to provide that guidance for use at all construction sites in the state. The individual Erosion and Sedimentation Control Plans are developed based on this guidance and become a condition of the Division of Water Quality's Construction Stormwater General Permit. As provided in this permit, "deviation from the approved E&SC Plan, or approved amendment to that plan, shall constitute a violation of the terms and conditions of this general permit."

SECTION II **STORMWATER POLLUTION PREVENTION REQUIREMENTS**

The State construction-related stormwater pollution prevention program provides for: (a) identification of the potential sources of stormwater pollution at the individual construction site; (b) description of the stormwater control measures to reduce or eliminate pollutants in stormwater discharges from the construction site; and (c) identification of the procedures the operator will implement to comply with the terms and conditions of this general permit and the Erosion and Sedimentation Control Plan (E&SC Plan). In North Carolina, the approved **Erosion and Sedimentation Control Plan** for the site, and the **NCG01 Construction General Permit** are considered the **Stormwater Pollution Prevention Plan (SWPPP)** for that site. These two documents, and any specifically-added water quality conditions for that site, contain the provisions necessary to meet the federal regulatory requirements of the NPDES program including provisions implementing the Effluent Limitations Guidelines effective at the time of this permit.

SECTION II.A. - STORMWATER POLLUTION PREVENTION REQUIREMENTS **IN THE EROSION AND SEDIMENTATION CONTROL PLAN**

The Erosion and Sedimentation Control program is mandated and funded according to state statutes. The majority of the technology-based requirements needed to satisfy the federal stormwater pollution prevention specifications are addressed in the approved E&SC Plan. Each applicant for an E&SC Plan approval is required to comply with a "checklist" of over 50 site-specific conditions*. The categories of these conditions include:

- 1) location information,
- 2) site features,
- 3) control measures,
- 4) drainage features,
- 5) stormwater calculations,
- 6) stabilization,
- 7) ownership information and
- 8) construction sequencing.

*The individual requirements to be addressed in each E&SC Plan application can be found at <http://portal.ncdenr.org/web/lr/erosion> . See "Plan check list for designers."

SECTION II.B. - STORMWATER POLLUTION PREVENTION REQUIREMENTS IN THE NC CONSTRUCTION GENERAL PERMIT

In addition to the stormwater pollution prevention controls found in the E&SC Plan, this Construction General Permit contains additional conditions that must be met in order to comply with the NPDES program requirements. They are as follows:

1) Construction Site Pollutants

Permittee must manage activities on the site such that water quality standards are not violated from site activities or allowed discharges. In addition to stream pollution from sediment discharge, other activities on construction and development sites can result in pollutants reaching the state's waters. EPA has prepared guidance documents that provide best management practices that address many activities. See http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=menu_measure&min_measure_id=4

The following activities, and others on a site-specific basis, require oversight throughout the construction and development process to assure that all water quality standards are protected:

- a) **Equipment Operation and Maintenance** - Equipment utilized during the construction activity on a site must be operated and maintained in such a manner as to prevent the potential or actual pollution of the surface or ground waters of the state. Fuels, lubricants, coolants, and hydraulic fluids, or any other petroleum products, shall not be discharged onto the ground or into surface waters. Spent fluids shall be cleaned up and disposed of in a manner so as not to enter the waters, surface or ground, of the state and in accordance with applicable state and federal regulations.
- b) **Material Handling - Herbicide, pesticide, and fertilizer usage** during the construction activity shall be consistent with the Federal Insecticide, Fungicide, and Rodenticide Act and shall be in accordance with label restrictions.
- c) **Building Material Waste Handling**
 - i) All wastes composed of building materials shall be disposed of in accordance with North Carolina General Statutes, Chapter 130A, Article 9 - Solid Waste Management, and rules governing the disposal of solid waste (North Carolina Administrative Code Section 15A NCAC 13B).
 - ii) Locate areas dedicated for management of land clearing and demolition debris, construction and domestic waste, and hazardous or toxic waste. This location shall be at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available.
 - iii) Dumping of paint and other liquid building material wastes in storm drains is prohibited.
 - iv) **Litter and Sanitary Waste** - The permittee shall control the management and disposal of litter and sanitary waste from the site.
- d) **Location of Stock Piles** - Locate earthen-material stock pile areas at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available.
- e) **Handling of Concrete**
 - i) Concrete materials onsite, including excess concrete, must be controlled and managed to avoid contact with surface waters, wetlands or buffers. No concrete or cement slurry shall be discharged from the site. (Note that discharges from onsite concrete plants require coverage under a separate NPDES permit - NCG140000.)
 - ii) Any hardened concrete residue will be disposed of, or recycled onsite, in accordance with local and state solid waste regulations.

2) Ground Stabilization

- a) Soil stabilization shall be achieved on any area of a site where land-disturbing activities have temporarily or permanently ceased according to the following schedule:
 - i) All perimeter dikes, swales, ditches, perimeter slopes and all slopes steeper than 3 horizontal to 1 vertical (3:1) shall be provided temporary or permanent stabilization with ground cover as soon as practicable but in any event within 7 calendar days from the last land-disturbing activity.
 - ii) All other disturbed areas shall be provided temporary or permanent stabilization with ground cover as soon as practicable but in any event within 14 calendar days from the last land-disturbing activity.
- b) Conditions - In meeting the stabilization requirements above, the following conditions or exemptions shall apply:
 - i) Extensions of time may be approved by the permitting authority based on weather or other site-specific conditions that make compliance impracticable.
 - ii) All slopes 50' in length or greater shall apply the ground cover within 7 days except when the slope is flatter than 4:1. Slopes less than 50' shall apply ground cover within 14 days except when slopes are steeper than 3:1, the 7 day-requirement applies.
 - iii) Any sloped area flatter than 4:1 shall be exempt from the 7-day ground cover requirement.
 - iv) Slopes 10' or less in length shall be exempt from the 7-day ground cover requirement except when the slope is steeper than 2:1.
 - v) Although stabilization is usually specified as ground cover, other methods, such as chemical stabilization, may be allowed on a case-by-case basis.
 - vi) For portions of projects within the Sediment Control Commission-defined "High Quality Water Zone" (15A NCAC 04A. 0105), stabilization with ground cover shall be achieved as soon as practicable but in any event on all areas of the site within 7 calendar days from the last land-disturbing act.
 - vii) Portions of a site that are lower in elevation than adjacent discharge locations and are not expected to discharge during construction may be exempt from the temporary ground cover requirements if identified on the approved E&SC Plan or added by the permitting authority.

3) Self Inspection and Reporting Requirements

Minimum self inspection and reporting requirements are as follows unless otherwise approved in writing by the Division of Water Quality.

- a) A rain gauge shall be maintained in good working order on the site unless another rain-monitoring device has been approved by the Division of Water Quality.
- b) A written record of the daily rainfall amounts shall be retained and all records shall be made available to Division of Water Quality or authorized agent upon request. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, the cumulative rain measurement for those un-attended days will determine if a site inspection is needed. (Note: if no rainfall occurred, the permittee must record "zero").
- c) Erosion and sedimentation control measures shall be inspected to ensure that they are operating correctly. Inspection records must be maintained for each inspection event and for each measure. At a minimum, inspection of measures must occur at the frequency indicated below:
 - i) All erosion and sedimentation control measures must be inspected by or under the direction of the permittee at least once every seven calendar days, and
 - ii) All erosion and sediment control measures must be inspected by or under the direction of the permittee within 24 hours after any storm event of greater than 0.50 inches of rain per 24 hour period.
- d) Once land disturbance has begun on the site, stormwater runoff discharge outfalls shall be inspected by observation for erosion, sedimentation and other stormwater discharge characteristics such as clarity, floating solids, and oil sheens. Inspections of the outfalls shall be made at least once every seven calendar days and within 24 hours after any storm event of greater than 0.50 inches of rain per 24 hour period.

- e) Inspections are only required to be made during normal business hours. When adverse weather conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection can be delayed until it is deemed safe to perform these duties. (Times when inspections were delayed because of safety issues should be noted in the Inspection Record.) If the inspection cannot be done on that day, it must be completed on the following business day.
- f) Twenty-four Hour Reporting for visible sediment deposition
 - i) The permittee shall report to the Division of Water Quality central office or the appropriate regional office any visible sediment being deposited in any stream or wetland or any noncompliance which may endanger health or the environment. (See Section VIII of this permit for contact information.) Any information shall be provided orally or electronically within 24 hours from the time the permittee became aware of the circumstances.
 - ii) A written submission shall be provided to the appropriate regional office of the Division of Water Quality within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the sediment deposition and actions taken to address the cause of the deposition. The Division of Water Quality staff may waive the requirement for a written report on a case-by-case basis.
- g) Records of inspections made during the previous 30 days shall remain on the site and available for agency inspectors at all times during normal working hours, unless the Division of Water Quality provides a site-specific exemption based on unique site conditions that make this requirement not practical. Older records must be maintained for a period of three years after project completion and made available upon request. The records must provide the details of each inspection including observations, and actions taken in accordance with this permit. The permittee shall record the required rainfall and monitoring observations on the Inspection Record form provided by the Division or a similar inspection form that is inclusive of all of the elements contained in the Division's form. Use of electronically-available records, in lieu of the required paper copies for inspection will be allowed if shown to provide equal access and utility as the hard-copy records.
- h) Inspection records must include, at a minimum, the following:
 - i) Control Measure Inspections: Inspection records must include at a minimum: 1) identification of the measures inspected, 2) date and time of the inspection, 3) name of the person performing the inspection, 4) indication of whether the measures were operating properly, 5) description of maintenance needs for the measure, 6) corrective actions taken (7) date of actions taken, as well as the date and amounts of rainfall received.
 - ii) Stormwater Discharge Inspections: Inspection records must include at a minimum: 1) identification of the discharge outfall inspected, 2) date and time of the inspection, 3) name of the person performing the inspection, 4) evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5) indication of visible sediment leaving the site, 6) actions taken to correct/prevent sedimentation and 7) date of actions taken.
 - iii) Visible Sedimentation Found Outside the Site Limits: Inspection records must include: 1) an explanation as to the actions taken to control future releases, 2) actions taken to clean up or stabilize the sediment that has left the site limits and 3) the date of actions taken.
 - iv) Visible Sedimentation Found in Streams or Wetlands: All inspections should include evaluation of streams or wetlands onsite or offsite (where accessible) to determine if visible sedimentation has occurred.
- i) Visible Stream Turbidity - If the discharge from a site results in an increase in visible stream turbidity, inspection records must record that evidence and actions taken to reduce sediment contributions. Sites discharging to streams named on the state's 303(d) list as impaired for sediment-related causes may be required to perform additional monitoring, inspections or

application of more-stringent management practices if it is determined that the additional requirements are needed to assure compliance with the federal or state impaired-waters conditions. If a discharge covered by this permit enters a stream segment that is listed on the Impaired Stream List for sediment-related causes, and a Total Maximum Daily Load (TMDL) has been prepared for those pollutants, the permittee must implement measures to ensure that the discharge of pollutants from the site is consistent with the assumptions and meets the requirements of the approved TMDL. The Division of Water Quality 303(d) list can be found at: http://h2o.enr.state.nc.us/tmdl/General_303d.htm/

4.) Sediment Basins

Sediment basins and traps shall meet the following requirements:

- a) Outlet structures shall be utilized that withdraw water from the surface.
- b) For basins or traps that have a drainage area of less than 1.0 acre, draw-down designs specified in the Division of Land Resources or delegated local program requirements are acceptable.
- c) Chemical treatment
 - i) All treatment chemicals must be stored in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures designed to protect adjacent surface waters.
 - ii) All treatment chemicals must be used in accordance with dosing specifications and application rates provided by the manufacturer, supplier and as specified by the Division of Water Quality.
 - iii) The Permittee must only use chemicals that have been approved by the NC Division of Water Quality and posted on their "North Carolina Division of Water Quality Approved PAMS/Flocculants List" found on their web site at: <http://portal.ncdenr.org/web/wq/ws/su>.
 - iv) The Permittee must route stormwater treated with polymers, flocculants, or other treatment chemicals through sediment trapping, filtering, and/or settling devices(s) to ensure adequate removal of sediment flocculent prior to discharge to surface waters.
- d) Discharge requirement - Discharges must meet the statutory requirements of the Sediment Pollution Control Act and utilize the provisions of Section 6.74 of the Erosion and Sediment Control Planning and Design Manual to assure that buffers and vegetated areas will be used to reduce the potential for visible siltation outside of the 25% buffer zone nearest the land-disturbing activity.

5.) Discharges to Special or Threatened Waters

- a) Disturbed areas within one mile of and draining to waters where federally-listed threatened or endangered aquatic species are present shall be limited at any time to a maximum total area within the boundaries of the tract of 20 acres. These projects shall also use control measures that are designed, installed and maintained in accordance with criteria set forth in 15A NCAC 04B .0124 - Design Standards in Sensitive Watersheds. The Division of Water Quality may require additional/alternative protection measures or require coverage under an individual Construction NPDES Stormwater permit. Other management practices may be acceptable if these designs are shown by the applicant, to the satisfaction of the Director, to provide equivalent protection.
- b) Construction activities in High Quality Waters Zones require quicker ground stabilization provisions as specified in Section II.B.2.b. of the permit.

SECTION III **FRAMEWORK OF PERMIT COVERAGE**

During the period beginning on the effective date of the permit and lasting until expiration, the Permittee is authorized to discharge stormwater associated with construction activity including clearing, grading and excavation activities resulting in the disturbance of land and related support activities. Such discharges shall be controlled, limited and monitored as specified in this permit.

- 1) Continuation of Previously Permitted Projects - Projects and their corresponding activities permitted under the previous version of the NC general permit for construction activities will continue to be valid with the previous permit conditions and will be considered covered under this general permit.
- 2) Projects submitted prior to the effective date of the permit – Complete project applications that were received prior to the effective date of this permit, but not approved by the permitting authority until after approval of this NPDES permit, can rely on design and management practices effective at the time of application submittal.
- 3) Implementation of the Erosion and Sedimentation Control Plan (E&SC Plan):
 - a) The Permittee must implement and follow the E&SC Plan, which has been approved by the Division of Land Resources or local delegated program.. The approved E&SC Plan is considered a condition of this general permit.
 - b) Deviation from the approved E&SC Plan, or approved amendment, shall constitute a violation of the terms and conditions of this general permit except that deviation from the approved plan will be allowed:
 - i) to correct an emergency situation where sediments are being discharged off the site, or,
 - ii) when minor modifications have been made that result in an alteration or relocation of an erosion or sedimentation control measure and does not affect the ability of the measure to perform as intended.
 - c) Allowed deviations must be noted on the approved E&SC Plan and maintained at the job site.
 - d) Prior to the commencement of any land disturbance onsite, and during the construction activities, a copy of the approved E&SC Plan and this NPDES construction permit shall be maintained on the site. These documents must be kept current and up to date.
- 4) BMPs and Control Measures - Consistent with the provisions contained in this permit and the E&SC Plan, the permittee must select, install, implement and maintain best management practices (BMPs) and control measures that minimize pollutants in the discharge to meet the requirements of this permit.
- 5) Additional Action - If there is evidence indicating that the stormwater discharges from the site are impacting or have the potential to impact surface waters or wetlands, the Division of Water Quality may take appropriate actions including any or all of the following:
 - a) take compliance and enforcement action;
 - b) require the permittee to include and implement appropriate control and restoration measures;
 - c) require the permittee to develop and implement additional site-specific stormwater pollution prevention measures;
 - d) require the permittee to obtain an individual permit.
- 6) When an Individual Permit may be Required - The Director may require any owner/operator authorized to discharge under a certificate of coverage issued pursuant to this general permit to apply for and obtain an individual permit or a general permit with additional conditions. Any interested person may petition the Director to require an individual permit pursuant to 15A NCAC 2H .0127. Cases where an individual permit may be required include, but are not limited to, the following:
 - a) The receiving stream is of a unique quality and the standard conditions may not provide adequate protection;
 - b) The discharger is a significant contributor of pollutants;
 - c) Conditions at the permitted site change, altering the constituents and/or characteristics of the discharge such that the discharge no longer qualifies for a General Permit;

- d) A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;
 - e) The discharge violates the terms or conditions of this general permit;
 - f) Effluent limitations are promulgated for the point sources covered by this general permit;
 - g) A Water Quality Management Plan containing requirements applicable to such point sources is approved after the issuance of this general permit.
- 7) When an Individual Permit may be Requested - Any permittee operating under this general permit may request to be excluded from the coverage of this general permit by applying for an individual permit. When an individual permit is issued to an owner/operator the applicability of this general permit is automatically terminated on the effective date of the individual permit.

SECTION IV

OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

- 1) Proper Operation and Maintenance - The permittee shall at all times properly operate and maintain all control measures and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this general permit.
- 2) Need to Halt or Reduce not a Defense - It shall not be a defense for a permittee in an enforcement action that it was necessary to halt or reduce the permitted activity in order to maintain compliance with the condition of this general permit.
- 3) Bypassing of Stormwater Control Facilities
 - a) Bypass Not Exceeding Limitations.
The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation or as part of a planned action specified in the approved Erosion and Sedimentation Control Permit. These bypasses are not subject to the provisions of Paragraphs b. and c. of this section.
 - b) Notice
 - i) Anticipated bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass; including an evaluation of the anticipated quality and effect of the bypass.
 - ii) Unanticipated bypass - The permittee shall submit notice to the Division contact (See Section VIII.) within 24 hours of the occurrence of an unanticipated bypass.
 - c) Prohibition of Bypass
Bypass is prohibited and the Director may take enforcement action against a permittee for bypass, unless:
 - i) Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;
 - ii) There were no feasible alternatives to the bypass, such as the use of auxiliary control facilities, retention of stormwater or maintenance during normal periods of equipment downtime or dry weather. This condition is not satisfied if adequate backup controls should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - iii) The permittee submitted notices as required under Paragraph b. of this section.
 - d) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in Paragraph c. of this section.
- 4) Upsets
 - a) Definition - "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment or control facilities,

- inadequate treatment or control facilities, lack of preventive maintenance, or careless or improper operation.
- b) Effect of an Upset - An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph c. of this condition are met. No determination made during administrative review of claims that noncompliance was caused by-upset, and before an action for noncompliance, is final administrative action subject to judicial review.
 - c) Conditions Necessary for a Demonstration of Upset - A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - i) An upset occurred and that the permittee can identify the cause(s) of the upset;
 - ii) The permitted facility was at the time being properly operated;
 - iii) The permittee submitted notice of the upset as required in this general permit, and,
 - iv) The permittee complied with any remedial measures required in this general permit.
 - d) Burden of Proof - In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.
- 5) Inspection and Entry - The permittee shall allow the Director or an authorized representative (including an authorized contractor acting as a representative of the Director), upon the presentation of credentials and other documents as may be required by law, to:
- a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this general permit;
 - b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this general permit;
 - c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and
 - d) Sample or monitor at reasonable times, for the purposes of assuring general permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

SECTION V

PERMIT ADMINISTRATION AND COMPLIANCE ISSUES

- 1) Time of compliance - Erosion and sedimentation control measures shall be maintained, and self-monitoring shall continue, after the completion of construction and development until the establishment of permanent ground cover sufficient to restrain erosion or until the financially responsible party has conveyed ownership or control of the tract of land for which the erosion and sedimentation control plan has been approved and the agency that approved the plan has been notified. If the financially responsible party has conveyed ownership or control of the tract of land for which the Erosion and Sedimentation Control Plan has been approved, the new owner or person in control shall conduct and document self-monitoring until the establishment of permanent ground cover sufficient to restrain erosion.

Upon establishment of permanent ground cover sufficient to restrain erosion, the permittee shall request an inspection by the permitting authority to verify the adequacy of the ground cover. Coverage under the permit shall end when a Sedimentation Inspection Report is issued documenting the final stabilization of the site with adequate permanent ground cover. The signed Sedimentation Inspection Report shall serve as a notice of termination.

- 2) Operation efficiency - During construction and until the completion of construction or development and the establishment of permanent stabilization, the permittee shall provide the operation and maintenance necessary to operate the storm water control measures and all erosion and sedimentation control measures at optimum efficiency.
- 3) Corrective action - If inspections required by this permit identify a need for maintenance of control measures, modifications or additions to control measures, or corrective actions to control sediment

or other pollutants these actions must be performed as soon as possible and before the next storm event to maintain the effectiveness of the control measures.

- 4) Duty to Comply - The permittee must comply with all conditions of this general permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; certificate of coverage termination, revocation and reissuance, or modification; or denial of a certificate of coverage upon renewal application.
 - a) The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
 - b) The Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed \$27,000 per day for each violation. The Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.
 - c) Under state law, a daily civil penalty of not more than twenty-five thousand dollars (\$25,000) per violation may be assessed against any person who violates or fails to act in accordance with the terms, conditions, or requirements of a permit. [Ref: NC General Statute 143-215.6A].
 - d) Any person may be assessed an administrative penalty by the Administrator of the U.S. Environmental Protection Agency for violating section 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed \$16,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$37,500. Penalties for Class II violations are not to exceed \$15,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$177,500.
- 5) Duty to Mitigate - The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this general permit that has a reasonable likelihood of adversely affecting human health or the environment.

- 6) Civil and Criminal Liability - Except as provided in Section IV.3. of this permit regarding bypassing of stormwater control facilities, nothing in this general permit shall be construed to relieve the permittee from any responsibilities, liabilities, or penalties for noncompliance pursuant to NCGS 143-215.3, 143-215.6A, 143-215.6B, 143-215.6C or Section 309 of the Federal Act, 33 USC 1319. Furthermore, the permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.
- 7) Oil and Hazardous Substance Liability - Nothing in this general permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under NCGS 143-215.75 et seq. or Section 311 of the Federal Act, 33 USC 1321. Furthermore, the permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.
- 8) Property Rights - The issuance of this general permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.
- 9) Severability - The provisions of this general permit are severable, and if any provision of this general permit, or the application of any provision of this general permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this general permit, shall not be affected thereby.
- 10) Duty to Provide Information - The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the certificate of coverage issued pursuant to this general permit or to determine compliance with this general permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this general permit.
- 11) Signatory Requirements
 - a) All applications, reports, or information submitted to the Director shall be signed and certified as follows:
 - i) For a corporation: by a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (a) a president, secretary, treasurer or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or (b) the manager of one or more manufacturing production or operating facilities provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
 - ii) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
 - iii) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
 - b) All reports required by the general permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - i) The authorization is made in writing by a person described above;
 - ii) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or well field, superintendent, a position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the

company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

iii) The written authorization is submitted to the Director.

c) Any person signing a document under paragraphs a. or b. of this section shall make the following certification:

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

- 12) Penalties for Tampering - The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this general permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or both.
- 13) General Permit Modification, Revocation and Reissuance, or Termination - The issuance of this general permit does not prohibit the Director from reopening and modifying the general permit, revoking and reissuing the general permit, or terminating the general permit as allowed by the laws, rules, and regulations contained in Title 40, Code of Federal Regulations, Parts 122 and 123; Title 15A of the North Carolina Administrative Code, Subchapter 2H .0100; and North Carolina General Statute 143-215.1 et. seq.
- 14) Availability of Reports - Except for data determined to be confidential under NCGS 143-215.3(a)(2) or Section 308 of the Federal Act, 33 USC 1318, all reports prepared in accordance with the terms shall be available for public inspection at the offices of the Division of Water Quality. As required by the Act, discharge data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NCGS 143-215.6B or in Section 309 of the Federal Act.
- 15) Penalties for Falsification of Reports - The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this general permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or by both.
- 16) Anticipated Noncompliance - The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity that may result in noncompliance with the general permit requirements.
- 17) Other Information - Where the permittee becomes aware that it failed to submit any relevant facts in any report to the Director, it shall promptly submit such facts or information.
- 18) Limitations Reopener - This general permit shall be modified or alternatively, revoked and reissued, to comply with any applicable effluent guideline or water quality standard issued or approved under Sections 302(b) (2) (c), and (d), 304(b) (2) and 307(a) of the Clean Water Act, if the effluent guideline or water quality standard so issued or approved:
 - a) contains different conditions or is otherwise more stringent than any effluent limitation in the general permit; or
 - b) controls any pollutant not limited in the general permit.
 - c) The general permit as modified or reissued under this paragraph shall also contain any other requirements in the Act then applicable.

SECTION VI
DISCHARGE MONITORING AND TURBIDITY LIMITATIONS

This General Permit does not include requirements for numeric limits for discharges from construction sites. However, the next reissuance of this North Carolina Construction General Permit (NCG 01) is scheduled for five years from the date of approval of this permit and will contain effluent limitations as required in *Subpart B-Construction and Development Effluent Guidelines* of Part 450 of the Code of Federal Regulations.

SECTION VII
DEFINITIONS

- 1) **Act** or "**the Act**" or CWA - The Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 USC 1251, et. seq.
- 2) **Best Management Practices (BMPs)** - Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operation procedures, and management practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
- 3) **Bypass** - The intentional diversion of stormwater from any portion of a stormwater control facility.
- 4) **Control Measures** - Refers to any BMP or other structural or non-structural practices and procedures used to prevent or reduce the discharge of pollutants including practices to control erosion and sedimentation.
- 5) **Director** - The Director of the Division of Water Quality.
- 6) **Division** - The Division of Water Quality, Department of Environment, and Natural Resources.
- 7) **EMC** - The North Carolina Environmental Management Commission.
- 8) **Erosion and Sedimentation Control Plan** - A plan developed in compliance with the North Carolina Sedimentation Pollution Control Act of 1973 to prevent the erosion and deposition of sediment and other materials into the waters of the State from construction or other land-disturbing activities that disturb one or more acres of land. Each plan must be approved by the NC Sedimentation Control Commission or a program delegated by the Commission to a local government.
- 9) **Ground cover** - Any vegetative growth or other material which, when applied to the soil surface, renders the soil surface stable against accelerated erosion.
- 10) **Normal Business Hours** - These are generally considered to be between the hours of 6 a.m. and 6 p.m., or when workers are normally present on the construction site. Weekends and federal holidays are not considered normal business hours unless construction activities are taking place on the site during those times.
- 11) **Permitting Authority** - The permitting authority is the agency that issues the permit. The Division of Water Quality is the delegated NPDES permitting authority and issues this permit. However, some erosion and sedimentation control activities are performed by Division of Land Resources or the locally-delegated programs. Other activities may be shared by the two divisions and the local programs. The Land Quality Section of the Division of Land Resources and the Surface Water Protection Section of the Division of Water Quality maintain a Memorandum of Understanding that specifies specific roles of the two divisions and the local programs and will be used to assign specific control and oversight activities between the agencies.
- 12) **Permanently Cease** - When all or part of the land disturbing activity is complete and no additional alteration or disturbance of the land surface is planned prior to final stabilization.
- 13) **Permanent Stabilization** - When all soil disturbing activity is completed and exposed soils have been stabilized with a vegetative cover with a density of at least 80% or covered with a structural stabilization method. Permanent perennial vegetation may include the use of sod, shrubs and ground cover plants mixed with mulching, aggregate or other landscaping techniques. Structural methods include concrete, asphalt, retaining wall or other stabilization techniques.

- 14) Permittee - The person, firm or organizational entity that signed as the financially responsible party on the Erosion and Sedimentation Control Plan.
- 15) Point Source Discharge - Any discernible, confined and discrete conveyance, including but specifically not limited to, any pipe, ditch, channel, tunnel, conduit, discrete fissure, or container from which pollutants are or may be discharged to waters of the state.
- 16) Soil Stabilization - The use of vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.
- 17) Stormwater Pollution Prevention Plan (SWPPP) - The elements of the State's stormwater pollution prevention program that provide the technology-based requirements designed to protect the state's waters from the adverse impacts of sediments. In North Carolina, the combination of the NCG01 Construction General and the Erosion and Sedimentation Control Plan are considered the SWPPP. It should be noted that on sites that involve multiple or complex sources of pollution, the Division may require additional control measures as needed to assure that water quality is protected and these additional measures will also be considered part of the SWPPP.
- 18) Temporarily Cease - When all or part of the site that is and will remain un-worked for a period of days but where site land disturbing activity is not complete and additional land disturbing activity is planned.
- 19) Temporary Stabilization - When the establishment of ground cover over all disturbed areas (such as mulching, rolled erosion control products, vegetation, or other material) renders the surface stable against accelerated erosion. Stabilization shall be achieved with the establishment of a uniform and evenly-distributed (i.e., without large bare areas) ground cover with a cover density of at least 80%.
- 20) Severe property damage - Substantial physical damage to property, damage to the control measures that cause them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

SECTION VIII
NC DIVISION OF WATER QUALITY CONTACTS

Asheville Regional Office

2090 U.S. Highway 70
Swannanoa, NC 28778
828/296-4500
FAX 828/299-7043

Fayetteville Regional Office

Systel Building,
225 Green St., Suite 714
Fayetteville, NC 28301-5094
910/433-3300
FAX 910/486-0707

Mooreville Regional Office

610 East Center Ave.
Mooreville, NC 28115
704/663-1699
FAX 704/663-6040

Winston-Salem Regional Office

585 Waughtown Street
Winston-Salem, NC 27107
336/771-5000
FAX 336/771-4630

Washington Regional Office

943 Washington Square Mall
Washington, NC 27889
252/946-6481
FAX 252/975-3716

Wilmington Regional Office

127 Cardinal Drive Extension
Wilmington, NC 28405
910/796-7215
FAX 910/350-2004

Raleigh Regional Office

3800 Barrett Drive
Raleigh, NC 27609
919/791-4200
FAX 919/571-4718

Raleigh Regional Office

Mail to:
1628 Mail Service Center
Raleigh, NC 27699-1628



Certificate of Sedimentation and Erosion Control Plan Approval and
Land-Disturbing Permit

For
Briar Chapel Phase 9 – Section 2

Project Name and Location

2013-035

Permit Number

The posting of this certificate certifies that an erosion and sedimentation control plan has been approved for this project by Chatham County, North Carolina in accordance with North Carolina General Statute 113A-57 (4) and 113A-54 (d)(4), the North Carolina Administrative Code, Title 15A, Chapter 4B.0007 (c) and as per applicable sections of the Chatham County Soil Erosion and Sedimentation Control Ordinance. This certificate must be posted at the primary entrance of the job site before construction begins and until establishment of permanent ground cover as required by North Carolina Administrative Code, Title 15A, Chapter 4B.0027 (b) and as per Chatham County's Erosion and Sediment Control Ordinance, Section 5 (i).

Responsible Person: Laurie Ford Phone: (919) 951-0714

This plan was approved with "modifications" Yes No and / or
"performance reservations" Yes No.

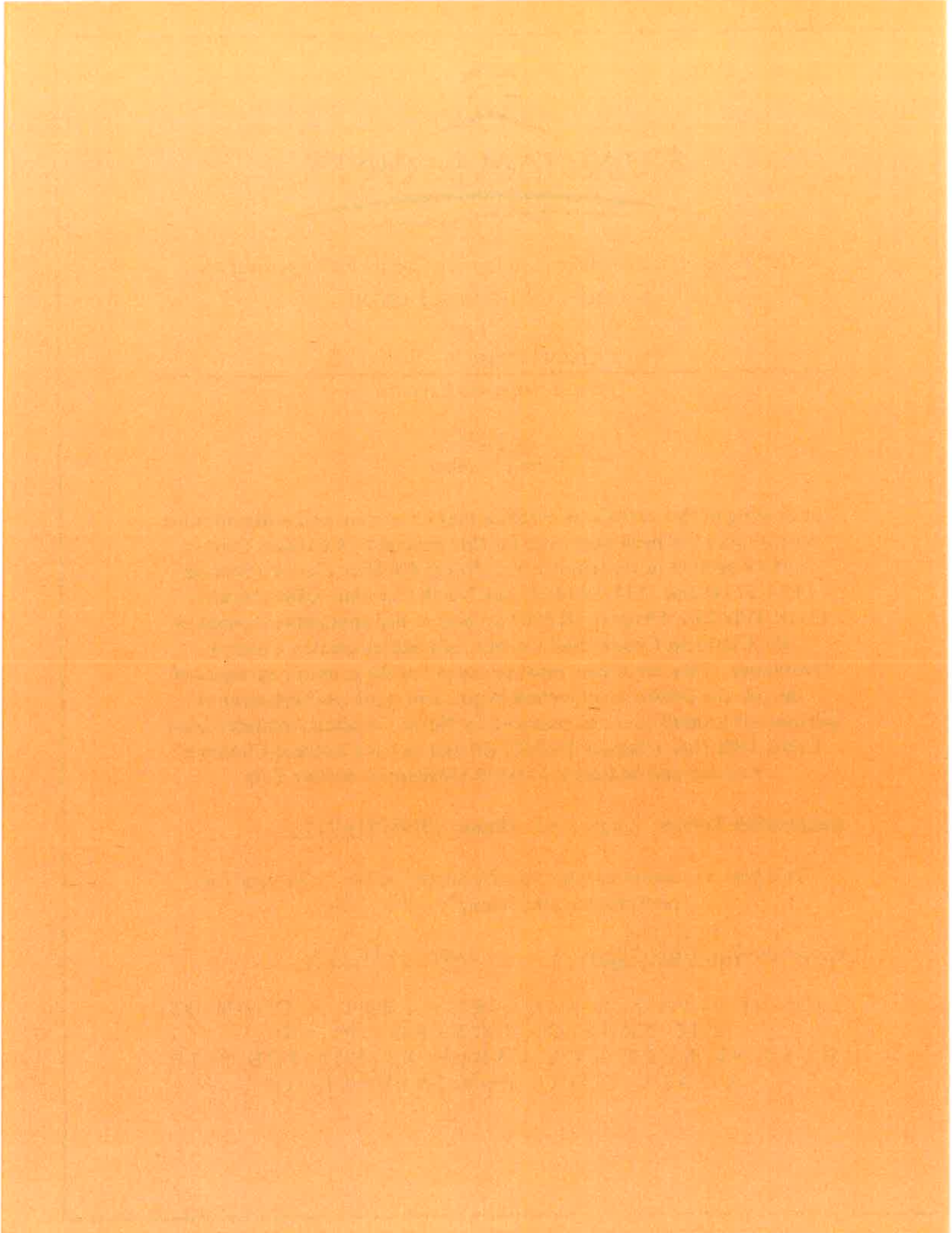
Reviewer:

Rachel Horn

Date:

11/5/13

THE ORDINANCE REQUIRES THAT A COPY OF
THE EROSION CONTROL PLAN
MUST BE KEPT AVAILABLE AT THE JOB SITE
AT ALL TIMES FOR INSPECTION





**Environmental Quality Department
Land and Water Resources Division
Soil Erosion & Sedimentation Control Program**

LETTER OF APPROVAL WITH MODIFICATIONS

November 5, 2013

NNP- Briar Chapel, LLC
Attn: Lee Bowman
16 Windy Knoll Circle
Chapel Hill, NC 27516

RE: Project Name: Briar Chapel Phase 9 Section 2
Project Number: 2013-035
Acres approved: 20.57
Total Acres: 176.76
Submitted By: McKim & Creed, Inc.
Date Received: 11-1-13

Dear Sir:

This office has reviewed the subject erosion and sedimentation control plan. We find the plan to be acceptable with modifications and hereby issue this letter of Approval With Modifications. The Modifications Required for Approval are listed on the attached page. This plan approval shall expire two (2) years following the date of approval, if no land-disturbing activity has been undertaken.

Please be advised that Section 6 (I) of the Chatham County Sedimentation and Erosion Control Ordinance requires that a copy of the approved erosion control plan be on file at the job site. Also, you should consider this letter to give the Notice required by G.S. 113A-61.1(a) of our right of periodic inspection to insure compliance with the approved plan.

North Carolina's Sedimentation Pollution Control Program is performance-oriented, requiring protection of existing natural resources and adjoining properties. If, following the commencement of this project,

it is determined that the erosion and sedimentation control plan is inadequate to meet the requirements of the Chatham County Sedimentation and Erosion Control Ordinance, this office may require revisions to the plan and implementation of the revisions to insure compliance with the Act.

Acceptance and approval of this plan is conditioned upon your compliance with Federal and State water quality laws, regulations, and rules. In addition, local city or county ordinances or rules may also apply to this land-disturbing activity. This approval does not supersede any other permit or approval.

Please be aware that your project will be covered by the enclosed NPDES General Stormwater Permit NCGO1000 (Construction Activities). You should first become familiar with all of the requirements for compliance with the enclosed general permit.

Please note that this approval is based in part on the accuracy of the information provided in the Financial Responsibility Form, which you have provided. You are requested to file an amended form if there is any change in the information included on the form. Please notify us when you would like to schedule a preconstruction conference. Notification shall be given at least 7 days prior to initiation of activity.

Your cooperation is appreciated.

Sincerely,

A handwritten signature in black ink that reads "Rachael Thorn". The signature is fluid and cursive, with the first name "Rachael" written in a larger, more prominent script than the last name "Thorn".

Rachael Thorn
Lead Sedimentation and Erosion Control Officer
Chatham County Environmental Quality Department

Enclosures: Certificate of Approval
NPDES Permit

MODIFICATIONS REQUIRED FOR APPROVAL

1. Issuance of Preliminary Plat Approval by the Chatham County Board of Commissioners is required before the installation/construction of permanent structures and infrastructure. Any modifications to the plan as required by the Board must be submitted to this office as a revision to the current approved plan. Please notify staff with the Chatham County Environmental Quality Department once Preliminary Plat Approval is granted.



NPDES Stormwater Discharge Permit for Construction Activities



Cover Sheet for NCG010000

Revised August 2, 2011

What is this permit?

This is your **General Stormwater Permit for Construction Activities**, developed to meet federal National Pollutant Discharge Elimination System (NPDES) requirements. It is separate from your Erosion and Sedimentation Control (E&SC) Plan, which has been a North Carolina requirement for over 35 years.

Federal regulations adopted by the U.S. Environmental Protection Agency (EPA) and North Carolina Division of Water Quality (DWQ) require an NPDES permit for your project. The EPA has delegated DWQ authority to administer the NPDES program in North Carolina. Two divisions of the Department of Environment and Natural Resources are responsible for different parts of the federal permitting requirements.

The E&SC plan approved by the Division of Land Resources (or a delegated local program) contains the core erosion control requirements for your project. The NPDES General Permit issued by DWQ contains additional requirements related to a broader range of water quality issues. **These permits are related, but separate. Both contain conditions your project site must meet.**

Are there new requirements in this permit?

This General Permit reflects changes made in the federal regulations effective February 1, 2010, that regulate discharges from construction sites. The federal regulations resulted from litigation decisions that mandated construction activities over a certain size must contain additional specifications to reduce the amount of wastes and sediment loading that reach the nation's waters.

The Division of Water Quality and the Division of Land Resources established the Construction General Permit Technical Advisory Group (CTAG) to guide the development of this NPDES permit. A draft permit was available for public review in May 2011, and the final permit became effective on August 3, 2011.

The most notable change in the new permit is a requirement that ground stabilization, such as wheat straw application, be applied within 14 days from the last land-disturbing activity. For steep slopes, that area must be stabilized within 7 days. Please see page 2 of this document for details.

What does this permit require me to do?

You should read and become familiar with the provisions of this permit. Below is a list of the major requirements, with indications where those differ from the previous Construction General Permit.

EROSION AND SEDIMENT CONTROL PLAN

You must implement the Erosion and Sedimentation Control Plan approved for your project by the Division of Land Resources or by an approved local program. Adherence to that E&SC Plan is an enforceable component of the Stormwater Permit.

Your E&SC plan will identify areas where the more stringent 7 and 14 day ground stabilization requirements apply. See "New Ground Stabilization Requirements" on page 2.

MONITORING & INSPECTIONS

- ▶ You must keep a rain gauge on site.
- ▶ Dedicated demolition and other waste areas and earthen material stockpiles must be located at least 50' from storm drains or streams unless no alternative is feasible (new requirement)

▶ You must inspect all E&SC measures **at least once a week and within 24 hours after any storm event greater than a half inch (during a 24-hour period).** You must take immediate corrective action for any device failure.

▶ You must inspect all outlets where stormwater runoff leaves your site and evaluate the effect on nearby streams or wetlands. Corrective action must be taken if sediment is deposited off site or into a stream or wetland, or causes a visible increase in turbidity (cloudiness) of any waterbody.

(continued on reverse side)

Permit Requirements (continued)

▶ You must keep records of these inspections and any corrective actions taken.

OPERATION & MAINTENANCE

You must provide the operation and maintenance necessary to maintain optimal performance of stormwater controls. This means **take corrective action** if erosion and sediment control facilities are not operating properly! Operation and maintenance includes, but is not limited to:

- Regularly cleaning out sedimentation basins.
- Stabilizing eroded banks or spillway structures.
- Repairing/clearing out inlets and outlets.
- Repairing piping, seepage and mechanical damage.
- Repairing silt fence damage.

REPORTING

Regular inspections are a chance to check impacts to nearby waters. **If you observe sediment that has deposited in a stream or wetland, you must notify the Division of Water Quality regional office within 24 hours and provide written notice within 5 days** (see # 3 on page 6 of the General Permit). Please send a copy of this correspondence to the Division of Land Resources (DLR).

NON-COMPLIANCE & FINES

Take compliance seriously! Projects that violate Stormwater Permit conditions and/or have unauthorized water quality impacts are subject to fines. **Civil penalties of up to \$25,000.00 per day for each violation may be assessed.**






Who inspects me for what?

DWQ coordinates with DLR's Land Quality Section to ensure compliance with state rules and regulations governing construction activities. That means your project is subject to enforcement by both divisions. In general, Land Quality staff will inspect your site on a regular basis. DWQ staff may also do inspections. The inspections may be routine in nature, or, the result of public complaints.

Do I need to submit a Notice of Intent to have coverage under this permit?

No. Once your E&SC Plan is approved, your site is automatically covered under this permit. You do not need to submit a Notice of Intent for a Certificate of Coverage.

NEW STABILIZATION TIMEFRAMES

Site Area Description	Stabilization	Timeframe Exceptions
 Perimeter dikes, swales, ditches and slopes	7 days	None
 High Quality Water (HQW) Zones	7 days	None
 Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
 Slopes 3:1 or flatter	14 days	7 days for slopes greater than 50' in length.
 All other areas with slopes flatter than 4:1	14 days	None, except for perimeters and HQW Zones.

Do you need more information?



NC Stormwater Permitting
 NCG01 Permit Information
 Map of Regional Offices

<http://portal.ncdenr.org/web/wq/ws/su>
<http://portal.ncdenr.org/web/wq/ws/su/construction>
<http://portal.ncdenr.org/web/wq/home>

Still have questions? Call the DWQ Regional Office nearest your project's location:

Asheville Office	(828) 296-4500	Washington Office	(252) 946-6481
Fayetteville Office	(910) 433-3300	Wilmington Office	(910) 796-7215
Mooresville Office	(704) 663-1699	Winston-Salem Office	(336) 771-5000
Raleigh Office	(919) 791-4200	Central Office	(919) 807-6300

Major Elements of DWQ Construction General Permit

This document contains the major elements of the recently-revised North Carolina Division of Water Quality (DWQ) Construction General Permit (NCG01) with emphasis placed on those elements that differ from the previous permit (expiration on August 2, 2011). Since the summary list below cannot contain details of every change, the complete Permit should be used to assure full implementation. See: <http://portal.ncdenr.org/web/wq/ws/su/construction>

The major change in the Permit from the previous one is the shorter times to apply ground stabilization such as mulch, wheat straw, or grasses. The NC laws and rules relating to the Sediment Act require, in most places, ground stabilization within 21 days. Based on the new EPA requirements and 9-months' work with a permit advisory group, CTAG, the Division and EPA-developed permit, now contains requirements for ground cover within 14, and in some places, 7 days.

1) Ground Stabilization*		
Site Area Description	Stabilization Time Frame	Stabilization Time Frame Exceptions
• Perimeter dikes, swales, ditches and slopes	7 days	None
• High Quality Water (HQW) Zones	7 days	None
• Slopes steeper than 3:1	7 days	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
• Slopes 3:1 or flatter	14 days	7-days for slopes greater than 50 feet in length
• All other areas with slopes flatter than 4:1	14 days	None (except for perimeters and HQW Zones)

* "Extensions of time may be approved by the permitting authority based on weather or other site-specific conditions that make compliance impracticable." (Section II.B(2)(b))

2) Building Wastes Handling	
•	No paint or liquid wastes in stream or storm drains
•	Dedicated areas for demolition, construction and other wastes must be located 50' from storm drains and streams unless no reasonable alternatives available.
•	Earthen-material stockpiles must be located 50' from storm drains and streams unless no reasonable alternatives available.
•	Concrete materials must be controlled to avoid contact with surface waters, wetlands, or buffers.

3) Discharges to Federally-listed Waters	
•	Requirements are the same as in previous permit.
•	The permit allows reduction from the 20 acre minimum if the Director of DWQ determines that other BMPs provide equivalent protection.

Major Elements of DWQ Construction General Permit- Continued

4) Inspections	<ul style="list-style-type: none"> • Same weekly inspection requirements • Same rain gauge & inspections after 0.5" rain event • Inspections are only required during "normal business hours" • Inspection reports must be available on-site during business hours unless a site-specific exemption is approved. • Records must be kept for 3 years and available upon request. • Electronically-available records may be substituted under certain conditions.
5) Implementation of New Permit Conditions	<ul style="list-style-type: none"> • Projects permitted under the previous permit can continue to follow the previously-permitted conditions. • Complete applications received prior to August 3, 2011 can follow conditions of approved application. • Applications received after August 2, 2011 must comply with new permit conditions.

6) Conditions in Erosion & Sedimentation Control Plans*	<p>Designation on the plans where the 7 and 14-day ground stabilization requirements of the NPDES permit apply</p> <p>Designation on the plans where basins that comply with the surface-withdrawal requirements of the NPDES permit are located.</p>
7) Building Wastes Handling	<ul style="list-style-type: none"> • No paint or liquid wastes in stream or storm drains • Dedicated areas for demolition, construction and other wastes located 50' from storm drains and streams unless no reasonable alternatives are available. • Earthen-material stockpiles located 50' from storm drains unless no reasonable alternatives available. • Concrete materials must be controlled to avoid contact with surface waters, wetlands, or buffers.
8) Sediment Basins	<ul style="list-style-type: none"> • Outlet structures must withdraw from basin surface unless drainage area is less than 1 acre. • Use only DWQ-approved flocculants.

* In order for the E&SC Plan to satisfy the conditions of the Construction General permit, it must identify areas where the ground stabilization requirements apply and the location of the basins where the surface-withdrawal requirements apply.

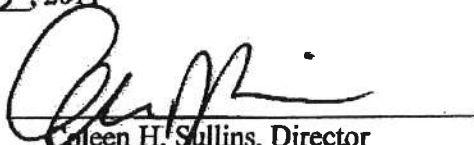
STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF WATER QUALITY
GENERAL PERMIT – NCG 010000
TO DISCHARGE STORMWATER UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
for
CONSTRUCTION ACTIVITIES

In compliance with the provision of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by North Carolina Environmental Management Commission and the Federal Water Pollution Control Act as amended:

All owners or operators of stormwater point source discharges associated with construction activities including clearing, grading or excavation activities resulting in the disturbance of land greater than or equal to one acre, or that are part of a common plan of development of that size, are hereby authorized to discharge stormwater to the surface waters of North Carolina or to a separate storm sewer system conveying stormwater to the surface waters in accordance with the terms and conditions set forth herein. Failure to receive coverage under this permit or violations of any of the conditions listed may result in assessment of state or federal civil or criminal penalties for each day of violation.

The General Permit shall become effective on August 3, 2011.
The General Permit shall expire at midnight on July 31, 2016.

Signed this day July 28th, 2011



Coleen H. Sullins, Director
Division of Water Quality

By the Authority of the Environmental Management Commission

TABLE OF CONTENTS

	Page
SECTION I - COVERAGE UNDER THE GENERAL PERMIT	3
SECTION II – STORMWATER POLLUTION PREVENTION REQUIREMENTS ...	4
Section II.A. - Stormwater Pollution Prevention Requirements in the E&SC Plan	4
Section II.B. - Stormwater Pollution Prevention Requirements in the Construction GP	5
Section II.B.1. - Construction Site Pollutants	5
Section II.B. 2 - Ground Stabilization	6
Section II.B. 3. - Self Inspection and Reporting Requirements	6
Section II.B.4. - Sediment Basins	8
Section II.B.5. -Discharges to Special or Threatened Waters	8
SECTION III – FRAMEWORK OF PERMIT COVERAGE	8
SECTION IV – OPERATION AND MAINTENANCE OF POLLUTION CONTROLS .	10
SECTION V – PERMIT ADMINISTRATION AND COMPLIANCE ISSUES	11
SECTION VI – DISCHARGE MONITORING AND TURBIDITY LIMITATIONS	15
SECTION VII – DEFINITIONS	15
SECTION VIII – DIVISION OF WATER QUALITY CONTACTS	16

SECTION I
COVERAGE UNDER THE GENERAL PERMIT

Until this State of North Carolina General Permit expires or is modified or revoked, the permittee is authorized to discharge stormwater in accordance with the terms and conditions of this permit and in accordance with an approved Erosion and Sedimentation Control Plan by the North Carolina Division of Land Resources, Land Quality Section, or a delegated local program under the provisions and requirements of North Carolina General Statutes in Article 4 of Chapter 113A to the surface waters of North Carolina or to a separate storm sewer system. The permit, along with state statutes (N.C.G.S. 143-215.1) and rules (NCAC 2H .0100) relating to stormwater permitting are designed to work together to assure compliance with the NPDES requirements of the Clean Water Act. Furthermore, North Carolina rules in Title 15A NCAC 2H .0126 adopt by reference the federal stormwater permitting requirements.

Any other point source discharge to surface waters of the state is prohibited unless covered by another permit, authorization or approval. The discharges allowed by this General Permit shall not cause or contribute to violations of North Carolina Water Quality Standards for surface waters and wetlands (15A NCAC 2B .0200). Discharges allowed by this permit must meet all applicable water quality certification or permit requirements as outlined in 15A NCAC 2H .0500 and 2H .1300. This permit does not relieve the permittee from responsibility for compliance with any other applicable federal, state, or local law, rule, standard, ordinance, order, judgment, or decree.

This General Permit is applicable to point source discharges from construction activities disturbing one or more acres of land. The application to the Division of Land Resources or a delegated local program for approval of a local Erosion and Sedimentation Control Plan (E&SC Plan) shall be considered to take the place of a Notice of Intent for coverage under this General Permit for those projects requiring this Permit coverage. Coverage under this General Permit shall become effective upon issuance of an approval for the E&SC Plan by the Division of Land Resources or delegated local program that includes the following:

- a. Designation on the plans where the specific ground stabilization requirements apply as per Section II.B.2 of this permit.
- b. Designs of basins with surface withdrawal as per Section II.B.4 of this permit.

Prior to the commencement of construction and land disturbing activities, approval of the E&SC Plan shall be obtained.

This General Permit revision reflects changes made in the federal regulations effective February 1, 2010. The federal regulations were a result of litigation that mandated that construction activities over a certain size must contain additional specifications that would result in reduced wastes and sediment loading reaching the nation's waters. The Division of Water Quality and the Division of Land Resources established a Construction General Permit Technical Advisory Group (CTAG) to provide them guidance in developing the permit. The CTAG was comprised of 14 members who represented a broad range of environmental, regulatory, government and development interests. A Draft Construction General Permit was prepared and made available for review on May 13, 2011. A public meeting was held on June 7th. This permit reflects the input received during the twelve- month development process.

Any owner or operator not wishing to be covered or limited by this General Permit may apply for an individual NPDES permit in accordance with NPDES procedures in 15A NCAC 2H .0100, stating the reasons supporting the request. Any application for an individual permit should be made at least 180 days prior to the time the permit is needed unless waived, by the Director.

This General Permit does not cover activities or discharges covered by an individual NPDES permit until the individual permit has expired or has been rescinded. Any person conducting an activity covered by an

individual permit but which could be covered by this General Permit may request that the individual permit be rescinded and coverage under this General Permit be provided.

The Division of Water Quality partners with the Division of Land Resources to implement a complete program for construction site coverage that includes state sedimentation control and NPDES stormwater control. The Division of Land Resources implements their control programs through an Erosion and Sedimentation Control Plan (E&SC Plan) issued for each construction site in the state disturbing one or more acres of land. An E&SC Plan is required for each site by the Division of Land Resources or a delegated local government program. The NPDES Construction Stormwater permit (NCG010000) is attached to Erosion and Sedimentation Control Plan approvals. The permittee is responsible for abiding by the conditions of both of these documents.

The Sedimentation Pollution Control Act of 1973 places a duty upon the Sedimentation Control Commission to "develop recommended methods of control of sedimentation and prepare and make available for distribution publications and other materials dealing with sedimentation control techniques appropriate for use by persons engaged in land-disturbing activities." The Sedimentation Control Commission and the Division of Land Resources have adopted the North Carolina Erosion and Sediment Control Planning and Design Manual as the document to provide that guidance for use at all construction sites in the state. The individual Erosion and Sedimentation Control Plans are developed based on this guidance and become a condition of the Division of Water Quality's Construction Stormwater General Permit. As provided in this permit, "deviation from the approved E&SC Plan, or approved amendment to that plan, shall constitute a violation of the terms and conditions of this general permit."

SECTION II **STORMWATER POLLUTION PREVENTION REQUIREMENTS**

The State construction-related stormwater pollution prevention program provides for: (a) identification of the potential sources of stormwater pollution at the individual construction site; (b) description of the stormwater control measures to reduce or eliminate pollutants in stormwater discharges from the construction site; and (c) identification of the procedures the operator will implement to comply with the terms and conditions of this general permit and the Erosion and Sedimentation Control Plan (E&SC Plan). In North Carolina, the approved **Erosion and Sedimentation Control Plan** for the site, and the **NCG01 Construction General Permit** are considered the **Stormwater Pollution Prevention Plan (SWPPP)** for that site. These two documents, and any specifically-added water quality conditions for that site, contain the provisions necessary to meet the federal regulatory requirements of the NPDES program including provisions implementing the Effluent Limitations Guidelines effective at the time of this permit.

SECTION II.A. - STORMWATER POLLUTION PREVENTION REQUIREMENTS **IN THE EROSION AND SEDIMENTATION CONTROL PLAN**

The Erosion and Sedimentation Control program is mandated and funded according to state statutes. The majority of the technology-based requirements needed to satisfy the federal stormwater pollution prevention specifications are addressed in the approved E&SC Plan. Each applicant for an E&SC Plan approval is required to comply with a "checklist" of over 50 site-specific conditions*. The categories of these conditions include:

- 1) location information,
- 2) site features,
- 3) control measures,
- 4) drainage features,
- 5) stormwater calculations,
- 6) stabilization,
- 7) ownership information and
- 8) construction sequencing.

*The individual requirements to be addressed in each E&SC Plan application can be found at <http://portal.ncdenr.org/web/lr/erosion> . See "Plan check list for designers."

SECTION II.B. - STORMWATER POLLUTION PREVENTION REQUIREMENTS IN THE NC CONSTRUCTION GENERAL PERMIT

In addition to the stormwater pollution prevention controls found in the E&SC Plan, this Construction General Permit contains additional conditions that must be met in order to comply with the NPDES program requirements. They are as follows:

1) Construction Site Pollutants

Permittee must manage activities on the site such that water quality standards are not violated from site activities or allowed discharges. In addition to stream pollution from sediment discharge, other activities on construction and development sites can result in pollutants reaching the state's waters. EPA has prepared guidance documents that provide best management practices that address many activities. See http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=nfu_measure&min_measure_id=4

The following activities, and others on a site-specific basis, require oversight throughout the construction and development process to assure that all water quality standards are protected:

- a) **Equipment Operation and Maintenance** - Equipment utilized during the construction activity on a site must be operated and maintained in such a manner as to prevent the potential or actual pollution of the surface or ground waters of the state. Fuels, lubricants, coolants, and hydraulic fluids, or any other petroleum products, shall not be discharged onto the ground or into surface waters. Spent fluids shall be cleaned up and disposed of in a manner so as not to enter the waters, surface or ground, of the state and in accordance with applicable state and federal regulations.
- b) **Material Handling** - Herbicide, pesticide, and fertilizer usage during the construction activity shall be consistent with the Federal Insecticide, Fungicide, and Rodenticide Act and shall be in accordance with label restrictions.
- c) **Building Material Waste Handling**
 - i) All wastes composed of building materials shall be disposed of in accordance with North Carolina General Statutes, Chapter 130A, Article 9 - Solid Waste Management, and rules governing the disposal of solid waste (North Carolina Administrative Code Section 15A NCAC 13B).
 - ii) Locate areas dedicated for management of land clearing and demolition debris, construction and domestic waste, and hazardous or toxic waste. This location shall be at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available.
 - iii) Dumping of paint and other liquid building material wastes in storm drains is prohibited.
 - iv) Litter and Sanitary Waste - The permittee shall control the management and disposal of litter and sanitary waste from the site.
- d) **Location of Stock Piles** - Locate earthen-material stock pile areas at least 50 feet away from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available.
- e) **Handling of Concrete**
 - i) Concrete materials onsite, including excess concrete, must be controlled and managed to avoid contact with surface waters, wetlands or buffers. No concrete or cement slurry shall be discharged from the site. (Note that discharges from onsite concrete plants require coverage under a separate NPDES permit - NCG140000.)
 - ii) Any hardened concrete residue will be disposed of, or recycled onsite, in accordance with local and state solid waste regulations.

2) Ground Stabilization

- a) Soil stabilization shall be achieved on any area of a site where land-disturbing activities have temporarily or permanently ceased according to the following schedule:
 - i) All perimeter dikes, swales, ditches, perimeter slopes and all slopes steeper than 3 horizontal to 1 vertical (3:1) shall be provided temporary or permanent stabilization with ground cover as soon as practicable but in any event within 7 calendar days from the last land-disturbing activity.
 - ii) All other disturbed areas shall be provided temporary or permanent stabilization with ground cover as soon as practicable but in any event within 14 calendar days from the last land-disturbing activity.
- b) Conditions - In meeting the stabilization requirements above, the following conditions or exemptions shall apply:
 - i) Extensions of time may be approved by the permitting authority based on weather or other site-specific conditions that make compliance impracticable.
 - ii) All slopes 50' in length or greater shall apply the ground cover within 7 days except when the slope is flatter than 4:1. Slopes less than 50' shall apply ground cover within 14 days except when slopes are steeper than 3:1, the 7 day-requirement applies.
 - iii) Any sloped area flatter than 4:1 shall be exempt from the 7-day ground cover requirement.
 - iv) Slopes 10' or less in length shall be exempt from the 7-day ground cover requirement except when the slope is steeper than 2:1.
 - v) Although stabilization is usually specified as ground cover, other methods, such as chemical stabilization, may be allowed on a case-by-case basis.
 - vi) For portions of projects within the Sediment Control Commission-defined "High Quality Water Zone" (15A NCAC 04A. 0105), stabilization with ground cover shall be achieved as soon as practicable but in any event on all areas of the site within 7 calendar days from the last land-disturbing act.
 - vii) Portions of a site that are lower in elevation than adjacent discharge locations and are not expected to discharge during construction may be exempt from the temporary ground cover requirements if identified on the approved E&SC Plan or added by the permitting authority.

3) Self Inspection and Reporting Requirements

Minimum self inspection and reporting requirements are as follows unless otherwise approved in writing by the Division of Water Quality.

- a) A rain gauge shall be maintained in good working order on the site unless another rain-monitoring device has been approved by the Division of Water Quality.
- b) A written record of the daily rainfall amounts shall be retained and all records shall be made available to Division of Water Quality or authorized agent upon request. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, the cumulative rain measurement for those un-attended days will determine if a site inspection is needed. (Note: if no rainfall occurred, the permittee must record "zero").
- c) Erosion and sedimentation control measures shall be inspected to ensure that they are operating correctly. Inspection records must be maintained for each inspection event and for each measure. At a minimum, inspection of measures must occur at the frequency indicated below:
 - i) All erosion and sedimentation control measures must be inspected by or under the direction of the permittee at least once every seven calendar days, and
 - ii) All erosion and sediment control measures must be inspected by or under the direction of the permittee within 24 hours after any storm event of greater than 0.50 inches of rain per 24 hour period.
- d) Once land disturbance has begun on the site, stormwater runoff discharge outfalls shall be inspected by observation for erosion, sedimentation and other stormwater discharge characteristics such as clarity, floating solids, and oil sheens. Inspections of the outfalls shall be made at least once every seven calendar days and within 24 hours after any storm event of greater than 0.50 inches of rain per 24 hour period.

- e) Inspections are only required to be made during normal business hours. When adverse weather conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection can be delayed until it is deemed safe to perform these duties. (Times when inspections were delayed because of safety issues should be noted in the Inspection Record.) If the inspection cannot be done on that day, it must be completed on the following business day.
- f) **Twenty-four Hour Reporting for visible sediment deposition**
 - i) The permittee shall report to the Division of Water Quality central office or the appropriate regional office any visible sediment being deposited in any stream or wetland or any noncompliance which may endanger health or the environment. (See Section VIII of this permit for contact information.) Any information shall be provided orally or electronically within 24 hours from the time the permittee became aware of the circumstances.
 - ii) A written submission shall be provided to the appropriate regional office of the Division of Water Quality within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the sediment deposition and actions taken to address the cause of the deposition. The Division of Water Quality staff may waive the requirement for a written report on a case-by-case basis.
- g) Records of inspections made during the previous 30 days shall remain on the site and available for agency inspectors at all times during normal working hours, unless the Division of Water Quality provides a site-specific exemption based on unique site conditions that make this requirement not practical. Older records must be maintained for a period of three years after project completion and made available upon request. The records must provide the details of each inspection including observations, and actions taken in accordance with this permit. The permittee shall record the required rainfall and monitoring observations on the Inspection Record form provided by the Division or a similar inspection form that is inclusive of all of the elements contained in the Division's form. Use of electronically-available records, in lieu of the required paper copies for inspection will be allowed if shown to provide equal access and utility as the hard-copy records.
- h) **Inspection records must include, at a minimum, the following:**
 - i) **Control Measure Inspections:** Inspection records must include at a minimum: 1) identification of the measures inspected, 2) date and time of the inspection, 3) name of the person performing the inspection, 4) indication of whether the measures were operating properly, 5) description of maintenance needs for the measure, 6) corrective actions taken (7) date of actions taken, as well as the date and amounts of rainfall received.
 - ii) **Stormwater Discharge Inspections:** Inspection records must include at a minimum: 1) identification of the discharge outfall inspected, 2) date and time of the inspection, 3) name of the person performing the inspection, 4) evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5) indication of visible sediment leaving the site, 6) actions taken to correct/prevent sedimentation and 7) date of actions taken.
 - iii) **Visible Sedimentation Found Outside the Site Limits:** Inspection records must include: 1) an explanation as to the actions taken to control future releases, 2) actions taken to clean up or stabilize the sediment that has left the site limits and 3) the date of actions taken.
 - iv) **Visible Sedimentation Found in Streams or Wetlands:** All inspections should include evaluation of streams or wetlands onsite or offsite (where accessible) to determine if visible sedimentation has occurred.
- i) **Visible Stream Turbidity -** If the discharge from a site results in an increase in visible stream turbidity, inspection records must record that evidence and actions taken to reduce sediment contributions. Sites discharging to streams named on the state's 303(d) list as impaired for sediment-related causes may be required to perform additional monitoring, inspections or

application of more-stringent management practices if it is determined that the additional requirements are needed to assure compliance with the federal or state impaired-waters conditions. If a discharge covered by this permit enters a stream segment that is listed on the Impaired Stream List for sediment-related causes, and a Total Maximum Daily Load (TMDL) has been prepared for those pollutants, the permittee must implement measures to ensure that the discharge of pollutants from the site is consistent with the assumptions and meets the requirements of the approved TMDL. The Division of Water Quality 303(d) list can be found at: http://h2o.enr.state.nc.us/tmdl/General_303d.htm/

4.) Sediment Basins

Sediment basins and traps shall meet the following requirements:

- a) Outlet structures shall be utilized that withdraw water from the surface.
- b) For basins or traps that have a drainage area of less than 1.0 acre, draw-down designs specified in the Division of Land Resources or delegated local program requirements are acceptable.
- c) Chemical treatment
 - i) All treatment chemicals must be stored in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures designed to protect adjacent surface waters.
 - ii) All treatment chemicals must be used in accordance with dosing specifications and application rates provided by the manufacturer, supplier and as specified by the Division of Water Quality.
 - iii) The Permittee must only use chemicals that have been approved by the NC Division of Water Quality and posted on their "North Carolina Division of Water Quality Approved PAMS/Flocculants List" found on their web site at: <http://portal.ncdenr.org/web/wq/ws/su>.
 - iv) The Permittee must route stormwater treated with polymers, flocculants, or other treatment chemicals through sediment trapping, filtering, and/or settling devices(s) to ensure adequate removal of sediment flocculent prior to discharge to surface waters.
- d) Discharge requirement - Discharges must meet the statutory requirements of the Sediment Pollution Control Act and utilize the provisions of Section 6.74 of the Erosion and Sediment Control Planning and Design Manual to assure that buffers and vegetated areas will be used to reduce the potential for visible siltation outside of the 25% buffer zone nearest the land-disturbing activity.

5.) Discharges to Special or Threatened Waters

- a) Disturbed areas within one mile of and draining to waters where federally-listed threatened or endangered aquatic species are present shall be limited at any time to a maximum total area within the boundaries of the tract of 20 acres. These projects shall also use control measures that are designed, installed and maintained in accordance with criteria set forth in 15A NCAC 04B .0124 – Design Standards in Sensitive Watersheds. The Division of Water Quality may require additional/alternative protection measures or require coverage under an individual Construction NPDES Stormwater permit. Other management practices may be acceptable if these designs are shown by the applicant, to the satisfaction of the Director, to provide equivalent protection.
- b) Construction activities in High Quality Waters Zones require quicker ground stabilization provisions as specified in Section II.B.2.b. of the permit.

SECTION III **FRAMEWORK OF PERMIT COVERAGE**

During the period beginning on the effective date of the permit and lasting until expiration, the Permittee is authorized to discharge stormwater associated with construction activity including clearing, grading and excavation activities resulting in the disturbance of land and related support activities. Such discharges shall be controlled, limited and monitored as specified in this permit.

- 1) Continuation of Previously Permitted Projects - Projects and their corresponding activities permitted under the previous version of the NC general permit for construction activities will continue to be valid with the previous permit conditions and will be considered covered under this general permit.
- 2) Projects submitted prior to the effective date of the permit – Complete project applications that were received prior to the effective date of this permit, but not approved by the permitting authority until after approval of this NPDES permit, can rely on design and management practices effective at the time of application submittal.
- 3) Implementation of the Erosion and Sedimentation Control Plan (E&SC Plan):
 - a) The Permittee must implement and follow the E&SC Plan, which has been approved by the Division of Land Resources or local delegated program.. The approved E&SC Plan is considered a condition of this general permit.
 - b) Deviation from the approved E&SC Plan, or approved amendment, shall constitute a violation of the terms and conditions of this general permit except that deviation from the approved plan will be allowed:
 - i) to correct an emergency situation where sediments are being discharged off the site, or,
 - ii) when minor modifications have been made that result in an alteration or relocation of an erosion or sedimentation control measure and does not affect the ability of the measure to perform as intended.
 - c) Allowed deviations must be noted on the approved E&SC Plan and maintained at the job site.
 - d) Prior to the commencement of any land disturbance onsite, and during the construction activities, a copy of the approved E&SC Plan and this NPDES construction permit shall be maintained on the site. These documents must be kept current and up to date.
- 4) BMPs and Control Measures - Consistent with the provisions contained in this permit and the E&SC Plan, the permittee must select, install, implement and maintain best management practices (BMPs) and control measures that minimize pollutants in the discharge to meet the requirements of this permit.
- 5) Additional Action - If there is evidence indicating that the stormwater discharges from the site are impacting or have the potential to impact surface waters or wetlands, the Division of Water Quality may take appropriate actions including any or all of the following:
 - a) take compliance and enforcement action;
 - b) require the permittee to include and implement appropriate control and restoration measures;
 - c) require the permittee to develop and implement additional site-specific stormwater pollution prevention measures;
 - d) require the permittee to obtain an individual permit.
- 6) When an Individual Permit may be Required - The Director may require any owner/operator authorized to discharge under a certificate of coverage issued pursuant to this general permit to apply for and obtain an individual permit or a general permit with additional conditions. Any interested person may petition the Director to require an individual permit pursuant to 15A NCAC 2H .0127. Cases where an individual permit may be required include, but are not limited to, the following:
 - a) The receiving stream is of a unique quality and the standard conditions may not provide adequate protection;
 - b) The discharger is a significant contributor of pollutants;
 - c) Conditions at the permitted site change, altering the constituents and/or characteristics of the discharge such that the discharge no longer qualifies for a General Permit;

- d) A change has occurred in the availability of demonstrated technology or practices for the control or abatement of pollutants applicable to the point source;
 - e) The discharge violates the terms or conditions of this general permit;
 - f) Effluent limitations are promulgated for the point sources covered by this general permit;
 - g) A Water Quality Management Plan containing requirements applicable to such point sources is approved after the issuance of this general permit.
- 7) When an Individual Permit may be Requested - Any permittee operating under this general permit may request to be excluded from the coverage of this general permit by applying for an individual permit. When an individual permit is issued to an owner/operator the applicability of this general permit is automatically terminated on the effective date of the individual permit.

SECTION IV OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

- 1) Proper Operation and Maintenance - The permittee shall at all times properly operate and maintain all control measures and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this general permit.
- 2) Need to Halt or Reduce not a Defense - It shall not be a defense for a permittee in an enforcement action that it was necessary to halt or reduce the permitted activity in order to maintain compliance with the condition of this general permit.
- 3) Bypassing of Stormwater Control Facilities
 - a) Bypass Not Exceeding Limitations.
The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation or as part of a planned action specified in the approved Erosion and Sedimentation Control Permit. These bypasses are not subject to the provisions of Paragraphs b. and c. of this section.
 - b) Notice
 - i) Anticipated bypass - If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass; including an evaluation of the anticipated quality and effect of the bypass.
 - ii) Unanticipated bypass - The permittee shall submit notice to the Division contact (See Section VIII.) within 24 hours of the occurrence of an unanticipated bypass.
 - c) Prohibition of Bypass
Bypass is prohibited and the Director may take enforcement action against a permittee for bypass, unless:
 - i) Bypass was unavoidable to prevent loss of life, personal injury or severe property damage;
 - ii) There were no feasible alternatives to the bypass, such as the use of auxiliary control facilities, retention of stormwater or maintenance during normal periods of equipment downtime or dry weather. This condition is not satisfied if adequate backup controls should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and
 - iii) The permittee submitted notices as required under Paragraph b. of this section.
 - d) The Director may approve an anticipated bypass, after considering its adverse effects, if the Director determines that it will meet the three conditions listed above in Paragraph c. of this section.
- 4) Upsets
 - a) Definition - "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment or control facilities,

- inadequate treatment or control facilities, lack of preventive maintenance, or careless or improper operation.
- b) **Effect of an Upset** - An upset constitutes an affirmative defense to an action brought for noncompliance with technology based permit effluent limitations if the requirements of paragraph c. of this condition are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
 - c) **Conditions Necessary for a Demonstration of Upset** - A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - i) An upset occurred and that the permittee can identify the cause(s) of the upset;
 - ii) The permitted facility was at the time being properly operated;
 - iii) The permittee submitted notice of the upset as required in this general permit, and,
 - iv) The permittee complied with any remedial measures required in this general permit.
 - d) **Burden of Proof** - In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.
- 5) **Inspection and Entry** - The permittee shall allow the Director or an authorized representative (including an authorized contractor acting as a representative of the Director), upon the presentation of credentials and other documents as may be required by law, to:
- a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this general permit;
 - b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this general permit;
 - c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and
 - d) Sample or monitor at reasonable times, for the purposes of assuring general permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

SECTION V

PERMIT ADMINISTRATION AND COMPLIANCE ISSUES

- 1) **Time of compliance** – Erosion and sedimentation control measures shall be maintained, and self-monitoring shall continue, after the completion of construction and development until the establishment of permanent ground cover sufficient to restrain erosion or until the financially responsible party has conveyed ownership or control of the tract of land for which the erosion and sedimentation control plan has been approved and the agency that approved the plan has been notified. If the financially responsible party has conveyed ownership or control of the tract of land for which the Erosion and Sedimentation Control Plan has been approved, the new owner or person in control shall conduct and document self-monitoring until the establishment of permanent ground cover sufficient to restrain erosion.

Upon establishment of permanent ground cover sufficient to restrain erosion, the permittee shall request an inspection by the permitting authority to verify the adequacy of the ground cover. Coverage under the permit shall end when a Sedimentation Inspection Report is issued documenting the final stabilization of the site with adequate permanent ground cover. The signed Sedimentation Inspection Report shall serve as a notice of termination.

- 2) **Operation efficiency** - During construction and until the completion of construction or development and the establishment of permanent stabilization, the permittee shall provide the operation and maintenance necessary to operate the storm water control measures and all erosion and sedimentation control measures at optimum efficiency.
- 3) **Corrective action** - If inspections required by this permit identify a need for maintenance of control measures, modifications or additions to control measures, or corrective actions to control sediment

or other pollutants these actions must be performed as soon as possible and before the next storm event to maintain the effectiveness of the control measures.

- 4) Duty to Comply - The permittee must comply with all conditions of this general permit. Any permit noncompliance constitutes a violation of the Clean Water Act and is grounds for enforcement action; certificate of coverage termination, revocation and reissuance, or modification; or denial of a certificate of coverage upon renewal application.
 - a) The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.
 - b) The Clean Water Act provides that any person who violates section 301, 302, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any such sections in a permit issued under section 402, or any requirement imposed in a pretreatment program approved under sections 402(a)(3) or 402(b)(8) of the Act, is subject to a civil penalty not to exceed \$27,000 per day for each violation. The Clean Water Act provides that any person who negligently violates sections 301, 302, 306, 307, 308, 318, or 405 of the Act, or any condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, or any requirement imposed in a pretreatment program approved under section 402(a)(3) or 402(b)(8) of the Act, is subject to criminal penalties of \$2,500 to \$25,000 per day of violation, or imprisonment of not more than 1 year, or both. In the case of a second or subsequent conviction for a negligent violation, a person shall be subject to criminal penalties of not more than \$50,000 per day of violation, or by imprisonment of not more than 2 years, or both. Any person who knowingly violates such sections, or such conditions or limitations is subject to criminal penalties of \$5,000 to \$50,000 per day of violation, or imprisonment for not more than 3 years, or both. In the case of a second or subsequent conviction for a knowing violation, a person shall be subject to criminal penalties of not more than \$100,000 per day of violation, or imprisonment of not more than 6 years, or both. Any person who knowingly violates section 301, 302, 303, 306, 307, 308, 318 or 405 of the Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of the Act, and who knows at that time that he thereby places another person in imminent danger of death or serious bodily injury, shall, upon conviction, be subject to a fine of not more than \$250,000 or imprisonment of not more than 15 years, or both. In the case of a second or subsequent conviction for a knowing endangerment violation, a person shall be subject to a fine of not more than \$500,000 or by imprisonment of not more than 30 years, or both. An organization, as defined in section 309(c)(3)(B)(iii) of the CWA, shall, upon conviction of violating the imminent danger provision, be subject to a fine of not more than \$1,000,000 and can be fined up to \$2,000,000 for second or subsequent convictions.
 - c) Under state law, a daily civil penalty of not more than twenty-five thousand dollars (\$25,000) per violation may be assessed against any person who violates or fails to act in accordance with the terms, conditions, or requirements of a permit. [Ref: NC General Statute 143-215.6A].
 - d) Any person may be assessed an administrative penalty by the Administrator of the U.S. Environmental Protection Agency for violating section 301, 302, 306, 307, 308, 318 or 405 of the Clean Water Act, or any permit condition or limitation implementing any of such sections in a permit issued under section 402 of this Act. Administrative penalties for Class I violations are not to exceed \$16,000 per violation, with the maximum amount of any Class I penalty assessed not to exceed \$37,500. Penalties for Class II violations are not to exceed \$16,000 per day for each day during which the violation continues, with the maximum amount of any Class II penalty not to exceed \$177,500.
- 5) Duty to Mitigate - The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this general permit that has a reasonable likelihood of adversely affecting human health or the environment.

- 6) Civil and Criminal Liability - Except as provided in Section IV.3. of this permit regarding bypassing of stormwater control facilities, nothing in this general permit shall be construed to relieve the permittee from any responsibilities, liabilities, or penalties for noncompliance pursuant to NCGS 143-215.3, 143-215.6A, 143-215.6B, 143-215.6C or Section 309 of the Federal Act, 33 USC 1319. Furthermore, the permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.
- 7) Oil and Hazardous Substance Liability - Nothing in this general permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under NCGS 143-215.75 et seq. or Section 311 of the Federal Act, 33 USC 1321. Furthermore, the permittee is responsible for consequential damages, such as fish kills, even though the responsibility for effective compliance may be temporarily suspended.
- 8) Property Rights - The issuance of this general permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.
- 9) Severability - The provisions of this general permit are severable, and if any provision of this general permit, or the application of any provision of this general permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this general permit, shall not be affected thereby.
- 10) Duty to Provide Information - The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating the certificate of coverage issued pursuant to this general permit or to determine compliance with this general permit. The permittee shall also furnish to the Director upon request, copies of records required to be kept by this general permit.
- 11) Signatory Requirements
 - a) All applications, reports, or information submitted to the Director shall be signed and certified as follows:
 - i) For a corporation: by a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (a) a president, secretary, treasurer or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or (b) the manager of one or more manufacturing production or operating facilities provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
 - ii) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
 - iii) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.
 - b) All reports required by the general permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:
 - i) The authorization is made in writing by a person described above;
 - ii) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or well field, superintendent, a position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the

company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

iii) The written authorization is submitted to the Director.

c) Any person signing a document under paragraphs a. or b. of this section shall make the following certification:

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations."

- 12) Penalties for Tampering - The Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this general permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment is a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or both.
- 13) General Permit Modification, Revocation and Reissuance, or Termination - The issuance of this general permit does not prohibit the Director from reopening and modifying the general permit, revoking and reissuing the general permit, or terminating the general permit as allowed by the laws, rules, and regulations contained in Title 40, Code of Federal Regulations, Parts 122 and 123; Title 15A of the North Carolina Administrative Code, Subchapter 2H .0100; and North Carolina General Statute 143-215.1 et. seq.
- 14) Availability of Reports - Except for data determined to be confidential under NCGS 143-215.3(a)(2) or Section 308 of the Federal Act, 33 USC 1318, all reports prepared in accordance with the terms shall be available for public inspection at the offices of the Division of Water Quality. As required by the Act, discharge data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in NCGS 143-215.6B or in Section 309 of the Federal Act.
- 15) Penalties for Falsification of Reports - The Clean Water Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this general permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than two years per violation, or by both.
- 16) Anticipated Noncompliance - The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity that may result in noncompliance with the general permit requirements.
- 17) Other Information - Where the permittee becomes aware that it failed to submit any relevant facts in any report to the Director, it shall promptly submit such facts or information.
- 18) Limitations Reopener - This general permit shall be modified or alternatively, revoked and reissued, to comply with any applicable effluent guideline or water quality standard issued or approved under Sections 302(b) (2) (c), and (d), 304(b) (2) and 307(a) of the Clean Water Act, if the effluent guideline or water quality standard so issued or approved:
 - a) contains different conditions or is otherwise more stringent than any effluent limitation in the general permit; or
 - b) controls any pollutant not limited in the general permit.
 - c) The general permit as modified or reissued under this paragraph shall also contain any other requirements in the Act then applicable.

SECTION VI
DISCHARGE MONITORING AND TURBIDITY LIMITATIONS

This General Permit does not include requirements for numeric limits for discharges from construction sites. However, the next reissuance of this North Carolina Construction General Permit (NCG 01) is scheduled for five years from the date of approval of this permit and will contain effluent limitations as required in *Subpart B-Construction and Development Effluent Guidelines* of Part 450 of the Code of Federal Regulations.

SECTION VII
DEFINITIONS

- 1) Act or "the Act" or CWA - The Federal Water Pollution Control Act, also known as the Clean Water Act, as amended, 33 USC 1251, et. seq.
- 2) Best Management Practices (BMPs) - Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operation procedures, and management practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.
- 3) Bypass - The intentional diversion of stormwater from any portion of a stormwater control facility.
- 4) Control Measures - Refers to any BMP or other structural or non-structural practices and procedures used to prevent or reduce the discharge of pollutants including practices to control erosion and sedimentation.
- 5) Director - The Director of the Division of Water Quality.
- 6) Division - The Division of Water Quality, Department of Environment, and Natural Resources.
- 7) EMC - The North Carolina Environmental Management Commission.
- 8) Erosion and Sedimentation Control Plan - A plan developed in compliance with the North Carolina Sedimentation Pollution Control Act of 1973 to prevent the erosion and deposition of sediment and other materials into the waters of the State from construction or other land-disturbing activities that disturb one or more acres of land. Each plan must be approved by the NC Sedimentation Control Commission or a program delegated by the Commission to a local government.
- 9) Ground cover - Any vegetative growth or other material which, when applied to the soil surface, renders the soil surface stable against accelerated erosion.
- 10) Normal Business Hours - These are generally considered to be between the hours of 6 a.m. and 6 p.m., or when workers are normally present on the construction site. Weekends and federal holidays are not considered normal business hours unless construction activities are taking place on the site during those times.
- 11) Permitting Authority - The permitting authority is the agency that issues the permit. The Division of Water Quality is the delegated NPDES permitting authority and issues this permit. However, some erosion and sedimentation control activities are performed by Division of Land Resources or the locally-delegated programs. Other activities may be shared by the two divisions and the local programs. The Land Quality Section of the Division of Land Resources and the Surface Water Protection Section of the Division of Water Quality maintain a Memorandum of Understanding that specifies specific roles of the two divisions and the local programs and will be used to assign specific control and oversight activities between the agencies.
- 12) Permanently Cease - When all or part of the land disturbing activity is complete and no additional alteration or disturbance of the land surface is planned prior to final stabilization.
- 13) Permanent Stabilization - When all soil disturbing activity is completed and exposed soils have been stabilized with a vegetative cover with a density of at least 80% or covered with a structural stabilization method. Permanent perennial vegetation may include the use of sod, shrubs and ground cover plants mixed with mulching, aggregate or other landscaping techniques. Structural methods include concrete, asphalt, retaining wall or other stabilization techniques.

- 14) Permittee - The person, firm or organizational entity that signed as the financially responsible party on the Erosion and Sedimentation Control Plan.
- 15) Point Source Discharge - Any discernible, confined and discrete conveyance, including but specifically not limited to, any pipe, ditch, channel, tunnel, conduit, discrete fissure, or container from which pollutants are or may be discharged to waters of the state.
- 16) Soil Stabilization - The use of vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.
- 17) Stormwater Pollution Prevention Plan (SWPPP) – The elements of the State’s stormwater pollution prevention program that provide the technology-based requirements designed to protect the state’s waters from the adverse impacts of sediments. In North Carolina, the combination of the NCG01 Construction General and the Erosion and Sedimentation Control Plan are considered the SWPPP. It should be noted that on sites that involve multiple or complex sources of pollution, the Division may require additional control measures as needed to assure that water quality is protected and these additional measures will also be considered part of the SWPPP.
- 18) Temporarily Cease - When all or part of the site that is and will remain un-worked for a period of days but where site land disturbing activity is not complete and additional land disturbing activity is planned.
- 19) Temporary Stabilization – When the establishment of ground cover over all disturbed areas (such as mulching, rolled erosion control products, vegetation, or other material) renders the surface stable against accelerated erosion. Stabilization shall be achieved with the establishment of a uniform and evenly-distributed (i.e., without large bare areas) ground cover with a cover density of at least 80%.
- 20) Severe property damage – Substantial physical damage to property, damage to the control measures that cause them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

SECTION VIII
NC DIVISION OF WATER QUALITY CONTACTS

Asheville Regional Office

2090 U.S. Highway 70
Swannanoa, NC 28778
828/296-4500
FAX 828/299-7043

Fayetteville Regional Office

Systel Building,
225 Green St., Suite 714
Fayetteville, NC 28301-5094
910/433-3300
FAX 910/486-0707

Mooreville Regional Office

610 East Center Ave.
Mooreville, NC 28115
704/663-1699
FAX 704/663-6040

Winston-Salem Regional Office

585 Waightown Street
Winston-Salem, NC 27107
336/771-5000
FAX 336/771-4630

Washington Regional Office

943 Washington Square Mall
Washington, NC 27889
252/946-6481
FAX 252/975-3716

Wilmington Regional Office

127 Cardinal Drive Extension
Wilmington, NC 28405
910/796-7215
FAX 910/350-2004

Raleigh Regional Office

3800 Barrett Drive
Raleigh, NC 27609
919/791-4200
FAX 919/571-4718

Raleigh Regional Office

Mail to:
1628 Mail Service Center
Raleigh, NC 27699-1628



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

August 21, 2009

Regulatory Division

Action ID. 200121252

Mr. William S. Mumford
NNP – Briar Chapel, LLC
16 Windy Knoll Circle
Chapel Hill, North Carolina 27516

Dear Mr. Mumford:

Reference the Department of the Army (DA) permit issued on October 2, 2006, to Mitch Barron of Newland Communities for impacts associated with the Briar Chapel Development. Also reference the modification to this permit approved in December, 2007. This development is approximately 1,589 acres in size and is located west of US Highway 15-501, north of Andrew's Store Road (SR 1528), and south of Mann's Chapel Road (SR 1532), approximately 5 miles south of Chapel Hill, in Chatham County, North Carolina. Coordinates (in decimal degrees) for the site are 35.8251 ° North, 79.1059 ° West. The site contains several unnamed tributaries and adjacent wetlands of Pokeberry Creek and Wilkinson Creek, in the Cape Fear River Basin (8-Digit Cataloging Unit 03030002).

Permanent impacts authorized by this permit and the subsequent 2007 modification totaled 1,666 linear feet of stream channel and 0.4422 acre of wetland, and temporary impacts totaled 359 linear feet of stream channel and 0.156 acre of wetlands. Mitigation was implemented for the unavoidable impacts by: a) Payment into the North Carolina Ecosystem Enhancement Program for the restoration of 0.6655 acre of riparian wetlands; b) Restoration of 2,127 linear feet of stream channel at the Harpers Crossroads Mitigation Site; and c) On-site preservation of 59.3 acres of wetlands and 63,412 linear feet of stream channel.

Also reference your permit modification request received by the Corps on May 8, 2009. This modification was to address impact amounts and location changes associated with roadway crossings in and near the development. Also included within the requested modification were impacts associated with restoration to streams and wetlands as required to satisfy an existing on-site Clean Water Act violation. On May 22, 2009, a Public Notice was issued detailing this modification request which would bring total impacts associated with Briar Chapel to: 2,237 linear feet of permanent stream channel, 634 linear feet of temporary stream channel, 0.4374 acre of permanent wetland impact,

and 0.197 acres of temporary wetland impact. Please note the attached Tables 1, 2, and 3; originally created by your consultant S&EC, which describe the impact history by site number and amount. No additional mitigation was proposed due to the relatively large amount of preservation mitigation required within the original permit.

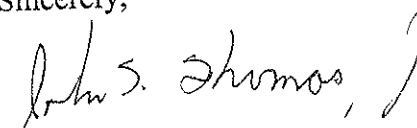
The Corps has completed the evaluation of your request and concurs with your request for a change in impacts associated with your referenced DA permit including the change to plans as requested. No additional mitigation is required for this modification.

Special condition 1 of your permit is hereby modified to read:

“All work authorized by this permit must be performed in strict compliance with the attached plans, Exhibit A, Exhibit E, and/or Exhibit F which are a part of this permit. These plans reflect the original proposal, Exhibit A; and the modifications as depicted within the January 26, and the revised June 7, 2007, proposals as shown in Exhibit E, and the modification request of May 8, 2009, as shown in Exhibit F. Only the attached modification plans reflect approved changes to the original plans, therefore any additional deviations from the original plans are not approved per this modification and any further modification to the plans must be approved by the US Army Corps of Engineers (USACE) prior to implementation. The temporary impacts as identified on Exhibit E shall be removed by May 1, 2008, or the project shall be considered non-compliant with this condition. In addition, the following time deadlines are hereby established for work considered authorized under this 2009 permit modification: all impacts, both temporary and permanent, as shown in the stream repair and stabilization document received with the modification application on May 8, 2009, must be completed prior to April 15, 2010; and all additional temporary impacts, not requested within the stream repair and stabilization document but requested and authorized under this 2009 modification, shall be removed within 30 days of the completion of each respective crossing. Proper documentation of permit compliance for this 2009 modification shall be submitted to the Corps of Engineers Regulatory Representative via email on or before April 15, 2010, or at the time of each temporary impact removal, respectively. ”

Please note that all other permit conditions and exhibits remain in effect as written. Should you have questions, contact Mr. Monte Matthews, Raleigh Regulatory Field Office at telephone (919) 554-4884, Extension 30.

Sincerely,


for/ Jefferson M. Ryscavage
Colonel, U.S. Army
District Commander

Attachments

Copy Furnished (w/o attachment)

Ms. Cyndi Karoly
Division of Water Quality
North Carolina Department of Environment
and Natural Resources
2321 Crabtree Boulevard, Suite 250
Raleigh, NC 27604

Copy Furnished (w/attachment)

Ms. Nicole Thomson
Soil & Environmental Consultants
11010 Raven Ridge Road
Raleigh, NC 27614



North Carolina Department of Environment and Natural Resources

Division of Water Quality
Coleen H. Sullins
Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

August 31, 2009



Mr. William S. Mumford
NNP – Briar Chapel, LLC
16 Windy Knoll Circle
Chapel Hill, NC 27516

Re: Briar Chapel, Chatham County
DWQ Project # 20050732, Ver. 13; USACE Action ID. No. 200121252
APPROVAL of 401 Water Quality Certification with Additional Conditions - MODIFICATION

Dear Mr. Mumford:

Attached hereto is a copy of Certification No. 3567 issued to Mr. William S. Mumford of NNP- Briar Chapel, LLC, Inc., dated August 31, 2009. **This Certification replaces the Certification issued to you on January 11, 2008, July 21, 2009, and July 24, 2009.** In addition, you should get any other federal, state or local permits before you go ahead with your project including (but not limited to) Solid Waste, Sediment and Erosion Control, Stormwater, Dam Safety, Non-discharge and Water Supply Watershed regulations.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

Coleen Sullins

CHS/cbk/ijm

Attachments: Certificate of Completion

cc: Becky Fox, EPA, 1307 Firefly Road, Whittier, NC 28789
U.S. Army Corps of Engineers, Raleigh Regulatory Field Office, Wilmington District
Lauren Witherspoon, DWQ Raleigh Regional Office
DLR, Raleigh Regional Office
File Copy
Nicole Thomson, S&EC, P.A., 11010 Raven Ridge Road, Raleigh, NC 27614

Filename: 050732Ver13BriarChapel(Chatham)401_IC_MOD2_Revised

NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (DWQ) Regulations in 15 NCAC 2H, Section .0500 to Mr. William S. Mumford of NNP- Briar Chapel, LLC to fill 0.4374 acres of 404/wetland (permanent impact), 0.197 acres 404/wetland (temporary impact), 2,154 linear feet of perennial stream (permanent impact), 612 linear feet of perennial stream (temporary impact), 83 linear feet of intermittent stream (permanent impact), and 22 linear feet of intermittent stream (temporary impact), in the Cape Fear River Basin, to construct the Briar Chapel residential and mixed use development at the site. The site is located west of U.S. Highway 15-501, and north of Andrew’s Store Road (SR 1528), and south of Mann’s Chapel Road (SR 1532), approximately 5 miles south of Chapel Hill, in Chatham County, North Carolina, pursuant to a permit application dated May 8, 2009, and received by the DWQ on May 8, 2009, by Public Notice issued by the USACE on May 22, 2009, and received by the DWQ on May 22, 2009, and by all additional correspondences received by the DWQ on May 20, 2009 and June 25, 2009.

The application and supporting documentation provides adequate assurance that the proposed work will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application, the supporting documentation, and conditions hereinafter set forth.

This approval is only valid for the purpose and design submitted in the application materials and as described in the Public Notice. If the project is changed, prior to notification a new application for a new Certification is required. If the property is sold, the new owner must be given a copy of the Certification and approval letter and is thereby responsible for complying with all conditions of this Certification. Any new owner must notify the Division and request the Certification be issued in their name. Should wetland or stream fill be requested in the future, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). If any plan revisions from the approved site plan result in a change in stream or wetland impact or an increase in impervious surfaces, the DWQ shall be notified in writing and a new application for 401 Certification may be required. For this approval to be valid, compliance with the conditions listed below is required.

Conditions of Certification:

1. Impacts Approved

The following impacts are hereby approved as long as all of the other specific and general conditions of this Certification (or Isolated Wetland Permit) are met. No other impacts are approved including incidental impacts:

Type of Impact	Amount Approved (Units)	Plan Location or Reference
404/401 Wetlands	0.4374 (acres) – permanent impact	Table 2, Application, and Public Notice
404/401 Wetlands	0.197 (acres) – temporary impact	Table 2, Application, and Public Notice
Stream (perennial)	2,154 (linear feet) – permanent impact	Table 2, Application, and Public Notice
Stream (perennial)	612 (linear feet) – temporary impact	Table 2, Application, and Public Notice
Stream (intermittent)	83 (linear feet) – permanent impact	Table 2, Application, and Public Notice
Stream (intermittent)	22 (linear feet) – temporary impact	Table 2, Application, and Public Notice

Sediment and Erosion Control:

2. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards:
 - a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
 - b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.
3. No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the footprint of the impacts depicted in the 404/401 Permit Application. All construction activities, including the design, installation, operation, and maintenance of sediment and erosion control Best Management Practices, shall be performed so that no violations of state water quality standards, statutes, or rules occur;
4. Sediment and erosion control measures shall not be placed in wetlands or waters without prior approval from the Division. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, design and placement of temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or stream beds or banks, adjacent to or upstream and down stream of the above structures. All sediment and erosion control devices shall be removed and the natural grade restored within two (2) months of the date that the Division of Land Resources or locally delegated program has released the project.
5. Protective Fencing - The outside buffer, wetland or water boundary and along the construction corridor within these boundaries approved under this authorization shall be clearly marked with orange warning fencing (or similar high visibility material) for the areas that have been approved to infringe within the buffer, wetland or water prior to any land disturbing activities.

Continuing Compliance:

6. Mr. William S. Mumford and NNP- Briar Chapel, LLC 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 law and federal law. 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 to include conditions appropriate to assure compliance with such standards and requirements in accordance with 15A NCAC 2H.0507(d). Before modifying the Certification, the Division shall notify Mr. William S. Mumford and NNP- Briar Chapel, LLC and the US Army Corps of Engineers, provide public notice in accordance with 15A NCAC 2H.0503 and provide opportunity for public hearing in accordance with 15A NCAC 2H.0504. Any new or revised conditions shall be provided to Mr. William S. Mumford and NNP- Briar Chapel, LLC in writing, shall be provided to the United States 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;

7. Construction Stormwater Permit NCG010000

Upon the approval of an Erosion and Sedimentation Control Plan issued by the Division of Land Resources (DLR) or a DLR delegated local erosion and sedimentation control program, an NPDES General stormwater permit (NCG010000) administered by DWQ is automatically issued to the project. This General Permit allows stormwater to be discharged during land disturbing construction activities as stipulated by conditions in the permit. If your project is covered by this permit [applicable to construction projects that disturb one (1) or more acres], full compliance with permit conditions including the sedimentation control plan, self-monitoring, record keeping and reporting requirements are required. A copy of this permit and monitoring report forms may be found at http://h2o.enr.state.nc.us/su/Forms_Documents.htm.

Mitigation:

8. Compensatory Mitigation

Compensatory stream mitigation shall be accomplished by using 2,127 linear feet of stream mitigation credit at the Harpers Crossroads stream mitigation site and the remaining 27 linear feet of required stream credit (10:1 ratio = 270 linear feet) from the 63,412 linear feet of available onsite stream preservation. These mitigation efforts shall be protected through use of conservation easement written to satisfy the US Army Corps of Engineers. Uses which may be allowable in the protected stream buffers include water dependent activities and greenway trails upon additional written approval of the Division of Water quality and the US Army Corps of Engineers. These provisions should be explicitly reflected in the conservation easements, or similar mechanisms, written to satisfy the USACE.

The Permittee shall provide stream restoration in accordance with the plan entitled 'Harpers Crossroads Stream Restoration Plan,' dated September 2005. The restoration site, which was authorized with a separate DA nationwide permit (USACE Action Id No. 200420489) has already been constructed. The as-built report dated June 12, 2006 states the total stream restoration generated by the project as 2,127 linear feet. Within 90 days of the USACE's determination that the Harpers Crossroads Stream Restoration Project has met the success criteria outlined in the 'Harpers Crossroads Stream Restoration Plan,' the permittee shall arrange for the transfer of the existing conservation easements to a third-party grantee, subject to approval by the USACE.

Type of Impact	Compensatory Mitigation Required	River and Sub-basin Number
Stream (perennial)	2,154 (linear feet)	Cape Fear/03030002

9. Stormwater Management Plan Implementation Procedures (No Further Approval Needed)

- The approved SMP must be constructed and operational before any permanent building or other structure is occupied at the site. If a development is phased, then the approved SMP for each future phase must be constructed and operational before any permanent building or other structure associated with that phase is occupied.
- The approved SMP as well as drainage patterns must be maintained in perpetuity.
- The SMP may not be modified without prior written authorization from the SMP approval authority. If the SMP falls under another state stormwater program, then a copy of the approval letter and the modified SMP must be submitted to the 401 Oversight/Express Unit prior to the commencement of the modifications.

10. Culvert Installation

All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual (http://www.ncdot.org/doh/operations/BMP_manual/download/BMP_Manual.pdf) such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water.

Culverts required for this project shall be installed in such a manner that the original stream profiles are not altered. Existing stream dimensions (including the cross section dimensions, pattern, and longitudinal profile) must be maintained above and below locations of each culvert. Culverts shall be designed and installed to allow for aquatic life movement as well as to prevent head cutting of the streams. If any of the existing pipes are or become perched, the appropriate stream grade shall be re-established or, if the pipes installed in a perched manner, the pipes shall be removed and re-installed correctly.

Culvert(s) shall not be installed in such a manner that will cause aggradation or erosion of the stream up or down stream of the culvert(s). Existing stream dimensions (including the cross section dimensions, pattern and longitudinal profile) shall be maintained above and below locations of each culvert.

Placement of culverts and other structures in waters, streams, and wetlands must be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in disequilibrium of wetlands or streambeds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium shall be maintained if requested in writing by DWQ.

The establishment of native, woody vegetation and other soft stream bank stabilization techniques must be used where practicable instead of rip rap or other bank hardening methods. If rip-rap is necessary, it shall not be placed in the stream bed, unless specifically approved by the Division of Water Quality.

Installation of culverts in wetlands must ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions.

Upon completion of the project, the Applicant shall complete and return the enclosed "Certificate of Completion" form to notify NCDWQ when all work included in the §401 Certification has been completed. The responsible party shall complete the attached form and return it to the 401/Wetlands Unit of the NC Division of Water Quality upon completion of the project. *Please send photographs upstream and downstream of each culvert site to document correct installation along with the Certificate of Completion form.*

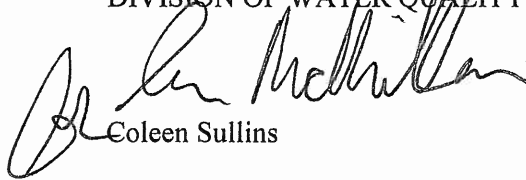
11. Certificate of Completion

Upon completion of all work approved within the 401 Water Quality Certification or applicable Buffer Rules, and any subsequent modifications, the applicant is required to return the attached certificate of completion to the 401/Wetlands Unit, North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1650.

Also, 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 or CAMA Permit.

If this Certification is unacceptable to you, you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Certification. This request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. If modifications are made to an original Certification, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Certification. Unless such demands are made, this Certification shall be final and binding.

This the 31st day of August 2009
DIVISION OF WATER QUALITY



Coleen Sullins

CHS/cbk/ijm

3567

Briar Chapel-Phase 9

Statement regarding historical structure(s) and/or features

1. Archaeological Survey

- a. Based on the August 2006 report by ESI (entitled "An Intensive Cultural Resource Investigation: Briar Chapel, Chatham County, NC"), there are no cemeteries or structures eligible for the National Register within the project area of Phase 9.



North Carolina Department of Environment and Natural Resources

Division of Water Resources

Water Quality Programs

Thomas A. Reeder

Director

Pat McCrory
Governor

John E. Skvarla, III
Secretary

September 17, 2013

Kevin Graham, Vice President, Operations
NNP Briar Chapel, LLC
16 Windy Knoll Circle
Chapel Hill, NC 27516

Subject: Permit No. WQ0036732
NNP Briar Chapel, LLC
Briar Chapel – Phase 9
Wastewater Collection System Extension
Chatham County

Dear Mr. Graham:

In accordance with your application received September 10, 2013 we are forwarding herewith Permit No. WQ0036732, dated September 17, 2013, to NNP Briar Chapel, LLC for the construction and operation of the subject wastewater collection system extension. This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein. This cover letter and supplement shall be considered a part of this permit and are therefore incorporated therein by reference.

Please pay particular attention to the following conditions contained within this permit:

Condition II.4: Requires that the wastewater collection facilities be properly operated and maintained in accordance with 15A NCAC 2T .0403 or any individual system-wide collection system permit issued to the Permittee.

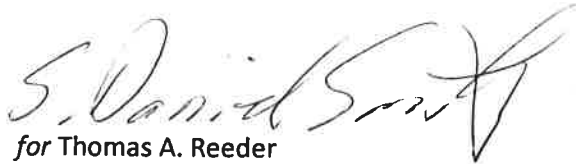
It shall be the responsibility of the NNP Briar Chapel, LLC to ensure that the as-constructed project meets the appropriate design criteria and rules. Failure to comply may result in penalties in accordance with North Carolina General Statute §143-215.6A through §143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

NNP Briar Chapel, LLC
WQ0036732

If you need additional information concerning this matter, please contact Ted Cashion at (919) 791-4254 or via e-mail at ted.cashion@ncdenr.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Daniel Smith". The signature is fluid and cursive, with a large, stylized "S" at the beginning and a long, sweeping tail that extends to the right.

for Thomas A. Reeder
Division of Water Resources

by S. Daniel Smith
Raleigh Region Surface Water Protection Supervisor

cc: Grant Livengood, P.E., McKim & Creed, Inc., 1730 Varsity Drive, Suite 500, Raleigh, NC 27606
Chatham County Health Department
Raleigh Regional Office, Surface Water Protection Section
Water Quality Central Files
PERCS (electronic copy)



STATE OF NORTH CAROLINA
ENVIRONMENTAL MANAGEMENT COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

WASTEWATER COLLECTION SYSTEM EXTENSION PERMIT


In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations, permission is hereby granted to the

NNP Briar Chapel, LLC
Chatham County

for the construction and operation of approximately 4,540 linear feet of 8-inch gravity sewer to serve 114 lots @ 250 gpd/lot (up to 4 bedrooms per lot) as part of the Briar Chapel – Phase 9 project, and the discharge of 28,500 gallons per day of collected domestic wastewater into the Briar Chapel Utilities existing sewerage system, pursuant to the application received September 10, 2013 and in conformity with 15A NCAC 2T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit.

This permit shall be effective from the date of issuance until rescinded and shall be subject to the specified conditions and limitations contained therein.

Permit issued this the 17th day of September, 2013.



for Thomas A. Reeder

Division of Water Resources

By Authority of The Environmental Management Commission

Permit Number: WQ0036732

SUPPLEMENT TO PERMIT COVER SHEET

NNP Briar Chapel, LLC is hereby authorized to:

Construct, and then operate upon certification the aforementioned wastewater collection extension. The sewage and wastewater collected by this system shall be treated in the Briar Chapel Utilities Wastewater Treatment Facility (Permit No. WQ0028552) prior to being land applied by spray irrigation.

Permitting of this project does not constitute an acceptance of any part of the project that does not meet 15A NCAC 2T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; and the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable, unless specifically mentioned herein. Division approval is based on acceptance of the certification provided by a North Carolina-licensed Professional Engineer in the application. It shall be the Permittee's responsibility to ensure that the as-constructed project meets the appropriate design criteria and rules.

Construction and operation is contingent upon compliance with the Standard Conditions and any Special Conditions identified below.

I. SPECIAL CONDITIONS

NONE

II. STANDARD CONDITIONS

1. **This permit shall not be transferable.** In the event there is a desire for the wastewater collection facilities to change ownership, or there is a name change of the Permittee, a formal permit request shall be submitted to the Division accompanied by documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request shall be considered on its merits and may or may not be approved.
2. This permit shall become voidable unless the wastewater collection facilities are constructed in accordance with the conditions of this permit; 15A NCAC 2T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials unless specifically mentioned herein.
3. This permit shall be effective only with respect to the nature and volume of wastes described in the application and other supporting data.
4. The wastewater collection facilities shall be properly maintained and operated at all times. The Permittee shall maintain compliance with an individual system-wide collection system permit for the operation and maintenance of these facilities as required by 15A NCAC 2T .0403. If an individual permit is not required, the following performance criteria shall be met as provided in 15A NCAC 2T .0403:
 - a. The sewer system shall be effectively maintained and operated at all times to prevent discharge to land or surface waters, and to prevent any contravention of groundwater standards or surface water standards.
 - b. A map of the sewer system shall be developed and shall be actively maintained.

- c. An operation and maintenance plan including pump station inspection frequency, preventative maintenance schedule, spare parts inventory and overflow response has been developed and implemented.
- d. Pump stations that are not connected to a telemetry system shall be inspected every day (i.e. 365 days per year). Pump stations that are connected to a telemetry system shall be inspected at least once per week.
- e. High-priority sewer lines shall be inspected at least once per every six-months and inspections are documented.
- f. A general observation of the entire sewer system shall be conducted at least once per year.
- g. Overflows and bypasses shall be reported to the appropriate Division regional office in accordance with 15A NCAC 2B .0506(a), and public notice shall be provided as required by North Carolina General Statute §143-215.1C.
- h. A Grease Control Program is in place as follows:
 - 1. For public owned collection systems, the Grease Control Program shall include at least biannual distribution of educational materials for both commercial and residential users and the legal means to require grease interceptors at existing establishments. The plan shall also include legal means for inspections of the grease interceptors, enforcement for violators and the legal means to control grease entering the system from other public and private satellite sewer systems.
 - 2. For privately owned collection systems, the Grease Control Program shall include at least bi-annual distribution of grease education materials to users of the collection system by the permittee or its representative.
 - 3. Grease education materials shall be distributed more often than required in Parts (1) and (2) of this Subparagraph if necessary to prevent grease-related sanitary sewer overflows.
- i. Right-of-ways and easements shall be maintained in the full easement width for personnel and equipment accessibility.
- j. Documentation shall be kept for Subparagraphs (a) through (i) of this Rule for a minimum of three years with exception of the map, which shall be maintained for the life of the system.

5. **Noncompliance Notification:**

The Permittee shall report by telephone to a water resources staff member at the Raleigh Regional Office, telephone number 919-791-4200, as soon as possible, but in no case more than 24 hours or on the next working day, following the occurrence or first knowledge of the occurrence of either of the following:

- a. Any process unit failure, due to known or unknown reasons, that renders the facility incapable of adequate wastewater transport, such as mechanical or electrical failures of pumps, line blockage or breakage, etc.; or
- b. Any SSO and/or spill over 1,000 gallons; or
- c. Any SSO and/or spill, regardless of volume, that reaches surface water

Voice mail messages or faxed information is permissible, but this shall not be considered as the initial verbal report. Overflows and spills occurring outside normal business hours may also be reported to the Division of Emergency Management at telephone number (800) 858-0368 or (919) 733-3300. Persons reporting any of the above occurrences shall file a spill report by completing and submitting Part I of Form CS-SSO (or the most current Division approved form) within five days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur. Part II of Form

CS-SSO (or the most current Division approved form) can also be completed to show that the SSO was beyond control.

6. Construction of the gravity sewers, pump stations, and force mains shall be scheduled so as not to interrupt service by the existing utilities nor result in an overflow or bypass discharge of wastewater to the surface waters of the State.
7. Per 15A NCAC 2T.0116, upon completion of construction and prior to operation of these permitted facilities, the completed Engineering Certification form attached to this permit shall be submitted with the required supporting documents to the address provided on the form. A complete certification is one where the form is fully executed and the supporting documents are provided as applicable. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.

If the permit is issued to a private entity with an Operational Agreement, then a copy of the Articles of Incorporation, Declarations/Covenants/Restrictions, and Bylaws that have been appropriately filed with the applicable County's Register of Deeds office shall be submitted with the certification.

A complete certification is one where the form is fully executed and the supporting documents are provided as applicable. Supporting documentation shall include the following:

- a. One copy of the project construction record drawings (plan & profile views of sewer lines & force mains) of the wastewater collection system extension. Final record drawings should be clear on the plans or on digital media (CD or DVD disk) and are defined as the design drawings that are marked up or annotated with after construction information and show required buffers, separation distances, material changes, etc.
- b. One copy of the supporting pump station design calculations (selected pumps, system curve, operating point, buoyancy calculations, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project.
- c. Changes to the project that do not result in non-compliance with this permit, regulations, or the Minimum Design Criteria should be clearly identified on the record drawings, on the certification in the space provided, or in written summary form.

Prior to Certification (Final or Partial): Permit modifications are required for any changes resulting in non-compliance with this permit (including pipe length increases of 10% or greater, increased flow, pump station design capacity design increases of 5% or greater, and increases in the number/type of connections), regulations, or the Minimum Design Criteria. Requested modifications or variances to the Minimum Design Criteria will be reviewed on a case-by-case basis and each on its own merit. Please note that variances to the Minimum Design Criteria should be requested and approved during the permitting process prior to construction. After-construction requests are discouraged by the Division and may not be approved, thus requiring replacement or repair prior to certification & activation.

8. A copy of the construction record drawings shall be maintained on file by the Permittee for the life of the wastewater collection facilities.
9. Failure to abide by the conditions and limitations contained in this permit; 15A NCAC 2T; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Mains adopted June 1, 2000 as applicable; and other supporting materials may subject the Permittee to an enforcement action by the Division, in accordance with North Carolina General Statutes §143-215.6A through §143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

10. In the event that the wastewater collection facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement facilities.
11. The issuance of this permit shall not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (local, state and federal) which have jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, erosion and sedimentation control requirements in 15A NCAC Ch. 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 15A NCAC 2H .0500.

FAST TRACK ENGINEERING CERTIFICATION

Permittee: **NNP Briar Chapel, LLC**
Project: **Briar Chapel – Phase 9**

Permit No. **WQ0036732**
Issue Date: **9-17-2013**

Complete and submit this form to the permit issuing regional office with the following:

- One copy of the project record drawings (plan & profile views and detail drawings of sewer lines) of the wastewater collection system extension. Final record drawings should be clear on the plans or on digital media (CD or DVD disk) in pdf format. Record drawings should indicate the design and the marked up changes during construction.
- Supporting design calculations (selected pumps, system curve, operating point, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project
- Changes to the project should be clearly identified on the record drawings or in written summary form. **Permit modifications are required for any changes resulting in non-compliance with this permit, regulations or minimum design criteria. Modifications should be submitted prior to certification.**

This project shall not be considered complete nor allowed to operate until the Division has received this Engineer's Certification and all required supporting documentation. **Therefore, it is highly recommended that this certification be sent in a manner that provides proof of receipt by the Division.**

PERMITTEE'S CERTIFICATION

I, _____, the undersigned agent for the Permittee, hereby state that this project has been constructed pursuant to the applicable standards & requirements, the Professional Engineer below has provided applicable design/construction information to the Permittee, and the Permittee is prepared to operate & maintain the wastewater collection system permitted herein or portions thereof.

Printed Name, Title

Signature

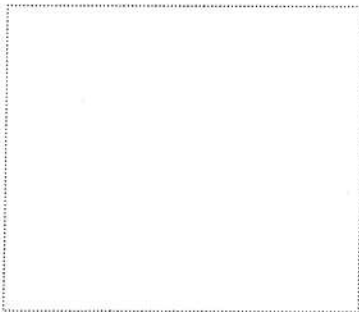
Date

ENGINEER'S CERTIFICATION

Partial Final

I, _____, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the subject project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance of this permit; 15A NCAC 02T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials.

North Carolina Professional Engineer's Seal, signature, and date:



SEND THIS FORM & SUPPORTING DOCUMENTATION WITH REQUIRED ATTACHMENTS TO THE FOLLOWING ADDRESS

**SURFACE WATER PROTECTION SUPERVISOR
RALEIGH REGIONAL OFFICE
3800 BARRETT DRIVE
RALEIGH, NC 27609**

The Permittee is responsible for tracking all partial certifications up until a final certification is received. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.

DWR Use Only:

Flow from this project is tributary to:



North Carolina Department of Environment and Natural Resources

Division of Water Quality

Coleen H. Sullins

Director

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

May 18, 2009

WILLIAM MUMFORD – ASSISTANT SECRETARY
BRIAR CHAPEL UTILITIES, LLC
16 WINDY KNOLL CIRCLE
CHAPEL HILL, NORTH CAROLINA 27516

Subject: Permit No. WQ0028552
Briar Chapel Development
Wastewater Treatment, Irrigation
and Non-Conjunctive Reclaimed
Water Utilization System
Chatham County

Dear Mr. Mumford:

In accordance with your permit modification request received April 23, 2009, and subsequent additional information received May 7, 2009, we are forwarding herewith Permit No. WQ0028552, dated May 18, 2009, to Briar Chapel Utilities, LLC for the continued operation of the Phase A wastewater treatment plant, 5-day upset pond and main wet weather storage pond, and the construction and operation of the remaining subject wastewater treatment, wastewater irrigation and non-conjunctive reclaimed water utilization facilities.

The subject modification is to add approximately 9.5 acres of non-conjunctive reclaimed utilization area along the existing parkway between US 15-501 and the bridge at Pokeberry Creek. This additional utilization area shall be known as Phase 1C.

This permit shall be effective from the date of issuance until March 31, 2010, shall void Permit No. WQ0028552 issued May 22, 2008, and shall be subject to the conditions and limitations as specified therein. Please pay particular attention to the monitoring requirements in this permit. Failure to establish an adequate system for collecting and maintaining the required operational information will result in future compliance problems.

Please note this permit contains two new permit conditions since the last permit issuance. Please review these conditions carefully:

- Condition I.3. – This condition requires the Permittee to abandon water supply well WSW-38 prior to operation of Phase 1C spray heads that throw within 100 feet of the aforementioned well.

AQUIFER PROTECTION SECTION

1636 Mail Service Center, Raleigh, North Carolina 27699-1636

Location: 2728 Capital Boulevard, Raleigh, North Carolina 27604

Phone: 919-733-3221 \ FAX 1: 919-715-0588; FAX 2: 919-715-6048 \ Customer Service: 1-877-623-6748

Internet: www.ncwaterquality.org

An Equal Opportunity \ Affirmative Action Employer

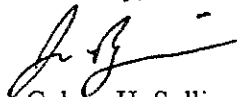
One
North Carolina
Naturally

- Condition II.17. – This condition requires the Permittee to aerate those areas in Phase 1C affected by significant compaction prior to any utilization of reclaimed water on those sites.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within thirty (30) days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of the North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made this permit shall be final and binding.

One set of approved plans and specifications is being forwarded to you. If you need additional information concerning this matter, please contact Nathaniel Thornburg at (919) 715-6160 or nathaniel.thornburg@ncdenr.gov.

Sincerely,


Coleen H. Sullins

cc: Chatham County Health Department
Raleigh Regional Office, Aquifer Protection Section
Mark P. Ashness, PE – CE Group
Technical Assistance and Certification Unit
APS Central Files
LAU Files

NORTH CAROLINA
ENVIRONMENTAL MANAGEMENT COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
RALEIGH

**WASTEWATER TREATMENT, WASTEWATER IRRIGATION AND NON-CONJUNCTIVE
RECLAIMED WATER UTILIZATION SYSTEM PERMIT**

In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations

PERMISSION IS HEREBY GRANTED TO

Briar Chapel Utilities, LLC
Chatham County

FOR THE

operation of a wastewater treatment, wastewater irrigation and non-conjunctive reclaimed water utilization facility consisting of the:

continued operation of a 250,000 gallon per day (GPD) extended aeration wastewater treatment plant (i.e., Phase A) consisting of: dual static screens for grit removal (serving Phases A, B and C); a manually cleaned bar screen; a 75,400 gallon aerated flow equalization basin with two (2) 225 gallon per minute (GPM) variable speed pumps each with an influent flow meter and one (1) 7.5 horsepower (hp) aerator; two (2) 31,500 gallon anoxic chambers each with two (2) 3 hp mixers; two (2) 189,000 gallon aeration basins each with two (2) 10 hp aerators; two (2) 31,500 gallon clarifiers each with one (1) variable speed sludge return pump; a 75,400 gallon sludge holding basin with one (1) variable speed decanting pump and one (1) 7.5 hp aerator; a 10,730 gallon chlorine contact chamber with two (2) variable speed chlorine injection pumps; a 16,800 gallon mudwell with two (2) 200 GPM return pumps; two (2) 90 square foot (ft²) tertiary filters; a 13,800 gallon clearwell with four (4) 675 GPM backwash pumps (pumps serve Phases A, B and C); dual banks of ultraviolet (UV) modules each with 10 bulbs; a 6,850 gallon dechlorination chamber with two (2) air diffusers; an effluent flow measuring device (serving Phases A, B and C); an effluent turbidimeter (serving Phases A, B and C); a permanent auxiliary generator (serving Phases A, B and C); and all associated piping, valves and appurtenances; the

continued operation of: a 3.5 million gallon (MG) clay lined five day upset pond with a 400 GPM dual submersible pumps station and audible/visual alarms; and a 21.3 MG clay lined central storage pond with dual 2,000 GPM flooded suction pumps; the

construction and operation of two additional 250,000 GPD extended aeration wastewater treatment plants to be constructed (i.e., Phases B and C) with each phase consisting of: a manually cleaned bar screen; a 75,400 gallon aerated flow equalization basin with two (2) 225 GPM variable speed pumps each with an influent flow meter and one (1) 7.5 hp aerator; two (2) 31,500 gallon anoxic chambers each with two (2) 3 hp mixers; two (2) 189,000 gallon aeration basins each with two (2) 10 hp aerators; two (2) 31,500 gallon clarifiers each with one (1) variable speed sludge return pump; a 75,400 gallon sludge holding basin with one (1) variable speed decanting pump and one (1) 7.5 hp aerator; a 10,730 gallon chlorine contact chamber with two (2) variable speed chlorine injection pumps; a 16,800 gallon mudwell with two (2) 200 GPM return pumps; two (2) 90 ft² tertiary filters; dual banks of ultraviolet (UV) modules each with 10

bulbs; a 6,850 gallon dechlorination chamber with two (2) air diffusers; and all associated piping, valves and appurtenances; the

construction and operation of a 253,027 GPD reclaimed water utilization system (Phase 1A: Fields C-1A through E-4C) consisting of: thirty-five (35) irrigation zones comprising approximately 82.2 acres; a 14.1 MG clay lined east storage pond with dual 1,200 GPM vertical turbine pumps serving nine (9) irrigation zones consisting of approximately 42.1 acres; and all associated piping, valves and appurtenances; the

construction and operation of a 51,499 GPD wastewater irrigation system (Phase 1B: Fields B-1A through B-9C) consisting of: sixteen (16) irrigation zones comprising approximately 22.0 acres; and all associated piping, valves and appurtenances; and the

construction and operation of a 21,749 GPD non-conjunctive reclaimed water utilization system (Phase 1C) consisting of: one (1) irrigation zone comprising approximately 9.48 acres; and all associated piping, valves and appurtenances; and the

to serve the Briar Chapel Development, with no discharge of wastes to the surface waters, pursuant to the application received April 23, 2009, and subsequent additional information received by the Division of Water Quality (Division), and in conformity with the project plan, specifications, and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit.

This permit shall be effective from the date of issuance until March 31, 2010, shall void Permit No. WQ0028552 issued May 22, 2008, and shall be subject to the following specified conditions and limitations:

I. SCHEDULES

1. Upon completion of construction and prior to operation of this permitted facility, a certification (see attached form) must be received from a professional engineer certifying that the permitted facility has been installed in accordance with this permit, the approved plans and specifications, and other supporting materials including the location of all monitoring wells as applicable. If this project is to be completed in phases and partially certified, you shall retain the responsibility to track further construction approved under the same permit, and shall provide a final certificate of completion once the entire project has been completed. Mail the Certification to the Aquifer Protection Section, Division of Water Quality, 1636 Mail Service Center, Raleigh, NC 27699-1636.
2. The Raleigh Regional Office, telephone number (919) 791-4200, shall be notified at least forty-eight (48) hours in advance (excluding weekends and holidays) of operation of the installed facilities so that an in-place inspection can be made. Such notification to the regional supervisor shall be made during the normal office hours from 8:00 a.m. until 5:00 p.m. on Monday through Friday, excluding State Holidays.
3. Prior to operation of any Phase 1C spray heads that throw within 100 feet of water supply well WSW-38, said well shall be permanently abandoned. Within thirty (30) days of abandonment, a Well Abandonment Record (GW-30 form) that lists this permit number and the appropriate well identification number shall be completed for each well abandoned and mailed to N.C. Division of Water Quality, Aquifer Protection Section, 1636 Mail Service Center, Raleigh, N.C. 27699-1636. The well shall be abandoned by a North Carolina Certified Well Contractor according to the North Carolina Well Construction Standards (15A NCAC 02C .0113) and local county rules.

4. No later than six months prior to the expiration of this permit, the Permittee shall request renewal of this permit on official Division forms. Upon receipt of the request, the Division will review the adequacy of the facilities described therein, and if warranted, will renew the permit for such period of time and under such conditions and limitations as it may deem appropriate. Please note that Rule 15A NCAC 02T .0105(d) requires an updated site map to be submitted with the permit renewal application.
5. Prior to commencement of irrigation, an updated soil scientist site evaluation shall be submitted for all areas that have been significantly impacted during construction or altered by grading, cutting or filling. This report shall specifically address, but not be limited to, soil features such as soil compaction and saturated hydraulic conductivity of the least permeable layer, as well as any other properties that might impact the soil's ability to accept irrigation water. The report shall certify that the disturbed areas are capable of accepting the designed annual hydraulic loading rate. The requested information must be received and acknowledged in writing by the Aquifer Protection Section, 1628 Mail Service Center, Raleigh, NC 27699-1628, prior to any irrigation of wastewater.

II. PERFORMANCE STANDARDS

1. The wastewater irrigation and non-conjunctive reclaimed water utilization facilities shall be effectively maintained and operated at all times so that there is no discharge to the surface waters, nor any contravention of groundwater or surface water standards. In the event that the facilities fail to perform satisfactorily, including the creation of nuisance conditions due to improper operation and maintenance, or failure of the irrigation area to adequately assimilate the wastewater, the Permittee shall take immediate corrective actions including those actions that may be required by the Division, such as the construction of additional or replacement wastewater treatment and disposal facilities.
2. The issuance of this permit shall not relieve the Permittee of the responsibility for damages to ground or surface waters resulting from the operation of this facility.
3. Effluent limitations shall not exceed those specified in Attachment A.
4. Application rates, whether hydraulic, nutrient, or other pollutant shall not exceed those specified in Attachment B.
5. The compliance and review boundaries for the specified reclaimed utilization areas (i.e., Phase 1A) are established at the property boundary. Any exceedance of standards at the Compliance or Review Boundary shall require action in accordance with 15A NCAC 02L .0106.
6. The compliance and review boundaries for the specified reclaimed utilization areas (i.e., Phase 1C) and the wastewater irrigation areas complying with 15A NCAC 02T .0506(c) (i.e., Phase 1B) are established at the irrigation/utilization area boundaries. Any exceedance of standards at the Compliance or Review Boundary shall require action in accordance with 15A NCAC 02L .0106.
7. The Permittee shall apply for a permit modification prior to any sale or transfer of property that affects a compliance boundary to establish a new compliance boundary.
8. In accordance with 15A NCAC 02L .0107(d), no wells, other than monitoring wells, shall be constructed within the compliance boundary except as provided by 15A NCAC 02L .0107(g).

9. Except as provided for in 15A NCAC 02L .0107(g), the Permittee shall ensure that any landowner who owns land within the compliance boundary, but who is not the Permittee, shall execute and file with the Register of Deeds in the county in which the land is located an easement running with the land that contains the following items:
- a. A notice of the permit and number or other description as allowed in 15A NCAC 02L .0107(f)(1);
 - b. Prohibits construction and operation of water supply wells within the compliance boundary; and
 - c. Reserves the right of the Permittee or the State to enter the property within the compliance boundary for purposes related to the permit.

The Director may terminate the easement when its purpose has been fulfilled or is no longer needed.

10. The facilities permitted herein must be constructed according to the following setbacks:

- a. The setbacks for reclaimed utilization sites (Phase 1A & Phase 1C) shall be as follows (all distances in feet):

i. Surface waters not classified SA:	25
ii. Surface waters classified SA:	100
iii. Any well with exception to monitoring wells	100

- b. The setbacks for the wastewater irrigation sites (Phase 1B) shall be as follows (all distances in feet):

a. Any habitable residence or place of public assembly under separate ownership:	400
b. Any habitable residence or place of public assembly owned by the Permittee:	200
c. Any private or public water supply source:	100
d. Surface waters:	100
e. Groundwater lowering ditches:	100
f. Surface water diversions:	25
g. Any well with exception of monitoring wells:	100
h. Any property line:	150 *
i. Top of slope of embankments or cuts of two feet or more in vertical height:	15
j. Any water line from a disposal system:	10
k. Subsurface groundwater lowering drainage systems:	100
l. Any swimming pool:	100
m. Public right of way:	50
n. Nitrification field:	20
o. Any building foundation or basement:	15

* Setback may be reduced to zero in accordance with 15A NCAC 2T .0506(c).

- c. The setbacks for treatment and storage units shall be as follows (all distances in feet):

i. Any habitable residence or place of public assembly under separate ownership:	100
ii. Any private or public water supply source:	100
iii. Surface waters:	50
iv. Any well with exception of monitoring wells:	100
v. Any property line:	50

11. The following shall be requirements for the reclaimed water distribution, storage, and utilization facilities (at a minimum Phase 1A & Phase 1C, but may include Phase 1B at the Permittee's discretion):
 - a. All reclaimed water valves, storage facilities, and outlets shall be tagged or labeled to warn the public or employees that the water is not intended for drinking. Where appropriate, such warning shall inform the public or employees to avoid contact with the water.
 - b. All reclaimed water piping, valves, outlets, and other appurtenances shall be color-coded, taped, or otherwise marked to identify the source of the water as being reclaimed water.
 - i. All reclaimed water piping and appurtenances shall be either colored purple (i.e., Pantone 522) and embossed or integrally stamped or marked "CAUTION: RECLAIMED WATER – DO NOT DRINK" or be installed with a purple (i.e., Pantone 522) identification tape or polyethylene vinyl wrap. The warning shall be stamped on opposite sides of the pipe and repeated every three feet or less.
 - ii. Identification tape shall be at least three inches wide and have white or black lettering on purple (i.e., Pantone 522) field stating "CAUTION: RECLAIMED WATER – DO NOT DRINK." Identification tape shall be installed on top of reclaimed water pipelines, fastened at least every 10 feet to each pipe length and run continuously the entire length of the pipe.
 - c. All reclaimed water valves and outlets shall be of a type, or secured in a manner, that permits operation by authorized personnel only.
 - d. Above-ground hose bibs (i.e., spigots or other hand-operated connections) shall not be present. Hose bibs shall be located in locked below-grade vaults that shall be clearly labeled as being of non-potable quality. As an alternative to the use of locked below-grade vaults with standard hose bib services, hose bibs, which can only be operated by a special tool or connected to a special hose connection, may be placed in non-lockable underground services boxes clearly labeled as non-potable water.
12. The Permittee shall maintain an active cross-connection control program that shall have the following minimum requirements (at a minimum Phase 1A & Phase 1C, but may include Phase 1B at the Permittee's discretion):
 - a. No direct cross-connections shall be allowed between the reclaimed water and potable water systems.
 - b. A reduced pressure principle backflow preventer, an approved air gap separation, or other device approved by the Division of Environmental Health shall be installed at the potable water service connection to the use area where both reclaimed water and potable water are supplied to a reclaimed water use area. The installation of the reduced pressure principle backflow prevention device shall allow proper testing.
 - c. An air gap separation, approved and regularly inspected by the Permittee shall be provided between the potable water and reclaimed water systems where potable water is used to supplement a reclaimed water system.
13. Reclaimed water distribution lines (at a minimum Phase 1A & Phase 1C, but may include Phase 1B at the Permittee's discretion) shall be located 10 feet horizontally from and 18 inches below any water line where practicable. Where these separation distances cannot be met, the piping and integrity testing procedures shall meet water main standards in accordance with 15A NCAC 18C.
14. Reclaimed water distribution lines (at a minimum Phase 1A & Phase 1C, but may include Phase 1B at the Permittee's discretion) shall not be less than 100 feet from a well unless the piping and integrity testing procedures meet water main standards in accordance with 15A NCAC 18C, but no case shall they be less than 25 feet from a private well or 50 feet from a public well.

15. Reclaimed water distribution lines (at a minimum Phase 1A & Phase 1C, but may include Phase 1B at the Permittee's discretion) shall meet the separation distances to sewer lines in accordance with Rule .0305 of Subchapter 02T.
16. The wastewater irrigation and reclaimed water utilization systems shall be connected to a rain or moisture sensor that shall indicate when reclaimed water application is not appropriate in accordance with Condition III.4. and III.5. of this permit.
17. Areas in Phase 1C affected by significant compaction shall be identified and the soil aerated prior to any irrigation in Zone C with reclaimed water.

III. OPERATION AND MAINTENANCE REQUIREMENTS

1. The facilities shall be properly maintained and operated at all times. The facilities shall be effectively maintained and operated as a non-discharge system to prevent the discharge of any wastewater resulting from the operation of this facility. The Permittee shall maintain an Operation and Maintenance Plan pursuant to 15A NCAC 02T .0507 & .0913 including operational functions, maintenance schedules, safety measures, and a spill response plan.
2. Upon classification of the wastewater treatment, wastewater irrigation and non-conjunctive reclaimed water utilization facilities by the Water Pollution Control System Operators Certification Commission (WPCSOCC), the Permittee shall designate and employ a certified operator to be in responsible charge (ORC) and one or more certified operator(s) to be back-up ORC(s) of the facilities in accordance with 15A NCAC 08G .0200. The ORC shall visit the facilities in accordance with 15A NCAC 08G .0200 or as specified in this permit and shall comply with all other conditions specified in these rules.
3. A suitable year round vegetative cover shall be maintained such that crop health is optimized, allows for even distribution of effluent, and allows inspection of the wastewater irrigation and non-conjunctive reclaimed water utilization systems.
4. Adequate measures shall be taken to prevent wastewater ponding or runoff from the wastewater irrigation and non-conjunctive reclaimed water utilization sites.
5. Wastewater irrigation and non-conjunctive reclaimed water utilization shall not be performed during inclement weather or when the ground is in a condition that will cause ponding or runoff.
6. All waste application equipment must be tested and calibrated at least once per permit cycle. Records of the calibration must be maintained for five years.
7. No type of wastewater other than that from the Briar Chapel Development shall be applied to the wastewater irrigation and non-conjunctive reclaimed water utilization sites.
8. An automatically activated standby power source shall be on site and operational at all times capable of powering all essential treatment units. If a generator is employed as an alternate power supply, it shall be tested weekly by interrupting the primary power source.
9. No traffic or equipment shall be allowed on the wastewater irrigation and non-conjunctive reclaimed water utilization sites except while installation occurs or while normal maintenance is being performed.
10. Public access to the land application sites shall be controlled.
11. The residuals generated from these treatment facilities must be disposed / utilized in accordance with 15A NCAC 02T .1100. The Permittee shall maintain a residual management plan pursuant to 15A NCAC 02T .0508 & .0914.

12. Diversion or bypassing of the untreated wastewater from the treatment facilities is prohibited.
13. Freeboard in the five-day upset pond, central storage pond and east storage pond shall not be less than two (2) feet at any time.
14. Gauges to monitor waste levels in the five-day upset pond, central storage pond and east storage pond shall be provided. These gauges shall have readily visible permanent markings indicating the maximum liquid level at the top of the temporary liquid storage volume, minimum liquid level at the bottom of the temporary liquid storage volume, and the lowest point on top of the dam elevations.
15. A protective vegetative cover shall be established and maintained on all earthen basin embankments (outside toe of embankment to maximum allowable temporary storage elevation on the inside of the embankment), berms, pipe runs, erosion control areas, and surface water diversions. Trees, shrubs, and other woody vegetation shall not be allowed to grow on the earthen basin dikes or embankments. Earthen basin embankment areas shall be kept mowed or otherwise controlled and accessible.
16. All wastewater shall be routed to the five-day holding pond should the limit for fecal coliform (daily maximum concentration of 25 per 100 ml) or turbidity (instantaneous maximum of 10 NTU) be exceeded, until such time that the problems associated with the treatment capability of the wastewater treatment plant have been corrected. The wastewater in the five-day holding pond shall be pumped back to the treatment plant for re-treatment or treated in the five-day pond prior to discharge to the storage pond.
17. The permitted wastewater treatment facility shall treat domestic strength wastewater only. The wastewater treatment plant shall not accept any wastewater from commercial facilities deemed industrial (i.e., from processes of trade or business, Laundromats, or vehicle/equipment washes) per Regulation 15A NCAC 2T .0103(20).

IV. MONITORING AND REPORTING REQUIREMENTS

1. Any monitoring (including groundwater, surface water, soil or plant tissue analyses) deemed necessary by the Division to ensure surface and ground water protection will be established and an acceptable sampling reporting schedule shall be followed.
2. All laboratory analyses for effluent, ground waters, or surface waters shall be made by a laboratory certified by the Division for the required parameter(s) under 15A NCAC 02H .0800.
3. Flow through the treatment facility shall be continuously monitored and daily flow values shall be reported on Form NDMR.

The Permittee shall install and maintain an appropriate flow measurement device consistent with approved engineering and scientific practices to ensure the accuracy and reliability of flow measurement. Flow measurement devices selected shall be capable of measuring flows with a maximum deviation of less than 10 percent from true flow, accurately calibrated at a minimum of once per year, and maintained to ensure that the accuracy of the measurements is consistent with the accepted capability of that type of device. The Permittee shall keep records of flow measurement device calibration on file for a period of at least three years. At a minimum, data to be included in this documentation shall be:

- a. Date of flow measurement device calibration,
 - b. Name of person performing calibration, and
 - c. Percent from true flow.
4. The effluent from the subject facilities shall be monitored by the Permittee at the frequencies and locations for the parameters specified in Attachment A.

5. The Permittee tracking the amount of wastewater irrigation and non-conjunctive reclaimed water utilization shall maintain adequate records. These records shall include, but are not necessarily limited to, the following information:
 - a. Date of wastewater irrigation and non-conjunctive reclaimed water utilization,
 - b. Volume of wastewater irrigated and reclaimed water utilized,
 - c. Field irrigated/utlized,
 - d. Length of time field is irrigated/utlized,
 - e. Continuous weekly, monthly, and year-to-date hydraulic (inches/acre) loadings for each field,
 - f. Continuous monthly and year-to-date loadings for any non-hydraulic parameter specifically limited in Attachment B for each field,
 - g. Weather conditions, and
 - h. Maintenance of cover crops.
6. Freeboard (waste level to the lowest elevation on the top of the embankment) in the 5-day upset pond, central storage pond and east storage pond shall be recorded weekly.
7. A record shall be maintained of all residuals removed from this facility. This record shall include the name of the hauler, permit authorizing the disposal or a letter from a municipality agreeing to accept the residuals, date the residuals were hauled, and volume of residuals removed.
8. A maintenance log shall be maintained at this facility including but not limited to the following items:
 - a. Visual observations of the plant and plant site.
 - b. Record of preventative maintenance (i.e., changing of equipment, adjustments, testing, inspections and cleanings, etc.).
 - c. Date of calibration of flow measurement device.
 - d. Date and results of power interruption testing on alternate power supply.
9. Three (3) copies of all monitoring data [as specified in Conditions IV.3. and IV.4.] on Form NDMR for each PPI and three (3) copies of all operation and disposal records [as specified in Conditions IV.5 and IV.6.] on Form NDAR-1 for every field shall be submitted on or before the last day of the following month. If no activities occurred during the monitoring month, monitoring reports are still required documenting the absence of the activity. All information shall be submitted to the following address:

Division of Water Quality
 Information Processing Unit
 1617 Mail Service Center
 Raleigh, North Carolina 27699-1617

10. An annual representative soils analysis (Standard Soil Fertility Analysis) shall be conducted on each wastewater irrigation field (i.e., Phase 1B) and the results maintained on file by the Permittee for a minimum of five years. The Standard Soil Fertility Analysis shall include, but is not necessarily limited to, the following parameters:

Acidity	Manganese	Potassium
Calcium	Percent Humic Matter	Sodium
Copper	pH	Zinc
Magnesium	Base Saturation (by calculation)	Phosphorus
Cation Exchange Capacity	Exchangeable Sodium Percentage	

11. Noncompliance Notification:

The Permittee shall report by telephone to the Raleigh Regional Office, telephone number (919) 791-4200, as soon as possible, but in no case more than 24 hours or on the next working day following the occurrence or first knowledge of the occurrence of any of the following:

- a. Any occurrence at the wastewater treatment facility which results in the treatment of significant amounts of wastes which are abnormal in quantity or characteristic, such as the dumping of the contents of a sludge digester; the known passage of a slug of hazardous substance through the facility; or any other unusual circumstances including ponding in the wastewater irrigation or reclaimed utilization areas or runoff from the wastewater irrigation or reclaimed utilization areas.
- b. Any process unit failure, due to known or unknown reasons, that render the facility incapable of adequate wastewater treatment such as mechanical or electrical failures of pumps, aerators, compressors, etc.
- c. Any failure of disposal system resulting in a by-pass directly to receiving waters.
- d. Any time that self-monitoring information indicates that the facility has gone out of compliance with its permit limitations including, but not limited to, freeboard measurements, effluent limitations, exceedances of groundwater standards, or overloading of any irrigation or utilization area.

For any emergency that requires immediate reporting (e.g., discharges to surface waters, imminent failure of a storage structure, etc.) outside normal business hours must be reported to the Division's Emergency Response personnel at telephone number (800) 662-7956, (800) 858-0368, or (919) 733-3300. Persons reporting such occurrences by telephone shall also file a written report in letter form within five (5) days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur.

V. INSPECTIONS


1. Adequate inspection and maintenance shall be provided by the Permittee to ensure proper operation of the subject facilities.
2. The Permittee or his designee shall inspect the wastewater treatment and disposal facilities to prevent malfunctions and deterioration, operator errors and discharges which may cause or lead to the release of wastes to the environment, a threat to human health, or a nuisance. The Permittee shall keep an inspection log or summary including at least the date and time of inspection, observations made, and any maintenance, repairs, or corrective actions taken by the Permittee. This log of inspections shall be maintained by the Permittee for a period of five years from the date of the inspection and shall be made available upon request to the Division or other permitting authority.
3. Any duly authorized officer, employee, or representative of the Division may, upon presentation of credentials, enter and inspect any property, premises or place on or related to the disposal site or facility at any reasonable time for the purpose of determining compliance with this permit; may inspect or copy any records that must be maintained under the terms and conditions of this permit, and may obtain samples of groundwater, surface water, or leachate.

VI. GENERAL CONDITIONS

1. Failure to abide by the conditions and limitations contained in this permit may subject the Permittee to an enforcement action by the Division in accordance with North Carolina General Statute 143-215.6A to 143-215.6C.
2. This permit shall become voidable unless the facilities are constructed in accordance with the conditions of this permit, the approved plans and specifications, and other supporting data.
3. This permit is effective only with respect to the nature and volume of wastes described in the application and other supporting data. No variances to applicable rules governing the construction and / or operation of the permitted facilities are granted unless specifically requested and granted in this permit.
4. The issuance of this permit does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances, which may be imposed by other government agencies (local, state, and federal) that have jurisdiction. Of particular concern to the Division are applicable river buffer rules in 15A NCAC 02B .0200, erosion and sedimentation control requirements in 15A NCAC Chapter 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 02B .0200 and 02H .0500.
5. In the event there is a desire for the facilities to change ownership, or there is a name change of the Permittee, a formal permit request must be submitted to the Division on official Division form(s), documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request will be considered on its merits and may or may not be approved. The Permittee of record shall remain fully responsible for compliance until a permit is issued to the new owner.
6. The Permittee shall retain a set of approved plans and specifications for the life of the facilities permitted herein.
7. The Permittee shall maintain this permit until all permitted facilities herein are properly closed or permitted under another permit issued by the appropriate permitting authority.
8. The Permittee must pay the annual fee within thirty (30) days after being billed by the Division. Failure to pay the fee accordingly may cause the Division to initiate action to revoke this permit pursuant to 15A NCAC 02T .0105(e).

Permit issued this the 18th day of May 2009

NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION


for Coleen H. Sullins, Director
Division of Water Quality
By Authority of the Environmental Management Commission

Permit Number WQ0028552

Permit No. WQ0028552
May 18, 2009

ENGINEER'S CERTIFICATION

_____ Partial _____ Final

I, _____, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the project,

Project Name _____ *Location and County*

for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of this permit, the approved plans and specifications, and other supporting materials.

Signature _____ Registration No. _____

Date _____

THIS PAGE BLANK

ATTACHMENT A - LIMITATIONS AND MONITORING REQUIREMENTS

Permit Number: WQ0028552

Version: 1.3

PPI 001 – WWTF Effluent

EFFLUENT CHARACTERISTICS	EFFLUENT LIMITS				MONITORING REQUIREMENTS	
	Monthly Average	Monthly Geometric Mean	Daily Minimum	Daily Maximum	Measurement Frequency	Sample Type
Parameter Description - PCS Code						
BOD, 5-Day (20 Deg. C) - 00310	10			15	2 x Month	Composite
Chloride (as Cl) - 00940					3 x Year ²	Composite
Chlorine, Total Residual - 50060					5 x Week	Grab
Coliform, Fecal MF, M-FC Broth, 44.5C - 31616		14		25	2 x Month ¹	Grab
Flow, in conduit or thru treatment plant - 50050	316,412 ³				Continuous	Recording
Nitrogen, Ammonia Total (as N) - 00610	4			6	2 x Month	Composite
Nitrogen, Nitrate Total (as N) - 00620					2 x Month	Composite
pH - 00400			6	9	5 x Week	Grab
Solids, Total Dissolved - 70300					3 x Year ²	Composite
Solids, Total Suspended - 00530 - Summer	5			10	2 x Month	Composite
Turbidity, HCH Turbidimeter - 00076				10	Continuous	Recording

1. Monthly average for Fecal Coliform shall a geometric mean.
2. 3 x Year monitoring shall be conducted in March, July & November.
3. The monthly average daily flow is limited to 316,412 GPD due to available wet weather storage capacity.

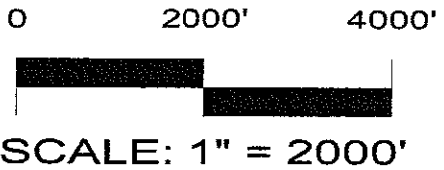
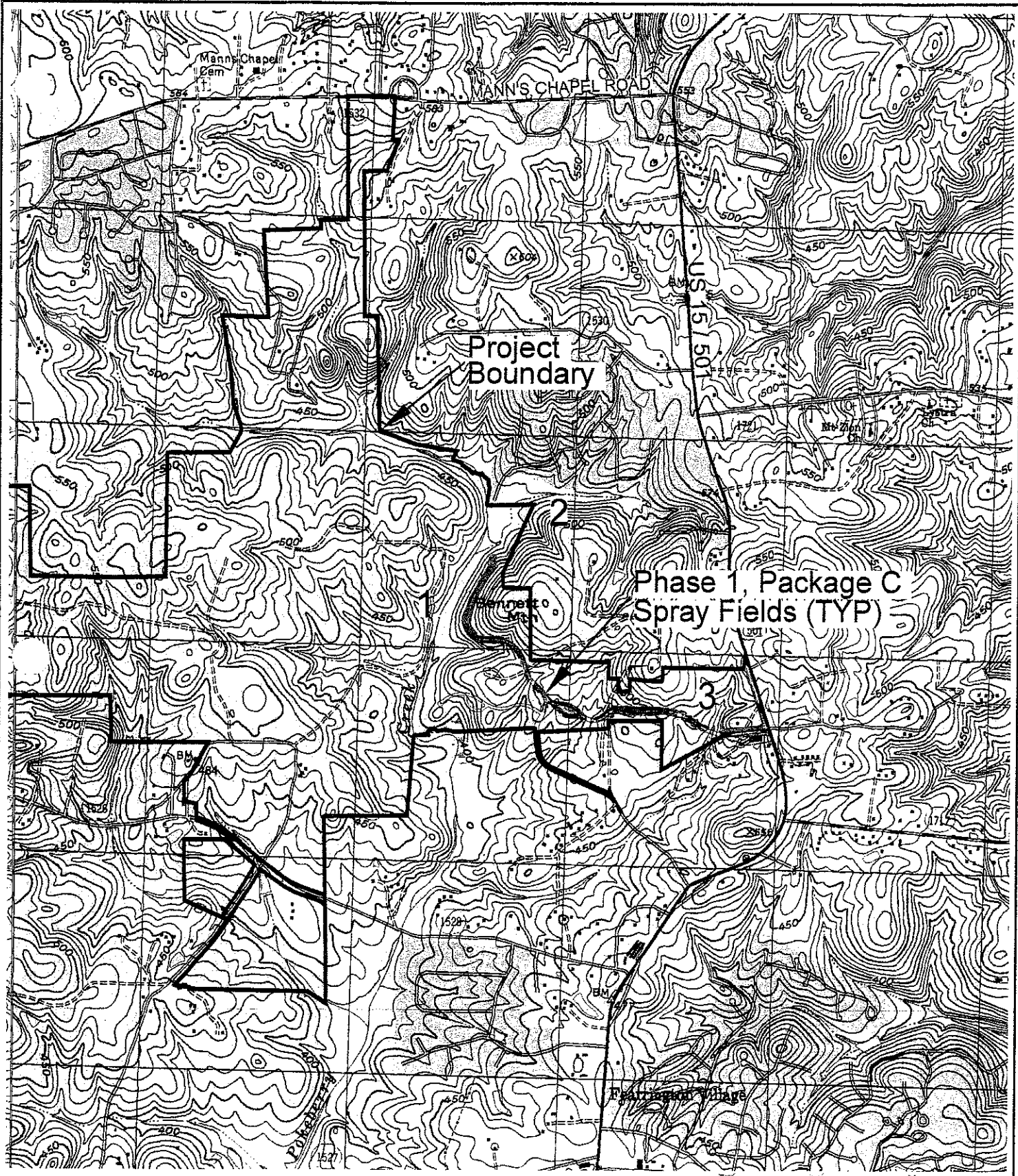
THIS PAGE BLANK

ATTACHMENT B - APPROVED LAND APPLICATION SITES AND LIMITATIONS **Permit Number: WQ0028552** **Version: 1.3**
Briar Chapel Utilities, LLC – Briar Chapel Development

IRRIGATION / UTILIZATION AREA INFORMATION										APPLICATION LIMITATIONS			
Field	Owner	County	Latitude	Longitude	Net Acreage	Dominant Soil Series	Parameter	Hourly Rate	Yearly Max	Units			
B-1A	Briar Chapel Utilities LLC	Chatham	35° 49' 28"	-79° 05' 58"	9.90	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-1B	Briar Chapel Utilities LLC	Chatham	35° 49' 25"	-79° 06' 05"	1.70	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches			
B-2A	Briar Chapel Utilities LLC	Chatham	35° 49' 22"	-79° 06' 15"	0.30	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches			
B-3B	Briar Chapel Utilities LLC	Chatham	35° 49' 36"	-79° 06' 11"	0.20	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-3C	Briar Chapel Utilities LLC	Chatham	35° 49' 41"	-79° 06' 11"	0.20	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-4A	Briar Chapel Utilities LLC	Chatham	35° 49' 42"	-79° 06' 17"	0.60	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-5A	Briar Chapel Utilities LLC	Chatham	35° 49' 07"	-79° 06' 34"	0.40	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-6A	Briar Chapel Utilities LLC	Chatham	35° 49' 07"	-79° 06' 31"	1.10	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-7A	Briar Chapel Utilities LLC	Chatham	35° 49' 59"	-79° 06' 28"	2.30	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-7B	Briar Chapel Utilities LLC	Chatham	35° 50' 16"	-79° 06' 32"	0.60	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-8A	Briar Chapel Utilities LLC	Chatham	35° 50' 14"	-79° 06' 26"	0.10	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-8B	Briar Chapel Utilities LLC	Chatham	35° 50' 32"	-79° 06' 27"	1.90	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
B-8D	Briar Chapel Utilities LLC	Chatham	35° 50' 25"	-79° 06' 25"	0.70	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches			
B-8E	Briar Chapel Utilities LLC	Chatham	35° 50' 37"	-79° 06' 22"	0.50	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches			
B-9A	Briar Chapel Utilities LLC	Chatham	35° 50' 42"	-79° 06' 26"	1.10	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches			
B-9C	Briar Chapel Utilities LLC	Chatham	35° 50' 41"	-79° 06' 20"	0.40	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
C-1A	Briar Chapel Utilities LLC	Chatham	35° 48' 35"	-79° 06' 47"	8.00	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
C-2A	Briar Chapel Utilities LLC	Chatham	35° 48' 45"	-79° 06' 38"	1.40	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches			
C-2B	Briar Chapel Utilities LLC	Chatham	35° 48' 44"	-79° 06' 35"	0.90	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches			
C-2C	Briar Chapel Utilities LLC	Chatham	35° 48' 38"	-79° 06' 35"	6.10	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
C-2D	Briar Chapel Utilities LLC	Chatham	35° 48' 41"	-79° 06' 36"	1.80	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches			
C-3A	Briar Chapel Utilities LLC	Chatham	35° 48' 52"	-79° 06' 55"	0.90	Wedowee	01284 - Application Surface Irrigation	0.10	19.95	inches			
C-3B	Briar Chapel Utilities LLC	Chatham	35° 48' 50"	-79° 06' 50"	0.80	Wedowee	01284 - Application Surface Irrigation	0.10	19.95	inches			
C-3C	Briar Chapel Utilities LLC	Chatham	35° 48' 47"	-79° 06' 49"	0.40	Wedowee	01284 - Application Surface Irrigation	0.10	19.95	inches			

C-3D	Briar Chapel Utilities LLC	Chatham	35° 48' 43"	-79° 06' 46"	0.40	Wedowee	01284 - Application Surface Irrigation	0.10	19.95	inches
C-3E	Briar Chapel Utilities LLC	Chatham	35° 48' 50"	-79° 06' 53"	9.80	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-3F	Briar Chapel Utilities LLC	Chatham	35° 48' 42"	-79° 06' 44"	3.40	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-5A	Briar Chapel Utilities LLC	Chatham	35° 49' 05"	-79° 06' 25"	4.10	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-6A	Briar Chapel Utilities LLC	Chatham	35° 49' 10"	-79° 06' 01"	0.50	Rion	01284 - Application Surface Irrigation	0.10	19.95	inches
C-6B	Briar Chapel Utilities LLC	Chatham	35° 49' 10"	-79° 06' 54"	0.10	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
C-6C	Briar Chapel Utilities LLC	Chatham	35° 49' 13"	-79° 06' 58"	0.20	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-6D	Briar Chapel Utilities LLC	Chatham	35° 49' 10"	-79° 06' 58"	0.70	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-9A	Briar Chapel Utilities LLC	Chatham	35° 49' 21"	-79° 07' 11"	4.20	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
C-9B	Briar Chapel Utilities LLC	Chatham	35° 49' 15"	-79° 07' 09"	3.20	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-12A	Briar Chapel Utilities LLC	Chatham	35° 49' 29"	-79° 07' 23"	2.00	Rion	01284 - Application Surface Irrigation	0.10	19.95	inches
C-12B	Briar Chapel Utilities LLC	Chatham	35° 49' 28"	-79° 07' 12"	2.60	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
C-12C	Briar Chapel Utilities LLC	Chatham	35° 49' 25"	-79° 07' 19"	3.40	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-12D	Briar Chapel Utilities LLC	Chatham	35° 49' 18"	-79° 07' 15"	0.40	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-13A	Briar Chapel Utilities LLC	Chatham	35° 49' 26"	-79° 07' 00"	0.40	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
C-13B	Briar Chapel Utilities LLC	Chatham	35° 49' 29"	-79° 06' 59"	1.00	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
C-13C	Briar Chapel Utilities LLC	Chatham	35° 49' 33"	-79° 07' 03"	1.10	Rion	01284 - Application Surface Irrigation	0.10	19.95	inches
C-13D	Briar Chapel Utilities LLC	Chatham	35° 49' 36"	-79° 06' 59"	1.00	Rion	01284 - Application Surface Irrigation	0.10	19.95	inches
C-13E	Briar Chapel Utilities LLC	Chatham	35° 49' 31"	-79° 06' 59"	2.70	Pacolet	01284 - Application Surface Irrigation	0.10	37.31	inches
C-13F	Briar Chapel Utilities LLC	Chatham	35° 49' 28"	-79° 07' 03"	6.40	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-15A	Briar Chapel Utilities LLC	Chatham	35° 49' 32"	-79° 06' 46"	3.50	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
C-15B	Briar Chapel Utilities LLC	Chatham	35° 49' 38"	-79° 06' 40"	0.90	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
C-15C	Briar Chapel Utilities LLC	Chatham	35° 49' 25"	-79° 06' 38"	0.90	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-15D	Briar Chapel Utilities LLC	Chatham	35° 49' 32"	-79° 06' 50"	0.90	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-15E	Briar Chapel Utilities LLC	Chatham	35° 49' 40"	-79° 06' 45"	1.40	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-16A	Briar Chapel Utilities LLC	Chatham	35° 49' 25"	-79° 06' 26"	6.20	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
C-20A	Briar Chapel Utilities LLC	Chatham	35° 49' 48"	-79° 07' 00"	0.40	Helena	01284 - Application Surface Irrigation	0.10	37.31	inches
E-1A	Briar Chapel Utilities LLC	Chatham	35° 49' 21"	-79° 06' 01"	10.40	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
E-2A	Briar Chapel Utilities LLC	Chatham	35° 49' 16"	-79° 06' 49"	9.00	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches

E-3A	Briar Chapel Utilities LLC	Chatham	35° 49' 13"	-79° 05' 30"	0.80	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
E-3B	Briar Chapel Utilities LLC	Chatham	35° 49' 11"	-79° 05' 22"	2.20	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
E-3C	Briar Chapel Utilities LLC	Chatham	35° 49' 10"	-79° 05' 27"	3.50	Wedowee	01284 - Application Surface Irrigation	0.10	37.31	inches
E-3D	Briar Chapel Utilities LLC	Chatham	35° 49' 12"	-79° 05' 39"	0.90	Rion	01284 - Application Surface Irrigation	0.10	37.31	inches
E-4A	Briar Chapel Utilities LLC	Chatham	35° 49' 16"	-79° 05' 35"	3.10	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
E-4B	Briar Chapel Utilities LLC	Chatham	35° 49' 18"	-79° 05' 18"	2.90	Helena	01284 - Application Surface Irrigation	0.10	19.95	inches
E-4C	Briar Chapel Utilities LLC	Chatham	35° 49' 16"	-79° 05' 26"	9.30	Rion	01284 - Application Surface Irrigation	0.10	37.31	inches
Phase 1C	Briar Chapel Utilities LLC	Chatham	35° 49' 14"	-79° 05' 46"	9.48	Wedowee	01284 - Application Surface Irrigation	0.10	30.84	inches
TOTAL					155.68					



FARRINGTON, NC
1993
NIMA 6155 I SE-SERIES V842





North Carolina Department of Environment and Natural Resources
Division of Water Resources
Water Quality Programs

Pat McCrory
Governor

Thomas A. Reeder
Director

John E. Skvarla, III
Secretary

October 14, 2013

Laurie Ford, Vice President, Operations
NNP Briar Chapel, LLC
16 Windy Knoll Circle
Chapel Hill, NC 27516

Subject: Permit No. WQ0036770
NNP Briar Chapel, LLC
Briar Chapel – Phase 9 Pump Station and FM
Wastewater Collection System Extension
Chatham County

Dear Ms. Ford:

In accordance with your application received October 8, 2013 we are forwarding herewith Permit No. WQ0036770, dated October 14, 2013, to NNP Briar Chapel, LLC for the construction and operation of the subject wastewater collection system extension. This permit shall be effective from the date of issuance until rescinded and shall be subject to the conditions and limitations as specified therein. This cover letter and supplement shall be considered a part of this permit and are therefore incorporated therein by reference.

Please pay particular attention to the following conditions contained within this permit:

Condition II.4: Requires that the wastewater collection facilities be properly operated and maintained in accordance with 15A NCAC 2T .0403 or any individual system-wide collection system permit issued to the Permittee.

It shall be the responsibility of the NNP Briar Chapel, LLC to ensure that the as-constructed project meets the appropriate design criteria and rules. Failure to comply may result in penalties in accordance with North Carolina General Statute §143-215.6A through §143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

If any parts, requirements, or limitations contained in this permit are unacceptable, you have the right to request an adjudicatory hearing upon written request within 30 days following receipt of this permit. This request must be in the form of a written petition, conforming to Chapter 150B of North Carolina General Statutes, and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, NC 27699-6714. Unless such demands are made, this permit shall be final and binding.

NNP Briar Chapel, LLC
WQ0036770

If you need additional information concerning this matter, please contact Ted Cashion at (919) 791-4254 or via e-mail at ted.cashion@ncdenr.gov.

Sincerely,

A handwritten signature in cursive script that reads "S. Daniel Smith".

for Thomas A. Reeder
Division of Water Resources

by S. Daniel Smith
Raleigh Region Surface Water Protection Supervisor

cc: Mark P. Ashness, P.E., CE Group, Inc., 301 Glenwood Avenue, Suite 220, Raleigh, NC 27603
Chatham County Health Department
Raleigh Regional Office, Surface Water Protection Section
Water Quality Central Files
PERCS (electronic copy)



STATE OF NORTH CAROLINA
ENVIRONMENTAL MANAGEMENT COMMISSION
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

WASTEWATER COLLECTION SYSTEM EXTENSION PERMIT

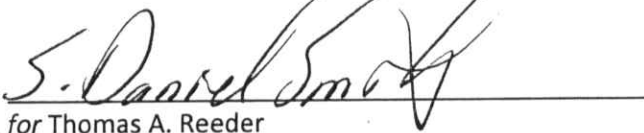
In accordance with the provisions of Article 21 of Chapter 143, General Statutes of North Carolina as amended, and other applicable Laws, Rules, and Regulations, permission is hereby granted to the

NNP Briar Chapel, LLC
Chatham County

for the construction and operation of a 113-gallon per minute pump station with duplex pumps, on-site audible and visual high water alarms, telemetry, and a portable generator receptacle with telemetry as well as approximately 1,450 linear feet of 4-inch force main as part of the Briar Chapel – Phase 9 Pump Station and FM project, and the discharge of no additional flow of collected domestic wastewater into the Briar Chapel Utilities existing sewerage system, pursuant to the application received October 8, 2013 and in conformity with 15A NCAC 2T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting data subsequently filed and approved by the Department of Environment and Natural Resources and considered a part of this permit.

This permit shall be effective from the date of issuance until rescinded and shall be subject to the specified conditions and limitations contained therein.

Permit issued this the 14th day of October, 2013.


for Thomas A. Reeder

Division of Water Resources
By Authority of The Environmental Management Commission

Permit Number: WQ0036770

SUPPLEMENT TO PERMIT COVER SHEET

NNP Briar Chapel, LLC is hereby authorized to:

Construct, and then operate upon certification the aforementioned wastewater collection extension. The sewage and wastewater collected by this system shall be treated in the Briar Chapel Utilities Wastewater Treatment Facility (Permit No. WQ0028552) prior to being land applied by spray irrigation.

Permitting of this project does not constitute an acceptance of any part of the project that does not meet 15A NCAC 2T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; and the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable, unless specifically mentioned herein. Division approval is based on acceptance of the certification provided by a North Carolina-licensed Professional Engineer in the application. It shall be the Permittee's responsibility to ensure that the as-constructed project meets the appropriate design criteria and rules.

Construction and operation is contingent upon compliance with the Standard Conditions and any Special Conditions identified below.

I. SPECIAL CONDITIONS

NONE

II. STANDARD CONDITIONS

1. **This permit shall not be transferable.** In the event there is a desire for the wastewater collection facilities to change ownership, or there is a name change of the Permittee, a formal permit request shall be submitted to the Division accompanied by documentation from the parties involved, and other supporting materials as may be appropriate. The approval of this request shall be considered on its merits and may or may not be approved.
2. This permit shall become voidable unless the wastewater collection facilities are constructed in accordance with the conditions of this permit; 15A NCAC 2T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials unless specifically mentioned herein.
3. This permit shall be effective only with respect to the nature and volume of wastes described in the application and other supporting data.
4. The wastewater collection facilities shall be properly maintained and operated at all times. The Permittee shall maintain compliance with an individual system-wide collection system permit for the operation and maintenance of these facilities as required by 15A NCAC 2T .0403. If an individual permit is not required, the following performance criteria shall be met as provided in 15A NCAC 2T .0403:
 - a. The sewer system shall be effectively maintained and operated at all times to prevent discharge to land or surface waters, and to prevent any contravention of groundwater standards or surface water standards.
 - b. A map of the sewer system shall be developed and shall be actively maintained.

- c. An operation and maintenance plan including pump station inspection frequency, preventative maintenance schedule, spare parts inventory and overflow response has been developed and implemented.
- d. Pump stations that are not connected to a telemetry system shall be inspected every day (i.e. 365 days per year). Pump stations that are connected to a telemetry system shall be inspected at least once per week.
- e. High-priority sewer lines shall be inspected at least once per every six-months and inspections are documented.
- f. A general observation of the entire sewer system shall be conducted at least once per year.
- g. Overflows and bypasses shall be reported to the appropriate Division regional office in accordance with 15A NCAC 2B .0506(a), and public notice shall be provided as required by North Carolina General Statute §143-215.1C.
- h. A Grease Control Program is in place as follows:
 - 1. For public owned collection systems, the Grease Control Program shall include at least biannual distribution of educational materials for both commercial and residential users and the legal means to require grease interceptors at existing establishments. The plan shall also include legal means for inspections of the grease interceptors, enforcement for violators and the legal means to control grease entering the system from other public and private satellite sewer systems.
 - 2. For privately owned collection systems, the Grease Control Program shall include at least bi-annual distribution of grease education materials to users of the collection system by the permittee or its representative.
 - 3. Grease education materials shall be distributed more often than required in Parts (1) and (2) of this Subparagraph if necessary to prevent grease-related sanitary sewer overflows.
- i. Right-of-ways and easements shall be maintained in the full easement width for personnel and equipment accessibility.
- j. Documentation shall be kept for Subparagraphs (a) through (i) of this Rule for a minimum of three years with exception of the map, which shall be maintained for the life of the system.

5. **Noncompliance Notification:**

The Permittee shall report by telephone to a water resources staff member at the Raleigh Regional Office, telephone number 919-791-4200, as soon as possible, but in no case more than 24 hours or on the next working day, following the occurrence or first knowledge of the occurrence of either of the following:

- a. Any process unit failure, due to known or unknown reasons, that renders the facility incapable of adequate wastewater transport, such as mechanical or electrical failures of pumps, line blockage or breakage, etc.; or
- b. Any SSO and/or spill over 1,000 gallons; or
- c. Any SSO and/or spill, regardless of volume, that reaches surface water

Voice mail messages or faxed information is permissible, but this shall not be considered as the initial verbal report. Overflows and spills occurring outside normal business hours may also be reported to the Division of Emergency Management at telephone number (800) 858-0368 or (919) 733-3300. Persons reporting any of the above occurrences shall file a spill report by completing and submitting Part I of Form CS-SSO (or the most current Division approved form) within five days following first knowledge of the occurrence. This report must outline the actions taken or proposed to be taken to ensure that the problem does not recur. Part II of Form

CS-SSO (or the most current Division approved form) can also be completed to show that the SSO was beyond control.

6. Construction of the gravity sewers, pump stations, and force mains shall be scheduled so as not to interrupt service by the existing utilities nor result in an overflow or bypass discharge of wastewater to the surface waters of the State.
7. Per 15A NCAC 2T.0116, upon completion of construction and prior to operation of these permitted facilities, the completed Engineering Certification form attached to this permit shall be submitted with the required supporting documents to the address provided on the form. A complete certification is one where the form is fully executed and the supporting documents are provided as applicable. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.

If the permit is issued to a private entity with an Operational Agreement, then a copy of the Articles of Incorporation, Declarations/Covenants/Restrictions, and Bylaws that have been appropriately filed with the applicable County's Register of Deeds office shall be submitted with the certification.

A complete certification is one where the form is fully executed and the supporting documents are provided as applicable. Supporting documentation shall include the following:

- a. One copy of the project construction record drawings (plan & profile views of sewer lines & force mains) of the wastewater collection system extension. Final record drawings should be clear on the plans or on digital media (CD or DVD disk) and are defined as the design drawings that are marked up or annotated with after construction information and show required buffers, separation distances, material changes, etc.
- b. One copy of the supporting pump station design calculations (selected pumps, system curve, operating point, buoyancy calculations, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project.
- c. Changes to the project that do not result in non-compliance with this permit, regulations, or the Minimum Design Criteria should be clearly identified on the record drawings, on the certification in the space provided, or in written summary form.

Prior to Certification (Final or Partial): Permit modifications are required for any changes resulting in non-compliance with this permit (including pipe length increases of 10% or greater, increased flow, pump station design capacity design increases of 5% or greater, and increases in the number/type of connections), regulations, or the Minimum Design Criteria. Requested modifications or variances to the Minimum Design Criteria will be reviewed on a case-by-case basis and each on its own merit. Please note that variances to the Minimum Design Criteria should be requested and approved during the permitting process prior to construction. After-construction requests are discouraged by the Division and may not be approved, thus requiring replacement or repair prior to certification & activation.

8. A copy of the construction record drawings shall be maintained on file by the Permittee for the life of the wastewater collection facilities.
9. Failure to abide by the conditions and limitations contained in this permit; 15A NCAC 2T; the Division's Gravity Sewer Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Station and Force Mains adopted June 1, 2000 as applicable; and other supporting materials may subject the Permittee to an enforcement action by the Division, in accordance with North Carolina General Statutes §143-215.6A through §143-215.6C, construction of additional or replacement wastewater collection facilities, and/or referral of the North Carolina-licensed Professional Engineer to the licensing board.

10. In the event that the wastewater collection facilities fail to perform satisfactorily, including the creation of nuisance conditions, the Permittee shall take immediate corrective action, including those as may be required by this Division, such as the construction of additional or replacement facilities.

11. The issuance of this permit shall not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (local, state and federal) which have jurisdiction, including but not limited to applicable river buffer rules in 15A NCAC 2B .0200, erosion and sedimentation control requirements in 15A NCAC Ch. 4 and under the Division's General Permit NCG010000, and any requirements pertaining to wetlands under 15A NCAC 2B .0200 and 15A NCAC 2H .0500.

FAST TRACK ENGINEERING CERTIFICATION

Permittee: NNP Briar Chapel, LLC
Project: Briar Chapel – Phase 9 Pump Station and FM

Permit No. WQ0036770
Issue Date: 10-14-13

Complete and submit this form to the permit issuing regional office with the following:

- One copy of the project record drawings (plan & profile views and detail drawings of sewer lines) of the wastewater collection system extension. Final record drawings should be clear on the plans or on digital media (CD or DVD disk) in pdf format. Record drawings should indicate the design and the marked up changes during construction.
- Supporting design calculations (selected pumps, system curve, operating point, available storage if portable generator(s) or storage greater than longest past three year outage reliability option selected) for any pump stations permitted as part of this project
- Changes to the project should be clearly identified on the record drawings or in written summary form. **Permit modifications are required for any changes resulting in non-compliance with this permit, regulations or minimum design criteria. Modifications should be submitted prior to certification.**

This project shall not be considered complete nor allowed to operate until the Division has received this Engineer's Certification and all required supporting documentation. **Therefore, it is highly recommended that this certification be sent in a manner that provides proof of receipt by the Division.**

PERMITTEE'S CERTIFICATION

I, _____, the undersigned agent for the Permittee, hereby state that this project has been constructed pursuant to the applicable standards & requirements, the Professional Engineer below has provided applicable design/construction information to the Permittee, and the Permittee is prepared to operate & maintain the wastewater collection system permitted herein or portions thereof.

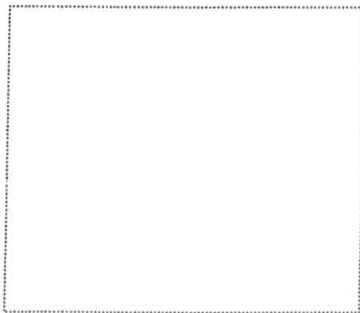
_____	_____	_____
Printed Name, Title	Signature	Date

ENGINEER'S CERTIFICATION

Partial Final

I, _____, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe (periodically, weekly, full time) the construction of the subject project for the Permittee hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance of this permit; 15A NCAC 02T; the Division's Gravity Sewer Minimum Design Criteria adopted February 12, 1996 as applicable; the Division's Minimum Design Criteria for the Fast-Track Permitting of Pump Stations and Force Mains adopted June 1, 2000 as applicable; and other supporting materials.

North Carolina Professional Engineer's Seal, signature, and date:



SEND THIS FORM & SUPPORTING DOCUMENTATION WITH REQUIRED ATTACHMENTS TO THE FOLLOWING ADDRESS

**SURFACE WATER PROTECTION SUPERVISOR
RALEIGH REGIONAL OFFICE
3800 BARRETT DRIVE
RALEIGH, NC 27609**

The Permittee is responsible for tracking all partial certifications up until a final certification is received. Any wastewater flow made tributary to the wastewater collection system extension prior to completion of this Engineer's Certification shall be considered a violation of the permit and shall subject the Permittee to appropriate enforcement actions.

DWR Use Only:
Flow from this project is tributary to:

Water and Wastewater Treatment Plant
Distribution and Collection Systems



Maintenance and Construction
Customer Service and Billing

CHATHAM COUNTY

PUBLIC WORKS DEPARTMENT – UTILITIES & WATER DIVISION

Phone: (919) 542-8270
Fax: (919) 542-8282
Email: leonard.mcbryde@chathamnc.org
Website: www.chathamnc.org

964 East Street, 2nd Floor/Suite 205
Post Office Box 910
Pittsboro, N.C. 27312

October 7, 2013

Chris Seamster, PLA
Project Manager/Landscape Architect
1730 Varsity Drive, Suite 500
Raleigh, NC 27606

Subject: Briar Chapel Phase 9

Mr. Semester,

Please find attached the following.

- Signed Application for Approval
- Approved Engineers Report, Drawings and Specifications

If you need any additional information or have any question, do not hesitate to call me at this office.

Sincerely,

Leonard McBryde III, P.E.
Public Utilities Director

**North Carolina Department of Environment
And Natural Resources
Division of Water Resources
Public Water Supply Section**

Application for Approval of Engineering Plans and Specifications For Water Supply Systems

Applicant	Design Engineer
Chatham County <small>(Name of Board, Council or Owner – the Applicant)</small>	Grant M. Livengood, P.E. <small>(Name of Design Engineer of Record)</small>
Charlie Horne, County Manager <small>(Name and Title of Authorized Official or Representative of the Applicant)</small>	McKim & Creed, Inc. <small>(Name of Engineering Firm)</small>
12 East Street, Courthouse Annex <small>(Street or Box Number)</small>	1730 Varsity Drive, Suite 500 <small>(Street or Box Number)</small>
Pittsboro, NC 27312 <small>(City, State & ZIP)</small>	Raleigh, NC 27606 <small>(City, State & ZIP)</small>
(919) 542-8200 <small>(Phone Number)</small>	(919) 233-8091 <small>(Phone Number)</small>
(919) 542-8272 <small>(FAX Number)</small>	(919) 233-8031 <small>(FAX Number)</small>
Charlie.Horne@chathamnc.org <small>(Email address)</small>	glivengood@mckimcreed.com <small>(Email address)</small>
 <small>(Signature of Authorized Official or Representative of the Applicant)</small>	

Project Name: Briar Chapel – Phase 9
(Name of Project to appear on Public Water Supply Section records and tracking system)

4,032 LF of 6-inch ductile iron water main and all associated appurtenances
(description of project)

To the North and South of Boulder Point Drive (to the West of Phase 8)
(general location of project)

in Chatham County.

Date _____
(for DENR use only)

Serial No. _____
(for DENR use only)

Application for Approval of Engineering Plans and Specifications for Water Supply Systems

To: Division of Water Resources,
Department of Environment and Natural Resources

The **Applicant** applies under and in full accord with the provision of NCGS 130A-317, and such other statutes and rules as relate to public water systems. The **Authorized Official** or **Representative** of the **Applicant** represents that he is authorized to act for the **Applicant**. The **Authorized Official** or **Representative** of the **Applicant** understands and agrees to the following:

1. The **Applicant** shall not award contracts or begin construction without first receiving "Authorization to Construct" from DENR.
2. The **Applicant** shall make no change or deviation from the engineering plans and specifications approved by DENR except as allowed by 15A NCAC 18C .0306 or with the written consent and approval of DENR.
3. The **Applicant** shall obtain Final Approval from DENR prior to placing the project (or any portion thereof) into service.
4. Digital (PDF) submittals are true image copy of the original sealed/signed documents.

An authorized representative of the **Public Water System** (not always the same as the **Applicant**) is to complete and sign the following WSMP section.

Status of Water System Management Plan (WSMP)

Check one of the following, and if applicable, provide the required information:

- The WSMP for the project, as defined in the attached engineering plans and specifications, has not been submitted.
- Three copies of the WSMP for the project, as defined in the attached engineering plans and specifications, are submitted with this application.
- The WSMP that includes this project, as defined in the attached engineering plans and specifications, was previously submitted.

Provide the following:

Public Water System Name: North Chatham

Owner Name: Chatham County

Water System No: NC 03-19-126

Serial Number of approved WSMP: 12-00936

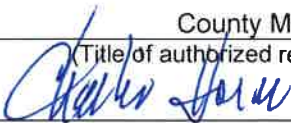
By my signature below, I certify that the previously submitted WSMP contains the information required by 15A NCAC 18C .0307(c) for the project defined in the attached engineering plans and specifications.

Charlie Horne

(Type or print name of authorized representative of Public Water System)

County Manager, Chatham County

(Title of authorized representative of Public Water System)



(Signature of authorized representative of Public Water System)

9/11/13

(Date)

Application for Approval of Engineering Plans and Specifications for Water Supply Systems

In accordance with NCGS 130A-328, the Public Water Supply Section charges a fee for plan review. **Any documents submitted for review must be accompanied by a check payable to DENR-Public Water Supply Section before the review will begin.**

There is a \$25 fee for returned checks.

The charges for review of plans are shown below. Check one of the following.

Distribution System fees

- | | | |
|-------------------------------------|---|-------|
| <input checked="" type="checkbox"/> | Construction of water lines, less than 5000 linear feet | \$150 |
| <input type="checkbox"/> | Construction of water lines, 5000 linear feet or more | \$200 |
| <input type="checkbox"/> | Other construction or alteration to a distribution system | \$ 75 |

Ground Water System fees

- | | | |
|--------------------------|--|-------|
| <input type="checkbox"/> | Construction of a new ground water system or adding a new well | \$200 |
| <input type="checkbox"/> | Alteration to an existing ground water system | \$100 |

Surface water system fees

- | | | |
|--------------------------|---|-------|
| <input type="checkbox"/> | Construction of a new surface water intake or treatment facility | \$250 |
| <input type="checkbox"/> | Alteration to existing surface water intake or treatment facility | \$150 |

Other fees

- | | | |
|--------------------------|--|-------|
| <input type="checkbox"/> | Water System Management Plan review | \$ 75 |
| <input type="checkbox"/> | Miscellaneous changes or maintenance not covered above | \$ 50 |

Notes:

1. Projects for Tank Rehabilitation use separate "Application for Water Tank Reconditioning Plan Approval."
2. The fee is not refundable if the plans are not approved
3. Revisions to plans to address the Public Water Supply Section's or other state agency's comments do not incur an additional fee.
4. If one set of plans has multiple related items (such as a new well with construction of water lines) only one fee must be submitted for highest price item. The amounts are not cumulative, except for fees for Water System Management Plans.
5. **If the appropriate plan review fee is not received within ten days after the receipt of plans and specifications for approval, then all plan documents will be recycled. A new set of documents must then be submitted with the appropriate fee for approval.**

This approval does not address all applicable laws, rules, standards and criteria, and other approvals and licenses that may be required by the local, state or federal government.

The Public Water Supply Section gives this approval with the understanding that upon installation of such works, its operation shall be placed under the care of a competent person, and the operation shall be carried out according to best accepted practice and in accordance with DENR's recommendations.

The Public Water Supply Section has stamped and sealed the official copies of plans and specifications accompanying this application with the serial number of this application _____ . Any erasures, additions or alterations of the proposed improvements except those permitted in 15A NCAC 18C .0306 make this approval null and void.

This approval does not constitute a warranty of the design, construction or future operation of the water system.

Signed: _____
Public Water Supply Section
DENR

Application for Approval of Engineering Plans and Specifications for Water Supply Systems

Other Information and Checklist Page

- Attached is a check for the proper plan review fee amount, in accordance with NCGS 130A-328. See note 4 on page 3.
-

This submittal includes one paper original with two digital (PDF) CDs of the following items, each item in separate folders:

- This completed "Application for Approval of Engineering Plans and Specifications for Water Supply Systems"
- The sealed plan drawings, separate file in PDF format for each drawing. Cover sheet must include drawings index;
- The project-specific Engineering Report (ER) describing the scope and purpose of the project and addressing each of the items listed in 15A NCAC 18C .0307(b), including the design basis of the project. [15A NCAC 18C .0307(b) (12)];
- Specifications for this project; **OR**
- The project will use the following system's previously approved standard specifications for waterline extensions:

Name of System: _____

Serial Number: _____

The Serial Numbers for previously approved standard specifications can be found at the following website:

<http://www.ncwater.org/pws/PlanReview/stdspecs.html>

One of the following:

- Attached is a letter signed by an authorized representative of the Public Water System agreeing to serve the project and stating that the system has adequate supply;
- OR**
- The **Applicant** is the Public Water System.
-

If the project has sought funding (for example, DWSRF loan) list the program and (if available) the application or funding number below:

Program Name	Application or Funding Number, if available



Newland by COMMUNITIES

Technical Specifications

Briar Chapel - Phase 9

Date: September 4, 2013

UTILITIES PLAN REVIEW

Review is for general conformance with Chatham County Specifications, NCDOT, NCDENR and Material standards. This review does not exempt plans from other review requirements.

- Approved
- Approved with Modifications
- Revise and Resubmit
- Disapproved

CHATHAM COUNTY PUBLIC UTILITIES & WATER DIVISION
P.O. Box 910, Pittsboro, NC 27312

Date: 10/7/13 By: *[Signature]*

Prepared for:
Chatham County Water Department
964 East Street
Pittsboro, NC 27312-0130

Prepared by:
McKim & Creed, Inc.
1730 Varsity Drive
Suite 500
Raleigh, NC 27606



McKim & Creed Project #02735-0096



by
Newland COMMUNITIES

Engineer's Report

Briar Chapel - Phase 9

Date: September 4, 2013

UTILITIES PLAN REVIEW
 Review is for general conformance with Chatham County Specifications, NCDOT, NCDENR and Material standards. This review does not exempt plans from other review requirements.

Approved
 Approved with Modifications
 Revise and Resubmit
 Disapproved

CHATHAM COUNTY PUBLIC UTILITIES & WATER DIVISION
 P.O. Box 910, Pittsboro, NC 27312
 Date: 10/7/13 By: *[Signature]*

Prepared for:
 Chatham County Water Department
 964 East Street
 Pittsboro, NC 27312-0130

Prepared by:
 McKim & Creed, Inc.
 1730 Varsity Drive
 Suite 500
 Raleigh, NC 27606

McKim & Creed Project #02735-0096





North Carolina Department of Environment and Natural Resources
Division of Water Resources

Pat McCrory
Governor

Thomas A. Reeder
Director

John E. Skvarla, III
Secretary

October 28, 2013

Mr. Charlie Horne, County Manager
Chatham County
12 East Street, Courthouse Annex
Pittsboro, North Carolina 27312

Re: Engineering Plans and Specifications Approval
Water Main Extension
Briar Chapel, Phase 9
Chatham County Water System-North
Water System No.: NC0319126, Chatham Co.
Serial No. 13-00910

Dear Mr. Horne:

Enclosed please find one copy of the "Application for Approval..." together with one copy of the referenced engineering plans and specifications bearing the Division of Water Resources stamp of approval for the referenced project. These engineering plans and specifications are approved under Division of Water Resources Serial Number 13-00910, dated October 28, 2013.

Engineering plans and specifications prepared by Grant M. Livengood, P.E, call for the installation of approximately 4,032 feet of 6-inch ductile iron pipe water main, 6 fire hydrants, valves and other appurtenances to serve Briar Chapel, Phase 9 which consists of two separate sections: Section 1 located along the north side of Boulder Point Road and Section 2 south of Boulder Point Drive, containing 110 single family lots combined. The proposed system will connect to Roads 'K' and 'L' in Briar Chapel Phase 7.

Please note that an "Authorization to Construct" requires both this approval of Engineering Plans and Specifications and submittal of a complete Water System Management Plan. No construction shall be undertaken, and no contract for construction, alteration, or installations shall be entered into until the Department issues an Authorization to Construct letter in accordance with 15A NCAC 18C .0305(a).

Please also note that in accordance with 15A NCAC 18C .0309(a), no construction, alteration, or expansion of a water system shall be placed into service or made available for human consumption until the Public Water Supply Section has issued Final Approval. Final Approval will be issued and mailed to the applicant upon receipt of both an Engineer's Certification and an Applicant's Certification submitted in accordance 15 A NCAC 18C .0303 (a) and (c).

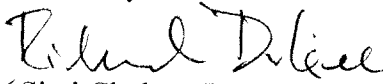
These plans and specifications in the foregoing application are approved insofar as the protection of public health is concerned as provided in the rules, standards and criteria adopted under the authority of Chapter 130A-317 of the General Statutes. This approval does not constitute a warranty of the design, construction or future operation of the water system.

Mr. Charlie Horne
Page 2 of 2
October 28, 2013

One copy of the "Application for Approval..." and a copy of the plans and specifications with a seal of approval from the department are enclosed. One copy of the enclosed documents is being forwarded to our Raleigh Regional Office. The third copy is being retained in our permanent files.

If the Public Water Supply Section can be of further service, please call (919) 707-9100.

Sincerely,


for Siraj Chohan, P.E.
Plan Review Team Leader

SMC/RJD

Enclosures: Approval Document

cc: Michael Douglas, P.E., Raleigh Regional Office
Chatham County Health Department
Grant M. Livengood, P.E., McKim & Creed, Inc.
Leonard McBryde, III, P.E., Chatham County Public Utilities Director



North Carolina Department of Environment and Natural Resources
Division of Water Resources

Pat McCrory
Governor

Thomas A. Reeder
Director

John E. Skvarla III
Secretary

October 29, 2013

CHARLIE HORNE, COUNTY MANAGER
CHATHAM COUNTY
12 EAST STREET COURTHOUSE ANNEX
PITTSBORO, NC 27312

Re: **Authorization to Construct**
BRIAR CHAPEL - PHASE 9
CHATHAM CO WATER SYSTEM
CHATHAM COUNTY, NC0319126

Authorization to Construct (This is not a Final Approval)

Dear Applicant:

This letter is to confirm that a complete Engineer's Report and a Water System Management Plan have been received, and that engineering plans and specifications have been approved by the Department for **BRIAR CHAPEL - PHASE 9, Serial No. 13-00910**.

The Authorization to Construct is valid for 24 months from the **Issue Date** (refer to next page). Authorization to Construct may be extended if the Rules Governing Public Water Supplies and site conditions have not changed (see Rule .0305). The Authorization to Construct and the engineering plans and specifications approval letter shall be posted at the primary entrance of the job site before and during construction.

Upon completion of the construction or modification, and prior to **placing the new construction or modification into service**, the applicant must submit an Engineer's Certification and Applicant Certification directly to RICHARD DICKIE, P.E. of this office.

- **Engineer Certification:** in accordance with Rule .0303 (a), the applicant shall submit a certification statement signed and sealed by a registered professional engineer stating that construction was completed in accordance with approved engineering plans and specifications, including any provisions stipulated in the Department's engineering plan and specification approval letter.
- **Applicant Certification:** in accordance with Rule .0303 (c), the applicant shall submit a signed certification statement indicating that the requirements for an Operation and Maintenance Plan and Emergency Management Plan have been satisfied in accordance with Rule .0307 (d) and (e) and that the system has a certified operator in accordance with Rule .1300. The "Applicant Certification" form is available at <http://www.deh.enr.state.nc.us/pws/> (click on Plan Review Forms, under Plan Review heading).

If this Authorization to Construct is for a new public water system, the owner must submit a completed **application for an Operating Permit** and the appropriate fee. For a copy of the application for an Operating Permit please call (919) 707-9085.

Once the certifications and permit application and fee, (if applicable), are received and determined adequate, the Department will issue a Final Approval letter to the applicant. In accordance with Rule .0309 (a), **no portion of this project shall be placed into service until the Department has issued Final Approval.**

If the Public Water Supply Section can be of further assistance, please call (919) 707-9100.

Sincerely,

Siraj Chohan, P.E.
Plan Review Team Leader

cc: Michael Douglas, P.E., REGIONAL ENGINEER
MCKIM AND CREED PA-CARY



North Carolina Department of Environment and Natural Resources
Division of Water Resources

Public Water System Authorization to Construct

Public Water System Name and Water System No.:	CHATHAM CO WATER SYSTEM NC0319126
Project Name:	BRIAR CHAPEL - PHASE 9
Serial No.:	13-00910
Issue Date:	10/28/2013
Expiration Date:	24 Months after Issue Date

In accordance with NCAC 18C .0305, this Authorization to Construct must be posted
at the primary entrance to the job site during construction.

MCKIM AND CREED PA-CARY
1730 VARSITY DR
SUITE 500
RALEIGH

NC 27606

SUMMARY OF IMPERVIOUS SURFACE CALCULATIONS
BRIAR CHAPEL DEVELOPMENT

November 8, 2013

Total Site Area	1,589.36 ac	
Total Phase 2	5.30 ac	230,840 sf
Total Phase 4	60.73 ac	2,645,299 sf
Total Phase 5 South	7.11 ac	309,920 sf
Total Phase 5 North	17.73 ac	772,486 sf
Total Phase 6 South	16.39 ac	714,021 sf
Total Phase 6 North	13.51 ac	588,450 sf
Total Phase 7	19.55 ac	851,782 sf
Total Phase 8	14.22 ac	619,546 sf
Total Phase 9	16.71 ac	727,700 sf
Total Phase 10	23.36 ac	1,017,722 sf
Total Phase 11	12.69 ac	552,614 sf
Total Phase 12	28.97 ac	1,261,923 sf
Total Phase 13	7.04 ac	306,624 sf
Total Phase 14	4.11 ac	178,832 sf
Total Phase 15	17.81 ac	775,645 sf
Total Phase 16	25.12 ac	1,094,311 sf
County Park	1.75 ac	76,314 sf
County School	7.32 ac	318,823 sf
Woods Charter School	4.15 ac	180,911 sf
Water Tank Site	0.32 ac	13,755 sf
Water Treatment Plant	0.89 ac	38,590 sf
BC Civic Building	0.95 ac	41,274 sf
BC Village Market (@ 15-501)	2.83 ac	123,156 sf
BC Town Center (@ 15-501)	31.08 ac	1,353,948 sf
Total Impervious	339.63 ac	14,794,486 sf
Total Impervious Percent	21.37%	

BRIAR CHAPEL - TRANSECT ZONE

Frontage by Zone/Area

T3 Zone	Phase 6 N	Ph 7	Ph 8	Ph 9	Cumulative (LF)	Cumulative (%)
50,500 LF	5,000 LF	2,355 LF	1,110 LF	3,000 LF	11,465 LF	23%
T4a Zone	Phase 6 N	Ph 7	Ph 8	Ph 9	Cumulative (LF)	Cumulative (%)
30,000 LF	600 LF	3,440 LF	4,150 LF	3,200 LF	11,390 LF	38%
T4b Zone	Phase 6 N	Ph 7	Ph 8	Ph 9	Cumulative (LF)	Cumulative (%)
5,500 LF	00 LF	780 LF	64 LF	00 LF	844 LF	15%



LETTER OF TRANSMITTAL

DATE: September 4, 2013	
PROJECT NO: 2735-0096	TASK NO: EXP
RE: Briar Chapel – Phase 9	
TRANSMITTAL NO: 1	PAGE 1 OF 1

TO: NCDENR – Division of Energy, Mineral and Land Resources, North Carolina Stormwater Permitting Program
1612 Mail Service Center Raleigh, NC 27604
ATTENTION: Ms. Annette Lucas

WE ARE SENDING: Originals Prints Shop Drawings Samples
 Specifications Calculations Other -

Quantity	Dwg No.	Rev.	Description	Status
2			Stormwater Design Plans	G
2			Narrative & Supporting Calculations	G
2			BMP #14 O&M Agreement and Design Supplements (1 Original, 1 copy)	G
2			BMP #15 O&M Agreement and Design Supplements (1 Original, 1 copy)	G
2			BMP #16 O&M Agreement and Design Supplements (1 Original, 1 copy)	G

Issue Status Code: A. Preliminary B. Fabrication Only C. For Information D. Bid
 E. Construction F. For Review & Comments G. For Approval H. See Remarks

REMARKS:

Annette,

Please find the enclosed documents for your review. Please let us know if you have any questions or comments. Thank you.

Cc:

McKIM & CREED, INC.

Signed *Gareth Avant*
 Gareth Avant, PE

401 NARRATIVE & SUPPORTING CALCULATIONS

Briar Chapel Development Phase 9

Chatham County, North Carolina
September 8, 2013

Prepared for:



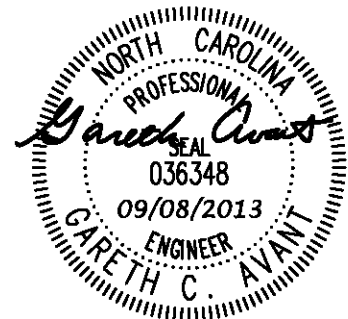
NNP Briar Chapel, LLC
16 Windy Knoll Circle
Chapel Hill, North Carolina 27516

Prepared By:



1730 Varsity Drive, Suite 500
Raleigh, North Carolina 27606
Phone: (919) 233.8091
Fax: (919) 233.8031

M&C Project No. 02735-0096



PROJECT DESCRIPTION

The purpose of the project is to construct water, sewer and roadway infrastructure to support 114 residential lots within the Briar Chapel development. This will be the third of several phases of construction in this proximity.

Based on the conditions of the approved 401 Water Quality Certification, NCDENR-DWQ will require runoff from the roads to be captured and treated for 85% TSS removal before being discharged into existing stream buffers. To meet this requirement, the runoff from the northern portion of this phase of construction will be directed to Wet Detention Pond #14. The runoff from the southern portion of this phase will be directed to a new BMP, Wet Detention Pond #15. To capture drainage from the existing portion of Boulder Point Drive that currently drains to a previously approved temporary LS/VFS measure (NCDENR-DWQ Project #05-0732v21), a stormwater wetland will be constructed to ensure the site meets the requirements of the 401 certification. Calculations for these new facilities are included in this package.

Upon completion of the project's construction, the proposed public roads will be turned over to and maintained by NCDOT.

SITE DESCRIPTION

The project area is approximately 30 acres of disturbed area located within the BC South development area, adjacent to Boulder Point Drive and north of Margaret B Pollard Middle School.

This portion of the site drains to the north on the north side of Boulder Point Drive and south on the south side of road.

SOILS

According to the Chatham County Generalized Soil Survey, the soils located on the site are classified as Wedowee sandy loam, 2% to 15% slopes (WeB, , WeD) and Wedowee sandy loam, 2% to 15% slopes, bouldery (WdC).

The following soil descriptions are associated with the soils found on the site:

We(X) – Wedowee sandy loam soils are often found in piedmont uplands, along ridges and side slopes. Permeability is moderate and the soils are well drained. Soils have a low shrink/swell potential. The seasonal high water is generally more than 6.0 feet below the surface.

WdC – Wedowee sandy loam, boulder soils carry the same characteristics of Wedowee We(X) soils, listed above, with the exception that large boulders are more commonly found.

WET DETENTION DESIGN

The wet detention pond on this site has been designed to remove 90% of the total suspended solids entering from the surrounding impervious drainage areas before discharging into the adjacent stream. The calculations provided with this package include all projected future

drainage areas that might be captured by the pond. Treated runoff will be dissipated by a riprap outlet protection device before entering any stream buffers.

Design parameters were taken from the BMP manual and from DWQ's design supplement forms.

STORMWATER WETLAND DESIGN

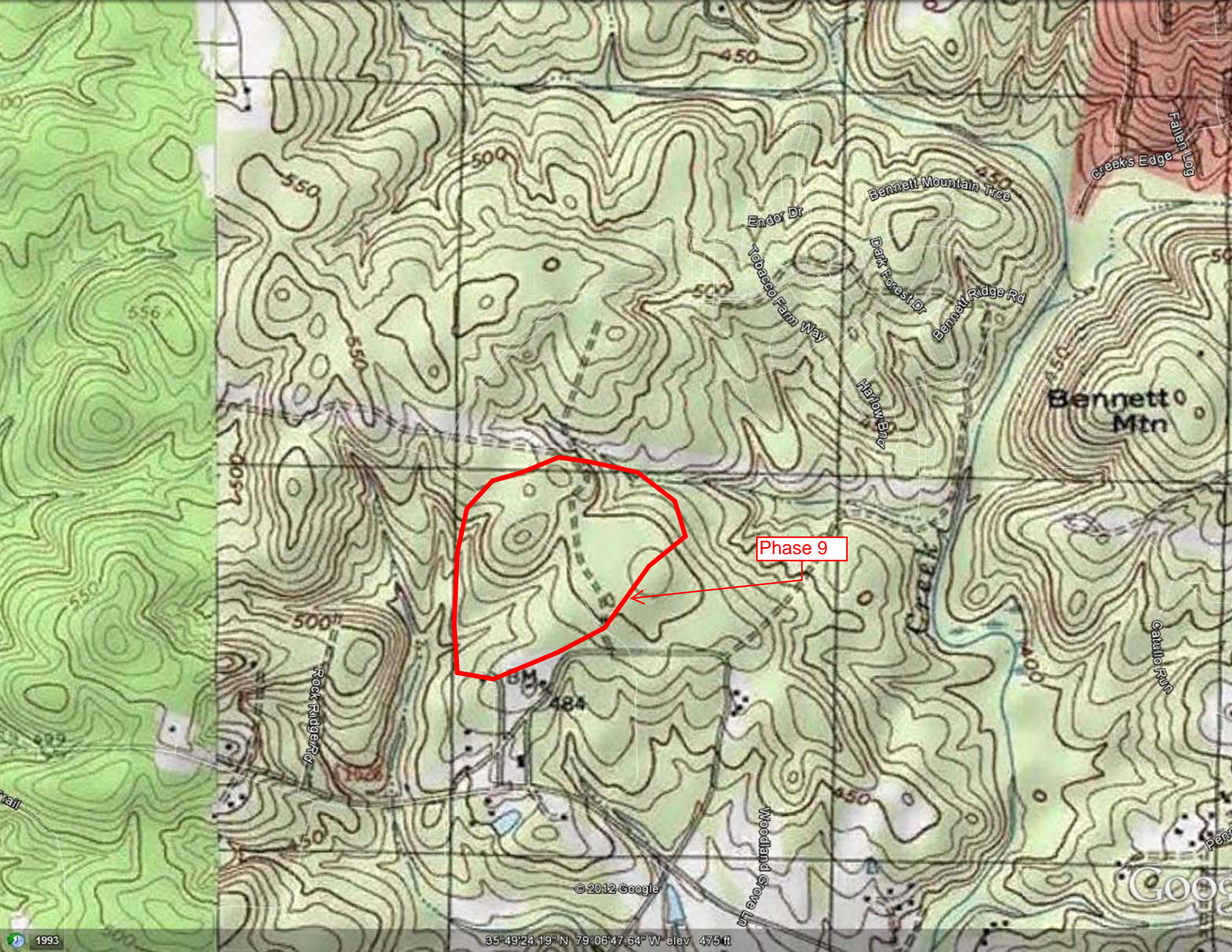
The stormwater wetland on this site has been designed to remove 85% of the total suspended solids entering from the surrounding impervious drainage areas before discharging into the adjacent stream. The calculations provided with this package include all projected future drainage areas that might be captured by the wetland. Treated runoff will be dissipated by a riprap outlet protection device before entering any stream buffers.

Design parameters were taken from the BMP manual and from DWQ's design supplement forms.

MAINTENANCE CONSIDERATIONS

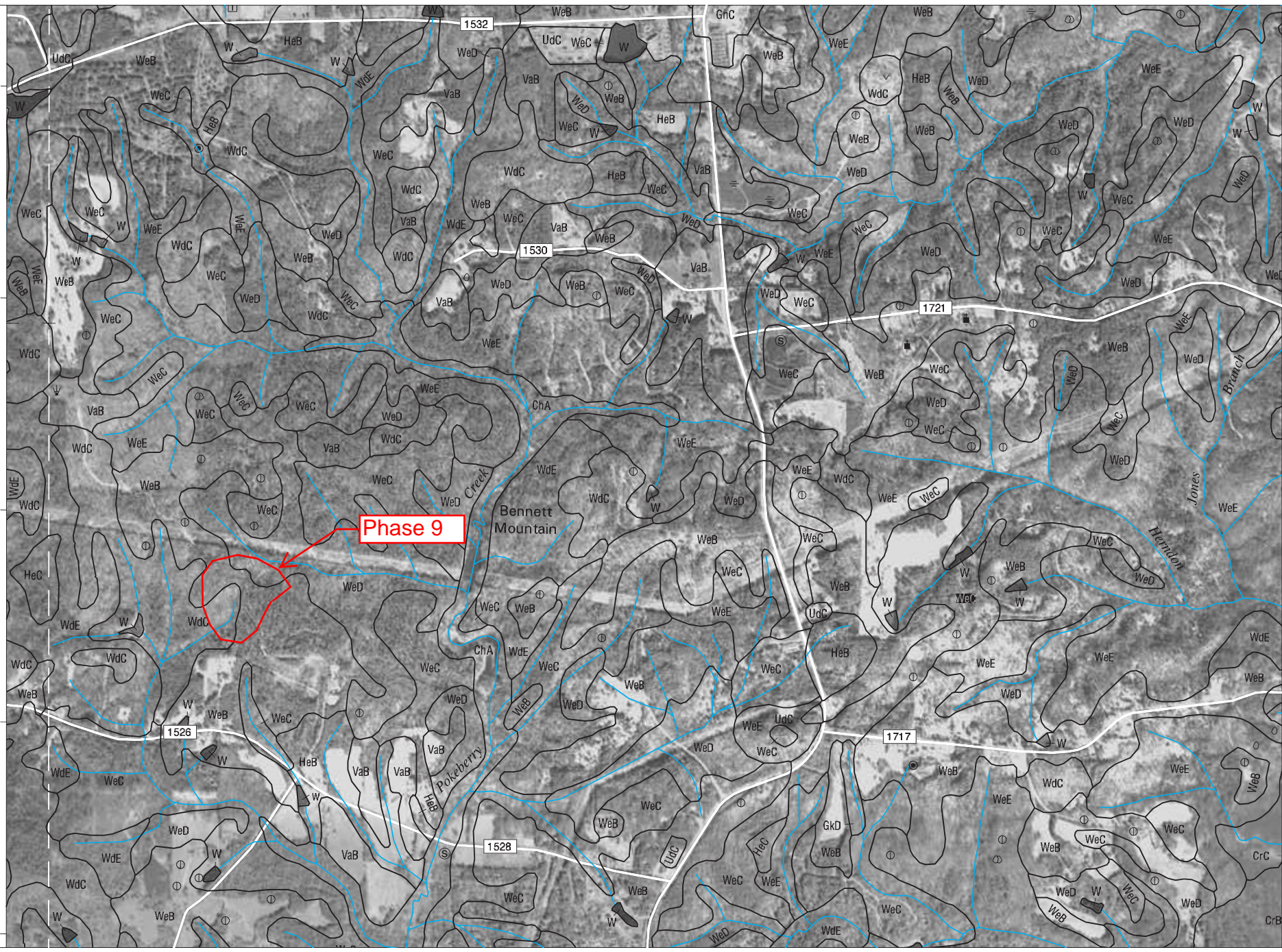
The property owner shall be responsible for periodic inspection and maintenance of all temporary erosion control measures devices. Any measure that fails to function as intended shall be repaired immediately.

MAPS



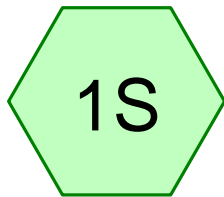
Phase 9

39° 59' 00" N
39° 67'
35° 50' 00" W
39° 66'
39° 65'
39° 64'

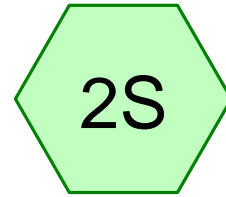


s sheet 4 Bynum

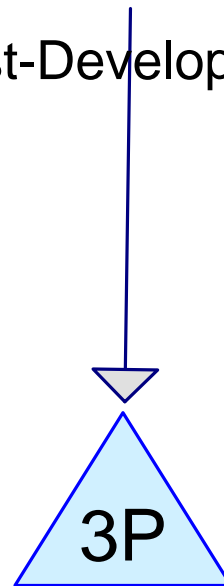
BMP #14 DESIGN



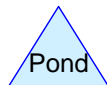
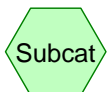
Pre-Development



Post-Development



BMP #14



Summary for Subcatchment 1S: Pre-Development

Runoff = 7.12 cfs @ 12.15 hrs, Volume= 0.544 af, Depth> 0.61"

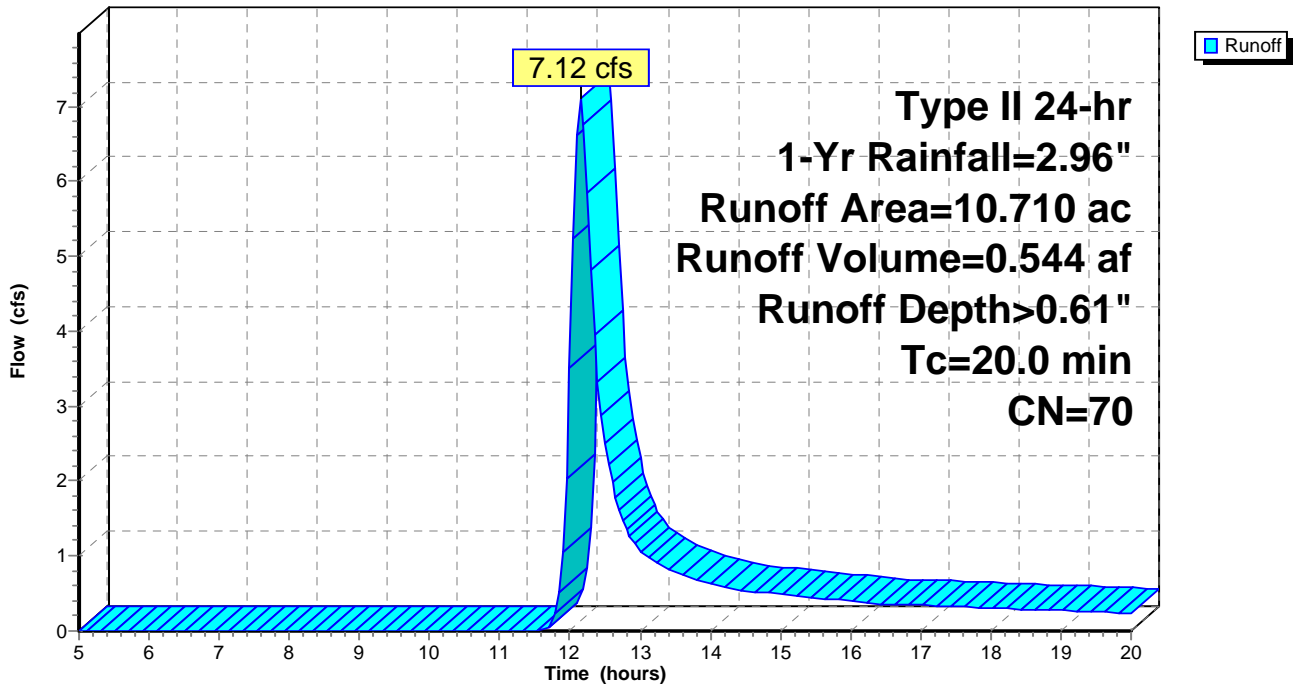
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1-Yr Rainfall=2.96"

Area (ac)	CN	Description
10.710	70	Woods, Good, HSG C
10.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					Direct Entry,

Subcatchment 1S: Pre-Development

Hydrograph



Summary for Pond 3P: BMP #14

Inflow Area = 10.710 ac, 61.62% Impervious, Inflow Depth > 1.73" for 1-Yr event
 Inflow = 29.86 cfs @ 12.01 hrs, Volume= 1.545 af
 Outflow = 6.79 cfs @ 12.25 hrs, Volume= 0.927 af, Atten= 77%, Lag= 14.4 min
 Primary = 6.79 cfs @ 12.25 hrs, Volume= 0.927 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 491.20' @ 12.25 hrs Surf.Area= 22,936 sf Storage= 35,921 cf

Plug-Flow detention time= 157.7 min calculated for 0.924 af (60% of inflow)
 Center-of-Mass det. time= 85.8 min (862.0 - 776.1)

Volume	Invert	Avail.Storage	Storage Description
#1	489.50'	136,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
489.50	18,132	0	0
490.00	20,871	9,751	9,751
491.00	22,590	21,731	31,481
492.00	24,366	23,478	54,959
493.00	26,198	25,282	80,241
494.00	28,086	27,142	107,383
495.00	30,031	29,059	136,442

Device	Routing	Invert	Outlet Devices
#1	Primary	484.00'	18.0" Round Culvert L= 105.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 484.00' / 482.00' S= 0.0190 1/1 Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	489.50'	2.7" Vert. Orifice/Grate C= 0.600
#3	Device 1	490.65'	20.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	490.90'	30.0" x 30.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	493.00'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=6.77 cfs @ 12.25 hrs HW=491.19' (Free Discharge)

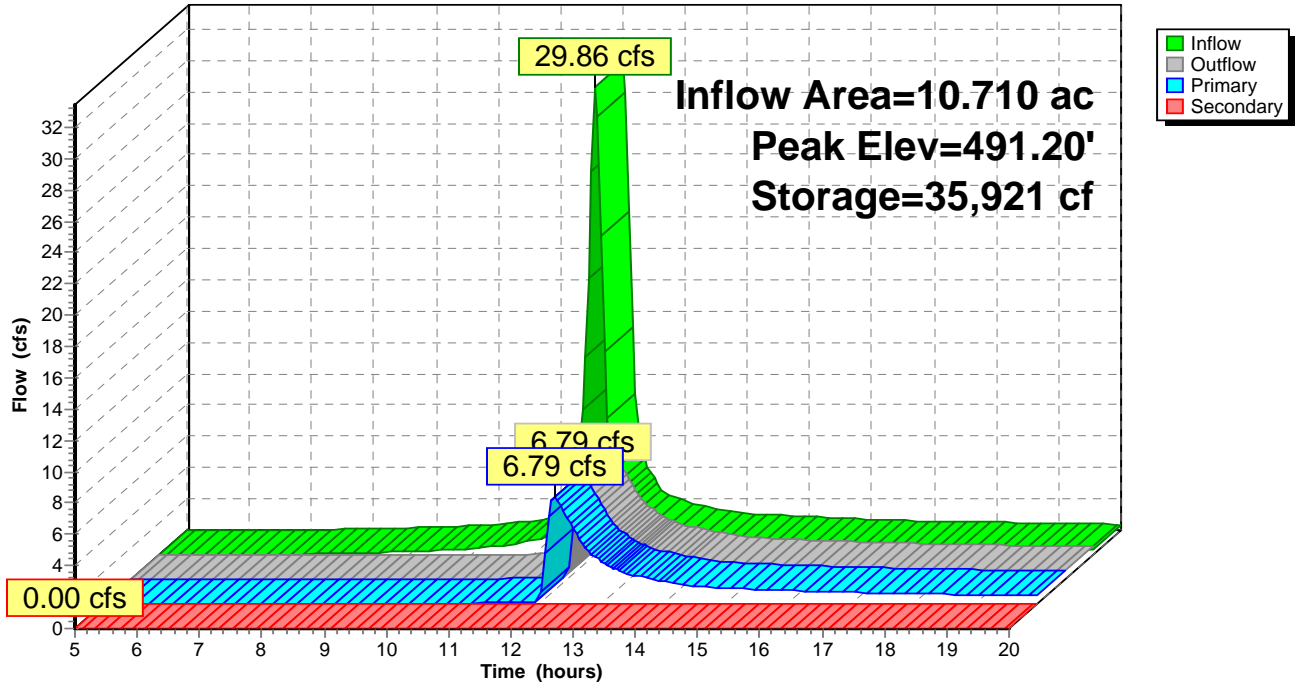
- 1=Culvert (Passes 6.77 cfs of 21.27 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.24 cfs @ 6.06 fps)
- 3=Orifice/Grate (Orifice Controls 1.29 cfs @ 3.11 fps)
- 4=Orifice/Grate (Weir Controls 5.23 cfs @ 1.78 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=489.50' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: BMP #14

Hydrograph



2013.08.19.BMP #14

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 10-Yr Rainfall=5.17"

Printed 9/8/2013

Page 17

Summary for Subcatchment 1S: Pre-Development

Runoff = 25.22 cfs @ 12.14 hrs, Volume= 1.753 af, Depth> 1.96"

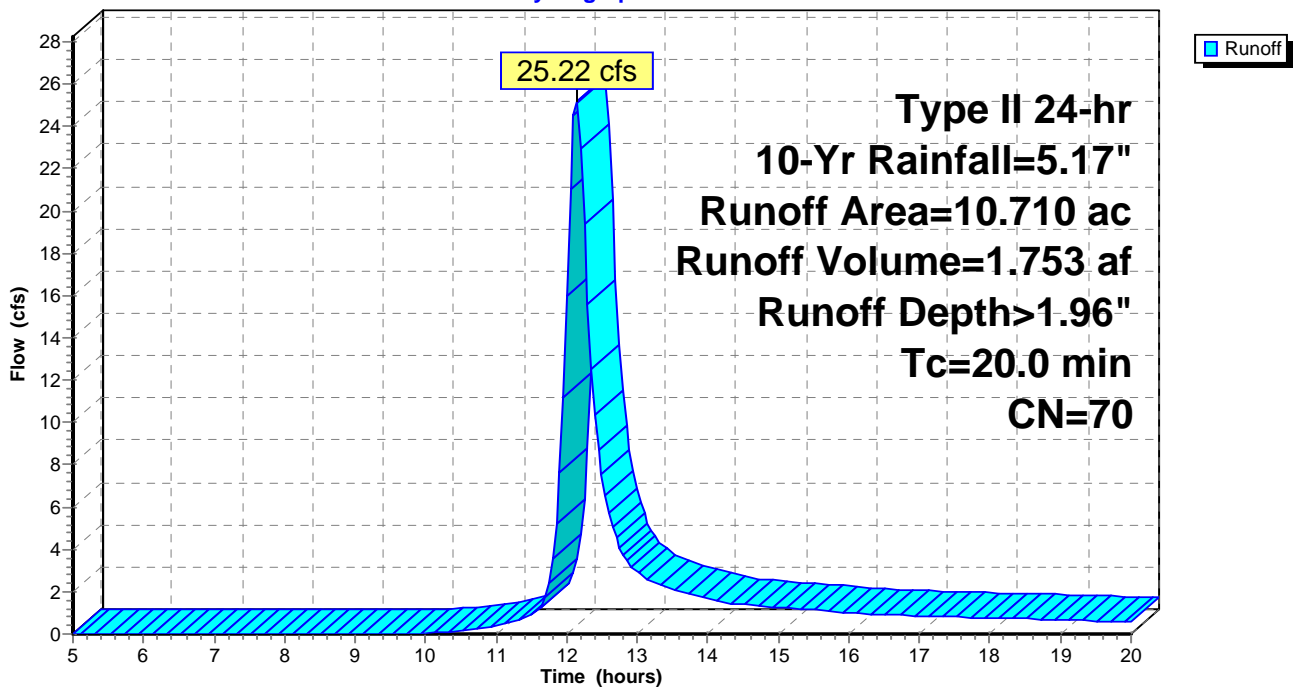
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=5.17"

Area (ac)	CN	Description
10.710	70	Woods, Good, HSG C
10.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					Direct Entry,

Subcatchment 1S: Pre-Development

Hydrograph



2013.08.19.BMP #14

Type II 24-hr 10-Yr Rainfall=5.17"

Prepared by McKim & Creed

Printed 9/8/2013

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Page 19

Summary for Pond 3P: BMP #14

[82] Warning: Early inflow requires earlier time span

Inflow Area = 10.710 ac, 61.62% Impervious, Inflow Depth > 3.69" for 10-Yr event
 Inflow = 60.90 cfs @ 12.01 hrs, Volume= 3.289 af
 Outflow = 22.79 cfs @ 12.17 hrs, Volume= 2.624 af, Atten= 63%, Lag= 9.6 min
 Primary = 22.79 cfs @ 12.17 hrs, Volume= 2.624 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 492.34' @ 12.17 hrs Surf.Area= 24,984 sf Storage= 63,281 cf

Plug-Flow detention time= 104.2 min calculated for 2.615 af (80% of inflow)
 Center-of-Mass det. time= 50.7 min (809.6 - 758.9)

Volume	Invert	Avail.Storage	Storage Description
#1	489.50'	136,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
489.50	18,132	0	0
490.00	20,871	9,751	9,751
491.00	22,590	21,731	31,481
492.00	24,366	23,478	54,959
493.00	26,198	25,282	80,241
494.00	28,086	27,142	107,383
495.00	30,031	29,059	136,442

Device	Routing	Invert	Outlet Devices
#1	Primary	484.00'	18.0" Round Culvert L= 105.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 484.00' / 482.00' S= 0.0190 1/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	489.50'	2.7" Vert. Orifice/Grate C= 0.600
#3	Device 1	490.65'	20.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	490.90'	30.0" x 30.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	493.00'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=22.78 cfs @ 12.17 hrs HW=492.33' (Free Discharge)

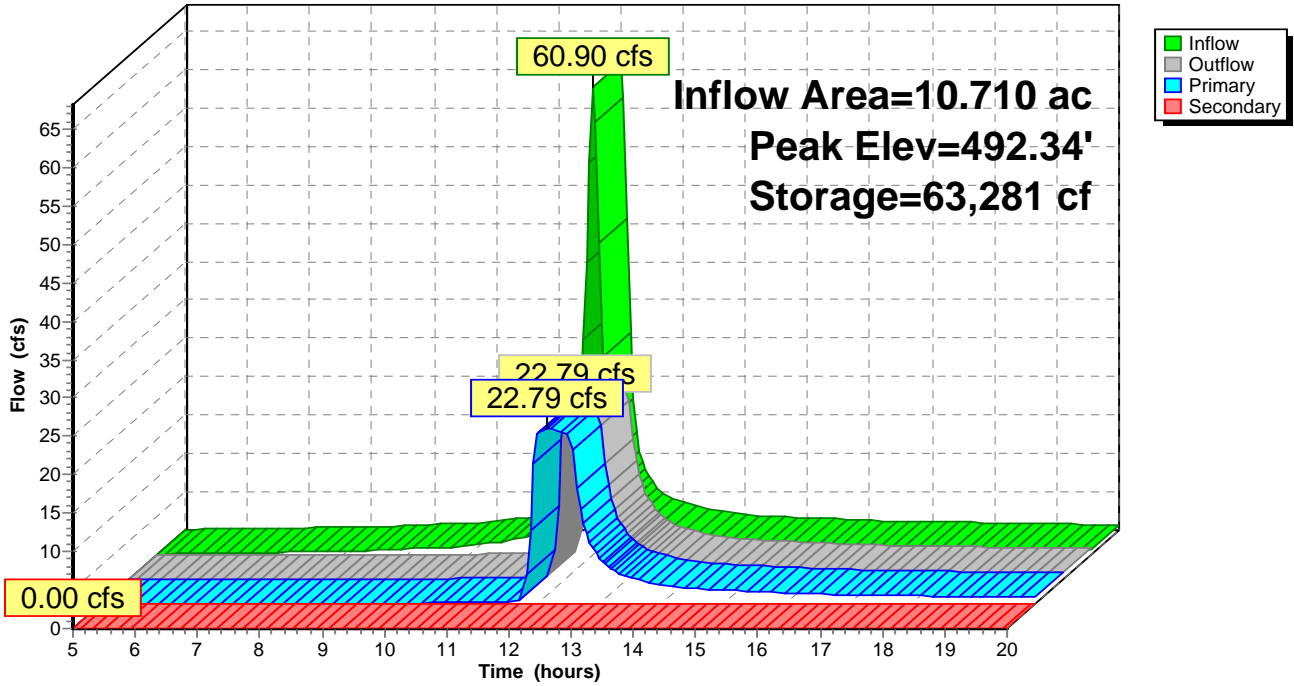
- ↑ 1=Culvert (Barrel Controls 22.78 cfs @ 12.89 fps)
- ↑ 2=Orifice/Grate (Passes < 0.32 cfs potential flow)
- ↑ 3=Orifice/Grate (Passes < 2.50 cfs potential flow)
- ↑ 4=Orifice/Grate (Passes < 35.95 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=489.50' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: BMP #14

Hydrograph



Summary for Subcatchment 1S: Pre-Development

Runoff = 49.00 cfs @ 12.13 hrs, Volume= 3.397 af, Depth> 3.81"

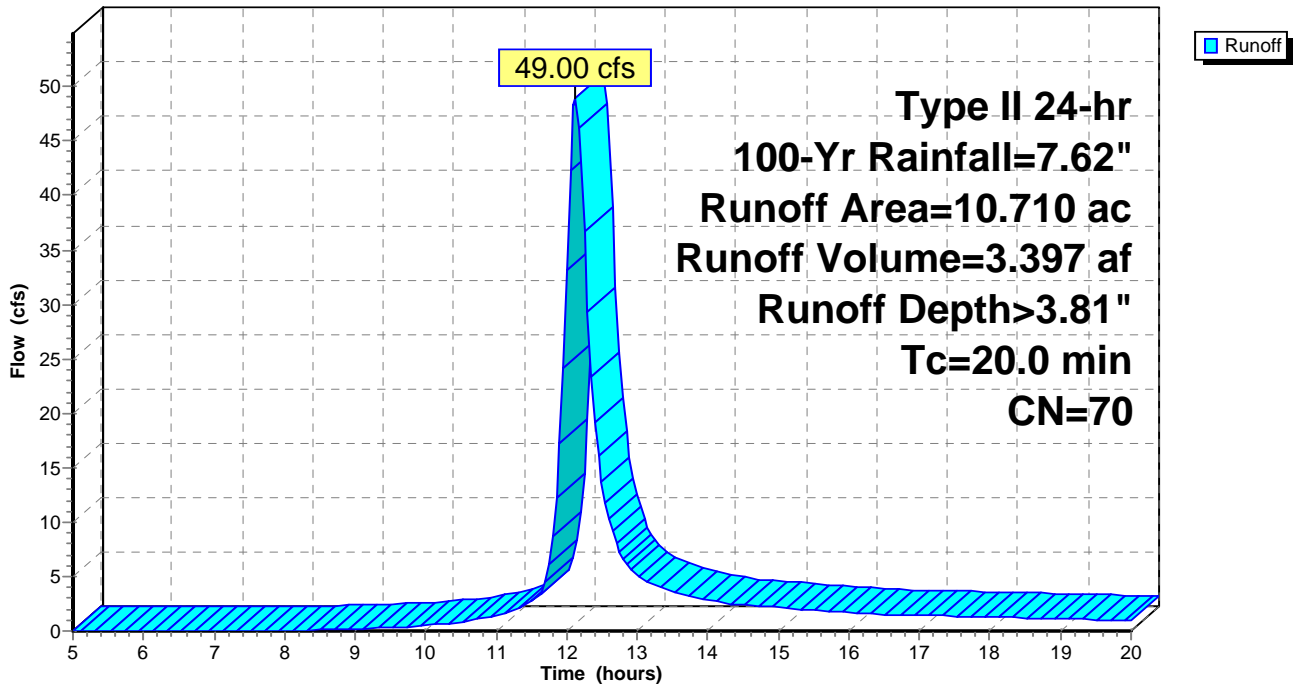
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 100-Yr Rainfall=7.62"

Area (ac)	CN	Description
10.710	70	Woods, Good, HSG C
10.710		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					Direct Entry,

Subcatchment 1S: Pre-Development

Hydrograph



Summary for Pond 3P: BMP #14

[82] Warning: Early inflow requires earlier time span

Inflow Area = 10.710 ac, 61.62% Impervious, Inflow Depth > 5.91" for 100-Yr event
 Inflow = 95.02 cfs @ 12.01 hrs, Volume= 5.277 af
 Outflow = 42.75 cfs @ 12.15 hrs, Volume= 4.590 af, Atten= 55%, Lag= 8.7 min
 Primary = 24.24 cfs @ 12.15 hrs, Volume= 4.293 af
 Secondary = 18.51 cfs @ 12.15 hrs, Volume= 0.297 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 493.50' @ 12.15 hrs Surf.Area= 27,139 sf Storage= 93,528 cf

Plug-Flow detention time= 90.4 min calculated for 4.574 af (87% of inflow)
 Center-of-Mass det. time= 49.3 min (799.0 - 749.7)

Volume	Invert	Avail.Storage	Storage Description
#1	489.50'	136,442 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
489.50	18,132	0	0
490.00	20,871	9,751	9,751
491.00	22,590	21,731	31,481
492.00	24,366	23,478	54,959
493.00	26,198	25,282	80,241
494.00	28,086	27,142	107,383
495.00	30,031	29,059	136,442

Device	Routing	Invert	Outlet Devices
#1	Primary	484.00'	18.0" Round Culvert L= 105.1' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 484.00' / 482.00' S= 0.0190 1/1 Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	489.50'	2.7" Vert. Orifice/Grate C= 0.600
#3	Device 1	490.65'	20.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	490.90'	30.0" x 30.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	493.00'	20.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=24.23 cfs @ 12.15 hrs HW=493.49' (Free Discharge)

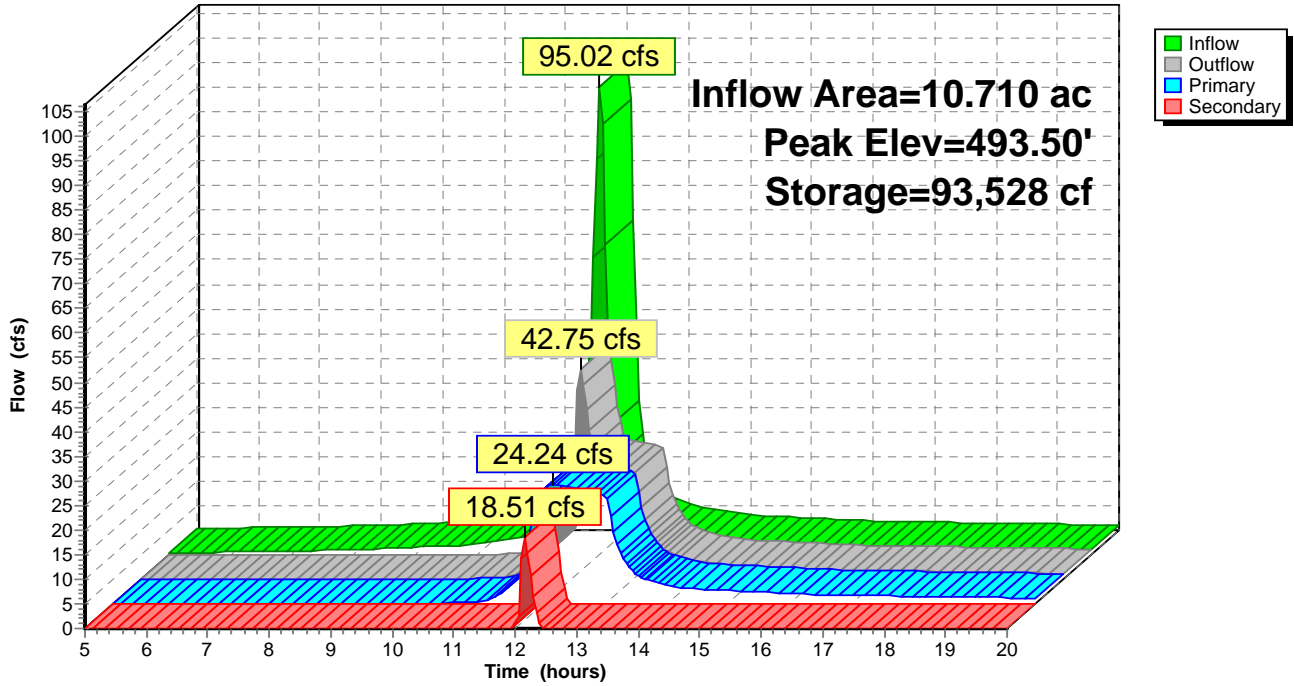
- ↑ 1=Culvert (Barrel Controls 24.23 cfs @ 13.71 fps)
- ↑ 2=Orifice/Grate (Passes < 0.38 cfs potential flow)
- ↑ 3=Orifice/Grate (Passes < 3.31 cfs potential flow)
- ↑ 4=Orifice/Grate (Passes < 48.47 cfs potential flow)

Secondary OutFlow Max=18.25 cfs @ 12.15 hrs HW=493.49' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Weir Controls 18.25 cfs @ 1.85 fps)

Pond 3P: BMP #14

Hydrograph



WATER QUALITY POND #14 CALCULATIONS

Project Name

Briar Chapel - Phase 9 - Section 1

Project Number

02735-0096

Date

August 6, 2013

3rd revision _____
2nd revision _____
1st revision _____

Water Quality Pond Drainage Area Data

Project Briar Chapel - Phase 9 - Section 1

Project No. 02735-0096

Date August 6, 2013

Total site area 466,607 square feet = 10.71 acres

	Drainage area to pond			Other Drainage Area	
	Existing [sf]	Proposed [sf]	Change [sf]	Existing [sf]	Proposed [sf]
Impervious areas					
On-site buildings (BUA)	0	192,000	192,000	0	0
On-site streets	0	44,537	44,537	0	0
On-site alleys	0	23,182	23,182	0	0
On-site sidewalks	0	13,072	13,072	0	0
On-site future (open space)	0	1,000	1,000	0	0
Off-site streets	0	0	0	0	0
5% Contingency	0	13,690	13,690	0	0
Total Impervious	0	287,481	287,481	0	0

	Drainage area to pond			Other Drainage Area	
	Existing [sf]	Proposed [sf]	Change [sf]	Existing [sf]	Proposed [sf]
Non-impervious areas					
On-site grass/landscape	0	179,126	179,126	0	0
On-site woods	466,607	0	-466,607	0	0
Other undeveloped	0	0	0	0	0
Total off-site non-impervious	0	0	0	0	0
Total non-impervious	466,607	179,126	-287,481	0	0

Total Drainage Area	466,607	466,607	0	3,167,850	3,167,850
Percent Impervious	0.0	61.6	61.6	0.0	0.0

Notes:

Water Quality Pond Surface Area Calculations

Project Briar Chapel - Phase 9 - Section 1
Project No. 02735-0096

Date August 6, 2013

Total on-site drainage area to pond 466,607 square feet
Total impervious area in drainage area 287,481 square feet

Average water depth of basin at normal pool 3.0 feet

Location of site Chatham County
Site region Piedmont

% Impervious cover 61.6 percent

If the site is in a coastal area, will a vegetative filter be used? n/a

Surface Area/Drainage Area Ratios:

For a site in the Piedmont (85%) 2.5 percent
For a site in the Piedmont (90%) 3.6 percent
For a site in a Coastal County w/ Vegetative Filter 5.2 percent
For a site in a Coastal County w/out Vegetative Filter 7.2 percent

Required surface area of pond:

For a site in the Piedmont (85%) 11,560.0 square feet
For a site in the Piedmont (90%) 16,710.0 square feet
For a site in a Coastal County w/ Vegetative Filter 24,090.0 square feet
For a site in a Coastal County w/out Vegetative Filter 33,490.0 square feet

Notes:

Water Quality Pond Stormwater Runoff Volume Calculations

Project Briar Chapel - Phase 9 - Section 1
Project No. 02735-0096

Date August 6, 2013

Drainage area 466,607 square feet
Impervious area 287,481 square feet
Rainfall depth 1.00 inches

Percent Impervious 61.6 percent

$R(v) = 0.05 + 0.009 * (\text{Percent impervious})$

Runoff coefficient - R(v) 0.60 in/in

Runoff volume = (Design rainfall) * (R(v)) * (Drainage area)

Runoff volume 23,505.2 cubic feet

Notes:

**Water Quality Pond Volume Calculations
Stage-Storage Data for Pond - Temporary Pool**

Project Briar Chapel - Phase 9 - Section 1

Project No. 02735-0096

Date August 6, 2013

Contour ID	Stage	Area [sq. ft.]	Area [acres]	Incremental Area [sq. ft.]	Incremental Area [acres]	Incremental volume [cu. ft.]	Incremental volume [acre-ft]	Cumulative volume [cu. ft.]	Cumulative volume [acre-ft]
489.5	0	18,131.9	0.416	18,131.9	0.4	0.0	0.0	0.0	0.0
490	0.5	20,871.1	0.479	20,871.1	0.1	9,750.8	0.2	9,750.8	0.2
490.65	1.15	21,982.0	0.505	21,982.0	0.0	13,927.3	0.3	23,678.0	0.5
491	1.5	22,590.1	0.519	22,590.1	0.0	7,800.1	0.2	31,478.2	0.5
492	2.5	24,365.6	0.559	24,365.6	0.0	23,477.8	0.5	54,956.0	0.7
493	3.5	26,197.6	0.601	26,197.6	0.0	25,281.6	0.6	80,237.6	1.1
494	4.5	28,086.2	0.645	28,086.2	0.0	27,141.9	0.6	107,379.5	1.2
495	5.5	30,031.4	0.689	30,031.4	0.0	29,058.8	0.7	136,438.3	1.3

Water Quality Pond Volume Calculations
Stage-Storage Data for Pond - Permanent Pool

Project Briar Chapel - Phase 9 - Section 1

Project No. 02735-0096

Date August 6, 2013

Contour ID	Stage	Area [sq. ft.]	Area [acres]	Incremental Area [sq. ft.]	Incremental Area [acres]	Incremental volume [cu. ft]	Incremental volume [acre-ft]	Cumulative volume [cu. ft]	Cumulative volume [acre-ft]
484	0	6,021.5	0.138	6,021.5	0.1	0.0	0.0	0.0	0.0
485	1	7,553.4	0.173	1,531.9	0.0	6,787.5	0.2	6,787.5	0.2
486	2	9,218.0	0.212	1,664.6	0.0	8,385.7	0.2	15,173.2	0.3
487	3	10,983.7	0.252	1,765.7	0.0	10,100.9	0.2	25,274.0	0.4
488	4	12,862.4	0.295	1,878.8	0.0	11,923.1	0.3	37,197.1	0.5
489	5	14,854.3	0.341	1,991.9	0.0	13,858.4	0.3	51,055.4	0.6
489.5	5.5	18,131.9	0.416	3,277.6	0.1	8,246.5	0.2	59,302.0	0.5

**Water Quality Pond Volume Calculations
Stage-Storage Data for Pond - Forebays**

Project Briar Chapel - Phase 9 - Section 1
 Project No. 02735-0096

Date August 6, 2013

Contour ID	Stage	Area [sq. ft.]	Area [acres]	Incremental Area [sq. ft.]	Incremental Area [acres]	Incremental volume [cu. ft]	Incremental volume [acre-ft]	Cumulative volume [cu. ft]	Cumulative volume [acre-ft]
484	0	749.2	0.017	749.2	0.0	0.0	0.0	0.0	0.0
485	1	1,139.6	0.026	390.4	0.0	944.4	0.0	944.4	0.0
486	2	1,603.2	0.037	463.5	0.0	1,371.4	0.0	2,315.8	0.1
487	3	2,114.0	0.049	510.9	0.0	1,858.6	0.0	4,174.4	0.1
488	4	2,681.5	0.062	567.4	0.0	2,397.7	0.1	6,572.2	0.1
489	5	3,305.4	0.076	624.0	0.0	2,993.4	0.1	9,565.6	0.1
489.5	5.5	4,471.0	0.103	1,165.6	0.0	1,944.1	0.0	11,509.7	0.1

Water Quality Basin Dewatering Time Calculations

Project Briar Chapel - Phase 9 - Section 1
 Project No. 02735-0096

Date August 6, 2013

Water quality treatment volume	<u>23,502</u>	square feet
Total treatment volume	<u>23,678</u>	square feet
Maximum head of water above dewatering hole	<u>1.15</u>	feet
Driving head	<u>0.38</u>	feet
Orifice coefficient	<u>0.60</u>	
Diameter of each hole	<u>2.75</u>	inches
Number of holes	<u>1</u>	
Cross sectional area of each hole =	<u>0.041</u>	square feet
Cross sectional area of each hole =	<u>5.9</u>	square inches
Cross sectional area of dewatering hole(s) =	<u>0.041</u>	square feet
Cross sectional area of dewatering hole(s) =	<u>5.9</u>	square inches
Dewatering time for water quality volume =	<u>2.2</u>	days
Dewatering time for total volume =	<u>2.2</u>	days

Notes:

Dewatering time formula: $t \text{ (days)} = V / (Cd * A * \text{Sqrt} (2 * 32.2 * H) * 86,400)$

- t = drawdown time
- V = treatment volume
- Cd = orifice coefficient
- A = cross sectional area of orifice
- H = driving head (1/3 max. head)

Water Quality Pond Summary Information

Project Briar Chapel - Phase 9 - Section 1
Project No. 02735-0096

Date August 6, 2013

Drainage area to pond 466,607 square feet = 10.71 acres
Impervious area in drainage area 287,481 square feet = 6.60 acres

Bottom of pond elevation 484.00 feet
Normal pool elevation 489.50 feet
Pond volume at normal pool 59,302 cubic feet

Required volume for design rainfall 23,505 cubic feet
Required surface area for pond 16,710 square feet

Volume provided for storage of design rainfall = 23,678 cubic feet at elevation 490.65

Surface area provided at normal pool 18,132 square feet

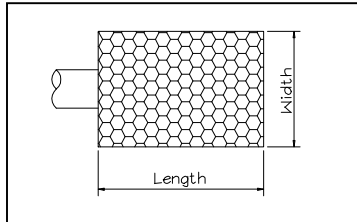
OUTLET PROTECTION DESIGN	DATE: 9/3/2013	DESIGNED BY: DJB
PROJECT NAME: Briar Chapel - Phase 9 PROJECT LOCATION: Chatham County, NC	PROJECT NO: 02735-0096	CHECKED BY GCA

Storm Outlet Structure

Structure= **BMP #14 Out**
 Size= 18 in
 Q₁₀ = 22.79 cfs
 Q_{full} = 14.45 cfs
 V_{full} = 8.18 fps

Q₁₀/Q_{full} = 1.58
 V/V_{full} = MAX
 V = #VALUE! fps

From Fig. 8.06.b.1:



Zone = **5**
 D₅₀ = 14 in
 D_{MAX} = 21 in
 Riprap Class = 2
 Apron Thickness = 36 in
 Apron Length = 15.0 ft
 Apron Width = 3 x Dia = 5.0 ft

ANTI-FLOATATION DESIGN	DATE: 8/23/2013	DESIGNED BY: GCA																																												
PROJECT NAME: Briar Chapel Phase 9 PROJECT LOCATION: Chatham County, NC	PROJECT NO: 02735-0096	CHECKED BY: GML																																												
<table> <tr> <td>Pond Name=</td> <td>BMP #14</td> <td></td> <td></td> </tr> <tr> <td>Riser Outer Width =</td> <td>3.5 ft</td> <td>Riser Resisting Force =</td> <td>6,210 lb</td> </tr> <tr> <td>Riser Outer Length =</td> <td>3.5 ft</td> <td>Base Resisting Force =</td> <td>3,038 lb</td> </tr> <tr> <td>Riser Inner Width =</td> <td>2.5 ft</td> <td>Total Resisting Force =</td> <td>9,248 lb</td> </tr> <tr> <td>Riser Inner Length =</td> <td>2.5 ft</td> <td></td> <td></td> </tr> <tr> <td>Riser Height =</td> <td>6.9 ft</td> <td>Riser Buoyant Force =</td> <td>5,274 lb</td> </tr> <tr> <td></td> <td></td> <td>Base Buoyant Force =</td> <td>1,264 lb</td> </tr> <tr> <td>Concrete Base Length =</td> <td>4.5 ft</td> <td>Total Buoyant Force =</td> <td>6,538 lb</td> </tr> <tr> <td>Concrete Base Width =</td> <td>4.5 ft</td> <td></td> <td></td> </tr> <tr> <td>Concrete Base Depth =</td> <td>12 in</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>Factor of Safety</td> <td>1.41 Design Acceptable</td> </tr> </table>			Pond Name=	BMP #14			Riser Outer Width =	3.5 ft	Riser Resisting Force =	6,210 lb	Riser Outer Length =	3.5 ft	Base Resisting Force =	3,038 lb	Riser Inner Width =	2.5 ft	Total Resisting Force =	9,248 lb	Riser Inner Length =	2.5 ft			Riser Height =	6.9 ft	Riser Buoyant Force =	5,274 lb			Base Buoyant Force =	1,264 lb	Concrete Base Length =	4.5 ft	Total Buoyant Force =	6,538 lb	Concrete Base Width =	4.5 ft			Concrete Base Depth =	12 in					Factor of Safety	1.41 Design Acceptable
Pond Name=	BMP #14																																													
Riser Outer Width =	3.5 ft	Riser Resisting Force =	6,210 lb																																											
Riser Outer Length =	3.5 ft	Base Resisting Force =	3,038 lb																																											
Riser Inner Width =	2.5 ft	Total Resisting Force =	9,248 lb																																											
Riser Inner Length =	2.5 ft																																													
Riser Height =	6.9 ft	Riser Buoyant Force =	5,274 lb																																											
		Base Buoyant Force =	1,264 lb																																											
Concrete Base Length =	4.5 ft	Total Buoyant Force =	6,538 lb																																											
Concrete Base Width =	4.5 ft																																													
Concrete Base Depth =	12 in																																													
		Factor of Safety	1.41 Design Acceptable																																											

III. REQUIRED ITEMS CHECKLIST

Please indicate the page or plan sheet numbers where the supporting documentation can be found. **An incomplete submittal package will result in a request for additional information. This will delay final review and approval of the project.** Initial in the space provided to indicate the following design requirements have been met. If the applicant has designated an agent, the agent may initial below. **If a requirement has not been met, attach justification.**

Initials	Page/ Plan Sheet No.	
GCA	C3.3-C3.4	1. Plans (1" = 50' or larger) of the entire site showing: <ul style="list-style-type: none"> - Design at ultimate build-out, - Off-site drainage (if applicable), - Delineated drainage basins (include Rational C coefficient per basin), - Basin dimensions, - Pretreatment system, - High flow bypass system, - Maintenance access, - Proposed drainage easement and public right of way (ROW), - Overflow device, and - Boundaries of drainage easement.
GCA	D4.1-D4.3	2. Partial plan (1" = 30' or larger) and details for the wet detention basin showing: <ul style="list-style-type: none"> - Outlet structure with trash rack or similar, - Maintenance access, - Permanent pool dimensions, - Forebay and main pond with hardened emergency spillway, - Basin cross-section, - Vegetation specification for planting shelf, and - Filter strip.
GCA	D4.1-D4.3	3. Section view of the wet detention basin (1" = 20' or larger) showing: <ul style="list-style-type: none"> - Side slopes, 3:1 or lower, - Pretreatment and treatment areas, and - Inlet and outlet structures.
GCA	N/A	4. If the basin is used for sediment and erosion control during construction, clean out of the basin is specified on the plans prior to use as a wet detention basin.
GCA	Calc Booklet	5. A table of elevations, areas, incremental volumes & accumulated volumes for overall pond and for forebay, to verify volume provided.
GCA	C3.1	6. A construction sequence that shows how the wet detention basin will be protected from sediment until the entire drainage area is stabilized.
GCA	Calc Booklet	7. The supporting calculations.
GCA	Included	8. A copy of the signed and notarized operation and maintenance (O&M) agreement.
GCA	Included	9. A copy of the deed restrictions (if required).
_____	N/A	10. A soils report that is based upon an actual field investigation, soil borings, and infiltration tests. County soil maps are not an acceptable source of soils information.

Red triangles at the upper right hand corner indicate design comments

Please complete the yellow shaded items.



STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

WET DETENTION BASIN SUPPLEMENT

This form must be filled out, printed and submitted.

The Required Items Checklist (Part III) must be printed, filled out and submitted along with all of the required information.

I. PROJECT INFORMATION

Project name	Briar Chapel Development - Great Ridge Parkway Extension
Contact person	Gareth Avant, PE
Phone number	919.233.8091
Date	30-Aug-2013
Drainage area number	1 - Wet Pond #14

II. DESIGN INFORMATION

Site Characteristics

Drainage area	466,528 ft ²
Impervious area, post-development	287,496 ft ²
% impervious	61.62 %
Design rainfall depth	1.0 in

Storage Volume: Non-SA Waters

Minimum volume required	23,506 ft ³	OK
Volume provided	23,678 ft ³	OK, volume provided is equal to or in excess of volume required.

Storage Volume: SA Waters

1.5" runoff volume	ft ³
Pre-development 1-yr, 24-hr runoff	ft ³
Post-development 1-yr, 24-hr runoff	ft ³
Minimum volume required	ft ³
Volume provided	ft ³

Peak Flow Calculations

Is the pre/post control of the 1yr 24hr storm peak flow required?	Y (Y or N)	
1-yr, 24-hr rainfall depth	3.0 in	
Rational C, pre-development	0.40 (unitless)	
Rational C, post-development	0.86 (unitless)	
Rainfall intensity: 1-yr, 24-hr storm	0.12 in/hr	Insufficient. Check intensity calculation.
Pre-development 1-yr, 24-hr peak flow	12.87 ft ³ /sec	
Post-development 1-yr, 24-hr peak flow	47.65 ft ³ /sec	
Pre/Post 1-yr, 24-hr peak flow control	34.78 ft ³ /sec	

Elevations

Temporary pool elevation	495.00 fmsl	
Permanent pool elevation	489.50 fmsl	
SHWT elevation (approx. at the perm. pool elevation)	fmsl	
Top of 10ft vegetated shelf elevation	490.00 fmsl	
Bottom of 10ft vegetated shelf elevation	489.00 fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment cleanout, top elevation (bottom of pond)	485.00 fmsl	
Sediment cleanout, bottom elevation	484.00 fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment storage provided	1.00 ft	

Is there additional volume stored above the state-required temp. pool?	N (Y or N)
Elevation of the top of the additional volume	fmsl

II. DESIGN INFORMATION
Surface Areas

Area, temporary pool	30,031	ft ²	
Area REQUIRED, permanent pool	11,663	ft ²	
SA/DA ratio	2.50	(unitless)	
Area PROVIDED, permanent pool, A_{perm_pool}	18,132	ft ²	OK
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	14,854	ft ²	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	6,022	ft ²	

Volumes

Volume, temporary pool	23,678	ft ³	OK
Volume, permanent pool, V_{perm_pool}	59,302	ft ³	
Volume, forebay (sum of forebays if more than one forebay)	11,510	ft ³	
Forebay % of permanent pool volume	19.4%	%	OK

SA/DA Table Data

Design TSS removal	90	%	
Coastal SA/DA Table Used?	N	(Y or N)	
Mountain/Piedmont SA/DA Table Used?	Y	(Y or N)	
SA/DA ratio	2.50	(unitless)	

Average depth (used in SA/DA table):

Calculation option 1 used? (See Figure 10-2b)	Y	(Y or N)	
Volume, permanent pool, V_{perm_pool}	59,302	ft ³	
Area provided, permanent pool, A_{perm_pool}	18,132	ft ²	
Average depth calculated	3.27	ft	OK
Average depth used in SA/DA, d_{av} , (Round to nearest 0.5ft)	3.5	ft	OK

Calculation option 2 used? (See Figure 10-2b)

Area provided, permanent pool, A_{perm_pool}	18,132	ft ²	
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	14,854	ft ²	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	6,022	ft ²	

"Depth" (distance b/w bottom of 10ft shelf and top of sediment)

Average depth calculated	4.00	ft	
Average depth used in SA/DA, d_{av} , (Round to nearest 0.5ft)		ft	

Drawdown Calculations

Drawdown through orifice?	Y	(Y or N)	
Diameter of orifice (if circular)	2.70	in	
Area of orifice (if non-circular)		in ²	
Coefficient of discharge (C_D)	0.60	(unitless)	
Driving head (H_0)	1.15	ft	
Drawdown through weir?	N	(Y or N)	
Weir type		(unitless)	
Coefficient of discharge (C_w)		(unitless)	
Length of weir (L)		ft	
Driving head (H)		ft	
Pre-development 1-yr, 24-hr peak flow	7.12	ft ³ /sec	
Post-development 1-yr, 24-hr peak flow	6.79	ft ³ /sec	
Storage volume discharge rate (through discharge orifice or weir)	0.24	ft ³ /sec	
Storage volume drawdown time	2.20	days	OK, draws down in 2-5 days.

Additional Information

Vegetated side slopes	3 :1	OK
Vegetated shelf slope	10 :1	OK
Vegetated shelf width	10.0 ft	OK
Length of flowpath to width ratio	3 :1	OK
Length to width ratio	1.5 :1	OK
Trash rack for overflow & orifice?	Y	(Y or N) OK
Freeboard provided	1.5 ft	OK
Vegetated filter provided?	N	(Y or N) OK
Recorded drainage easement provided?	Y	(Y or N) OK
Capures all runoff at ultimate build-out?	Y	(Y or N) OK
Drain mechanism for maintenance or emergencies is:	8" DIP with gate valve	

Permit Number: _____
(to be provided by DWQ)

Drainage Area Number: _____

Wet Detention Basin Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

The wet detention basin system is defined as the wet detention basin, pretreatment including forebays and the vegetated filter if one is provided.

This system (check one):

does does not incorporate a vegetated filter at the outlet.

This system (check one):

does does not incorporate pretreatment other than a forebay.

Important maintenance procedures:

- Immediately after the wet detention basin is established, the plants on the vegetated shelf and perimeter of the basin should be watered twice weekly if needed, until the plants become established (commonly six weeks).
- No portion of the wet detention pond should be fertilized after the first initial fertilization that is required to establish the plants on the vegetated shelf.
- Stable groundcover should be maintained in the drainage area to reduce the sediment load to the wet detention basin.
- If the basin must be drained for an emergency or to perform maintenance, the flushing of sediment through the emergency drain should be minimized to the maximum extent practical.
- Once a year, a dam safety expert should inspect the embankment.

After the wet detention pond is established, it should be inspected **once a month and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County)**. Records of operation and maintenance should be kept in a known set location and must be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

BMP element:	Potential problem:	How I will remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The perimeter of the wet detention basin	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.

Permit Number: _____

(to be provided by DWQ)

Drainage Area Number: _____

BMP element:	Potential problem:	How I will remediate the problem:
The inlet device: pipe or swale	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Erosion is occurring in the swale.	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
The forebay	Sediment has accumulated to a depth greater than the original design depth for sediment storage.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The vegetated shelf	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The main treatment area	Sediment has accumulated to a depth greater than the original design sediment storage depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Algal growth covers over 50% of the area.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the basin surface.	Remove the plants by wiping them with pesticide (do not spray).

Permit Number: _____
 (to be provided by DWQ)

Drainage Area Number: _____

BMP element:	Potential problem:	How I will remediate the problem:
The embankment	Shrubs have started to grow on the embankment.	Remove shrubs immediately.
	Evidence of muskrat or beaver activity is present.	Use traps to remove muskrats and consult a professional to remove beavers.
	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair. (if applicable)	Make all needed repairs.
The outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the local NC Division of Water Quality Regional Office, or the 401 Oversight Unit at 919-733-1786.

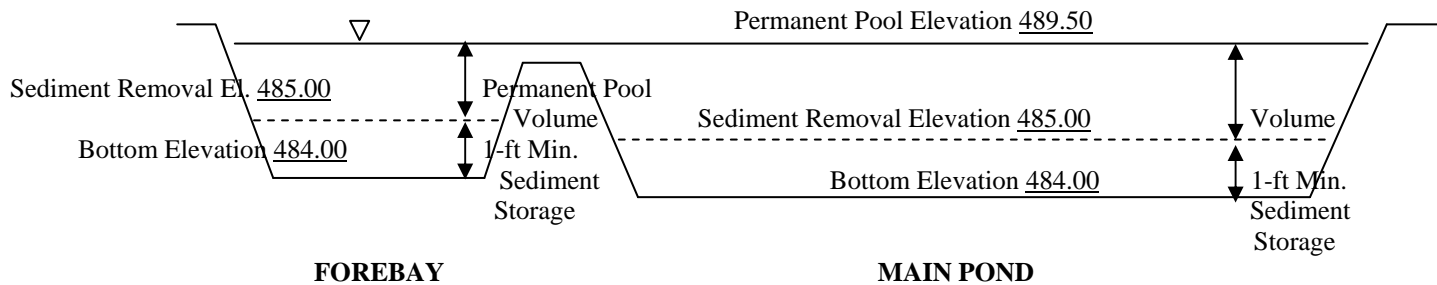
The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

When the permanent pool depth reads 4.50 feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads 4.50 feet in the forebay, the sediment shall be removed.

BASIN DIAGRAM

(fill in the blanks)



Permit Number: _____
(to be provided by DWQ)

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed above. I agree to notify DWQ of any problems with the system or prior to any changes to the system or responsible party.

Project name: Briar Chapel - Phase 9

BMP drainage area number: 1 - Wet Detention Pond #14

Print name: Kevin Graham

Title: Vice President, Operations

Address: 16 Windy Knoll Circle, Chapel Hill, NC 27516

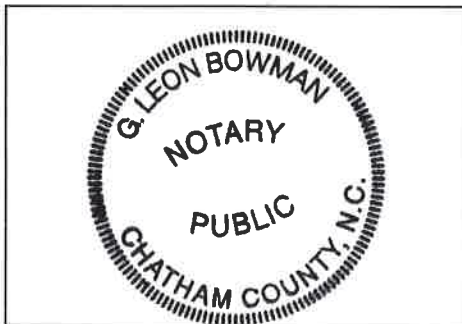
Phone: (919) 951-0709

Signature: [Handwritten Signature]

Date: 8/29/13

Note: The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.

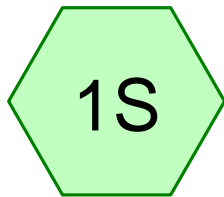
I, G. Leon Bowman, a Notary Public for the State of NC, County of Chatham, do hereby certify that Kevin Graham personally appeared before me this 29th day of August, 2013, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,



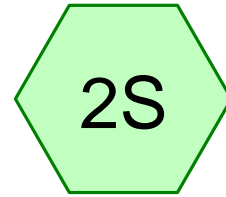
SEAL

My commission expires 9/10/14

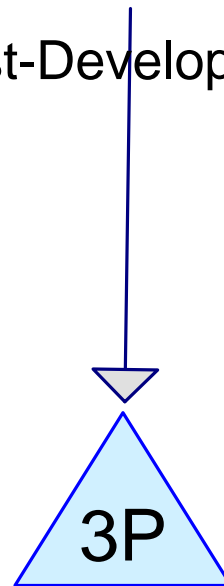
BMP #15 DESIGN



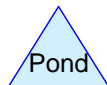
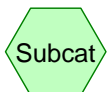
Pre-Development



Post-Development



BMP #15



Summary for Subcatchment 1S: Pre-Development

Runoff = 10.18 cfs @ 12.15 hrs, Volume= 0.778 af, Depth> 0.61"

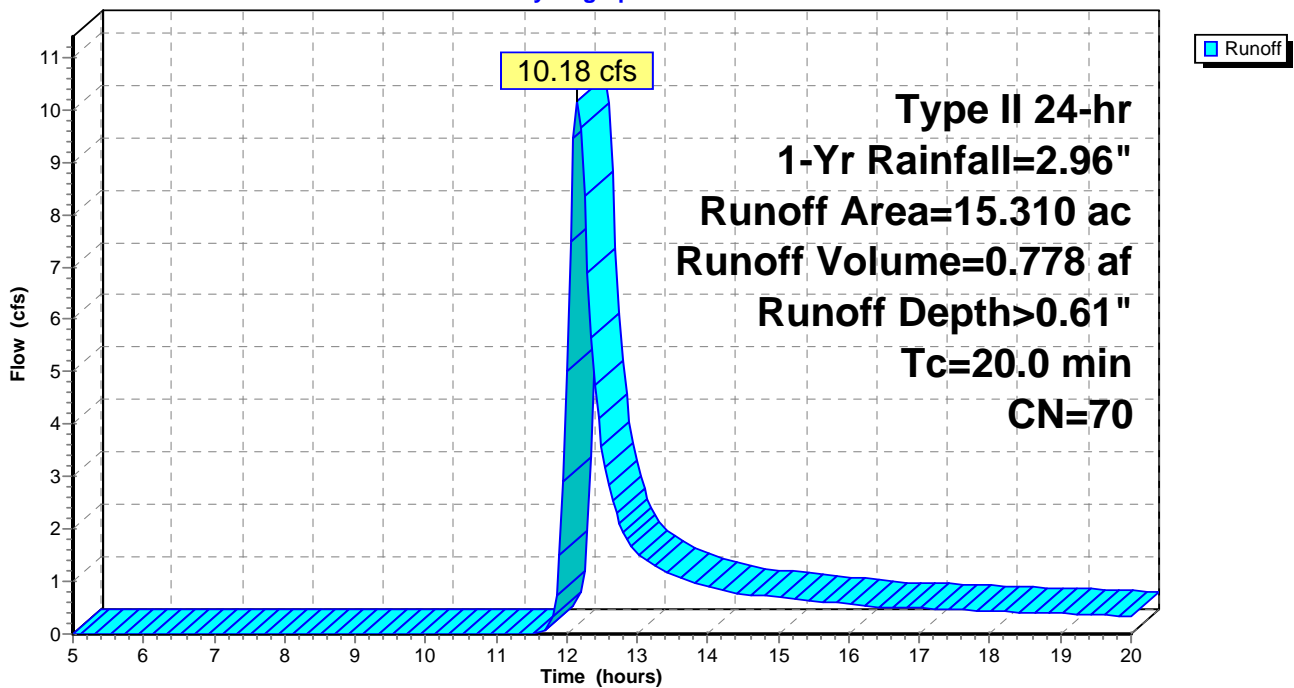
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Type II 24-hr 1-Yr Rainfall=2.96"

Area (ac)	CN	Description
15.310	70	Woods, Good, HSG C
15.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					Direct Entry,

Subcatchment 1S: Pre-Development

Hydrograph



Summary for Pond 3P: BMP #15

Inflow Area = 15.310 ac, 60.16% Impervious, Inflow Depth > 1.65" for 1-Yr event
 Inflow = 41.01 cfs @ 12.01 hrs, Volume= 2.109 af
 Outflow = 8.93 cfs @ 12.26 hrs, Volume= 1.259 af, Atten= 78%, Lag= 14.9 min
 Primary = 8.93 cfs @ 12.26 hrs, Volume= 1.259 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 466.55' @ 12.26 hrs Surf.Area= 25,732 sf Storage= 48,489 cf

Plug-Flow detention time= 155.8 min calculated for 1.255 af (60% of inflow)
 Center-of-Mass det. time= 83.3 min (862.7 - 779.4)

Volume	Invert	Avail.Storage	Storage Description
#1	464.50'	182,141 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.50	20,017	0	0
465.00	22,898	10,729	10,729
466.00	24,702	23,800	34,529
467.00	26,562	25,632	60,161
468.00	28,479	27,521	87,681
469.00	30,453	29,466	117,147
470.00	32,483	31,468	148,615
471.00	34,569	33,526	182,141

Device	Routing	Invert	Outlet Devices
#1	Primary	458.00'	18.0" Round Culvert L= 108.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 458.00' / 456.00' S= 0.0185 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	464.50'	3.2" Vert. Orifice/Grate C= 0.600
#3	Primary	465.95'	24.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	466.20'	30.0" x 30.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	468.50'	30.0' long x 12.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=8.86 cfs @ 12.26 hrs HW=466.55' (Free Discharge)

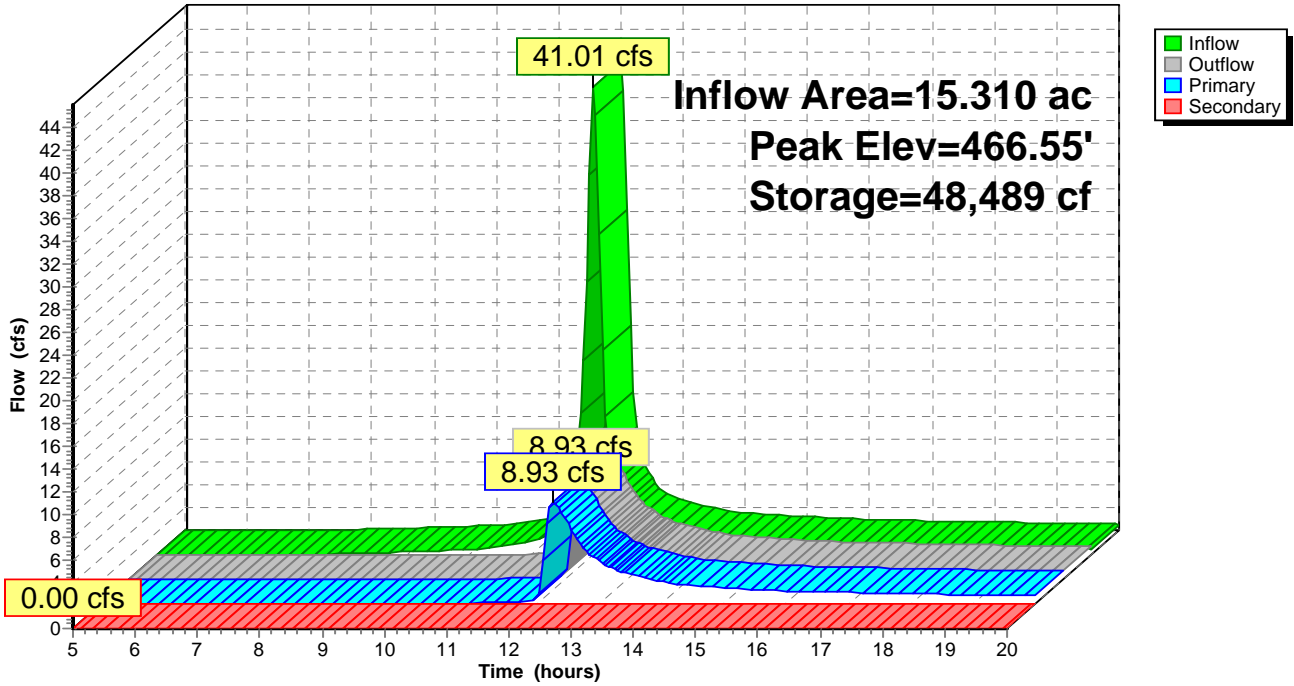
- 1=Culvert (Passes 7.20 cfs of 22.89 cfs potential flow)
- 2=Orifice/Grate (Orifice Controls 0.37 cfs @ 6.67 fps)
- 4=Orifice/Grate (Weir Controls 6.83 cfs @ 1.94 fps)
- 3=Orifice/Grate (Orifice Controls 1.66 cfs @ 3.32 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=464.50' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: BMP #15

Hydrograph



2013.08.21.BMP #15

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 10-Yr Rainfall=5.17"

Printed 9/8/2013

Page 12

Summary for Subcatchment 1S: Pre-Development

Runoff = 36.06 cfs @ 12.14 hrs, Volume= 2.506 af, Depth> 1.96"

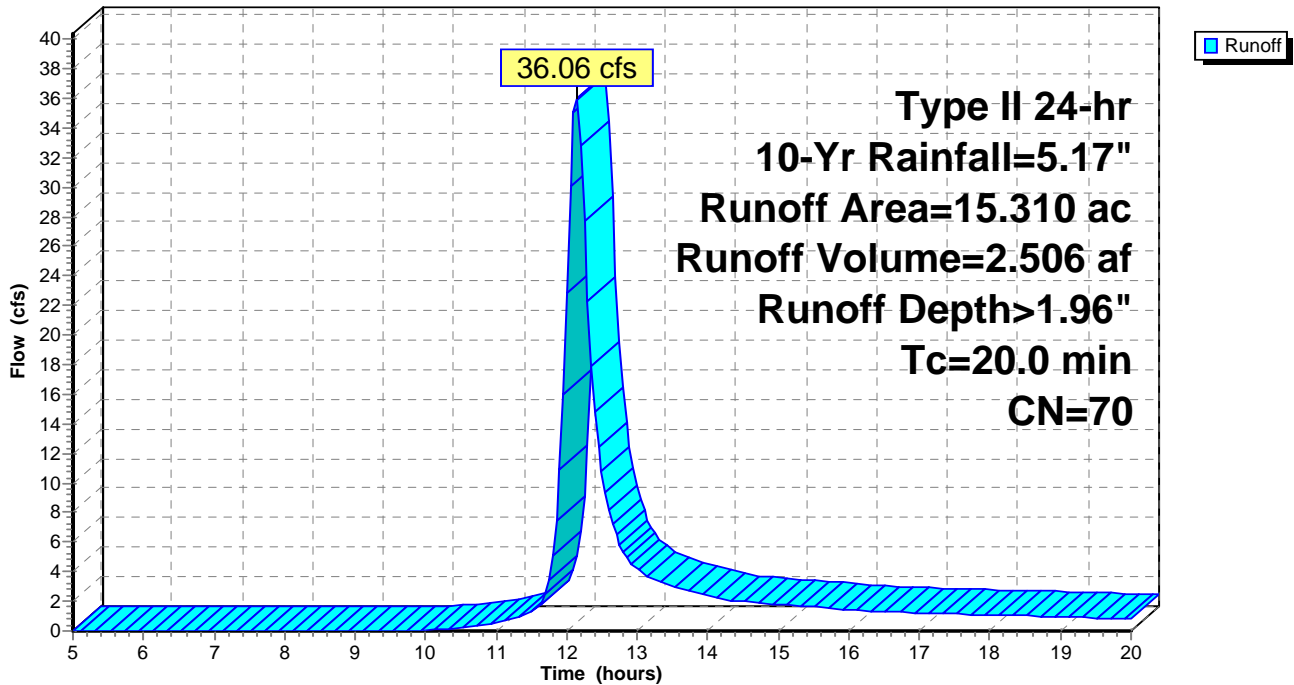
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=5.17"

Area (ac)	CN	Description
15.310	70	Woods, Good, HSG C
15.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					Direct Entry,

Subcatchment 1S: Pre-Development

Hydrograph



Summary for Pond 3P: BMP #15

Inflow Area = 15.310 ac, 60.16% Impervious, Inflow Depth > 3.59" for 10-Yr event
 Inflow = 85.34 cfs @ 12.01 hrs, Volume= 4.574 af
 Outflow = 28.13 cfs @ 12.19 hrs, Volume= 3.668 af, Atten= 67%, Lag= 10.6 min
 Primary = 28.13 cfs @ 12.19 hrs, Volume= 3.668 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 468.07' @ 12.19 hrs Surf.Area= 28,618 sf Storage= 89,691 cf

Plug-Flow detention time= 103.2 min calculated for 3.656 af (80% of inflow)
 Center-of-Mass det. time= 50.3 min (811.9 - 761.6)

Volume	Invert	Avail.Storage	Storage Description
#1	464.50'	182,141 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.50	20,017	0	0
465.00	22,898	10,729	10,729
466.00	24,702	23,800	34,529
467.00	26,562	25,632	60,161
468.00	28,479	27,521	87,681
469.00	30,453	29,466	117,147
470.00	32,483	31,468	148,615
471.00	34,569	33,526	182,141

Device	Routing	Invert	Outlet Devices
#1	Primary	458.00'	18.0" Round Culvert L= 108.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 458.00' / 456.00' S= 0.0185 1/ S Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	464.50'	3.2" Vert. Orifice/Grate C= 0.600
#3	Primary	465.95'	24.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	466.20'	30.0" x 30.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	468.50'	30.0' long x 12.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=28.12 cfs @ 12.19 hrs HW=468.06' (Free Discharge)

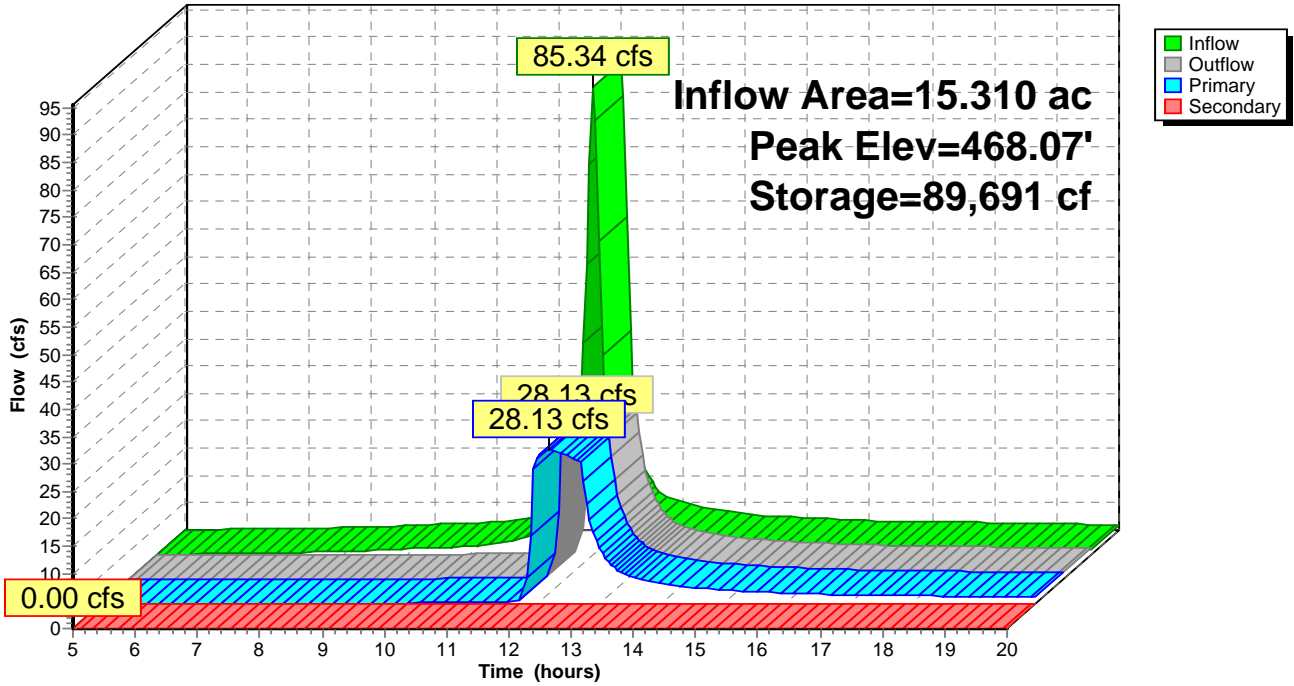
- 1=Culvert (Barrel Controls 24.73 cfs @ 13.99 fps)
- 2=Orifice/Grate (Passes < 0.50 cfs potential flow)
- 4=Orifice/Grate (Passes < 41.10 cfs potential flow)
- 3=Orifice/Grate (Orifice Controls 3.40 cfs @ 6.79 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=464.50' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: BMP #15

Hydrograph



2013.08.21.BMP #15

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 100-Yr Rainfall=7.62"

Printed 9/8/2013

Page 17

Summary for Subcatchment 1S: Pre-Development

Runoff = 70.05 cfs @ 12.13 hrs, Volume= 4.856 af, Depth> 3.81"

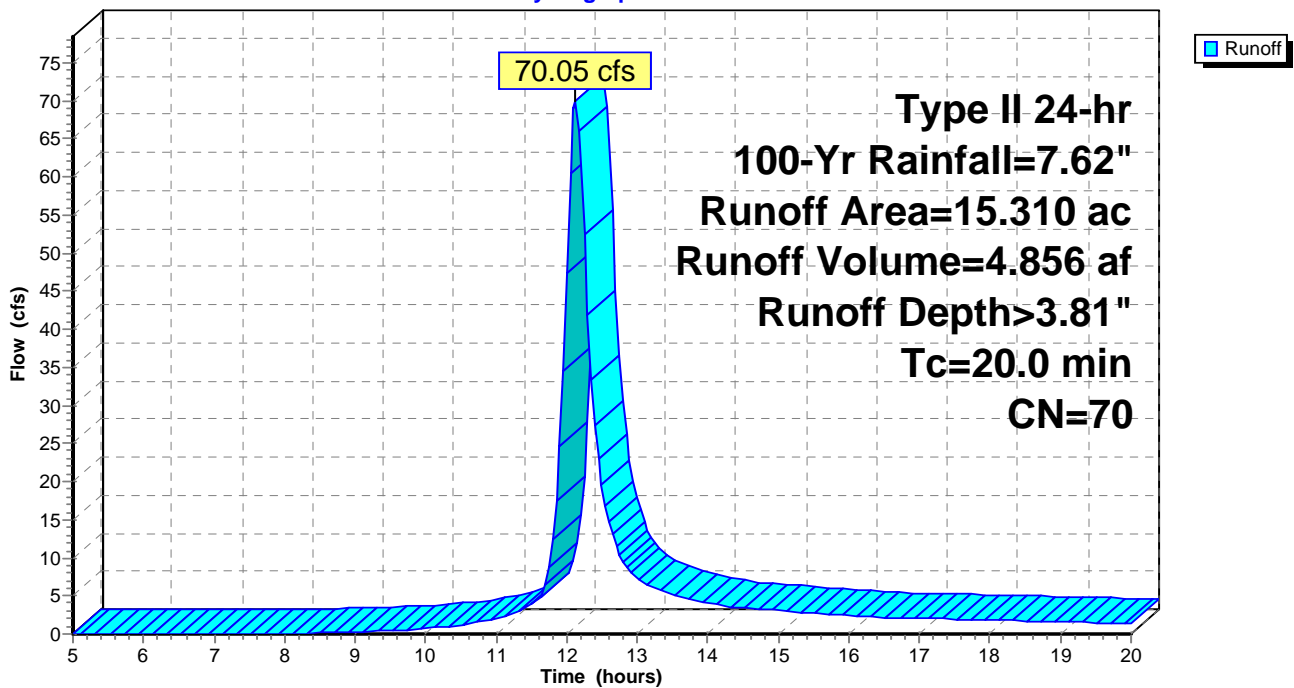
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Yr Rainfall=7.62"

Area (ac)	CN	Description
15.310	70	Woods, Good, HSG C
15.310		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.0					Direct Entry,

Subcatchment 1S: Pre-Development

Hydrograph



2013.08.21.BMP #15

Type II 24-hr 100-Yr Rainfall=7.62"

Prepared by McKim & Creed

Printed 9/8/2013

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Page 19

Summary for Pond 3P: BMP #15

[82] Warning: Early inflow requires earlier time span

Inflow Area = 15.310 ac, 60.16% Impervious, Inflow Depth > 5.81" for 100-Yr event
 Inflow = 134.27 cfs @ 12.01 hrs, Volume= 7.407 af
 Outflow = 81.77 cfs @ 12.12 hrs, Volume= 6.473 af, Atten= 39%, Lag= 6.6 min
 Primary = 30.35 cfs @ 12.12 hrs, Volume= 5.645 af
 Secondary = 51.42 cfs @ 12.12 hrs, Volume= 0.828 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 469.24' @ 12.12 hrs Surf.Area= 30,947 sf Storage= 124,619 cf

Plug-Flow detention time= 87.5 min calculated for 6.472 af (87% of inflow)
 Center-of-Mass det. time= 46.7 min (798.5 - 751.8)

Volume	Invert	Avail.Storage	Storage Description
#1	464.50'	182,141 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
464.50	20,017	0	0
465.00	22,898	10,729	10,729
466.00	24,702	23,800	34,529
467.00	26,562	25,632	60,161
468.00	28,479	27,521	87,681
469.00	30,453	29,466	117,147
470.00	32,483	31,468	148,615
471.00	34,569	33,526	182,141

Device	Routing	Invert	Outlet Devices
#1	Primary	458.00'	18.0" Round Culvert L= 108.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 458.00' / 456.00' S= 0.0185 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 1.77 sf
#2	Device 1	464.50'	3.2" Vert. Orifice/Grate C= 0.600
#3	Primary	465.95'	24.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	466.20'	30.0" x 30.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	468.50'	30.0' long x 12.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=30.30 cfs @ 12.12 hrs HW=469.21' (Free Discharge)

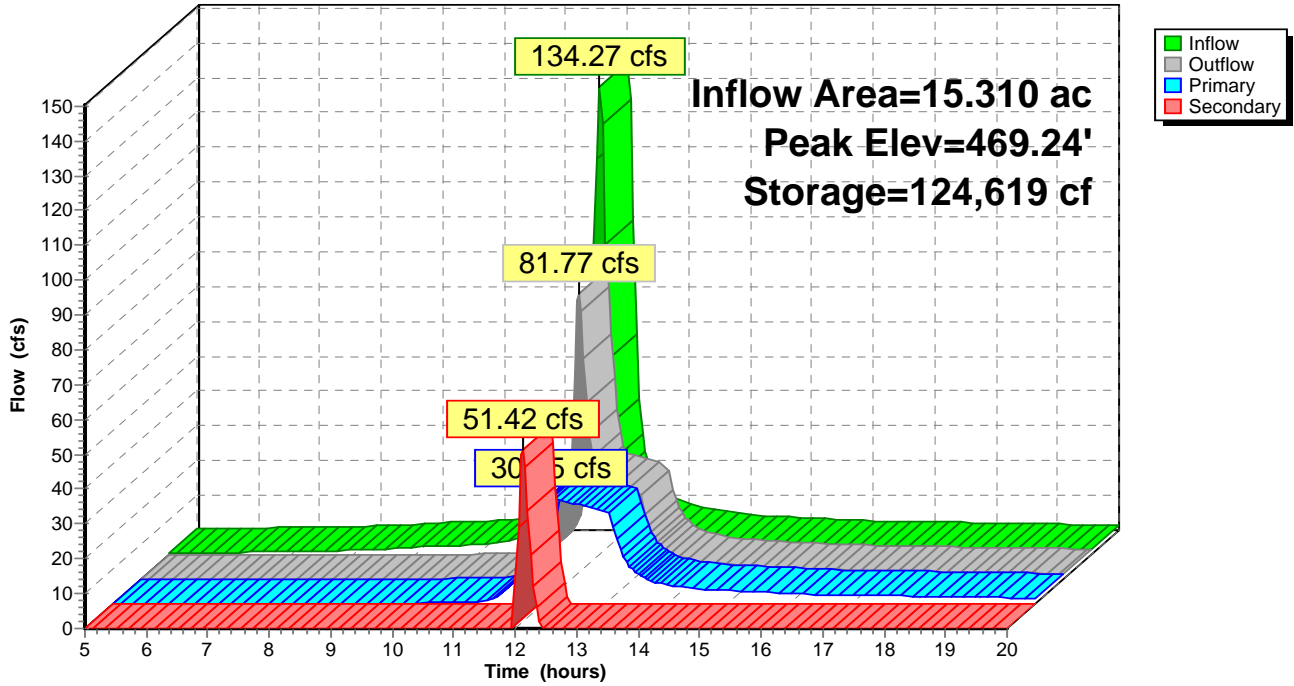
- 1=Culvert (Barrel Controls 26.04 cfs @ 14.73 fps)
- 2=Orifice/Grate (Passes < 0.58 cfs potential flow)
- 4=Orifice/Grate (Passes < 52.25 cfs potential flow)
- 3=Orifice/Grate (Orifice Controls 4.27 cfs @ 8.53 fps)

Secondary OutFlow Max=48.62 cfs @ 12.12 hrs HW=469.21' (Free Discharge)

- 5=Broad-Crested Rectangular Weir (Weir Controls 48.62 cfs @ 2.27 fps)

Pond 3P: BMP #15

Hydrograph



WATER QUALITY POND #15 CALCULATIONS

Project Name

Briar Chapel - Phase 9 - Section 2 - BMP #15

Project Number

02735-0096

Date

August 6, 2013

3rd revision _____
2nd revision _____
1st revision _____

Water Quality Pond Drainage Area Data

Project Briar Chapel - Phase 9 - Section 2 - BMP #15

Project No. 02735-0096

Date August 6, 2013

Total site area 666,950 square feet = 15.31 acres

	Drainage area to pond			Other Drainage Area	
	Existing [sf]	Proposed [sf]	Change [sf]	Existing [sf]	Proposed [sf]
Impervious areas					
On-site buildings (BUA)	0	238,000	238,000	0	0
On-site streets	0	104,466	104,466	0	0
On-site alleys	0	6,701	6,701	0	0
On-site sidewalks	0	31,922	31,922	0	0
On-site future (open space)	0	1,000	1,000	0	0
Off-site streets	0	0	0	0	0
5% Contingency	0	19,104	19,104	0	0
Commercial building	0	10,000	10,000	0	0
Commercial pavement	0	25,000	25,000	0	0
Total Impervious	0	401,193	401,193	0	0

	Drainage area to pond			Other Drainage Area	
	Existing [sf]	Proposed [sf]	Change [sf]	Existing [sf]	Proposed [sf]
Non-impervious areas					
On-site grass/landscape	0	265,757	265,757	0	0
On-site woods	666,950	0	-666,950	0	0
Other undeveloped	0	0	0	0	0
Total off-site non-impervious	0	0	0	0	0
Total non-impervious	666,950	265,757	-401,193	0	0

Total Drainage Area	666,950	666,950	0	3,167,850	3,167,850
Percent Impervious	0.0	60.2	60.2	0.0	0.0

Notes:

Water Quality Pond Surface Area Calculations

Project Briar Chapel - Phase 9 - Section 2 - BMP #15
 Project No. 02735-0096

Date August 6, 2013

Total on-site drainage area to pond 666,950 square feet
 Total impervious area in drainage area 401,193 square feet

Average water depth of basin at normal pool 4.0 feet

Location of site Chatham County
 Site region Piedmont

% Impervious cover 60.2 percent

If the site is in a coastal area, will a vegetative filter be used? n/a

Surface Area/Drainage Area Ratios:

For a site in the Piedmont (85%) 2.0 percent
 For a site in the Piedmont (90%) 2.8 percent
 For a site in a Coastal County w/ Vegetative Filter 3.8 percent
 For a site in a Coastal County w/out Vegetative Filter 5.3 percent

Required surface area of pond:

For a site in the Piedmont (85%) 13,580.0 square feet
 For a site in the Piedmont (90%) 18,730.0 square feet
 For a site in a Coastal County w/ Vegetative Filter 25,420.0 square feet
 For a site in a Coastal County w/out Vegetative Filter 35,420.0 square feet

Notes:

Water Quality Pond Stormwater Runoff Volume Calculations

Project Briar Chapel - Phase 9 - Section 2 - BMP #
Project No. 02735-0096

Date August 6, 2013

Drainage area 666,950 square feet

Impervious area 401,193 square feet

Rainfall depth 1.00 inches

Percent Impervious 60.2 percent

$R(v) = 0.05 + 0.009 * (\text{Percent impervious})$

Runoff coefficient - R(v) 0.59 in/in

Runoff volume = (Design rainfall) * (R(v)) * (Drainage area)

Runoff volume 32,868.5 cubic feet

Notes:

Water Quality Pond Volume Calculations
Stage-Storage Data for Pond - Temporary Pool

Project Briar Chapel - Phase 9 - Section 2 - BMP #15

Project No. 02735-0096

Date August 6, 2013

Contour ID	Stage	Area [sq. ft.]	Area [acres]	Incremental Area [sq. ft.]	Incremental Area [acres]	Incremental volume [cu. ft]	Incremental volume [acre-ft]	Cumulative volume [cu. ft]	Cumulative volume [acre-ft]
464.5	0	20,017.0	0.460	20,017.0	0.5	0.0	0.0	0.0	0.0
465	0.5	22,898.0	0.526	2,881.0	0.1	10,728.8	0.2	10,728.8	0.2
465.95	1.45	24,610.3	0.565	1,712.3	0.0	22,566.4	0.5	33,295.2	0.8
466	1.5	24,702.0	0.567	91.8	0.0	1,232.8	0.5	34,528.0	0.8
467	2.5	26,562.0	0.610	1,860.0	0.0	25,632.0	0.6	60,160.0	1.1
468	3.5	28,479.0	0.654	1,917.0	0.0	27,520.5	0.6	87,680.5	1.2
469	4.5	30,453.0	0.699	1,974.0	0.0	29,466.0	0.7	117,146.5	1.3
470	5.5	32,483.0	0.746	2,030.0	0.0	31,468.0	0.7	148,614.5	1.4

Water Quality Pond Volume Calculations
Stage-Storage Data for Pond - Permanent Pool

Project Briar Chapel - Phase 9 - Section 2 - BMP #15

Project No. 02735-0096

Date August 6, 2013

Contour ID	Stage	Area [sq. ft.]	Area [acres]	Incremental Area [sq. ft.]	Incremental Area [acres]	Incremental volume [cu. ft]	Incremental volume [acre-ft]	Cumulative volume [cu. ft]	Cumulative volume [acre-ft]
394	0	6,007.0	0.138	6,007.0	0.1	0.0	0.0	0.0	0.0
395	1	7,474.0	0.172	1,467.0	0.0	6,740.5	0.2	6,740.5	0.2
396	2	9,071.0	0.208	1,597.0	0.0	8,272.5	0.2	15,013.0	0.3
397	3	10,770.0	0.247	1,699.0	0.0	9,920.5	0.2	24,933.5	0.4
398	4	12,583.0	0.289	1,813.0	0.0	11,676.5	0.3	36,610.0	0.5
399	5	14,509.0	0.333	1,926.0	0.0	13,546.0	0.3	50,156.0	0.6
400	6	16,547.0	0.380	2,038.0	0.0	15,528.0	0.4	65,684.0	0.7
400.5	6.5	20,017.0	0.460	3,470.0	0.1	9,141.0	0.2	74,825.0	0.6

**Water Quality Pond Volume Calculations
Stage-Storage Data for Pond - Forebays**

Project Briar Chapel - Phase 9 - Section 2 - BMP #15

Project No. 02735-0096

Date August 6, 2013

Contour ID	Stage	Area [sq. ft.]	Area [acres]	Incremental Area [sq. ft.]	Incremental Area [acres]	Incremental volume [cu. ft.]	Incremental volume [acre-ft]	Cumulative volume [cu. ft.]	Cumulative volume [acre-ft]
458	0	636.0	0.015	636.0	0.0	0.0	0.0	0.0	0.0
459	1	1,005.0	0.023	369.0	0.0	820.5	0.0	820.5	0.0
460	2	1,442.0	0.033	437.0	0.0	1,223.5	0.0	2,044.0	0.0
461	3	1,927.0	0.044	485.0	0.0	1,684.5	0.0	3,728.5	0.1
462	4	2,469.0	0.057	542.0	0.0	2,198.0	0.1	5,926.5	0.1
463	5	3,068.0	0.070	599.0	0.0	2,768.5	0.1	8,695.0	0.1
464	6	3,723.0	0.085	655.0	0.0	3,395.5	0.1	12,090.5	0.1
464.5	6.5	4,940.0	0.113	1,217.0	0.0	2,165.8	0.0	14,256.3	0.1

Water Quality Basin Dewatering Time Calculations

Project Briar Chapel - Phase 9 - Section 2 - BMP #15
 Project No. 02735-0096

Date August 6, 2013

Water quality treatment volume	<u>32,869</u>	square feet
Total treatment volume	<u>33,295</u>	square feet
Maximum head of water above dewatering hole	<u>1.45</u>	feet
Driving head	<u>0.48</u>	feet
Orifice coefficient	<u>0.60</u>	
Diameter of each hole	<u>3.25</u>	inches
Number of holes	<u>1</u>	
Cross sectional area of each hole =	<u>0.058</u>	square feet
Cross sectional area of each hole =	<u>8.3</u>	square inches
Cross sectional area of dewatering hole(s) =	<u>0.058</u>	square feet
Cross sectional area of dewatering hole(s) =	<u>8.3</u>	square inches
Dewatering time for water quality volume =	<u>2.0</u>	days
Dewatering time for total volume =	<u>2.0</u>	days

Notes:

Dewatering time formula: $t \text{ (days)} = V / (Cd * A * \text{Sqrt} (2 * 32.2 * H) * 86,400)$

- t = drawdown time
- V = treatment volume
- Cd = orifice coefficient
- A = cross sectional area of orifice
- H = driving head (1/3 max. head)

Water Quality Pond Summary Information

Project Briar Chapel - Phase 9 - Section 2 -
Project No. 02735-0096

Date August 6, 2013

Drainage area to pond 666,950 square feet = 15.31 acres
Impervious area in drainage area 401,193 square feet = 9.21 acres

Bottom of pond elevation 457.00 feet
Normal pool elevation 562.50 feet
Pond volume at normal pool 178,071 cubic feet

Required volume for design rainfall 32,868 cubic feet
Required surface area for pond 18,730 square feet

Volume provided for storage of design rainfall = 71,862 cubic feet at elevation 463.9

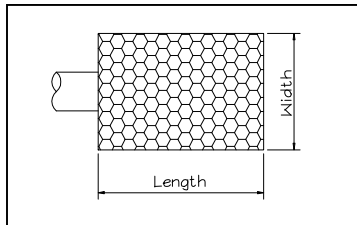
Surface area provided at normal pool 46,957 square feet

Storm Outlet Structure

Structure= BMP #15 Out
 Size= 18 in
 Q₁₀ = 24.93 cfs
 Q_{full} = 14.45 cfs
 V_{full} = 8.18 fps

Q₁₀/Q_{full} = 1.72
 V/V_{full} = MAX
 V = 10.9 fps

From Fig. 8.06.b.1:



Zone = 5
 D₅₀ = 14 in
 D_{MAX} = 21 in
 Riprap Class = 2
 Apron Thickness = 36 in
 Apron Length = 15.0 ft
 Apron Width = 3 x Dia = 5.0 ft

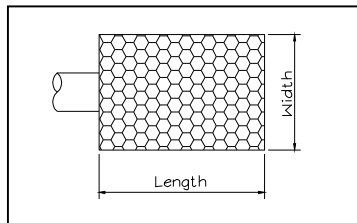
OUTLET PROTECTION DESIGN	DATE: 9/3/2013	DESIGNED BY: DJB
PROJECT NAME: Briar Chapel - BC South PROJECT LOCATION: Chatham County, NC	PROJECT NO: 02735-0096	CHECKED BY GCA

Storm Outlet Structure

Structure= **BMP #16 Out**
 Size= 12 in
 Q₁₀ = 7.19 cfs
 Q_{full} = 3.98 cfs
 V_{full} = 5.06 fps

Q₁₀/Q_{full} = 1.81
 V/V_{full} = MAX
 V = #VALUE! fps

From Fig. 8.06.b.1:



Zone = **5**

D₅₀ = 14 in
 D_{MAX} = 21 in
 Riprap Class = 2
 Apron Thickness = 36 in
 Apron Length = 10.0 ft
 Apron Width = 3 x Dia = 3.0 ft

ANTI-FLOATATION DESIGN	DATE: 8/23/2013	DESIGNED BY: GCA																																												
PROJECT NAME: Briar Chapel Phase 9 PROJECT LOCATION: Chatham County, NC	PROJECT NO: 02735-0096	CHECKED BY: GML																																												
<table> <tr> <td>Pond Name=</td> <td>BMP #15</td> <td></td> <td></td> </tr> <tr> <td>Riser Outer Width =</td> <td>3.5 ft</td> <td>Riser Resisting Force =</td> <td>7,758 lb</td> </tr> <tr> <td>Riser Outer Length =</td> <td>3.5 ft</td> <td>Base Resisting Force =</td> <td>3,038 lb</td> </tr> <tr> <td>Riser Inner Width =</td> <td>2.5 ft</td> <td>Total Resisting Force =</td> <td>10,796 lb</td> </tr> <tr> <td>Riser Inner Length =</td> <td>2.5 ft</td> <td></td> <td></td> </tr> <tr> <td>Riser Height =</td> <td>8.62 ft</td> <td>Riser Buoyant Force =</td> <td>6,589 lb</td> </tr> <tr> <td></td> <td></td> <td>Base Buoyant Force =</td> <td>1,264 lb</td> </tr> <tr> <td>Concrete Base Length =</td> <td>4.5 ft</td> <td>Total Buoyant Force =</td> <td>7,853 lb</td> </tr> <tr> <td>Concrete Base Width =</td> <td>4.5 ft</td> <td></td> <td></td> </tr> <tr> <td>Concrete Base Depth =</td> <td>12 in</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>Factor of Safety</td> <td>1.37 Design Acceptable</td> </tr> </table>			Pond Name=	BMP #15			Riser Outer Width =	3.5 ft	Riser Resisting Force =	7,758 lb	Riser Outer Length =	3.5 ft	Base Resisting Force =	3,038 lb	Riser Inner Width =	2.5 ft	Total Resisting Force =	10,796 lb	Riser Inner Length =	2.5 ft			Riser Height =	8.62 ft	Riser Buoyant Force =	6,589 lb			Base Buoyant Force =	1,264 lb	Concrete Base Length =	4.5 ft	Total Buoyant Force =	7,853 lb	Concrete Base Width =	4.5 ft			Concrete Base Depth =	12 in					Factor of Safety	1.37 Design Acceptable
Pond Name=	BMP #15																																													
Riser Outer Width =	3.5 ft	Riser Resisting Force =	7,758 lb																																											
Riser Outer Length =	3.5 ft	Base Resisting Force =	3,038 lb																																											
Riser Inner Width =	2.5 ft	Total Resisting Force =	10,796 lb																																											
Riser Inner Length =	2.5 ft																																													
Riser Height =	8.62 ft	Riser Buoyant Force =	6,589 lb																																											
		Base Buoyant Force =	1,264 lb																																											
Concrete Base Length =	4.5 ft	Total Buoyant Force =	7,853 lb																																											
Concrete Base Width =	4.5 ft																																													
Concrete Base Depth =	12 in																																													
		Factor of Safety	1.37 Design Acceptable																																											

III. REQUIRED ITEMS CHECKLIST

Please indicate the page or plan sheet numbers where the supporting documentation can be found. **An incomplete submittal package will result in a request for additional information. This will delay final review and approval of the project.** Initial in the space provided to indicate the following design requirements have been met. If the applicant has designated an agent, the agent may initial below. **If a requirement has not been met, attach justification.**

Initials	Page/ Plan Sheet No.	
GCA	C3.3-C3.4	1. Plans (1" - 50' or larger) of the entire site showing: <ul style="list-style-type: none"> - Design at ultimate build-out, - Off-site drainage (if applicable), - Delineated drainage basins (include Rational C coefficient per basin), - Basin dimensions, - Pretreatment system, - High flow bypass system, - Maintenance access, - Proposed drainage easement and public right of way (ROW), - Overflow device, and - Boundaries of drainage easement.
GCA	D4.1-D4.3	2. Partial plan (1" = 30' or larger) and details for the wet detention basin showing: <ul style="list-style-type: none"> - Outlet structure with trash rack or similar, - Maintenance access, - Permanent pool dimensions, - Forebay and main pond with hardened emergency spillway, - Basin cross-section, - Vegetation specification for planting shelf, and - Filter strip.
GCA	D4.1-D4.3	3. Section view of the wet detention basin (1" = 20' or larger) showing: <ul style="list-style-type: none"> - Side slopes, 3:1 or lower, - Pretreatment and treatment areas, and - Inlet and outlet structures.
GCA	N/A	4. If the basin is used for sediment and erosion control during construction, clean out of the basin is specified on the plans prior to use as a wet detention basin.
GCA	Calc Booklet	5. A table of elevations, areas, incremental volumes & accumulated volumes for overall pond and for forebay, to verify volume provided.
GCA	C3.1	6. A construction sequence that shows how the wet detention basin will be protected from sediment until the entire drainage area is stabilized.
GCA	Calc Booklet	7. The supporting calculations.
GCA	Included	8. A copy of the signed and notarized operation and maintenance (O&M) agreement.
GCA	Included	9. A copy of the deed restrictions (if required).
_____	N/A	10. A soils report that is based upon an actual field investigation, soil borings, and infiltration tests. County soil maps are not an acceptable source of soils information.

Red triangles at the upper right hand corner indicate design comments
Please complete the yellow shaded items.



STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

WET DETENTION BASIN SUPPLEMENT

This form must be filled out, printed and submitted.

The Required Items Checklist (Part III) must be printed, filled out and submitted along with all of the required information.

I. PROJECT INFORMATION

Project name	Briar Chapel Development - Great Ridge Parkway Extension
Contact person	Gareth Avant, PE
Phone number	919.233.8091
Date	30-Aug-2013
Drainage area number	2 - Wet Pond #15

II. DESIGN INFORMATION

Site Characteristics

Drainage area	666,904 ft ²
Impervious area, post-development	401,188 ft ²
% impervious	60.16 %
Design rainfall depth	1.0 in

Storage Volume: Non-SA Waters

Minimum volume required	32,869 ft ³	OK
Volume provided	33,295 ft ³	OK, volume provided is equal to or in excess of volume required.

Storage Volume: SA Waters

1.5" runoff volume	ft ³
Pre-development 1-yr, 24-hr runoff	ft ³
Post-development 1-yr, 24-hr runoff	ft ³
Minimum volume required	ft ³
Volume provided	ft ³

Peak Flow Calculations

Is the pre/post control of the 1yr 24hr storm peak flow required?	Y	(Y or N)
1-yr, 24-hr rainfall depth	3.0 in	
Rational C, pre-development	0.40 (unitless)	
Rational C, post-development	0.86 (unitless)	
Rainfall intensity: 1-yr, 24-hr storm	0.13 in/hr	OK
Pre-development 1-yr, 24-hr peak flow	12.87 ft ³ /sec	
Post-development 1-yr, 24-hr peak flow	47.65 ft ³ /sec	
Pre/Post 1-yr, 24-hr peak flow control	34.78 ft ³ /sec	

Elevations

Temporary pool elevation	471.00 fmsl	
Permanent pool elevation	464.50 fmsl	
SHWT elevation (approx. at the perm. pool elevation)	fmsl	
Top of 10ft vegetated shelf elevation	465.00 fmsl	
Bottom of 10ft vegetated shelf elevation	464.00 fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment cleanout, top elevation (bottom of pond)	459.00 fmsl	
Sediment cleanout, bottom elevation	458.00 fmsl	Data not needed for calculation option #1, but OK if provided.
Sediment storage provided	1.00 ft	

Is there additional volume stored above the state-required temp. pool?	N	(Y or N)
Elevation of the top of the additional volume	fmsl	

II. DESIGN INFORMATION
Surface Areas

Area, temporary pool		ft ²	
Area REQUIRED, permanent pool	16,673	ft ²	
SA/DA ratio	2.50	(unitless)	
Area PROVIDED, permanent pool, A_{perm_pool}	74,689	ft ²	OK
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	16,547	ft ²	
Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	7,474	ft ²	

Volumes

Volume, temporary pool	33,295	ft ³	OK
Volume, permanent pool, V_{perm_pool}	74,689	ft ³	
Volume, forebay (sum of forebays if more than one forebay)	14,256	ft ³	
Forebay % of permanent pool volume	19.1%	%	OK

SA/DA Table Data

Design TSS removal	90	%
Coastal SA/DA Table Used?	N	(Y or N)
Mountain/Piedmont SA/DA Table Used?	Y	(Y or N)
SA/DA ratio	2.50	(unitless)

Average depth (used in SA/DA table):

Calculation option 1 used? (See Figure 10-2b)	Y	(Y or N)
Volume, permanent pool, V_{perm_pool}	74,689	ft ³
Area provided, permanent pool, A_{perm_pool}	74,689	ft ²
Average depth calculated	3.73	ft
Average depth used in SA/DA, d_{av} , (Round to nearest 0.5ft)	3.5	ft

Calculation option 2 used? (See Figure 10-2b)	N	(Y or N)
Area provided, permanent pool, A_{perm_pool}	74,689	ft ²
Area, bottom of 10ft vegetated shelf, A_{bot_shelf}	16,547	ft ²

Area, sediment cleanout, top elevation (bottom of pond), A_{bot_pond}	7,474	ft ²
--	-------	-----------------

"Depth" (distance b/w bottom of 10ft shelf and top of sediment)	5.00	ft
---	------	----

Average depth calculated		ft
--------------------------	--	----

Average depth used in SA/DA, d_{av} , (Round to nearest 0.5ft)		ft
--	--	----

Drawdown Calculations

Drawdown through orifice?	Y	(Y or N)
Diameter of orifice (if circular)	3.50	in
Area of orifice (if non-circular)		in ²
Coefficient of discharge (C_D)	0.60	(unitless)
Driving head (H_0)	1.50	ft
Drawdown through weir?	N	(Y or N)
Weir type		(unitless)
Coefficient of discharge (C_w)		(unitless)
Length of weir (L)		ft
Driving head (H)		ft
Pre-development 1-yr, 24-hr peak flow	10.18	ft ³ /sec
Post-development 1-yr, 24-hr peak flow	5.92	ft ³ /sec
Storage volume discharge rate (through discharge orifice or weir)	0.38	ft ³ /sec
Storage volume drawdown time	2.23	days

OK, draws down in 2-5 days.

Additional Information

Vegetated side slopes	3 :1	OK
Vegetated shelf slope	10 :1	OK
Vegetated shelf width	10.0	ft
Length of flowpath to width ratio	3 :1	OK
Length to width ratio	1.5 :1	OK
Trash rack for overflow & orifice?	Y	(Y or N)
Freeboard provided	1.5	ft
Vegetated filter provided?	N	(Y or N)
Recorded drainage easement provided?	Y	(Y or N)
Capures all runoff at ultimate build-out?	Y	(Y or N)
Drain mechanism for maintenance or emergencies is:	8" DIP with gate valve	

Permit Number: _____
(to be provided by DWQ)

Drainage Area Number: _____

Wet Detention Basin Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

The wet detention basin system is defined as the wet detention basin, pretreatment including forebays and the vegetated filter if one is provided.

This system (check one):

does does not incorporate a vegetated filter at the outlet.

This system (check one):

does does not incorporate pretreatment other than a forebay.

Important maintenance procedures:

- Immediately after the wet detention basin is established, the plants on the vegetated shelf and perimeter of the basin should be watered twice weekly if needed, until the plants become established (commonly six weeks).
- No portion of the wet detention pond should be fertilized after the first initial fertilization that is required to establish the plants on the vegetated shelf.
- Stable groundcover should be maintained in the drainage area to reduce the sediment load to the wet detention basin.
- If the basin must be drained for an emergency or to perform maintenance, the flushing of sediment through the emergency drain should be minimized to the maximum extent practical.
- Once a year, a dam safety expert should inspect the embankment.

After the wet detention pond is established, it should be inspected **once a month and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County)**. Records of operation and maintenance should be kept in a known set location and must be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

BMP element:	Potential problem:	How I will remediate the problem:
The entire BMP	Trash/debris is present.	Remove the trash/debris.
The perimeter of the wet detention basin	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at a height of approximately six inches.

Permit Number: _____

(to be provided by DWQ)

Drainage Area Number: _____

BMP element:	Potential problem:	How I will remediate the problem:
The inlet device: pipe or swale	The pipe is clogged.	Unclog the pipe. Dispose of the sediment off-site.
	The pipe is cracked or otherwise damaged.	Replace the pipe.
	Erosion is occurring in the swale.	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.
The forebay	Sediment has accumulated to a depth greater than the original design depth for sediment storage.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The vegetated shelf	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if a soil test indicates it is necessary.
	Weeds are present.	Remove the weeds, preferably by hand. If pesticide is used, wipe it on the plants rather than spraying.
The main treatment area	Sediment has accumulated to a depth greater than the original design sediment storage depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Algal growth covers over 50% of the area.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the basin surface.	Remove the plants by wiping them with pesticide (do not spray).

Permit Number: _____

(to be provided by DWQ)

Drainage Area Number: _____

BMP element:	Potential problem:	How I will remediate the problem:
The embankment	Shrubs have started to grow on the embankment.	Remove shrubs immediately.
	Evidence of muskrat or beaver activity is present.	Use traps to remove muskrats and consult a professional to remove beavers.
	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by an appropriate professional shows that the embankment needs repair. (if applicable)	Make all needed repairs.
The outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
The receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the local NC Division of Water Quality Regional Office, or the 401 Oversight Unit at 919-733-1786.

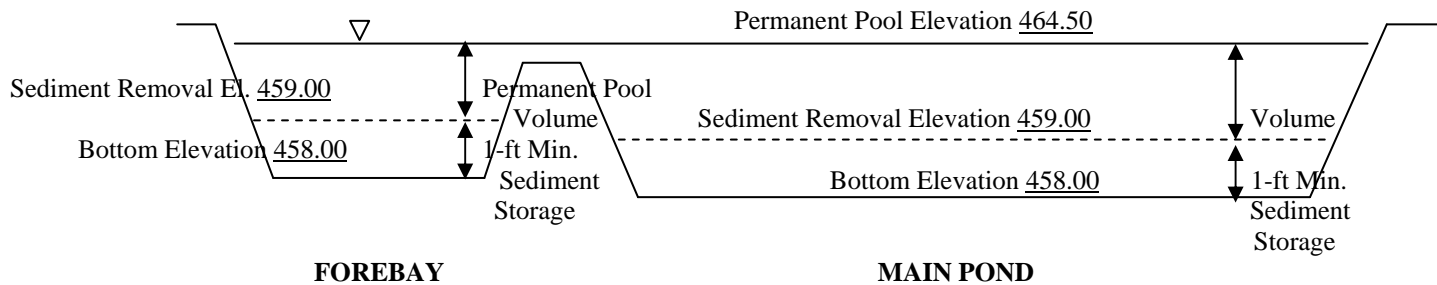
The measuring device used to determine the sediment elevation shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

When the permanent pool depth reads 5.50 feet in the main pond, the sediment shall be removed.

When the permanent pool depth reads 5.50 feet in the forebay, the sediment shall be removed.

BASIN DIAGRAM

(fill in the blanks)



Permit Number: _____
(to be provided by DWQ)

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed above. I agree to notify DWQ of any problems with the system or prior to any changes to the system or responsible party.

Project name: Briar Chapel - Phase 9

BMP drainage area number: 1 - Wet Detention Pond #15

Print name: Kevin Graham

Title: Vice President, Operations

Address: 16 Windy Knoll Circle, Chapel Hill, NC 27516

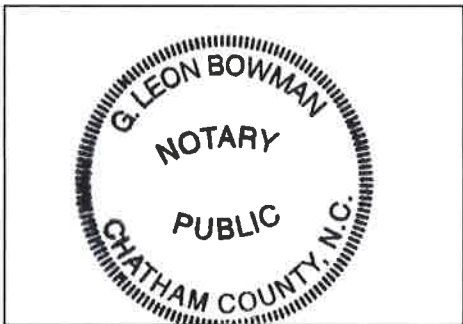
Phone: (919) 951-0709

Signature: *Kevin Graham*

Date: 9/29/13

Note: The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.

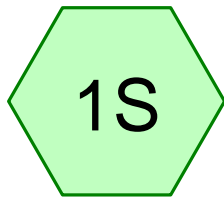
I, G. Leon Bowman, a Notary Public for the State of NC, County of Chatham, do hereby certify that Kevin Graham personally appeared before me this 29th day of August, 2013, and acknowledge the due execution of the forgoing wet detention basin maintenance requirements. Witness my hand and official seal,



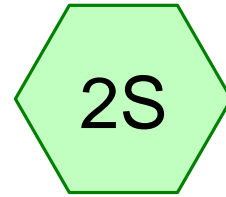
SEAL

My commission expires 9/10/14

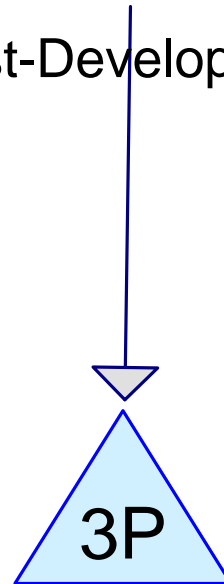
BMP #16 DESIGN



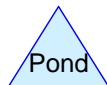
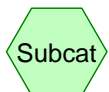
Pre-Development



Post-Development



BMP #16



BMP #16.Gareth

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 1-Yr Rainfall=2.96"

Printed 9/8/2013

Page 7

Summary for Subcatchment 1S: Pre-Development

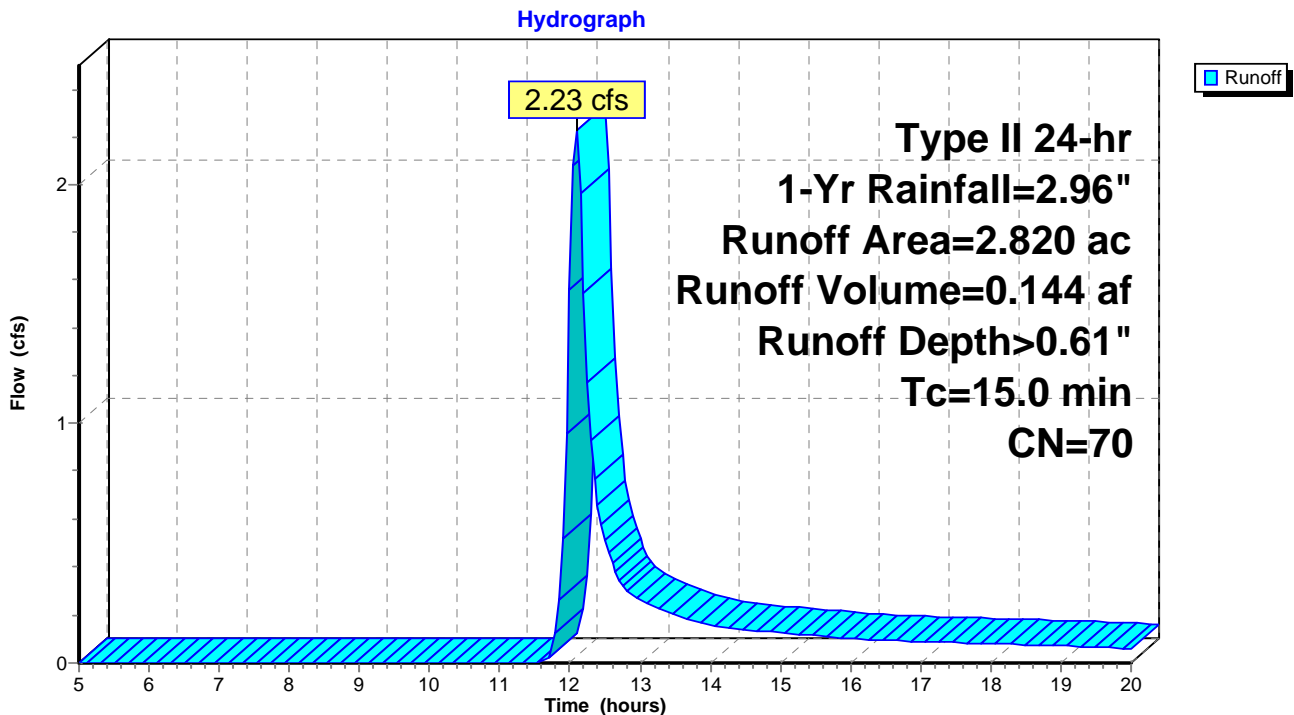
Runoff = 2.23 cfs @ 12.09 hrs, Volume= 0.144 af, Depth> 0.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-Yr Rainfall=2.96"

Area (ac)	CN	Description
2.820	70	Woods, Good, HSG C
2.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment 1S: Pre-Development



BMP #16.Gareth

Type II 24-hr 1-Yr Rainfall=2.96"

Prepared by McKim & Creed

Printed 9/8/2013

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Page 9

Summary for Pond 3P: BMP #16

Inflow Area = 2.820 ac, 49.65% Impervious, Inflow Depth > 1.50" for 1-Yr event
 Inflow = 6.94 cfs @ 12.02 hrs, Volume= 0.353 af
 Outflow = 1.97 cfs @ 12.22 hrs, Volume= 0.225 af, Atten= 72%, Lag= 12.2 min
 Primary = 1.97 cfs @ 12.22 hrs, Volume= 0.225 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 492.37' @ 12.22 hrs Surf.Area= 6,711 sf Storage= 7,607 cf

Plug-Flow detention time= 144.6 min calculated for 0.225 af (64% of inflow)
 Center-of-Mass det. time= 72.1 min (857.5 - 785.4)

Volume	Invert	Avail.Storage	Storage Description
#1	491.00'	29,289 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
491.00	4,139	0	0
492.00	6,302	5,221	5,221
493.00	7,418	6,860	12,081
494.00	8,590	8,004	20,085
495.00	9,819	9,205	29,289

Device	Routing	Invert	Outlet Devices
#1	Primary	489.00'	12.0" Round Culvert L= 40.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 489.00' / 488.50' S= 0.0125 '/ S= 0.0125 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	491.00'	1.3" Vert. Orifice/Grate C= 0.600
#3	Device 1	492.00'	18.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	492.25'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	493.25'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.93 cfs @ 12.22 hrs HW=492.36' (Free Discharge)

- ↑ 1=Culvert (Passes 1.93 cfs of 6.40 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.05 cfs @ 5.51 fps)
- ↑ 3=Orifice/Grate (Orifice Controls 0.87 cfs @ 2.33 fps)
- ↑ 4=Orifice/Grate (Weir Controls 1.01 cfs @ 1.10 fps)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=491.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

BMP #16.Gareth

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

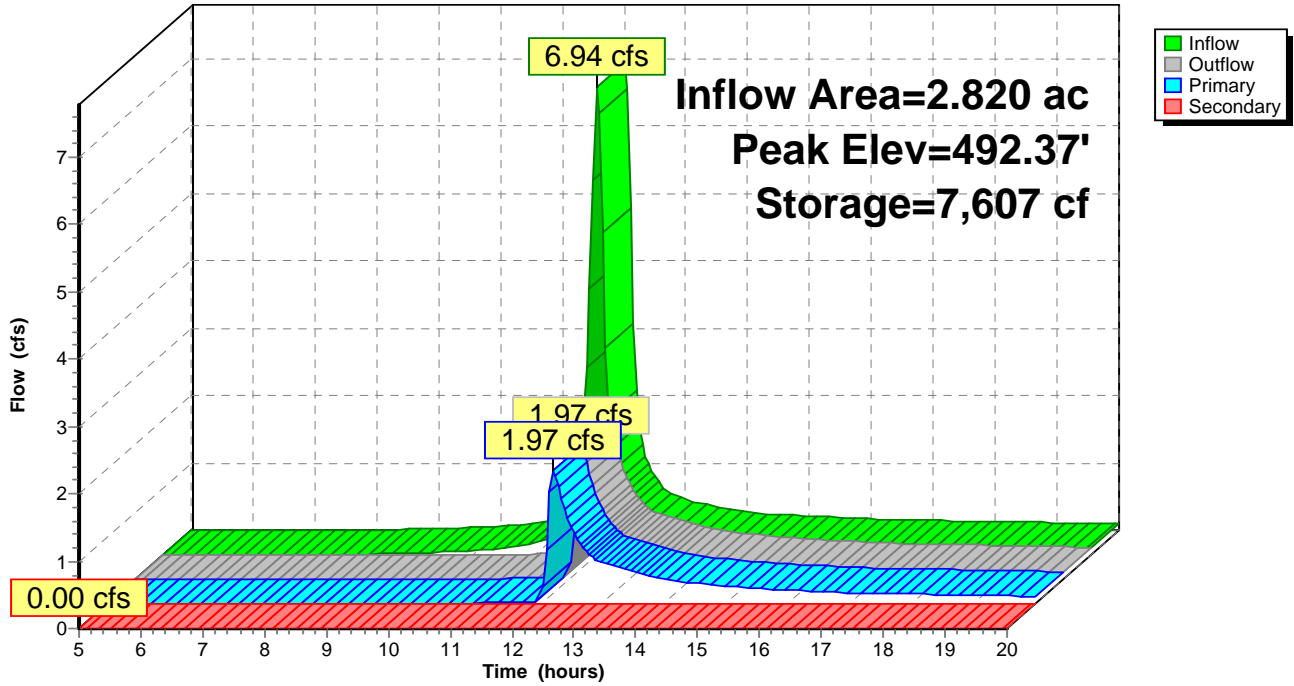
Type II 24-hr 1-Yr Rainfall=2.96"

Printed 9/8/2013

Page 10

Pond 3P: BMP #16

Hydrograph



BMP #16.Gareth

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 10-Yr Rainfall=5.17"

Printed 9/8/2013

Page 12

Summary for Subcatchment 1S: Pre-Development

Runoff = 7.75 cfs @ 12.08 hrs, Volume= 0.462 af, Depth> 1.97"

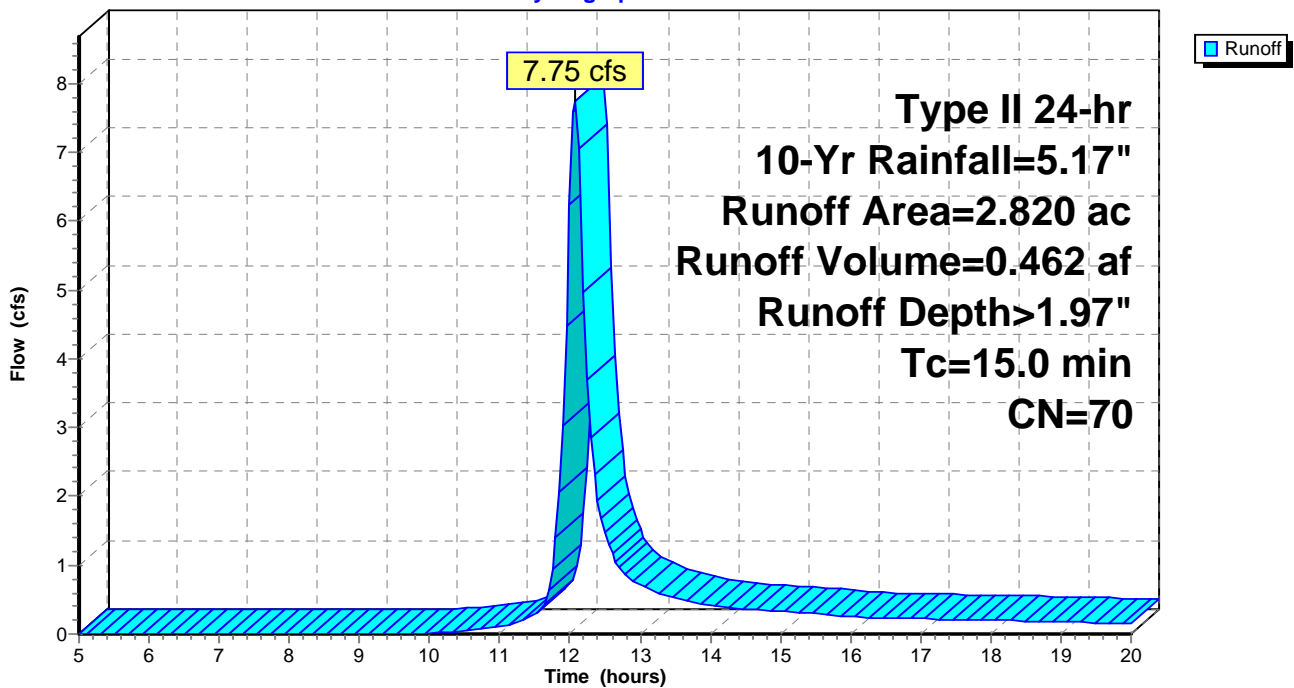
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-Yr Rainfall=5.17"

Area (ac)	CN	Description
2.820	70	Woods, Good, HSG C
2.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment 1S: Pre-Development

Hydrograph



BMP #16.Gareth

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 10-Yr Rainfall=5.17"

Printed 9/8/2013

Page 14

Summary for Pond 3P: BMP #16

Inflow Area = 2.820 ac, 49.65% Impervious, Inflow Depth > 3.39" for 10-Yr event
 Inflow = 15.05 cfs @ 12.01 hrs, Volume= 0.796 af
 Outflow = 7.19 cfs @ 12.14 hrs, Volume= 0.661 af, Atten= 52%, Lag= 8.0 min
 Primary = 7.19 cfs @ 12.14 hrs, Volume= 0.661 af
 Secondary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 493.11' @ 12.14 hrs Surf.Area= 7,552 sf Storage= 12,935 cf

Plug-Flow detention time= 90.5 min calculated for 0.661 af (83% of inflow)
 Center-of-Mass det. time= 41.3 min (808.3 - 767.0)

Volume	Invert	Avail.Storage	Storage Description
#1	491.00'	29,289 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
491.00	4,139	0	0
492.00	6,302	5,221	5,221
493.00	7,418	6,860	12,081
494.00	8,590	8,004	20,085
495.00	9,819	9,205	29,289

Device	Routing	Invert	Outlet Devices
#1	Primary	489.00'	12.0" Round Culvert L= 40.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 489.00' / 488.50' S= 0.0125 '/ S= 0.0125 ' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	491.00'	1.3" Vert. Orifice/Grate C= 0.600
#3	Device 1	492.00'	18.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	492.25'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	493.25'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.19 cfs @ 12.14 hrs HW=493.11' (Free Discharge)

- ↑ 1=Culvert (Inlet Controls 7.19 cfs @ 9.15 fps)
- ↑ 2=Orifice/Grate (Passes < 0.06 cfs potential flow)
- ↑ 3=Orifice/Grate (Passes < 1.79 cfs potential flow)
- ↑ 4=Orifice/Grate (Passes < 17.87 cfs potential flow)

Secondary OutFlow Max=0.00 cfs @ 5.00 hrs HW=491.00' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

BMP #16.Gareth

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

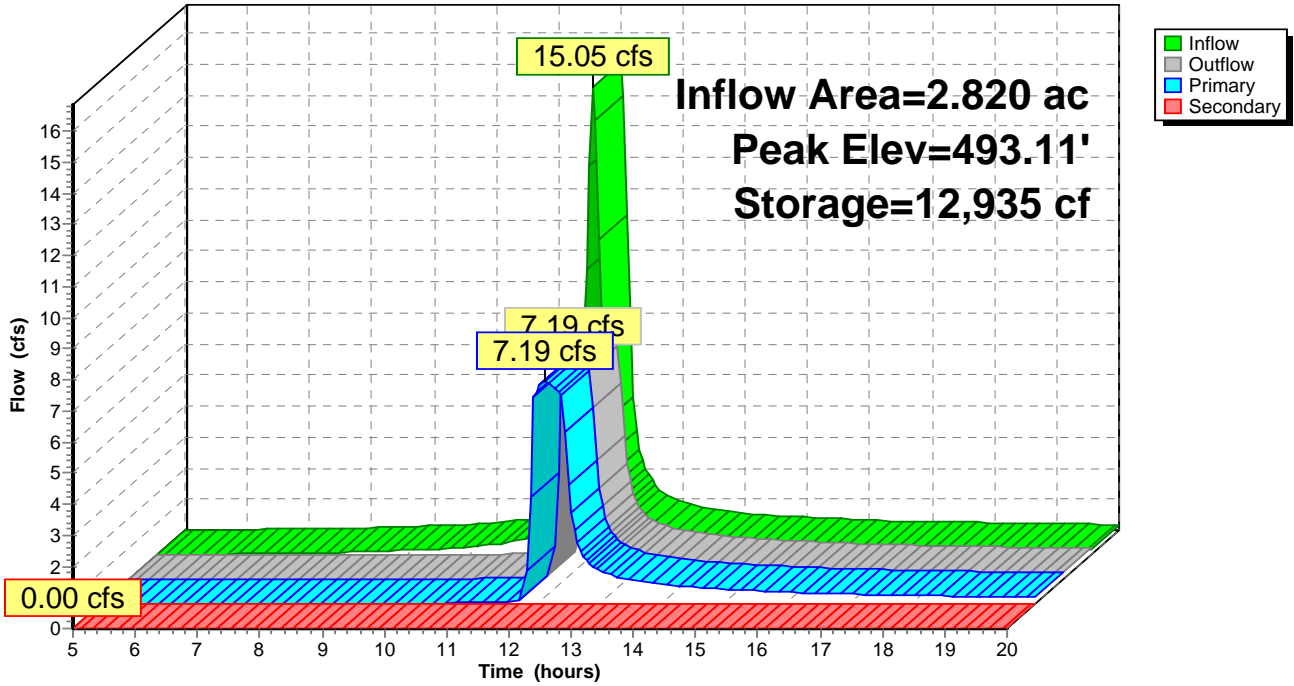
Type II 24-hr 10-Yr Rainfall=5.17"

Printed 9/8/2013

Page 15

Pond 3P: BMP #16

Hydrograph



BMP #16.Gareth

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 100-Yr Rainfall=7.62"

Printed 9/8/2013

Page 17

Summary for Subcatchment 1S: Pre-Development

Runoff = 14.99 cfs @ 12.07 hrs, Volume= 0.896 af, Depth> 3.81"

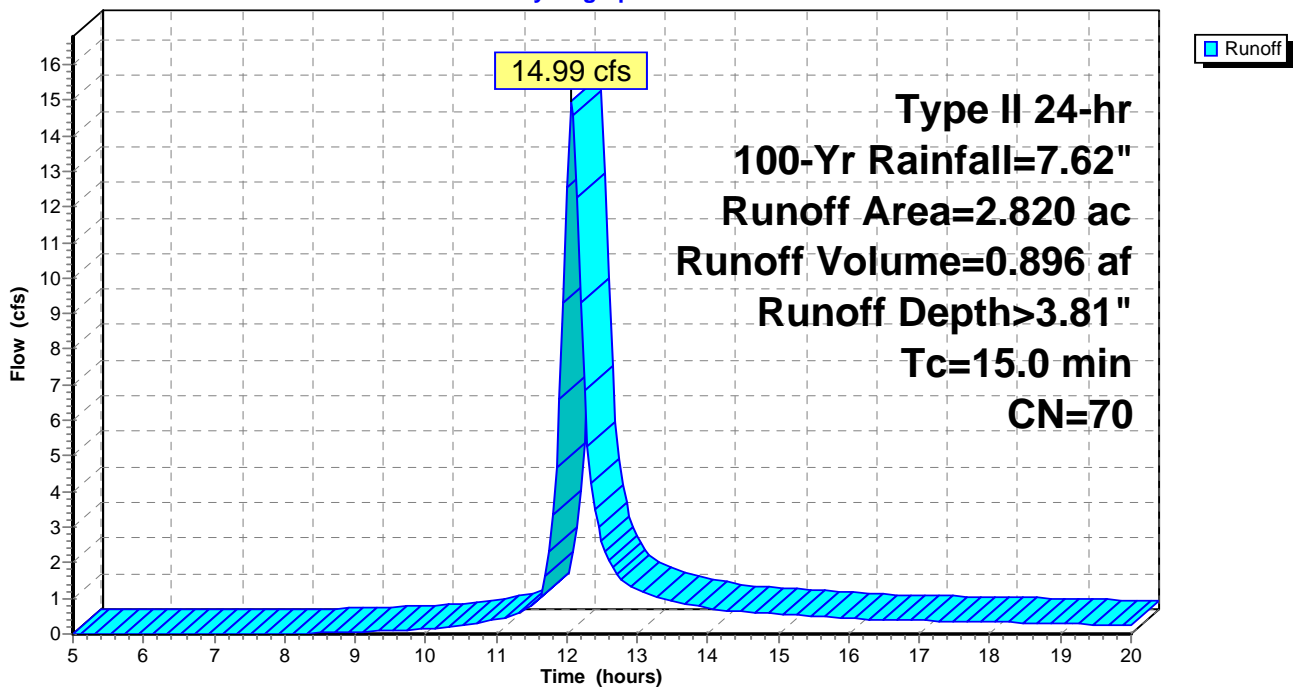
Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-Yr Rainfall=7.62"

Area (ac)	CN	Description
2.820	70	Woods, Good, HSG C
2.820		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0					Direct Entry,

Subcatchment 1S: Pre-Development

Hydrograph



BMP #16.Gareth

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

Type II 24-hr 100-Yr Rainfall=7.62"

Printed 9/8/2013

Page 19

Summary for Pond 3P: BMP #16

[82] Warning: Early inflow requires earlier time span

Inflow Area = 2.820 ac, 49.65% Impervious, Inflow Depth > 5.59" for 100-Yr event
 Inflow = 24.11 cfs @ 12.01 hrs, Volume= 1.313 af
 Outflow = 16.71 cfs @ 12.10 hrs, Volume= 1.172 af, Atten= 31%, Lag= 5.6 min
 Primary = 7.78 cfs @ 12.10 hrs, Volume= 1.040 af
 Secondary = 8.93 cfs @ 12.10 hrs, Volume= 0.133 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 493.73' @ 12.10 hrs Surf.Area= 8,271 sf Storage= 17,793 cf

Plug-Flow detention time= 73.2 min calculated for 1.172 af (89% of inflow)
 Center-of-Mass det. time= 36.9 min (792.9 - 756.0)

Volume	Invert	Avail.Storage	Storage Description
#1	491.00'	29,289 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
491.00	4,139	0	0
492.00	6,302	5,221	5,221
493.00	7,418	6,860	12,081
494.00	8,590	8,004	20,085
495.00	9,819	9,205	29,289

Device	Routing	Invert	Outlet Devices
#1	Primary	489.00'	12.0" Round Culvert L= 40.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 489.00' / 488.50' S= 0.0125 '/ Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 0.79 sf
#2	Device 1	491.00'	1.3" Vert. Orifice/Grate C= 0.600
#3	Device 1	492.00'	18.0" W x 3.0" H Vert. Orifice/Grate C= 0.600
#4	Device 1	492.25'	24.0" x 24.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#5	Secondary	493.25'	10.0' long x 15.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.77 cfs @ 12.10 hrs HW=493.72' (Free Discharge)

- ↑ 1=Culvert (Inlet Controls 7.77 cfs @ 9.90 fps)
- ↑ 2=Orifice/Grate (Passes < 0.07 cfs potential flow)
- ↑ 3=Orifice/Grate (Passes < 2.28 cfs potential flow)
- ↑ 4=Orifice/Grate (Passes < 23.38 cfs potential flow)

Secondary OutFlow Max=8.82 cfs @ 12.10 hrs HW=493.72' (Free Discharge)

- ↑ 5=Broad-Crested Rectangular Weir (Weir Controls 8.82 cfs @ 1.86 fps)

BMP #16.Gareth

Prepared by McKim & Creed

HydroCAD® 10.00 s/n 04927 © 2011 HydroCAD Software Solutions LLC

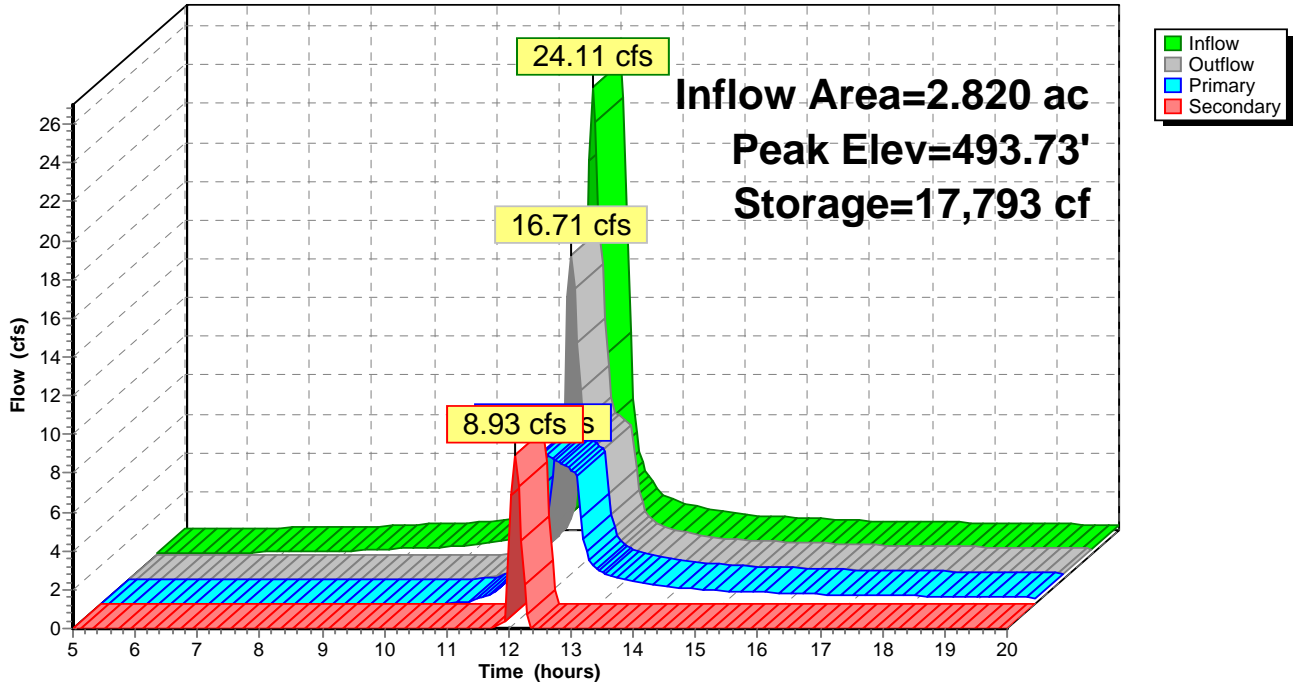
Type II 24-hr 100-Yr Rainfall=7.62"

Printed 9/8/2013

Page 20

Pond 3P: BMP #16

Hydrograph



BMP SIZING - SIMPLE METHOD

Briar Chapel Phase 9

BMP #16

Stormwater Wetland

Project: 02735-0096

Prepared by: GCA

Date: 8/19/2013

Drainage area: 122,794 sf

Impervious area: 61,033 sf

Volume to Catch The First 1.0 Inches of Runoff:

Runoff : $R_v = 0.05 + 0.9 * I_a$ Simple Method, Schueler

I_a (ac/ac)= 0.497

$R_v = 0.497$

Volume: $V = 3630 * P * R_v * A$

$P = 1.00$ in

$R_v = 0.497$

$A = 2.82$ ac

$V = 5,089$ cf

Surface Area: SA = Volume / Depth

Depth = 12 in

SA = 5,089 sf

STORMWATER WETLAND #16 CALCULATIONS

Project Name

Briar Chapel Phase 9

Project Number

2735-0096

Date

August 19, 2013

3rd revision

2nd revision

1st revision

Water Quality Pond Drainage Area Data

Project Briar Chapel Phase 9

Project No. 2735-0096

Date August 19, 2013

Total site area 122,794 square feet = 2.82 acres

	Drainage area to pond			Other Drainage Area	
	Existing [sf]	Proposed [sf]	Change [sf]	Existing [sf]	Proposed [sf]
Impervious areas					
On-site buildings (lots)	0	33,400	33,400	0	0
On-site streets	0	20,672	20,672	0	0
On-site sidewalks	0	6,961	6,961	0	0
On-site future (open space)	0	0	0	0	0
Off-site buildings	0	0	0	0	0
Off-site streets	0	0	0	0	0
Off-site sidewalks	0	0	0	0	0
Total Impervious	0	61,033	61,033	0	0

	Drainage area to pond			Other Drainage Area	
	Existing [sf]	Proposed [sf]	Change [sf]	Existing [sf]	Proposed [sf]
Non-impervious areas					
On-site grass/landscape	0	785,984	785,984	0	0
On-site woods	1,639,768	30,917	-1,608,851	0	0
Other undeveloped	0	0	0	0	0
Total off-site non-impervious	0	0	0	0	0
Total non-impervious	1,639,768	816,901	-822,867	0	0

Total Drainage Area	122,794	122,794	0	3,167,850	3,167,850
Percent Impervious	0.0	49.7	49.7	0.0	0.0

Notes:

Stormwater Wetland Volume Calculations
Stage-Storage Data for Wetland - Temporary Pool

Project Briar Chapel Phase 9

Project No. 2735-0096

Date August 19, 2013

Contour ID	Stage	Area [sq. ft.]	Area [acres]	Incremental Area [sq. ft.]	Incremental Area [acres]	Incremental volume [cu. ft]	Incremental volume [acre-ft]	Cumulative volume [cu. ft]	Cumulative volume [acre-ft]
491	0	4,139.0	0.095	4,139.0	0.1	0.0	0.0	0.0	0.0
492	1	6,302.0	0.145	2,163.0	0.0	5,220.5	0.1	5,220.5	0.1
493	2	7,418.0	0.170	1,116.0	0.0	6,860.0	0.2	12,080.5	0.3
494	3	8,590.0	0.197	1,172.0	0.0	8,004.0	0.2	20,084.5	0.3
495	4	9,819.0	0.225	1,229.0	0.0	9,204.5	0.2	29,289.0	0.4

Water Quality Basin Dewatering Time Calculations

Project Briar Chapel Phase 9
 Project No. 2735-0096

Date August 19, 2013

Water quality treatment volume	<u>5,089</u>	square feet
Total treatment volume	<u>5,221</u>	square feet
Maximum head of water above dewatering hole	<u>1.00</u>	feet
Driving head	<u>0.33</u>	feet
Orifice coefficient	<u>0.60</u>	
Diameter of each hole	<u>1.33</u>	inches
Number of holes	<u>1</u>	
Cross sectional area of each hole =	<u>0.010</u>	square feet
Cross sectional area of each hole =	<u>1.4</u>	square inches
Cross sectional area of dewatering hole(s) =	<u>0.010</u>	square feet
Cross sectional area of dewatering hole(s) =	<u>1.4</u>	square inches
Dewatering time for water quality volume =	<u>2.2</u>	days
Dewatering time for total volume =	<u>2.3</u>	days

Notes:

Dewatering time formula: $t \text{ (days)} = V / (Cd * A * \text{Sqrt} (2 * 32.2 * H) * 86,400)$

- t = drawdown time
- V = treatment volume
- Cd = orifice coefficient
- A = cross sectional area of orifice
- H = driving head (1/3 max. head)

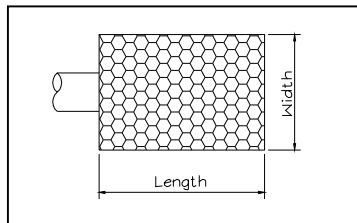
OUTLET PROTECTION DESIGN	DATE: 9/3/2013	DESIGNED BY: DJB
PROJECT NAME: Briar Chapel - BC South PROJECT LOCATION: Chatham County, NC	PROJECT NO: 02735-0096	CHECKED BY GCA

Storm Outlet Structure

Structure= **BMP #16 Out**
 Size= 12 in
 Q₁₀ = 7.19 cfs
 Q_{full} = 3.98 cfs
 V_{full} = 5.06 fps

Q₁₀/Q_{full} = 1.81
 V/V_{full} = MAX
 V = #VALUE! fps

From Fig. 8.06.b.1:



Zone = **5**

D₅₀ = 14 in
 D_{MAX} = 21 in
 Riprap Class = 2
 Apron Thickness = 36 in
 Apron Length = 10.0 ft
 Apron Width = 3 x Dia = 3.0 ft

III. REQUIRED ITEMS CHECKLIST

Please indicate the page or plan sheet numbers where the supporting documentation can be found. **An incomplete submittal package will result in a request for additional information. This will delay final review and approval of the project.** Initial in the space provided to indicate the following design requirements have been met. If the applicant has designated an agent, the agent may initial below. **If a requirement has not been met, attach justification.**

Initials	Page/ Plan Sheet No.	
GCA	D4.7-D4.8	1. Plans (1" = 50' or larger) of the entire site showing: <ul style="list-style-type: none"> - Design at ultimate build-out, - Off-site drainage (if applicable), - Delineated drainage basins (include Rational C coefficient per basin), - Wetland dimensions (and length to width ratio), - Pretreatment system, - Maintenance access, - Proposed drainage easement and public right of way (ROW), - Overflow device, and - Boundaries of drainage easement.
GCA	D4.7-D4.8	2. Plan details (1" = 50' or larger) for the wetland showing: <ul style="list-style-type: none"> - Wetland dimensions (and length to width ratio) - Pretreatment system, - Maintenance access, - Proposed drainage easement and public right of way (ROW), - Design at ultimate build-out, - Off-site drainage (if applicable), - Overflow device, and - Boundaries of drainage easement.
GCA	D4.7	3. Section view of the wetland (1" = 20' or larger) showing: <ul style="list-style-type: none"> - Side slopes, 3:1 or lower - Wetland layers <ul style="list-style-type: none"> All wetlands: Shallow land depth, shallow water depth, deep pool depth Option 1, no clay liner: SLWT depth Option 2, clay liner: Depth of topsoil on top of liner, liner specifications
GCA	D4.7	4. A detailed planting plan (1" = 20' or larger) prepared by a qualified individual showing: <ul style="list-style-type: none"> - A variety of several suitable species (not including cattails), - Sizes, spacing and locations of plantings, - Total quantity of each type of plant specified, - A planting detail, - The source nursery for the plants, and - Fertilizer and watering requirements to establish vegetation.
GCA	C3.1	5. A construction sequence that shows how the wetland will be protected from sediment until the entire drainage area is stabilized.
GCA	Calc Book	6. The supporting calculations (including drawdown calculations).
GCA	Included	7. A copy of the signed and notarized operation and maintenance (O&M) agreement.
GCA	N/A	8. A copy of the deed restrictions (if required).
GCA	N/A	9. A soils report that is based upon an actual field investigation and soil borings. County soil maps are not an acceptable source of soils information.



STORMWATER MANAGEMENT PERMIT APPLICATION FORM
401 CERTIFICATION APPLICATION FORM

WETLAND SUPPLEMENT

This form must be filled out, printed and submitted.

The Required Items Checklist (Part III) must be printed, filled out and submitted along with all the required information.

I. PROJECT INFORMATION

Project name	Briar Chapel Development - Phase 9
Contact name	Gareth Avant, PE
Phone number	9193233.809
Date	September 8, 2013
Drainage area number	3 - BMP #16

II. DESIGN INFORMATION

Site Characteristics		
Drainage area	122,794.00 ft ²	
Impervious area	61,033.00 ft ²	
Percent impervious	49.7% %	
Design rainfall depth	1.00 inch	
Peak Flow Calculations		
1-yr, 24-hr rainfall depth	3.00 in	
1-yr, 24-hr intensity	0.12 in/hr	
Pre-development 1-yr, 24-hr runoff	2.23 ft ³ /sec	
Post-development 1-yr, 24-hr runoff	6.94 ft ³ /sec	
Pre/Post 1-yr, 24-hr peak control	4.71 ft ³ /sec	
Storage Volume: Non-SA Waters		
Minimum required volume	5,089.00 ft ³	
Volume provided (temporary pool volume)	5,221.00 ft ³	OK
Storage Volume: SA Waters Parameters		
1.5" runoff volume	ft ³	
Pre-development 1-yr, 24-hr runoff volume	ft ³	
Post-development 1-yr, 24-hr runoff volume	ft ³	
Minimum volume required	ft ³	
Volume provided	ft ³	
Outlet Design		
Depth of temporary pool/ponding depth (D _{Plants})	12.00 in	OK
Drawdown time	2.20 days	OK
Diameter of orifice	1.33 in	OK
Coefficient of discharge (C _D) used in orifice diameter calculation	0.60 (unitless)	
Driving head (H ₀) used in the orifice diameter calculation	0.33 ft	Provide calculations to support this driving head.

Surface Areas of Wetland Zones

Surface Area of Entire Wetland	6,301.00 ft ²	OK
Shallow Land	2,215.00 ft ²	OK
The shallow land percentage is:	35% %	
Shallow Water	2,602.00 ft ²	OK
The shallow water percentage is:	41% %	
Deep Pool		
Forebay portion of deep pool (pretreatment)	648.00 ft ²	OK
The forebay surface area percentage is:	10% %	
Non-forebay portion of deep pool	836.00 ft ²	OK
The non-forebay deep pool surface area percentage is:	13% %	
Total of wetland zone areas	6,301.00 ft ²	OK
Add or subtract the following area from the zones	0.00 ft ²	

Topographic Zone Elevations

Temporary Pool Elevation (TPE)		
Shallow Land (top)	492.00 ft amsl	
Permanent Pool Elevation (PPE)		
Shallow Water/Deep Pool (top)	491.00 ft amsl	
Shallow Water bottom	490.50 ft amsl	
Most shallow point of deep pool's bottom	489.50 ft amsl	
Deepest point of deep pool's bottom	489.00 ft amsl	
Design must meet one of the following two options:		
This design meets Option #1,		
Top of PPE is within 6" of SHWT, If yes:	(Y or N)	
SHWT (Seasonally High Water Table)	ft amsl	OK
This design meets Option #2,		
Wetland has liner with permeability < 0.01 in/hr, If yes:	Y (Y or N)	
Depth of topsoil above impermeable liner	4.00 in	OK

Topographic Zone Depths

Temporary Pool		
Shallow Land	12.00 in	OK
Permanent Pool		
Shallow Water	6.00 in	OK
Deep Pool (shallowest)	18.00 in	OK
Deep Pool (deepest)	24.00 in	OK

Planting Plan

Are cattails included in the planting plan?	N	(Y or N)	OK
<u>Number of Plants recommended in Shallow Water Area:</u>			
Herbaceous (4+ cubic-inch container)	700		
<u>Number of Plants recommended in Shallow Land Area:</u>			
Herbaceous (4+ cubic-inch container), OR	600		
Shrubs (1 gallon or larger), OR	96		
Trees (3 gallon or larger) and Herbaceous (4+ cubic-inch)	12	and	480
<u>Number of Plants provided in Shallow Water Area:</u>			
Herbaceous (4+ cubic-inch container)	700		OK
<u>Number of Plants provided in Shallow Land Area:</u>			
Herbaceous (4+ cubic-inch container)	600		OK
Shrubs (1 gallon or larger)			
Trees (3 gallon or larger) and			
Grass-like Herbaceous (4+ cubic-inch)			

Additional Information

Can the design volume be contained?	Y	(Y or N)	OK
Does project drain to SA waters? If yes, What is the length of the vegetated filter?	N	(Y or N)	Excess volume must pass through filter.
	N/A	ft	
Are calculations for supporting the design volume provided in the application?	Y	(Y or N)	OK
Is BMP sized to handle all runoff from ultimate build-out?	Y	(Y or N)	OK
Is the BMP located in a recorded drainage easement with a recorded access easement to a public Right of Way (ROW)?	Y	(Y or N)	OK
The length to width ratio is:	2.85	:1	OK
Approximate wetland length	137.00	ft	
Approximate wetland width	48.00	ft	
Approximate surface area using length and width provided	6,576.00	ft ²	This approx. surface area is within this number of square feet of the entire wetland surface area reported above:
Will the wetland be stabilized within 14 days of construction?	Y	(Y or N)	OK

Permit Number: _____
(to be provided by DWQ)

Drainage Area Number: _____

Stormwater Wetland Operation and Maintenance Agreement

I will keep a maintenance record on this BMP. This maintenance record will be kept in a log in a known set location. Any deficient BMP elements noted in the inspection will be corrected, repaired or replaced immediately. These deficiencies can affect the integrity of structures, safety of the public, and the removal efficiency of the BMP.

Important maintenance procedures:

- Immediately following construction of the stormwater wetland, bi-weekly inspections will be conducted and wetland plants will be watered bi-weekly until vegetation becomes established (commonly six weeks).
- No portion of the stormwater wetland will be fertilized after the first initial fertilization that is required to establish the wetland plants.
- Stable groundcover will be maintained in the drainage area to reduce the sediment load to the wetland.
- Once a year, a dam safety expert should inspect the embankment.

After the stormwater wetland is established, I will inspect it **monthly and within 24 hours after every storm event greater than 1.0 inches (or 1.5 inches if in a Coastal County)**. Records of operation and maintenance will be kept in a known set location and will be available upon request.

Inspection activities shall be performed as follows. Any problems that are found shall be repaired immediately.

BMP element:	Potential problem:	How I will remediate the problem:
Entire BMP	Trash/debris is present.	Remove the trash/debris.
Perimeter of wetland	Areas of bare soil and/or erosive gullies have formed.	Regrade the soil if necessary to remove the gully, and then plant a ground cover and water until it is established. Provide lime and a one-time fertilizer application.
	Vegetation is too short or too long.	Maintain vegetation at an appropriate height.
Inlet device: pipe or swale	The pipe is clogged (if applicable).	Unclog the pipe. Dispose of the sediment offsite.
	The pipe is cracked or otherwise damaged (if applicable).	Replace the pipe.
	Erosion is occurring in the swale (if applicable).	Regrade the swale if necessary to smooth it over and provide erosion control devices such as reinforced turf matting or riprap to avoid future problems with erosion.

BMP element:	Potential problem:	How I will remediate the problem:
Forebay	Sediment has accumulated in the forebay to a depth that inhibits the forebay from functioning well.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
	Erosion has occurred.	Provide additional erosion protection such as reinforced turf matting or riprap if needed to prevent future erosion problems.
	Weeds are present.	Remove the weeds, preferably by hand. If a pesticide is used, wipe it on the plants rather than spraying.
Deep pool, shallow water and shallow land areas	Algal growth covers over 50% of the deep pool and shallow water areas.	Consult a professional to remove and control the algal growth.
	Cattails, phragmites or other invasive plants cover 50% of the deep pool and shallow water areas.	Remove invasives by physical removal or by wiping them with pesticide (do not spray) – consult a professional.
	Shallow land remains flooded more than 5 days after a storm event.	Unclog the outlet device immediately.
	Plants are dead, diseased or dying.	Determine the source of the problem: soils, hydrology, disease, etc. Remedy the problem and replace plants. Provide a one-time fertilizer application to establish the ground cover if necessary.
	Best professional practices show that pruning is needed to maintain optimal plant health.	Prune according to best professional practices.
	Sediment has accumulated and reduced the depth to 75% of the original design depth of the deep pools.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
Embankment	A tree has started to grow on the embankment.	Consult a dam safety specialist to remove the tree.
	An annual inspection by appropriate professional shows that the embankment needs repair.	Make all needed repairs.
	Evidence of muskrat or beaver activity is present.	Consult a professional to remove muskrats or beavers.
Micropool	Sediment has accumulated and reduced the depth to 75% of the original design depth.	Search for the source of the sediment and remedy the problem if possible. Remove the sediment and dispose of it in a location where it will not cause impacts to streams or the BMP.
Outlet device	Clogging has occurred.	Clean out the outlet device. Dispose of the sediment off-site.
	The outlet device is damaged	Repair or replace the outlet device.
Receiving water	Erosion or other signs of damage have occurred at the outlet.	Contact the NC Division of Water Quality 401 Oversight Unit at 919-733-1786.

Permit Number: _____
(to be provided by DWQ)

I acknowledge and agree by my signature below that I am responsible for the performance of the maintenance procedures listed above. I agree to notify DWQ of any problems with the system or prior to any changes to the system or responsible party.

Project name: Briar Chapel - Phase 9

BMP drainage area number: 3 - Stormwater Wetland #16

Print name: Kevin Graham

Title: Vice President, Operations

Address: 16 Windy Knoll Circle, Chapel Hill, NC 27516

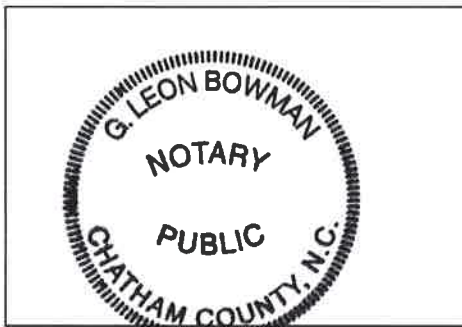
Phone: (919) 951-0709

Signature: *Kevin Graham*

Date: 8/29/13

Note: The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.

I, G. Leon Bowman, a Notary Public for the State of NC, County of Chatham, do hereby certify that Kevin Graham personally appeared before me this 29th day of August, 2013, and acknowledge the due execution of the forgoing stormwater wetland maintenance requirements. Witness my hand and official seal,



SEAL

My commission expires 9/10/14



North Carolina Department of Environment and Natural Resources

Division of Water Resources
Water Quality Programs
Thomas A. Reeder
Director

Pat McCrory
Governor

John E. Skvarla, III
Secretary

October 21, 2013

DWR Project # 05-0732v28
Chatham County

Mr. Bill Mumford, Assistant Vice President
NNP – Briar Chapel LLC
16 Windy Knoll Circle
Chapel Hill, NC 27516

Subject Property: **Briar Chapel, Phase 9**

APPROVAL OF STORMWATER PLAN

Dear Mr. Mumford:

On January 11, 2008, the Division of Water Resources (DWR) issued a revised 401 Water Quality Certification to temporarily impact 339 linear feet of stream and 0.157 acre of 404 wetlands and to permanently impact 1,666 linear feet of stream and 0.159 acre of 404 wetland in order to construct the Briar Chapel Subdivision in Chatham County.

In order to meet Condition 10 of the 401 Certification for this project, a stormwater management plan (SMP) for Phase 9 of Briar Chapel, dated September 3, 2013, was received on September 10, 2013.

This approval is for the purpose and design that you described in your application. If you change your project, you must notify us and you may be required to send us a new SMP. This approval requires to you follow the conditions listed in the General Water Quality Certification for the project and the following additional conditions listed below:

1. The SMP approved by the DWR consists of a wet detention pond #14, a wet detention pond #15, a stormwater wetland #16 and all associated stormwater conveyances, inlet and outlet structures, and the grading and drainage patterns depicted on plan sheets dated September 3, 2013. The plans and specifications for Phase 9 approved by DWR are incorporated by reference into this approval and are enforceable by DWR provided however that any modification of the design for the stormwater management system that is accepted by DWR shall take precedence over the original plans and specifications.
2. The maximum allowable drainage and maximum impervious areas to the wet detention pond #14 (Phase 9), the wet detention pond #15, and the stormwater wetland #16 shall be those provided in the "401 Narrative & Supporting Calculations – Briar Chapel Development

Any changes to these maximum areas shall require the applicant to submit and receive approval for a revised stormwater management plan by the DWR.

3. The footprint of all stormwater management devices as well as an additional 10-foot wide area on all sides of the devices shall be located in public rights-of-way, dedicated common areas or recorded easement areas. The final plats for the project showing all such rights-of-way, common areas and easement areas shall be in accordance with the approved plans.
4. Maintenance activities for the three stormwater management devices shall be performed in accordance with the notarized O&M agreements signed by Kevin Graham (Vice President, Operations) on August 29, 2013. The O&M agreements must transfer with the sale of the land or transfer of ownership/responsibility for the BMP facility. DWR must be notified promptly of every transfer.
5. The applicant and/or authorized agent shall provide a completed Certificate of Completion form to the DWR within thirty (30) days of project completion (available at <http://portal.ncdenr.org/web/wq/swp/ws/401/certs> and permits/apply/forms).

Thank you for your attention to this matter. If you have any questions or wish to discuss these matters further, please do not hesitate to contact Boyd Devane at (919) 807-6373.

Sincerely,



Karen Higgins, Supervisor
401 and Buffer Permitting Unit

Cc: USACE, Raleigh
Cherri Smith, DWQ Raleigh Regional Office
Chatham County Public Works Dept., P.O. Box 1550, Pittsboro, NC 27312
File Copy