

# CE GROUP

301 GLENWOOD AVENUE, SUITE 220  
RALEIGH, NC 27603  
Phone: (919) 367-8790  
E-Mail: mark@cegroupinc.com

May 16, 2014

Mr. Dan Lamontagne, PE  
Chatham County Environmental Quality  
P.O. Box 87  
Pittsboro, NC 27312

RE: **The Retreat at Haw River**  
**Response to Peer Review Comments (dated 5/9/14)**  
**Chatham County, NC**

Dear Mr. LaMontagne:

Please find attached our follow-up response to comments provided by your peer review consultant (Froehling & Robertson, Inc.)

### Proposed Project Description and Need

6) Discuss the land acreage to be disturbed during each phase.

- The specific the land acreage to be disturbed during each phase is not discussed.

**We anticipate 98 AC of disturbance in Phase1 and 109 AC of disturbance in Phase 2. Exhibit attached.**

7) List square footage and height (in stories) of new buildings.

- The specific square footage and height (in stories) of new buildings is not discussed.

**We anticipate that all residential dwellings will not to exceed 2.5 stories (from first floor). The amenity will have both conditioned and unconditioned space. The square footage is yet to be determined for residences and amenity. Restrictive Covenants will address this in the future.**

9) Show number of parking spaces in parking lots and decks.

- The number of parking spaces for the amenity space and garden parking lots is not shown on a map.

**No decks are planned. On Page 7 of the EIA submission we referenced +/- 35 spaces at the amenity and +/- 12 spaces near the community garden. We do anticipate some other small parking areas (5-6 spaces near trail access points.**

### Existing Environment and Project Impacts

1) Geography

- Provide a topographic map of the property and surrounding area, use the county GIS website topography (2' contour interval) data at a scale appropriate for the project size, i.e., 1" = 100', etc.).

- The provided Topographic map (Figure 4) references NCDOT's GIS topography (2' contour interval) and not the county's GIS topography. The scale is 1":1,200' scale.

**A topographic map at same size as plat map is attached. The contour info (NCDOT) is the same as County info (same source).**

- Show areas that will be graded or filled, and provide estimated cut/fill volumes.
- Estimated cut/fill volumes are not provided.

**The Geography exhibit is attached reflecting preliminary earthwork and areas requiring grading.**

## 2) Soils and Prime Farmlands

- Discuss any soil constraints (fill, wetland soils, septic suitability, slopes, etc.), and indicate those areas on a map.
- Soil constraints (fill, wetland soils, septic suitability, slopes, etc.), are not discussed or indicated on a map.
- If soil will be relocated, specify the number of square yards/feet to be moved, and its relocation site.
- The number of square yards/feet of soil to be moved is not specified nor is the relocation site.

**Areas of soil constraint have been identified in the previous submission (steep slopes, wetlands, floodplain, etc.). The attached Geography exhibit addresses the soil relocation. No off-site spoil or borrow is anticipated.**

- Describe runoff management plans for the project.
- Runoff management plans are not discussed.

**On page 12 of the EIA submittal we reference applicable Chatham County permits that address runoff during construction and post construction water quality. These regulations have great specificity already.**

## 6) Areas of Archaeological or Historical Value

- A period should be added to the last sentence in the first paragraph.
- Provide photographs of any significant resources, including all structures older than 50-years.
- Photographs of the Bynum-Lambeth House located on-site are not included.
- Provide relevant correspondence with the Chatham County Historical Association and NC SHPO.
- Relevant correspondence is not included (the determination made by the Chatham County Planning Department that the conditional use permit requirement for an archeological survey has been met, as well as, the correspondence with Bev Wiggins of the Chatham County Historical Society).

**Correspondence with Chatham Historical Association and SHPO is attached along with photos**

8) Noise Levels

- Specify the distance at which the increased noise will be heard.

- The distance at which the increased noise will be heard is not specified.

- Discuss whether surrounding properties will be affected by noise levels.

- Whether or not surrounding properties will be affected by noise levels is not discussed.

**Page 7 of EIA submission addresses Noise levels. The distance noise levels may be heard depends upon forestation and topography. The level of noise at the property line (surrounding properties) will be no greater than the current decibel associated with roadway traffic on adjoining public roads.**

10) Surface and Groundwater Resources (discuss separately)

- Discuss any known groundwater quality issues.

- Known groundwater quality issues, or the lack thereof, are not discussed.

**There are no known groundwater issues in the immediate project vicinity.**

11) Fish and Aquatic Habitats

- River is misspelled in the first sentence of the first paragraph.

**So noted.**

12) Wildlife and Natural Vegetation

- If forests will be cleared, discuss the extent of planned deforestation and specify the forestry methods to be used, including BMPs.

- The forestry methods to be used, including BMPs, is not discussed.

**Any proposed land disturbance will be regulated by the Chatham County Erosion Control Ordinance as identified on Page 12 of the EIA submission.**

13) Hazardous Materials

- List all hazardous materials to be stored or introduced during construction or operation.

- Different size fonts are used within the same paragraph in this section.

**We anticipate fuel to be stored on site during construction and will be stored in storage containers conforming to applicable State and Federal regulations.**

**Font size is so noted.**

References

- Please include references and or supporting documentation for the following:
  - Chatham County Subdivision Regulations and Ordinance;
  - Sources for:
    - Job Growth Statistics; **Forbes (Feb 2014) Here and Now (Jan 2014)**

May 16, 2014

- Current and Projected Population;
- Annual Growth Rate;
- Chatham County Stormwater Regulations;
- Chatham County Sediment and Erosion Control regulations;
- Chatham county Zoning Regulations;
- Publicly Available Records Used in Section 3;
- USGS Topographic Map;
- 1985 Detailed Geologic Map of North Carolina;
- Chatham Co GIS;
- NC Flood Mapping Program;
- FEMA FIRM Map;
- Previous 401 and 404 permits;
- NOV-2008-PC-0714;
- Repair and Stabilization Plans;
- Monitoring Reports;
- Close Out Letter;
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual;
- A field Guide to North Carolina Wetlands;
- State Historic Preservation Office
- County Ordinances Related to Parking, Lighting and Signage;
- NC-DWR's Classification and Water Quality Standards Aplicable to Surface Waters and Wetlands of North Carolina.
- Hydrologic Maps; and
- Sources of Aerial Photography.

**So Noted**

Please contact us if you have any questions for need any additional information.

Respectfully submitted,



Mark P. Ashness, PE  
CE Group, Inc.

cc: Scott Munday, Crescent Resources



**FROEHLING & ROBERTSON, INC.**  
*Engineering Stability Since 1881*

310 Hubert Street  
Raleigh, North Carolina 27603-2302  
T 919.828.3441 | F 919.828.5751  
NC License #F-0266

May 9, 2014

Dan J. LaMontagne, P.E.  
Chatham County  
Environmental Quality Director  
12 East Street  
Pittsboro, NC 27312

Re: **EIA Peer Review**  
**Retreat at the Haw**  
Chatham County, North Carolina  
F&R Project No. 66S-0031

Dear Mr. LaMontagne:

Froehling & Robertson, Inc. (F&R) is pleased to present Chatham County with our comments related to reviewing the above EIA with respect to the requirements listed in the Chatham County Subdivision Regulations (Regulations) as amended September 16, 2013. At this time minor discussions, additions, and corrections are suggested for the EIA to be considered in general compliance with the Regulations. Please see below for F&R's list of comments.

**PROJECT INFORMATION**

F&R understands the EIA was prepared by Soil and Environmental Consultants (S&EC) under S&EC Project No. 6748.D5. The EIA states, "The Retreat at Haw River consists of +/- 646 AC. The property is currently entitled for the development of up to 185 single family residential lots with County Water and Individual Septic Systems. The project is bordered by State Park property and the Haw River to the south. The community of Bynum is located to the west. Two existing large lot subdivisions (Redbud and Bynum Ridge) are located to the east. Baldwin Peak Subdivision is located to the north across Bynum Ridge Road. There are already 67 platted lots within the project. The project as proposed will provide for 393 single family residential lots along with a community amenity. The conservation subdivision ordinance requires at least 40% of the land mass be preserved with 80% of that to be left as natural space. We anticipate this project having at least 66% open space versus the required 40%. The conservation space (which will account for up to 260 acres) will primarily be left as natural space other than introduction of trails and minimal utility crossings. We expect that closer to 95% of the conservation area to be left undisturbed as open space versus 80% (permitted by ordinance)".

---

Corporate HQ: 3015 Dumbarton Road Richmond, Virginia 23228 T 804.264.2701 F 804.264.1202 [www.fandr.com](http://www.fandr.com)

**VIRGINIA • NORTH CAROLINA • SOUTH CAROLINA • MARYLAND • DISTRICT OF COLUMBIA**

*A Minority-Owned Business*



## SCOPE OF WORK

F&R has reviewed the EIA as well as Section 6.2 Additional First Plat Information of the Regulations and compared the required information/documentation with what is provided in the EIA. F&R has listed the specific regulation requirements with associated comments below. F&R has commented on items needed to bring the EIA into accordance with the Regulations, as well as items needed for clarity or that would be beneficial to the EIA.

## COMMENTS

### Proposed Project Description and Need

6) Discuss the land acreage to be disturbed during each phase.

- The specific the land acreage to be disturbed during each phase is not discussed.

7) List square footage and height (in stories) of new buildings.

- The specific square footage and height (in stories) of new buildings is not discussed.

9) Show number of parking spaces in parking lots and decks.

- The number of parking spaces for the amenity space and garden parking lots is not shown on a map.

### Existing Environment and Project Impacts

1) Geography

- Provide a topographic map of the property and surrounding area, use the county GIS website topography (2' contour interval) data at a scale appropriate for the project size, i.e., 1" = 100', etc.).

- The provided Topographic map (Figure 4) references NCDOT's GIS topography (2' contour interval) and not the county's GIS topography. The scale is 1":1,200' scale.

- Show areas that will be graded or filled, and provide estimated cut/fill volumes.

- Estimated cut/fill volumes are not provided.

2) Soils and Prime Farmlands

- Discuss any soil constraints (fill, wetland soils, septic suitability, slopes, etc.), and indicate those areas on a map.

- Soil constraints (fill, wetland soils, septic suitability, slopes, etc.), are not discussed or indicated on a map.

- If soil will be relocated, specify the number of square yards/feet to be moved, and its relocation site.

- The number of square yards/feet of soil to be moved is not specified nor is the relocation site.



- Describe runoff management plans for the project.
  - Runoff management plans are not discussed.
- 6) Areas of Archaeological or Historical Value
- A period should be added to the last sentence in the first paragraph.
  - Provide photographs of any significant resources, including all structures older than 50-years.
  - Photographs of the Bynum-Lambeth House located on-site are not included.
  - Provide relevant correspondence with the Chatham County Historical Association and NC SHPO.
  - Relevant correspondence is not included (the determination made by the Chatham County Planning Department that the conditional use permit requirement for an archeological survey has been met, as well as, the correspondence with Bev Wiggins of the Chatham County Historical Society).
- 8) Noise Levels
- Specify the distance at which the increased noise will be heard.
  - The distance at which the increased noise will be heard is not specified.
  - Discuss whether surrounding properties will be affected by noise levels.
  - Whether or not surrounding properties will be affected by noise levels is not discussed.
- 10) Surface and Groundwater Resources (discuss separately)
- Discuss any known groundwater quality issues.
  - Known groundwater quality issues, or the lack thereof, are not discussed.
- 11) Fish and Aquatic Habitats
- River is misspelled in the first sentence of the first paragraph.
- 12) Wildlife and Natural Vegetation
- If forests will be cleared, discuss the extent of planned deforestation and specify the forestry methods to be used, including BMPs.
  - The forestry methods to be used, including BMPs, is not discussed.
- 13) Hazardous Materials
- List all hazardous materials to be stored or introduced during construction or operation.
  - Different size fonts are used within the same paragraph in this section.



## References

- Please include references and or supporting documentation for the following:
  - Chatham County Subdivision Regulations and Ordinance;
  - Sources for:
    - Job Growth Statistics;
    - Current and Projected Population;
    - Annual Growth Rate;
  - Chatham County Stormwater Regulations;
  - Chatham County Sediment and Erosion Control regulations;
  - Chatham county Zoning Regulations;
  - Publicly Available Records Used in Section 3;
  - USGS Topographic Map;
  - 1985 Detailed Geologic Map of North Carolina;
  - Chatham Co GIS;
  - NC Flood Mapping Program;
  - FEMA FIRM Map;
  - Previous 401 and 404 permits;
  - NOV-2008-PC-0714;
  - Repair and Stabilization Plans;
  - Monitoring Reports;
  - Close Out Letter;
  - Regional Supplement to the Corps of Engineers Wetland Delineation Manual;
  - A field Guide to North Carolina Wetlands;
  - State Historic Preservation Office
  - County Ordinances Related to Parking, Lighting and Signage;
  - NC-DWR's Classification and Water Quality Standards Applicable to Surface Waters and Wetlands of North Carolina.
  - Hydrologic Maps; and
  - Sources of Aerial Photography.





## LIMITATIONS

Comments do not include additional assessment of any of the environmental categories listed in the EIA or verification of the information that was presented as accurate. Additional assessment services typically include, but are not limited to: detailed surveys for traffic, air quality, noise, archaeological and cultural resources, threatened and endangered species; determinations of National Register eligibility; wetland delineations; and/or floodplain analysis, including the 8 step process.

Please do not hesitate to contact F&R if you have any questions regarding our comments.

Respectfully Submitted,  
**FROEHLING & ROBERTSON, INC.**

Christopher J. Burkhardt  
Senior Environmental Professional

301 GLENWOOD AVE. 220  
 RALEIGH NC 27603  
 PHONE: 919-367-8790  
 FAX: 919-322-0032  
 www.cegroupinc.com  
 License # C-1739

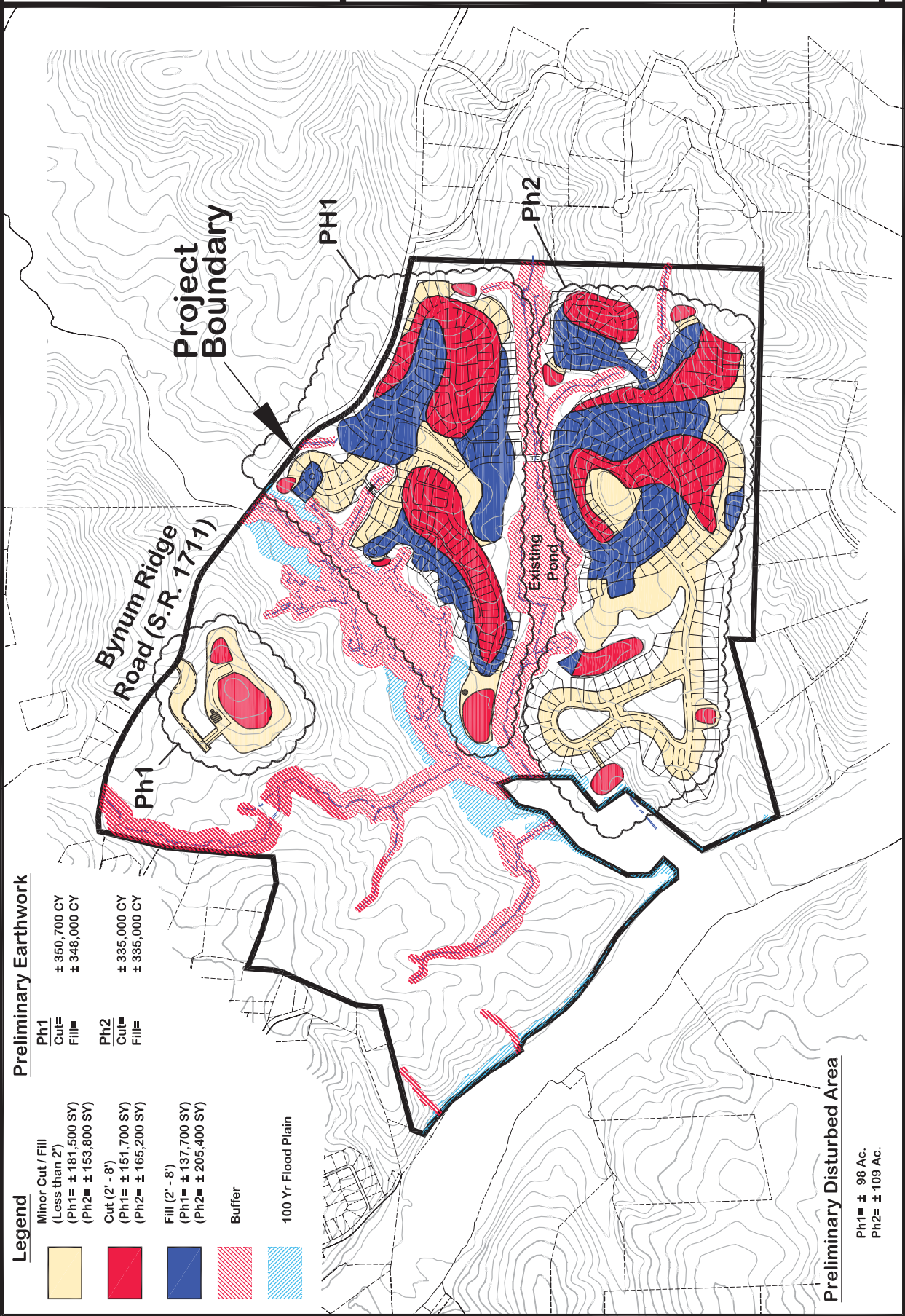


**The Retreat at Haw River**  
 Chatham County, NC  
**Geography Exhibit Map**  
 SCALE: 1" = 800'



NORTH

May 13, 2014



**Preliminary Earthwork**

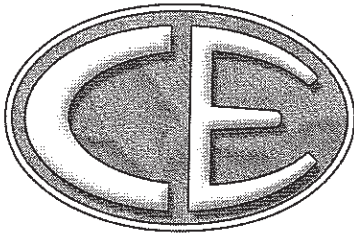
Phase	Cut	Fill
Ph1	± 350,700 CY	± 348,000 CY
	± 335,000 CY	± 335,000 CY
Ph2	± 335,000 CY	± 335,000 CY
	± 335,000 CY	± 335,000 CY

**Legend**

- Minor Cut / Fill (Less than 2')  
 (Ph1= ± 181,500 SY)  
 (Ph2= ± 153,800 SY)
- Cut (2' - 8')  
 (Ph1= ± 151,700 SY)  
 (Ph2= ± 165,200 SY)
- Fill (2' - 8')  
 (Ph1= ± 137,700 SY)  
 (Ph2= ± 205,400 SY)
- Buffer
- 100 Yr Flood Plain

**Preliminary Disturbed Area**

Ph1= ± 98 Ac.  
 Ph2= ± 109 Ac.



# CE GROUP

301 GLENWOOD AVENUE, SUITE 220  
RALEIGH, NC 27603  
Phone: (919) 367-8790  
E-Mail: mark@cegroupinc.com

May 16, 2014

Mr. Dan Lamontagne, PE  
Chatham County Environmental Quality  
P.O. Box 87  
Pittsboro, NC 27312

RE: **The Retreat at Haw River**  
**Response to Peer Review Comments (dated 5/9/14)**  
**Chatham County, NC**

Dear Mr. LaMontagne:

Please find attached our follow-up response to comments provided by your peer review consultant (Froehling & Robertson, Inc.)

### **Proposed Project Description and Need**

6) Discuss the land acreage to be disturbed during each phase.

- The specific the land acreage to be disturbed during each phase is not discussed.

**We anticipate 98 AC of disturbance in Phase1 and 109 AC of disturbance in Phase 2. Exhibit attached.**

7) List square footage and height (in stories) of new buildings.

- The specific square footage and height (in stories) of new buildings is not discussed.

**We anticipate that all residential dwellings will not to exceed 2.5 stories (from first floor). The amenity will have both conditioned and unconditioned space. The square footage is yet to be determined for residences and amenity. Restrictive Covenants will address this in the future.**

9) Show number of parking spaces in parking lots and decks.

- The number of parking spaces for the amenity space and garden parking lots is not shown on a map.

**No decks are planned. On Page 7 of the EIA submission we referenced +/- 35 spaces at the amenity and +/- 12 spaces near the community garden. We do anticipate some other small parking areas (5-6 spaces near trail access points.**

### **Existing Environment and Project Impacts**

1) Geography

- Provide a topographic map of the property and surrounding area, use the county GIS website topography (2' contour interval) data at a scale appropriate for the project size, i.e., 1" = 100', etc.).

- The provided Topographic map (Figure 4) references NCDOT's GIS topography (2' contour interval) and not the county's GIS topography. The scale is 1":1,200' scale.

**A topographic map at same size as plat map is attached. The contour info (NCDOT) is the same as County info (same source).**

- Show areas that will be graded or filled, and provide estimated cut/fill volumes.
- Estimated cut/fill volumes are not provided.

**The Geography exhibit is attached reflecting preliminary earthwork and areas requiring grading.**

## 2) Soils and Prime Farmlands

- Discuss any soil constraints (fill, wetland soils, septic suitability, slopes, etc.), and indicate those areas on a map.
- Soil constraints (fill, wetland soils, septic suitability, slopes, etc.), are not discussed or indicated on a map.
- If soil will be relocated, specify the number of square yards/feet to be moved, and its relocation site.
- The number of square yards/feet of soil to be moved is not specified nor is the relocation site.

**Areas of soil constraint have been identified in the previous submission (steep slopes, wetlands, floodplain, etc.). The attached Geography exhibit addresses the soil relocation. No off-site spoil or borrow is anticipated.**

- Describe runoff management plans for the project.
- Runoff management plans are not discussed.

**On page 12 of the EIA submittal we reference applicable Chatham County permits that address runoff during construction and post construction water quality. These regulations have great specificity already.**

## 6) Areas of Archaeological or Historical Value

- A period should be added to the last sentence in the first paragraph.
- Provide photographs of any significant resources, including all structures older than 50-years.
- Photographs of the Bynum-Lambeth House located on-site are not included.
- Provide relevant correspondence with the Chatham County Historical Association and NC SHPO.
- Relevant correspondence is not included (the determination made by the Chatham County Planning Department that the conditional use permit requirement for an archeological survey has been met, as well as, the correspondence with Bev Wiggins of the Chatham County Historical Society).

**Correspondence with Chatham Historical Association and SHPO is attached along with photos**

8) Noise Levels

- Specify the distance at which the increased noise will be heard.

- The distance at which the increased noise will be heard is not specified.

- Discuss whether surrounding properties will be affected by noise levels.

- Whether or not surrounding properties will be affected by noise levels is not discussed.

**Page 7 of EIA submission addresses Noise levels. The distance noise levels may be heard depends upon forestation and topography. The level of noise at the property line (surrounding properties) will be no greater than the current decibel associated with roadway traffic on adjoining public roads.**

10) Surface and Groundwater Resources (discuss separately)

- Discuss any known groundwater quality issues.

- Known groundwater quality issues, or the lack thereof, are not discussed.

**There are no known groundwater issues in the immediate project vicinity.**

11) Fish and Aquatic Habitats

- River is misspelled in the first sentence of the first paragraph.

**So noted.**

12) Wildlife and Natural Vegetation

- If forests will be cleared, discuss the extent of planned deforestation and specify the forestry methods to be used, including BMPs.

- The forestry methods to be used, including BMPs, is not discussed.

**Any proposed land disturbance will be regulated by the Chatham County Erosion Control Ordinance as identified on Page 12 of the EIA submission.**

13) Hazardous Materials

- List all hazardous materials to be stored or introduced during construction or operation.

- Different size fonts are used within the same paragraph in this section.

**We anticipate fuel to be stored on site during construction and will be stored in storage containers conforming to applicable State and Federal regulations.**

**Font size is so noted.**

References

- Please include references and or supporting documentation for the following:
  - Chatham County Subdivision Regulations and Ordinance;
  - Sources for:
    - Job Growth Statistics; **Forbes (Feb 2014) Here and Now (Jan 2014)**

May 16, 2014

- Current and Projected Population;
- Annual Growth Rate;
- Chatham County Stormwater Regulations;
- Chatham County Sediment and Erosion Control regulations;
- Chatham county Zoning Regulations;
- Publicly Available Records Used in Section 3;
- USGS Topographic Map;
- 1985 Detailed Geologic Map of North Carolina;
- Chatham Co GIS;
- NC Flood Mapping Program;
- FEMA FIRM Map;
- Previous 401 and 404 permits;
- NOV-2008-PC-0714;
- Repair and Stabilization Plans;
- Monitoring Reports;
- Close Out Letter;
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual;
- A field Guide to North Carolina Wetlands;
- State Historic Preservation Office
- County Ordinances Related to Parking, Lighting and Signage;
- NC-DWR's Classification and Water Quality Standards Aplicable to Surface Waters and Wetlands of North Carolina.
- Hydrologic Maps; and
- Sources of Aerial Photography.

**So Noted**

Please contact us if you have any questions for need any additional information.

Respectfully submitted,



Mark P. Ashness, PE  
CE Group, Inc.

cc: Scott Munday, Crescent Resources



**FROEHLING & ROBERTSON, INC.**  
*Engineering Stability Since 1881*

310 Hubert Street  
Raleigh, North Carolina 27603-2302  
T 919.828.3441 | F 919.828.5751  
NC License #F-0266

May 9, 2014

Dan J. LaMontagne, P.E.  
Chatham County  
Environmental Quality Director  
12 East Street  
Pittsboro, NC 27312

Re: **EIA Peer Review**  
**Retreat at the Haw**  
Chatham County, North Carolina  
F&R Project No. 66S-0031

Dear Mr. LaMontagne:

Froehling & Robertson, Inc. (F&R) is pleased to present Chatham County with our comments related to reviewing the above EIA with respect to the requirements listed in the Chatham County Subdivision Regulations (Regulations) as amended September 16, 2013. At this time minor discussions, additions, and corrections are suggested for the EIA to be considered in general compliance with the Regulations. Please see below for F&R's list of comments.

**PROJECT INFORMATION**

F&R understands the EIA was prepared by Soil and Environmental Consultants (S&EC) under S&EC Project No. 6748.D5. The EIA states, "The Retreat at Haw River consists of +/- 646 AC. The property is currently entitled for the development of up to 185 single family residential lots with County Water and Individual Septic Systems. The project is bordered by State Park property and the Haw River to the south. The community of Bynum is located to the west. Two existing large lot subdivisions (Redbud and Bynum Ridge) are located to the east. Baldwin Peak Subdivision is located to the north across Bynum Ridge Road. There are already 67 platted lots within the project. The project as proposed will provide for 393 single family residential lots along with a community amenity. The conservation subdivision ordinance requires at least 40% of the land mass be preserved with 80% of that to be left as natural space. We anticipate this project having at least 66% open space versus the required 40%. The conservation space (which will account for up to 260 acres) will primarily be left as natural space other than introduction of trails and minimal utility crossings. We expect that closer to 95% of the conservation area to be left undisturbed as open space versus 80% (permitted by ordinance)".

---

Corporate HQ: 3015 Dumbarton Road Richmond, Virginia 23228 T 804.264.2701 F 804.264.1202 [www.fandr.com](http://www.fandr.com)

**VIRGINIA • NORTH CAROLINA • SOUTH CAROLINA • MARYLAND • DISTRICT OF COLUMBIA**

*A Minority-Owned Business*



## SCOPE OF WORK

F&R has reviewed the EIA as well as Section 6.2 Additional First Plat Information of the Regulations and compared the required information/documentation with what is provided in the EIA. F&R has listed the specific regulation requirements with associated comments below. F&R has commented on items needed to bring the EIA into accordance with the Regulations, as well as items needed for clarity or that would be beneficial to the EIA.

## COMMENTS

### Proposed Project Description and Need

6) Discuss the land acreage to be disturbed during each phase.

- The specific the land acreage to be disturbed during each phase is not discussed.

7) List square footage and height (in stories) of new buildings.

- The specific square footage and height (in stories) of new buildings is not discussed.

9) Show number of parking spaces in parking lots and decks.

- The number of parking spaces for the amenity space and garden parking lots is not shown on a map.

### Existing Environment and Project Impacts

1) Geography

- Provide a topographic map of the property and surrounding area, use the county GIS website topography (2' contour interval) data at a scale appropriate for the project size, i.e., 1" = 100', etc.).

- The provided Topographic map (Figure 4) references NCDOT's GIS topography (2' contour interval) and not the county's GIS topography. The scale is 1":1,200' scale.

- Show areas that will be graded or filled, and provide estimated cut/fill volumes.

- Estimated cut/fill volumes are not provided.

2) Soils and Prime Farmlands

- Discuss any soil constraints (fill, wetland soils, septic suitability, slopes, etc.), and indicate those areas on a map.

- Soil constraints (fill, wetland soils, septic suitability, slopes, etc.), are not discussed or indicated on a map.

- If soil will be relocated, specify the number of square yards/feet to be moved, and its relocation site.

- The number of square yards/feet of soil to be moved is not specified nor is the relocation site.





- Describe runoff management plans for the project.
  - Runoff management plans are not discussed.
- 6) Areas of Archaeological or Historical Value
- A period should be added to the last sentence in the first paragraph.
  - Provide photographs of any significant resources, including all structures older than 50-years.
  - Photographs of the Bynum-Lambeth House located on-site are not included.
  - Provide relevant correspondence with the Chatham County Historical Association and NC SHPO.
  - Relevant correspondence is not included (the determination made by the Chatham County Planning Department that the conditional use permit requirement for an archeological survey has been met, as well as, the correspondence with Bev Wiggins of the Chatham County Historical Society).
- 8) Noise Levels
- Specify the distance at which the increased noise will be heard.
  - The distance at which the increased noise will be heard is not specified.
  - Discuss whether surrounding properties will be affected by noise levels.
  - Whether or not surrounding properties will be affected by noise levels is not discussed.
- 10) Surface and Groundwater Resources (discuss separately)
- Discuss any known groundwater quality issues.
  - Known groundwater quality issues, or the lack thereof, are not discussed.
- 11) Fish and Aquatic Habitats
- River is misspelled in the first sentence of the first paragraph.
- 12) Wildlife and Natural Vegetation
- If forests will be cleared, discuss the extent of planned deforestation and specify the forestry methods to be used, including BMPs.
  - The forestry methods to be used, including BMPs, is not discussed.
- 13) Hazardous Materials
- List all hazardous materials to be stored or introduced during construction or operation.
  - Different size fonts are used within the same paragraph in this section.



## References

- Please include references and or supporting documentation for the following:
  - Chatham County Subdivision Regulations and Ordinance;
  - Sources for:
    - Job Growth Statistics;
    - Current and Projected Population;
    - Annual Growth Rate;
  - Chatham County Stormwater Regulations;
  - Chatham County Sediment and Erosion Control regulations;
  - Chatham county Zoning Regulations;
  - Publicly Available Records Used in Section 3;
  - USGS Topographic Map;
  - 1985 Detailed Geologic Map of North Carolina;
  - Chatham Co GIS;
  - NC Flood Mapping Program;
  - FEMA FIRM Map;
  - Previous 401 and 404 permits;
  - NOV-2008-PC-0714;
  - Repair and Stabilization Plans;
  - Monitoring Reports;
  - Close Out Letter;
  - Regional Supplement to the Corps of Engineers Wetland Delineation Manual;
  - A field Guide to North Carolina Wetlands;
  - State Historic Preservation Office
  - County Ordinances Related to Parking, Lighting and Signage;
  - NC-DWR's Classification and Water Quality Standards Applicable to Surface Waters and Wetlands of North Carolina.
  - Hydrologic Maps; and
  - Sources of Aerial Photography.



## LIMITATIONS

Comments do not include additional assessment of any of the environmental categories listed in the EIA or verification of the information that was presented as accurate. Additional assessment services typically include, but are not limited to: detailed surveys for traffic, air quality, noise, archaeological and cultural resources, threatened and endangered species; determinations of National Register eligibility; wetland delineations; and/or floodplain analysis, including the 8 step process.

Please do not hesitate to contact F&R if you have any questions regarding our comments.

Respectfully Submitted,  
**FROEHLING & ROBERTSON, INC.**

Christopher J. Burkhardt  
Senior Environmental Professional



# **Soil & Environmental Consultants, PA**

11010 Raven Ridge Road • Raleigh, North Carolina 27614 • Phone: (919) 846-5900 • Fax: (919) 846-9467  
www.SandEC.com

## **Environmental Impact Assessment for the Retreat at Haw River**

**Chatham County, North Carolina**

**April 2014**

**Prepared for:**

**Crescent Communities  
Scott Munday  
227 W. Trade Street, Suite 1000  
Charlotte, NC 28202**

**Submitted to:**

**Chatham County, North Carolina  
Division of Environmental Quality  
Dan LaMontagne, PE  
12 East Street, Suite 5106  
Pittsboro, NC 27312  
Telephone: (919) 542-0945**

**Prepared By:**

**Soil and Environmental Consultants, PA  
David Gainey  
11010 Raven Ridge Rd.  
Raleigh, NC 27614  
Phone: (919) 846-5900  
E-mail: [dgainey@sandec.com](mailto:dgainey@sandec.com)**

**CE Group  
Mark Ashness  
301 Glenwood Avenue, Suite 220  
Raleigh, NC 27613  
Phone: (919) 367-8790  
E-mail: [mark@cegrouppinc.com](mailto:mark@cegrouppinc.com)**

**S&EC Project No. 6748.D5**

**Table of Contents**

**1.0 Proposed Project Description and Need ..... 1**

**2.0 Alternatives Analysis ..... 1**

**3.0 Existing Environment and Project Impacts ..... 2**

**3.1 Geography ..... 2**

        3.1.1 Geographic Setting/Geology..... 2

        3.1.2 Topography ..... 2

        3.1.3 FEMA Floodplains..... 2

**3.2 Soils and Prime Farmlands ..... 2**

**3.3 Land Use ..... 4**

**3.4 Wetlands ..... 4**

**3.5 Public Lands, Scenic, and Recreational Areas ..... 5**

**3.6 Areas of Archaeological or Historical Value ..... 6**

**3.7 Air Quality ..... 7**

**3.8 Noise Levels ..... 7**

**3.9 Light Levels ..... 7**

**3.10 Water Resources ..... 7**

        3.10.1 Surface Water..... 7

        3.10.2 Ground Water ..... 8

**3.11 Fish and Aquatic Habitats..... 8**

**3.12 Wildlife and Natural Vegetation..... 8**

        3.12.1 Natural Communities ..... 8

        3.12.2 Endangered and Threatened Species ..... 10

        3.12.3 Wildlife..... 11

        3.12.4 Invasive Species ..... 12

        3.12.5 Forest Resources ..... 12

**3.13 Hazardous Materials..... 12**

**4.0 State & Federal Permits Required ..... 12**

**5.0 References ..... 13**

**Appendix A - Figures**

**Figure 1 - Project Location Map**

**Figures 2 (a & b) - USGS Topographic Maps Figure 3 - FEMA Floodplains Map**

**Figures 3 (a & b) - Aerial Maps**

**Figure 4 - Existing Topography Map**

**Figure 5 - FEMA Flood Lines Map**

**Figure 6 - Soil Survey Map**

**Figure 7 - Farmland Classification Map**

**Figure 8 - Land Use Map**

**Figure 9 - Tax Parcel Map**

**Figure 10 - Zoning Map**

**Figure 11 - Stream & Wetland Map**

**Figure 12 - Chatham County Buffers Map**

**Figure 13 - Public Lands Map**

**Figure 14 - Historic Areas Map**

**Figure 15 - Natural Communities Map**

**Figure 16 - Hydrologic Map**

**Figures 17 (a & b) - Natural Heritage Element Maps**

**Appendix B - Site Photographs (Natural Communities, Cultural Resources, Wildlife Habitat)**

**Appendix C - Site Calculations**

**Appendix D - Existing Conditions Plan**

**Appendix E - Conservation Space Plan**

**Appendix F - Master Plan**

**Appendix G - Utility and Land Disturbance Plan**

**Appendix H - Traffic Report**

**Appendix I - SHPO Letter**

## **1.0 Proposed Project Description and Need**

The Retreat at Haw River consists of +/- 646 AC. The property is currently entitled for the development of up to 185 single family residential lots with County Water and Individual Septic Systems. The project is bordered by State Park property and the Haw River to the south. The community of Bynum is located to the west. Two existing large lot subdivisions (Redbud and Bynum Ridge) are located to the east. Baldwin Peak Subdivision is located to the north across Bynum Ridge Road. There are already 67 platted lots within the project. The project as proposed will provide for 393 single family residential lots along with a community amenity. The conservation subdivision ordinance requires at least 40% of the land mass be preserved with 80% of that to be left as natural space. We anticipate this project having at least 66% open space versus the required 40%. The conservation space (which will account for up to 260 acres) will primarily be left as natural space other than introduction of trails and minimal utility crossings. We expect that closer to 95% of the conservation area to be left undisturbed as open space versus 80% (permitted by ordinance). The supporting calculations can be found in Appendix C. Appendix E provides the designated conservation areas which includes: State Natural Heritage Area, Wetlands & Stream Buffers, Floodplain, Steep Slopes, and Perimeter Buffers.

The Triangle region as a whole is now recognized nationally as one of the top 10 locations for job growth and concurrently population growth. The triangle region is home to 1.5 million people and is expected to add 1 million additional residents by 2035. With the University of North Carolina to the north and Cary to the east, Chatham County will likely exceed the current annual growth rate of 3.5%.

The option to develop this property as a conservation subdivision is very appealing in that prime natural areas can be left in open space rather than in lots as currently entitled. With direct connection to the Haw River substantial open space can be provided. The existing meadows on the west side of Pokeberry Creek are now reserved as open space. Existing trails along the Haw River (portions of which enter the property) can now be set aside as permanent open space. All residential construction will comply with applicable County codes. The amenity on the east side of Pokeberry Creek will serve the community. We expect the site construction to take place in (2) phases; The first phase north and east of Williams Pond. The second phase will include the remainder. The project will comply with County regulations addressing both stormwater quantity and quality. The project will be compliant with County sediment and erosion control regulations during construction phase. No off-site impacts are anticipated.

## **2.0 Alternatives Analysis**

The project can be developed as currently approved. Much of the State Natural Heritage Area is located inside residential lots on the current approved subdivision plan. The entitled plan does have some limited buffers along the Haw River, however, the vast majority of area set aside for conservation will be within lots under the current plan. The current zoning of R-2 would also allow for the development of 260 single family lots.

The site could also be developed to match the surrounding zoning of R-5 in the river corridor and R-1 outside. This zoning would allow for the development of up to 355 residential lots. The conservation subdivision approach affords a density bonus to the developer for setting aside significant conservation and further protecting the site's natural features. Both alternatives would allow for a total site impervious coverage of up to 24%. The proposed conservation subdivision will be less than 15% impervious. More importantly, the impervious coverage within the river corridor associated with the subdivision (east side of Pokeberry Creek) will be less than 7%.

### **3.0 Existing Environment and Project Impacts**

The following sections (3.1 – 3.13) describe conditions as observed during several visits to the project site between 2004 and 2013, and as collected from other sources including GIS data resources and publicly available records.

#### **3.1 Geography**

The Retreat at Haw River site is located in the Piedmont physiographic province in the Cape Fear River Basin. Figures 2A and 2B depict the site as shown on the Bynum and Farrington USGS topographic quadrangles.

##### **3.1.1 Geographic Setting and Geology**

The Retreat at Haw River site is situated in the Carolina Slate Belt. The 1985 Detailed Geologic Map of North Carolina shows geology across the site transitioning from metamorphosed granitic rock in the extreme northwestern portion of the site to felsic metavolcanic rock to the south and east. No impacts to the geographic setting or geology are anticipated.

##### **3.1.2 Topography**

Existing topography on the site ranges from steep slopes to relatively flat areas. Drainage is generally southwestern. Elevation above sea level ranges from 300 feet at the floodplain of the Haw River to 510 feet, in the southeastern portion of the site. For reference, USGS and Chatham County 2-foot Lidar based topographic maps of the site are included as Figures 2A, 2B, and 4.

##### **3.1.3 FEMA Floodplains**

Figure 5 depicts the studied extent of FEMA flood hazard areas, as per the NC Flood Mapping Program data, on and adjacent to the Retreat site. The project site is located on FEMA FIRM panel 9753. See figure 5 for the 1 percent annual chance flood hazard lines along the Haw River and Pokeberry Creek. No impacts to the 100-year floodplain are anticipated.

##### **3.1.4 Areas anticipated for Grading Activity**

Appendix G depicts areas anticipated for clearing and or grading activity. We anticipated (1) aerial sewer crossing of a buffered stream (temporary impact) and (1) location for subsurface bore under Pokeberry Creek. The sub-surface bore location will also have a trail crossing with pedestrian bridge for future access and maintenance.

#### **3.2 Soils and Prime Farmlands**

Figure 6 depicts the soil series located on the Retreat at Haw River site as shown on the Chatham County Soil Survey. Descriptions of select characteristics of these soil series follow. For additional information, the interested reader is referred to the Soil Survey of Chatham County, North Carolina (NRCS 2006). Figure 7 depicts the soil series on-site by their respective farmland classifications. No soils contamination expected.

Soil series located on-site include:



ChA – Chewacla and Wehadkee Soils, 0 to 2 % slopes, frequently flooded: Poorly to somewhat poorly drained, unsuitable for urban development and septic fields. This is a hydric soil series, and is considered to be prime farmland if drained and protected from flooding.

GaB – Georgeville Silt Loam, 2 to 6 % slopes: Well drained, moderately permeable, suitable for woodland, pasture, hayland, cropland, and urban development. This soil series is considered to be prime farmland.

GaC – Georgeville Silt Loam, 6 to 10 % slopes: Well drained, moderately permeable, suitable for woodland, pasture, hayland, cropland, and urban development. This soil series is considered to be farmland of statewide importance.

GeB2 – Georgeville Silty Clay Loam, 2 to 6 % slopes, moderately eroded: Well drained, moderately permeable, suitable for woodland, pasture, hayland, cropland, and urban development. This soil series is considered to be prime farmland.

GeC2 – Silty Clay Loam, 6 to 10 % slopes, moderately eroded: Well drained, moderately permeable, suitable for woodland, pasture, hayland, cropland, and urban development. This soil series is considered to be farmland of statewide importance.

GkD – Georgeville-Badin Complex, 10 to 15 % slopes: Well drained, moderately permeable, suitable for woodland, pasture and hayland. This soil series is considered to be farmland of statewide importance.

GkE – Georgeville-Badin Complex, 15 to 30% slopes: Well drained, moderately permeable, suitable for woodland, pasture and hayland. This soil series is considered to be unimportant for farmland.

GoE – Goldston-Badin Complex, 15 to 35 % slopes: Well to excessively drained, moderate to moderately rapid permeability, suitable for woodland, pasture, and hayland. This soil series is considered to be unimportant for farmland.

NaB – Nanford-Badin Complex, 2 to 6 % slopes: Well drained, moderately permeable, suitable for woodland pasture, hayland cropland, and urban development. This soil series is considered to be prime farmland.

NaC – Nanford-Badin Complex, 6 to 10 % slopes: Well drained, moderately permeable, suitable for woodland pasture, hayland cropland, and urban development. This soil series is considered to be farmland of statewide importance.

RvA – Riverview Silt Loam, 0 to 3 % slopes: Well drained, moderately permeable, frequently flooded, suitable for woodland, pasture, hayland, cropland, and recreation. This soil series is considered to be prime farmland if it is protected from flooding and not flooded during the growing season.

Anticipated impacts to soils during development include grading, excavation and filling during construction. These activities will modify the composition of the soils within the Retreat at Haw River site. The following table lists approximate estimates of anticipated future disturbance to soils, including farmland soils.

Soil Series	Farmland Classification	Approximate Total Acreage On-Site	Proposed Total Disturbed Acreage	Proposed Undisturbed Acreage
ChA	Prime if Drained & Protected from Flooding during the Growing Season	70.73	12.81	57.92
GaB	Prime	69.88	60.84	9.04
GaC	Statewide Importance	64.07	49.02	15.05
GeB2	Prime	77.09	60.90	16.19
GeC2	Statewide Importance	144.50	105.33	39.17
GkD	Statewide Importance	103.75	47.52	56.23
GkE	Not Important	103.51	33.90	69.61
GoE	Not Important	4.48	4.18	0.30
NaB	Prime	4.45	3.45	1.00
NaC	Statewide Importance	1.60	0.94	0.66
RvA	Prime if Protected from Flooding and Not Flooded during the Growing Season	0.21	0.00	0.21
Water	Not Important	5.29	0.00	5.29

### 3.3 Land Use

The Existing land use within and adjacent to the site is primarily a mix of forested areas and residential development. A portion of the site has previously been cleared and infrastructure (roads, stormwater devices, and some utilities) installed. The remainder of the site is forested. The Retreat at Haw River site is currently zoned as CU-RA-90 for residential development. Other zoning designations within a 1-mile radius of the site include Unzoned, MH-NC, B-1, IND-H, MH-NC, R-1, CU-IND-L, O&I, and R-5. Zoning and land use is shown in Figures 8 and 10.

The proposed change in land use of forested portions of the Retreat at Haw River site to residential development is consistent with the surrounding land use. Portions of the site have been designated as open space, and many of these areas will remain in a forested or mostly forested condition after development.

The proposed project will revert and conform to the pre-existing zoning of R-5 (River Corridor) and R- 1 (outside River Corridor). This reversion is in conformance with surrounding zoning.

### 3.4 Wetlands

A detailed wetland delineation of the Retreat site was conducted in 2004. Streams and wetlands were reviewed and confirmed by the US Army Corps of Engineers (USACE). These streams and wetlands were surveyed and a final survey map was submitted to the USACE and a Signed Jurisdictional Determination was received from the USACE in August of 2005 that was good for 5 years. USACE Nationwide Permit 39 and North Carolina Division of Water Quality (DWR) 401 approval were issued for wetland and stream impacts to the Retreat site in February of 2005 and November of 2004. The construction of the approved activities within these areas was completed in 2007. No additional permanent wetland or stream impacts are proposed for the Retreat site; we do anticipate some temporary impacts to install various trails and utilities. None of the temporary impacts will involve wetland or stream disturbance.

Violation NOV-2008-PC-0714 was issued in October of 2008 based upon a General Site Permit Inspection performed by DWR in October of 2008. A final Repair and Stabilization Plan was submitted and approved by the DWR and USACE in May of 2009. Repair and Stabilization was performed in February of 2010. Three year monitoring of the repair and stabilization began in 2010. Year Three Monitoring was conducted in July of 2012. A close out letter was submitted to the USACE and DWR in January of 2013.

A re-verification of the streams and wetlands was conducted by S&EC in July and August of 2013. A site visit was conducted with Andy Williams of the USACE in December of 2013 to confirm the stream and wetland delineation. Wetlands and streams on-site have been identified on the attached Wetland Sketch Map, presented as Figure 11. Based on survey map preparation, the total wetland acreage within the area evaluated for this Environmental Impact Assessment is approximately 15.43 acres. Buffers have been added to wetlands in order to comply with current requirements.

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 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) (USACE April 2012). 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).

Ephemeral channels are also regulated by Chatham County. Ephemeral channels were identified during the wetland delineation and stream evaluation conducted in July of 2012, and are shown in Figure 12. The Ephemeral Review was conducted and finalized on October 22, 2013 with Natalie Landry of the Chatham County Land and Water Resources Division.

The wetlands onsite were identified as both Headwater and Bottomland Hardwood Forest wetland type as outlined in the publication A Field Guide to North Carolina Wetlands. These wetland types are common throughout the piedmont region of North Carolina and are found mainly along headwater streams and floodplains like the ones onsite. The primary functions of the wetlands on-site include flood attenuation, pollutant removal, and wildlife habitat.

### **3.5 Public Lands and Scenic, Recreational, and State Natural Areas**

The Retreat at Haw River site is adjacent to public lands owned by the NC Division of Parks & Recreation. This land is located along the southwestern property boundary in the vicinity of the Haw River and the lower floodplain of Pokeberry Creek, and shares approximately 2.5 miles of border with the Retreat at Haw River site. No impacts to recreational use of the public lands are anticipated.

The Haw River Levees and Bluffs site, designated by the NC Natural Heritage Program as a Significant Natural Heritage Area (SNHA), overlaps approximately 36.49 acres of the Retreat at Haw River site in the vicinity of the Haw River. Some of this area is currently within platted lots and can be disturbed. The proposed project moves all of the area designated by SNHA into open space rather than within lots. No impacts to the Haw River Levees and Bluffs SNHA are anticipated.

At the appropriate time additional land will be conveyed to the State Park to ensure that the existing river trail falls within State property and not within the conservation subdivision.

### **3.6 Areas of Archaeological or Historical Value**

A review of online records maintained by the North Carolina State Historic Preservation Office (SHPO) was conducted in March of 2014. Correspondence from SHPO with respect to this project is attached hereto as Appendix I

Two structures are documented by SHPO within the proposed Retreat at Haw River site. These structures are the Bynum-Lambeth House and the Snipe House. Both structures are designated by SHPO as Surveyed Only, and currently are not on the Study List, National Register, or Determined Eligible list. The Snipe House was deconstructed by the Chatham Historical Association. The Bynum-Lambeth House is still standing and is located along Bynum Ridge Road at its most north location adjacent to the site.

Several other existing structures are documented by SHPO to exist within a 1-mile radius of the site. These structures are depicted on Figure 14 and listed below.

Documented structures within a 1-mile radius of the Retreat at Haw River site include:

- CH 0274 Dr. Hackney House (Surveyed Only)
- CH 0279 Snipes House (Gone) (Surveyed Only)
- CH 0280 John Burnett House (Gone?) (Surveyed Only)
- CH 0319 Robert & Louise Moore House (Surveyed Only)
- CH 0320 Bynum-Lambeth House (Surveyed Only)
- CH 0321 Bynum United Methodist Church (Surveyed Only)
- Ch 0322 Main St. Business (Surveyed Only)
- CH 0323 Luther Bynum House (Surveyed Only)
- CH 0324 Carney Bynum House (Surveyed Only)
- CH 0325 Robert Joseph Moore House (National Register, 1998)
- CH 0326 Ben Lambeth House (Surveyed Only)
- CH 0327 Jim Atwater House (Surveyed Only)
- CH 0328 Houses (Surveyed Only)
- CH 0329 J.M. Odell Manufactory Company (Bynum Mill) (Surveyed Only)
- CH 0658 Bridge 405 (Bynum Bridge) (Determined Eligible, 1997)
- CH 0674 Bynum Schoolhouse (Gone) (Surveyed Only)
- CH 0675 Bynum Misc. Bldgs. (Surveyed Only)
- CH 0685 Bynum Mill & Mill Village (Determined Eligible Hist. Dist., 1997)
- CH 0750 Durham House (Surveyed Only)

No impacts are anticipated to any historic structures documented by SHPO except that the Bynum-Lambeth house will likely be removed or deconstructed after consultation with Chatham County Historical Association.

No areas of archaeological significance were noted during previous submittals of the Retreat at Haw River site plan. A request for comments has been sent to the State Office of Archaeology. The original conditional use permit for this project, approved in 2005 contained a condition requiring a certain archeological survey prior to preliminary plat. The Chatham County Planning Department determined that this condition had been met in 2006.

Correspondence was conducted with Bev Wiggins of the Chatham Historical Society. Two cemeteries were noted within the project boundaries. A cemetery was located south of the pond (Bynum E80.1) and has been shown on the proposed site plan. Another cemetery (Bynum-Slave E80.2) was not found during site visits from the Chatham Historical Society and is believed to have been disturbed beyond recognition.

### **3.7 Air Quality**

The proposed development is a residential neighborhood and impacts on ambient air quality will be minimal if any.

Open burning during construction may take place as allowed by local regulations, depending on conditions prevailing at time of need. There will be no open burning after development build out.

Since this is a residential project, there are only two areas where parking will be provided. There will be approximately 35 parking spaces provided at the amenity swimming pool and approximately 12 parking spaces will be provided close to the community garden.

The project as proposed (393 residential units on 646 acres) has a residential density (1 unit per 1.3 AC). With the substantial conservation of wooded areas and limited development, the project will have minimal impact to the ambient air quality.

See Appendix H for Traffic report.

### **3.8 Noise Levels**

Noise levels associated with residential communities are relatively low. During construction temporary noise levels associated with logging, earth moving activities, home construction will occur during daytime hours. These activities will diminish once the project is fully developed in approximately 5 – 7 years.

### **3.9 Light Levels**

The project will follow the Chatham County regulations requiring full cut-off fixtures for the street lighting. Ample perimeter buffering has been provided in order to keep light intensity within the project limits.

### **3.10 Water Resources**

#### **3.10.1 Surface Waters**

##### **Surface Waters**

Surface waters on the Retreat site flow into Pokeberry Creek and the Haw River, which has been classified in NC-DWR's "Classification and Water Quality Standards Applicable to Surface Waters and Wetlands of North Carolina" as WS-IV; NSW. A hydrologic map is provided as Figure 16. S&EC's stream buffer evaluation consisted of examining each feature on the site that

is shown on the most recent version of the US Geological survey's 7.5 Minute Quadrangle or NRCS soil survey using NC-DWR stream evaluation techniques. Jurisdictional streams and Ephemeral drainages were identified during the site evaluation, the approximate locations of which are illustrated in Figure 12. There are no additional impacts to any streams due to the modification of the Retreat site plan. Additional buffers have been added to the Retreat site due to the modification of the Retreat site plan.

***NOTE: Streams on-site have been identified in the field, confirmed by the USACE, and surveyed by a licensed professional surveyor. Ephemeral drainages on-site have been verified by Chatham County.***

### 3.10.2 Groundwater

Drinking water for the Retreat at Haw River site will be provided by Chatham County and no groundwater wells will be utilized at Retreat at Haw River. No impacts are expected to the Groundwater on the Retreat Site

## 3.11 Fish and Aquatic Habitats

Fish and aquatic habitat within the Retreat at Haw River site consists of Pokeberry Creek and Williams Pond and their tributaries and adjacent wetlands. No specific survey for fish or aquatic organisms was performed for the purpose of this assessment; however, some aquatic species were incidentally observed on-site. Aquatic species observed in site tributaries include the Green Sunfish (*Lepomis cyanellus*) and the NHP-designated Significantly Rare Carolina Ladle Crayfish (*Cambarus davidi*). Temporary pools in the floodplain of Pokeberry Creek were observed to support breeding populations of Spring Peepers (*Pseudacris crucifer*) and Upland Chorus Frogs (*Pseudacris feriarum*), and are also expected to provide breeding habitat for American Toads (*Bufo (Anaxyrus) americanus*), Spotted Salamanders (*Ambystoma maculatum*), and other amphibians.

Culverted road crossings with adequate aquatic life passageways have already been constructed across two streams. Incidental observation of aquatic organisms in the vicinity of these impacts shows that many species, including the Carolina Ladle Crayfish, persist immediately upstream and downstream of the impacts. No additional permit stream impacts are anticipated for this project.

## 3.12 Wildlife and Natural Vegetation

The recently conducted wildlife and natural vegetation assessment of the Retreat at Haw River site included both field reconnaissance and investigation of North Carolina Natural Heritage Program (NHP) records. The overall condition of the site with respect to its existing vegetation and wildlife species composition was observed.

### 3.12.1 Natural Communities

Natural Communities and habitat types on the Retreat at Haw River site include dry-mesic oak-hickory, mesic mixed hardwoods, bottomland hardwoods, impoundments, and previously cleared and/or paved areas. Descriptions and locations of these areas follow (See Figure 15).

Dry-mesic oak-hickory forest: This community type occurs at higher elevations and on steeper slopes, and covers approximately 54.24 acres on the Retreat at Haw River site.

Species composition within the dry-mesic oak-hickory forest is as follows: Canopy composed primarily of Southern Red Oak (*Quercus falcata*), Northern Red Oak (*Quercus rubra*), Post Oak (*Quercus stellata*), and White Oak (*Quercus alba*). Understory is moderately sparse and varies across the site. Generally, the understory is composed primarily of American Holly (*Ilex opaca*), with occasional specimens of Red Maple (*Acer rubrum*), Elm (*Ulmus americana*), Dogwood (*Cornus florida*), and Sourwood (*Oxydendrum arboreum*). The understory in these drier areas is notably absent of the invasive Autumn Olive (*Elaeagnus umbellata*). Herb stratum is sparse, with Spotted Wintergreen (*Chimaphila maculata*), Wild Ginger (*Hexastylis arifolia*), and Crane-fly Orchid (*Tipularia discolor*). Vine stratum is also sparse, and is composed primarily of Muscadine (*Vitis rotundifolia*), with some Crossvine (*Bignonia capreolata*).

Mesic mixed hardwood forest: This community type is widespread and covers approximately 469.85 acres of the site. It is found at lower elevations and on the less steep slopes.

Species composition within the mesic mixed hardwood forest varies with stand age across the site, with younger stands composed primarily of densely spaced Loblolly Pine (*Pinus taeda*). Composition in more mature areas is as follows: Canopy varies across the site, but is generally composed primarily of Tulip Poplar (*Liriodendron tulipifera*), with Sweet Gum (*Liquidambar styraciflua*), Red Maple, Sycamore (*Platanus occidentalis*), and Black Walnut (*Juglans nigra*). Understory composed primarily of Autumn Olive, and also includes American Holly and other sapling hardwood species. Herbaceous cover within this community type is generally sparse, and includes Christmas Fern (*Polystichum acrostichoides*), Buttercup Phacelia (*Phacelia covillei*), Baby Blue-eyes (*Nemophila aphylla*), Wild Garlic (*Allium sp.*), and Ebony Spleenwort (*Asplenium platyneuron*). Sporadic other herbaceous species include Sedges (*Carex sp.*) and Lady Fern (*Athyrium filix-femina*). Vines in the mesic mixed hardwood forest include Poison Ivy (*Toxicodendron radicans*), Crossvine, Muscadine, and Roundleaf Greenbrier (*Smilax rotundifolia*).

Bottomland hardwood forest: This community type accounts for approximately 23.57 acres of the Retreat at Haw River site, and is restricted to the less steep topography in the floodplain of Pokeberry Creek.

Species composition within the bottomland hardwood forest is as follows: Canopy dominated by large Sycamore and Tulip Poplar, with occasional River Birch and large Loblolly Pines. The understory is moderately dense, and includes Ironwood (*Carpinus caroliniana*), Spicebush (*Lindera benzoin*), Hazelnut (*Corylus americana*), and Tag Alder (*Alnus serrulata*) as well as the invasive Chinese Privet (*Ligustrum sinense*). The herb stratum is generally dense, and includes False Nettle (*Boehmeria cylindrica*), Buttercup Phacelia, Baby Blue-eyes, Wild Garlic, Royal Fern (*Osmunda regalis*), and the invasive Japanese Stilt Grass (*Microstegium vimineum*). Vines are common, with Japanese Honeysuckle (*Lonicera japonica*) the dominant species. Other vines include Muscadine, Roundleaf Greenbrier, Crossvine, and Poison Ivy.

Impoundment: This community type includes the impounded portion of Williams Pond on the Retreat at Haw River site. The pond is approximately 5.91 acres in size. Plant growth is restricted due to water depth.

Managed Herbaceous: Areas that have been previously cleared of forest account for approximately 81.73 acres on the Retreat at Haw River site. These areas have been managed as pasture and a powerline right-of-way by periodic mowing. Species composition in these areas consists of a mix of primarily herbaceous grasses, with sporadic young woody trees and shrubs.

### 3.12.2 Endangered Species

Endangered species research and site surveys were performed. The scope of rare species investigated during the preparation of this Environmental Impact Assessment includes all species federally protected as Endangered or Threatened under the Endangered Species Act or protected under the Bald and Golden Eagle Protection Act (BGPA) which have been documented by the NC Natural Heritage program as occurring in Chatham County. Additionally, all federally listed, state listed, and NHP listed species documented within a 2-mile radius of the site boundary are described. The tables below describe these species and their habitats, with an assessment of whether potentially suitable habitat for these species may exist on-site.

The Buttercup Phacelia was found to exist within the project boundaries of the Retreat at Haw River Site. The boundary of this population was delineated during April of 2013. The confirmed population acreage is approximately 117 acres within the project boundaries. The approved plan for the Retreat proposed an impact 66 acres of the confirmed population. The newly revised site plan will only impact 39 acres of the confirmed Phacelia population, conserving an additional 27 acres above and beyond the existing approved plan. An additional 30 acres of habitat containing sporadic Phacelia populations within the Pokeberry Creek Floodplain will also be protected and will encourage further spreading of the species within the project boundaries (in total 78 acres preserved).

**Chatham County Federally Protected Endangered and Threatened Species**

<u>Scientific Name</u>	<u>Common Name</u>	<u>Fed. Status</u>	<u>State Status</u>	<u>Co. Status</u>	<u>Habitat Comments</u>	<u>Potentially Suitable Habitat On-site?</u>
<i>Notropis mekistocholas</i>	Cape Fear Shiner	E	E	Chatham – Current	Cape Fear drainage	Not on-site, but documented adjacent to site
<i>Picoides borealis</i>	Red-cockaded Woodpecker	E	E	Chatham– Historical	Mature open pine forests, mainly longleaf	No
<i>Ptilimnium nodosum</i>	Harperella	E	E	Chatham – Current	Rocky riverbeds	Not on-site, but potential habitat adjacent to site
<i>Haliaeetus leucocephalus</i>	Bald Eagle	BGPA	T	Chatham – Current	Nests in large trees adjacent to large water bodies	Yes



**Federal, State, and NHP-listed Species documented within a 2-mile radius of the boundaries of recently added portions of the site (Chatham County)**

<u>Scientific Name</u>	<u>Common Name</u>	<u>Fed. Status</u>	<u>State Status</u>	<u>EO. Status</u>	<u>Habitat Comments (as per NHP)</u>	<u>Potentially Suitable Habitat On-site?</u>
<i>Cambarus davidi</i>	Carolina Ladle Crayfish		SR	Current	Streams in the Neuse and Cape Fear drainages	Yes – Found on-site
<i>Alasmidonta varicosa</i>	Brook Floater	FSC	E	Historical	Perennial streams	Yes
<i>Phacelia covillei</i>	Buttercup Phacelia	FSC	SR-T	Current	Moist woodlands	Yes – Found on-site
<i>Villosa delumbis</i>	Eastern Creekshell		SR	Current	Large perennial streams in Atlantic drainages	Yes
<i>Gomphus septima</i>	Septima's Clubtail	FSC	SR	Current	Rocky rivers	Not on-site, but documented adjacent to site
<i>Lampsilis cariosa</i>	Yellow Lampmussel	FSC	E	Current	River systems, mainly near Fall Line	Not on-site, but documented adjacent to site

### 3.12.3 Wildlife

The Retreat at Haw River site supports many species of mammals, birds, reptiles, and amphibians, as well as fish and aquatic and terrestrial invertebrates. During site visits, Wild Turkey (*Meleagris gallopavo*) and many White-tailed Deer (*Odocoileus virginianus*) were observed.

The Retreat at Haw River site currently contains good quality habitat for many species of wildlife. Oaks, hickories, Persimmons, and other trees and shrubs provide food for mammals and birds. The predominantly deciduous overstory produces a thick layer of leaf litter which supports various detritivores, decomposers, insects, and arachnids. These, in turn, provide food for small insectivorous mammals, reptiles, and amphibians. The leaf layer also provides humidity for woodland species of amphibians, and refuge for small reptile and mammal species. Larger debris, including fallen rotting logs and piles of large rocks relict from previous human activity on the site provide refuge for larger reptiles such as Black Rat Snakes (*Elaphe obsoleta*), Copperheads (*Agkistrodon contortrix*), and rodents. The mature forest trees and sporadically dense shrubs on the site support nests of both large raptors and Neotropical migrant songbirds. Edges between forest and previously cleared areas provide opportunities for reptiles such as Northern Fence Lizards (*Sceloporus hyacinthinus*) to thermoregulate. The semipermanent impoundment and floodplain area supports turtles, fish, amphibians, native mussel species and other aquatic invertebrates.

Anticipated impacts to wildlife habitat include the conversion of forest for residential development, and the fragmentation of forested areas by roads. Smaller species of wildlife and species such as terrestrial amphibians which require specific habitat parameters (i.e. moisture and temperature constraints) will be directly affected the most by this development. Larger species of wildlife and habitat generalists are expected to be less directly affected by the development. During construction, larger wildlife and more mobile wildlife (mammals, birds) will be displaced into the surrounding

areas, which consist of a mixture of forest and residential areas. The only barriers to this displacement are Bynum Ridge Road, east of the site and the Haw River west of the site. Construction may result in a moderate increase in the hazards from displaced wildlife crossing the road.

Following construction, portions of the developed area will remain available for use by larger species of wildlife (deer, coyotes, foxes, squirrels, birds, etc...)

#### **3.12.4 Invasive Species**

Invasive plant species on the Retreat at Haw River site are generally abundant. The most notable of these is the Autumn Olive (*Elaeagnus umbellata*), present in large numbers in the understory of the mesic mixed hardwood forest. Privet is also common, especially at lower elevations and in portions of the bottomland hardwood forest. Other, less common invasive plants include Tree of Heaven, Chinaberry (*Melia azedarach*), Princess Tree (*Paulownia tomentosa*), Japanese Stilt Grass, Japanese Honeysuckle, and English Ivy (*Hedera helix*).

#### **3.12.5 Forest Resources**

Future phases of the proposed development will require additional clearing for road and home construction. Only roadway corridors will be cleared during road construction and clearing only as necessary for this construction.

### **3.13 Hazardous Materials**

During construction gasoline and diesel will be utilized for mechanical equipment. Re-fueling for this equipment will be required to take place in upland areas away from surface waters. For each hazardous material, other than in deminimis quantities or for routine housekeeping purposes, describe the procedures to be used to ensure their proper management, storage, and disposal.

## **4.0 State and Federal Permits Required**

The following site-related permits will be obtained:

Stormwater and Buffer: Chatham County

Sedimentation /Erosion Control: Chatham County

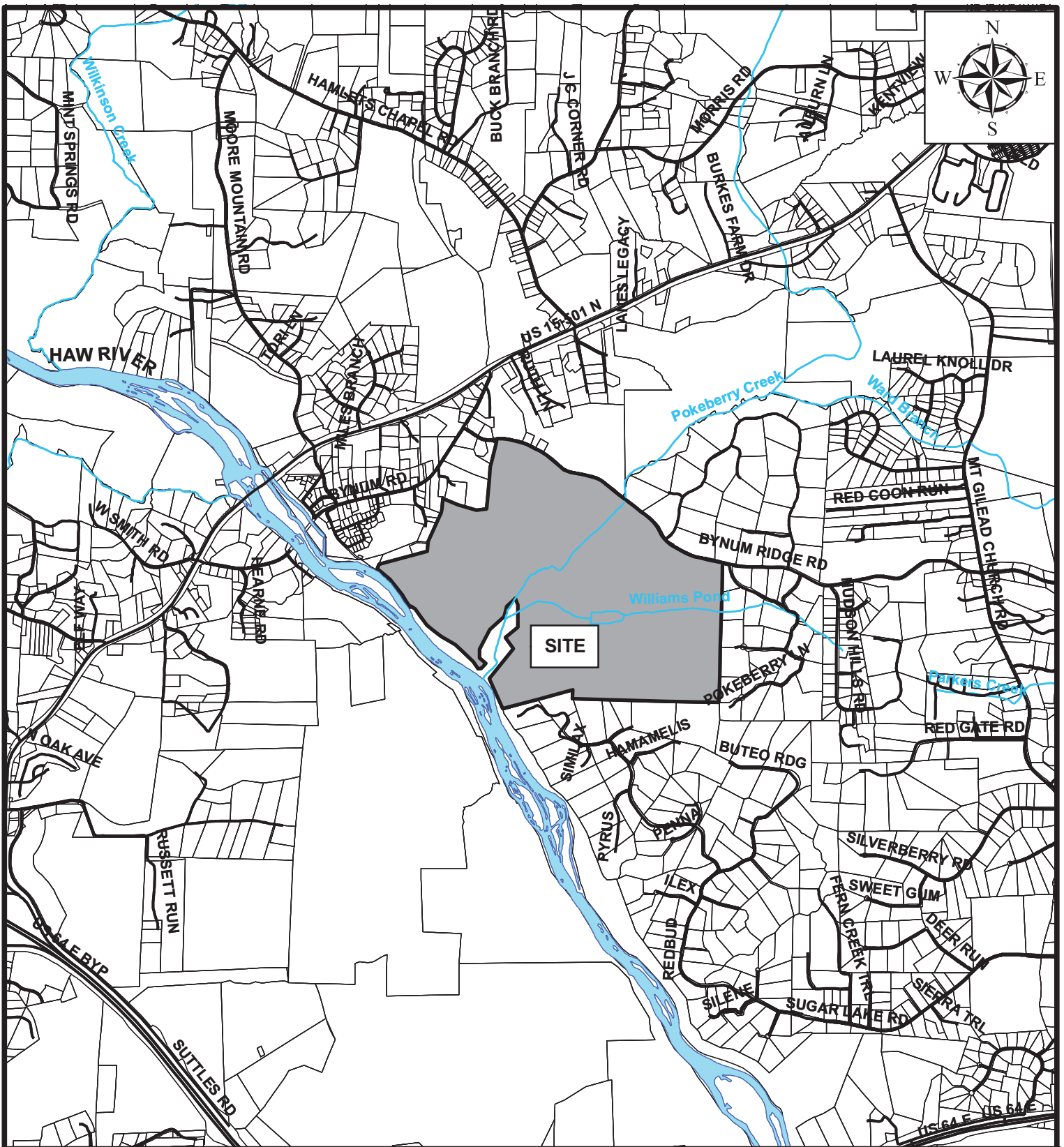
Water Distribution: Chatham County and NC Public Water Supply

Sanitary Sewer: Permit required from the NCDENR Division of Water Quality, Non-Discharge Permitting Unit for proposed sanitary sewer extensions.

## 5.0 References

[NHP] North Carolina Natural Heritage Program. 2014. Internet-based search:  
<<http://www.nconemap.com/GetData/DownloadFTP/tabid/286/Default.aspx>> accessed February 2014.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture.  
Official Soil Series Descriptions [Online]. Available URL: "  
<http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx> " Accessed January, 2014.



**Figure 1:  
Project Location Map**



Project No.  
6748.D5

Project Mgr.:  
DG

Scale:  
1" = 3,000'

2014-02-17

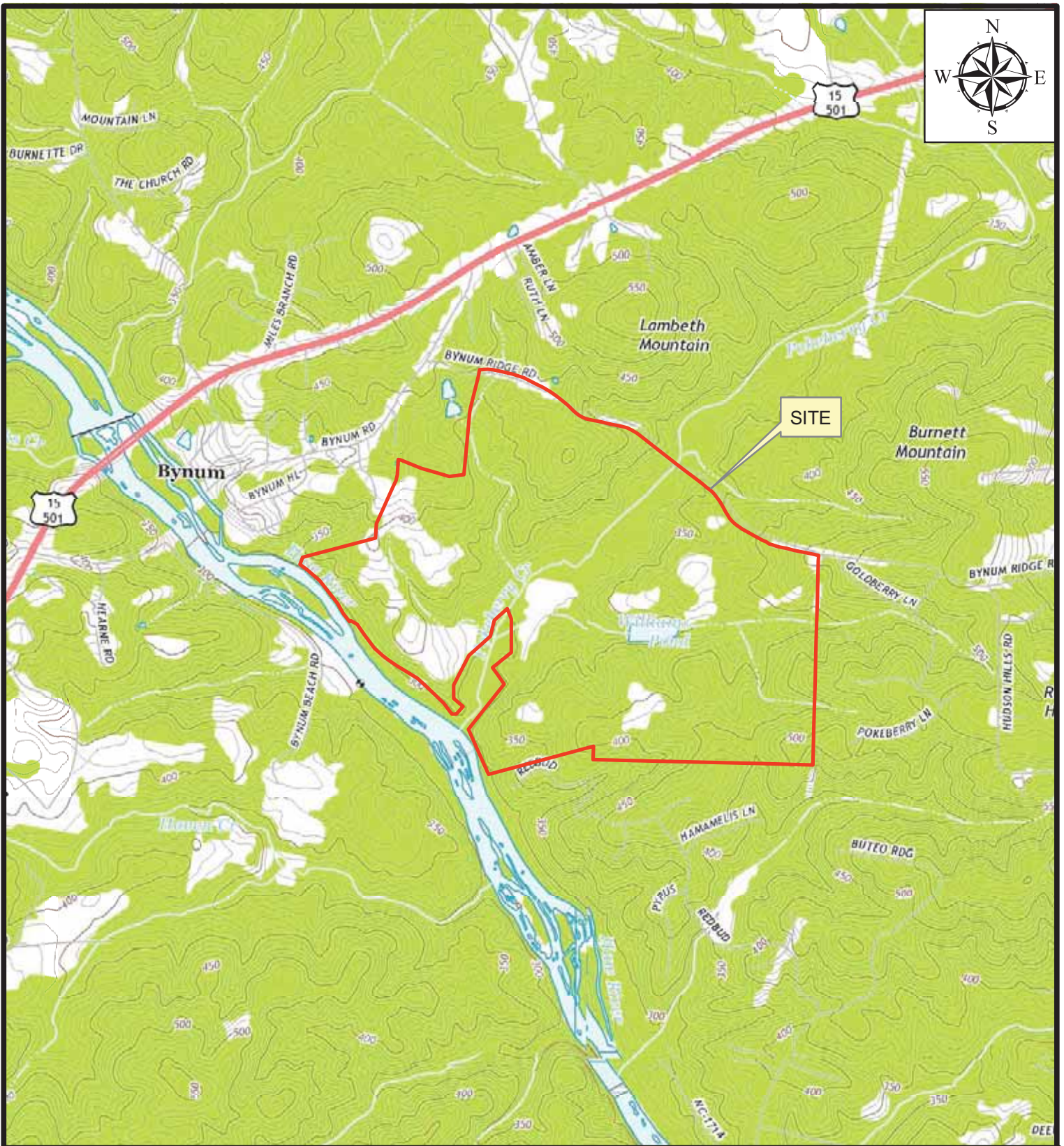
The Retreat at Haw River  
Chatham Co., NC

Parcels, Centerlines & Hydro  
Polygons from Chatham Co. GIS  
Hydro Lines from NCDENR GIS



**Soil & Environmental Consultants, PA**

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



**Figure 2a:  
USGS Vicinity Map**



Project No.  
6748.D5

Project Mgr.:  
DG

Scale:  
1" = 2,000'

2014-02-17

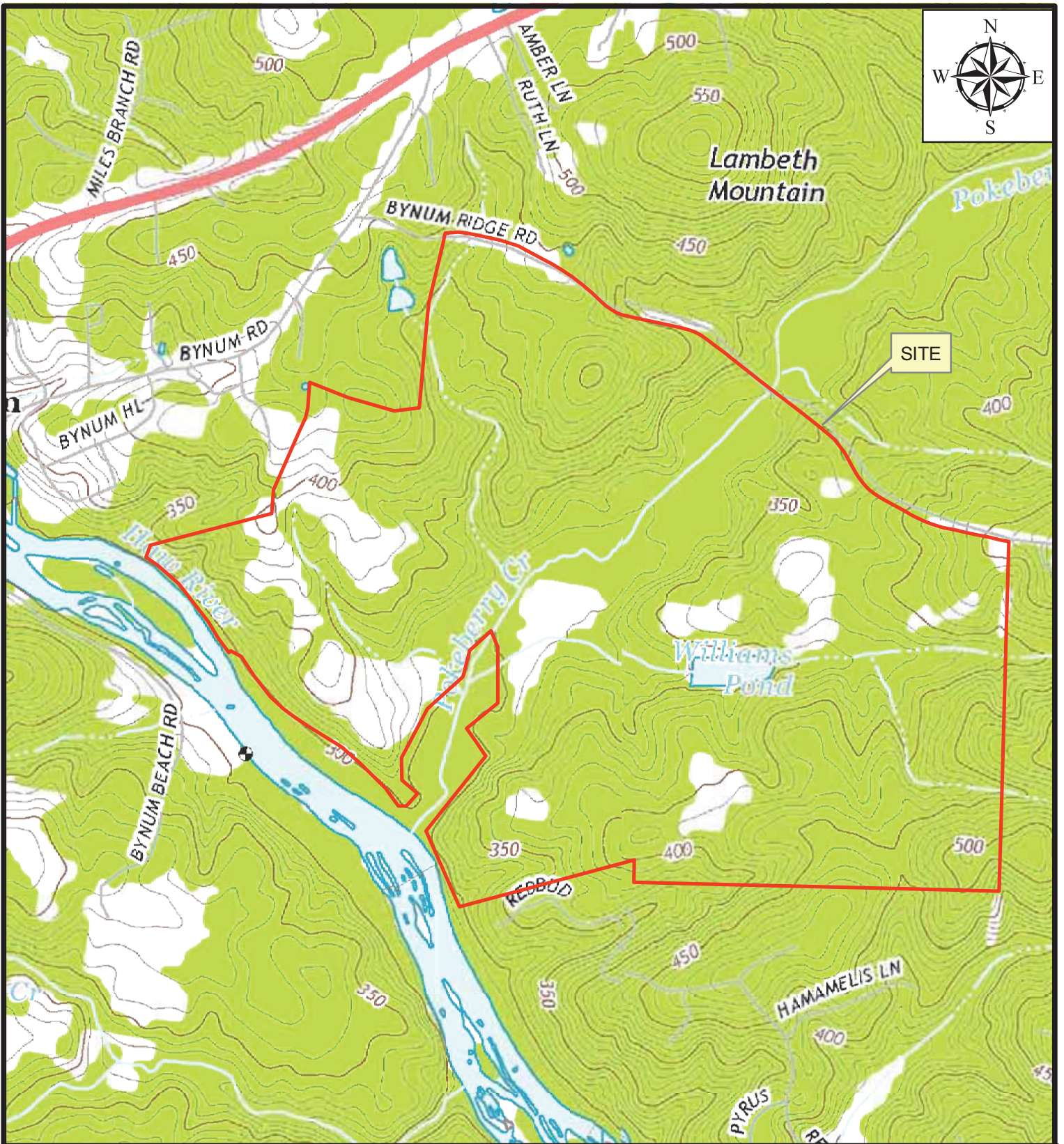
The Retreat at Haw River  
Chatham Co., NC

2013 Bynum & Farrington  
USGS Quadrangles  
(Portions of Merry Oaks &  
Pittsboro Quads also shown)



**Soil & Environmental Consultants, PA**

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



**Figure 2b:  
USGS Site Map**



Project No.  
6748.D5

Project Mgr.:  
DG

Scale:  
1" = 1,200'

2014-02-17

The Retreat at Haw River  
Chatham Co., NC

2013 Bynum & Farrington  
USGS Quadrangles



**Soil & Environmental Consultants, PA**

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



Project No.  
6748.D5

Project Mgr.:  
DG

Scale:  
1" = 2,000'

2014-02-17

**Figure 3a:  
Aerial Vicinity Map**

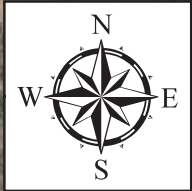
The Retreat at Haw River  
Chatham Co., NC

2013 Aerial from NCOneMap.com



**Soil & Environmental Consultants, PA**

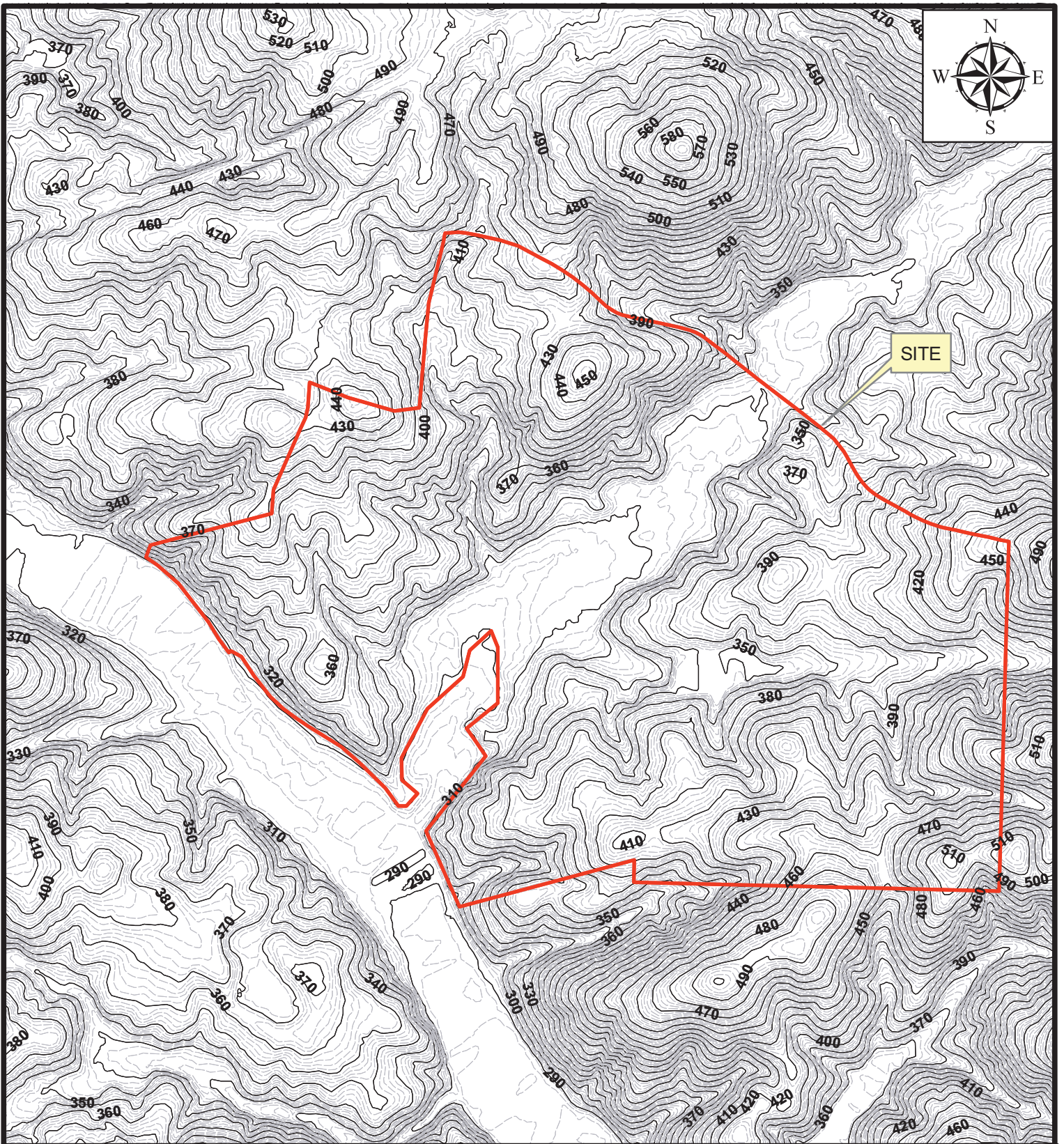
8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467  
sandec.com



SITE

<p><b>Project No.</b> 6748.D5</p>	<p align="center"><b>Figure 3b:</b> <b>Aerial Site Map</b></p> <p>The Retreat at Haw River Chatham Co., NC</p>	<p align="center">0    600    1,200    2,400    3,600</p> <p align="center">————— Feet</p>
<p><b>Project Mgr.:</b> DG</p>		
<p><b>Scale:</b> 1" = 1,200'</p>	<p>2013 Aerial from NCOneMap.com</p>	<div data-bbox="711 1885 867 2039" style="background-color: black; color: white; padding: 5px; display: inline-block; font-weight: bold; font-size: 24px;"> <b>S&amp; EC</b> </div> <p><b>Soil &amp; Environmental Consultants, PA</b> 8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467 sandec.com</p>
<p>2014-02-17</p>		





**Figure 4:**  
**Existing Topography Map**  
 The Retreat at Haw River  
 Chatham Co., NC



Project No.  
 6748.D5

Project Mgr.:  
 DG

Scale:  
 1" = 1,200'

2014-02-17




Contours from NCDOT GIS,  
 Contour interval = 2'

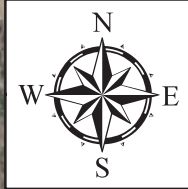


**Soil & Environmental Consultants, PA**

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

# Legend

-  FEMA 1 PCT ANNUAL CHANCE FLOOD HAZARD
-  FEMA Water Lines
-  Site Boundary



**Figure 5:  
FEMA Flood Lines Map**



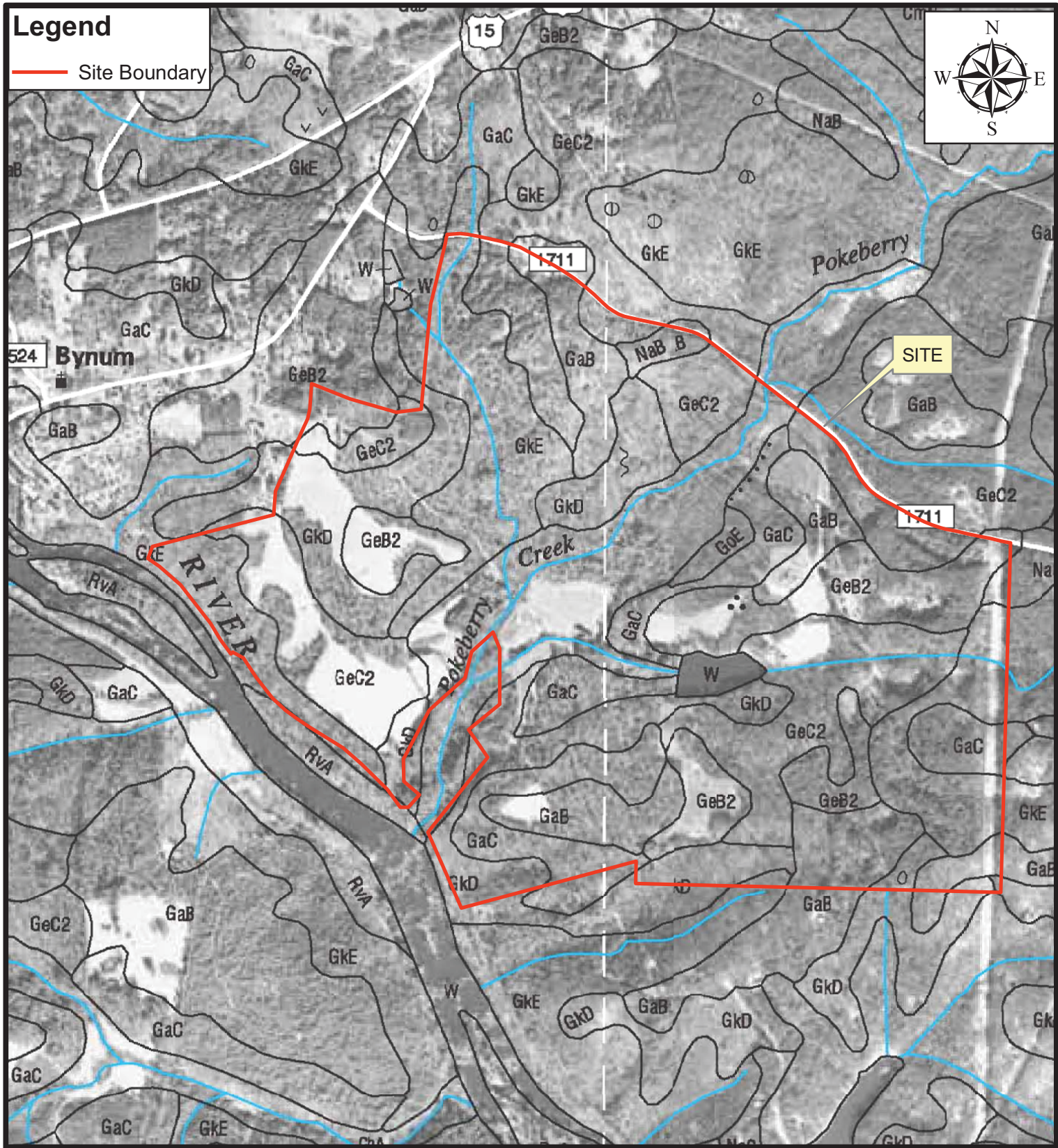
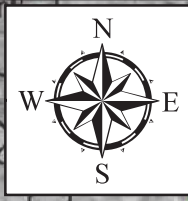
Project No. 6748.D5
Project Mgr.: DG
Scale: 1" = 1,200'
2014-02-17

The Retreat at Haw River Chatham Co., NC
FEMA Flood Lines from NCFloodMaps.com



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

**Legend**  
 — Site Boundary



**Figure 6:  
 Soil Survey Map**

Project No.  
 6748.D5

Project Mgr.:  
 DG

Scale:  
 1" = 1,200'

2014-02-18

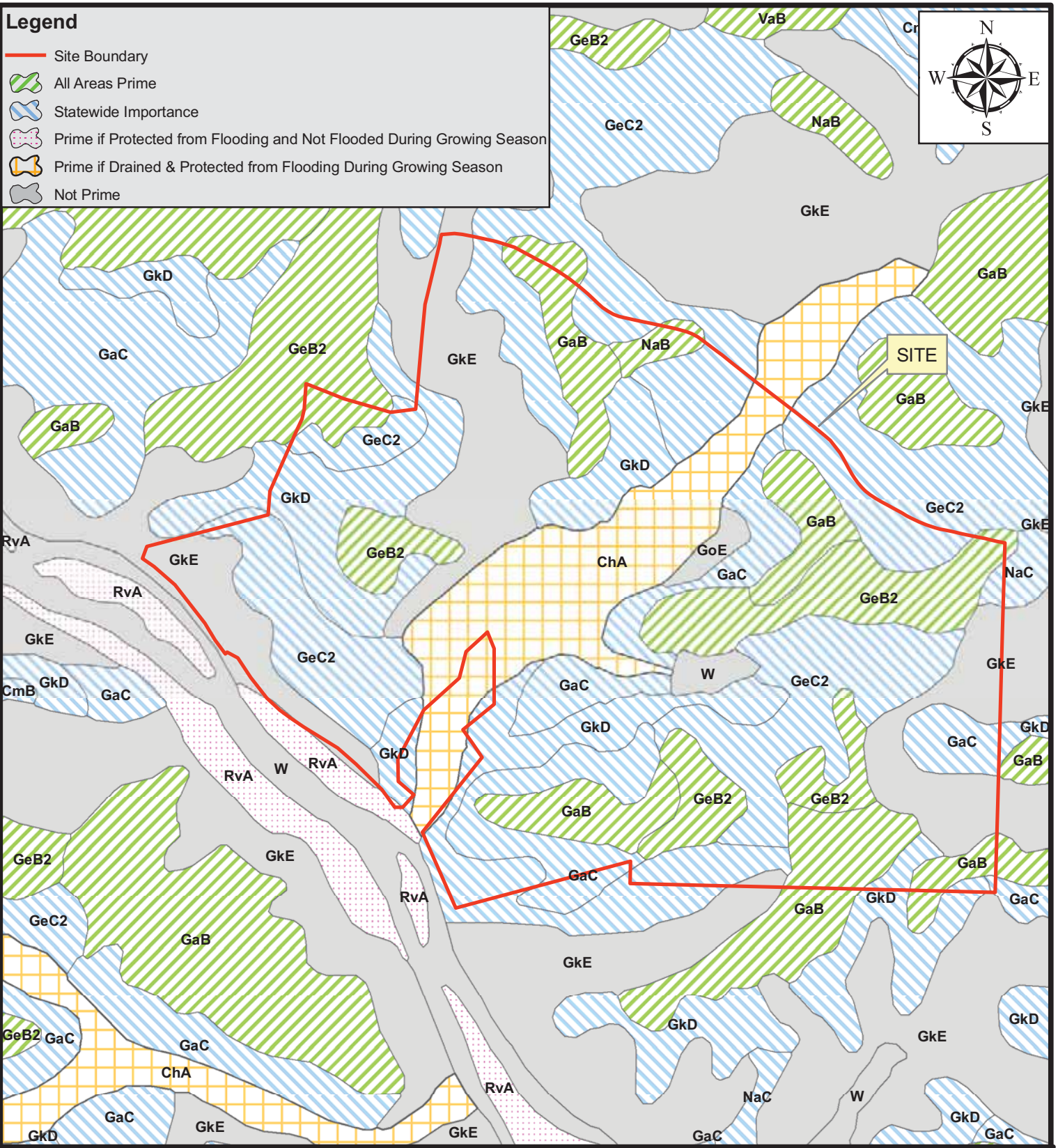
The Retreat at Haw River  
 Chatham Co., NC

2006 Printed Chatham  
 Co. Soil Survey, Bynum  
 & Farrington Map Sheets



**Soil & Environmental Consultants, PA**

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



Project No.  
6748.D5

Project Mgr.:  
DG

Scale:  
1" = 1,200'

2014-02-18

**Figure 7:  
Farmland  
Classification Map**  
The Retreat at Haw River  
Chatham Co., NC

Farmland Classifications from  
NRCS/USDA Web Soil Survey



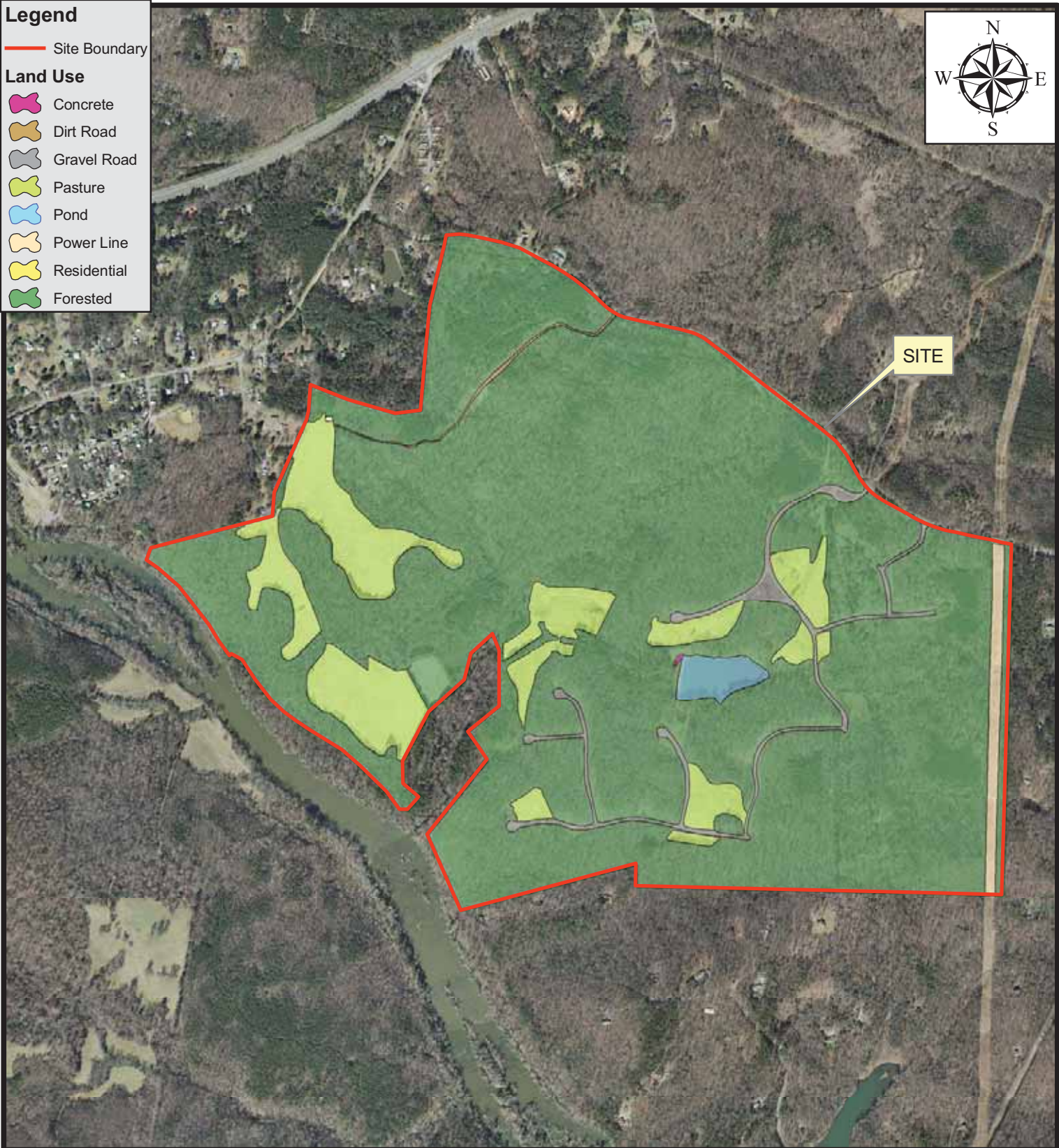
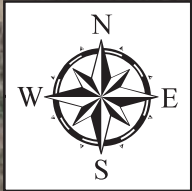
**Soil & Environmental Consultants, PA**  
 8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467  
 sandec.com

**Legend**

- Site Boundary

**Land Use**

- Concrete
- Dirt Road
- Gravel Road
- Pasture
- Pond
- Power Line
- Residential
- Forested



Project No. 6748.D5	<b>Figure 8: Land Use Map</b>	<p>0    600    1,200    2,400    3,600 Feet</p>
Project Mgr.: DG	The Retreat at Haw River Chatham Co., NC	<p><b>Soil &amp; Environmental Consultants, PA</b></p> <p>8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467 sandec.com</p>
Scale: 1" = 1,200'	Land Uses Digitized from 2013 Aerial	
2014-02-18		

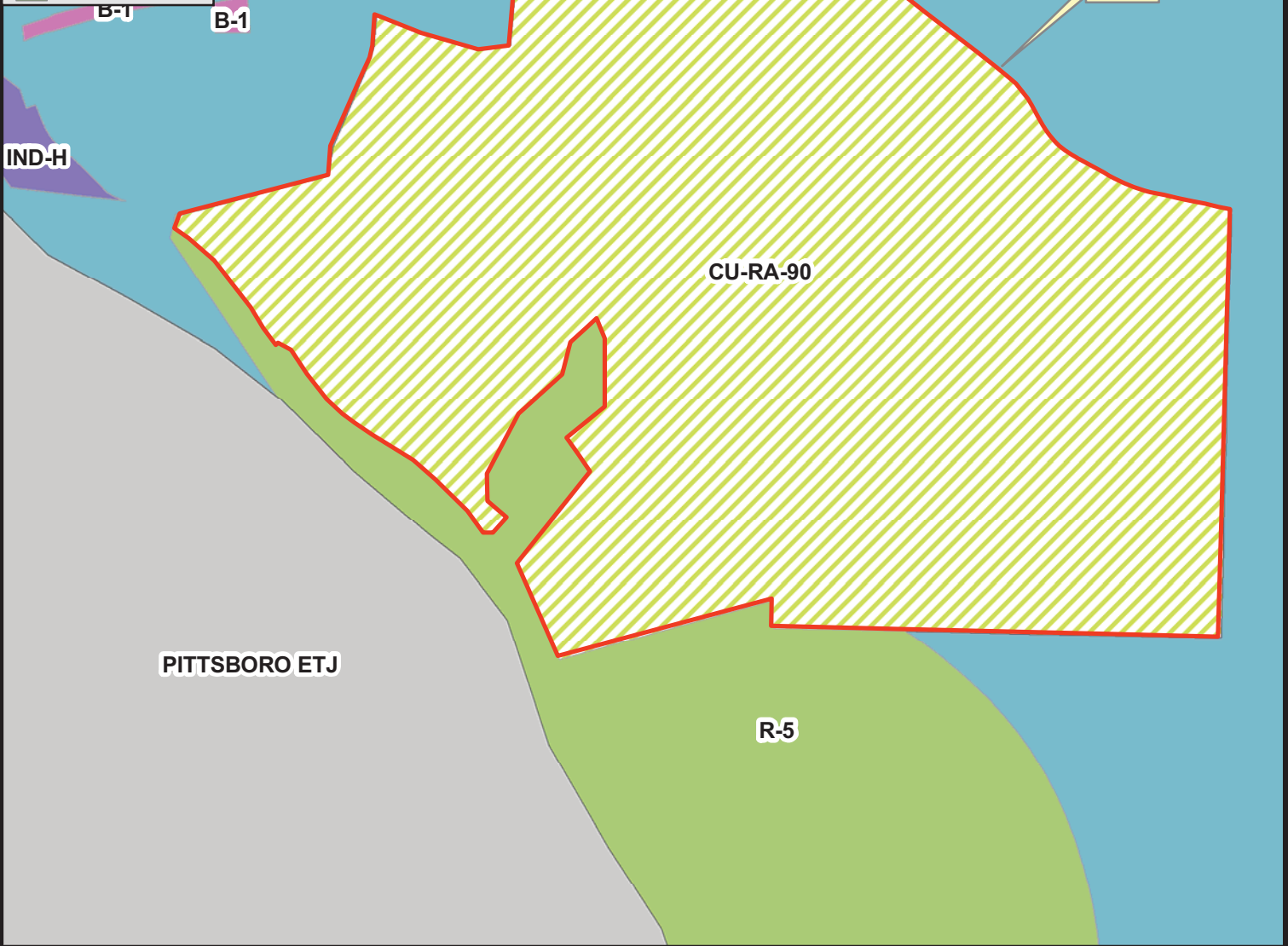


**Legend**

- Site Boundary

**Zoning**

- B-1
- CU-B-1
- CU-IND-L
- CU-O&I
- CU-RA-90
- IND-H
- MH-NC
- PITTSBORO ETJ
- R-1
- R-5



<b>Project No.</b> 6748.D5
<b>Project Mgr.:</b> DG
<b>Scale:</b> 1" = 1,200'
2014-02-18

**Figure 10:  
Zoning Map**

The Retreat at Haw River  
Chatham Co., NC

---

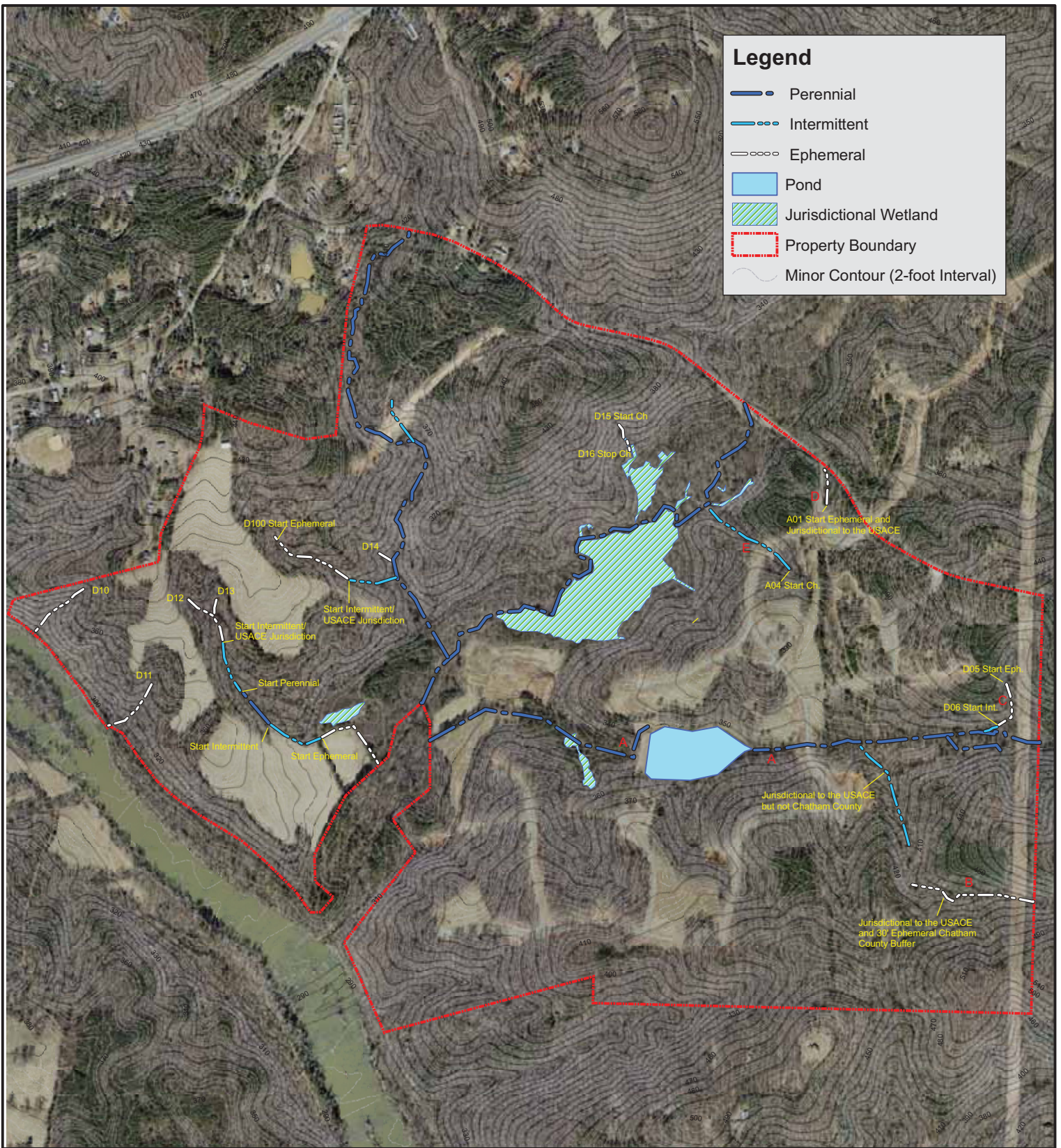
Zoning from Chatham Co.  
GIS, Version May 2012

0    600    1,200    2,400    3,600

Feet

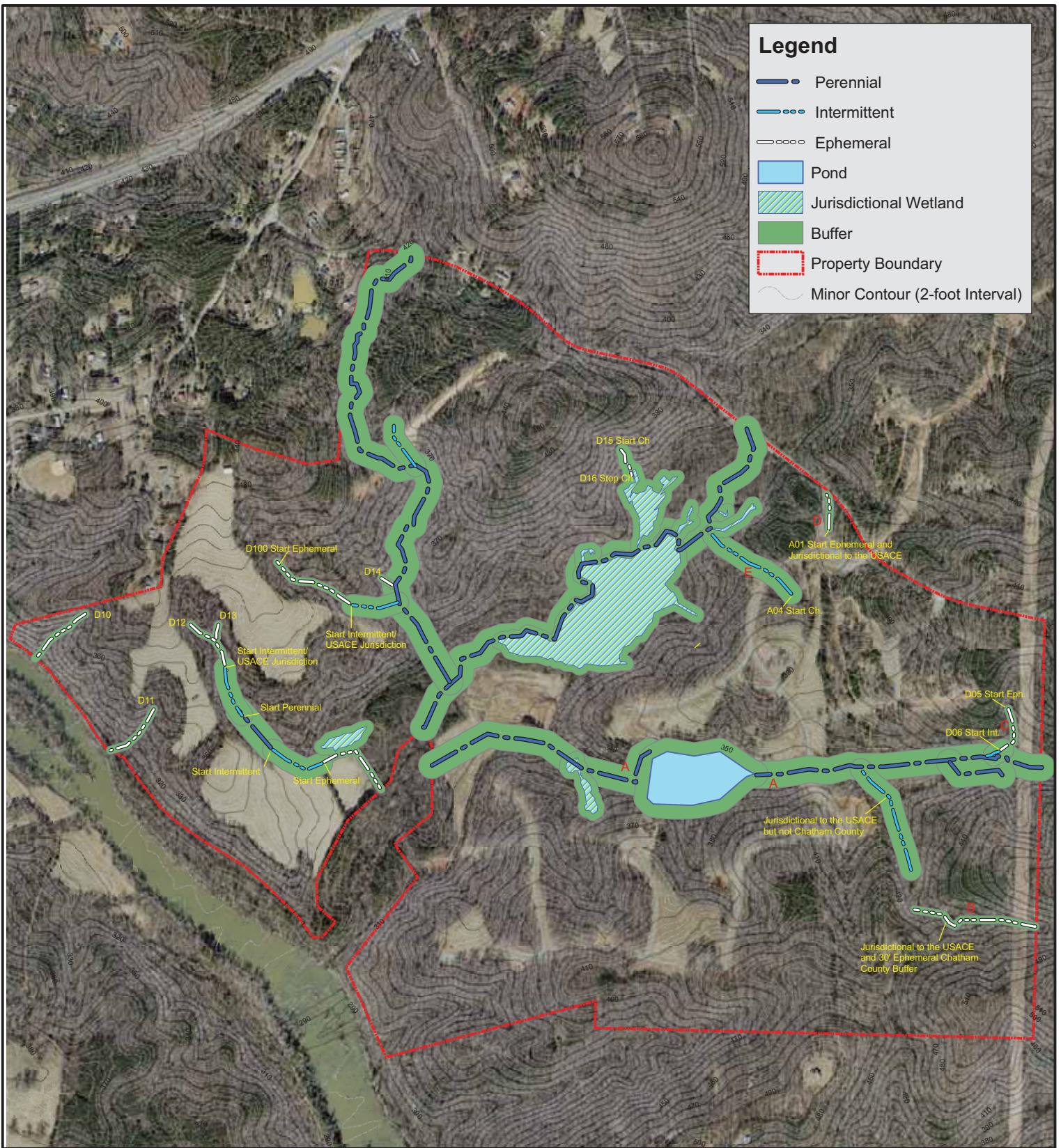
**Soil & Environmental Consultants, PA**

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



Project No. 6748.D5	<p align="center"><b>Figure 11</b> Stream and Wetland Map Retreat at Haw River Site Chatham County, NC</p>	<p align="center">0 500 1,000 2,000 1" = 500'</p>	<p><b>Soil &amp; Environmental Consultants, PA</b> 8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467 sandec.com</p>
Project Mgr.: DG			
Scale: 1" = 500'	2010 Aerial from NC One Map		
01/7/2014			








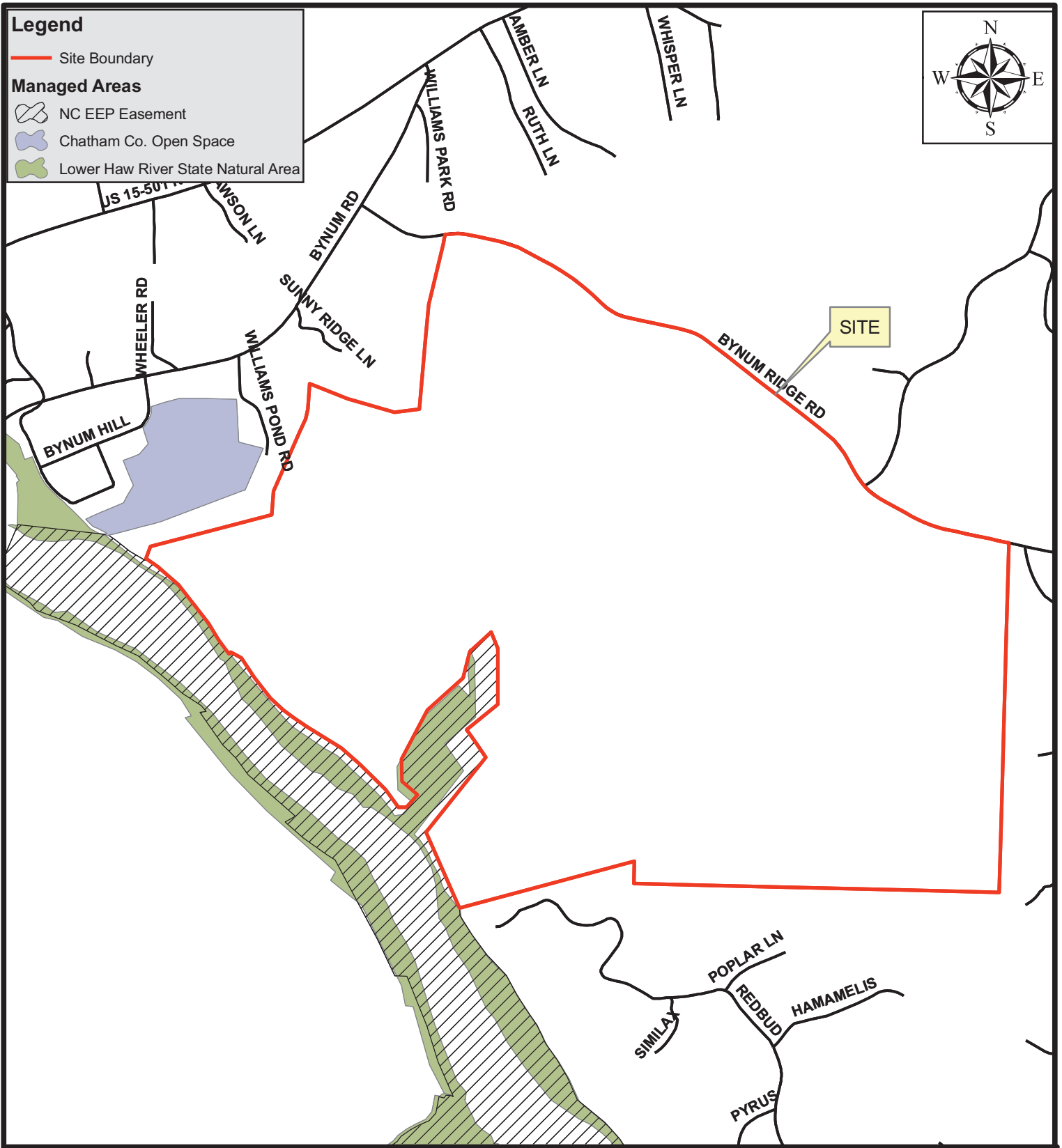
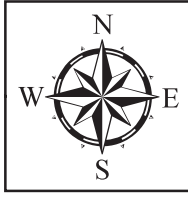
Project No. 6748.D5	<p style="text-align: center;">Figure 12 Chatham County Buffer Map</p>	<div style="text-align: center;">  <p>0 500 1,000 2,000 1" = 500'</p> </div>
Project Mgr.: DG		
Scale: 1" = 500'	<p style="text-align: center;">2010 Aerial from NC One Map</p>	<div style="display: flex; align-items: center;">  <div> <p><b>Soil &amp; Environmental Consultants, PA</b></p> <p><small>8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467 sandec.com</small></p> </div> </div>
01/7/2014		

**Legend**

— Site Boundary

**Managed Areas**

-  NC EEP Easement
-  Chatham Co. Open Space
-  Lower Haw River State Natural Area



Project No.  
6748.D5

Project Mgr.:  
DG

Scale:  
1" = 1,200'

2014-02-18

**Figure 13:  
Public Lands Map**

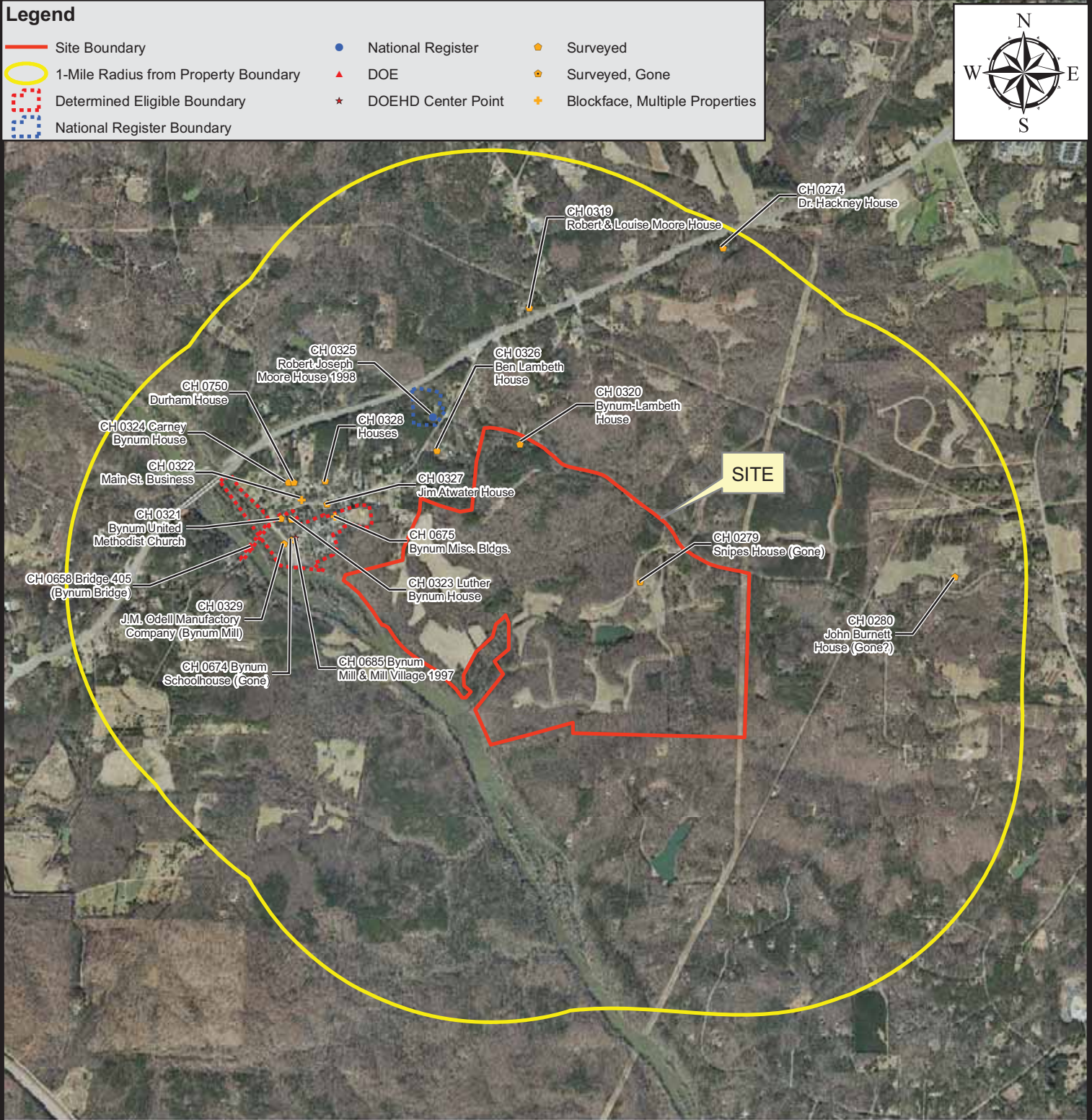
The Retreat at Haw River  
Chatham Co., NC

Managed Areas from NC Natural  
Heritage Program GIS Data  
Distribution Dated Jan. 2014



**Soil & Environmental Consultants, PA**

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



Project No.  
6748.D5

Project Mgr.:  
DG

Scale:  
1" = 1/2 Mile

2014-03-05

**Figure 14:  
Historic Areas Map**

The Retreat at Haw River  
Chatham Co., NC

Historic Properties Digitized from  
State Historic Preservation  
Office HPOWeb website

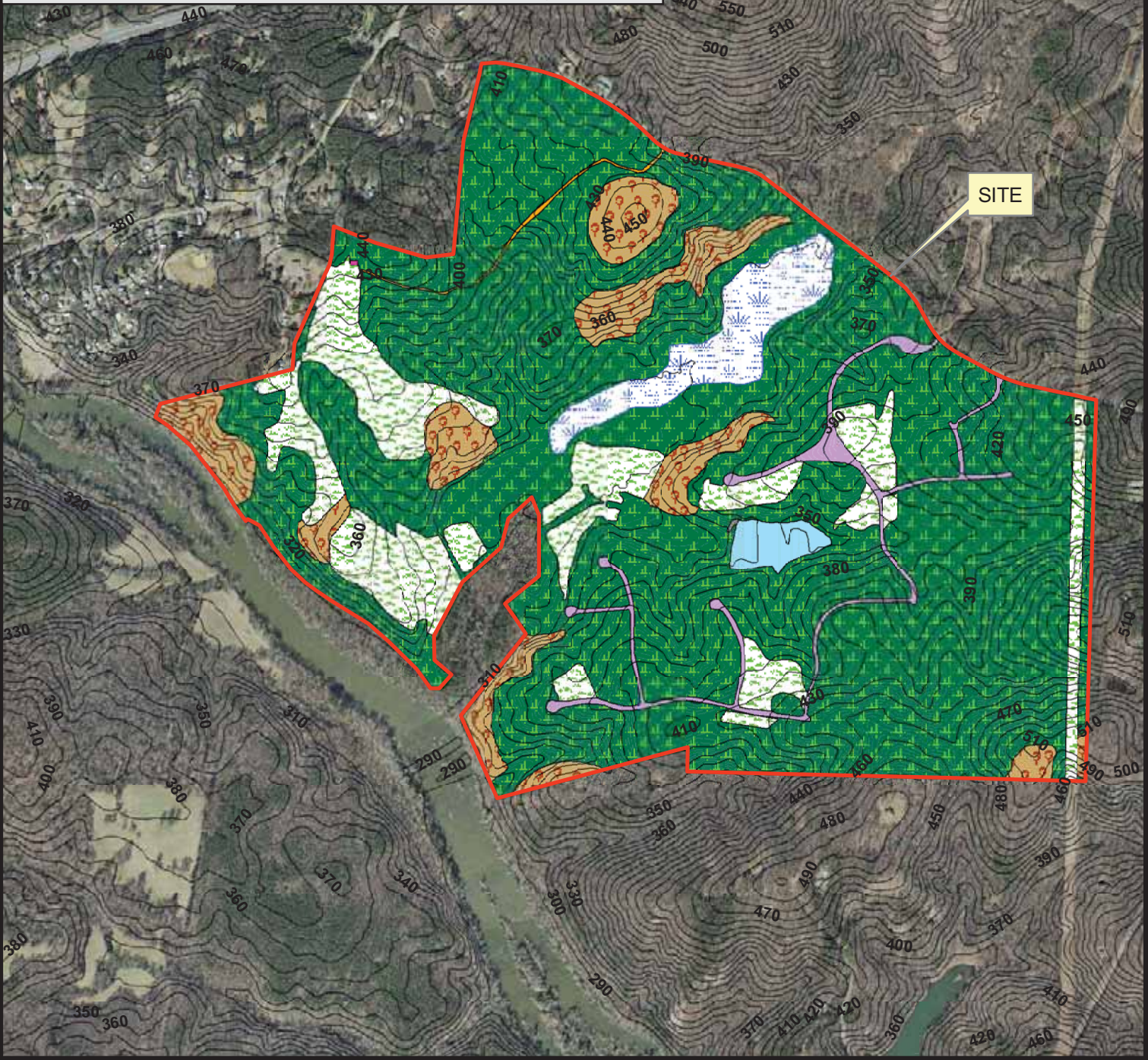
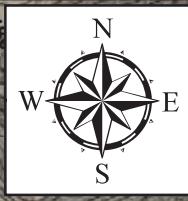
0 0.25 0.5 1 1.5  
Miles

**S&EC**  
**Soil & Environmental Consultants, PA**

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

**Legend**

- Site Boundary
- Minor Contour, 2-foot Interval
- Major Contour, 10-foot Interval
- Community Types**
- Dry-Mesic Oak-Hickory
- Mesic Mixed
- Managed Herbaceous
- Bottomland
- Pond
- Concrete
- Dirt Road
- Gravel Road
- Residential



Project No.  
6748.D5

Project Mgr.:  
DG

Scale:  
1" = 1,200'

2014-03-05



**Figure 15:**  
**Natural Communities Map**  
The Retreat at Haw River  
Chatham Co., NC

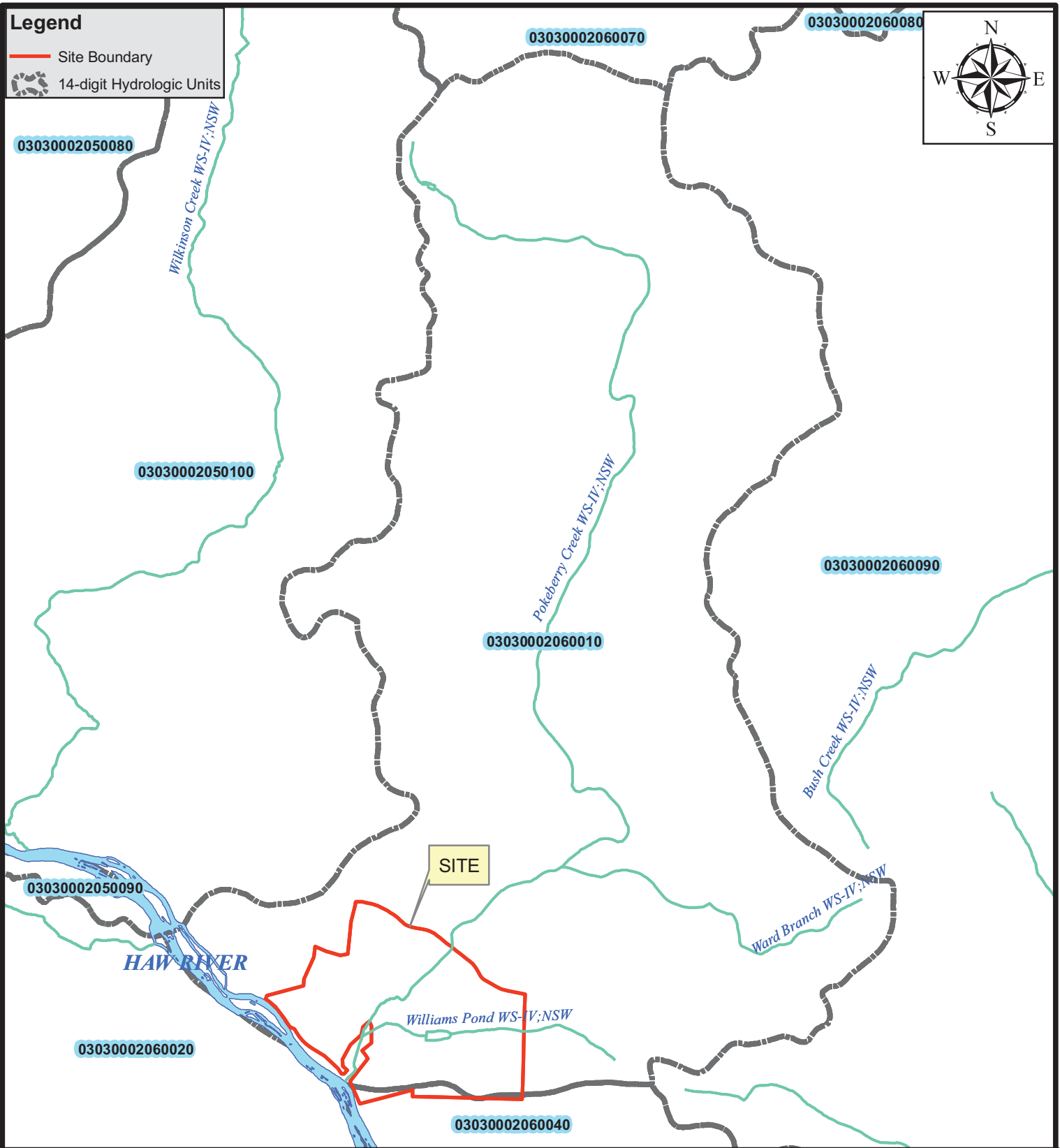
Natural Communities Digitized  
based on Field Observations  
and 2013 Aerial



**Soil & Environmental Consultants, PA**

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

**Legend**  
 Site Boundary  
 14-digit Hydrologic Units



Project No.  
6748.D5

**Figure 16:  
Hydrologic Map**



Project Mgr.:  
DG

The Retreat at Haw River  
Chatham Co., NC

Scale:  
1" = 4,000'

Hydrologic Units from  
BasinPro 3.1 from NC CGIA  
Hydro Layers from NCDENR GIS

2014-02-18

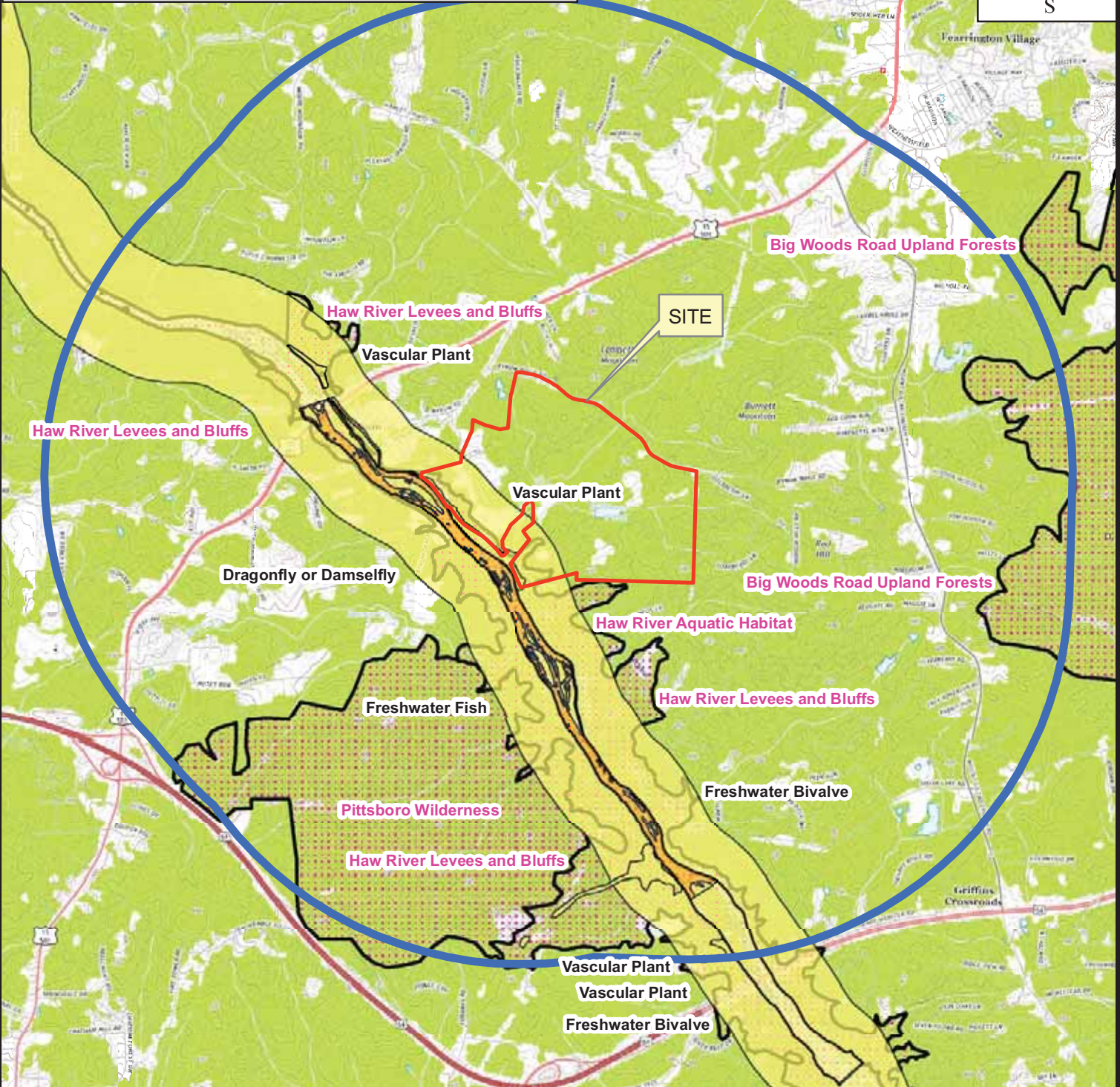
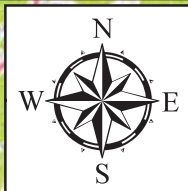


**Soil & Environmental Consultants, PA**

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

**Legend**

- Site Boundary
- 2-Mile Project Area Radius
- Significant Natural Heritage Areas
- Federally Listed Species**
- Federally Endangered Species
- Federal Species of Concern



**Figure 17a:**  
**Natural Heritage**  
**Element Vicinity Map**  
 The Retreat at Haw River  
 Chatham Co., NC



Project No.  
6748.D5

Project Mgr.:  
DG

Scale:  
1" = 4,000'

2014-02-18

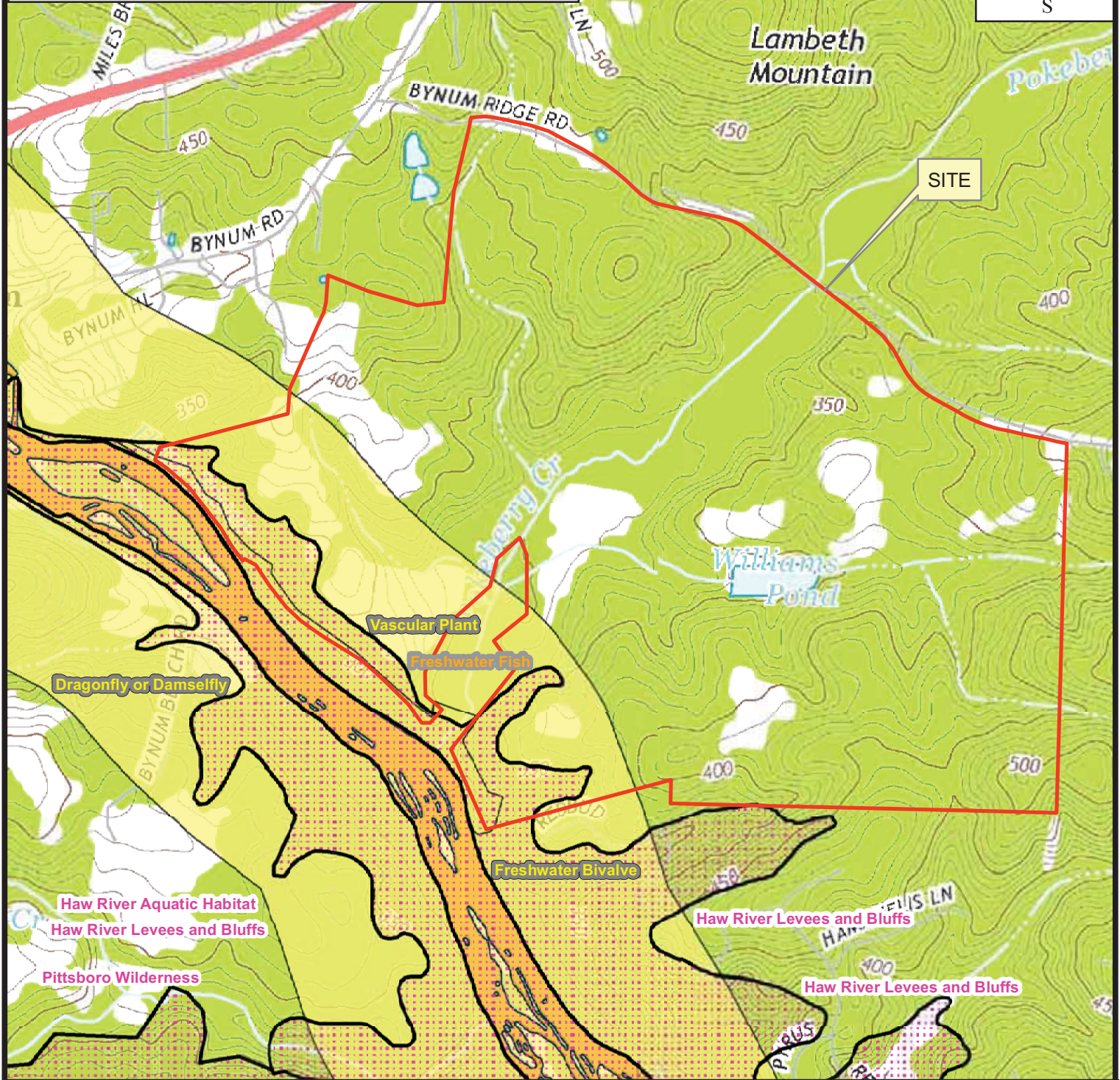
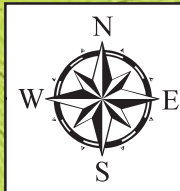
Natural Heritage Element  
 Occurrences from NC Natural  
 Heritage Program GIS Data  
 Distribution Dated Jan. 2014



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

**Legend**

- Site Boundary
- Significant Natural Heritage Areas
- Federally Endangered Species
- Federal Species of Concern



Project No. 6748.D5	<b>Figure 17b:</b> <b>Natural Heritage Element Site Map</b>	0    600    1,200    2,400    3,600 — Feet
Project Mgr.: DG	The Retreat at Haw River Chatham Co., NC	<p><b>Soil &amp; Environmental Consultants, PA</b></p> <p>8412 Falls of Neuse Road, Suite 104, Raleigh, NC 27615 • Phone: (919) 846-5900 • Fax: (919) 846-9467 sandec.com</p>
Scale: 1" = 1,200'	Natural Heritage Element Occurrences from NC Natural Heritage Program GIS Data Distribution Dated Jan. 2014	
2014-02-18		

**Site Photographs – Natural Community and Habitat Types**



**Typical Dry-mesic Oak-hickory Community Type**



**Typical Mesic Mixed Hardwood Community Type**





**Typical Bottomland Hardwood Forest Community Type adjacent to Pokeberry Creek**



**Typical Impoundment (Manmade Pond)**



**Typical Managed Herbaceous Area**

## The Retreat at Haw River Appendix - C (Site Calculations)

<b>Total Acreage</b>	<b>646.13 AC</b>	
<b>Minimum Area in Conservation</b>	258.45 AC	(40%)
	206.76	Natural Space
	51.69	Active Open Space

### Base Density Calculation (Section I of Subdivision Ordinance)

In River Corridor	240 AC		Min. 96.0 AC in Conservation Req'd
	<del>-34.8 AC</del>	Floodplain & Riparian Buffers	
	205.2 AC		
	Divide by 5 AC units and Multiply by 1.1		
	<b>45.1 Lots</b>		

Outside River Corridor	406.1 AC		Min. 162 AC in Conservation Req'd
	<del>-91.54 AC</del>	Floodplain & Riparian Buffers	
	314.56 AC		
	Divide by 0.918 AC units and Multiply by 1.1		
	<b>376.8 Lots</b>		

**Max Density 422.0 Lots**

**Proposed Lots 393 Lots**

### Impervious Summary

<b>Total Acreage</b>	<b>646.13 AC</b>		
Subdivision Roads		1200000	
Subdivision Alleys		50000	
Subdivision Sidewalk		250000	
Subdivision Trails		100000	
Amenity		220000	
Subdivision Lots	335 lots	4500 sf	1507500
Subdivision Estate Lots	58 lots	6000 sf	348000
Wastewater Utility Area			130000
<b>sub-total</b>			<b>3805500 sf</b>
			13.52 %
Park Road		55000	
(Future) Park Development		350000	8.0 AC
<b>sub-total</b>		<b>405,000 sf</b>	<b>1.44 %</b>
<b>Total</b>	<b>4,210,500</b>	<b>96.7 AC</b>	
<b>% Impervious</b>		<b>15.0 %</b>	

# The Retreat At Haw River

Existing Conditions

Chatham County, North Carolina  
March 21, 2014



227 West Trade St. Suite 1000  
Charlotte, NC 28202

Total Acreage: 646.13 Ac.

67 Lots With Final Plat Approval (Constructed)

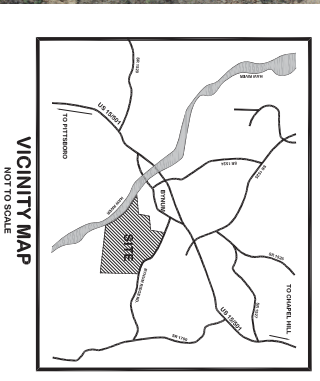
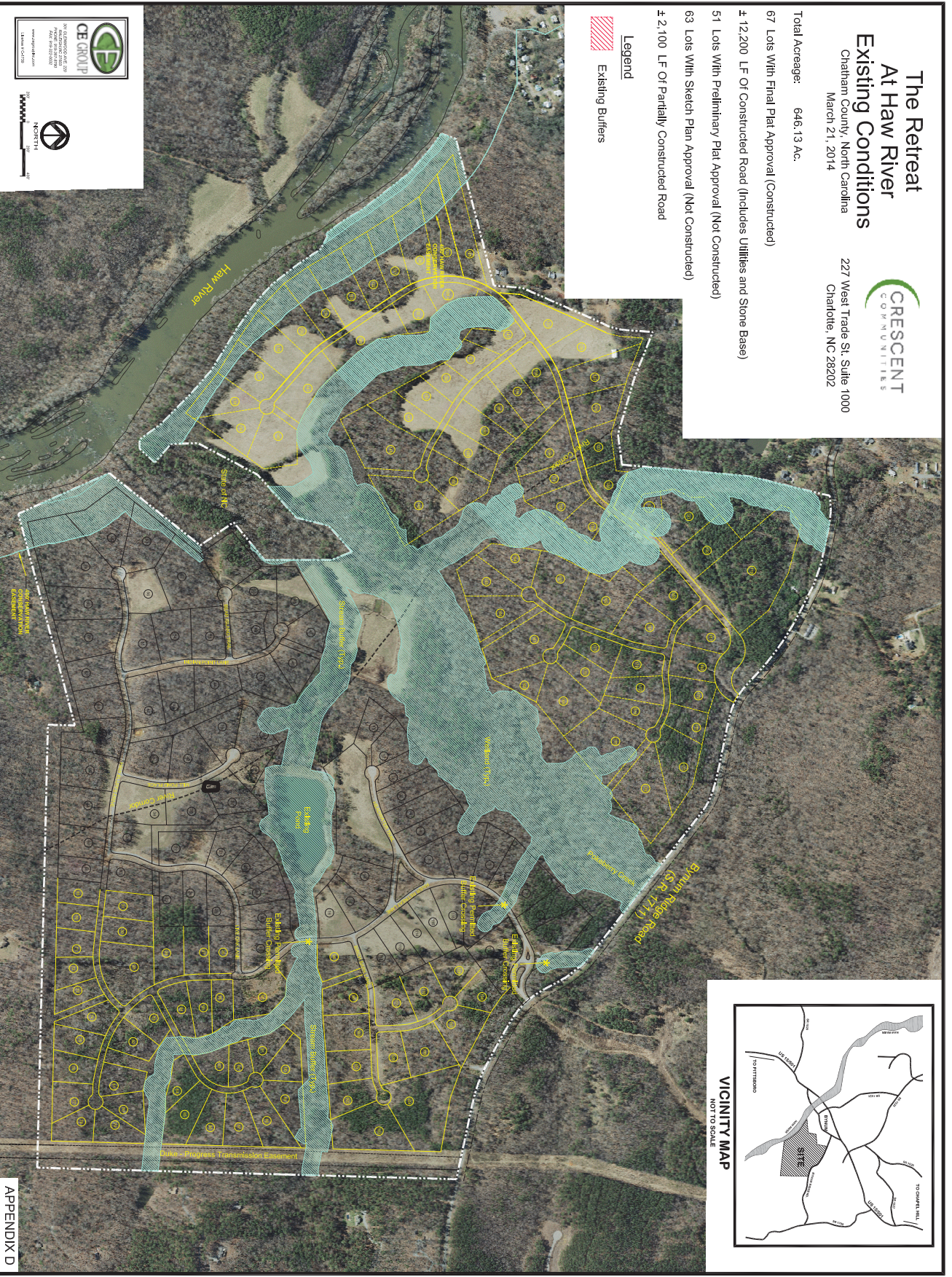
± 12,200 LF Of Constructed Road (Includes Utilities and Stone Base)

51 Lots With Preliminary Plat Approval (Not Constructed)

63 Lots With Sketch Plan Approval (Not Constructed)

± 2,100 LF Of Partially Constructed Road

- Legend**
-  Existing Buffers



# The Retreat At Haw River Conservation Space Plan

Chatham County, North Carolina  
March 21, 2014



227 West Trade St. Suite 1000  
Charlotte, NC 28202

Total Acreage:

646.13 Ac.

Minimum Area in Conservation:

258.45 Ac. (± 260 Ac. Provided)




Maximum Area in Active Open Space:

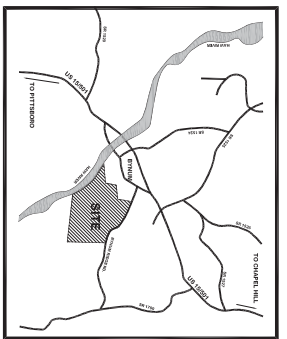
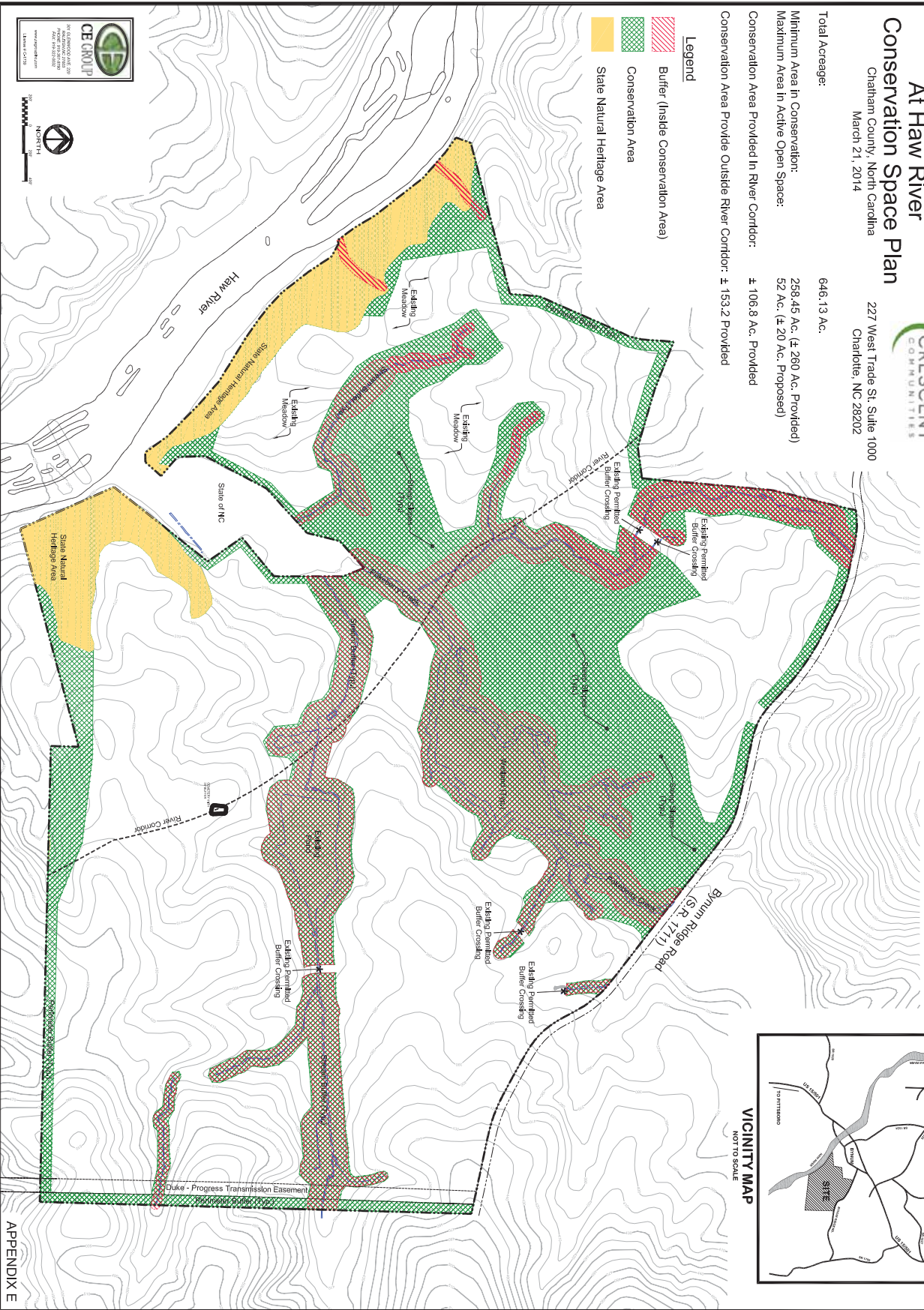
52 Ac. (± 20 Ac. Proposed)

Conservation Area Provided in River Corridor:

± 106.8 Ac. Provided

Conservation Area Provide Outside River Corridor: ± 153.2 Provided

- Legend**
-  Buffer (Inside Conservation Area)
  -  Conservation Area
  -  State Natural Heritage Area



# The Retreat At Haw River Master Plan

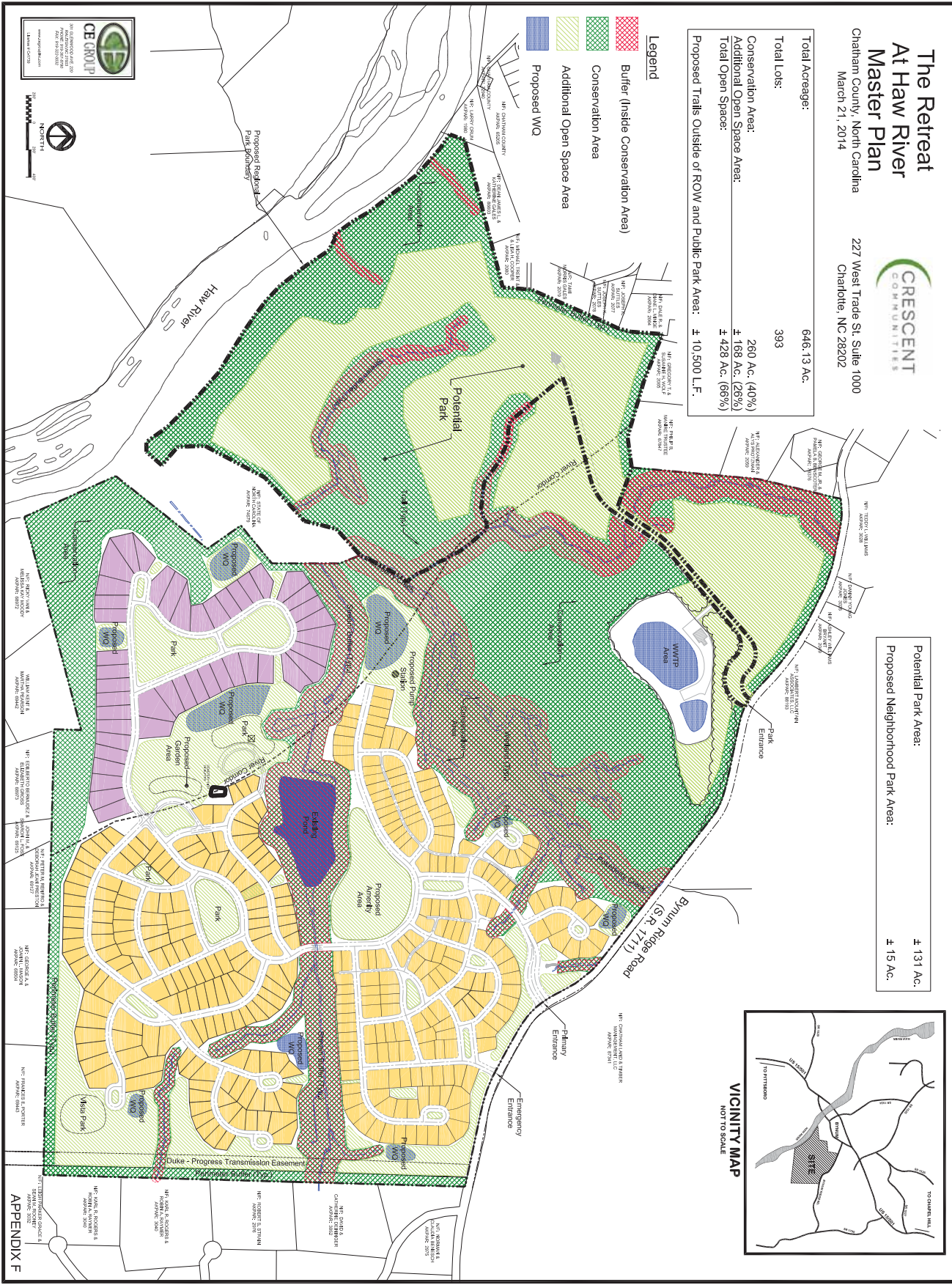
Chatham County, North Carolina  
March 21, 2014



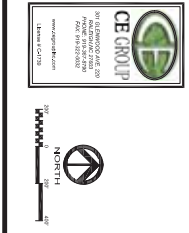
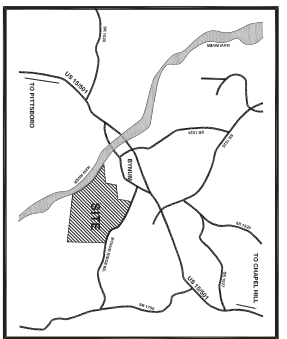
227 West Trade St, Suite 1000  
Charlotte, NC 28202

Total Acreage:	646.13 Ac.
Total Lots:	393
Conservation Area:	260 Ac. (40%)
Additional Open Space Area:	± 168 Ac. (28%)
Total Open Space:	± 428 Ac. (68%)
Proposed Trails Outside of ROW and Public Park Area:	± 10,500 L.F.

- Legend**
- Buffer (Inside Conservation Area)
  - Conservation Area
  - Additional Open Space Area
  - Proposed W/O



Potential Park Area: ± 131 Ac.  
Proposed Neighborhood Park Area: ± 15 Ac.



APPENDIX F

# The Retreat At Haw River Utility & Land Disturbance Plan



Chatham County, North Carolina  
March 21, 2014

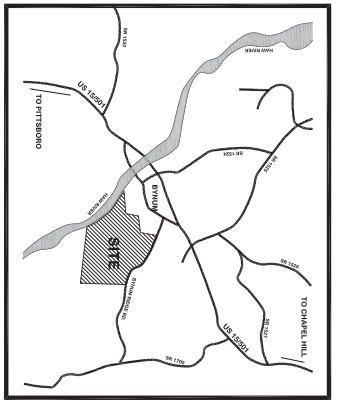
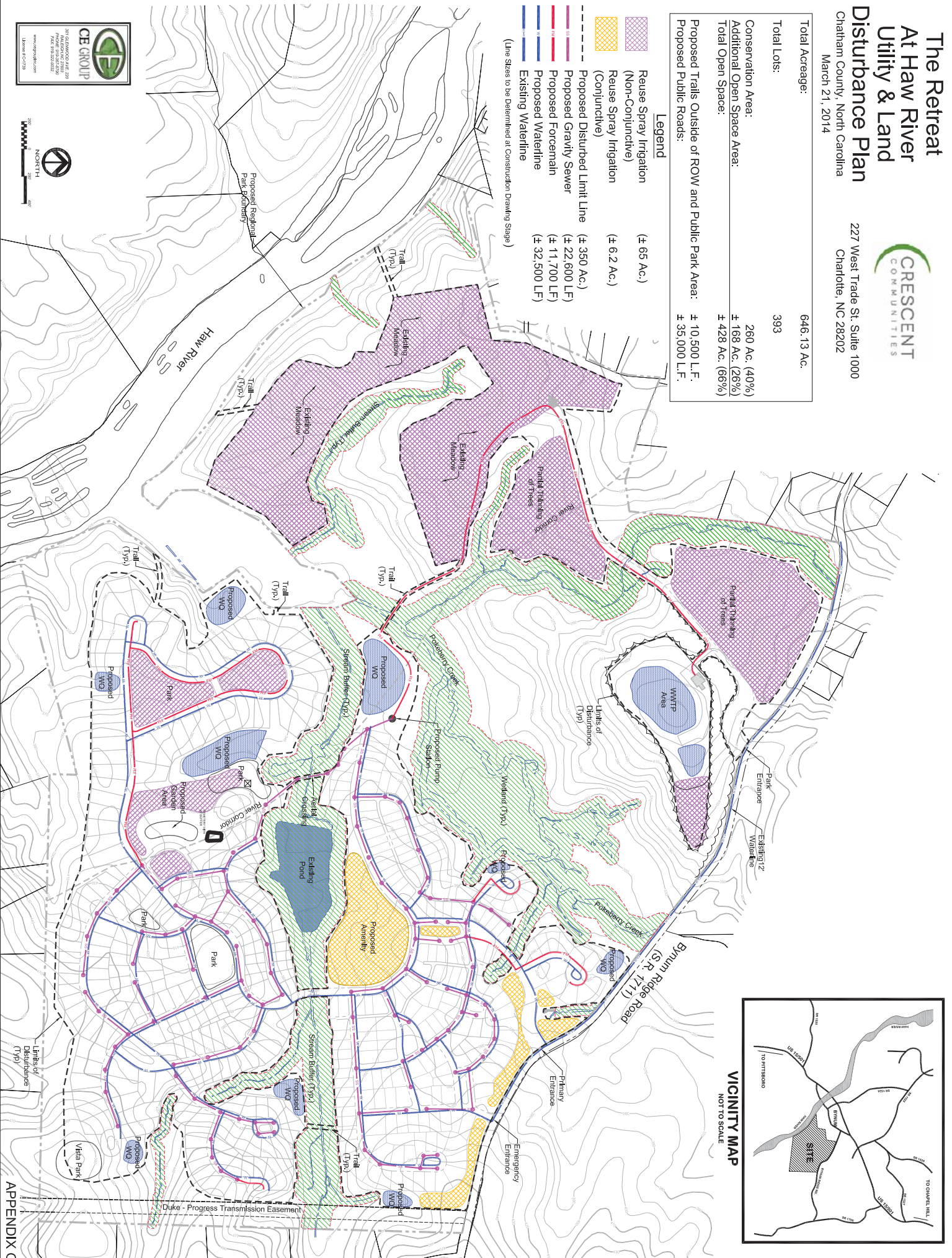
227 West Trade St. Suite 1000  
Charlotte, NC 28202

Total Acreage:	646.13 Ac.
Total Lots:	393
Conservation Area:	260 Ac. (40%)
Additional Open Space Area:	± 168 Ac. (26%)
Total Open Space:	± 428 Ac. (66%)
Proposed Trails Outside of ROW and Public Park Area:	± 10,500 L.F.
Proposed Public Roads:	± 35,000 L.F.

### Legend

	Reuse Spray Irrigation (Non-Conjunctive)	(± 65 Ac.)
	Reuse Spray Irrigation (Conjunctive)	(± 6.2 Ac.)
	Proposed Disturbed Limit Line	(± 350 Ac.)
	Proposed Gravity Sewer	(± 22,600 LF)
	Proposed Foremain	(± 11,700 LF)
	Proposed Waterline	(± 32,500 LF)
	Existing Waterline	

(Line Sizes to be Determined at Construction Drawing Stage)



April 7, 2014

Scott Munday  
Crescent Communities  
227 W. Trade Street, Suite 100  
Charlotte, NC 28202  
Phone: 864-710-3989

**Subject: Traffic Assessment**  
The Retreat at Haw River – Chatham County

Dear Mr. Munday:

This letter provides the findings of the Traffic Assessment (TA) prepared by Ramey Kemp & Associates, Inc. (RKA) for the proposed residential development on the south side of Bynum Ridge Road (SR 1711) east of Bynum Road in Chatham County, North Carolina. The purpose of this study is to determine the impacts to the surrounding transportation system created by traffic generated by the development. See Figure 1 (attached) for a map with the location of the proposed development and study intersection.

### **Site Access**

Access for the proposed development is anticipated to be provided via one driveway. The driveway is proposed to be located approximately 5,400 feet east of the intersection of Bynum Ridge Road and Bynum Road. See Figure 2 (attached) for the site plan of the proposed.

### **Existing and Future Traffic Volumes**

Traffic data was collected by RKA for the purposes of this analysis. Peak hour turning movement counts were performed in March during both the AM peak hour (7:00 am to 9:00 am) and the PM peak hour (4:00 pm to 6:30 pm) at the intersections below:

- Bynum Ridge Road and Mt Gilead Church Road
- Bynum Ridge Road and Bynum Road

Additionally, RKA collected existing roadway geometric data in the field. See Figure 3 for the existing lane configurations and Figure 4 for the existing peak hour traffic volumes. A copy of the traffic count data is also included in the attached appendix.

The background traffic volumes (2019 - future traffic without the proposed development) were generated as a combination of growth to the existing traffic volumes, and trips expected from adjacent developments.



The existing traffic volumes were projected using an annual growth rate of 3% to the build out year of 2019. Through discussions with the Chatham County offices, it was determined that adjacent developments to consider would consist of the Baldwin Peak residential development. The Baldwin Peak development is located on the north side of the Bynum Ridge Road west of Mt Gilead Road and is proposed to consist of 28 single-family detached housing dwelling units. See Figure 5 for the adjacent development trips. Adjacent development trip generation has also been included in the appendix.

The background traffic consists of the projected existing traffic volumes and the adjacent development traffic volumes. See Figure 6 for the background peak hour traffic volumes.

**Trip Generation and Distribution**

The proposed Retreat at Haw River development is planned to consist of 395 single-family detached housing dwelling units. Trips generated by the proposed development were estimated utilizing methodology contained within the Institute of Transportation Engineers (ITE) *Trip Generation* manual, 9<sup>th</sup> Edition. Refer to Table 1 (below) for a summary of the trip generation calculations.

**Table 1  
Trip Generation**

Land Use	ITE Code	Size	Unit	24 Hour Volume	AM Peak Hour Trips		PM Peak Hour Trips	
					Enter	Exit	Enter	Exit
Single-Family Detached Housing	210	395	Units	3717	72	214	228	134

Site trip distribution percentages for the proposed development were determined based on a combination of existing traffic patterns, location of other residential areas, site access locations, and engineering judgment. This distribution is as follows:

- 35% to/from the north via Bynum Road
- 5% to/from the south via Bynum Road
- 30% to/from the north via Mt Gilead Church Road
- 30% to/from the south via Mt Gilead Church Road

Refer to Figure 7 for an illustration of the primary site trip distribution percentages and Figure 8 for an illustration of the primary site trips.

Once the site trips were calculated and distributed in the study area, these totals were added to the background traffic to produce the combined traffic conditions in the anticipated build out year. See Figure 9 (attached) for the combined 2019 peak hour traffic conditions.

**Capacity Analysis**

The study intersections were analyzed to determine the current levels of service under existing roadway conditions. The intersections were analyzed under existing (2014), background (2019) and combined (2019) conditions. Analysis was performed using the Synchro (Version 7) software. Synchro operates using the methodology outlined in the 2000 Highway Capacity Manual to calculate capacity and level of service of the study area intersections. The unsignalized capacity analysis, used in this study, does not provide an overall level of service for an intersection; only delay for an approach with a conflicting movement. The results of the capacity analysis can be found in the following tables.

**TABLE 2  
CAPACITY ANALYSIS RESULTS – EXISTING (2014)**

INTERSECTION	A P P R O A C H	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach	Overall Delay (sec)	Approach	Overall Delay (sec)
Bynum Ridge Road and Mt Gilead Church Road	EB	1 LT-TH-RT	A <sup>2</sup>	9.7	A <sup>2</sup>	9.8
	WB	1 LT-TH-RT	A <sup>2</sup>	9.8	A <sup>2</sup>	10.7
	NB	1 LT-TH-RT	A <sup>1</sup>	0.4	A <sup>1</sup>	1.2
	SB	1 LT-TH-RT	A <sup>1</sup>	0.0	A <sup>1</sup>	0.1
Bynum Ridge Road and Bynum Road	WB	1 LT-TH-RT	A <sup>2</sup>	8.5	A <sup>2</sup>	8.5
	NB	1 TH-RT	-	0.0	-	0.0
	SB	1 TH-LT	A <sup>1</sup>	2.3	A <sup>1</sup>	3.0

1. Level of service for left turn movement on major approach
2. Level of service for minor approach

Capacity analysis indicates all approaches for the study intersections currently operate at LOS A during the AM and PM peak hours. As shown in Table 3, capacity analysis indicates all approaches for the study intersections currently operate at LOS B or better during the AM and PM peak hours under background (2019) conditions without the site.

Under combined (2019) conditions with the addition of site trips, capacity analysis indicates all approaches for the study intersections currently operate at LOS B or better during the AM and PM peak hours. The area roadways are anticipated to be operating well below their maximum capacity under background conditions, as they are today. This, coupled with the relatively small amount of traffic anticipated to be generated by the proposed development, indicates the proposed development will have very little impact on the study area roadways and intersections.

A copy of the Synchro reports for the capacity analysis performed is included in the attached appendix.

**TABLE 3  
CAPACITY ANALYSIS RESULTS – BACKGROUND (2019)**

INTERSECTION	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach	Overall Delay (sec)	Approach	Overall Delay (sec)
Bynum Ridge Road and Mt Gilead Church Road	EB	1 LT-TH-RT	B <sup>2</sup>	10.2	B <sup>2</sup>	10.4
	WB	1 LT-TH-RT	B <sup>2</sup>	10.2	B <sup>2</sup>	11.4
	NB	1 LT-TH-RT	A <sup>1</sup>	0.5	A <sup>1</sup>	1.6
	SB	1 LT-TH-RT	A <sup>1</sup>	0.0	A <sup>1</sup>	0.1
Bynum Ridge Road and Bynum Road	WB	1 LT-TH-RT	A <sup>2</sup>	8.6	A <sup>2</sup>	8.6
	NB	1 TH-RT	-	0.0	-	0.0
	SB	1 TH-LT	A <sup>1</sup>	3.0	A <sup>1</sup>	3.8

**TABLE 4  
CAPACITY ANALYSIS RESULTS – COMBINED (2019)**

INTERSECTION	APPROACH	LANE CONFIGURATIONS	AM PEAK HOUR		PM PEAK HOUR	
			Approach	Overall Delay (sec)	Approach	Overall Delay (sec)
Bynum Ridge Road and Mt Gilead Church Road	EB	1 LT-TH-RT	B <sup>2</sup>	12.3	B <sup>2</sup>	13.3
	WB	1 LT-TH-RT	B <sup>2</sup>	11.2	B <sup>2</sup>	14.8
	NB	1 LT-TH-RT	A <sup>1</sup>	1.4	A <sup>1</sup>	4.0
	SB	1 LT-TH-RT	A <sup>1</sup>	0.0	A <sup>1</sup>	0.1
Bynum Ridge Road and Bynum Road	WB	1 LT-TH-RT	A <sup>2</sup>	9.0	A <sup>2</sup>	9.0
	NB	1 TH-RT	-	0.0	-	0.0
	SB	1 TH-LT	A <sup>1</sup>	5.6	A <sup>1</sup>	6.4
Bynum Ridge Road and Site Driveway	EB	1 TH-RT	-	0.0	-	0.0
	WB	1 TH-LT	A <sup>1</sup>	4.8	A <sup>1</sup>	6.4
	NB	1 LT-RT	B <sup>2</sup>	10.2	B <sup>2</sup>	11.2

1. Level of service for left turn movement on major approach

2. Level of service for minor approach

Improvements and/or revised lane configurations are shown in **BOLD**.

## Conclusions

In conclusion, the proposed Retreat at Haw River development is not expected to have a significant impact on traffic operations in the study area. The area roadways are currently, and expected to continue to operate below their capacity. Additionally, the 395 single family detached homes are expected to generate a relatively small amount of trips during both the AM and PM peak hours. All study intersections are expected to continue operating at an acceptable level of service with very little delay upon full build out of the proposed development.

## Recommendations

The following geometric improvements are recommended for the proposed Retreat at Haw River development.

### Bynum Ridge Road and Site Driveway

- Construct an exclusive westbound left turn lane on Bynum Ridge Road with 100 feet of storage and appropriate taper.

### Bynum Ridge Road and Mt Gilead Church Road

- No Improvements

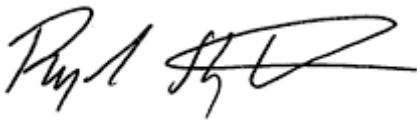
### Bynum Ridge Road and Bynum Road

- No Improvements

If you should have any questions, please feel free to contact me at (919) 872-5115.

Sincerely,

**Ramey Kemp & Associates, Inc.**



Rynal Stephenson, P.E.  
Regional Manager

NC Corporate License # C-0910

Attachments: Figures  
Appendix



**North Carolina Department of Cultural Resources**  
**State Historic Preservation Office**

Ramona M. Bartos, Administrator

Governor Pat McCrory  
Secretary Susan Kluttz

Office of Archives and History  
Deputy Secretary Kevin Cherry

April 7, 2014

David Gainey  
Soil & Environmental Consultants, PA  
11010 Raven Ridge Road  
Raleigh, NC 27614

Re: The Retreat at Haw River, Chatham County, ER 14-0431

Dear Mr. Gainey:

Thank you for your letter of March 5, 2014, transmitting information for our review concerning the above project. We apologize for the delay in our response.

A limited archaeological reconnaissance survey was undertaken of this property in 2005. At that time, 31CH810\*\*, a cemetery was recorded, and the Snipes House property, a nineteenth century residence, was noted as being dismantled, but was not evaluated as an archaeological resource. As noted in our review of that report, the methodology and its implementation were unclear and inadequate to locate potentially eligible sites. No discussion was included of soils, vegetation or past land use.

We recommend that 31CH810\*\* be re-located and its current condition assessed. Project effects to the cemetery should also be discussed. The nineteenth century Snipes property should be investigated, including historic research, and its eligibility as an archaeological site should be evaluated. A sample survey of the remainder of the property should be undertaken by an experienced professional archaeologist to locate and evaluate other archaeological sites present on the tract. Consultation with staff of the NC Office of State Archaeology to delineate high probability area should be undertaken by your archaeological consultant. Potential effects on unknown resources must be assessed prior to the initiation of construction activities.

Two copies of the resulting archaeological report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are available and well in advance of any construction activities.

A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at [www.archaeology.ncdcr.gov/ncarch/resource/consultants.htm](http://www.archaeology.ncdcr.gov/ncarch/resource/consultants.htm). The archaeologists listed, or any other experienced archaeologist, may be contacted to conduct the recommended survey.

We have determined that the project as proposed will not have an effect on any historic structures.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or [renee.gledhill-earley@ncdcr.gov](mailto:renee.gledhill-earley@ncdcr.gov). In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

A handwritten signature in blue ink that reads "Renee Gledhill-Earley". The signature is written in a cursive style.

for Ramona M. Bartos