



June 29, 2011

Mr. Andrew Williams
Regulatory Project Manager
U.S. Army Corps of Engineers
Wilmington District, Raleigh Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587

Reference: Response to May 31, 2011 UNC North Comments Received
SAW-2010-01840
Individual Permit Application for Carolina North Project
The University of North Carolina at Chapel Hill
Orange County
North Carolina

Dear Mr. Williams:

On May 31, 2011, the United States Army Corp of Engineers (USACE) provided the University of North Carolina at Chapel Hill (UNC-CH or University) the public comments resulting from the USACE Public Comment period (April 8 through May 9, 2011) for the UNC-CH Carolina North Individual Permit Application. Below are the comments in italics followed by the University's responses to those comments.

1. *Simonsen Comment re: Stormwater and Flooding Issues: Mr. Simonsen stated "I don't know if you can do anything about the situation at the southern end of the Airport property. My wife and I own KALAMANI and the property at 216 Barclay Rd. The university and the town of Chapel Hill appear to drain a lot of water down toward our property so as to completely flood the property at times."*

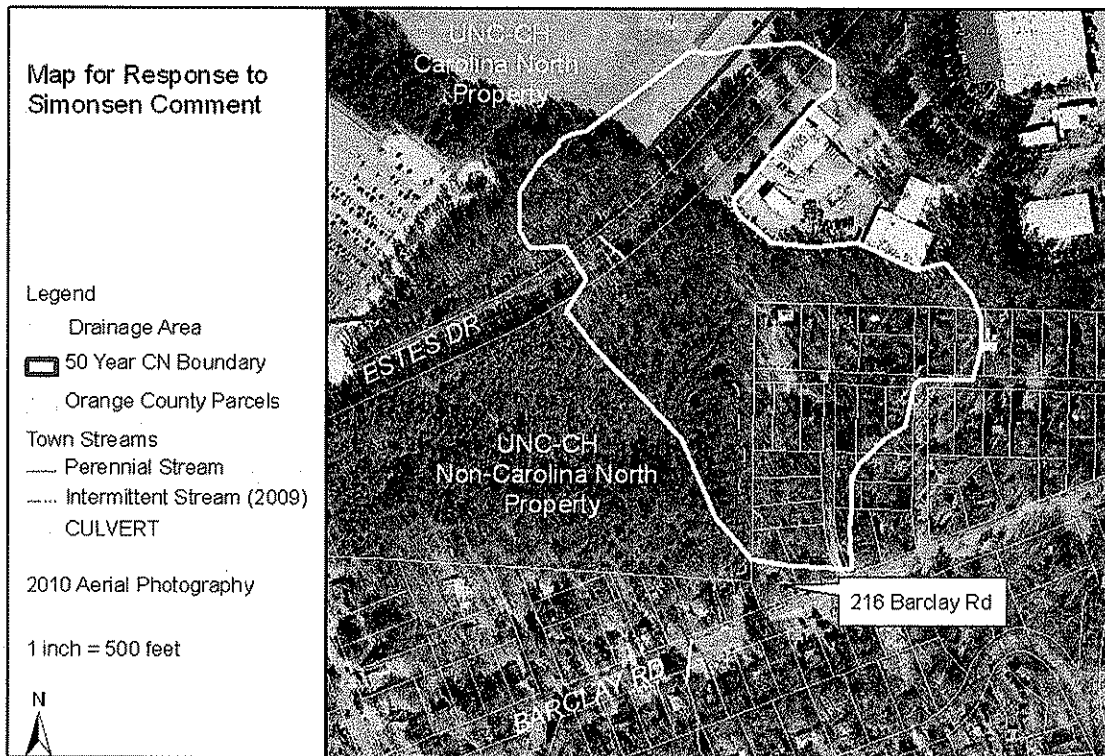
UNC Response to Simonsen Comment: Mr. Simonsen's property is located at a low point where stormwater run-off forms a stream that has been identified and mapped by the Town of Chapel Hill (TOCH) Stormwater Management Division as an intermittent stream. The Carolina North (CN) development will not increase the run-off to Mr. Simonsen's property.

Where the intermittent stream formed by stormwater run-off crosses the property, the stream's drainage area is approximately 20 acres and is composed of: forested University property south of Estes Drive that is not part of the Carolina North (CN) Project (40%); residential area and residential streets (30%); CN property (20%); and Estes Drive North Carolina Department of Transportation (NCDOT) right-of-way (10%).

As part of the CN Development Agreement (DA), the University is required to meet stormwater management criteria that address the volume and peak flow of runoff

from each point where stormwater runoff leaves the CN property. These criteria prevent additional runoff from impacting downstream properties. For each Site Development Permit (SDP) at CN, the TOCH Stormwater Management Division will review the University's stormwater plans and calculations for compliance with the stormwater management criteria.

We have also referred Mr. Simonsen's comments to the TOCH's Stormwater Management Division.



2. ***North Carolina Wildlife Resource Commission (NCWRC) provided seven (7) recommendations regarding further efforts at avoidance and minimization to terrestrial and aquatic resource impacts that should be addressed.***

NCWRC Recommendation 1: "Maintain a 100-foot undisturbed, native, forested buffer along perennial stream, and along intermittent streams and wetlands. Maintaining undisturbed, forested buffers along these areas will minimize impacts to aquatic and terrestrial wildlife resources, water quality, and aquatic habitat both within and downstream of the project area. In addition, wide riparian buffers are helpful in maintaining the stability of stream banks and for treatment of pollutants associated with stormwater runoff. Whereas, a grassed buffer, particularly fescue, is a vegetated buffer but will not provide the necessary and highly valuable functions as discussed for forested buffers."

UNC Response: The University recognizes the value of undisturbed, forested buffer along streams and wetlands and has planned the CN site to minimize disturbance of streams, wetlands and buffers. Also, buffers on the site are protected as follows:

CN is located in the Jordan Lake watershed, and, as a State property, it has been subject to the Jordan Water Supply Nutrient Strategy rule 15A North Carolina Administrative Code (NCAC) 02B .0267 “Protection of Existing Riparian Buffers” (Jordan Buffer Rule) since August of 2009. The Jordan Buffer Rule requires a 50 foot buffer on perennial and intermittent streams and specifies the allowable vegetation management in Zone 1 (0-30 feet) and Zone 2 (30-50 feet). Per the Jordan Buffer Rule, forest vegetation must be protected and maintained in Zone 1. More details on the Jordan Buffer Rule can be found here:

<http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environment%20and%20natural%20resources/chapter%2002%20-%20environmental%20management/subchapter%20b/15a%20ncac%2002b%20.0267.pdf>

As part of the CN DA, the University agreed that development at CN would be consistent with the TOCH Resource Conservation District (RCD) regulations in effect as of the date of the DA. The RCD regulations are the TOCH’s buffer controls and are detailed in the TOCH Land Use Management Ordinance (LUMO). For intermittent streams and perennial water bodies, the RCD extends 50 feet from the stream bank. For perennial streams, the RCD extends 150 feet from the stream bank or to an elevation 3 feet above the 100-year floodplain, whichever is greater. Uses within the first 50 feet of buffer are most limited, protecting existing vegetation. Table 3.6.3-2 of the LUMO describes the permitted uses within each zone of the RCD and can be found here:

http://library.municode.com/HTML/19952/level3/CO_APXALOUSMA_ART3ZODIUSDIST.html#CO_APXALOUSMA_ART3ZODIUSDIST_3.6OVDI

NCWRC Recommendation 2: *“Protect all remaining wetlands and streams on the site by placing them in a permanent conservation easement to prohibit filling, draining, flooding, and excavation.”*

UNC Response: According to the terms of the DA and subject to any required State of North Carolina approvals, the University will place approximately 311 acres of CN property, which includes many streams and wetlands, into permanent conservation protection.

NCWRC Recommendation 3: *“Culverts should be designed to allow passage of aquatic life.”*

UNC Response: New culverts at CN will be designed to allow passage of aquatic life per the culvert burial requirements from the USACE. These culvert burial requirements were stated in a January 18, 2011 letter from Mr. Andrew Williams of the USACE as follows, “For all box culverts and for pipes greater than 48 inches in

diameter, the bottom of the pipe must be buried at least one foot below the bed of the stream unless burial would be impractical and the Corps of Engineers has waived this requirement. For culverts 48 inches in diameter or smaller, the bottom of the pipe must be buried below the bed of the stream to a depth equal to or greater than 20 percent of the diameter of the culvert.”

As stated in the University’s response to Mr. Williams, dated February 16, 2011, the culvert burial requirements described above will be met for the one proposed new culvert that will convey Stream 14A under the proposed railroad spur (see Figure C-6 in the Individual Permit (IP) application). At all of the proposed culvert extensions, the requirements will be met when possible and practicable. All of the proposed culvert extensions occur on the upstream sides of existing NCDOT culverts. If the existing culvert meets the pipe burial requirements described above, the proposed upstream culvert extension will meet these requirements as well.

In cases where the existing culvert invert, or bottom of culvert, was placed at the existing channel bottom on the upstream end, meeting the culvert burial requirement will not be practicable and the inverts of the proposed culvert sections will need to match the existing upstream inverts. Since the streams are low gradient, it is unlikely that the requirement for burying could be met by installing the upstream culvert extension at a low slope. Replacing the entire pipe is beyond the scope of the University project and is not considered a practicable alternative for these existing NCDOT culverts. Though not meeting the requirements for burying the invert, the proposed upstream extensions to existing NCDOT culverts will continue to pass low stream flows, will not restrict the movement of fish and other aquatic life more than the current conditions.

NCWRC Recommendation 4: “Locate sewers and other utilities as far away from streams as functionally possible and minimize stream crossings. It is preferable that sewers be located outside the riparian buffers as detailed in #1.”

UNC Response: The University has located any proposed new sewers and other utilities as far away from streams as functionally possible and has minimized stream crossings. The only utility impacts to the 50 foot Jordan Buffer are at perpendicular crossings.

Stream and buffer impacts due to sanitary sewer scalping force mains and an electric duct bank are shown in Figures C-9, C-10, and C-14 of the IP application. These impacts have been minimized by using perpendicular crossings, by calling for the grades to be returned to original elevations after installation, and by siting adjacent to existing impacts from road crossings. Other utilities have been located outside of the 50 foot Jordan Buffers.

There is one location where a proposed utility is planned parallel to a stream, and is within 100 feet of the stream, though outside of the 50 foot Jordan buffer. A gravity

sanitary sewer and a sanitary sewer scalping force main are planned parallel to Stream 2.

NCWRC Recommendation 5: “For greenways, porous pavement materials are preferred over asphalt. Porous pavement facilitates infiltration of stormwater as opposed to the direct runoff produced from asphalt.”

UNC Response: The University has evaluated permeable pavement as a possible surface material and stormwater best management practice (BMP) for greenways. The analysis concluded that permeable pavement is not the most suitable technique for addressing runoff from a greenway at the CN site due to the low infiltration capacity of the underlying soils and the difficulty of preventing the permeable pavement from clogging.

This conclusion is consistent with the permeable pavement siting considerations contained within Chapter 18 of the *North Carolina Department of Environment and Natural Resources (NCDENR) Stormwater BMP Manual*, located at the following link: http://ncdenr.gov/c/document_library/get_file?uuid=c2917ea9-e620-48e6-beec-a6fafc4be47d&groupId=38364

NCWRC Recommendation 6: “Use landscaping that consists of non-invasive native species. Using native species instead of ornamentals should provide benefits by reducing the need for water, fertilizers, and pesticides.”

UNC Response: Native plantings will dominate the CN landscape. The University recognizes the benefits of reducing the use of water, fertilizers, and pesticides, and the use of native plants supports a University goal of connecting the existing native forest into and through the developed portion of the campus. One example of proposed native planting is the proposed stormwater wetland. This is a constructed system within the developed area that mimics the function of a natural wetland. It serves multiple purposes including educational/research opportunities, enhanced habitat, and stormwater treatment. Due to programmatic and aesthetic requirements in some of the developed area, open spaces may also include non-native plantings such as lawn, and other non-invasives.

NCWRC Recommendation 7: “Sediment and erosion control measures should be installed prior to any land clearing or construction. These measures should be routinely inspected and properly maintained. Excessive silt and sediment loads can have numerous detrimental effects on aquatic resources including destruction of spawning habitat, suffocation of eggs, and clogging of gills of aquatic species.”

UNC Response: The project will obtain an Erosion and Sedimentation Control permit from the NCDENR Land Quality Section. The project will install, inspect and maintain appropriate best management practices to protect aquatic resources and comply with permit conditions.

3. **Ms. Julie McClintock, representing the Non-Governmental Organization, Friends of Bolin Creek, provided comments via electronic mail dated May 9, 2011. Specific issues mentioned in this correspondence are as follows:**

Friends of Bolin Creek/McClintock Comment 1: *The letter from Mr. Andrew Williams, USACE Regulatory Project Manager, dated Tuesday, May 31, 2011 summarized the first comment requiring response as follows: "The wastewater reuse portion of the project, including impacts associated with the route of the force main and the pump station location."*

The full comment text from the Friends of Bolin Creek is "Waste water reuse project. The project is described in the application as creating unavoidable impacts. A water reuse project, while laudable, is not necessary infrastructure and would come at a high financial cost while causing damage to area creeks. The route of a force main on C-9 would unnecessarily cross and disturb a main section of Bolin Creek. 14 B is an example of a stream that originates north of Bolin Creek, flows through a forested upland area to a culvert under Estes Drive, which would also be impacted by this project. Even if this expensive and voluntary project were to be undertaken, locating the pump station as sited on map C-9 is not the only feasible location."

UNC Response: In this comment the Friends of Bolin Creek and Ms. McClintock express concerns about the stream and wetland impacts and the cost associated with the proposed water reuse project. This response addresses only the stream and wetland impacts. First, the sanitary sewer scalping force main routing and associated stream and wetland impacts are discussed. Second, the pump station location is discussed. Third, the idea of voluntary water reuse is addressed and reclaimed water is compared to other water supply options for CN.

The University studied alternatives for sanitary sewer scalping force main routes for the purposes of minimizing impacts to wetlands and waterways. The feasible alternatives were developed based on projections about non-potable water demand, on-site rainwater and sewage volumes available for non-potable water production and the sewage flows in Orange Water and Sewer Authority (OWASA) sanitary sewers near the site. The selected routes shown in the University's IP application are those that meet the requirements and have the least impacts to streams, wetlands and buffers.

Stream and buffer impacts due to the proposed sanitary sewer scalping force mains are shown in Figures C-9 and C-10 of the USACE IP application. These impacts have been minimized by using perpendicular crossings, by designing for the grades and stream bottoms to be returned to original elevations after installation and by siting the crossings adjacent to existing impacts from road crossings.

Several potential pump station locations were considered for the sanitary sewer scalping force main prior to selecting the site shown in Figure C-9. The site shown in the IP application was chosen because the location: is adjacent to the OWASA Bolin

Creek Interceptor; does not impact perennial, intermittent or ephemeral streams; is outside of the 50 foot Jordan Buffer; is outside of the 100 foot buffer zone of the TOCH RCD; is above of the 100 year Federal Emergency Management Agency (FEMA) floodplain; does not require the extensive grading that would be required at other sites; requires minimal clearing to provide access from a public right-of-way; is not immediately adjacent to residential property; and is owned by OWASA and would therefore not require property acquisition or easements.

The Friends of Bolin Creek and Ms. McClintock refer to the water reuse project as voluntary; however, the University's involvement with reclaimed water is no longer voluntary. The CN DA with the TOCH requires that "A comprehensive, holistic approach shall be employed at the Carolina North Project that includes water reclamation strategies for buildings, landscape, and all other water users on the site" and that "All buildings constructed at the Carolina North Project pursuant to this Agreement shall be designed, constructed, and operated to include water-reclamation and water-reuse."

On the State level, North Carolina General Statute G.S. 143-355(l) requires that public water suppliers, such as OWASA, include their current and future plans for water reuse in their annual Local Water Supply Plans. As OWASA's largest customer and primary non-residential water user, the University is the key participant in plans for water reuse. Water reuse systems reduce the demand for water from reservoirs or groundwater sources. Use of reclaimed water can postpone or eliminate a community's need to develop new water supply sources (e.g. new reservoirs and new water intakes) or to build water treatment facilities. These statements can be put in local context by reviewing the OWASA *Long Range Water Supply Plan*, dated April 8, 2010. While the proposed reclaimed water line in the University's IP application would result in small stream and buffer impacts to Bolin Creek, the project is potentially preventing far more significant impacts to streams, wetlands, and buffers associated with other options for meeting the community's future water supply needs.

Friends of Bolin Creek/McClintock Comment 2: *The letter from Mr. Andrew Williams, USACE Regulatory Project Manager, dated May 31, 2011 summarized the comment requiring response as follows: "Sewell [sic] School Road Bike Lanes, including the Town of Chapel Hill approval for minor modifications to reduce jurisdictional impacts for these lanes and the effect of any permitted impacts on an off road bike path described in the Development Agreement between UNC and the Town of Chapel Hill."*

The full comment text from the Friends of Bolin Creek is "Sewell [sic] School Road Bikelanes. The application states that two off-road bike lanes will be built along Seawell School Road. This appears to be inconsistent with the statement on page 36 of the application that states that the Town of Chapel Hill approved a minor modification to the Development Agreement to allow placement of a sidewalk and bicycle facilities along the east side of Seawell School Road, thus reducing the impact

to perennial and intermittent streams. We want the assurance from the applicant that approving this permit will retain the ability for the University to build an off-road bike path along Seawell School Road as described in the Development Agreement.”

UNC Response: We are unaware of any requirement in the DA for the construction of an off-road bike path along Seawell School Road. Section 5.8.18 of the DA reads:

“Bicycle Improvements. Bicycle facilities shall be built in existing right-of-way or on University property. Bicycle facilities shall be provided on the following streets. The locations are:

- 1) Both sides of Estes Drive from Martin Luther King Jr. Blvd. to Seawell School Road; and
- 2) Both sides of Seawell School Road between Estes Drive and Homestead Road. “

Minor Modification 2010-2 to the DA approved on August 12, 2010, allows the University to meet the requirement of Section 5.8.18 by locating the bicycle facilities in an off road multi-use path along one section of Seawell School Road in order to avoid impact to streams 5B and 14A. Along the rest of Seawell School Road bicycle facilities will be located on both sides of the road. The minor modification request to the TOCH, which includes a map of Seawell School Road, may be seen at: <http://www.ci.chapel-hill.nc.us/Modules/ShowDocument.aspx?documentid=6837>

Friends of Bolin Creek/McClintock Comment 3: *The letter from Mr. Andrew Williams, USACE Regulatory Project Manager, summarized the comment requiring response as follows: “Impacts of Bolin Creek from the Carolina North Project, including effects of proposed transit improvement and increased impervious surfaces on the Bolin Creek and Booker Creek watersheds. Additionally, concerns are expressed for Stream 5A and the effectiveness of the proposed stormwater facilities.”*

The full comment text from the Friends of Bolin Creek is “Impact on Bolin Creek from Carolina North project. The application seeks to address impacts on streams and wetlands outside the development footprint with the goal of minimizing those impacts. Yet many of the transit improvements and additional impervious surfaces of the new campus will cause significant impacts to the Bolin and Booker Creek watersheds. For example, Stream 5A is described as inconsequential, but is a high value tributary as it flows toward Bolin Creek. We are concerned about the effectiveness of stormwater facilities to actually prevent increased flow through protected buffers and into perennial and intermittent streams such as 5A. The Jordan Lake rules mandate that even activities outside the protected buffer are not allowed to cause hydrologic impacts to the buffer and stream. Stormwater facilities should exceed minimum standards to ensure that buffers and streams are protected even in unusual storm events.”

UNC Response: This response will focus on the points specifically referenced by Mr. Williams. First, the effects of transit improvements and other increased impervious area on the Bolin and Booker Creek watersheds will be addressed. Second, Stream 5A will be specifically discussed. Third, the effectiveness of the proposed stormwater facilities to prevent increased flow through buffers and into streams is presented. This response will also address a fourth item not mentioned by Mr. Williams, but was included in the full comment text, i.e. the comment that stormwater facilities should exceed minimum standards.

The University will address the impacts of additional impervious cover within the CN development area and outside the development footprint (e.g. transit improvements required by the DA) by meeting or exceeding minimum stormwater management performance criteria related to water quality, peak discharge, and runoff volume as described in Section 3.0 of the Stormwater Concept Plan (Appendix F of the IP application). The University and the TOCH established performance criteria for stormwater management at CN in the DA. Additionally, State stormwater management criteria are applied through the Jordan Buffer Rule diffuse flow requirement and the Jordan Water Supply Nutrient Strategy Rule 15A NCAC 02B .0271 “Stormwater Requirements for State and Federal Entities” (Jordan New Development Rule and Jordan Existing Development Rule).

The Friends of Bolin Creek and Ms. McClintock expressed a specific concern that “Stream 5A is described as inconsequential, but is a high value tributary as it flows toward Bolin Creek.” Stream 5A is not a tributary of Bolin Creek; it is a tributary of Crow Branch and Booker Creek, located adjacent to the pre-regulatory TOCH landfill.

The University will prevent increased flow to streams and buffers by meeting or exceeding the stormwater management performance criteria from the Jordan Buffer Rule and in the DA with the TOCH. The University’s stormwater facilities will be effective by requiring designs based on the most recent version of the *NCDENR Stormwater BMP Manual* and more stringent requirements in the University’s *Design and Construction Guidelines* section titled *Stormwater Performance Criteria, Design Standards, and Procedures*.

The NCDENR Division of Water Quality (DWQ) provides two options for meeting the diffuse flow requirement in the Jordan Buffer Rule: a level spreader with a vegetated filter strip or stormwater BMPs that remove at least 30% of the Total Nitrogen (TN) and Total Phosphorus (TP). Stormwater BMPs that remove at least 30% of the TN and TP, such as bioretention and stormwater wetlands, are the most appropriate means to meet the diffuse flow requirement at CN and are shown in the Stormwater Concept Plan.

The University will also meet the stormwater runoff volume and peak runoff rate performance criteria established in the DA with the TOCH. Additionally, the University stormwater staff is engaged in the professional stormwater community and

keeps abreast of research regarding stormwater management facility performance and design. The University's Stormwater Concept Plan is based on performance criteria and stormwater facility designs that reflect the leading edge of the stormwater profession.

Stormwater facilities at CN will exceed minimum standards as compared to other development in Chapel Hill by controlling peak discharge at additional design storms, by exceeding the Jordan New Development Rule requirements and addressing the Jordan Existing Development Rule on-site and by being a part of a robust stormwater program.

The stormwater performance criteria in the DA with the TOCH requires that peak post-development stormwater runoff rate not exceed the peak existing conditions runoff rate at the 1-year, 2-year, 10-year, 25-year, and 50-year frequency, 24-hour duration storm events. The TOCH LUMO only applies this requirement to the 1-year, 2-year, and 25-year frequency storms; thus, the University has agreed to stormwater standards that exceed those applied to other development in the TOCH.

The Jordan New Development Rule requires stormwater treatment to reduce TN and TP at development sites that increase impervious area but not at redevelopment sites that reduce impervious area. Some sites at CN will be redevelopment that reduces impervious area, so TN and TP reductions are not required at those locations. Meanwhile, the Jordan Existing Development Rule requires State entities, including the University, to decrease existing TN and TP loads to Jordan Lake but provides many options, including purchasing off-site credits. As one strategy to meet the Jordan Existing Development Rule, the University decided to require redevelopment sites that reduce impervious area to reduce the TN and TP loads through on-site stormwater treatment. Though these TN and TP reductions are required for the Jordan Existing Development Rule, minimum standards will be exceeded to the benefit of the Bolin and Booker Creek watersheds because these reductions will occur at CN rather than in another part of the Jordan Lake watershed.

The University holds a stormwater permit from NCDENR similar to the permits held by local governments. The University's National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) permit requires that the University review stormwater plans; inspect erosion and sediment controls at construction sites; train staff about pollution prevention; find and fix pollution sources; map the stormwater system; and maintain, inspect, and identify ways to improve existing stormwater facilities. The University is required to have this NPDES permit; however, this robust stormwater program distinguishes the University from those who only are required to meet minimum standards for development in TOCH or elsewhere.

Friends of Bolin Creek/McClintock Comment 4: The letter from Mr. Andrew Williams, USACE Regulatory Project Manager, dated May 31, 2011 summarized the comment requiring response as follows: "Concerns that the Chapel Hill Stormwater

Management staff has not assessed or commented on the stream impacts of the proposed project.”

The full comment text from the Friends of Bolin Creek is “The University further states that throughout the permit application process, the University communicated with other agencies and with the Town of Chapel Hill and OWASA. We are concerned that the Chapel Hill Storm Water Management utility has not assessed or commented on the many miles of streams affected by Carolina North.”

UNC Response: The University is subject to multiple regulations at the local, state, and federal levels. This IP application specifically addresses regulations implemented by the USACE and DWQ. The TOCH was provided with a copy of the IP application, a meeting was held with TOCH staff and TOCH staff were able to review and comment on the IP application if desired. Additionally, the TOCH will conduct separate reviews regarding streams, buffers and stormwater management.

This IP application was submitted to USACE and DWQ to address impacts to streams and wetlands. At the beginning of the process, staff from USACE and DWQ visited the site and determined which streams and wetlands were under their respective jurisdictions. The USACE implements the federal permitting that is called for in Section 404 of the Clean Water Act. DWQ implements the associated state-level certification that is called for in Section 401 of the Clean Water Act. The DWQ 401 Water Quality Certification and Isolated Wetland Permit also include reviews of isolated wetlands that are not in the USACE jurisdiction, State-level buffer regulations, diffuse flow requirement, and other State-level stormwater management requirements. Under the Jordan Water Supply Nutrient Strategy, DWQ has jurisdiction for the Jordan Buffer Rule because the University is a State entity.

As part of the CN DA, the University agreed that development would be consistent with the TOCH RCD regulations as of the date of the DA. In a separate effort from the USACE and DWQ site visits, the TOCH Stormwater Management Division has conducted an assessment of the streams at CN that will be used to apply the TOCH RCD regulations. The TOCH RCD regulations are not addressed in the IP application to USACE and DWQ. The TOCH staff will review for compliance with the TOCH RCD rules on a project by project basis.

The TOCH Stormwater Management Division will also conduct reviews of the stormwater management at CN. Per the DA, the University is required to submit a stormwater concept plan with the first SDP application. The University intends to submit the Stormwater Concept Plan that is included in Appendix F of the IP application. The TOCH Stormwater Management Division will also review for compliance with the stormwater management criteria in the DA on a project by project basis.

4. ***Willardson Comment re: NCEEP Mitigation:*** *The letter from Mr. Andrew Williams, USACE Regulatory Project Manager, dated May 31, 2011 summarized the comment*

requiring response as follows: "They requested a public hearing regarding the proposed payment to the North Carolina Ecosystem Enhancement Program (NCEEP) for the compensatory mitigation of streams and wetlands impacts by this proposed project. While the decision to hold a public hearing resides with the Corps of Engineers, you must provide a response regarding your decision to mitigate through the NCEEP. Also, please be aware that there is an approved mitigation bank located within the Cape Fear watershed, cataloging unit 03030002 (which is the watershed of your proposed impacts) that has additional stream and wetland credits released since receipt of your application. The bank is operated by Restoration Systems, Inc. and you can contact them at 919-334-9119."

UNC Response: On April 10, 2008 the US Environmental Protection Agency and the USACE published new wetland mitigation regulations in the Federal Register (33 CFR Parts 325 and 332 and 40 CFR Part 230). These regulations state that the most preferred mitigation option is purchase of mitigation bank credits, which are usually in place before the activity is permitted. In-lieu fee program credits are second in the preference hierarchy, because they may involve larger, more ecologically valuable compensatory mitigation projects as compared to permittee-responsible mitigation. Permittee-responsible mitigation is the third option.

In addition, the 2008 regulations say that state agencies may choose between purchase of mitigation bank credits and in-lieu fee program credits as their first option. There is currently one mitigation bank available to supply mitigation credits, however, they do not have credits sufficient to satisfy the CN impacts. Therefore, the University as a state agency, may choose where mitigation credit is purchased, from either a mitigation bank or NCEEP (in-lieu fee), based on availability and the lowest cost to state taxpayers.

5. **USACE Comment in text of letter:** *"Furthermore, we are still evaluating the proposed phases of this project and may require additional information regarding the proposed phases as well as additional coordination with the North Carolina Division of Water Quality."*

UNC Response: The University acknowledges the comment above, and will respond to additional requirements for information upon request.

6. **USACE Comment in text of email:** *"Also, we have reviewed the alternatives analysis provided in your application and will need additional clarification regarding the impacts for Plan "Revised 2007" as shown on Table D-5 on page 37 of your application. These impacts do not match the proposed impacts of the permit application. The "Revised 2007" impacts are 2.32 acre of wetlands and 203 linear feet of stream, while the permit application requests impacts to 2.412 acre of wetlands and 552 linear feet of stream."*

UNC Response: The information listed in Table D-5, Summary of Impacts for Carolina North – Avoidance and Minimization in the row entitled "Revised 2007 (on 947-acre site only)" lists the wetland impacts as being 2.32 acres and the stream impacts as being 203 linear feet.

Based on the information listed in Table D-6 Wetland Impacts Within the Approximately 947-acre Carolina North Boundary, the wetland impacts in Table D-5 should be listed as 2.397 acres, not 2.32 acres. However, Table D-6 has a typo in it. The impact shown for Wetland T(5) is shown to be 0.14 acres and it is actually 0.014 acres, as depicted in the corrected table below.

Wetland	Area (acres)	Impact (acres)
A	0.861	0.099
A1	0.403	0
B	0.25	0
B1	0.041	0
C	1.64	0
C1	0.243	0
D	0.03	0
D1	0.041	0
E	0.02	0
F	0.57	0
G	0.16	0
H	0.22	0
I	1.34	0
J	0.01	0
K	0.36	0
L	0.24	0
LA	0.03	0
N	0.14	0
O	0.72	0
P	0.06	0
Q	0.04	0
R	0.04	0
S	0.28	0
T (5)	0.02	0.014
U	0.01	0
V	0.47	0
W	0.14	0
X	0.03	0.143
XA	0.025	0.025
XB	0.06	0.06
Y	0.13	0.13
Z	1.214	1.214
AA	0.014	0.014
AB	0.572	0.572
Totals	10.42493	2.271

So the total acreage of wetland impacts within the approximately 947-acre boundary is actually 2.271 acres. The remaining offsite impacts are as follows:

<u>Wetland</u>	<u>Impact (acres)</u>
2	0.005
3	0.011
6	0.037
17	0.023
18	0.065
<u>TOTAL</u>	<u>0.141</u>

So the corrected wetland impacts in Table D-5 (2.271 acres) plus the offsite impacts (0.141 acres) total the wetland impacts listed for the entire project in the permit application (2.412 acres).

To recap the stream impacts, Table D-5 Summary of Impacts for Carolina North – Avoidance and Minimization lists stream impacts inside the 947-acre site only as being 203 feet. This is correct. However, there is a typo in Table D-7 Stream Impacts Within the Approximately 947-acre Carolina North Boundary. The impact listed for Stream 1 is 32 feet, and it should be 31 feet, per Figure C-13 of the application. When the Stream 1 impact is corrected to 31 feet as shown in the revised Table D-7 below, then the total impacts in Table D-7 agree with the 203 linear feet listed in Table D-5.

Stream	Length (ft)	Impact (ft)
Bolin Creek	6,821	0
Crow Branch	5,508	72
1	325	31
3	425	0
4	370	0
5A	245	100
5B	125	0
8	494	0
12A	232	0
14A	2,546	174*
16	1,881	0
19	449	0
20	247	0
21	131	0
22	932	0
23	1,086	0
24	1,312	0
25	1,017	0
26	2,057	0
27A	1,823	0
27B	1,054	0
Totals	29,079	203

*classified as unimportant, by USACE
no impact

Stream 14A, listed in Table D-7 above, was deemed “unimportant” by the USACE. While impacts to this stream must be reported, they do not require mitigation. If the 174 feet of impact to Stream 14A are included in Tables D-5 and D-7 for stream impacts, the total stream impact would be $203 + 174 = 377$ feet.

The impacts to streams outside the approximately 947-acre boundary are as follows.

<u>Stream</u>	<u>Impact (linear feet)</u>
2	27
8	47
13	60
14B	20
<u>Bolin Creek</u>	<u>21</u>
TOTAL	175

When the 175 feet of impacts outside the boundary are added to the 377 feet of impacts inside, then the total is 552 linear feet, as reported in the permit application.

If you have any questions regarding this submittal or need additional information, please contact me at (919) 962-9752 or Jill Coleman at (919) 843-3246.

Sincerely,



Sharon A. Myers, L.G.
Environmental Compliance Officer

Cc: Ms. Jill Coleman
Mr. Daniel Elliott
Ms. Mary Beth Koza
Mr. Ian McMillan
Mr. Kevin Nunnery
Mr. Bruce Runberg
Ms. Anna Wu