S&ME

September 29, 2015

Wake County Board of Education
1429 Rock Quarry Road, Suite 116
Raleigh, NC 27610

Attention: Ms. Betty Parker
Director, Real Estate Services

Reference: **Report for Preliminary Jurisdictional Wetland and Stream Assessment, Town of Holly Springs Cape Fear River Riparian Buffer Evaluation**
WCPSS E-45 Proposed Elementary School Site
5651 Honeycutt Road, Holly Springs, Wake County, North Carolina
S&ME Project No. 4305-15-194

Dear Mrs. Parker

S&ME completed a preliminary jurisdictional wetland and stream assessment and Town of Holly Springs Cape Fear River riparian buffer evaluation on the proposed Wake County Public School System (WCPSS) E-45 site. These services were performed in general accordance with S&ME Proposal 13-1500514, dated September 21, 2015.

PROJECT INFORMATION

We understand that WCPSS is proposing a new elementary school (E-45) on a +/- 22.50-acre portion of land that totals approximately 43.60-acres. The proposed site is located on the southern side of Honeycutt Road west of the intersection with Piney Grove Wilbon Road, in Holly Springs, Wake County, North Carolina. The property is further identified by Wake County PIN# 0647-69-2661, and Real Estate ID# 0032891. The proposed site is depicted on the attached United States Department of Agriculture (USDA) Soil Conservation Service (SCS) Wake County soil survey map (**Figure 1**), United States Geologic Service (USGS) Topographic Map (**Figure 2**), and color aerial and topographic map (**Figure 3**).

SCOPE OF SERVICES

The preliminary jurisdictional wetland and stream assessment consisted of traversing the site to assess soils, vegetation, and hydrology in search of areas that meet the minimum criteria for jurisdictional wetlands as described by the procedures set forth in the United States Army Corps of Engineers (USACE) "Wetlands Delineation Manual" (January 1987 – Final Report). 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. 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).

On September 23rd and 24th, 2015, multiple hand auger borings to assess the soil conditions for evidence of hydric soil indicators and for wetland hydrology were performed in drainage areas and topographically concave areas within the project boundary. In addition, a USACE data form was completed documenting the plant, soil and hydrology findings of suspected wetland areas on-site, and is included as **Attachment 1.** The area where the data form was recorded was located with a GPS receiver and is shown on the attached **Figure 4** labeled as DP1.

S&ME's Town of Holly Springs Cape Fear River stream buffer evaluation consisted of examining features on or in close proximity to the site that is shown on **Figure 1** and **Figure 2** using North Carolina Division of Water Resources (NCDWR) stream evaluation techniques contained in the NCDWR publication, *Identification Methods for the Origins of Intermittent and Perennial Streams, v 3.1 February 28, 2005.* There is a pond (Feature A) depicted on the USGS topographic map (**Figure 2**). There are two ponds and one intermittent stream depicted within the project boundary on the Wake County soil survey map (**Figure 1**), which are labeled as Feature A (Pond), Feature B (Pond) and Feature B (Stream). A NCDWR Stream Identification Form (Version 4.11) was completed for Feature B and is included as **Attachment 2**. The area where the stream form was recorded was located with a GPS receiver and is shown on the attached **Figure 4** labeled as SF1. Site photographs documenting the conditions of Features A and B are included as **Attachment 3**.

FINDINGS

One small man-made pond (Feature B – Pond) was found on-site and is represented by Flags B1 through B13, as depicted on the attached **Figure 4**. This pond was dug and has no hydrologic connection to any jurisdictional feature, and therefore, we believe the pond could be considered non-jurisdictional by the USACE and not subject to the Cape Fear River buffer by the Town of Holly Springs.

We believe that Feature B (Stream) depicted on the attached **Figure 1**, would not be considered a jurisdictional stream by the USACE based on our observations and not subject to the Cape Fear River buffer by the Town of Holly Springs.

A large man-made pond (Feature A – Pond) is located just off the southwest corner of the project site, and the eastern edge of this feature is represented by flags A1 through A16 on the attached. **Figure 4**. This pond was dug in high ground and has no hydrologic connection to any jurisdictional feature, and therefore, we believe the pond could be considered non-jurisdictional by the USACE and not subject to the Cape Fear River buffer by the Town of Holly Springs.

RECOMMENDATIONS

S&ME's jurisdictional wetland and stream assessment and Town of Holly Springs Cape Fear River riparian buffer evaluation should be considered preliminary. A preliminary Jurisdictional Determination by the USACE would be needed to confirm our findings regarding wetlands and streams. Also, The Town of Holly Springs is the designated local government with delegated authority to administer the State riparian protection buffer rules, and as such, their concurrence with our findings regarding the 30-foot Cape Fear River buffer is required. S&ME can provide these additional services in a separate proposal upon request.

REGULATIONS

A general list of regulations that apply to stream buffers 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&ME personnel are available to discuss these regulations as they apply to your project.

The Town of Holly Springs is a delegated local government that has authority to administer State riparian buffer protection rules by the North Carolina Department of Natural Resources (NCDENR). According to the Holly Springs Buffer Rules (Cape Fear Basin Riparian Buffer Protection: 7.06-24), thirty-foot (30') riparian buffers will be placed on each side of all intermittent and perennial streams, ponds, lakes, and other bodies of water that are shown on the most recent version of the relevant USGS topographic quadrangle and/or Wake County Soil Survey. When conflicts occur between field conditions and the depiction on the USGS or Soil Survey maps, documentation must be submitted for staff consideration.

CLOSING

S&ME appreciates the opportunity to provide the natural resources services related to this project. If you have any questions or require additional information, please do not hesitate to contact Walter Cole at (919) 801-3798 or wcole@smeinc.com.

Sincerely,

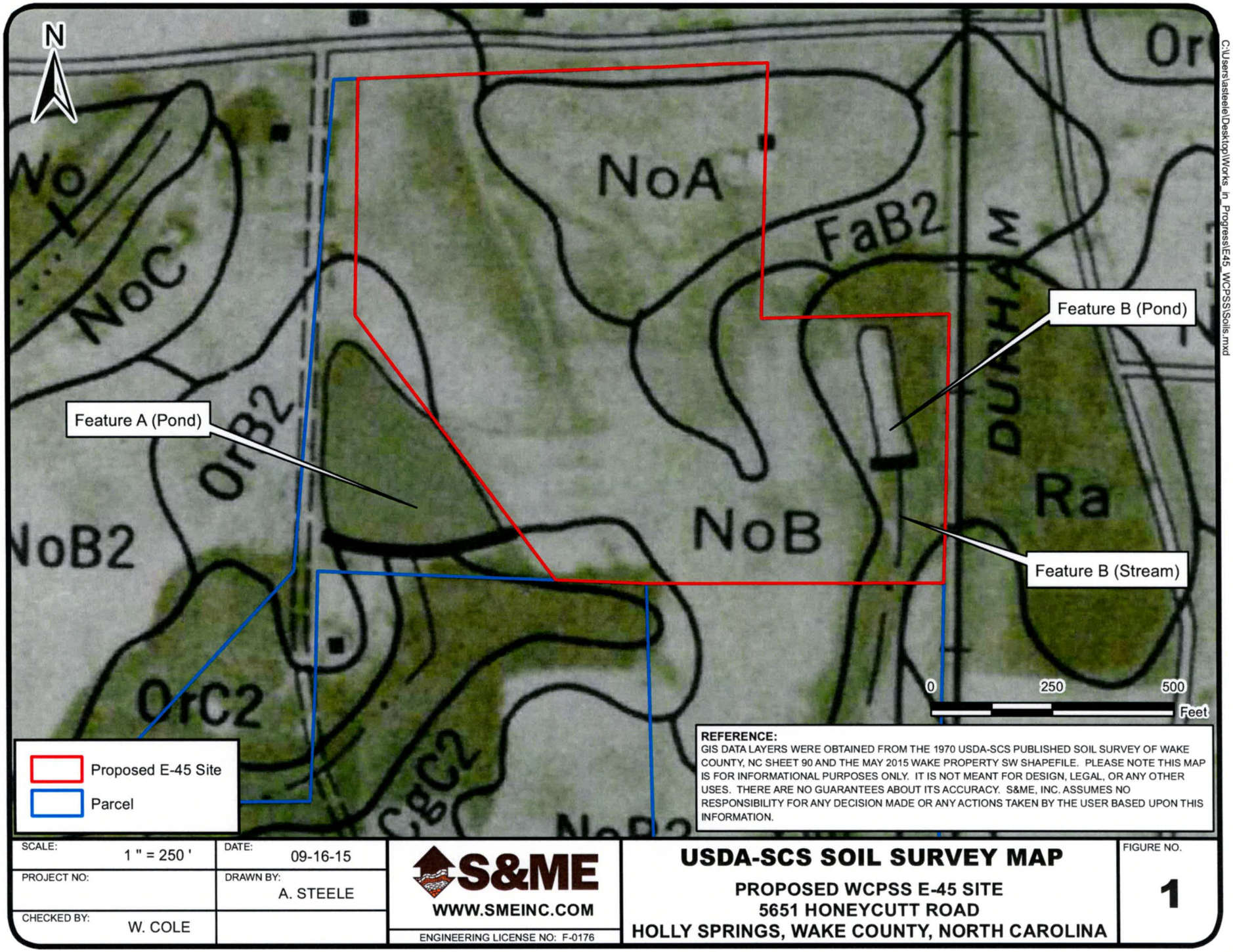
S&ME, Inc.

Walter Cole, L.S.S.
Natural Resources Project Manager

Samuel P. Watts, P.G.
Senior Project Manager

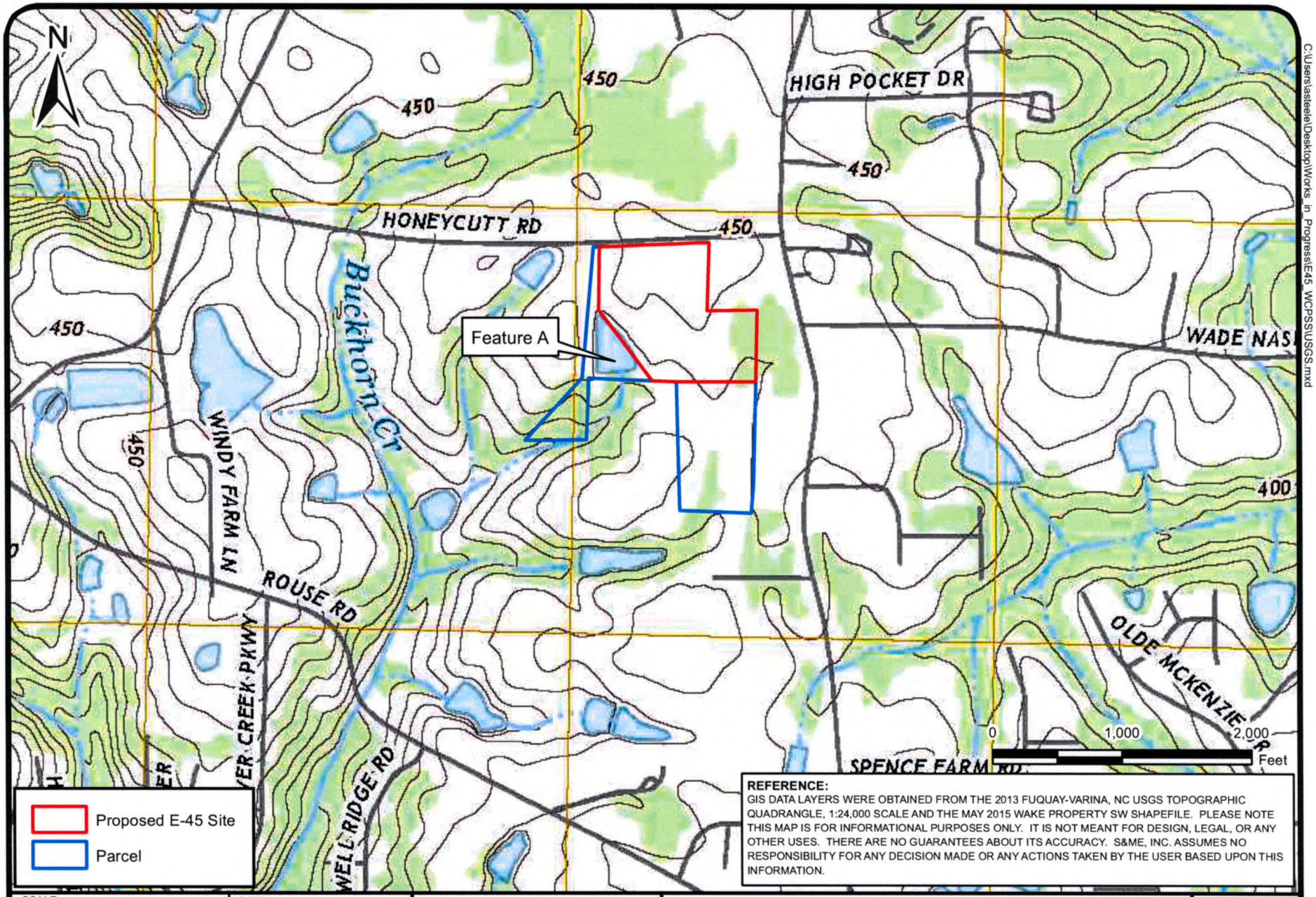
Enclosed:
Figure 1: USDA-SCS Wake County Soil Survey – Sheet 90
Figure 2: USGS Topographic Quadrangle – 2013 Fuquay-Varina Quadrangle
Figure 3: Color Aerial and Topographic Map
Figure 4: Jurisdictional Features Map
Attachment 1: USACE Data Form
Attachment 2: NCDWR Stream Identification Form
Attachment 3: Site Photographs (1 through 8)

Figures



C:\Users\asteele\Desktop\Works_in_Progress\E45_WCPSS\Soils.mxd

SCALE: 1 " = 250 '	DATE: 09-16-15	S&ME WWW.SMEINC.COM	**USDA-SCS SOIL SURVEY MAP**
PROJECT NO:	DRAWN BY: A. STEELE		**PROPOSED WCPSS E-45 SITE**
CHECKED BY: W. COLE		ENGINEERING LICENSE NO: F-0176	**5651 HONEYCUTT ROAD**
			HOLLY SPRINGS, WAKE COUNTY, NORTH CAROLINA
			FIGURE NO. **1**



REFERENCE:
GIS DATA LAYERS WERE OBTAINED FROM THE 2013 FUQUAY-VARINA, NC USGS TOPOGRAPHIC QUADRANGLE, 1:24,000 SCALE AND THE MAY 2015 WAKE PROPERTY SW SHAPEFILE. PLEASE NOTE THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. THERE ARE NO GUARANTEES ABOUT ITS ACCURACY. S&ME, INC. ASSUMES NO RESPONSIBILITY FOR ANY DECISION MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON THIS INFORMATION.

SCALE: 1 " = 1,000 '	DATE: 09-16-15	S&ME WWW.SMEINC.COM ENGINEERING LICENSE NO: F-0176	**USGS TOPOGRAPHIC MAP** PROPOSED WCPSS E-45 SITE 5651 HONEYCUTT ROAD HOLLY SPRINGS, WAKE COUNTY, NORTH CAROLINA
PROJECT NO:	DRAWN BY: A. STEELE		FIGURE NO. **2**
CHECKED BY: W. COLE			

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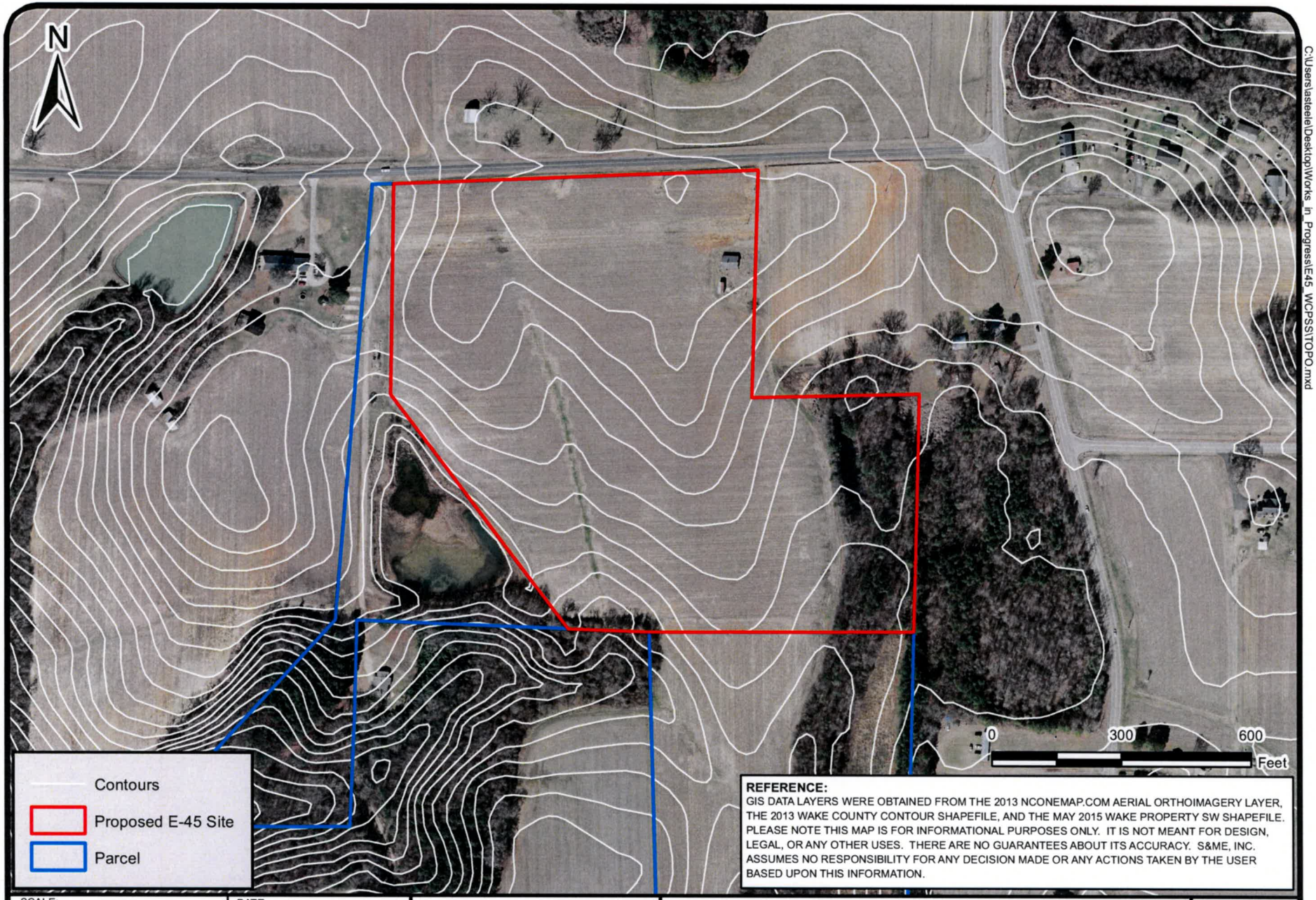

C:\Users\asteele\Desktop\Works_in_Progress\E45_WCPSS\TOPO.mxd

REFERENCE:
GIS DATA LAYERS WERE OBTAINED FROM THE 2013 NCONEMAP.COM AERIAL ORTHOIMAGERY LAYER, THE 2013 WAKE COUNTY CONTOUR SHAPEFILE, AND THE MAY 2015 WAKE PROPERTY SW SHAPEFILE. PLEASE NOTE THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. THERE ARE NO GUARANTEES ABOUT ITS ACCURACY. S&ME, INC. ASSUMES NO RESPONSIBILITY FOR ANY DECISION MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON THIS INFORMATION.

SCALE: 1 " = 300 '	DATE: 09-16-15	S&ME WWW.SMEINC.COM	**COLOR AERIAL AND TOPOGRAPHIC MAP**
PROJECT NO:	DRAWN BY: A. STEELE		**PROPOSED WCPSS E-45 SITE**
CHECKED BY: W. COLE		ENGINEERING LICENSE NO: F-0176	**5651 HONEYCUTT ROAD**
			HOLLY SPRINGS, WAKE COUNTY, NORTH CAROLINA

FIGURE NO. **3**

N

Non-Jurisdictional Ephemeral Drainage Area

Feature A
Potentially Non-Jurisdictional Pond that is Potentially Not Subject to Holly Springs 30' Buffer

Feature B (Pond)
Potentially Non-Jurisdictional Man-Made Pond that is Potentially Not Subject to Holly Springs 30' Buffer

a1 a2 a3 a4 a5 a6 a7 a8 a9 a10 a11 a12 a13 a14 a15 a16

b1 b2 b3 b4 b5 b6 b7 b8 b9 b10 b11 b12 b13 tt b1

sf1 dp1

1 2 3 4 5 6 7 8

Photo Location/ Direction
Flag Location
Pond
Proposed E-45 Site
Parcel

0 150 300 Feet

REFERENCE:
GIS DATA LAYERS WERE OBTAINED FROM THE 2013 NCONEMAP.COM AERIAL ORTHOIMAGERY LAYER AND THE MAY 2015 WAKE PROPERTY SW SHAPEFILE. PLEASE NOTE THIS MAP IS FOR INFORMATIONAL PURPOSES ONLY. IT IS NOT MEANT FOR DESIGN, LEGAL, OR ANY OTHER USES. THERE ARE NO GUARANTEES ABOUT ITS ACCURACY. S&ME, INC. ASSUMES NO RESPONSIBILITY FOR ANY DECISION MADE OR ANY ACTIONS TAKEN BY THE USER BASED UPON THIS INFORMATION.

DATE: 09.28.2015
DRAWN BY: A. STEELE
CHECKED BY: W. COLE
SCALE: 1 " = 150 '
PROJECT NO. 4305-15-194
ENGINEERING LICENSE NO. F-0176

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JURISDICTIONAL FEATURES MAP

PROPOSED WCPSS E-45 SITE
5651 HONEYCUTT ROAD
HOLLY SPRINGS, WAKE COUNTY, NORTH CAROLINA

FIGURE NO.
4

Q:\PROJECTS\2015\4305-15-194\FEATURE.mxd

Attachment 1 – USACE Data Form

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Proposed WCPSS E-45 School Site City/County: Holly Springs/Wake Sampling Date: 9/23/2015
Applicant/Owner: WCPSS / Honeycutt Road 5701 LLC State: NC Sampling Point: Data Point 1
Investigator(s): Walter Cole, Ashley Steele Section, Township, Range:
Landform (hillslope, terrace, etc.): Toe Slope Local relief (concave, convex, none): None Slope (%): <5%
Subregion (LRR or MLRA): LRR P Lat: 35.617364 Long: -78.842533 Datum: NAD83
Soil Map Unit Name: Rains fine sandy loam NWI classification: N/A
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✔ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? ☐ Are "Normal Circumstances" present? Yes ✔ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? ☐ (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✔	No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ✔
Hydric Soil Present?	Yes ☐	No ✔	
Wetland Hydrology Present?	Yes ☐	No ✔	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ✔	Depth (inches):
Water Table Present?	Yes ☐	No ✔	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ☐	No ✔	Depth (inches):

Wetland Hydrology Present? Yes ☐ No ✔

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: Data Point 1

Tree Stratum (Plot size: 50 x 50 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	50%	YES	FAC
2. Quercus phellos	30%	YES	FAC
3. Liquidambar styraciflua	10%	NO	FAC
4. Fraxinus pennsylvanica	10%	NO	FACW
5. Carpinus caroliniana	10%	NO	FAC
6.			
7.			
	110%	= Total Cover	

Sapling Stratum (Plot size: 50 x 50 ft)			
1. Fraxinus pennsylvanica	10%	YES	FACW
2. Ligustrum sinense	10%	YES	FACU
3. Acer rubrum	5%	YES	FAC
4.			
5.			
6.			
7.			
	25%	= Total Cover	

Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Herb Stratum (Plot size: 50 x 50 ft)			
1. Microstegium vimineum	4%	NO	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	4%	= Total Cover	

Woody Vine Stratum (Plot size: 50 x 50 ft)			
1. Wisteria frutescens	2%	YES	FACW
2. Toxicodendron radicans	2%	YES	FAC
3.			
4.			
5.			
	4%	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 88% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: Data Point 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	7.5YR 5/4	100%					L	Loam
3-6	7.5YR 5/3	100%					L	Loam
6-13+	10YR 6/4	90%	7.5YR 5/6	10%	C	PL	L	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MLRA 147, 148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks:

Attachment 2 – NCDWR Stream Identification Form

NC DWQ Stream Identification Form Version 4.11

Date: 9/23/2015	**Project/Site:** WCPSS E-45	**Latitude:** 35.617348
Evaluator: A. Steele, W. Cole	**County:** Wake	**Longitude:** -78.842638
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 8.5	**Stream Determination (circle one)** **Ephemeral**	**Other** *e.g. Quad Name:* Feature B, SF-1

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

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

B. Hydrology (Subtotal = 3.5)				
12. Presence of Baseflow	0 ●	1	2	3
13. Iron oxidizing bacteria	0 ●	1	2	3
14. Leaf litter	1.5	1	0.5 ●	0
15. Sediment on plants or debris	0 ●	0.5	1	1.5
16. Organic debris lines or piles	0 ●	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3 ●	

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

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

Notes:

Sketch:

Attachment 3 – Site Photographs

1 View of Feature B (Pond) which is man-made and has no hydrologic connection to any jurisdictional features.

2 View of area where Data Point 1 (DP1) was recorded.

3 View of Feature B (Stream) where NCDWR Stream Form 1 (SF1) was recorded looking north toward pond. This feature rated as ephemeral.

4 View of Feature B (Stream) where NCDWR Stream Form 1 (SF1) was recorded looking south.

S&ME	WCPSS E-45 Proposed Elementary School Site Honeycutt Road, Holly Springs, Wake County, NC	S&ME Project No. 4305-15-194	
		Taken by: A.Steele	Date Taken: 9-23-2015

5 View of ephemeral drainage looking north toward soybean fields.

6 View of ephemeral drainage looking south toward property line.

7 View of Feature A (Pond) looking north.

8 View of Feature A (Pond) looking south toward property line.

S&ME	WCPSS E-45 Proposed Elementary School Site Honeycutt Road, Holly Springs, Wake County, NC	S&ME Project No. 4305-15-194	
		Taken by: A.Steele	Date Taken: 9-23-2015