



Soil & Environmental Consultants, PA

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

March 1, 2018
S&EC Project No.: 13441.W1

To: Orange County Government
Attn: Jeffery Thompson
131 West Margaret Lane, Suite 300, PO Box 8181
Hillsborough, N.C. 27278

Re: Wetland Delineation and Stream Evaluation
Tilley Property
Orange County, NC

Mr. Thompson:

On February 28, 2018, S&EC personnel completed the wetland delineation and stream evaluation on the Tilley Property in Orange County, NC. You will find the attached report detailing our findings. Maps that further document the wetland and stream related site characteristics are also attached.

The next step in the wetland and stream verification process is to visit the site with the Army Corps of Engineers' agent for Orange County. S&EC will schedule this site visit at your request. The town of Hillsborough has already confirmed the Neuse River buffers on site in an active letter dated February 13, 2018.

As you move forward in planning your development, S&EC personnel are available for site plan review and permit consultation services. Please contact S&EC if you have any questions related to wetland and stream regulations or if you need clarification of the attached report.

Sincerely,
SOIL & ENVIRONMENTAL CONSULTANTS, PA

Steven Ball, RF, PWS

Project Manager

Attachments:

- 1) Wetland Delineation Report
- 2) USGS site vicinity map
- 3) NRCS Soil Survey
- 4) Wetland & Stream Sketch Map
- 5) Requirements for Delineation Maps
- 6) Agent Authorization Form
- 7) Hillsborough Stream Determination

cc: Tony Whitaker / Civil Consultants

Dan McCauley

Environmental Scientist



Soil & Environmental Consultants, PA

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DETAILED WETLAND DELINEATION & STREAM EVALUATION FOR THE TILLEY PROPERTY

On **FEBRUARY 28, 2018**, S&EC personnel completed a detailed wetland delineation and stream evaluation on the Tilley Property (± 20 acres). The site is located on US 70 in Orange County, NC. Figure 1 and Figure 2 show the location of the site on a USGS topographic quadrangle and NRCS County Soil Survey, respectively.

EXECUTIVE SUMMARY

We have determined that wetlands, a pond and a stream generally account for the jurisdictional waters observed on the site. The attached wetland sketch map depicts the approximate locations of the stream, pond and wetlands identified during our evaluation. Please refer to the sketch map and the results and recommendations section below for more detailed information.

SCOPE OF WORK

The detailed wetland delineation consisted of traversing the property to examine soils, vegetation, and hydrology across the site in search of areas that meet the criteria for jurisdictional wetlands as described by the procedures set forth in the Corps of Engineers Wetlands Delineation Manual (January 1987 – Final Report). Areas on the site with positive indicators of hydric soils, evidence of wetland hydrology, and presence of hydrophytic vegetation were flagged with sequentially numbered, pink S&EC logo flagging. Proof of wetland hydrology would be the existence of hydric soils with oxidized root channels in the upper 12 inches of the soil profile, water borne deposits, drift lines, scour marks, drainage patterns, regional indicators of soil saturation, etc. Surface waters such as intermittent and perennial stream channels, ponds, and lakes, which are also subject to regulation by the US Army Corps of Engineers (USACE) as waters of the US, were also identified. These surface waters may also be referred to as jurisdictional waters to indicate that they are within the jurisdiction of the USACE. It is important to note that wetlands are also classified as waters of the US and regulated by the USACE under authority of the Clean Water Act (33 USC 1344).

RESULTS & RECOMMENDATIONS

The results of the detailed wetland delineation and stream evaluation are discussed below.

Wetlands and Jurisdictional Waters:

We have determined that jurisdictional waters (i.e., a stream, pond and wetlands) exist on the site. Please refer to the attached “Wetland Sketch Map” for specific flag numbers and approximate locations.

Jurisdictional features were observed during the site evaluation; the approximate locations of each are illustrated on the attached wetland sketch map. Features identified on-site are described below:

- **Feature A** (UT to Eno River) begins at flag S01 and flows south off property. This feature is believed to be considered intermittent. The Town considered the segment between the pond and flag S01 intermittent. The USACE should review this feature to confirm in is jurisdictional. There is a possibility it may contain a buffered non-jurisdictional feature through this segment.
- **Pond 1** is located within the drainage of Feature A. Pond 1 is believed to be jurisdictional.
- **Wetland 1** is believed to contain the necessary criteria to be considered a jurisdictional wetland.

One marginal wetland area was noted in the field. This area will need to be reviewed by the USACE.

Surface waters on this site flow into the Eno River in the Neuse River Basin, which has been classified in “Classification and NC DWQ Standards Applicable to Surface Waters and Wetlands of North Carolina” as WS-II;NSW,HQW,CA.

The wetlands onsite were identified as being a Headwater Forest wetland type as outlined in the publication ¹“NCWAM.” This wetland type is common throughout the piedmont region of North Carolina and is found mainly along headwater streams like the one onsite.

Neuse River Buffers:

Terry L. Hackett from the Town of Hillsborough determined the Neuse River riparian buffers on February 9, 2018. Pond 1 and Feature A from Pond 1 south off property will be considered subject to the buffers. Although Pond 2 is located on both the soil survey and USGS map, this feature was not found to be present in the field. See the attached Town of Hillsborough letter dated February 13, 2018.

All S&EC flags comprising the wetland and jurisdictional waters delineation should be surveyed and a Wetland Delineation Map generated for use in site planning and USACE approval and permitting. The entire length of each stream feature was not flagged, but will need to be survey located for the Wetland Delineation Map. Stream features may be located either along the centerline (with channel widths noted at each survey point) or at the top-of-bank. The Wetland Delineation Map should include all of the information listed on the attached “**Obtaining a Jurisdictional Determination – Submitting a Plat for Corps Verification.**” S&EC delineation flag numbers should be shown on the wetland survey. Please have the property owner or contracting buyer complete the attached agent authorization form if you would like S&EC to act on their behalf for requesting approval of the wetland delineation. This form will also be used in preparing a permit application for impacts to wetlands or surface waters when we are provided with a plan showing the proposed impacts. **S&EC cannot conduct correspondence with the USACE unless we have agent authorization (see attached Agent**

¹North Carolina Wetland Assessment Method

Authorization). This authorization form must be filled out in its entirety and returned to S&EC (a faxed copy is acceptable).

Regulations

A general list of regulations that apply to jurisdictional wetlands and waters present on the site are discussed below. Please be aware that other local, state, and federal regulations not included in this list may also apply. S&EC personnel are available to discuss these regulations as they apply to your project.

Neuse River Buffer Rules:

The Neuse River Basin: Nutrient Sensitive Waters Management Strategy: Protection and Maintenance of Riparian Areas with Existing Forest Vegetation (15A NCAC 2B.0233) rules apply 50-foot wide riparian buffers directly adjacent to surface waters in the Neuse River Basin (intermittent streams, perennial streams, lakes, ponds, and estuaries), excluding wetlands. The rule defines surface waters as features approximately shown on either the most recent version of the soil survey map prepared by the Natural Resource Conservation Service (NRCS) of the US Department of Agriculture (USDA) or the 7.5-minute quadrangle topographic maps prepared by the US Geologic Survey (USGS). Surface waters that appear on these maps are not subject only if an on-site determination by the NC Division of Water Resources / Water Quality Programs (DWR/WQP) shows that they fall into one of the following categories:

- 1) Ditches and manmade conveyances other than modified natural streams;
- 2) Manmade ponds and lakes that are located outside natural drainage ways; or
- 3) Ephemeral (stormwater) streams.

Wetland Permitting:

The current Nationwide Permits were issued by the USACE on March 18, 2017. The USACE Wilmington District issued revised Regional Conditions for the 2017 Nationwide Permits. We recommend you forward a conceptual site plan to our office for review by one of our permitting specialist, who can best advise you of the specific permitting needs as you progress through the planning process.

Generally, wetland impact permits are issued on a per-project basis as determined by the USACE. The USACE has determined that impacts on parcels sub-divided from larger tracts are sometimes considered to be cumulative to existing impacts for the large tract. If this is the case, then thresholds for notification may not apply to your project and impacts to streams/wetlands must be considered in light of existing permits.

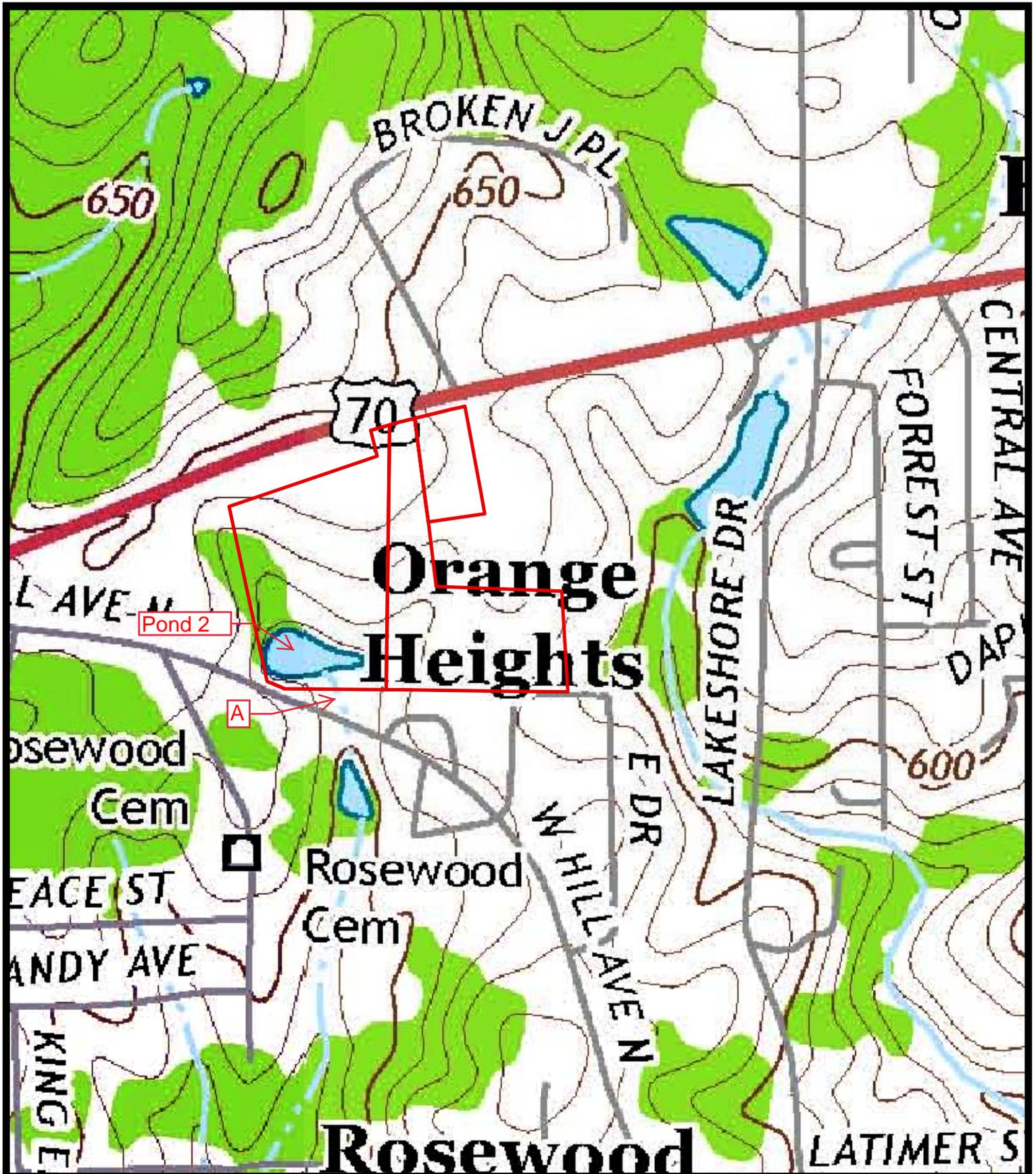
Limitations

Our evaluations, conclusions, and recommendations are based on project and site information available to us at the time of this report and may require modification if there are any changes in the project or site conditions, or if additional data about the project or site becomes available in the future. This report is intended for use by the Orange County Government on this project. These findings are not intended or recommended to be suitable for reuse on extensions of the project or on any other project. Reuse on extensions of this project or on any other project shall

be done only after written verification or adaptation by SOIL & ENVIRONMENTAL CONSULTANTS, PA, for the specific purpose intended.

CONCLUSION

The wetland and stream delineation for the Tilley Property was completed by S&EC on February 28, 2018. This site contains jurisdictional streams and wetland areas that may require preconstruction authorization for impacts, depending on the size and nature of the impact (i.e. road construction, lot fill, stormwater pond construction, etc.). USACE verification of our site assessment should be obtained. Following verification meetings with regulatory agencies, the next step in the stream and wetland identification and permitting process is to obtain a field survey of our delineation for formal approval by the USACE. Upon completing the survey, these site constraints may then be integrated into planning for property development.



Project Number: 13441.W1
 Project Manager: SB
 Scale: 1" = 500'
 Date: 2/26/18

Map Title:
Figure 1 - USGS Map
 Tilley Property
 Orange County, NC
 Source: NC USGS
 Efland & Hillsborough Quads

0 500 1,000
 Feet

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Project Number: **13441.W1**

Project Manager: **SB**

Scale: **1" = 1250'**

Date: **2/26/18**

Map Title:
Figure 2 - Soil Survey Map
 Tilley Property
 Orange County, NC
 Source: Wake County
 Soil Survey Sheet 14

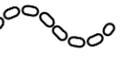
0 1,250 2,500
 Feet

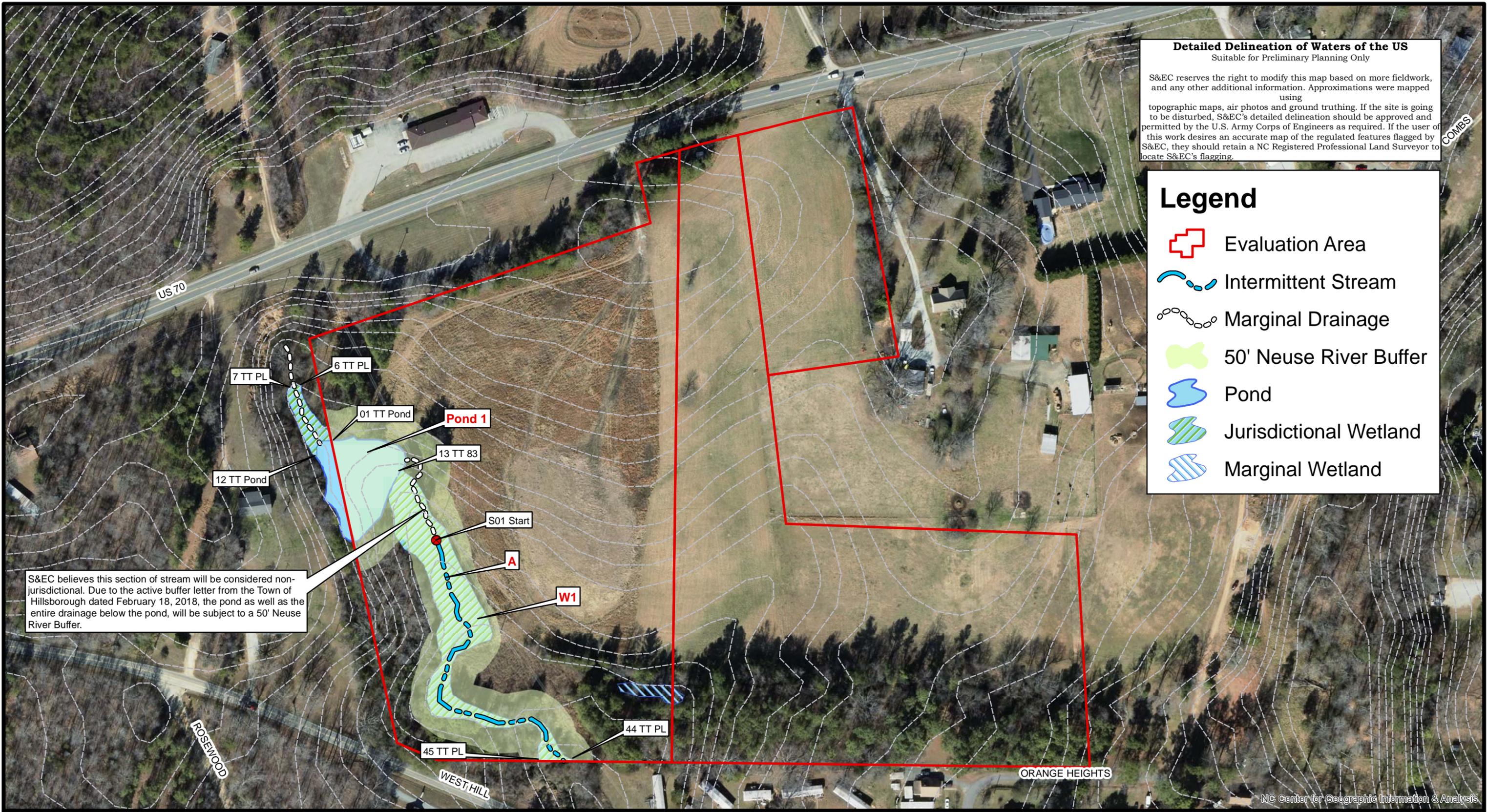
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Detailed Delineation of Waters of the US
 Suitable for Preliminary Planning Only

S&EC reserves the right to modify this map based on more fieldwork, and any other additional information. Approximations were mapped using topographic maps, air photos and ground truthing. If the site is going to be disturbed, S&EC's detailed delineation should be approved and permitted by the U.S. Army Corps of Engineers as required. If the user of this work desires an accurate map of the regulated features flagged by S&EC, they should retain a NC Registered Professional Land Surveyor to locate S&EC's flagging.

Legend

-  Evaluation Area
-  Intermittent Stream
-  Marginal Drainage
-  50' Neuse River Buffer
-  Pond
-  Jurisdictional Wetland
-  Marginal Wetland



Project No.
13441.W1

Project Mgr.:
SB

Scale:
1" = 150'

2/28/18

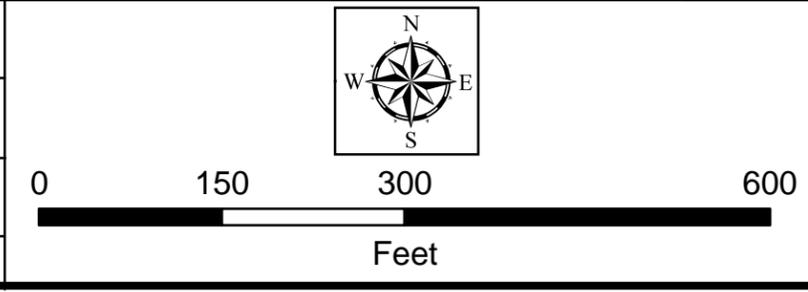


Figure 3 - Wetland Sketch Map
 Tillley Property
 Orange Co., NC

NOTE: Parcel boundary shown is based on a georeferenced image from the Orange Co. GIS mapping website, aligned based on NCDOT roads GIS layer. As such, all calculated areas shown herein are approximate and subject to change based on new or better information.



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Survey Standards for Jurisdictional Determinations

Please note that the approval and signature of survey plats will only be done in association with an Approved Jurisdictional Determination. The Corps accepts both electronic and hardcopy plats for signature, however this will be at the discretion of the project manager. If a hard copy is submitted, the Corps requires that all hard-copy submittals include at least one original Plat (to scale) that is no larger than 11"x17". Submitted plats must be legible, including labeling (the use of match lines for larger tracts are encouraged). Additional copies of a plat, including those larger than 11"x17", may also be submitted for Corps signature as needed. Prior to final production of a plat, the Wilmington District recommends that the surveyor electronically submit a draft of the survey to the Corps project manager for review.

PLATS SUBMITTED FOR APPROVAL

- Must be signed and sealed by a licensed professional land surveyor
- Must be to scale (all maps must include an accurate graphic scale and verbal scale)
- Must include a North Arrow, Scale(s), Title, Property Information
- Must clearly depict surveyed property or project boundaries
- Must clearly identify the known surveyed point(s) used as reference (e.g. property corner, USGS monument)
- Jurisdictional wetlands depicted on the survey should:
 - Be labeled as Wetland Waters of the US, 404 wetlands, wetlands, etc.
 - Include acreage (or square footage) of wetland polygons
 - Identify each wetland polygon using an alphanumeric system
- Jurisdictional non-wetland waters (non-wetland tidal/navigable waters, tributaries, impoundments, ditches, etc.) depicted on the survey should:
 - Be labeled as Non-Wetland Waters of the US, stream, tributary, open water, relatively permanent waters (RPW), pond, etc.
 - Mark the centerline of linear waters (tributaries), with approximate widths to the Ordinary High Water Mark (OHMW) OR a surveyed OHWM boundary of the tributary.
 - List the linear footage of linear features and area (using approximate widths)
 - Mark the extent of OHMW for non-linear waters such as lakes, ponds, etc.
 - List the acreage of non-linear features
 - Identify each feature using an alphanumeric system

- Isolated waters, waters that lack a significant nexus to navigable waters, or non-jurisdictional upland features should be identified as non-jurisdictional. Please include the acreage and/or linear length of these features as appropriate.
- Must include a legible Waters of the United States (wetlands and other waters) Delineation Table of distances and bearings/metes and bounds/GPS coordinates of all surveyed delineation points
- Must ensure that all depicted wetlands or other waters intersect or tie-to surveyed project/property boundaries

CERTIFICATION LANGUAGE

- Plats submitted for Corps approval should include the following Certification language when the entire actual Jurisdictional Boundary is depicted:

"This certifies that this copy of this plat accurately depicts the boundary of the jurisdiction of the Section 404 of the Clean Water Act as determined by the undersigned on this date. Unless there is change in the law or our published regulations, this determination of Section 404 jurisdiction may be relied upon for a period not to exceed five years from this date. The undersigned completed this determination utilizing the appropriate Regional Supplement to the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual, 33 C.F.R. part 328 and other U.S. Army Corps of Engineers guidance."

Regulatory Official: _____

Title: _____

Date: _____

USACE Action ID No.: _____

- Plats submitted for Corps approval should include the following Certification language when uplands may be present within a depicted Jurisdictional Boundary:

"This certifies that this copy of this plat identifies all areas of waters of the United States regulated pursuant to Section 404 of the Clean Water Act as determined by the undersigned on this date. Unless there is change in the law or our published regulations, this determination of Section 404 jurisdiction may be relied upon for a period not to exceed five years from this date. The undersigned completed this determination utilizing the appropriate Regional Supplement to the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual, 33 C.F.R. part 328 and other U.S. Army Corps of Engineers guidance."

Regulatory Official: _____

Title: _____

Date: _____

USACE Action ID No.: _____

GPS SURVEYS

For surveys prepared using a Global Positioning System (GPS), the survey must include all of the above, as well as:

- be at sub-meter accuracy at each survey point.
- include an accuracy verification. One of more of the known points (property corner, monument) shall be located with the GPS and cross referenced with the existing traditional property survey (metes and bounds).
- include a brief description of the GPS equipment utilized.



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PROPERTY OWNER CERTIFICATION / AGENT AUTHORIZATION

Project Name/Description:

S&EC Project #

Date:

The Department of the Army
U.S. Army Corps of Engineers, Wilmington District
69 Darlington Avenue
Wilmington, NC 28403

Attn:

Field Office:

I, the undersigned, a duly authorized owner of record of the property/properties identified herein, do authorize representatives of the Wilmington District, U.S. Army Corps of Engineers (Corps) and Soil & Environmental Consultants, PA (S&EC) staff (as my agent) to enter upon the property herein described for the purpose of conducting on-site investigations and issuing a determination associated with Waters of the U.S. subject to Federal jurisdiction under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. This document also authorizes S&EC (as my agent) to act on my behalf and take all actions necessary for the processing, issuance and acceptance of a permit or certification and any and all associated standard and special conditions. This notification supersedes any previous correspondence concerning the agent for this project.

NOTICE: This authorization, for liability and professional courtesy reasons, is valid only for government officials to enter the property when accompanied by S&EC staff. You should call S&EC to arrange a site meeting prior to visiting the site.

PARCEL INFORMATION:

Parcel Index Number(s) (PIN):

Site Address:

Watershed:

PROPERTY OWNER INFORMATION:

Name:

Address:

Phone No.:

Mobile No.:

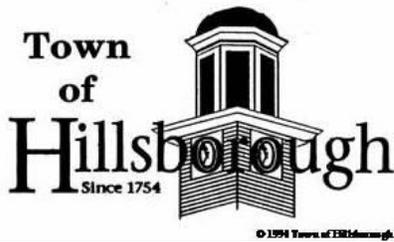
Email:

Property Owner (please print)

Date

Property Owner Signature

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



ONSITE STREAM DETERMINATION
Stormwater and Environmental Services Division
101 E. Orange Street / P.O. Box 429
Hillsborough, NC 27278
Phone: (919) 296-9621, Fax: (919) 644-2390
Website: www.hillsboroughnc.gov

February 13, 2018

Mr. Tony Whitaker, PE
Civil Consultants, Inc.
3708 Lyckan Parkway, Suite 201
Durham, NC 27707

Re: Hall/Tilley Parcels
PIN # 9864392344, 9864397758, 9864398253

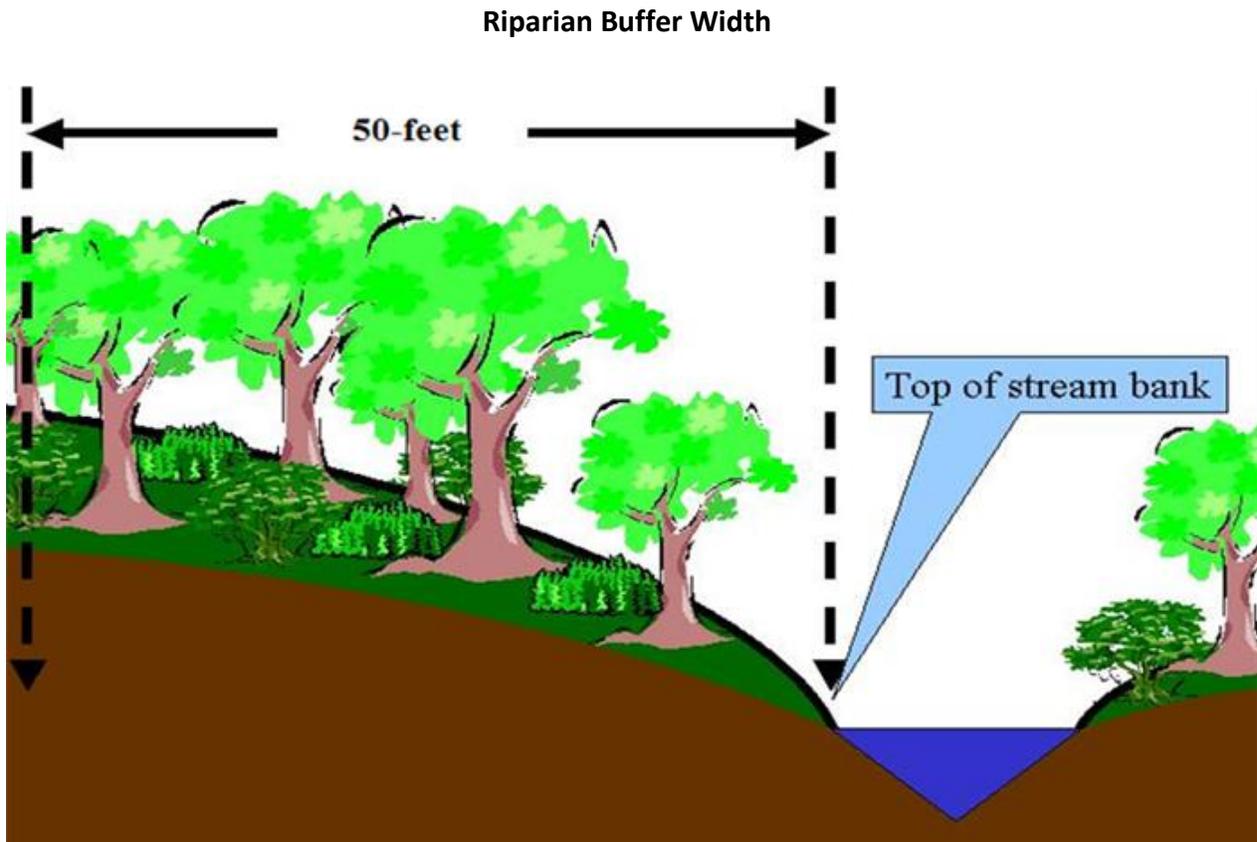
Dear Tony:

This letter serves as confirmation of an on-site stream determination made by Town of Hillsborough (Town) Stormwater and Environmental Services Division staff on February 9, 2018 for the referenced properties. The Town of Hillsborough is the local delegated authority for enforcing the Neuse Riparian Buffer Rules (Neuse River Basin: Nutrient Sensitive Waters Management Strategy Protection and Maintenance of Riparian Areas Rule (15A NCAC 2B.0233)) and also conducts stream determinations pursuant to the Town's riparian buffer regulations (Section 6.20.16, Riparian Buffers, Town of Hillsborough Unified Development Ordinance).

Our initial review of Geographic Information System (GIS) data indicated a pond with a connected drainage feature present. The pond and drainage feature were evaluated in the field to determine if the drainage feature met the criteria to be considered a stream. The evaluation was conducted pursuant to the North Carolina Division of Water Quality's Identification Methods for the Origins of Intermittent and Perennial Streams (Version 4.11, September 1, 2010).

Based on the field evaluation it was determined that this previously unmapped feature does meet the criteria to be considered a stream. Pursuant to Section 6.20.17.3, item (c) of the Town's UDO, riparian buffers apply to previously unmapped streams when field evidence indicates the feature meets the criteria. The stream connects hydrologically to the pond, and it appears that the pond is groundwater fed. Below the pond there are areas where the channel is less defined, but the area contains wetland indicators. Since the pond is connected to the stream, both the stream and the pond are subject to the Town's riparian buffer rules. A data form for the stream is attached.

The approximate location of the stream and pond is shown on the enclosed aerial photograph as Feature A. Feature A will require a 50-foot buffer on both sides of the stream measured from the top of bank as indicated below. A 50-foot buffer will also be required around the perimeter of the pond. For planning purposes, the approximate location of the riparian buffer is also shown on the attached aerial photograph.



Please note that the Town's riparian buffer rules essentially require a 50-foot undisturbed forested area on either side of the stream. The purpose of the buffer is to protect water quality. However, there are some uses/impacts allowed within the riparian buffer. Please consult Section 6.20.16 of the Town's Unified Development Ordinance for more details.

This on-site determination expires five (5) years from the date of this letter. This determination can also be contested as provided in Articles 3 and 4 of General Statute 150B by filing a written petition for an administrative hearing to the Office of Administrative Hearings. Please see the attached document for specific details on how to file a petition.

If you have questions about this determination, or how the Neuse/Town Riparian Buffer rules apply to your parcel please contact me by email at terry.hackett@hillsboroughnc.gov or by telephone at (919) 296-9621.

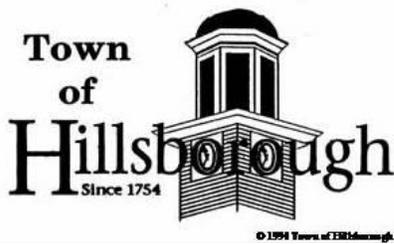
Sincerely,

A handwritten signature in black ink, appearing to read "Terry L. Hackett". The signature is fluid and cursive, with the first name "Terry" and last name "Hackett" clearly distinguishable.

Terry L. Hackett
Stormwater and Environmental Services Manager

Attachments: Contesting an On-Site Stream/Riparian Buffer Determination
Aerial Photograph / Map
Stream Determination Score Sheets

cc: Tom King, Senior Planner, Town of Hillsborough
Jeff Thompson, Orange County
Mark O'Neal, Pickett Sprouse Real Estate



ONSITE STREAM DETERMINATION
Stormwater and Environmental Services Division
101 E. Orange Street / P.O. Box 429
Hillsborough, NC 27278
Phone: (919) 296-9621, Fax: (919) 644-2390
Website: www.hillsboroughnc.gov

Contesting an On-Site Stream/Riparian Buffer Determination

On-site stream/riparian buffer Determinations can be contested as provided in Articles 3 and 4 of General Statute 150B by filing a written petition for an administrative hearing to the Office of Administrative Hearings (hereby known as OAH). A petition form may be obtained from the OAH at <http://www.ncoah.com/> or by calling the OAH Clerk's Office at (919) 431-3000 for information.

Within **sixty (60) calendar days** of receipt of this notice, a petition must be filed with the OAH. A petition is considered filed when the original and one (1) copy along with any applicable OAH filing fee is received in the OAH during normal office hours (Monday through Friday between 8:00am and 5:00pm, excluding official state holidays).

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

Mailing address for the OAH:

If sending via US Postal Service:

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714

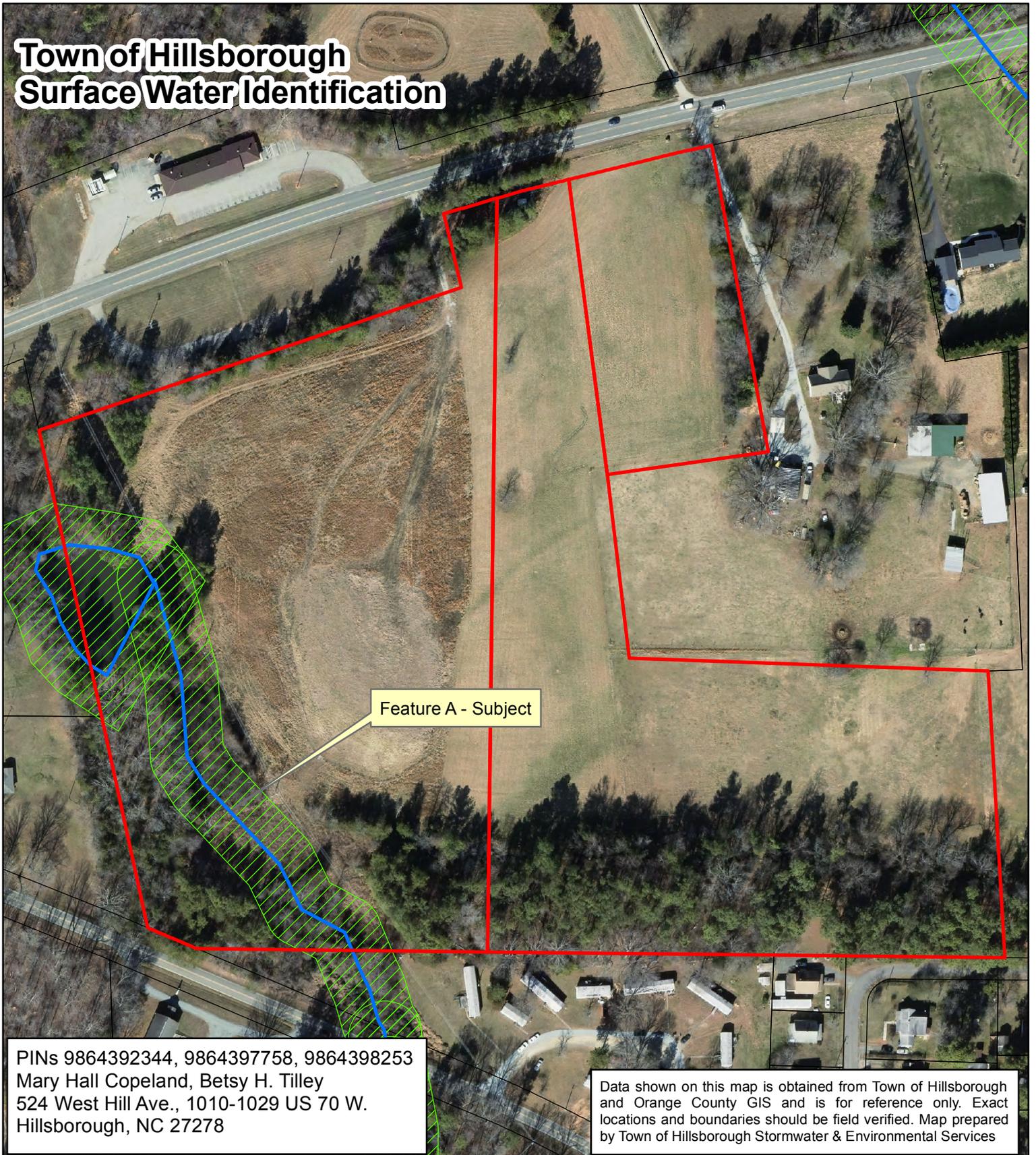
If sending via delivery service (UPS, FedEx, etc):

Office of Administrative Hearings
1711 New Hope Church Road
Raleigh, NC 27609-6285

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

Lacy Presnell, General Counsel
Department of Environment and Natural Resources
1601 Mail Service Center
Raleigh, NC 27699-1601

Town of Hillsborough Surface Water Identification



Legend

-  Streams
-  Deleted Streams
-  Approximate Buffer
-  Parcel

175 87.5 0 175 Feet



1 in = 175 ft





SURFACE WATER IDENTIFICATION FORM

Date: 2/9/2018 Project/Site: OC Proposed Jail Site

Evaluator: Terry Hackett PIN: 9864392344

Total Points: 23 **Stream Determination:** Intermittent

A. Geomorphology (Subtotal = 9.5)

	Absent	Weak	Moderate	Strong
1. Continuity of channel bed and bank*			2	
2. Sinuosity of channel along thalweg			2	
3. In-channel structure		1		
4. Particle size of stream substrate			2	
5. Active/relict floodplain	0			
6. Depositional bars or benches	0			
7. Recent alluvial deposits	0			
8. Headcuts		1		
9. Grade Control		0.5		
10. Natural Valley			1	
11. Second or greater order channel	0			

*artificial ditches are not rated; see discussion in manual

B. Hydrology (Subtotal = 6.5)

	Absent	Weak	Moderate	Strong
12. Presence of baseflow		1		
13. Iron oxidizing bacteria	0			
14. Leaf litter		1		
15. Sediment on plants or debris			1	
16. Organic debris lines or piles		0.5		
17. Soil-based evidence of high water table?				3

C. Biology (Subtotal = 7)

	Absent	Weak	Moderate	Strong
18. Fibrous roots in streambed	3			
19. Rooted upland plants in streambed	3			
20. Macrobenthos	0			
21. Aquatic mollusks	0			
22. Fish	0			
23. Crayfish	0			
24. Amphibians	0			
25. Algae			1	
26. Wetland Plants in Streambed				0

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

Notes: