# Environmental Impact Assessment

*To:* *Western Intake Partnership*

*From:* *CDM Smith*

*Date:* *October 2023*

*Subject:* *Environmental Impact Assessment*

The Western Intake Partnership (WIP) is seeking rezoning of the Seaforth Property, owned by the Orange Water and Sewer Authority (OWASA), from Residential to Light Industrial Conditional District to facilitate the construction of a regional water treatment facility (RWTF) with supply from Jordan Lake. This Environmental Impact Assessment (EIA) has been prepared according to the requirements of Section 11.3 of the Chatham County Zoning Ordinance to support the rezoning request. This document describes the anticipated environmental effects of the WIP RWTF project.

# Contents

# FIGURES

# TABLES

# 1.0 Proposed Project Description and Need

Historically, the Haw River, a tributary of the Cape Fear River Basin, has been long prone to flooding disasters. Thus, the construction of a dam downstream of the confluence of the Haw River and the New Hope River commenced in 1967 and resulted in the completion of B. Everett Jordan Lake (Jordan Lake) in 1982. Jordan Lake is owned and operated by the U.S. Army Corps of Engineers and has the federally authorized purposes of flood control, water supply, recreation, water quality, and fish and wildlife conservation. The State of North Carolina has been given the task of allocating the lake's storage to local governments expressing need for water supply; Jordan Lake has an estimated safe yield of approximately 100 million gallons per day (mgd) that can be allocated.

## A. Project Details

Formed in 2014, the Western Intake Partnership (WIP) includes the City of Durham, Chatham County, and the Town of Pittsboro; the Orange Water and Sewer Authority (OWASA) is a partner for future water demands. The WIP is committed to providing and securing long-term water supply for their customers and meeting the WIP's core values of quality, sustainability, transparency, equity, and partnership. As the region's water supply needs grow, the WIP's mission can best be accomplished with the establishment of a new regional drinking water treatment facility (RWTF) to be shared by the Partners (City of Durham, Chatham County, Town of Pittsboro, and OWASA). Given its intended purpose, the southwest region of Jordan Lake (depicted on **Figure 1**) is the proposed location to plan, design, construct, and operate all components of the project. The project will include:

- A Jordan Lake intake, raw water pump station, and pipeline
- One new 18- to 27-million-gallons-per-day (mgd) regional WTF with plans for expansion
- Approximately 26 miles of finished water transmission pipelines to convey drinking water to the Partners' water distribution systems

The proposed project will provide the Partners with access to their Jordan Lake allocations. The project is planned to proceed in three phases, which include Planning and Permitting (2020-2024); Design and Bidding (2024-2027); and Construction, Start-Up, and Commissioning (2027-2031). The RWTF is anticipated to be fully operational by the year 2031.

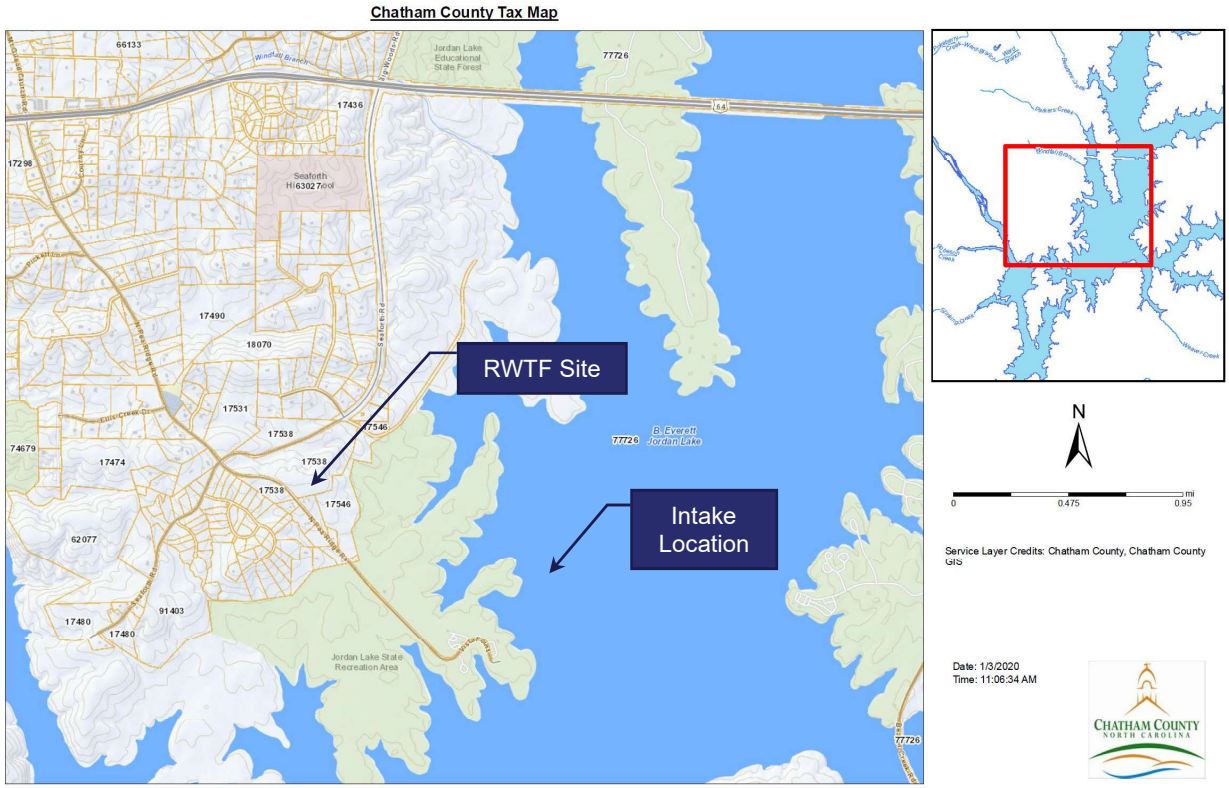



**Figure 1 | Jordan Lake Area**

## B. Location Map

Figure 1 and **Figure 2** show the project location and surrounding area on a map and the locations of the water treatment facility, water supply pipelines to the Partners, and the water supply source, respectively.

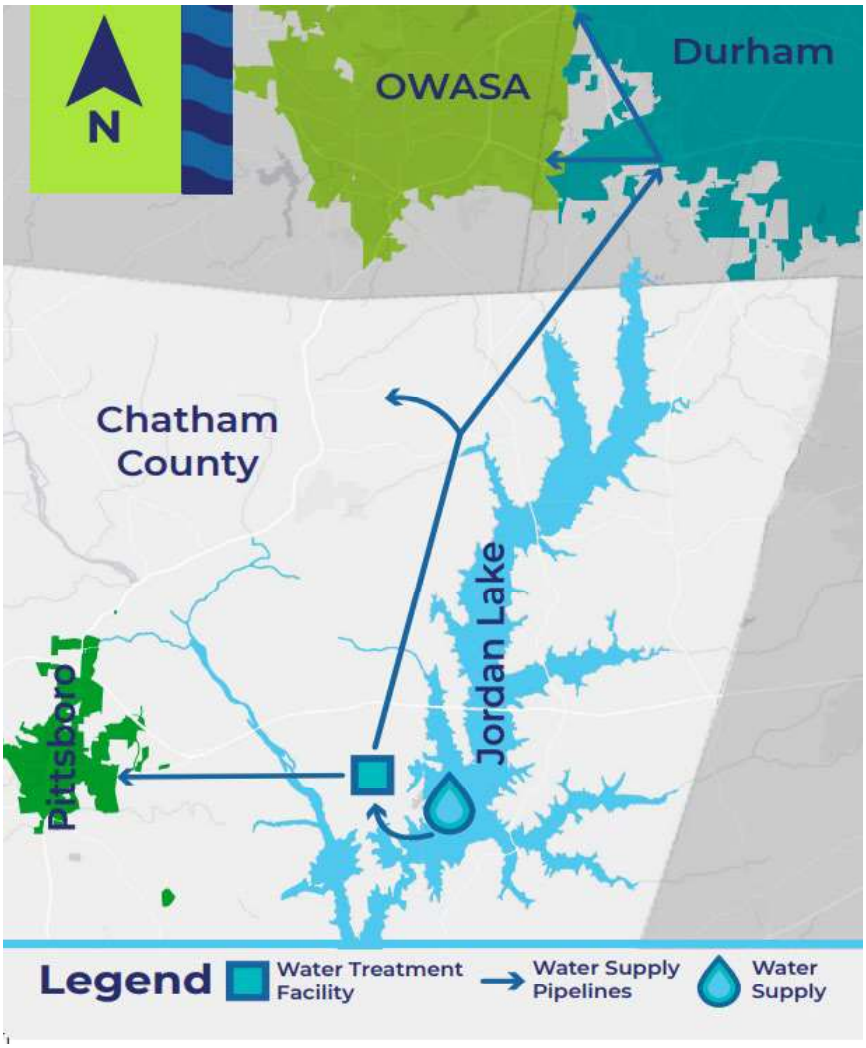



**Figure 2 | Western Intake Partnership Water Treatment Facility, Pipelines, and Water Supply**

## C. Existing and Proposed Facilities

**Figure 3** and **Figure 4** depict the proposed facilities at the project location on an aerial site plan and a 3-dimensional rendering of the proposed facilities on an aerial site plan, respectively. **Figure 5** depicts the existing conditions at the site.

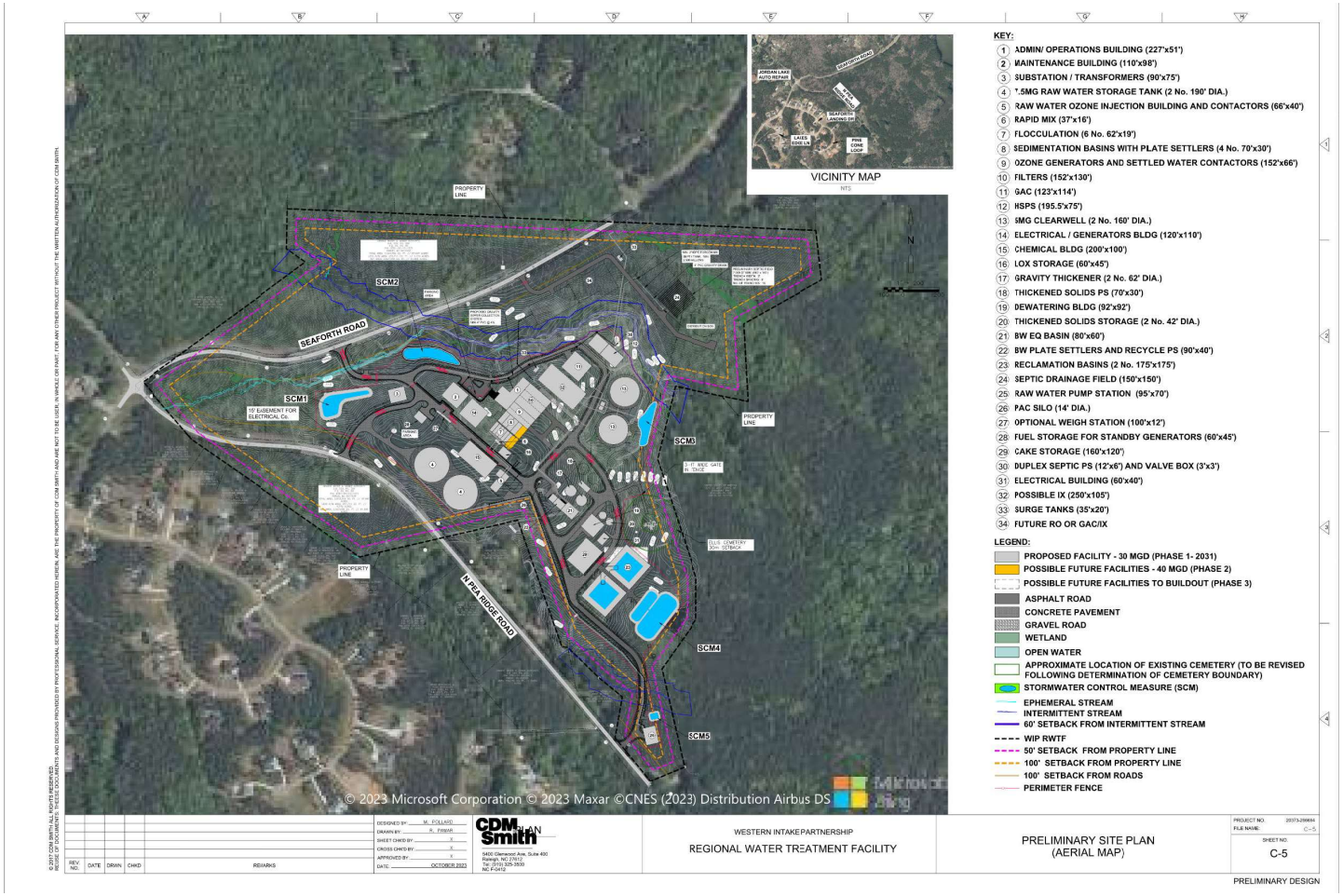



**Figure 3 | Preliminary Site Plan on Aerial Map**


**Figure 4 | 3-D Aerial View of Preliminary Site Plan**

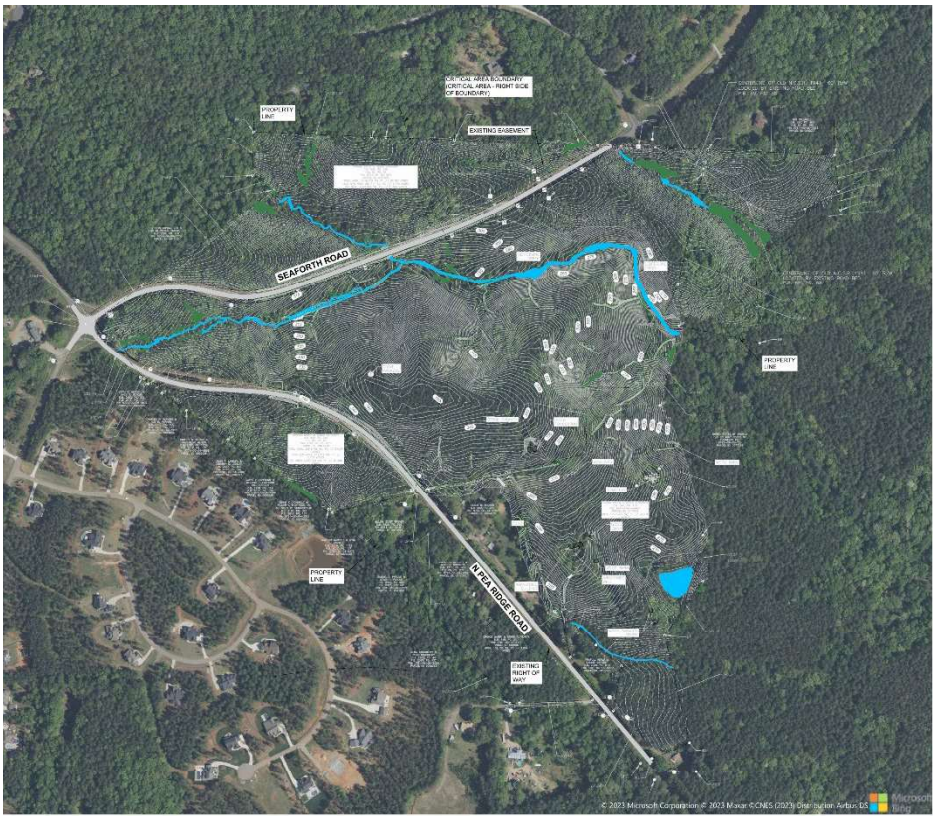



**Figure 5 | Existing Conditions Site Plan (Aerial Map)**

## D. Need for Project

The WIP (Chatham County, the City of Durham, the Town of Pittsboro, and OWASA) proposes to construct a new regional surface RWTF to meet their long-term water supply needs and support their anticipated future growth. The RWTF will allow the WIP Partners to access their portions of the Jordan Lake water supply allocations made by the NC Environmental Management Commission. The RWTF is proposed to be constructed in Chatham County on a site near the intersection of North Pea Ridge Road and Seaforth Road and will treat water withdrawn from Jordan Lake.

The needs of the WIP communities around the Triangle intersect with the needs of Chatham County as expressed in their 2017 “Plan Chatham,” a Comprehensive Plan that acts as a strategic guide for the future decisions made by the County. Thus, the proposed project fits into larger plans and adjacent projects in the proposed project location. Plan Chatham states that economics and growth are two of the biggest issues and opportunities that the County will face in the coming years. According to the U.S. Census Bureau and the N.C. Department of Commerce, the projected population growth in Chatham County by the year 2040 is 128,327, and recently, the County has experienced slower job growth than neighboring counties. The proposed project will indirectly provide jobs during construction and operation and accommodate the forementioned anticipated population growth. Plan Chatham also lists utility needs as one of the County’s major infrastructural opportunities and one of the “10 Plan Elements.” The construction and operation of a new RWTF will help fulfill the goal of providing infrastructure to support development, economic, and environmental objectives that are desired by Chatham County.

## E. Project Benefits

There are several public benefits that would be provided by the establishment of a new RWTF to be shared by the WIP. As previously mentioned, the proposed project will indirectly provide jobs during construction and operation. For example, construction contracts will create opportunities for qualified construction contractors to provide job opportunities for others. Operation of the facility will require continual oversight by qualified professional RWTF operators and other staff. It is anticipated that 2 to 3 employees per shift plus a plant superintendent, lab manager, and maintenance manager may be hired to operate and maintain the new facility.

Another projected benefit of the RWTF is its alignment with a multitude of Plan Chatham’s “Goals,” which provide direction for Chatham County’s leaders to make decisions about the next couple of decades of development and conservation. For example, Goal #8 states the County’s desire to become more resilient by mitigating, responding, and adapting to emerging threats. The proposed RWTF will directly and positively impact the County’s, in addition to the other Partners’, resiliency with the addition of a state-of-the-art drinking water facility. Plan Chatham’s Goal #10 is to “foster a

healthy community," which can be achieved through the project providing access to clean and safe drinking water to Chatham County's and other Partners' current and future customers. Furthermore, construction of a RWTF with supply from Jordan Lake will help accomplish Strategy 3.1 under the "Health" subsection of Plan Elements and Recommendations, which reads: "maintain and improve water quality and supply to improve utility systems to meet critical needs." Likewise, this project will be in accordance with Strategy 2.1, which asks new development to consider the demands of existing and planned water capacity, consider its relationship to water supply service areas, and consider water supply allocations that will be administered both at present and in the future. Lastly, Chatham County and the general public will benefit from the RWTF because it will directly satisfy Plan Chatham's Action Item 05 under Utility and Public Services Action Items: "partner with municipalities to serve economic development priorities with water."

## F. Disturbed Land

A total of approximately 47 acres will be disturbed for the full build out of the facility. This includes the main facility components on 40 acres and an additional 7-acre area across a creek tributary to the lake, accessed from Seaforth Road where the septic drainage field, and future clearwell and reverse osmosis (RO) will be located.

The main facility area of 40 acres will be disturbed in Phase 1 to provide preliminary grading for future components and utilize those areas to maximize the retainage of excavated materials on the site. All work for future phases of the main facility will be located within the Phase 1 disturbance zone.

Disturbance of the area across the tributary from the main site in Phase 1 will be limited to construction of the roadway leading to the future structures and for the septic drainage field. Phase 1 disturbance in this area across the tributary will be limited to approximately 3 acres. During Phase 2 buildout, disturbance of additional 4 acres is anticipated to accommodate the future clearwell and RO for a total of approximately 7 acres in the area across the tributary.

Except for connection to the roadways, land disturbance will be limited to an area 50 feet from the roadway right-of-way and beyond. The first 50 feet will remain undisturbed, and existing vegetation will be preserved.

Best management erosion control practices will be utilized for the disturbed areas and will be consistent with County, State, and Federal requirements.

## G. New Building Details

As shown on the proposed facilities site plan in Figure 3, several new buildings will be constructed and operated as part of the proposed RWTF. The new buildings' aesthetic will exemplify a natural modern material palette using stone veneer, treated concrete, coated metal panels, and other architectural treatments as depicted in the Administrative and Operations Building in **Figure 6**. Colors will be refined as the project progresses. These buildings and their respective dimensions are outlined in **Table 1** below.

**Table 1 | New Building Square Footage Information**

| Site Building # on Figure 3 | Building Name | First Floor (Square Feet) | Second Floor (Square Feet) | Roof/Potential Future Expansion (Square Feet) | Total (Square Feet) | Approximate Building Height (Feet) |
|---|---|---|---|---|---|---|
| 1 | Administrative and Operations Building | 12,817 | 5,342 | 6,357 | 18,159[1] | 54 |
| 2 | Maintenance Building | 8,425 | N/A | N/A | 8,425 | 24 |
| 5 | Raw Water Ozone Injection Building | 1,752 | 1,397 | N/A | 3,149 | 34 |
| 9 | Ozone Generator and Electrical Building | N/A | 8,140 | N/A | 8,140[2] | 44 |
| 10 | Filter Gallery Building | N/A | 4,924 | N/A | 4,924[3] | 44 |
| 11 | Granular Activated Carbon Building (GAC) | 14,785 | N/A | N/A | 14,785 | 50 |
| 12 | High Service Pump Station (HSPS) | 15,180 | N/A | N/A | 15,180 | 33 |
| 14 | Electrical and Generators Building | 7,157 | 15,076 | N/A | 22,233 | 43 |
| 15 | Chemical Building | 25,520 | N/A | N/A | 25,520 | 45 |
| 18 | Thickened Solids PS | 2,270 | N/A | N/A | 2,270 | 25 |
| 19 | Dewatering Building | 7,612 | 4,998 | N/A | 12,610 | 40 |
| 31 | Electrical Building | 2,679 | N/A | N/A | 2,679 | 23 |
| 32 | Ion Exchange Building | 29,239 | N/A | N/A | 29,239 | 43 |

1. Does not include roof/potential future expansion
2. Includes the square footage of the upper ozone generator and electrical room spaces; does not include spaces in the process structure
3. Includes square footage of upper Filter Gallery Building, not pipe gallery or other spaces in the process structure

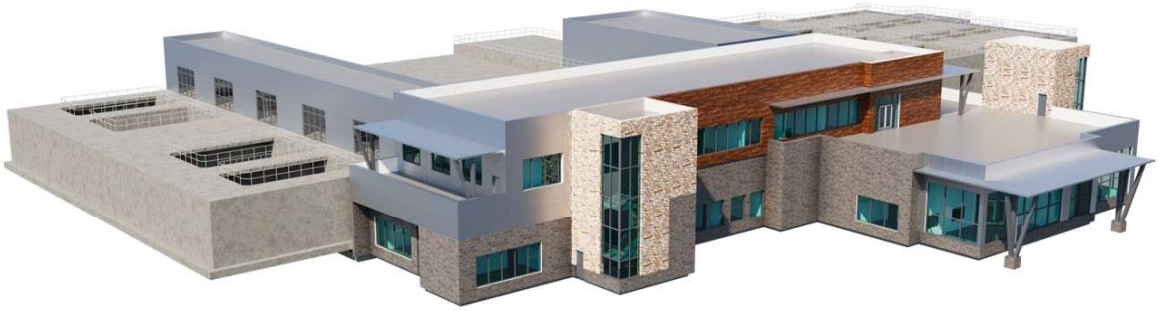


Figure 6 | Preliminary Administration/Operations Building Visual – Natural Aesthetic

## H. Location and Use of Proposed Buildings and Facilities

As reflected in Figure 3, the proposed use of the Administration/Operations Building is to house offices for plant staff, control room, plant laboratory, electrical and mechanical rooms, storage space for files, and conference rooms. Pre-treatment process train will be located to the east of the Administration/Operations Building. This will include rapid mix basins, flocculation basins, sedimentation basins with plate settlers or SuperPulsators®, ozone generators, settled water ozone contactors and filters. The Maintenance Building will be on the northwest side of the property. The Raw Water Ozone Injection Building, located to southeast of the Maintenance Building, will serve to treat the raw water by feeding ozone to oxidize taste and odor causing compounds and enhance removal of organics. The Electrical and Generators Building will be located next to the Maintenance Building and the Chemical Building, directly south, will house chemical storage tanks and feed equipment for various chemicals.

The Dewatering Building will be located on the southeast corner of the property, next to an Electrical Building.

There will be several other facilities on the site, including a substation and transformers and two 7.5-million-gallon (mg) raw water storage tanks. There will also be facilities for granular activated carbon (GAC) or Ion-Exchange (IX) and a high service pump station (HSPS) onsite. Beside the HSPS, there will be a duplex septic pump station (PS) and corresponding valve box. Two clearwells will be located on the eastern side of the property.

Residuals handling facilities capable of supporting plant operations will be provided. The WIP RWTF process design will generate three primary residuals streams that will be discharged to the residuals handling facilities located on the east side of the property. These include backwash wastewater (BWW), filter-to-waste (FTW), and sedimentation basin blowdown (SBB). The proposed residuals handling facility design will treat each of the three processes residuals stream separately and will include equalization basin with plate settlers, recycle basin and recycle pump station, gravity thickeners, thickened solids storage tanks, Dewatering Building, cake storage, and reclamation basins,

A septic drainage field on the northeast side of the site will serve the purpose of managing onsite domestic wastewater. There will also be a raw water PS and a powdered activated carbon (PAC) silo; PAC is added on an as needed basis for removal of taste and odor causing compounds. An optional weigh station for trucks will be located directly outside of the Maintenance Building and fuel storage for standby generators will be located directly across from the Maintenance Building. The north-most point of the RWTF property will house surge tanks and to the southwest there will be space for future RO.

## I. Parking Details

There will be two parking lots on the property. One will be located directly in front of the Administrative and Operations Building and will have 18 parking spaces and the other will be in front of the Maintenance Building and have 7 parking spaces (see Figure 3). The parking lots will have both employee and visitor parking available. There will not be any parking decks on the RWTF property.

## J. Proposed Land Use

As shown in **Figure 7**, there are areas to be cleared, paved, and landscaped throughout the project area. Areas that are anticipated to be cleared will be where buildings and facilities (shaded in light gray), possible future facilities (shaded in orange), and paved roads, parking lots, and walkways (shaded in dark gray) will be located. All paved areas will be on the property south of Seaforth Road and will be utilized to connect the WTF entrances and exits with Seaforth Road and North Pea Ridge Road, in addition to connecting buildings and facilities with one another. However, there will be landscaping both south and north of Seaforth Road, as can be seen on the preliminary site landscape plan (Figure 7). Long term (over 40 years) and other possible, but uncertain spaces are marked with black dash outlines on Figure 7. To the north of Seaforth Road, segments of the land on either side of the 50-foot riparian buffer adjacent to the intermittent stream will be cleared and landscaped with grass for staging or future development, though most of existing vegetation will be preserved and undisturbed. There are also wetlands on either side of the intermittent stream in the northeast and wetlands directly to the north of Seaforth Road that will remain untouched. To the south of Seaforth Road and to the north of North Pea Ridge Road, there will be a 50-to-100-foot buffer around the entirety of the RWTF that will be composed of the preserved and undisturbed existing vegetation. Images of the existing vegetation on the edge of the site as if looking from Seaforth Road can be seen in the right 3 photos on **Figure 8** with images as if looking from North Pea Ridge Road for the left side 3 photos. The majority of the landscaping on the RWTF property will include grass used for staging or future development, except for the existing vegetated buffer, existing vegetation to be enhanced for compliance, selected areas for screening plantings, and various wetlands (see Figure 7). All land south of North Pea Ridge Road will be preserved and

undisturbed. Areas to be graded and filled are described in Section N below ("Graded and Filled Areas" subsection of this EA under "Geography").


**Figure 7 | Preliminary Site Landscape Plan**


**Figure 8 | Images of the Property Edge from Seaforth Road and N. Pea Ridge Road**

## K. Existing and Proposed Utility Connections

Figure 3, the preliminary site plan, includes thick gray lines depicting where new water lines will be located on the project site. Two finished water transmission mains will be leaving the RWTF property to take finished water to each of the Partners: City of Durham and Chatham County to the north and Town of Pittsboro to the south. One finished water transmission main will exit the property nearest the facility entrance on Seaforth Road and head west toward the intersection of Seaforth Road and North Pea Ridge Road. The other finished water transmission main will leave the site on the north side of the property and continue heading north on Seaforth Road. Additionally, there will be a pipe bringing raw water from the Jordan Lake intake to the raw water pump station on the southeast edge of the property (see Figure 3).

## L. Wastewater Management Systems

The wastewater management system at the proposed facility will be a septic system treating domestic wastewater. Figure 3 depicts that the septic system will be located on the north side of the property on the opposite side of the intermittent stream. Permits for the septic system will be submitted to the Environmental Health division of the Chatham County Public Health Department. Additionally, the WIP will request a National Pollutant Discharge Elimination System (NPDES) permit from the North Carolina Department of Environmental Quality (NCDEQ) for the process wastewater from RWTF processes. Process wastewater, according to the Environmental Protection Agency (EPA), may include any water, during either manufacturing or processing, that comes into direct contact with, or results from either the use or production of any raw material, intermediate product, finished product, byproduct, or waste product.

## M. Impervious and Semi-Pervious Surfaces

The locations of proposed impervious and semi-pervious surfaces are shown in Figure 7, the preliminary site landscape plan. Impervious surfaces will include asphalt and concrete paving in the forms of roadways, parking lots, and walkways as well as proposed buildings and facilities. Pervious areas at the project location will include existing vegetation and wetlands, stormwater control measures (SCM), grass plantings, and screening plantings with deciduous canopy trees.

## N. Proposed Stormwater Control Devices

Based on current site topography, stormwater on the site flows towards the creeks located on the eastern portion of the site or towards the pond located on the southeastern portion of the side. Due to the lack of impermeable cover (such as asphalt or concrete) on the property, some stormwater likely infiltrates into the subsurface. The preliminary site plan, Figure 3, shows all proposed stormwater quality and quantity control devices that will be utilized after construction of the RWTF; they are labelled as SCM1, SCM2, SCM3, SCM4, and SCM5. On the site plan, SCM1 is located at the west-most point of the property, directly beside the substation and transformers, and SCM2 is across the street, to the northeast. SCM3 is on the eastern edge of the property. SCM4 and SCM5 are farther south from SCM3 following the eastern edge of the property. During construction, stormwater will be controlled to mitigate runoff using temporary sediment and erosion control devices as outlined in a Sediment and Erosion Control Plan that will be submitted to NCDEQ. Additionally, a Stormwater Permit Application will be sent to the Chatham County Watershed Protection Department (which includes a post-construction stormwater management plan) and a Stormwater NPDES Permit (NCG010000) for NCDEQ Department of Energy, Mineral, and Land Resources (DEMLR) will be completed.

# 2.0 Alternatives Analysis

## A. Development Alternatives

As part of their planning process, the WIP completed preliminary engineering to identify other potential RWTF site alternatives for their suitability to address the Partners' water supply needs, as opposed to utilizing the site previously acquired and planned for a RWTF. Five alternatives (including the selected site) for RWTF site were evaluated. Each alternative is required to adhere to the following, as defined in the 2023 Water Treatment Facility Site Evaluation conducted by Hazen and Sawyer:

- Site Area: Minimum buildable area of 60 acres on a parcel or assemblage of parcels for construction of a RWTF with a future capacity of 85.5 mgd
- Status: Undeveloped to avoid relocation of existing facilities or uses
- Environmental: Limited streams and wetlands
- Floodplain: Outside the floodplain
- Topography: Favorable for site development
- Proximity: Sites near the proposed intake and finished water routes under consideration

A summary of the five criteria considered for the comparison of the five site alternatives, in addition to the requirements defined above for determining the initial list of sites, is below:

- Site Zoning: Zoning for the potential site
- Adjacent Land Use: Zoning and uses of adjacent property
- Water Transmission: Efficient raw and finished water transmission without additional piping, associated impacts, or whether the site requires transmission piping along an unfavorable corridor.
- Raw Water Pumping: Opportunity to locate the raw water pump station on the same site as the RWTF to reduce impacts outside the RWTF site during construction and improve security or operations and maintenance access during operations.
- Site Access: The location of the site relative to roadways

Alternative 1 is to locate the RWTF on OWASA-owned property adjacent to Jordan Lake State Recreation Area and close to the southwest end of Jordan Lake. This alternative has adequate size and arrangement for the proposed and future water treatment facilities, as it is bordered by federally owned lands largely undeveloped. The site has a total area of 122 acres, a buildable area of 78 acres of land, is made up of two parcels, and both it and the adjacent land are zoned residentially (though required setbacks and buffers can be maintained). Most RWTF infrastructure can be located on the opposite sides of Seaforth Road and North Pea Ridge Road from neighboring developments and property. Field reconnaissance has confirmed that the RWTF can be developed on the site without significantly impacting wetlands, streams, or cultural resources. The site is centrally located to transmit finished water to the Partners without excess piping required. Lastly, the site allows the construction of the raw water pump station within the RWTF site, avoiding encroachment on United States Army Corps of Engineers (USACE) and North Carolina State Parks (NC Parks) lands. The construction of the raw water pump station and other treatment facilities on a common site also provides security and operation benefits. Alternative 1 achieves the WIP's security and operational preferences to co-locate the raw water pump station and RWTF on the same site, will not require additional land acquisition, is centrally located reducing additional pipelines, and minimizes environmental impacts, and is, therefore, the preferred RWTF site.

Alternative 1 is depicted in **Figure 9**.

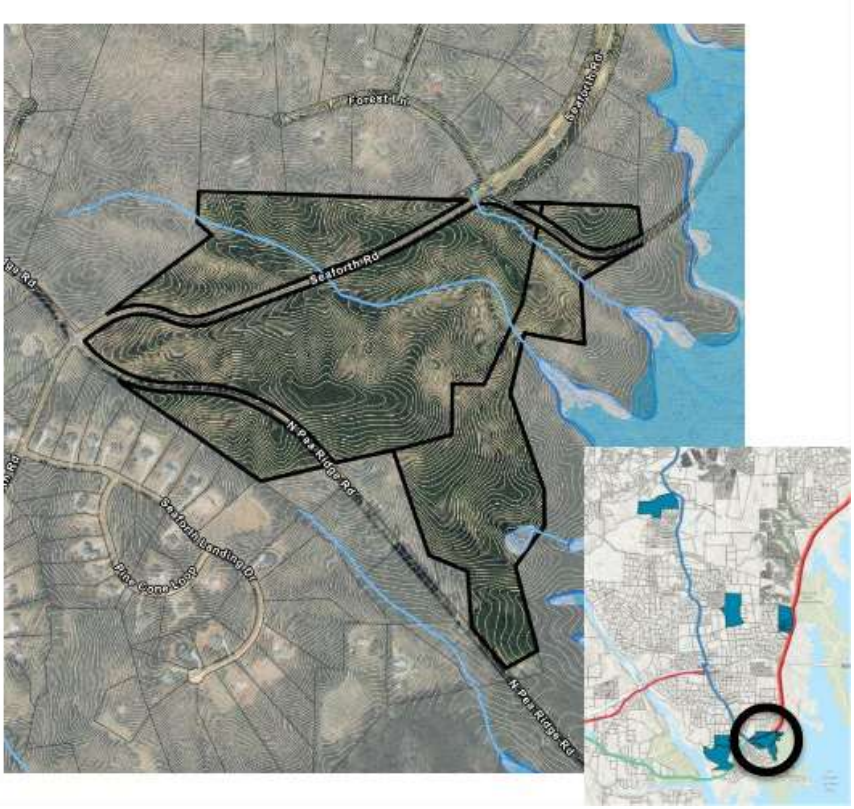



**Figure 9 | Alternative 1 RWTF Location**

Alternative 2 is to locate the RWTF on land owned by Seaforth Road, LLC, just to the west of the proposed site and in close proximity to the south end of Jordan Lake. Access to and from the site would be along Seaforth Road, south of its intersection with North Pea Ridge Road. This site has a total area of 125 acres and a buildable area of 87 acres of land. This site is made up of one parcel and both it and the adjacent land are zoned residentially (though required setbacks and buffers can be maintained). This property has adequate size and arrangement for the proposed and future water treatment facilities. Desktop mapping has indicated that there are two streams on the property but, like Alternative 1, the streams can likely be avoided with site development. The site is centrally located to transmit finished water to the Partners with limited excess piping required. However, the site is too far from the intake location to allow the raw water pump station to be located on the site. Therefore, the raw water pump station would have to be constructed on USACE property leased by NC Parks, on Alternative 1, or additional property in the area of Alternative 1 would need to be acquired. Thus, the construction of the raw water pump station with the other treatment facilities on a common site cannot be achieved with this alternative. As with all alternatives, rezoning would be required. Alternative 2 does not achieve the WIP's security and operational preferences to co-locate the raw water pump station and RWTF on the same site, will require additional land acquisition, is not centrally located requiring additional pipelines, and provides no environmental benefit over Alternative 1 (the preferred alternative). Based on this analysis, Alternative 2 was considered unacceptable.

Alternative 2 is depicted in **Figure 10**.

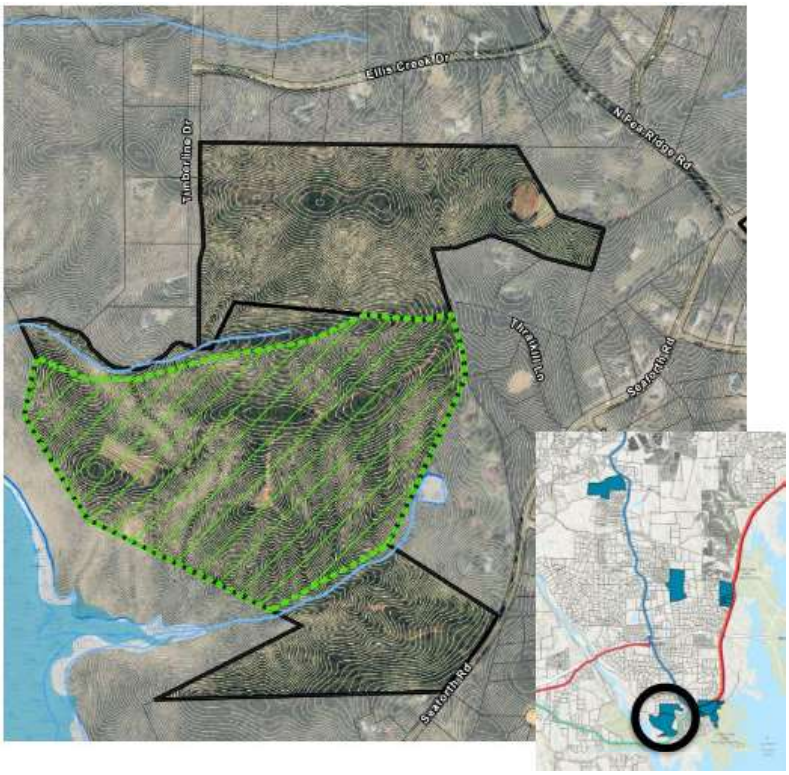



**Figure 10 | Alternative 2 RWTF Location**

Alternative 3 is to locate the RWTF on land closer to US 64. This site is adjacent to Big Wood Road, north of US 64, and is not centrally located to permit drinking water transmission to Partners without additional transmission mains when compared to Alternative 1. However, it does have adequate size and shape to accommodate the proposed and future water treatment facilities. This property is managed by four owners: F-L Legacy Owner, LLC, Kimberly Ann Kitchens, Ann B. Burke, and Betsy B. Sturdivant. This land has a total area of 88 acres, all of which is buildable. This site is made up of five parcels and both it and the adjacent land are zoned residentially (though required setbacks and buffers can be maintained). Desktop data suggests there are no streams or wetlands on the site. However, the site is too far from the intake location to allow the raw water pump station to be located on the site. Therefore, the raw water pump station would have to be constructed on USACE property leased by NC Parks, on Alternative 1, or additional property in the area of Alternative 1 would need to be acquired. Thus, the construction of the raw water pump station with the other treatment facilities on a common site cannot be achieved with this alternative. As with all alternatives, rezoning would be required. Alternative 3 does not achieve the WIP's security and operational preferences to co-locate the raw water pump station and RWTF on the same site, will require additional land acquisition, is not centrally located requiring additional pipelines, and provides no environmental benefit over Alternative 1 (the preferred alternative). Based on this analysis, Alternative 3 was considered unacceptable.

Alternative 3 is depicted in **Figure 11**.

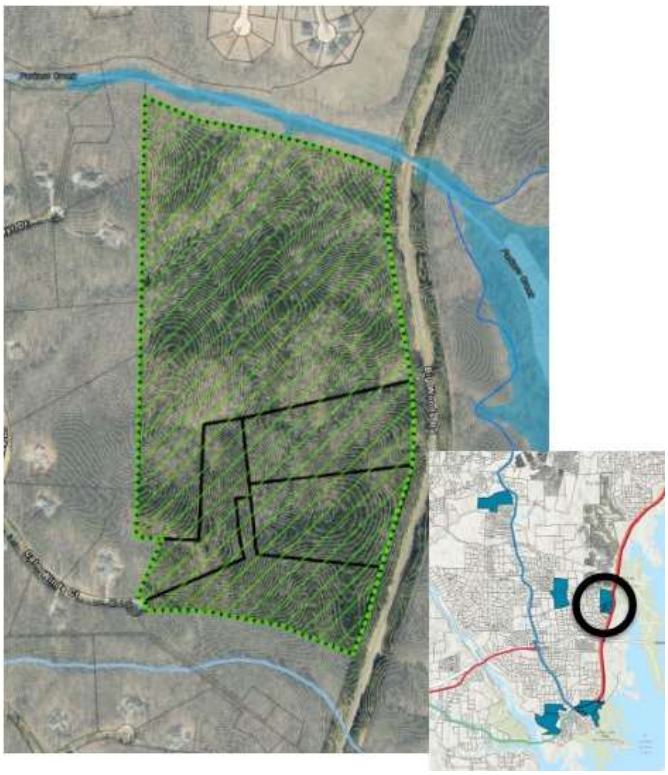


**Figure 11 | Alternative 3 RWTF Location**

Alternative 4 is to locate the RWTF on a parcel to the west of Alternative 3 and more inland from Jordan Lake, having a single access off Hatley Road. This property is owned by Contentnea Creek Development Company, has a total area of 131 acres, and has a buildable area of 113 acres (the whole parcel except for the land north of Parkers Creek). Alternative 4 has adequate size and shape to accommodate the proposed future water treatment facilities. This site is made up of one parcel and both it and the adjacent land are zoned residentially; the site has conditional zoning for smaller 2-acre lots but is undergoing rezoning to R5, with development planned for the site. The site is north of US 64 and is not centrally located to permit drinking water transmission to the Partners without additional transmission mains compared to Alternative 1. Desktop data suggests there are no streams or wetlands on the site. However, the site is too far from the intake location to allow the raw water pump station to be located on the site. Therefore, the raw water pump station would have to be constructed on USACE property leased by NC Parks, on Alternative 1, or additional property in the area of Alternative 1 would need to be acquired. Thus, the construction of the raw water pump station with the other treatment facilities on a common site cannot be achieved with this alternative. As with all alternatives, rezoning would be required. Alternative 4 does not achieve the WIP's security and operational preferences to co-locate the raw water pump station and RWTF on the same site, will require additional land acquisition, is not centrally located requiring additional pipelines, and provides no environmental benefit over Alternative 1 (the preferred alternative). Based on this analysis, Alternative 4 was considered unacceptable.

Alternative 4 is depicted in **Figure 12**.

**Figure 12 | Alternative 4 RWTF Location**

Alternative 5 is to locate the RWTF to the northwest, further inland from Jordan Lake, nestled between Ward Branch Stream and Pokeberry Creek and near Mount Gilead Road. This property is owned by Wayne Strowd, has a total area of 147 acres, and has a total buildable area of 93 acres. Alternative 5 has adequate size and shape to accommodate the proposed and future water treatment facilities. However, it is not centrally located to permit drinking water transmission to the Partners without significant additional transmission mains when compared to Alternative 1. This site is the furthest location from the raw water intake. The transmission route studies have revealed that transmission mains along Mount Gilead Road are longer and significantly more impactful than those along Big Woods Road. Alternative 5 would necessitate the transmission mains following Mount Gilead Road, which is unfavorable from a transmission routing perspective.

Additionally, Alternative 5 is made up of one parcel and both it and the adjacent land are zoned residential (though required setbacks and buffers can be maintained). Desktop data suggests one stream on the site and it is anticipated that the facilities could be constructed on the site with limited impacts on the stream. However, the site is too far from the intake location to allow the raw water pump station to be located on the site. Therefore, the raw water pump station would have to be constructed on USACE property leased by NC Parks, on Alternative 1, or additional property in the area of Alternative 1 would need to be acquired. Thus, the construction of the raw water pump station with the other treatment facilities on a common site cannot be achieved with this alternative. As with all alternatives, rezoning would be required. Alternative 5 does not achieve the WIP's security and operational preferences to co-locate the raw water pump station and RWTF on the same site, will require additional land acquisition, is not centrally located requiring additional pipelines, and provides no environmental benefit over Alternative 1 (the preferred alternative). Based on this analysis, Alternative 5 was considered unacceptable.

Alternative 5 is depicted in **Figure 13**.

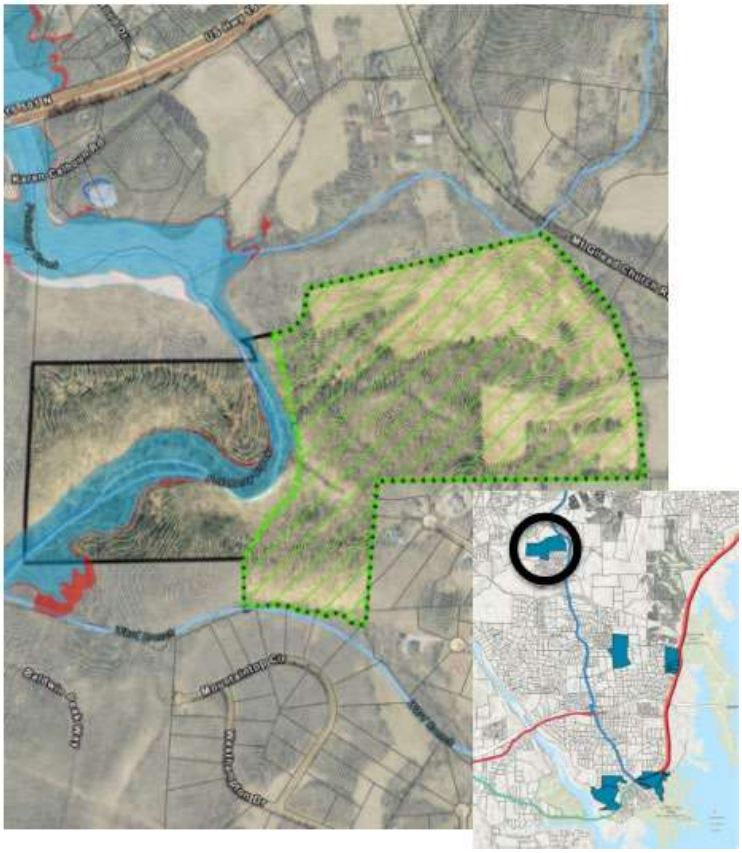


Figure 13 | Alternative 5 RWTF Location

## B. Selected Alternative

Each of the five alternative sites evaluated had the requisite size and configuration to accommodate the proposed and future water treatment facilities. Differences in environmental impacts were found to be insignificant between the sites. Additionally, all the sites are currently zoned for residential use and have residential zoning and existing residences adjacent to their perimeter. A No-Build Alternative was not considered, because it is not feasible. If the proposed RWTF is not constructed, the WIP will not be able to adequately supply water to the City of Durham, the Town of Pittsboro, Chatham County, and OWASA and thus will not be able to meet current and future water capacity needs. A No-Build Alternative would not allow the WIP to provide and secure long-term water supply for the previously listed regions of the Triangle nor allow them to adhere to their five core values of quality, sustainability, transparency, equity, and partnership. For these reasons, the No-Build Alternative does not meet the purpose and need for the project.

The WIP selected Alternative 1 as their preferred alternative. The proposed action of constructing and operating a water treatment facility on the proposed property was selected because, relative to other alternatives, the degree to which it cost-effectively accommodates the water transmission and its ability to accommodate the raw water pump station on a site with the treatment facilities are unmatched compared to Alternatives 2 through 5. It is also the only property already owned by a WIP Partner and hence not requiring acquisition from a property owner that may not be interested. Location was the primary difference between the evaluated sites and the reason that Alternative 1 was found to be most favorable and recommended for developing the WIP RWTF.

# 3.0 Existing Environment and Project Impacts

This section describes the affected environment and environmental consequences of the proposed WIP Regional Drinking RWTF project.

## A. Geography

### 1. Geographic Background

A geographic background, entitled Baseline Environmental Conditions Report on Orange Water and Sewer Authority Property Proposed for Regional Water Treatment Facility, was compiled for the project location in 2022 by Brown and Caldwell (BC) on behalf of the WIP. The report indicates that the proposed RWTF site is 121.64 acres in size and irregular in shape. The geographic coordinates at the approximate center of the site are latitude 35° 42’ 56.78” North and longitude 79° 3’ 45.68” West. Additionally, the property is in an area that is sparsely developed but with some nearby residential use. The 2019 Merry Oaks 7.5-minute United States Geological Survey (USGS) Topographic Quadrangle Map indicates that the site is located on generally undulating terrain. Topographic maps indicate that the general direction of regional surface slope appears to be southeasterly towards Jordan Lake which is located between approximately ¼ to ½ mile from the site. According to Environmental Data resources, Inc. (EDR), a government and historical records search firm, the site elevation varies between approximately 250 feet above mean sea level and 350 feet above mean sea level. The geological units in the general area of the project location are from the Mesozoic Era, the Triassic System, and the Triassic Series; the category is Stratified Sequence.

## 2. Topographic Map

**Figure 14** depicts a topographic map of the property and surrounding area.

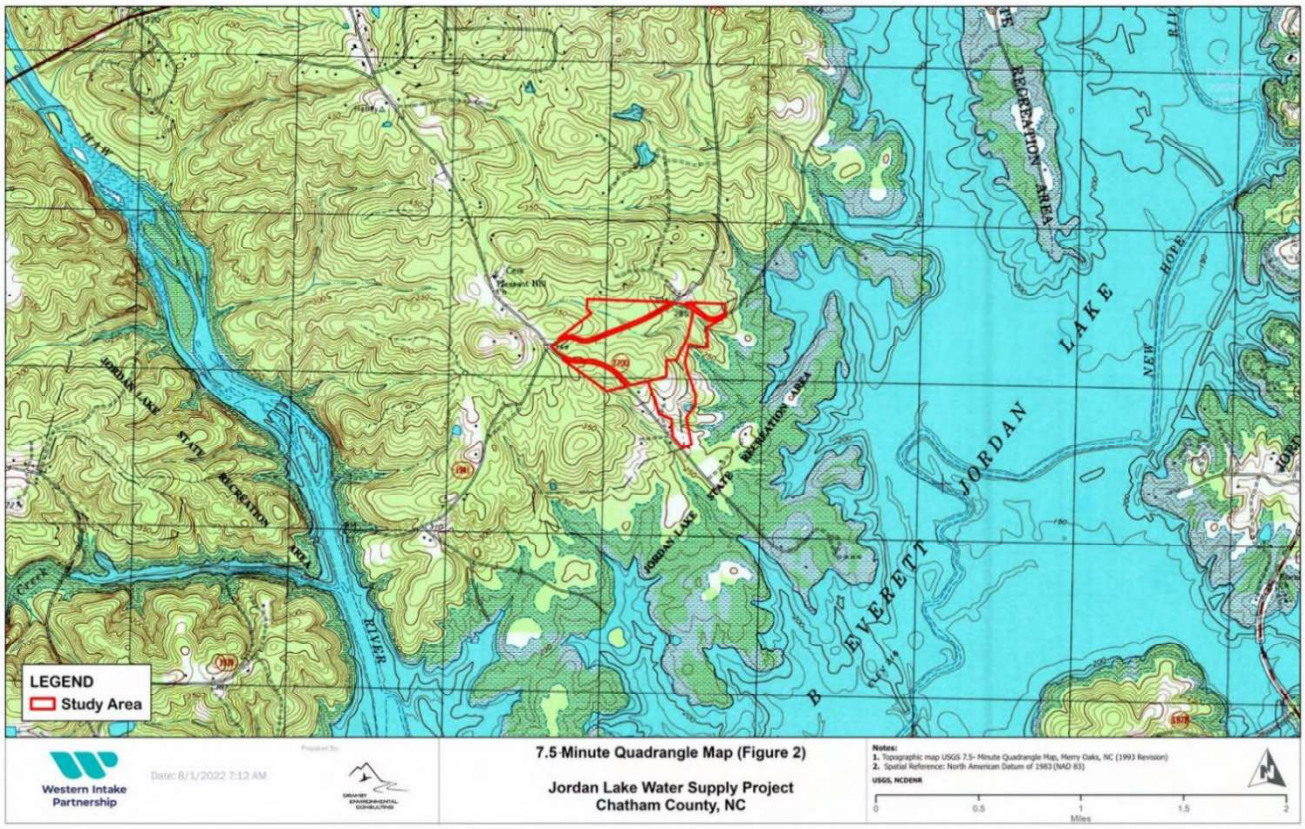



**Figure 14 | 7.5-Minute Quadrangle Map of the Study Area and Surrounding Properties**

## 3. 100-Year Floodplains

According to the EDR Radius Map Report, the Federal Emergency Management Agency (FEMA) Flood Plain Panel is 3710978000J, with additional panels 3710978200J and 3710977100J in the project area. According to the Overview Map and Detail Map in the EDR Radius Map Report, the site is not located in a FEMA identified 100- or 500-year floodplain. However, adjacent to the property, there is a FEMA identified 100-year floodplain. **Figure 15** shows this flood-prone area as defined by the North Carolina Mapping Program.

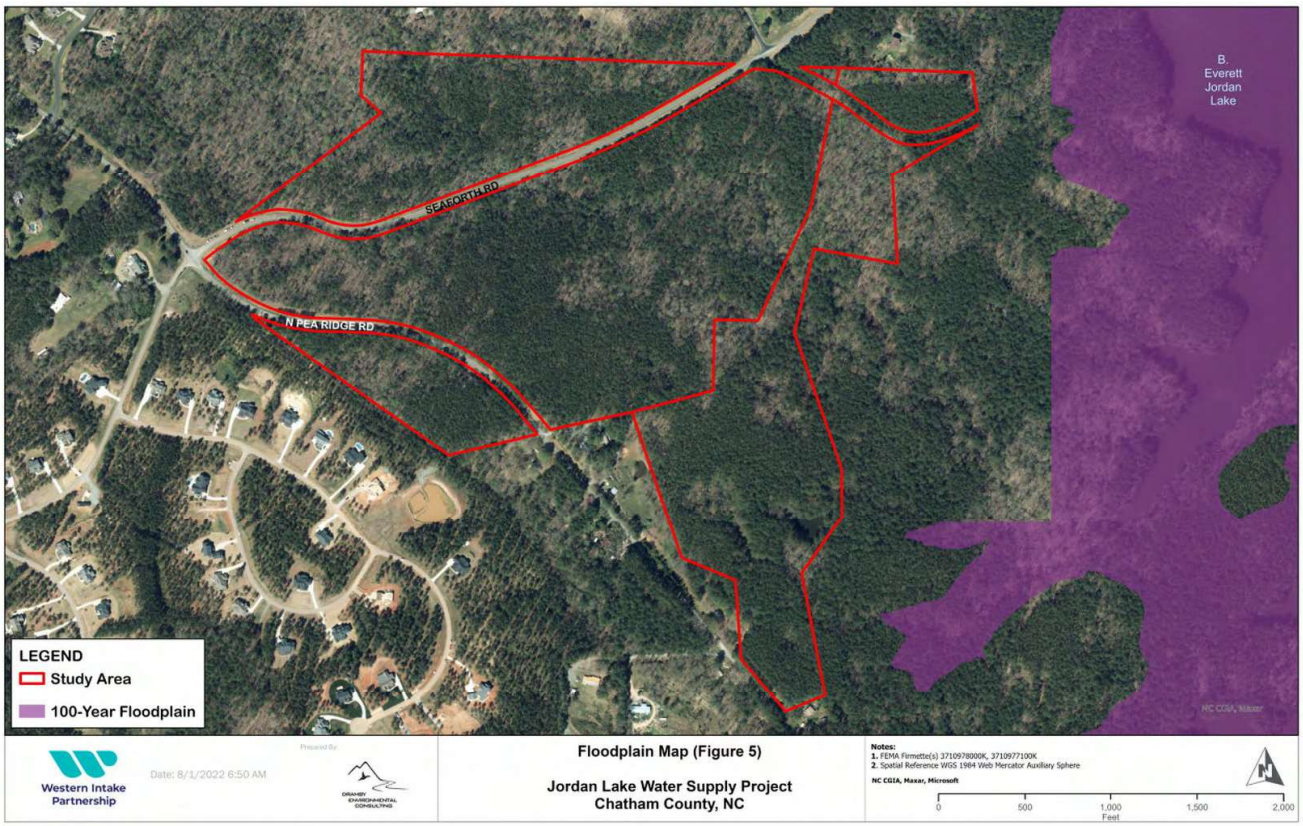



**Figure 15 | Floodplain Map of the Study Area and Surrounding Properties**

## 4. Graded and Filled Areas

**Figure 16** and **Figure 17** show the proposed areas on the RWTF property to be graded or filled.

Due to the topography, it will be difficult to balance earthwork. Preliminary cut/fill numbers are as follows:

- Cut: 345,582 cy
- Fill: 67,165 cy
- Difference: 278,416 cy

Excess cut will be managed in multiple ways to minimize the amount of spoils offhaul required. Mounding will be provided in landscape areas. Flatter side slopes will be provided along roadways in fill sections and berms for stormwater ponds in fill. Any rock included in the excess cut will either be crushed and used as base course for roads and parking lots and some rock could be used as decorative boulders in landscape areas.

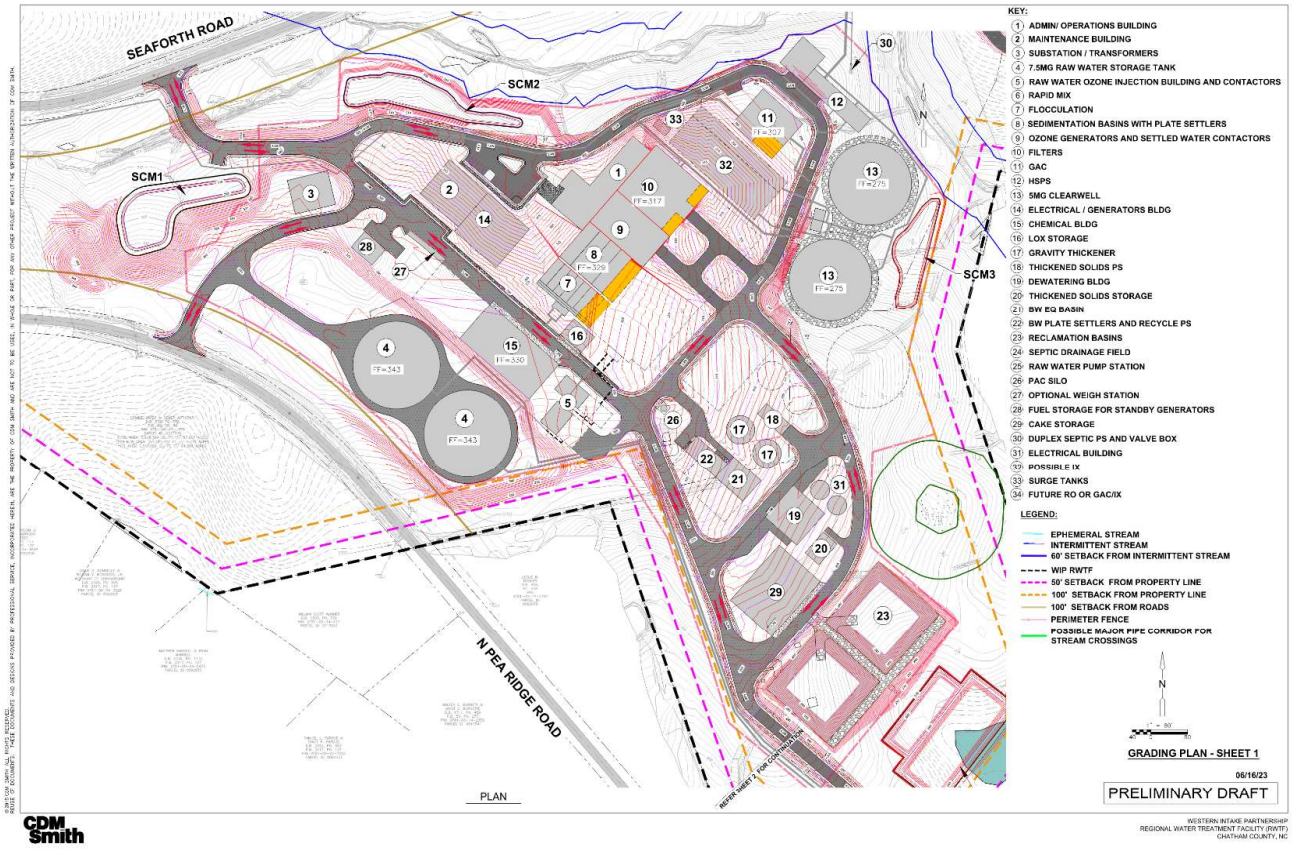



**Figure 16 | Grading Plan for RWTF – Sheet 1 of 2**

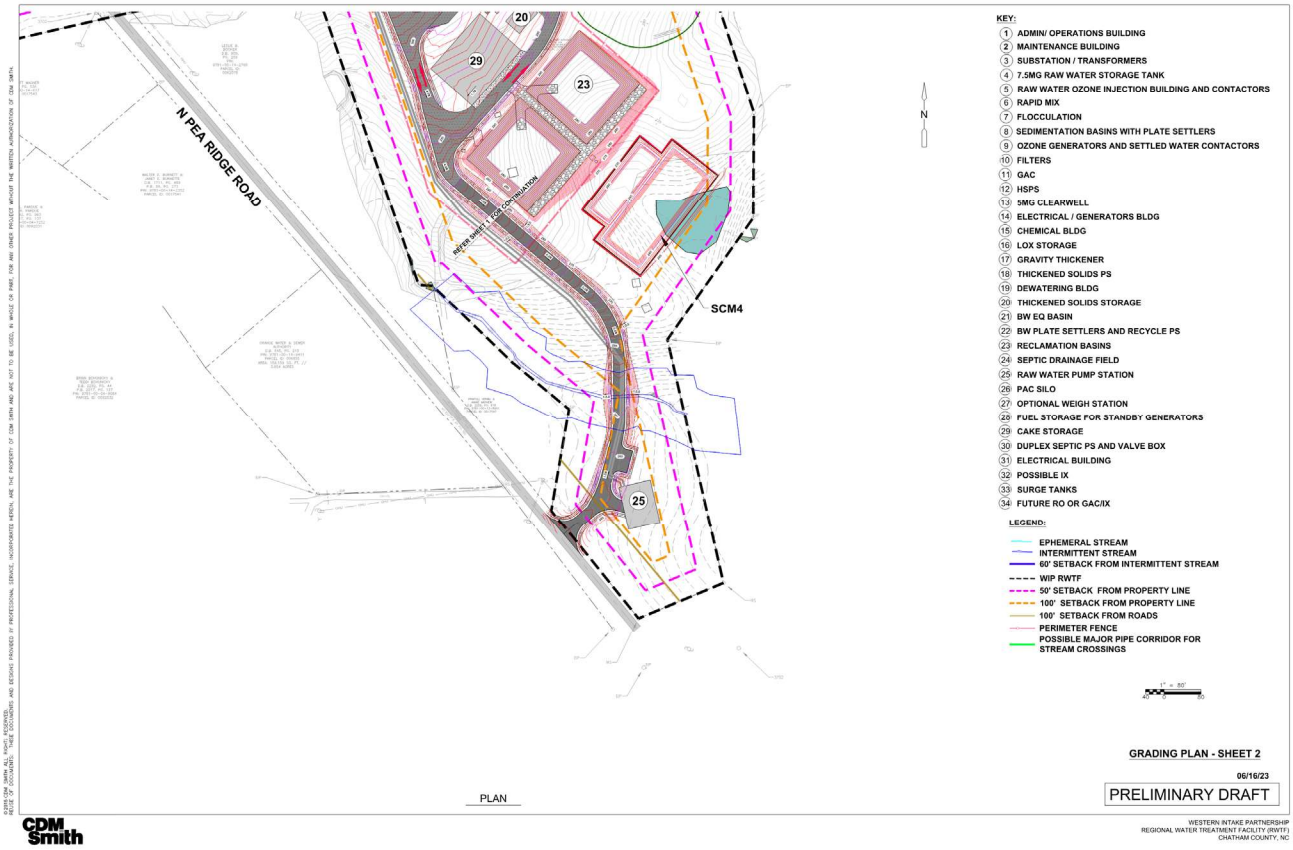



**Figure 17 | Grading Plan for RWTF – Sheet 2 of 2**

### 5. Risk of Flooding

There is no anticipated increased risk of flooding during the construction and operation of the RWTF. Thus, no alternative selection, design strategies, construction methods, long-term maintenance procedures, or any other form of flood mitigation is planned or required.

## B. Soils and Prime Farmlands

### 1. Dominant Soils

According to the Soil Conservation Service Information provided in the EDR report, the soil component at the site is named Creedmoor. More specifically, the Natural Resources Conservation Service's (NRCS) Web Soil Survey (WSS) identifies Creedmoor-Green Level complex (CrB, CRC), Georgeville silt loam (GaB, GeC2), Goldston-Badin complex (GoC), Mayodan fine sandy loam (MdB, MdC), Nanford-Badin complex (NaB, NaC, NaD), and Pittsboro-Iredell complex (PsB) within the study area. The soil is predominantly sandy loam with Class C hydrologic characteristics and slow infiltration rates (**Figure 18**).

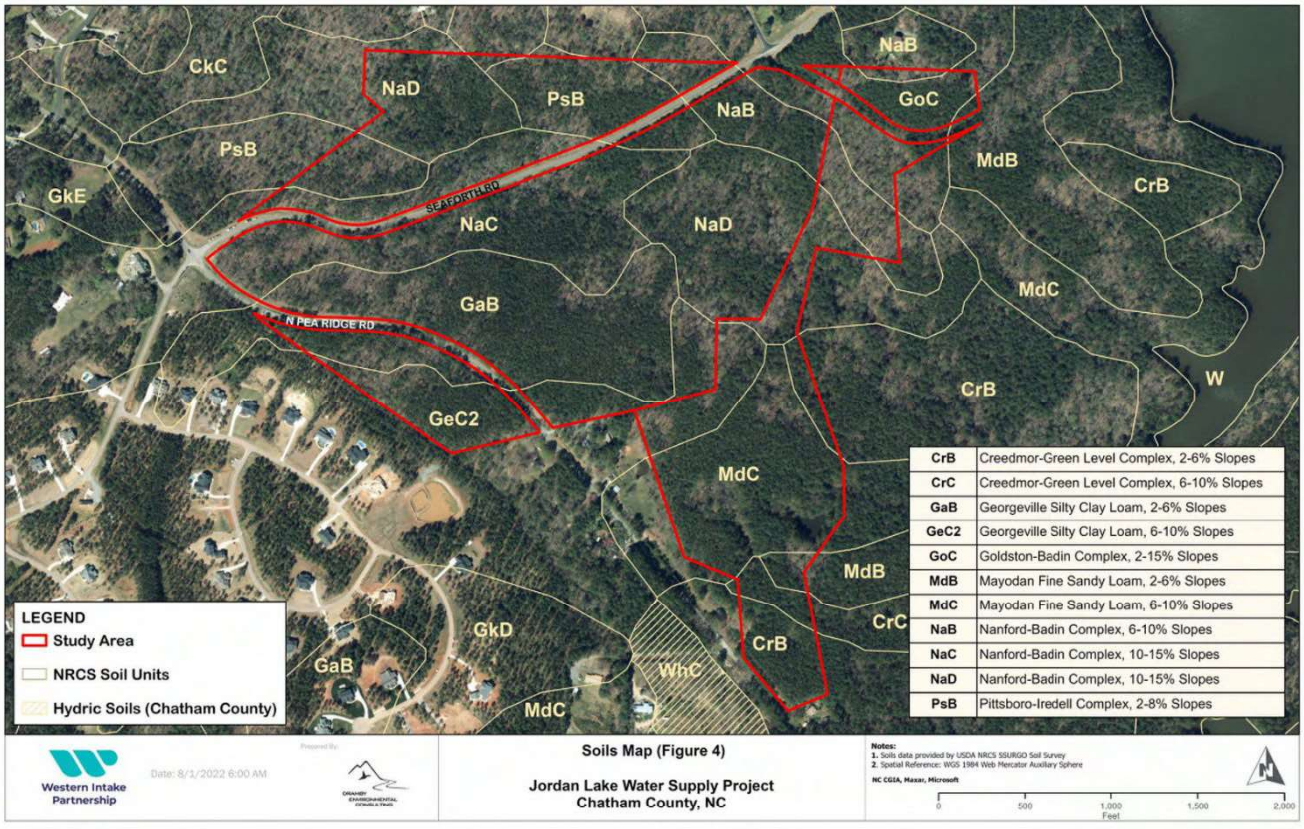



**Figure 18 | Soils Map of Project Area**

### 2. Soil Constraints

There are no soil constraints within the project area. None of the mapped, onsite soil units in Figure 18 are classified as hydric by the NRCS within Chatham County. Furthermore, neither wetland soils not septic suitability is discussed in the Waters of the United States (WOTUS) Preliminary Jurisdictional Determination (PJD) request for the site submitted by Dramby Environmental Consulting, Inc. in 2022. Therefore, no alternative selection, design strategies, construction methods, long-term maintenance procedures, or any other form of mitigation due to soil constraints is planned or required.

### 3. Expected Soil Disturbance and Contamination

There is no soil contamination expected as a result of this project. There is no soil disturbance expected during operation of the completed RWTF, though there will be apparent soil disturbance during the construction phase. Disturbances to soil caused by the construction of the proposed buildings and facilities and the finished water transmission mains will be mitigated by installing the necessary pipelines underground and revegetating or restoring the ground to existing condition upon completion of construction. Additionally, impacts to soil disturbance for all above-ground structures will be mitigated by utilizing only the minimum footprint required to build the RWTF infrastructure. Lastly, proper erosion and sediment control measures during construction will be enforced to prevent construction sediment from leaving the work areas.

### 4. Containment Plans and Procedures

As previously mentioned, no soil contamination is expected as a result of this project. Thus, no containment plans and procedures are planned or required during construction and operation.

### 5. Soil Relocation

Soil will be relocated during construction of the water treatment facility. The relocation site of the excess soil will primarily consist of the 50 to 100-foot vegetated buffer and a permitted facility for disposal. See section 3.0.A.4 for more information regarding earthwork and disposal of spoils.

### 6. Runoff Management Plan

The runoff management plan for this project includes three primary components: a Sediment and Erosion Control Plan, construction practices, and proposed facilities. Creating a Sediment and Erosion Control Plan for construction will outline proper and stable stormwater conveyances and outlets, thereby regulating site development and post-construction stormwater runoff control.

Construction practices will also be employed to avoid contaminating natural aquatic and wetland systems with runoff. These practices include limiting all equipment maintenance, staging laydown, and dispensing of fuel, oil, etc., to designated upland areas. Additionally, there will be five proposed stormwater control measures, designated as SCM1, SCM2, SCM3, SCM4, and SCM5 in the preliminary site design (Figure 3), to act as permanent stormwater devices to remove pollutants from stormwater runoff before the water reaches streams and other surface water. Together, these design strategies, construction methods, and maintenance procedures will mitigate any anticipated runoff resulting from this project.

### 7. Off-Site Impacts of Soil Disturbance

As previously mentioned, temporary sediment and erosion control devices as outlined in a Sediment and Erosion Control Plan will be used to control runoff from the site. Creating a Sediment and Erosion Control Plan for construction will outline proper and stable stormwater conveyances and outlets, thereby regulating site development and limiting any off-site impacts of soil disturbance. No other forms of mitigation are required.

### 8. Prime and Unique Farmland Soils

Several soil map units found at the project site and surrounding areas are designated as prime or unique farmland by the NRCS WSS for Chatham County. These designations are listed below in **Table 2** and depicted in **Figure 19**.

### 9. Impacts to Prime and Unique Farmland Soils

**Table 3** depicts the areas (acres and percentages) of prime and unique farmland soils in the area of interest (AOI), which is defined by the boundaries set forth in Figure 19 for the project site and surrounding area. **Table 4** includes the areas (acres and percentages) of prime and unique farmland soils at the project site only. However, the site is not currently utilized as farmland. Therefore, any impacts to prime or unique farmland soils at the project site are not significant. No alternative selection, design strategies, construction methods, long-term maintenance procedures, or any other form of mitigating impact to prime or unique farmland soils is planned or required.

**Table 2 | Prime and Unique Farmland Soils at Project Site and Surrounding Areas**

| Map Unit Symbol | Map Unit Name | Rating |
|---|---|---|
| CrB | Creedmoor-Green Level complex, 2 to 6 percent slopes | All areas are prime farmland |
| GaB | Georgeville silt loam, 2 to 6 percent slopes | All areas are prime farmland |
| GeB2 | Georgeville silty clay loam, 2 to 6 percent slopes, moderately eroded | All areas are prime farmland |
| MdB | Mayodan fine sandy loam, 2 to 6 percent slopes | All areas are prime farmland |
| NaB | Nanford-Badin complex, 2 to 6 percent slopes | All areas are prime farmland |
| PeA | Peawick fine sandy loam, 0 to 2 percent slopes | All areas are prime farmland |
| CkC | Cid silt loam, 6 to 10 percent slopes | Farmland of statewide importance |
| CmB | Cid-Lignum complex, 2 to 6 percent slopes | Farmland of statewide importance |
| CrC | Creedmoor-Green Level complex, 6 to 10 percent slopes | Farmland of statewide importance |
| CrD | Creedmoor-Green Level complex, 10 to 15 percent slopes | Farmland of statewide importance |
| GaC | Georgeville silt loam, 6 to 10 percent slopes | Farmland of statewide importance |
| GeC2 | Georgeville silty clay loam, 6 to 10 percent slopes, moderately eroded | Farmland of statewide importance |
| GkD | Georgeville-Badin complex, 10 to 15 percent slopes | Farmland of statewide importance |
| HrC | Herndon silt loam, 6 to 10 percent slopes | Farmland of statewide importance |
| MdC | Mayodan fine sandy loam, 6 to 10 percent slopes | Farmland of statewide importance |
| MgD | Mayodan gravelly sandy loam, 10 to 15 percent slopes | Farmland of statewide importance |
| NaC | Nanford-Badin complex, 6 to 10 percent slopes | Farmland of statewide importance |
| NaD | Nanford-Badin complex, 10 to 15 percent slopes | Farmland of statewide importance |
| WhB | White Store-Polkton complex, 2 to 6 percent slopes | Farmland of statewide importance |
| WhC | White Store-Polkton complex, 6 to 10 percent slopes | Farmland of statewide importance |
| WhD | White Store-Polkton complex, 10 to 15 percent slopes | Farmland of statewide importance |
| RvA | Riverview silt loam, 0 to 3 percent slopes, frequently flooded | Prime farmland if protected from flooding or not frequently flooded during the growing season. |

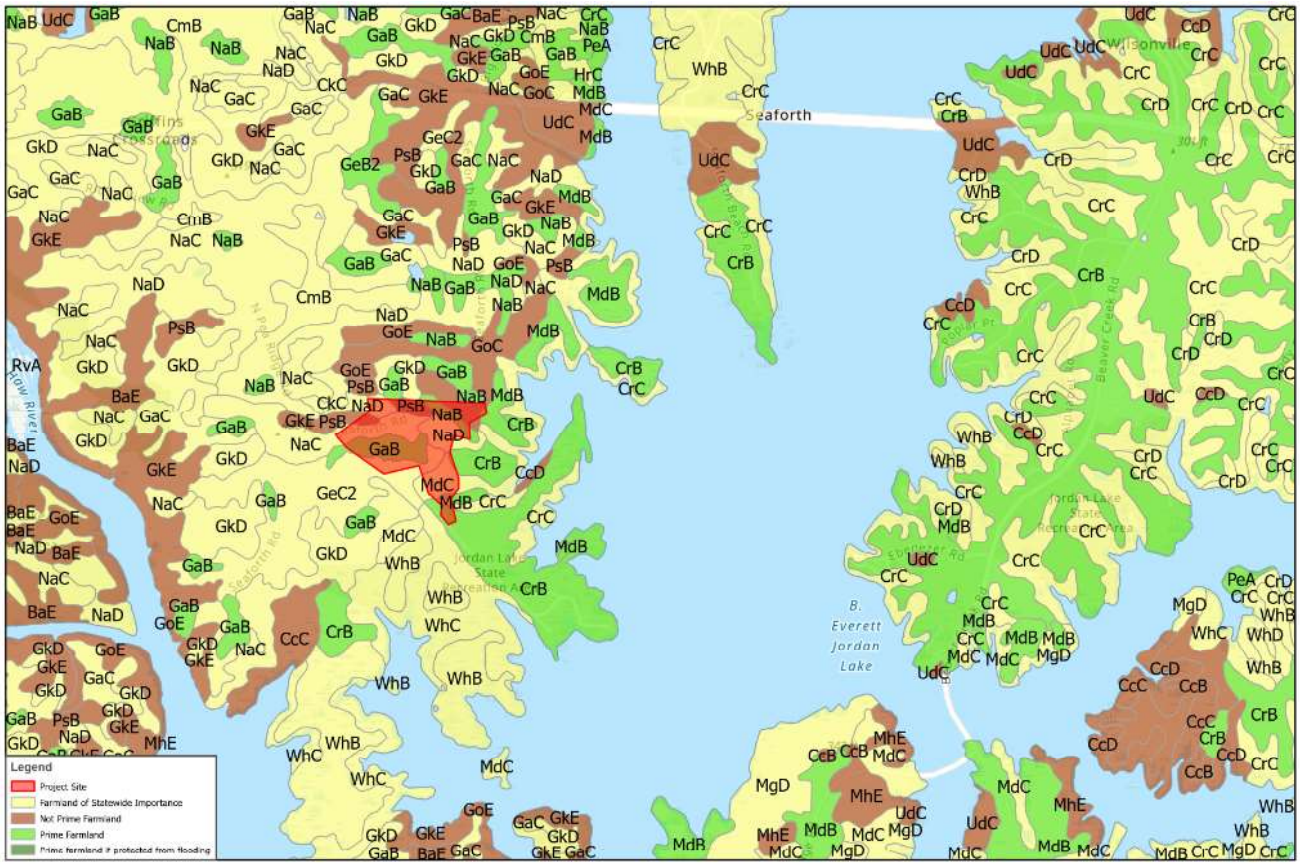



**Figure 19 | Prime Farmland and Farmland of Statewide Importance Soils Map**

Table 3 | Prime and Unique Farmland Soil Areas at Project Site and Surrounding Areas.

| Map Unit Symbol | Acres of AOI | Percent of AOI |
|---|---|---|
| CrB | 1,608 | 10.8% |
| GaB | 292.6 | 2% |
| GeB2 | 37.2 | 0.3% |
| MdB | 334.9 | 2.3% |
| NaB | 117.3 | 0.8% |
| PeA | 22.7 | 0.2% |
| CkC | 50.3 | 0.3% |
| CmB | 314.7 | 2.1% |
| CrC | 1,150.9 | 7.7% |
| CrD | 341.9 | 2.3% |
| GaC | 327.3 | 2.2% |
| GeC2 | 216.9 | 1.5% |
| GkD | 759 | 5.1% |
| HrC | 7.8 | 0.1% |
| MdC | 293.7 | 2% |
| MgD | 203.3 | 1.4% |
| NaC | 837.2 | 5.6% |
| NaD | 360.4 | 2.4% |
| WhB | 476.4 | 3.2% |
| WhC | 282.6 | 1.9% |
| WhD | 12.6 | 0.1% |
| RvA | 29.1 | 0.2% |
| **Total** | **8,076.8** | **54.50%** |

Table 4. Prime and Unique Farmland Soil Areas at Project Site

| Map Unit Symbol | Acres of Project Site | Percent of Project Site |
|---|---|---|
| CrB | 3.5 | 2.90% |
| CrC | 1.1 | 0.90% |
| GaB | 22.7 | 18.70% |
| GeC2 | 12.7 | 10.40% |
| MdB | 1.3 | 1.10% |
| MdC | 13.1 | 10.70% |
| NaB | 7.3 | 6.00% |
| NaC | 22.1 | 18.10% |
| NaD | 20.7 | 17.00% |
| **Total** | **104.5** | **85.80%** |

## C. Land Use

### 1. Current Land Use

The current owner of the project site, according to the 50-year-Chain-of-Title Report, is Orange Water and Sewer Authority (OWASA). The site currently consists of unoccupied forested land. The term “adjoining property,” as part of the Baseline Environmental Conditions Report (Brown and Caldwell. October 11, 2022), refers to properties that border or are contiguous or partially contiguous to the site or properties that would be if a street, road, or other public thoroughfare did not separate them. Adjoining properties were visually observed from public access right-of-way to make a cursory assessment for the current land use and the potential for environmental conditions that may impact the site. Reconnaissance of adjoining properties was performed by review of vicinity records, information provided on Google Earth Maps, viewing land use from legal boundaries, or by driving by the adjoining properties that were legally accessible. Uses of the adjoining properties to the site are as follows: the north is undeveloped land and single-family residences, the east is undeveloped land, the west is single-family residences, and the south is undeveloped land and single-family residences.

### 2. Current Land Use and the Surrounding Area

As previously mentioned, the land immediately to the north of the site is undeveloped and single-family residences, the east is undeveloped, the west is single-family residences, and the south is undeveloped and single-family residences. The surrounding area also consists of USACE and NC Parks land. This adjacent public land, namely, Jordan Lake State Recreation Area, extends to the edge of the Jordan Lake reservoir and has recreational use amenities present, including those for camping, hiking, and boating. While the current land use of the proposed RWTF site does not fit that of the developed and residential areas, it does fit into the surrounding areas that serve purposes of conservation and ecological function. Plan Chatham states that “preserving rural character” was identified as the most important goal during the planning process of the report; the current land use of the proposed facility location exemplifies this rural character.

Besides the current land use of the project site matching the surrounding areas’ rural character, it also falls into the second largest land use category in Chatham County: open space. Like the adjacent Jordan Lake State Recreation Area, which is 41,000 acres of protected open space with a few large tracts of land in conservation easements held by trusts, the project site is largely undeveloped and forested.

### 3. Current Zoning

The current zoning of both the project site and the surrounding area is residential. More specifically, the project area parcels are zoned as R1 - Residential District. Several permitted uses of R1 zones are outlined in the Chatham County Zoning Ordinance. These uses are permitted subject to obtaining a zoning and/or special use permit from the Zoning Official. There are also several dimensional requirements for R1 zones. The minimum required lot area is 40,000 square feet or 65,340 square feet for lots with individual wells and individual wastewater disposal systems. For an R1 zone, lots to be created for the express purpose of minor utilities are exempted from the required minimum lot area but must comply with the required setback of the district. Any noise producing equipment or generators must be stored within a structure or must be setback a minimum 50 feet from any public right-of-way or property line. The minimum required lot width is 100 feet, the minimum required front setback is 40 feet, the minimum required rear setback is 25 feet, and the maximum building height is 60 feet. Additionally, accessory buildings and structures must conform to the minimum required setbacks for the district. Provided, however, well houses, satellite dishes, and open structures may be located in the required yards provided they are at least 10 feet from any street or property line. Fences are permitted within the front, side, and rear yards with no minimum setback requirement. Lastly, on a corner lot nothing shall be erected, placed, planted, or allowed to grow in such a manner as materially to impede vision between a height of 2 ½ feet and 10 feet in a sight triangle as established by NCDOT.

### 4. Proposed Land Use and the Surrounding Area

According to Plan Chatham, the intended land use of the area in which the project will be located is rural. Major recommendations for land use include, but are not limited to:

- Concrete future growth in compact, walkable development, located in municipalities as well as existing and planned growth areas.
- Increase employment opportunities within the County.
- Support context-sensitive design that preserves rural and small-town character.
- Bring open space in its many forms to the forefront of development.
- Preserve concentrations and connections of green infrastructure.
- Promote agriculture as the key component of the local economy.
- Provide flexibility for rural business.

The proposed use of the site to construct and operate a RWTF fits into several of the intended land uses, including increasing employment opportunities, supporting design that preserves rural character, bringing open space to the forefront of development, and preserving green infrastructure. As previously mentioned, new employees may be hired to operate and maintain the new facility. Additionally, 50- to 100-foot vegetated buffers will be placed around the perimeter of the site and the

height of all structures are expected to be below the tops of trees. These design elements will maintain the proposed rural vision and open space design. Including these elements into the proposed project also adheres to Plan Chatham's Strategy 5.1 under Land Use, which emphasizes working landscapes and viewsheds from public roadways, integrated open space, and preservation of unique natural features, and Land Use Policy 10: Encourage integrated open space in new development. Green infrastructure and sustainable design will also be incorporated into the construction of the RWTF, as light fixtures at the facility will use energy efficient LED technology. Light fixtures will include outdoor lighting installations for site maintenance roadways, parking areas, walkways adjacent to buildings, and for general illumination at process structures.

### 5. Changes to Zoning and Local Land Use

Zoning for the site will need to be changed, causing local land use plans to change. More specifically, the project site is currently made up of two parcels, which are undergoing a recombination process to combine the parcels into one parcel. Both parcels are currently zoned as R1 Residential District, which will need to be changed to IL-CD Light Industrial Conditional District. Several permitted uses of IL zones are outlined in the Chatham County Zoning Ordinance. These uses are permitted subject to obtaining a zoning and/or special use permit from the Zoning Official. There are also several dimensional requirements for IL zones.

The minimum required lot area is 40,000 square feet or 65,340 square feet for lots with individual wells and individual wastewater disposal systems. Lots to be created for the express purpose of minor utilities are exempted from the required minimum lot area but must comply with the required setback of the district. Any noise producing equipment or generators must be stored within a structure or must be setback a minimum of 50 feet from any public right-of-way or property line. The minimum required lot width is 150 feet, the minimum required front setback is 50 feet, the minimum required side setback is 50 feet, and the minimum required rear setback is 50 feet. Additionally, accessory buildings and structures must conform to the minimum required setbacks for the district. Provided, however, well houses, satellite dishes, open structures and telephone booths may be located in the required yards provided that they are at least 10 feet from any street or property line. Fences are permitted within the front, side, and rear yards with no minimum setback requirement. Lastly, on a corner nothing shall be erected, placed, planted, or allowed to grow in such a manner as materially to impede vision between a height of 2 ½ feet and 10 feet in a sight triangle as established by NCDOT.

## D. Wetlands

### 1. Identified Wetlands

Dramby Environmental Consulting, Inc. (DEC) conducted a field delineation of the project site between April 23 and April 29, 2022, and determined that wetlands are present on the property. These determinations were made by Cara A. Nice and Robert T. Belcher, PWS, CSE, of DEC. Delineated boundaries were sequentially numbered, flagged, and located using sub-meter capable Global Positioning System (GPS) technology. DEC applied the technical criteria outlined in the *1987 Corps of Engineers Wetland Delineation Manual* and the *2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0). Vegetation data was based upon the USACE's 2020 National Wetland Plant List. Hydric soils were identified using criteria outlined in the United States Department of Agriculture (USDA) NRCS *Field Indicators of Hydric Soils in the United States, A Guide for Identifying and Delineating Hydric Soils* (Version 8.2, 2018). Hydrology, soil, and vegetation data were compiled using the USACE's Automated Eastern Mountain and Piedmont (EMP) Wetland Determination Data Sheets for Major Land Resource Area (MRLA) 136 of Land Resource Region (LRR) P. The delineation was summarized in a Preliminary Jurisdictional Determination Request submitted to USACE (Dramby Environmental Consulting, Inc. August 8, 2022). It should be noted that the jurisdictional status of some of the features identified during the delineation might change with the revised definition of Waters of the United States that became effective on September 8, 2023.

### 2. Wetlands Details

Within the proposed site (the study area), the field investigation identified approximately 1.37 acres (59,552 ft2) of palustrine forested (PFO) wetlands. Findings are summarized in the wetland and waters delineation maps (see **Figure 20**, **Figure 21**, **Figure 22**, **Figure 23**, **Figure 24**, and **Figure 25**). Onsite PFO wetlands exhibited hydrology indicators of a high-water table, saturation, geomorphic position, drainage patterns, surface soil cracks, and water-stained leaves. Sparsely vegetated concave surface vegetation within PFOs included a tree stratum typically dominated by red maple (*Acer rubrum*), loblolly pine (*Pinus taeda*), and sweet gum (*Liquidambar styraciflua*). PFOs tended to have sparsely vegetated understories that included saplings of the listed dominated species as well as American hornbeam (*Carpinus caroliniana*), flowering dogwood (*Cornus florida*), and American elm (*Ulmus americana*). The woody vine stratum consisted of spars occurrences of greenbrier (*Smilax rotundifolia*), grapevine (*Vitis* sp.), and Japanese honeysuckle (*Lonicera japonica*). The herbaceous stratum consisted of seedling trees and woody vine species.

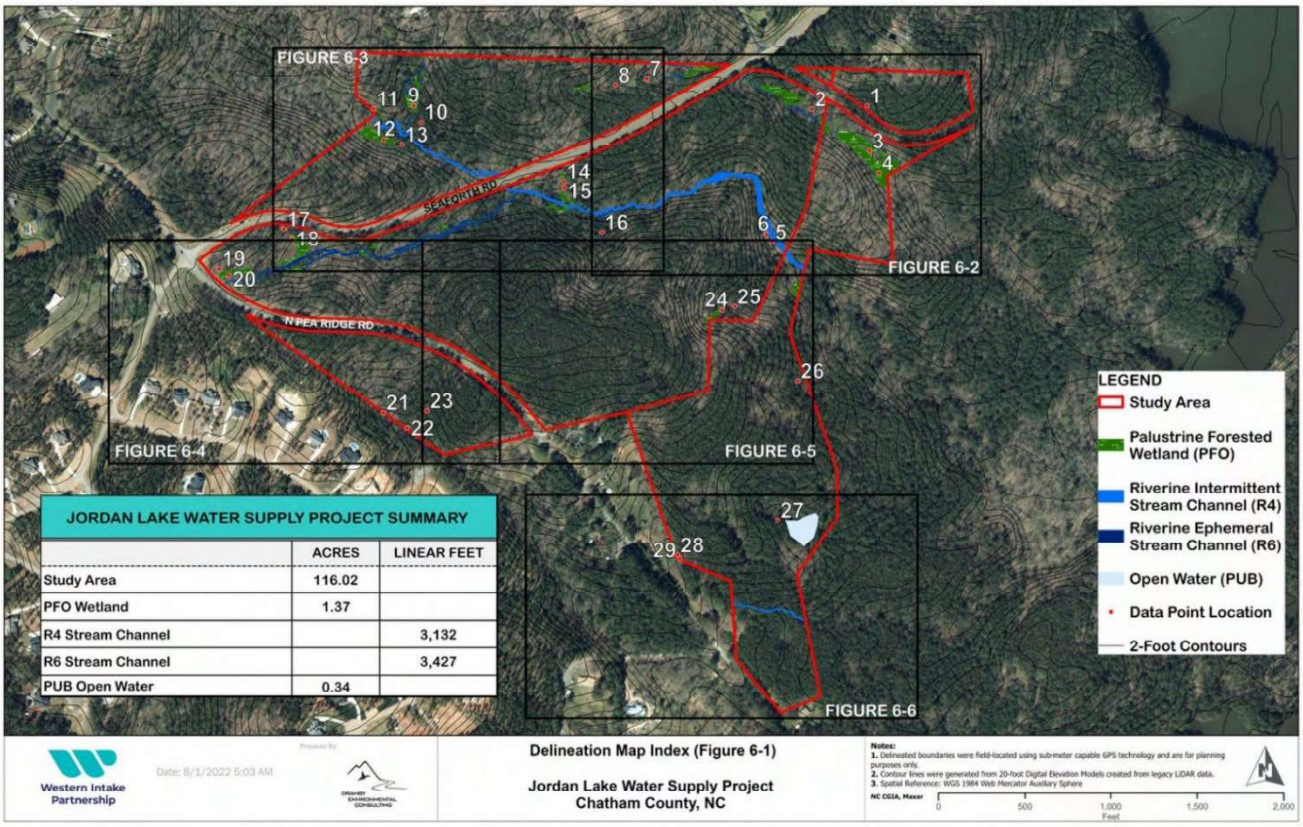



**Figure 20 | Project Area Delineation Map Index**

From "Western Intake Partnership Jordan Lake Water Supply Project Preliminary Jurisdictional Determination Request," August 8, 2022, Dramby Environmental Consulting, Inc.

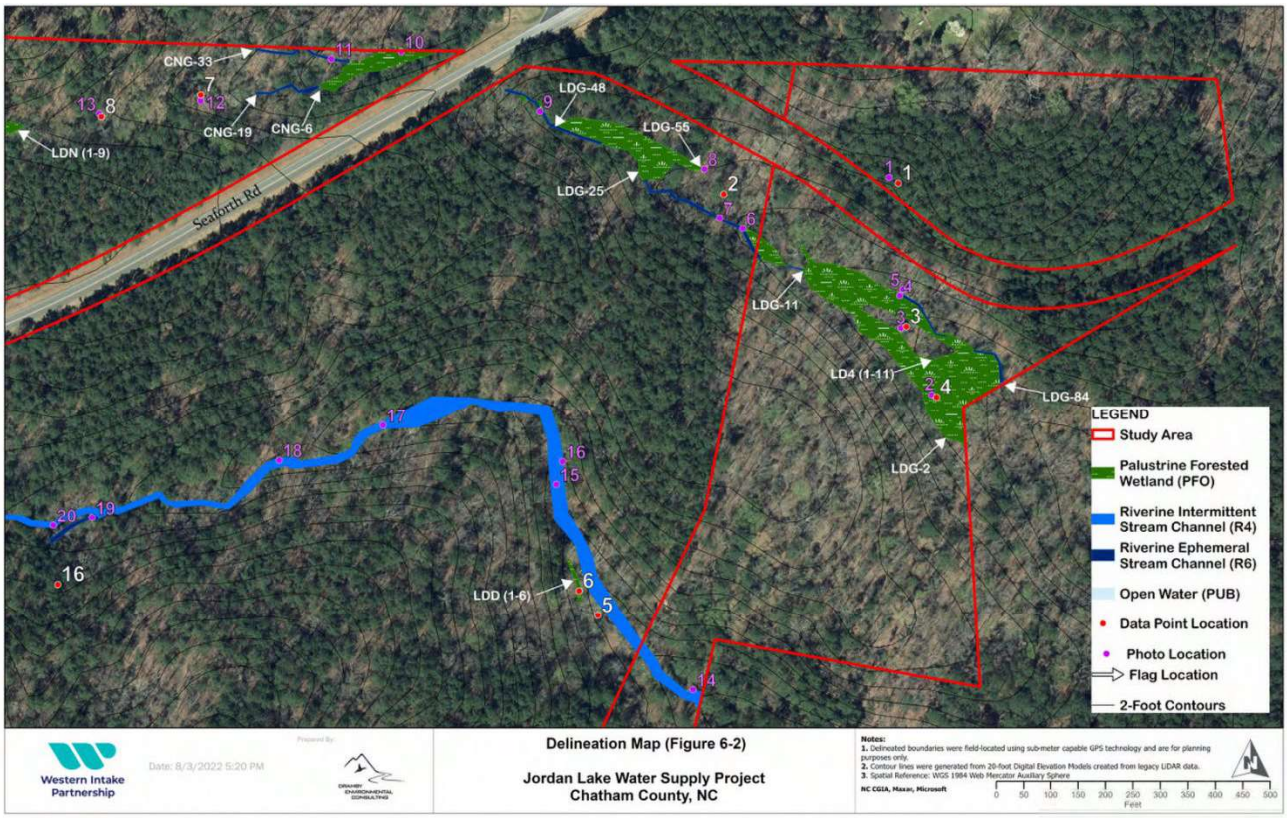



**Figure 21 | Project Area Delineation Map 1**

From "Western Intake Partnership Jordan Lake Water Supply Project Preliminary Jurisdictional Determination Request," August 8, 2022, Dramby Environmental Consulting, Inc.

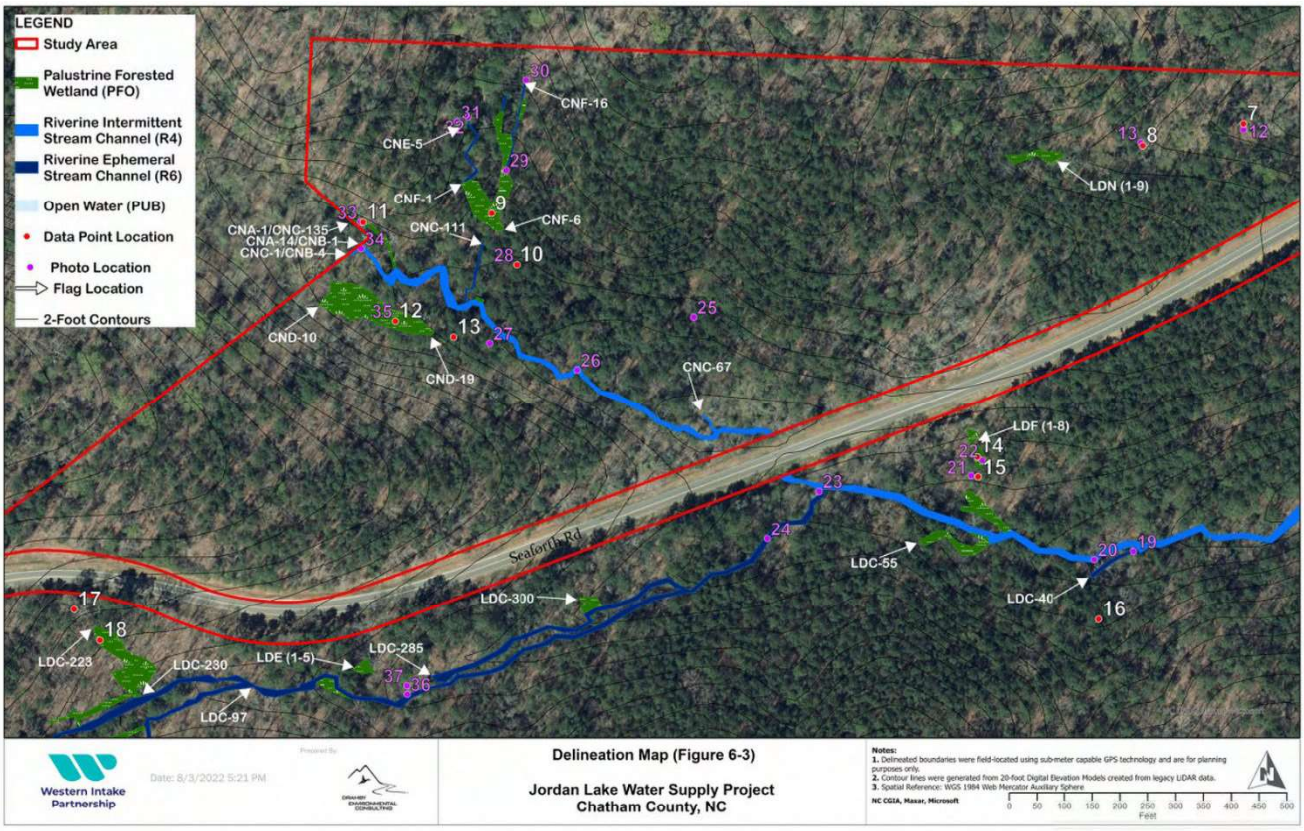



**Figure 22 | Project Area Delineation Map 2**

From "Western Intake Partnership Jordan Lake Water Supply Project Preliminary Jurisdictional Determination Request," August 8, 2022, Dramby Environmental Consulting, Inc.

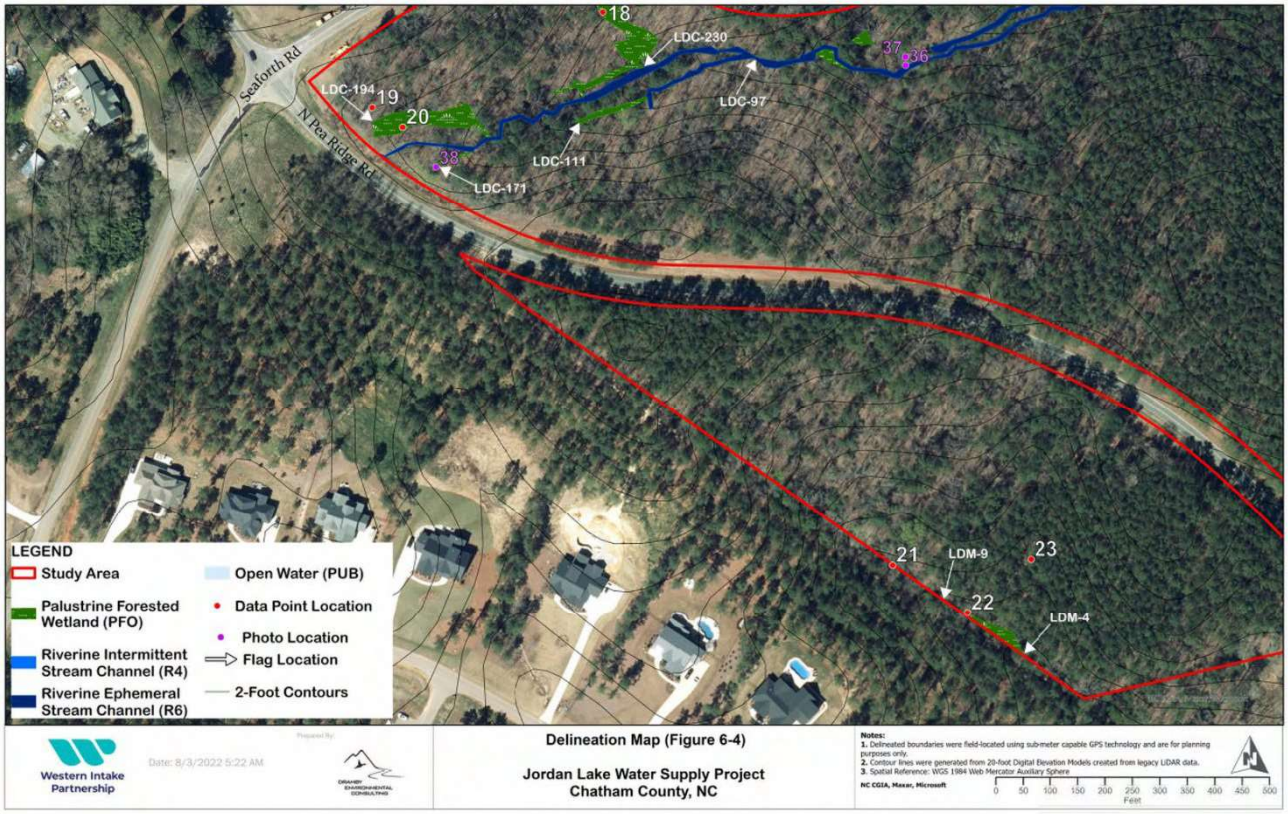



**Figure 23 |Project Area Delineation Map 3**

From "Western Intake Partnership Jordan Lake Water Supply Project Preliminary Jurisdictional Determination Request," August 8, 2022, Dramby Environmental Consulting, Inc.

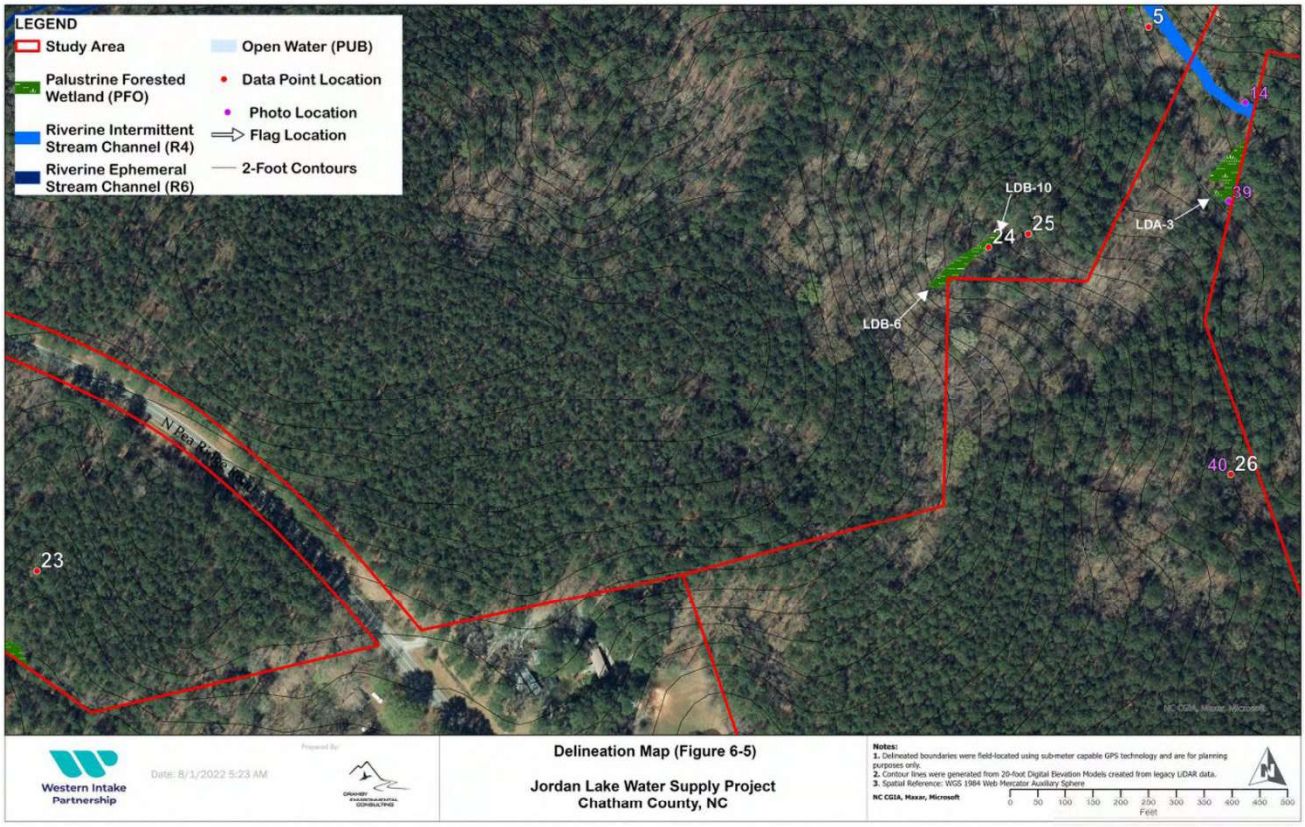



**Figure 24 | Project Area Delineation Map 4**

From "Western Intake Partnership Jordan Lake Water Supply Project Preliminary Jurisdictional Determination Request," August 8, 2022, Dramby Environmental Consulting, Inc.

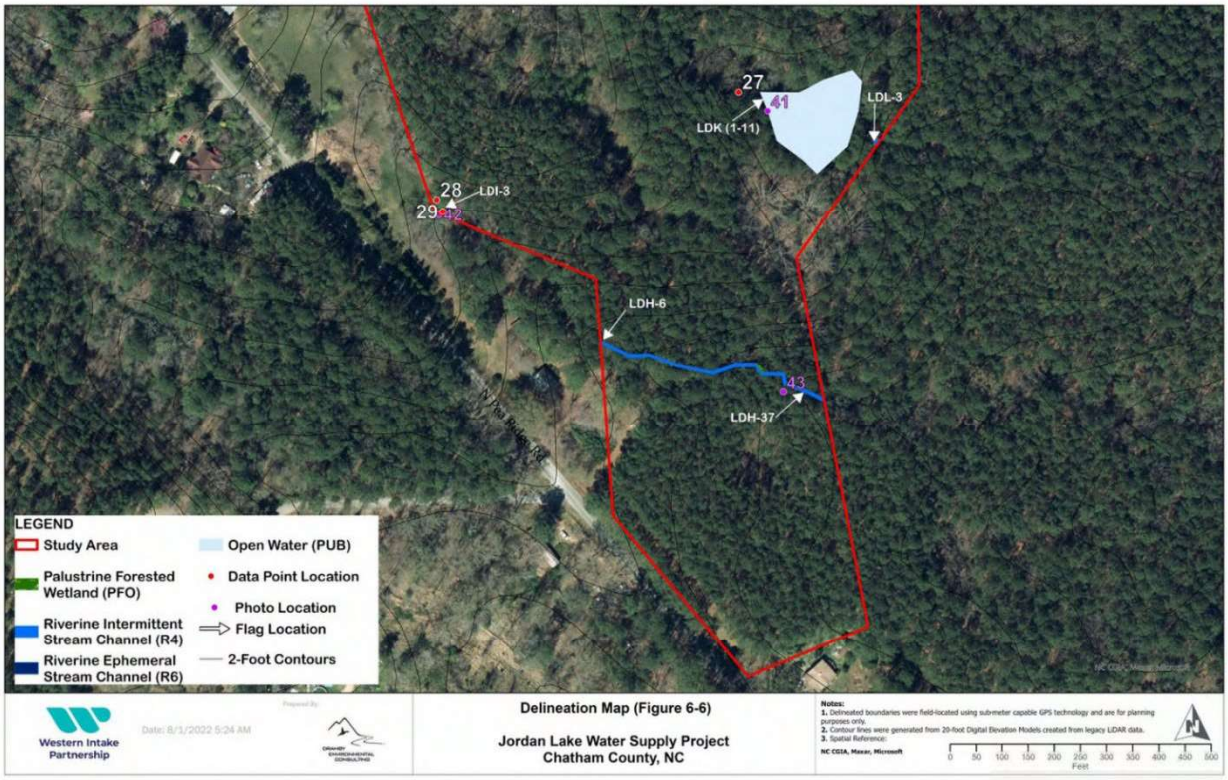



**Figure 25 | Project Area Delineation Map 5**

From "Western Intake Partnership Jordan Lake Water Supply Project Preliminary Jurisdictional Determination Request," August 8, 2022, Dramby Environmental Consulting, Inc.

### 3. Affected Wetlands

A small amount of onsite wetlands will be filled or temporarily impacted during the construction of the RWTF. Permanent impacts to wetlands will occur at the proposed location of the clearwell (Figure 3) on the eastern edge along the center of the property. These wetlands are labeled as LBD-10 on Figure 24; approximately 0.035 acre of wetlands will be filled at this location. Additionally, approximately 0.36 acre of permanent impacts will occur to the open water (PUB) on Figure 25 to accommodate construction of SCM4 (Figure 3). It should be noted that the jurisdictional status of some of both of these features identified during the delineation might change with the revised definition of Waters of the United States that became effective on September 8, 2023.

### 4. Required Permits

A Clean Water Act (CWA) Section 404 Permit (Nationwide Permit 58 or 18) must be submitted to the USACE whenever there is work pertaining to the WOTUS (including wetlands). A Wilmington District Regulatory Preliminary Jurisdictional Determination (PJD) Request Form has been completed by the WIP and submitted to the USACE due to the nature of the project, which requires authorization from

the Corps in order to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in the future permitting process.

### 5. Wetlands Impacted by Surface Water

There will be no diversions, additions, or withdrawals of surface water on the project site that will affect wetlands. However, there will be a Jordan Lake intake that will bring surface water to the RWTF. As there are no anticipated impacts of surface water activities on wetlands, no alternative selection, design strategies, construction methods, long-term maintenance procedures, or any other form of mitigation is planned or required.

## E. Public Lands and Scenic, Recreational, and State Natural Areas

### 1. Pertinent Municipal Parks, Scenic, Recreational, and State Natural Areas

**Figure 26** depicts all pertinent municipal parks, scenic, recreational, and state natural areas that are located in the segments of Chatham County surrounding the project site. Though adjacent to the property, the project site will avoid encroachment on all USACE and NC Parks lands (Jordan Lake State Recreation Area).

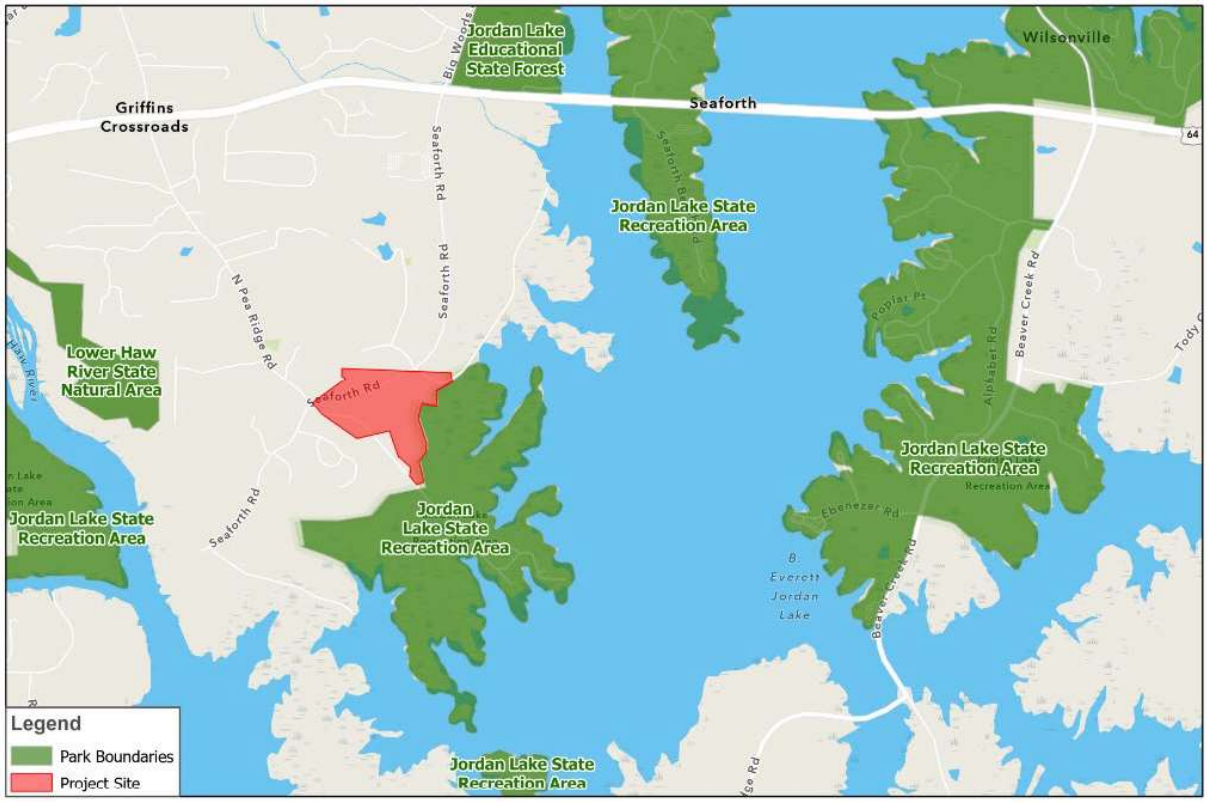



**Figure 26 | Park Data from Chatham County GIS Website**

# F. Areas of Archaeological and Historical Value

## 1. Archaeological and Historical Studies

An archaeological report titled "Cultural Resources Survey for the Jordan Lake Water Supply, Chatham and Durham Counties, North Carolina," was prepared in July 2023 by Archaeological Consultants of the Carolinas, Inc. The study was prepared for the overall WIP project and included Lake Jordan's Vista Point Recreation Area, the WIP survey corridors located in Chatham and Durham counties, and the RWTF site (the project location). The survey was requested by the North Carolina State Historic Preservation Office (NC SHPO) and identified all archaeological resources located withing the project area, assessed those resources for eligibility to the National Register of Historic Places (NRHP), and provided recommendations for management. The study also involved collecting background information on recorded historic resources and gathering historic maps of the project area. After conducting a field investigation on the RWTF site, seven archeological sites were determined (**Figure 27**). These archeological sites are summarized below in **Table 5** and sites 31CH1365, 31CH1367, 31CH1366, and 31CH1372 are discussed in further detail in the following subsection.

**Table 5 | Summary of Archaeological Sites Identified at the RWTF Site**

| Site Number | Description | NRHP Recommendation |
|---|---|---|
| 31CH1365 | Historic Grave | Not Eligible, Protected |
| 31CH1364 | Early Archaic – Middle Woodland Lithic Scatter | Not Eligible |
| 31CH1363 | Undetermined Prehistoric Lithic Isolate; Mid-19th – 20th Century Building Remains and Artifact Scatter | Not Eligible |
| 31CH1367 | 20th Century Tobacco Barns | Not Eligible |
| 31CH1366 | Undetermined Prehistoric Lithic Isolate; Late 19th – 20th Century Building Remains and Artifact Scatter | Not Eligible |
| 31CH1372 | Ellis Cemetery, 19th – 20th Century | Not Eligible, Protected |
| 31CH1368 | Undetermined Prehistoric Lithic Scatter | Not Eligible |

From "Cultural Resources Survey for the Jordan Lake Water Supply, Chatham and Durham Counties, North Carolina," July 2023, Archaeological Consultants of the Carolinas, Inc.

Site 31CH1364 is an Early Archaic to Middle Woodland lithic scatter. Although artifact density was high in select portions of the site and temporally diagnostic artifacts were recovered, the landform is extremely eroded with shallow A-Horizon soils. All artifacts were confined to the upper 20 centimeters of soil, below which is clay subsoil. The deposits retain no stratigraphic integrity. The extent of the erosion of the A-horizon soils also precludes the likelihood that preserved cultural features are present. No organic material was recovered. While this site was utilized from the Early Archaic to Middle Woodland, there is little to suggest that it retains the potential to new or significant information regarding prehistoric settlement beyond this level of investigation. Due to these factors, this site is recommended not eligible for the NRHP (Archaeological Consultants of the Carolinas, Inc. July 2023).

Site 31CH1363 is a prehistoric lithic isolate dating to an unknown period and the remains of nineteenth to twentieth century buildings and an associated artifact scatter. The prehistoric artifact is not diagnostic. There was no evidence of intact prehistoric cultural features or organic preservation at this site. The historic artifacts recovered are not atypical for sites of this type and there were relatively few of them. Other than two building foundation remains and the well, there is no other evidence of historic features present. Due to these factors, this site is unlikely to yield new or significant data to our understanding of prehistoric or historic settlement in this area. It has fulfilled its research potential at this level of investigation and is recommended not eligible for the NRHP.

Site 31CH1368 is a prehistoric lithic scatter that dates to an indeterminate period. Only three artifacts were recovered from this site, and they were all recovered from the same shovel test. Soils were shallow and deflated due to silviculture and erosion. There is no indication of cultural features or organic preservation at this site. Due to these factors, this site is unlikely to yield new or significant data to our understanding of prehistoric settlement in this area. It has fulfilled its research potential at this level of the investigation and is recommended not eligible for the NRHP (Archaeological Consultants of the Carolinas, Inc. July 2023).

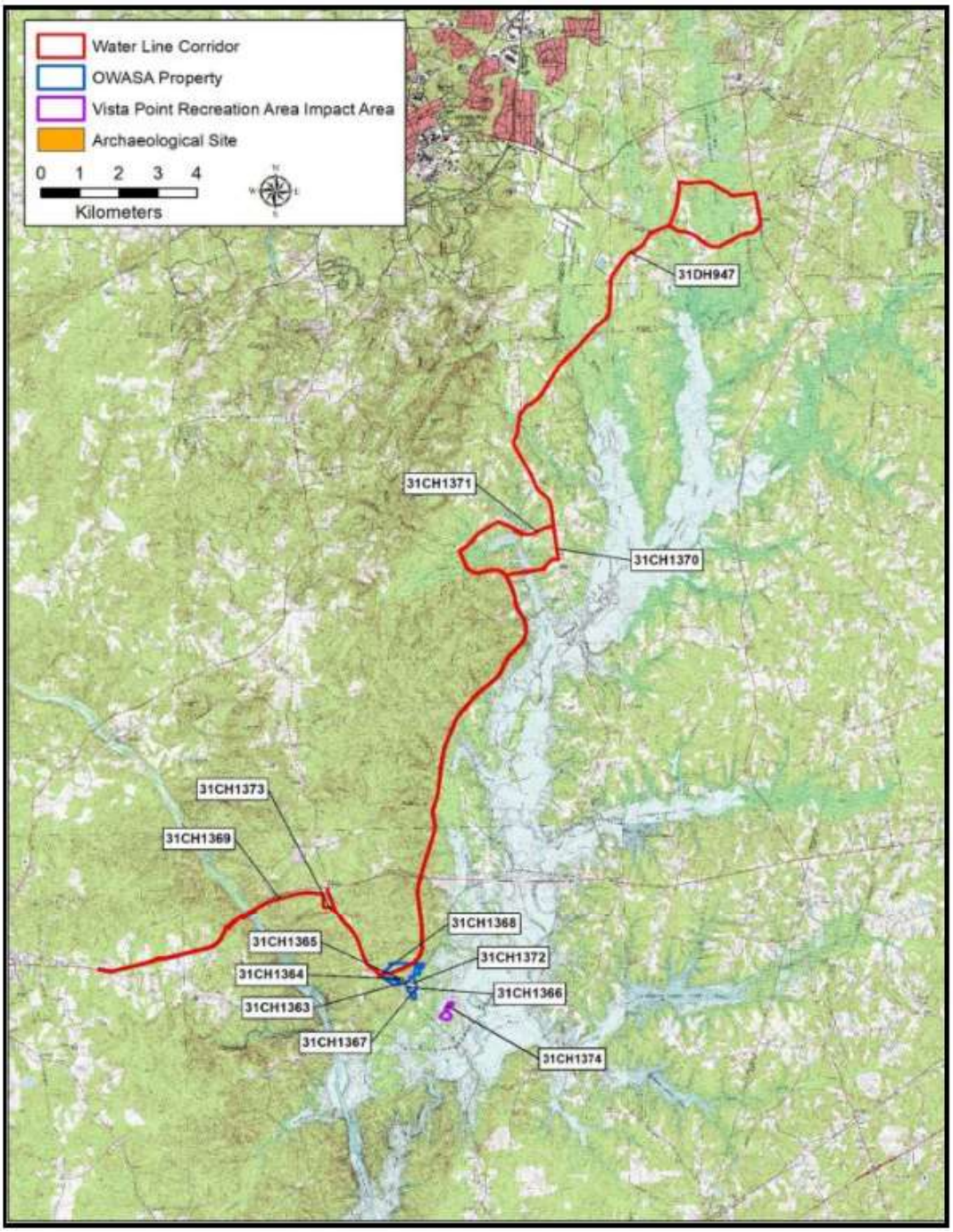



**Figure 27 | Map of Archaeological Sites Identified in the Project Area**

From "Cultural Resources Survey for the Jordan Lake Water Supply, Chatham and Durham Counties, North Carolina," July 2023, Archaeological Consultants of the Carolinas, Inc.

## 2. Structures

The Cultural Resources Survey for the Jordan Lake Water Supply, Chatham and Durham Counties, North Carolina (Archaeological Consultants of the Carolinas, Inc. July 2023) identified various structures at the RWTF site as part of sites 31CH1365, 31CH1367, 31CH1366, and 31CH1372 (see Figure 27).

Site 31CH1365 is a historic grave identified in the central portion of the RWTF property east of North Pea Ridge Road that likely dates to the nineteenth century. The initials AB are carved on the headstone. Details surrounding the individual buried here could not be determined though it is likely that they were a member of the Bynum family. This cemetery does not meet NRHP eligibility criteria. However, burials are protected under state statutes (Archaeological Consultants of the Carolinas, Inc. July 2023).

Site 31CH1367 consists of two historic tobacco barns located in the southern-central portion of the RWTF site that likely date to the twentieth century (see **Figure 28**). Both barns are approximately the same size. The northernmost barn, Barn 1, was constructed with logs and concrete chinking. It rests on a stone and concrete foundation and has a sheet metal roof; wire nails were used in its construction. The southernmost barn, Barn 2, is similar in construction, though there are some bricks in the eastern portion of its foundation. Remnants of curing equipment are present, which include pipes, copper tubes, and metal flues used in the process of drying tobacco. No artifacts were recovered, though this is not atypical for sites of this type. While there were no other buildings or features identified in this area, it is likely that these barns are associated with site 31CH1366. One of the barns has been utilized to store modern trash and debris. Due to these factors, this site is unlikely to yield new or significant data to our understanding of historic settlement in this area. It has fulfilled its research potential at this level of the investigation and is recommended not eligible for NRHP (Archaeological Consultants of the Carolinas, Inc. July 2023).

**Figure 28 | Barn 1 and Barn 2 at Site 31CH1367**

From "Cultural Resources Survey for the Jordan Lake Water Supply, Chatham and Durham Counties, North Carolina," July 2023, Archaeological Consultants of the Carolinas, Inc.

Site 31CH1366 is a prehistoric lithic isolate and the remains of a mid-nineteenth to twentieth century farmstead and an associated artifact scatter. This site is located in the western portion of the RWTF site. The prehistoric component of this site is ephemeral and cannot be dated. A few historic artifacts were recovered from this site, and they are not atypical for sites of this type.

There are five buildings present at this site (see **Figure 29**). The first building is a house (Building 1) in the northern-central portion of the site. It was constructed with brick and stone piers and a combination of cut and wire nails. It has a sheet metal roof with wooden siding and two chimneys are present on the eastern half of the house, which are brick with concrete bases. The western third of the house is constructed solely with wire nails and has a different type of window than the rest of the building, suggesting that it was a later addition. The second building (Building 2) is a small log outbuilding to the northeast side of the house. It has stone piers and was constructed with wire nails. Directly south of the house is a small covered well (Building 3). It has a wooden frame and a sheet metal roof, is on a concrete pad, and has a stone and concrete portion built up around the well. Both wire and cut nails were used for its construction. Building 4 is in the southeastern portion of the site and is a larger barn with a sheet metal roof and wooden siding. It has a partial foundation constructed of rock and wooden flooring. Wire nails were used in its construction and there is a lean-to attached to the southern side of the building. Just to the south of Building 2 is a collapsed outbuilding (Building 5) that appears to have been a springhouse or root cellar. Sheet metal roofing, wire nails, and a few wooden beams are its only visible architectural remains.

While the house was constructed prior to 1890, the remaining buildings postdate 1890. The buildings are also not unique for farmsteads of this period. Due to these factors, this site is unlikely to yield new or significant data to our understanding of prehistoric or historic settlement in this area. It has fulfilled its research potential at this level of investigation and is recommended not eligible for NRHP (Archaeological Consultants of the Carolinas, Inc. July 2023).

**Figure 29 | Buildings at Site 31CH1366 (Top: Building 1, Building 2. Bottom: Building 4, Building 3)**

From "Cultural Resources Survey for the Jordan Lake Water Supply, Chatham and Durham Counties, North Carolina," July 2023, Archaeological Consultants of the Carolinas, Inc.

Site 31CH1372 is a historic cemetery (Ellis Cemetery) located in the southeastern portion of the RWTF site. A total of 58 graves were identified within this cemetery, with three being marked with cut stones, two sharing a headstone but having separate footstones, eighteen having both fieldstone head- and footstones present, five having only headstones, three having only footstones, twenty-one being identified based on depressions only, and eight having no associated depressions. It is not known if these stones are natural or denote graves. Based on the inscriptions, the earliest death date is 1889 and the latest is 1901. Two artifacts were also recovered from the ground surface of this cemetery. The first is a utilitarian porcelain knob with a screw through the center and the second is an axe head.

The cemetery identified does not contain the remains of individuals of particular significance to the development of the project area, nor does it contain markers of significant artistic merit. For these reasons, it is not considered to meet NRHP eligibility criteria. However, cemeteries are protected under state statutes (Archaeological Consultants of the Carolinas, Inc. July 2023).

### 3. Impacts to Archaeological and Historical Resources

In accordance with received recommendations following the field investigation completed as part of the survey by Archaeological Consultants of the Carolinas, Inc., there will be measures put in place to mitigate impacts to archeological or historical resources in the proposed project area. Current project plans include the establishment of a 10-meter buffer around the single grave that is part of site 31CH1365 to ensure that it is not disturbed during construction or operation of the RWTF. Similarly, the current project plans call for the establishment of a 30-meter buffer around the north, south, and east sides and a 25-meter buffer around the west side of Ellis Cemetery (site 31CH1372). No disturbances will take place within this buffer during construction and operation of all buildings and facilities. Thus, there are no anticipated impacts to archeological sites 31CH1365 and 31CH1372. However, as mentioned in the following subsection, sites 31CH1364, 31CH1363, 31CH1367, 31CH1366 and 31CH1368 will be disturbed and their respective structures will be demolished without plans for rebuilding.

### 4. Demolition and Rebuilding Plans

There are no plans to demolish or rebuild the single grave identified on archaeological site 31CH1365 or the Ellis Cemetery at site 31CH1372 during the construction or operation of the proposed RWTF. As previously mentioned, there will be a 10-meter buffer around the single grave that is part of site 31CH1365, and a 30-meter buffer around the north, south, and east sides and a 25-meter buffer around the west side of Ellis Cemetery. However, all other structures on the RWTF site will be demolished. This includes all lithic scatters, buildings, artifact scatters, tobacco barns, and farmsteads located at sites 31CH1364, 31CH1363, 31CH1367, 31CH1366 and 31CH1368. These structures will be demolished and not rebuilt because they have not been deemed significant by the NRHP. As determined by Archaeological Consultants of the Carolinas, Inc., these sites will not contribute new or significant data to our understanding of prehistory or history of the region and

have fulfilled their research potential (Archaeological Consultants of the Carolinas, Inc. July 2023). Correspondence from NC SHPO is included in Appendix A.

### 5. Significant Resources

There are no significant resources at the project location. There were seven archeological sites identified at the RWTF site, but these sites will not contribute new or significant data to our understanding of prehistory or history of the region. All seven archaeological sites have fulfilled their research potential at this level of investigation and no further work was determined by Archaeological Consultants of the Carolinas, Inc. However, sites 31CH1365, 31CH1364, 31CH1363, 31CH1367, 31CH1366, 31CH1372 and 31CH1368 are all likely over 50 years old (Archaeological Consultants of the Carolinas, Inc. July 2023).

### 6. Relevant Correspondence

Relevant correspondence with NC SHPO is included in Appendix A.

Representatives of the WIP also met with Mr. Sy Robbins of the Chatham County Historical Association on July 18, 2023 to discuss the project and provided the draft Cultural Resources Survey report to Mr. Robbins for review. Representatives of the WIP conducted a site field visit to the RWTF with Ms. Kelly Gomez of the Chatham County Historical Association on September 25, 2023.

## G. Air Quality

### 1. Impacts on Ambient Air Quality

According to the NCDEQ Division of Air Quality (DAQ) data, sections of Chatham County are part of the Raleigh-Durham-Chapel Hill Ozone Designation area and have been in Attainment/Maintenance status for ozone since 2007. The project site is within this designation area. The County is unclassified and considered in Attainment status for fine particulate matter (PM 2.5), carbon monoxide, and sulfur dioxide. Construction of the project may cause temporary, short-term, localized air quality impacts such as increases in suspended particulate matter due to dust emissions from the construction sites and exhaust emissions from diesel and gasoline powered equipment. Equipment exhaust emissions typically include nitrogen oxides, hydrocarbons, carbon monoxide, and particulate matter. Additionally, operation of the emergency generators at the project site will result in occasional exhaust emissions. However, the generators will be used only during times of loss of power and during exercising for regular maintenance.

To mitigate project impacts on ambient air quality, construction equipment will be required to have air quality/emission reduction devices installed in proper operational condition. Dust on the construction site will be controlled by spraying the area with water if necessary. Temporary gravel construction entrances will also be used to control dust. Emergency generators on the property will operate only as needed for emergency power and during exercising for regular maintenance. Lastly, an Air Quality Permit will be submitted to the NCDEQ DAQ with pertinent emissions calculations.

### 2. Open Burning

Open burning is not permitted on the project site prior to, during, or after construction. Therefore, no alternative selection, design strategies, construction methods, long-term maintenance procedures, or any other form of mitigation is planned or required for open burning. There are no anticipated impacts to the current state of site resources and conditions due to open burning.

### 3. Proposed Parking Spaces

As previously mentioned, there will be two parking lots on the property. One parking lot will be directly in front of the Administrative and Operations Building and one will be directly in front of the Maintenance Building (see Figure 3). These parking lots will have 18 parking spaces and 7 parking spaces, respectively. The parking lots will have both employee and visitor parking available.

### 4. Odor

At present, there are no detectable odors at the RWTF site. As there will be no detectable odors from the chemicals used at the RWTF, there will not be an increase in odor levels at the proposed project location and there is no likelihood of odor complaints. Thus, no alternative selection, design strategies, construction methods, long-term maintenance procedures, or any other form of odor mitigation is planned or required.

### 5. Required Traffic Studies

The proposed RWTF buildings, facilities, and finished water transmission mains will be constructed adjacent to two existing public roads: Seaforth Road and North Pea Ridge Road. The project will not result in a permanent or long-term impact to transportation. However, during construction, temporary impacts to transportation will occur while the pipelines are installed within or next to Seaforth Road and North Pea Ridge Road right-of-ways to deliver drinking water to the Partners' service areas. Vehicular traffic will also be temporarily impacted during restoration such as paving. These impacts will be temporary and localized, as construction is expected to last approximately three years. The bulk of the construction traffic will occur in the middle two years of construction and, at the peak of construction, approximately 100 to 150 construction staff will be working onsite at the RWTF site. More specifically, construction traffic for the RWTF will include concrete work, delivery of materials and equipment, and hauling of excess fill and cut material as required. After construction, when the facility is open and operating, a small number of employees (approximately 10 to 20 staff members) will visit and work at the facility daily. Deliveries and service vehicles will infrequently visit the site during weekday daytime hours. Therefore, plant operation will not be impactful to traffic.

The completion of a traffic study is not required at this time. However, the WIP is currently coordinating with the North Carolina Department of Transportation (NCDOT) for guidance and the necessary requirements. All work in NCDOT right-of-way will be included in an Encroachment Agreement and will be subject to NCDOT's special provisions and requirements associated with the permit. NCDOT Driveway Permits will also be submitted. For work along roads, a traffic control plan will be used to minimize impacts and maintain access to property. Impacted segments of Seaforth

Road and North Pea Ridge Road will be restored and reopened as soon as the finished water transmission main construction is complete.

## H. Noise Levels

Current noise levels are exceedingly low at the project location, as it is undeveloped and forested, and low at the adjacent properties, as they are largely residential. Noise will be generated at the project location during operation of the proposed RWTF by equipment such as pumps and equipment at the facility. This will increase the noise levels on the property. However, 50- to 100-foot vegetated buffers around the perimeter of the site will help mitigate off-site noise and the height of all structures are expected to be below the tops of trees. Equipment such as pump motors that create noise will also be specified within noise limits. Further, pumps and emergency generators will be placed in buildings that are designed with sound attention, a noise study will be conducted during the design phase of the project, and the project will meet the Chatham County Noise Ordinance requirements. Thus, expected noise levels will not surpass the Chatham County limits at the RWTF property line and surrounding properties will not be affected by noise levels that may occur during hours of operation, which is 24 hours a day, 7 days a week. If there are significant vibrations emitted from the facility during construction or operation for any reason, notifications will be sent to immediate neighbors of the site and the vibrations will be measured.

## I. Light Levels

### 1. Lighting Plans and Impacts

The proposed industrial use of the RWTF will require outdoor lighting installations for site maintenance roadways, parking areas, walkways adjacent to buildings, and for general illumination at process structures. Proposed lighting will primarily use full cut off light fixtures with low uplight rating on the backlight, uplight, and glare (BUG) rating system. Light fixtures will use energy efficient LED technology, sodium fixtures, and a warm color temperature of 3000K. Light fixtures will consume between 30 to 580 watts and fixtures consuming higher wattages will primarily be roadway light fixtures. Roadway and process structure lighting will consist of pole mounted lighting systems. For roadway lighting, pole mounted luminaires will be mounted not to exceed 37 feet above the ground. Poles mounted at heights exceeding 37 feet may be required to illuminate walkways located on tall process structures. A combination of building mounted light fixtures, bollards, and poles will be used to illuminate walkways, building entrances, and facades.

There are several design strategies that will be used in order to mitigate lighting impacts to nearby residents and wildlife. As previously mentioned, there will be 50 to 100-foot vegetated buffers, additional plantings designed for extra screening beyond the natural growth, and the heights of all structures are expected to be below the tops of trees. Additionally, house-side shields will be provided on luminaires where glare or light trespasses may be expected. Lighting controls utilizing photocells and timeclocks will be integrated into the lighting system to activate the lighting system at dusk and to deactivate it at dawn. In outdoor process areas where it is not deemed a concern for safety, lighting systems will be controlled by timer switches to reduce on-site lighting use. Furthermore, lighting systems will be designed to limit offsite light by using fixtures that limit up-lighting into the sky and only the necessary amount of on-premise lighting will be provided. Lastly, lighting will be designed to meet Section 13 requirements of the Chatham County Zoning Ordinance and will be in accordance with the Illuminating Engineering Society of North America (IESNA) standards.

## J. Surface and Groundwater Resources

### 1. Surface Water and Groundwater Identification

A waters delineation conducted by DEC in April 2022 identified water resources within the study area. The USACE's Antecedent Precipitation Tool (APT) (Version 1.0) was used to identify conditions at the time of the field investigation to be within 'Normal Conditions' (APT Index Score = 13) with the Palmer Drought Severity Index (PSDI) identifying a 'Moderate Drought' condition (PSDI Value = -2.64). Information about the names, locations, and classifications of the surface waters identified in the delineation map (see Figure 20) is provided in the next subsection. Additionally, Environmental Data resources, Inc. (EDR), a government and historical records search firm, identified four wet wells within one mile of the site with a depth to groundwater reported for one well at 50 feet below ground surface. There was one water well observed onsite near the old homesite. The general direction of groundwater flow was not provided by the EDR Aquiflow Information System. However, since groundwater flow will sometimes follow the general topographic gradient of an area, it may be assumed to generally flow southeasterly towards Jordan Lake.

### 2. Surface Water Details

Figure 20 illustrates two intermittent stream channels which traverse the northern portions of the study area from east to west before discharging offsite to Jordan Lake. In addition, a small pond is shown along the southeastern boundary and is drained by a third intermittent stream which also discharges offsite to Jordan Lake. Similarly, the map identifies riverine intermittent streambeds (R4) and palustrine unconsolidated bottom (PUB) features consistent with USGS quad mapping. Within the study area, the field investigation identified approximately 0.34 acre (14,977 $ft^2$) of palustrine unconsolidated bottom (PUB) waters and approximately 6,559 linear feet of the stream channel, of which 3,132 linear feet are classified as riverine intermittent (R4) and 3,427 linear feet of riverine ephemeral (R6) stream bed.

During WTF construction, there will be both temporary and permanent impacts to surface water at the project site. Permanent impact will occur to approximately 0.36 acre of the open water (PUB) on Figure 25, prior to the construction of SCM4 (Figure 3). Permanent impacts to streams will occur where culverts will be constructed under roadways. These streams include the riverine intermittent stream channel on Figure 25 (approximately 435 square feet disturbed for installation of pipeline, grading, and permanent culvert for road crossing) near the raw water pump station off North Pea Ridge Road and on Figure 22 (approximately 600 square feet disturbed for installation of pipeline, grading, and permanent culvert for road crossing) at the entrance to the site off Seaforth Road. Approximately 600 square feet of streams depicted on Figure 21 will be temporarily impacted during pipe installation in two locations and a temporary culvert for access across the riverine intermittent stream channel on the north side of the RWTF property. Approximately 7,440 square feet of riparian buffer will also be temporarily impacted in these two locations.

A Clean Water Act (CWA) Section 404 Permit (Nationwide Permit 58 or 18) must be submitted to the USACE whenever there is work pertaining to the WOTUS (including jurisdictional surface waters). A Wilmington District Regulatory Preliminary Jurisdictional Determination (PJD) Request Form has been completed by the WIP and submitted to the USACE due to the nature of the project, which requires authorization from the Corps in order to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in the future permitting process. It should be noted that the jurisdictional status of some of the features identified during the delineation might change with the revised definition of Waters of the United States that became effective on September 8, 2023.

All anticipated impacts to surface water quality during construction will be mitigated through the enforcement of a Sediment and Erosion Control Plan and the completion of a 401 Water Quality Certification and Riparian Buffer Authorization for the NCDEQ Division of Water Resources (DWR).

### 3. River Basin

The project area is located within the Cape Fear River Basin, as shown in **Figure 30**.

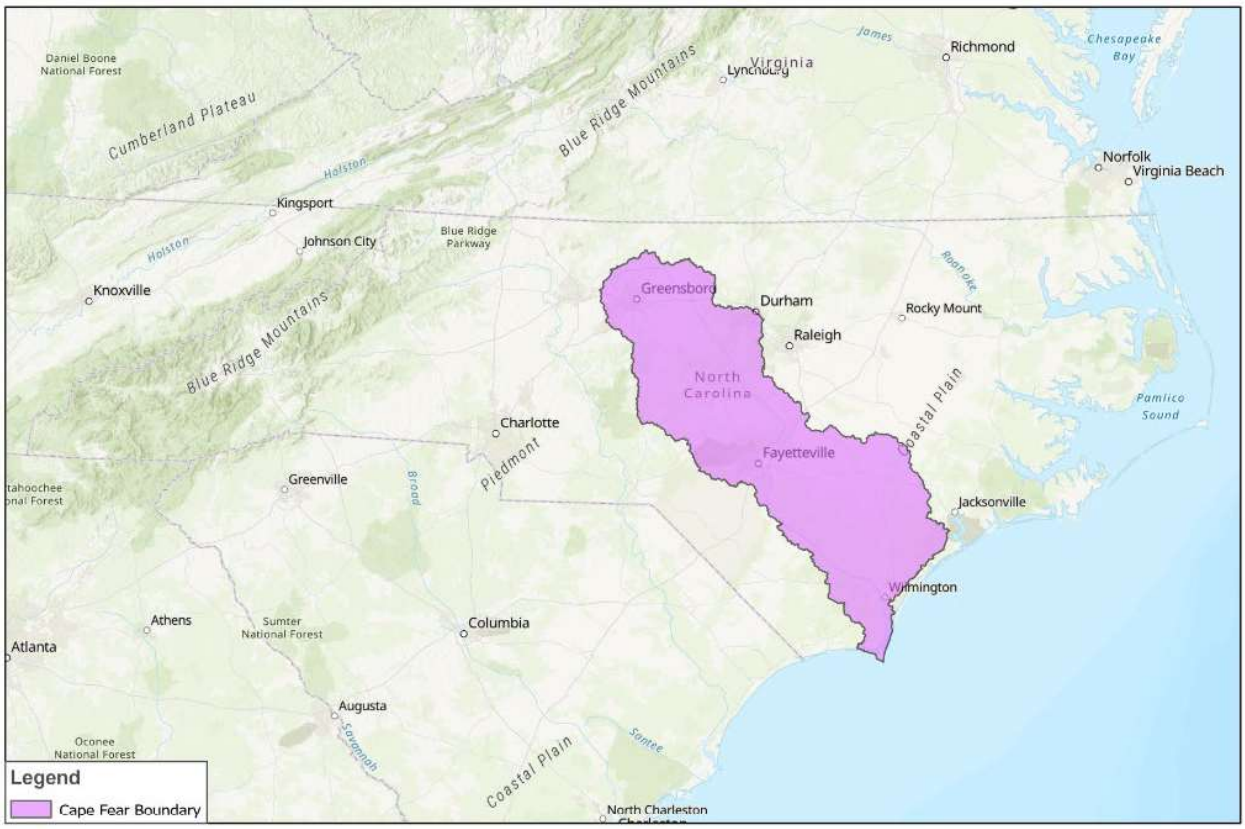



**Figure 30 | Cape Fear River Basin Boundary**

## 4. Groundwater Quality Issues

The aforementioned Baseline Environmental Conditions Report on Orange Water and Sewer Authority Property Proposed for Regional Water Treatment Facility, compiled for the project location in 2022 by BC on behalf of the WIP, identified one known groundwater quality issue on a property nearby the project location. Vista Point Gaskins, located at 2060 North Pea Ridge Road, is approximately 85 feet west of the site and is listed on the Leaking Underground Storage Tank (LUST), Leaking Aboveground Storage Tank (LAST), Incident Management Database (IMB), and Underground Storage Tank (UST) databases. The property is listed on the LUST, LAST, and IMB databases for an incident reported on January 7, 1988. Based on information provided by the EDR Radius Map Report, the property has a status of Release and groundwater contamination of gasoline/diesel with no further information. The NCDEQ website did not contain information or documentation on the incident. BC has submitted a Freedom of Information Act (FOIA) request to NCDEQ. The facility is listed on the UST database for two 2,000-gallon gasoline/gas mix USTs, which are listed as permanently closed on August 30, 1989. Although the inferred groundwater flow direction is southeasterly, the lack of information concerning the reported groundwater contamination associated with the identified incident and the proximity of the property to the site is listed as an Environmental Condition in the report. Additionally, as there is uncertainty regarding the potential for

groundwater contamination beneath the project site, there is a possibility of a Vapor Encroachment Condition (VEC) for the site, which is listed as a potential Environmental Condition in the report.

### 5. Drinking Water Sources

The project area is within ½ to 1 mile of Jordan Lake and four wells, which serve as drinking water sources to the greater community. As previously mentioned, Jordan Lake is owned and operated by the USACE and has the federally authorized purposes of flood control, water supply, recreation, water quality, and fish and wildlife conservation. The State of North Carolina has been given the task of allocating the lake's storage to local governments expressing need for water supply; Jordan Lake has an estimated safe yield of approximately 100 mgd that can be allocated. Currently, Jordan Lake supplies finished drinking water to the Towns of Cary and Apex, Chatham County, City of Durham, Town of Holly Springs, Town of Morrisville, Orange County, OWASA, and Wake County – RTP South. Additionally, the drinking water wells summarized below in **Table 6** were identified within a 1-mile radius using federal USGS well information, federal FRDS public water supply system information, and state database well information. There are no anticipated negative impacts to current drinking water resources and conditions during construction or operation of the WTF. Therefore, no alternative selection, design strategies, construction methods, long-term maintenance procedures, or any other form of mitigation is planned or required.

**Table 6 | Well Search Distance Information**

| Map ID | Well ID | Location from RWTF | Source |
|---|---|---|---|
| 4 | USGS40000889819 | ½ - 1 mile NE | Federal USGS Well Information |
| A2 | NC0319426 | ½ - 1 mile SSE | Federal FRDS Public Water Supply Information |
| A1 | NC3000000004976 | ½ - 1 mile SSE | State Database Well Information |
| 3 | NC3000000005007 | ½ - 1 mile WNW | State Database Well Information |

## K. Fish and Aquatic Habitats

### 1. Identification and Impacts to Fish and Aquatic Habitats

Figure 20 indicates the locations of wetland, stream, and open water areas identified on the RWTF property during a jurisdictional determination in 2022. Note that the recent Sackett Decision by the US Supreme Court along with changes to the definition of “waters of the state” by the NC General Assembly may result in some of the indicated areas no longer being under the jurisdiction of federal or state regulations.

The wetland areas on the RWTF property are not continuously inundated and may have no standing water for some parts of the year. Some of the stream segments are indicated as ephemeral and thus subject to extended periods of no flow. The largest stream on the site is characterized as intermittent and thus experiences periods of little or no flow. The streams include sections of braided channels, with large tree roots and exposed rock, contributing to physical habitat diversity. Because none of these habitats provides continuously available water, any aquatic species inhabiting them is subject to loss of habitat on a seasonal or more frequent basis. This restricts their use to those species with short life spans or the ability to move into the habitats when water is present, and then relocate as the water recedes. Therefore, the fauna is largely limited to a few early-colonizing fish species, various frogs, and other amphibians that use ephemeral and intermittent aquatic habitats for breeding, and aquatic invertebrates with shorter life cycles. The intermittent stream flows from the RWTF property through the State Recreation Area lands into Jordan Lake, which can serve as a colonization source for various fish, aquatic snakes, turtles, and other aquatic species.

The only semi-permanent water feature on the site is the farm pond that was created by constructing a dam. While the pond may provide habitat for various fish species, its small size (approximately 0.3 acre) and low habitat diversity limit its value as a fishery or other aquatic habitat. The fact that the pond is not connected to a permanent upstream aquatic feature and is only connected to downstream waters via a small drainpipe running through the dam, means it is quite isolated from other aquatic habitats that could serve as colonization sources for the pond.

Preliminary plans for development of the RWTF property for the Jordan Lake water supply project include very limited potential impacts to streams and wetlands, so existing opportunities for aquatic life uses would be maintained and no measures of mitigation would be required.

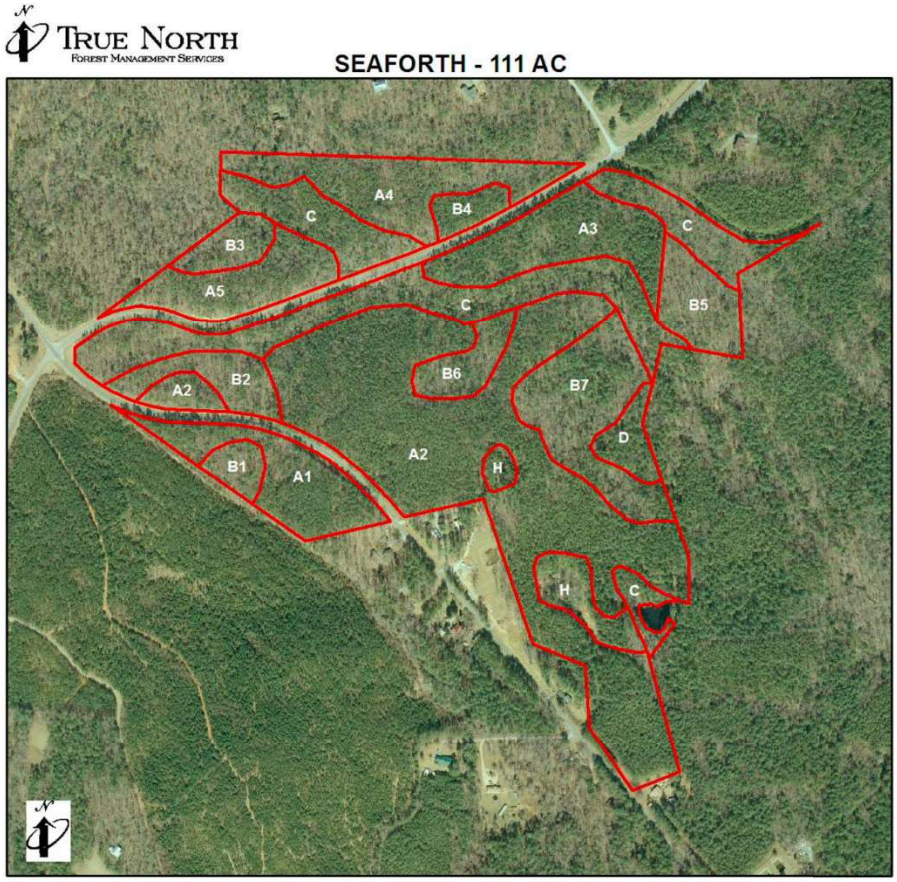
# L. Wildlife and Natural Vegetation

## 1. Natural Community Types

According to field efforts conducted in 2022, recent aerial imagery, and the USGS National Landcover Database, the site is dominated by evergreen forest with areas of mixed and deciduous forest.

A 2010 forestry management plan by True North Forest Management Services (True North) separated the site into four categories based upon tree cover and other features present. **Figure 31** indicates the location of those categories and category subunits as assessed in that plan. There have been no clearing or timbering activities at the site since the forestry management plan was prepared, so it still provides a reasonable representation of current conditions. The plan classified nearly 80 percent of the 111 assessed acres as “Natural Pine” (67 acres) dominated by loblolly pine (*Pinus taeda*) with some sweetgum (*Liquidambar styraciflua*), red oak (*Quercus rubra*), white oak (*Quercus alba*), hickory (*Carya* spp.), and a few shortleaf pine (*Pinus echinate*), or “Hardwoods” (21 acres) dominated by red oak, white oak, sweetgum, hickory, and scattered loblolly pine. Most of the remainder of the site was categorized as “Riparian Buffer” (20 acres) associated with several streams and dominated by loblolly pine, sweetgum, white oak, red maple (*Acer rubrum*), and yellow poplar (*Liriodendron tulipifera*). The plan identified an additional 2 acres of Natural Pine that is dominated by loblolly and shortleaf pine (*Pinus echinata*), with older trees that were not harvested when the site was used for agriculture.

In addition to the dominant tree species reported in the forestry management plan, data forms completed in 2022 as part of a wetland and stream delineation effort also noted the presence of American elm (*Ulmus americana*), white ash (*Fraxinus americana*), eastern red cedar (*Juniperus virginiana*), post oak (*Quercus stellata*), and sugar maple (*Acer saccharum*). Several of these were also listed as understory species in the forestry management plan, along with various other shrubs and smaller tree species.




| STAND | ACRES | COVER TYPE |
|---|---|---|
| A | 64 | NATURAL PINE |
| B | 21 | HARDWOOD |
| C | 20 | RIPARIAN BUFFER |
| D | 2 | NATURAL PINE |
| H | 4 | RESIDENTIAL / HISTORIC |

**Figure 31 | Site Tree Cover Types**

True North indicated that much of the site was converted from forest to agriculture at some point and then allowed to regrow as forest. Therefore, most of the site is not a natural forest community, which makes it difficult to readily align it with one or more of the natural communities described by the North Carolina Natural Heritage Program (NCNHP). Following the natural community definitions by the NCNHP, the areas mapped as "Hardwood" by True North have similarities to the Dry Mesic Oak-Hickory Forest (Piedmont subtype) which is defined as follows:

> *Type covers dry-mesic forests of acidic upland slopes and somewhat sheltered ridges in the Piedmont and Coastal Plain, dominated by combinations of Quercus alba, Quercus rubra, Quercus velutina, Carya tomentosa, Carya glabra, along with varying amounts of pine, maple, and poplar. Basic soil plants are absent or scarce, and acid tolerant species such as Oxydendrum arboreum and Vaccinium spp. are common. These forests cover the moisture range between that where Fagus becomes a significant component and that where Quercus falcata, Quercus stellata, Quercus marilandica, or Quercus montana become significant components. Subtype covers Piedmont examples, which lack characteristic Coastal Plain species.*

There are also similarities with the Mesic Mixed Hardwood Forest (Piedmont Subtype) community as defined by the NCNHP, which is described as:

> *Type covers mesic hardwood forests of acidic north slopes and other sheltered sites in the Piedmont and Coastal Plain, dominated by combinations of Fagus grandifolia, Quercus nigra, Liriodendron tulipifera, Quercus rubra, or species of similar moisture tolerance but lacking the more diverse components of Rich Cove Forest or Acidic Cove Forest. Species of drier or wetter sites, such as Quercus alba or Quercus michauxii, are often present and may be abundant.*

These two community types are recognized as among the most prevalent in Chatham County, so it is not surprising that many of the same tree species have been recorded on the RWTF property. The predominance of loblolly pine on the site is assumed to be the result of silviculture influences rather than a remnant of natural dominance by this species. **Figure 32** indicates general locations of natural communities adjacent to the RWTF property. Immediately to the east and south of the RWTF property is a portion of the Jordan Lake Reservoir Recreation Area which is owned by the USACE and managed by NC Parks. The adjacent public lands have areas of similar connected habitat types, all the way to the edge of the Jordan Lake reservoir. There are several large parcels to the north of the site with generally similar habitat types, although some parcels have varying degrees of disturbance because of residential uses. To the southwest is a relatively new subdivision (Seaforth Landing) with lots of varying sizes. Some lots were predominantly cleared for residential building, while some (typically the larger ones) retain over 50% of their area in a more-or-less forested state, thus providing some degree of wildlife habitat.

Impacts to natural community types will be mitigated by reducing the required project area to the minimum footprint needed for infrastructure. Additionally, a Sediment and Erosion Control Plan will enforce measures to be used during construction to protect habitat surrounding the work area. As previously mentioned, a 50- to 100-foot vegetated buffer will also be placed around the RWTF property—a decision that was made by the Partners to facilitate the growth of natural community types at the site even after project completion.

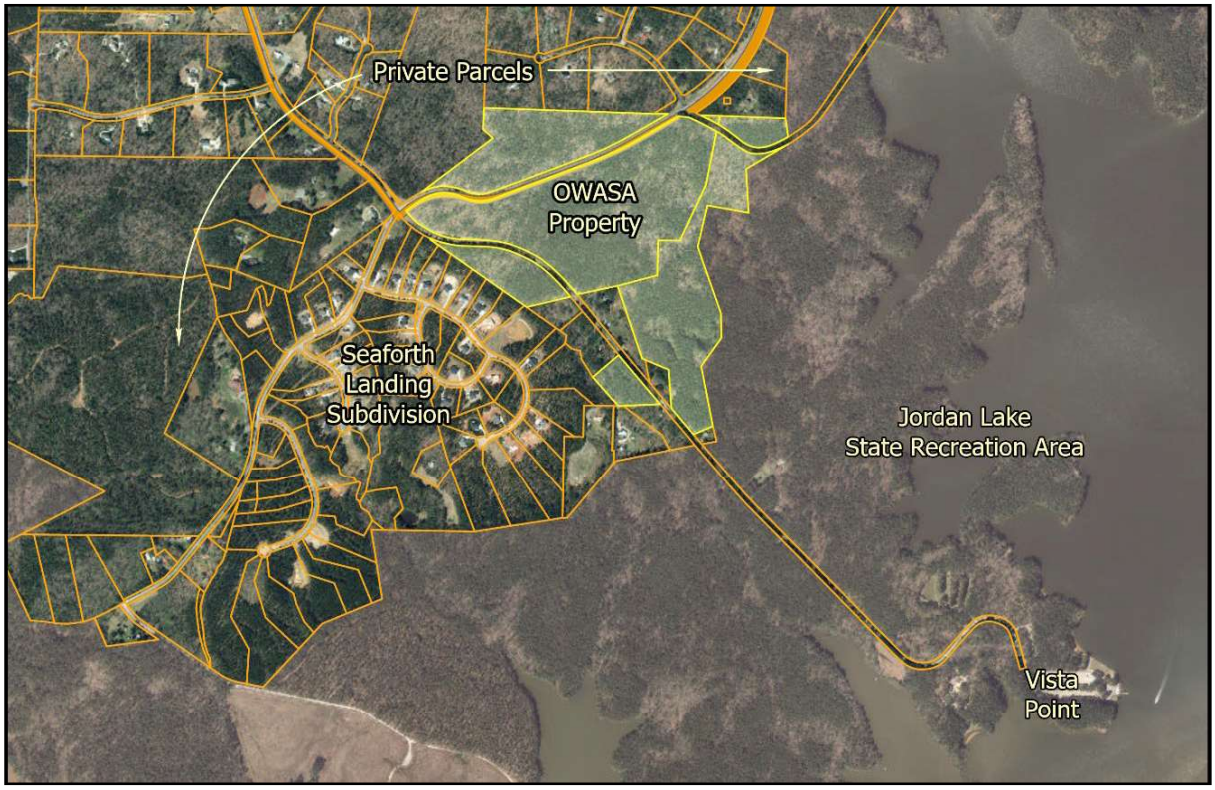



**Figure 32 | Areas of Natural Communities Generally Adjacent to the RWTF Property**

### 2. Dominant Plants and Animals

Dominant tree species are noted in the forementioned natural communities. Much of the site has minimal shrub layer and groundcover due to the generally closed tree canopy. Small tree, shrub, and groundcover species noted by True North include dogwood (*Cornus florida*), redbud (*Cercis canadensis*), American holly (*Ilex opaca*), red cedar (*Juniperus virginina*) wild cherry (*Prunus serotina*), blueberry (*Vaccinium corymbosum*), eastern hop hornbeam (*Ostrya virginiana*), sourwood (*Oxydendrum arboreum*), greenbrier (*Smilax* spp.), and ferns (various species).

There has been no formal survey of wildlife on the RWTF property. Based on the location and habitats present, is it reasonable to assume the site is occupied by a variety of mammals, including white-tailed deer *(Odocoileus virginianus),* Virginia opossum (*Didelphis virginiana*), raccoon *(Procyon lotor),* bobcat *(Lynx rufus),* red fox *(Vulpes vulpes*), coyote *(Canis latrans),* striped skunk (*Mephitis mephitis*), Eastern cottontail (*Sylvilagus floridanus*), and various squirrels, other small rodents, insectivores, and bats. Expected avian fauna includes wild turkey (*Meleagris gallopavo*), one or more species each of vulture, hawk, crow, jay, owl, and woodpecker, along with various woodland songbirds. Typical herpetofauna may include various common snakes, lizards, turtles, toads, frogs, treefrogs, and salamanders. As previously discussed, the site was used for agriculture for many years and then allowed to re-forest, so it has little in the way of natural vegetated communities and offers no rare or unusual habitats.

Impacts to dominant plants and animals will be mitigated by reducing the required project area to the minimum footprint needed for infrastructure. Additionally, a Sediment and Erosion Control Plan will enforce measures to be used during construction to protect habitat surrounding the work area. As previously mentioned, a 50 to 100-foot vegetated buffer will also be placed around the WTF property—a decision that was made by the Partners to provide habitats to dominant plants and animals at the site even after project completion.

### 3. Rare, Threatened, and Endangered Species

The site has been assessed for potentially-suitable habitat for federally listed endangered, threatened, proposed and candidate species. These species are legally protected under the federal Endangered Species Act (ESA) of 1973, administered by the US Fish and Wildlife Service (USFWS). Potentially-suitable habitat has been identified for the following federally listed species:

- Northern long-eared bat
- Tri-colored bat (proposed for listing)
- Red-cockaded woodpecker
- Smooth coneflower
- Michaux's sumac
- Monarch butterfly (proposed for listing)
- Harperella

The assessment for potentially-suitable habitat was performed in a conservative manner and does not imply that identified habitats are occupied or expected to be colonized by the associated listed species. To date, no federally listed species have been observed on the site. Environmental permitting efforts for the Jordan Lake water supply project include correspondence with local representatives of the USFWS and the NC Wildlife Resources Commission (NCWRC).

In North Carolina, endangered, threatened, and special concern species of animals have legally protected status through the NCWRC and plants have legally protected status through the North Carolina Plant Conservation Program (NCPCP). Significantly Rare designations indicate rarity and the need for population monitoring and conservation action. However, it is a non-regulatory NCNHP designation. The NCNHP also maintains Watch Lists for species of plants and animals that are rare or uncommon, are not well studied, or are otherwise threatened with serious decline but are not currently legally protected or designated as Significantly Rare.

According to the NCNHP, there are 95 different endangered, threatened, rare, special concern and watch species listed as observed in Chatham County. However, after filtering these results based on the types of habitats present at the site and considering only species that are listed as endangered, threatened, significantly rare or of special concern in the state of North Carolina, there are seven species with potential habitat on the site. Of these, there are three vascular plants, one bird (bald eagle), one reptile (Eastern slender glass lizard), one dragonfly (coppery emerald), and one moth (*Lytrosis permagnaria*, a geometrid moth). The lizard and dragonfly are both listed from historical records in Chatham County, meaning they haven't been observed in over 20 years.

**Table 7** provides the federally listed species and the additional seven potential species from the NCNHP list. The species are categorized as flora or fauna, with the federal and state species status, and a habitat description for each. None of the species in Table 7 are known to inhabit, or have been recorded on, the RWTF property.

As none of the species in Table 7 are known to inhabit, or have been recorded on, the RWTF property, there is no required alternative selection, design strategies, construction methods, long-term maintenance procedures, or any other form of mitigation planned or required.

## Table 7 | Federally Listed and NCNHP-Listed Species with Habitat and Range Distributions that Include the RWTF Property

| Common Name | Scientific Name | Federal Status | State Status | Habitat Description |
|---|---|---|---|---|
| **Flora** | | | | |
| Harperella | *Harperella nodosa* | Endangered | Endangered | Clear, swiftly flowing perennial streams with rocky or gravelly substrates and banks, as well as along the banks of hydrologically stable water bodies. |
| Michaux's sumac | *Rhus michauxii* | Endangered | Endangered | Irregularly maintained roadside ROW, utility ROW, grazed fields, and pastures. |
| Smooth coneflower | *Echinacea laevigata* | Threatened | Threatened | Irregularly maintained roadside ROW, utility ROW, grazed fields, and pastures. |
| Buttercup Phacelia | *Phacelia covillei* | Not listed | Significantly Rare | Bottomlands, rich lower slopes; rare throughout range |
| Piedmont horsebalm | *Collinsonia tuberosa* | Not listed | Significantly Rare | Rich hardwood forests; NC is on periphery of range |
| Catchfly cutgrass | *Leersia lenticularis* | Not listed | Significantly Rare | Low woods; NC is on periphery of range |
| **Fauna** | | | | |
| Red-cockaded woodpecker | *Picoides borealis* | Endangered | Endangered | Forested stands with 50% or greater of pine/pine-hardwood forest, with pine trees of 30 years of age (10" dbh) or older. |
| Northern long-eared bat | *Myotis septentrionalis* | Endangered | Endangered | Forested stands of trees greater the 5 inches in diameter. |
| Tri-colored bat | *Perimyotis subflavus* | Proposed Endangered | Endangered | Forested stands of trees greater the 5 inches in diameter or manmade structures such as buildings, bridges, or culverts. Roosts in clumps of leaves (mainly in summer), caves, rock crevices, and other dark and sheltered places |
| Monarch butterfly | *Danaus plexippus* | Candidate | Not Listed | Irregularly maintained roadsides ROW, utility ROW, grazed fields, and pastures. |
| Bald eagle | *Haliaeetus leucocephalus* | Bald & Golden Eagle Protection Act | Threatened | mature forests near large bodies of water (nesting); rivers, lakes, and sounds (foraging) [breeding evidence only] |
| Eastern slender glass lizard | *Ophisaurus attenuatus longicaudus* | Not listed | Special Concern | old fields, wooded edges, open woods; from historical record (more than 20 years old) |
| Coppery emerald dragonfly | *Somatochlora georgiana* | Not listed | Significantly Rare | creeks and other slow-moving acidic streams, in forested areas |
| Geometrid moth | *Lytrosis permagnaria* | Not listed | Significantly Rare | apparently in mixed forests |

ROW = right-of-way

### 4. Displaced Wildlife

A large proportion of the forested areas on the site will be removed for the construction of the water treatment facility on the site. Wildlife using these forested areas will be displaced by this activity. White-tailed deer, fox, squirrels, raccoons, chipmunks, mice, woodland songbirds, owls, frogs, salamanders, snakes, and various invertebrate species that are typical of these types of habitats would no longer be able to use the site for shelter, feeding or breeding. However, there is a substantial amount of similar habitat in the state park directly adjacent to the site that will provide refuge for these animals. The adjacent state park area is not across a road or any other type of barrier to movement for wildlife. Furthermore, the timing of forest clearing for the proposed project will be scheduled to avoid the breeding season for most of the wildlife expected to be using this site.

### 5. Invasive Species

There has not been a specific field survey to identify the presence and distribution of invasive species on the RWTF property. However, during field work in 2022, ecologists recorded the presence of the following non-native and/or invasive plant species in their field notes:

- Japanese stiltgrass – *Microstegium vimineum*
- Japanese Honeysuckle - *Lonicera Japonica*
- Chinese privet – *Ligustrum sinense*
- Tree of Heaven – *Ailanthus altissima*
- Autumn Olive – *Elaeagnus umbellate*
- Russian Olive - *Elaeagnus angustifolia*
- Multiflora Rose – *Rosa Multiflora*
- Oriental bittersweet - *Celastrus orbiculatus*
- Wineberry - *Rubus phoenicolasius*
- Callery pear - *Pyrus calleryana*
- Chinese bushclover - *Lespedeza cuneata*

In general, these species were observed along the edge of roads and utility rights-of-way, and field teams did not observe large areas dominated by invasive species. However, True North did report the presence of a stand of autumn olive in the vicinity of one of the home sites and provided steps to control or eliminate it; these steps will be followed in accordance with their recommendations. Comments from the 2022 field surveys indicates that this species has apparently not colonized across more of the site since the forestry plan was prepared.

### 6. Planned Deforestation

The site primarily consists of old-growth hardwood forest with oaks, maples, poplars, hickory and other deciduous trees with a few pines and cedars located in the mix.

A total of approximately 47 acres will be disturbed for the full build out of the facility. This includes the main facility components on 40 acres and a 7-acre area across a creek tributary to the lake, accessed from Seaforth Road where the septic drainage field, and future clearwell and RO will be located. The WIP anticipates removal of nearly all trees, stumps and undergrowth as part of this disturbance and currently exploring options to reuse as much of this vegetation on site as possible. Possible options include portable sawmills to create lumber to be used onsite. Branches, vines, bark and other items can be ground onsite and used as mulch.

Land disturbance will be limited to an area 100 feet from the roadway right-of-way and beyond (within 50 feet at two stormwater control measures). The first 100 feet will remain undisturbed and existing vegetation will be preserved and supplemented where thin.

Stream buffers and wetlands will remain in a natural state with a few minor exceptions for access road construction.

## M. Hazardous Materials

### 1. Hazardous Materials

The following chemicals will be introduced and stored at the RWTF during construction and/or operation:

- Coagulant (such as alum or ferric sulfate)
- Caustic
- Polymer
- Sodium Hypochlorite (for disinfection)
- Fluoride
- Corrosion Inhibitor
- Ozone
- Liquid Oxygen
- Permanganate
- Powdered Activated Carbon
- Aqua Ammonia
- Calcium Thiosulfate or Bisulfate (for dechlorination)

### 2. Hazardous Materials Management, Storage, and Disposal

Each chemical listed above will be stored in accordance with County and State Building Codes to ensure their proper management, storage, and disposal. All chemicals previously listed will be liquid (with the exception of ozone, which is generated on an as-needed basis, liquid oxygen for ozone production, powdered activated carbon (stored as dry) and potentially a dry polymer) and will be held in vertical chemical storage tanks, made out of materials suitable for bulk chemical storage, in buildings across the RWTF. Most of the chemicals that are introduced and stored at the RWTF during construction and/or operation will be in quantities over 6,000 gallons. This practice will be done to ensure that the chemicals can be purchased in truckloads on a less-frequent basis in order to reduce truck traffic from deliveries. A fuel tank will be required for the storage of fuel for the generators.

## 4.0 References


Archaeological Consultants of the Carolinas, Inc. July 2023. Cultural Resources Survey for the Jordan Lake Water Supply Project, Chatham and Durham Counties, North Carolina.

Brown and Caldwell. August 2, 2023. Responses to selected questions from Chatham County rezoning application, as requested by Kelly Boone of CDM Smith.

Brown and Caldwell. October 11, 2022. Baseline Environmental Conditions Report on Orange Water and Sewer Authority Property Proposed for Regional Water Treatment Facility.

CDM Smith. August 2023. Chatham County Rezoning Work Plan.

Chatham County. Adopted November 20, 2017. Plan Chatham: Comprehensive Plan 2017. https://www.chathamcountync.gov/home/showpublisheddocument/48133/637209066019700000

Chatham County. Updated March 21, 2022. The Chatham County Zoning Ordinance. https://www.chathamcountync.gov/home/showpublisheddocument/60309/637878641569930000

Dramby Environmental Consulting, Inc. August 8, 2022. Western Intake Partnership Jordan Lake Water Supply Project Preliminary Jurisdictional Determination Request.

Environmental Protection Agency (EPA). NPDES Permit Writer Training Manual: Glossary of Terms. https://www3.epa.gov/npdes/pubs/glossary.pdf

Hazen and Sawyer. July 19, 2023. Water Treatment Facility Site Evaluation.

Hazen and Sawyer. September 14, 2022. Water Intake and Transmission Infrastructure Preliminary Engineering: Finished Water Transmission Mains and Water Treatment Facilities Review and Comparison.

Monroe Environmental. Plate Settlers. https://www.monroeenvironmental.com/water-and-wastewater-treatment/plate-settlers/#:~:text=Plate%20Settler%20Design%20and%20Operation&text=The%20effluent%20is%20collected%20uniformly,to%20stainless%20steel%20collection%20troughs

North Carolina Department of Environmental Quality (NCDEQ) Division of Water Resources. Jordan Lake Water Supply Allocation: Background Information. https://www.deq.nc.gov/about/divisions/water-resources/water-planning/basin-planning/jordan-lake-water-supply-allocation/background-information

NCDEQ Division of Energy, Mineral, and Land Resources: SCM Operation & Maintenance. https://www.deq.nc.gov/about/divisions/energy-mineral-and-land-resources/stormwater/stormwater-program/stormwater-design-manual/scm-operation-maintenance

Sulzer. Equalization. https://sulzer.com/en/shared/applications/equalization#:~text=Equalization%20in%20wastewater%20treatment,that%20arrive%20from%20different%20sources

US Department of Agriculture Natural Resources Conservation Service. Web Soil Survey of Chatham County, North Carolina. https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Western Intake Partnership. August 23, 2023. Chatham County Appearance Commission Presentation.

Western Intake Partnership. Home. https://westernintakepartnership.com

Western Intake Partnership. July 20, 2023. Western Intake Partnership Community Meeting July 20, 2023.

## 5.0 Exhibits

All figures, maps, photographs, and tables can be found in the relevant sections.

## 6.0 Required State and Federal Permits

**Table 8** lists the required state and federal permits and regulatory approvals for the WIP RWTF Project. Permits pertaining to zoning, building, septic, stormwater, etc. will also be obtained from Chatham County.

**Table 8 | Required State and Federal Permits and Approvals**

| Permit | Agency | Description |
|---|---|---|
| Approval of Engineering Plans and Specifications for Authorization to Construct | NCDEQ DWR Public Water Supply | Required for construction or alteration of water system. Certifications required to place in service. |
| NPDES Permit | NCDEQ DWR NPDES Unit | Required for discharge of filter backwash, sedimentation basin supernatant, and process wastewater. |
| Sediment and Erosion Control Plan Approval | NCDEQ DEMLR | Required for land disturbance of 1 acre or more. |
| Stormwater NPDES (NCG010000) | NCDEQ DEMLR | Required for land disturbance of 1 acre or more. |
| Air Quality Permit | NCDEQ DAQ | Required for air emissions unless exempt (e.g., generators used for emergencies may be under fuel usage threshold). |
| CWA Section 404 Permit (Nationwide Permit 58 or 18) | US Army Corps of Engineers | Required for work in Waters of the United States (such as wetlands and streams). |
| 401 Water Quality Certification and Riparian Buffer Authorization | NCDEQ DWR | Required for work in Waters of the United States/State and impacts to Jordan Lake riparian buffers. Triggered by the need for 404 Permit. |
| NCDOT Encroachment Agreement | NCDOT | Required for work in NCDOT right-of-way. |
| NCDOT Driveway Permit | NCDOT | Required for construction of new driveway connecting to a NCDOT road. |
| OSFM Review of Construction Plans | NC Department of Insurance (DOI) Office of the State Fire Marshal (OSFM) | Required for construction of buildings larger than 20,000 square feet. |

# Appendix A

## Correspondence

# North Carolina Department of Natural and Cultural Resources

**State Historic Preservation Office**

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary D. Reid Wilson

Office of Archives and History
Deputy Secretary, Darin J. Waters, Ph.D.

October 9, 2023

Brooke Brilliant
Archaeological Consultants of the Carolinas, Inc.
121 East First Street
Clayton, NC 27520

brookebrilliant@archcon.org

Re: Jordan Lake Regional Water Supply Project, Chatham and Durham Counties, ER 22-1314

Dear Ms. Brilliant:

Thank you for your letter of August 22, 2023, transmitting the archaeological survey report for the above-referenced undertaking. We have reviewed the submittal and offer the following comments.

We do not request any further edits to the submitted document. Please send one hard copy of the report to our Environmental Review Branch using one of the following addresses:

| By US Postal Service: | By FedEx, UPS, or courier: |
|---|---|
| Renee Gledhill-Earley<br>State Historic Preservation Office<br>4617 Mail Service Center<br>Raleigh, NC 27699-4617 | Renee Gledhill-Earley<br>State Historic Preservation Office<br>109 East Jones Street, Room 258<br>Raleigh, NC 27601 |

Upon receipt of a hard copy of the report, we will provide our formal concurrence letter for your client's use.

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 919-814-6579 or environmental.review@dncr.nc.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona Bartos, Deputy
State Historic Preservation Officer

# North Carolina Department of Natural and Cultural Resources

**State Historic Preservation Office**

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary D. Reid Wilson

Office of Archives and History
Deputy Secretary, Darin J. Waters, Ph.D.


June 16, 2022


Robert Belcher bbelcher@drambyenv.com
Dramby Environmental Consulting, Inc.
8801 Fast Park Drive, Suite 301
Raleigh, NC 27617


Re: Jordan Lake water supply water treatment plant project, Chatham County, ER 22-1314

Dear Mr. Belcher:

Thank you for your letter dated April 29, 2022, concerning the above-referenced project. We have reviewed the information provided and offer the following comments.

Based on our records, two previously recorded archaeological sites have been identified within the proposed project area and others have been documented in the immediate vicinity. Site 31CH173 has not been evaluated regarding its eligibility for listing on the National Register of Historic Places (NRHP) and site 31CH727 is an unmarked cemetery.

The Lemuel Ellis cemetery and the remnant homesite observed in your reconnaissance survey do not appear to have been previously recorded as archaeological sites. Most of the project area has not been systematically surveyed for the presence of archaeological resources and due to the presence of existing archaeological sites and landforms with a high probability for archaeological sites, plus the observed historic cemetery, we expect the project area may contain intact, significant archaeological sites.

We recommend that the Ellis cemetery be documented and assigned a state archaeological site number, and both cemeteries' boundaries mapped by a licensed surveyor, recorded on deeds or plats, and filed with the county. Evaluation of the potential for unmarked burials should be assessed using both archival research and field documentation include ground penetrating radar (GPR), as appropriate.

Please note that cemeteries are protected under NC General Statutes Chapter 14-148 and 14-149, and are afforded consideration under Chapter 65. If unmarked human skeletal remains are encountered during construction, the provisions of North Carolina General Statute Chapter 70, Article 3 apply. Construction activities should immediately cease and the county medical examiner should be contacted.

Prior to the initiation of any ground disturbing activities within the project area, we also recommend that a comprehensive archaeological survey be conducted by an experienced archaeologist. The purpose of this survey is to identify any archaeological sites that may be damaged or destroyed by the proposed project and make recommendations regarding their eligibility status in terms of the NRHP. Potential effects on eligible resources must be assessed prior to the initiation of construction activities.

This work should be conducted by an experienced archaeologist who meets the *Secretary of the Interior Professional Qualifications Standards*. A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at https://archaeology.ncdcr.gov/programs/environmental-review/archaeological-consultant-list.

***Please note that our office requests consultation with the Office of State Archaeology Review Archaeologist to discuss appropriate field methodologies prior to the archaeological field investigation.*** One paper copy and one digital copy (PDF) of all resulting archaeological reports, as well as a digital copy (PDF) of the North Carolina site form for each site recorded, should be forwarded to the Office of State Archaeology (OSA) through this office for review and comment as soon as they are available and in advance of any construction or ground disturbance activities. OSA's *Archaeological Standards and Guidelines for Background Research, Field Methodologies, Technical Reports, and Curation* can be found online at: https://archaeology.ncdcr.gov/osa-guidelines.

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 919-814-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona Bartos, Deputy
State Historic Preservation Officer

April 29, 2022

North Carolina Department of Natural and Cultural Resources
State Historic Preservation Office
109 East Jones Street, Room 258
Raleigh, NC 27601

**Submitted via email: Environmental.Review@ncdcr.gov**

**Subject: Site Review for Jordan Lake Water Supply Project, Chatham County, North Carolina**

Dear Madam or Sir:

Dramby Environmental Consulting, Inc. (DEC), in partnership with Brown and Caldwell (BC) and the Western Intake Partnership, is requesting a preliminary project review for a proposed water treatment plant site associated with the Jordan Lake Water Supply Project (JLWSP) located in Chatham County, North Carolina (Figure 1). The project team has conducted a site reconnaissance and has reviewed the existing NC State Historic Preservation Office's (NCSHPO) HPOWEB 2.0 GIS data mapper and other existing mapping. The purpose of this inquiry is to seek existing information on the features found, identify studies that may need to be conducted, and begin a dialog with the NCSHPO for the proposed project.

**Study Area**
The study area (Parcel ID#17538) is approximately 87.67-acres. The current owner of the study area is the Orange Water and Sewer Authority (OWASA). OWASA purchased the property in 1989 with the plan that the site would eventually be used for a water treatment plant. There is currently no mailing address; however, coordinates for the approximate center of the property are as follows (35.715610°, -79.062196°). The western extent of the property is the intersection of Seaforth Road and North Pea Ridge Road. Both Seaforth Road and North Pea Ridge Road bisect the property into three parcels as shown in Figure 1. This field review did not include areas north of Seaforth Road or northeast of the stream on the main parcel.

A specific site layout for the water treatment plant has not been determined. A project review of this property is requested for project planning purposes. While a specific project layout cannot be provided at this time, based on the site topography, it can be assumed that cut and fill will be needed to level portions of the site.

**Preliminary Site Evaluation**
A reconnaissance level site evaluation was conducted on March 10, 2022, by BC and DEC staff. During this data gathering visit, what appeared to be an old homesite/farm buildings were observed on the property, including the following:

- Partial remanent chimney and foundation
- Abandoned home with water well, shed, barn, and two tobacco barns.
- Family cemetery

These structures are further described below.

Remnant Homesite

Remnants of an old homesite were observed near the following coordinates (35.714686°, -79.062067°). The remnants of a partially collapsed stone chimney were observed on one end of the site (Photos 1, 2, and 3). Another large pile of stone was also observed on the opposite end of the structure (Photo 4). Due to the condition, the original purpose of the stone was unclear, but it appears that part of the stone had been stacked to form part of a wall or possibly another chimney. There were foundation stones observed running between the chimney and the other stone structure (Photos 5 and 6). There was no evidence of any of the original wood that was part of the structure remaining.

Lemuel Ellis Family Cemetery

A small cemetery is present at approximately the following coordinates (35.713900°, -79.060828°). This cemetery appears to be the same as the cemetery shown in the Chatham County Cemeteries GIS data set (326-ELLIS,_LEMUEL__L25.2_). The cemetery is less than 0.1-acre in size (approximately 60-feet by 60-feet). The first known burial based on marker inscriptions was in 1889 and the last was in 1901. The cemetery has been abandoned and is suffering from neglect. Cemetery Census (www.cemeterycensus.net) reports the cemetery originally had a wrought iron fence on a stone wall, but no evidence of the wall or wrought iron was observed during the March 10, 2022, site visit.

The cemetery had three graves with inscriptions on the markers. These graves included Lemuel Ellis (b. 1824 - d. 10 Feb 1889) and his wife, Tilitha (Hatley) Ellis (b. 1832 – d. 28 May 1895), who shared a marble pedestal approximately 1-foot square and 4-feet high on a 1.5-foot sq. base. The name "ELLIS" can be seen on the base (Photo No. 7). The marker is currently leaning. A footstone labeled "L.E." (Lemuel Ellis) was observed and an adjacent footstone with no initials appears to have been damaged (Photo No. 8a). Based on the proximity to the above-referenced pedestal it is believed the footstone belongs to Tilitha Ellis (Photo No. 8b). The third grave was for Ralph Ellis (b. 19 Dec 1899 - d. 8 Dec 1901), a grandchild of Lemuel and Tilitha Ellis (Photo No. 9). The vertical marble slab was inscribed with “Son of J.A. & M.F. Ellis,” birth and death date, and "Gone to be an angel". The full name of Ralph Ellis’ parents is Joseph Andrew and Mannie Frances (Copeland) Ellis. Both Andrew and Manie Frances are buried at the Pleasant Hill Baptist Cemetery in Seaforth, Chatham County.

The cemetery also appeared to have approximately 18 to 20 other graves that were marked with fieldstones and had no legible inscriptions (Photo No. 10 through 12). Cemetery Census’ website reports that OWASA has promised the right of access to Mrs. Zilpha Ellis Cooley, 919-542-2043. Mrs. Cooley is the granddaughter of Lemuel Ellis, the original family owner.

Tobacco Barns

There are two 17.5-foot by 17.5-foot square tobacco barns (35.712582°, -79.060073°) each located in the vicinity of a small pond, on the eastern boundary of the property (Photo No. 13 through 18). The specific ages of the barns are unknown, but given the variety of material used, they appeared to have potentially been in service for a considerable period of time. The barns are primarily constructed of saw-cut logs with mud or mortar chinking. The foundation is comprised of fieldstone, brick, and an unspecified type of metal piping (Photos 14 and 15). A large eye bolt and an iron ring were observed in one of the logs (Photo 17). Piping, filter, and copper tubing associated

with a tobacco curer (Photo 18) were also observed. One of the barns has been used to dispose of numerous empty motor oil bottles and other waste material. The other has a portion of its tin roof compromised, resulting in substantial decay of the underlying wall.

House and Surrounding Structures

A house (Photo No. 19 through 21) constructed of milled boards was observed on the southeastern portion of the property (35.713179°, -79.061195°). The house had a tin roof and a large front porch. A variety of materials were used for the foundation including fieldstone, logs, and bricks. The top of the porch column had potential Victorian-era gingerbread and scrollwork. The stairs leading to the front porch were missing and are presumed to have rotted. The house appears that it has been left open to the environment for a considerable period of time. A small covered well was located north of the house (Photo 21). The opening of the well was boarded shut and the internal condition of the well is unknown.

A barn (Photo 22) constructed of milled boards was observed in the vicinity of the house. Numerous boards and doors are missing from the structure and the structure is generally in poor condition. Piles of debris including numerous oil cans are in the structure and immediately around the site.

In addition, an unidentified log outbuilding approximately 12.5-foot by 9-foot was observed (Photo No. 23 through 25). The structure has a tin roof, of which part is missing (Photo 24). The logs under the missing roofing panel were severely rotted. The structure contained the remnants of a 50-gallon steel drum.

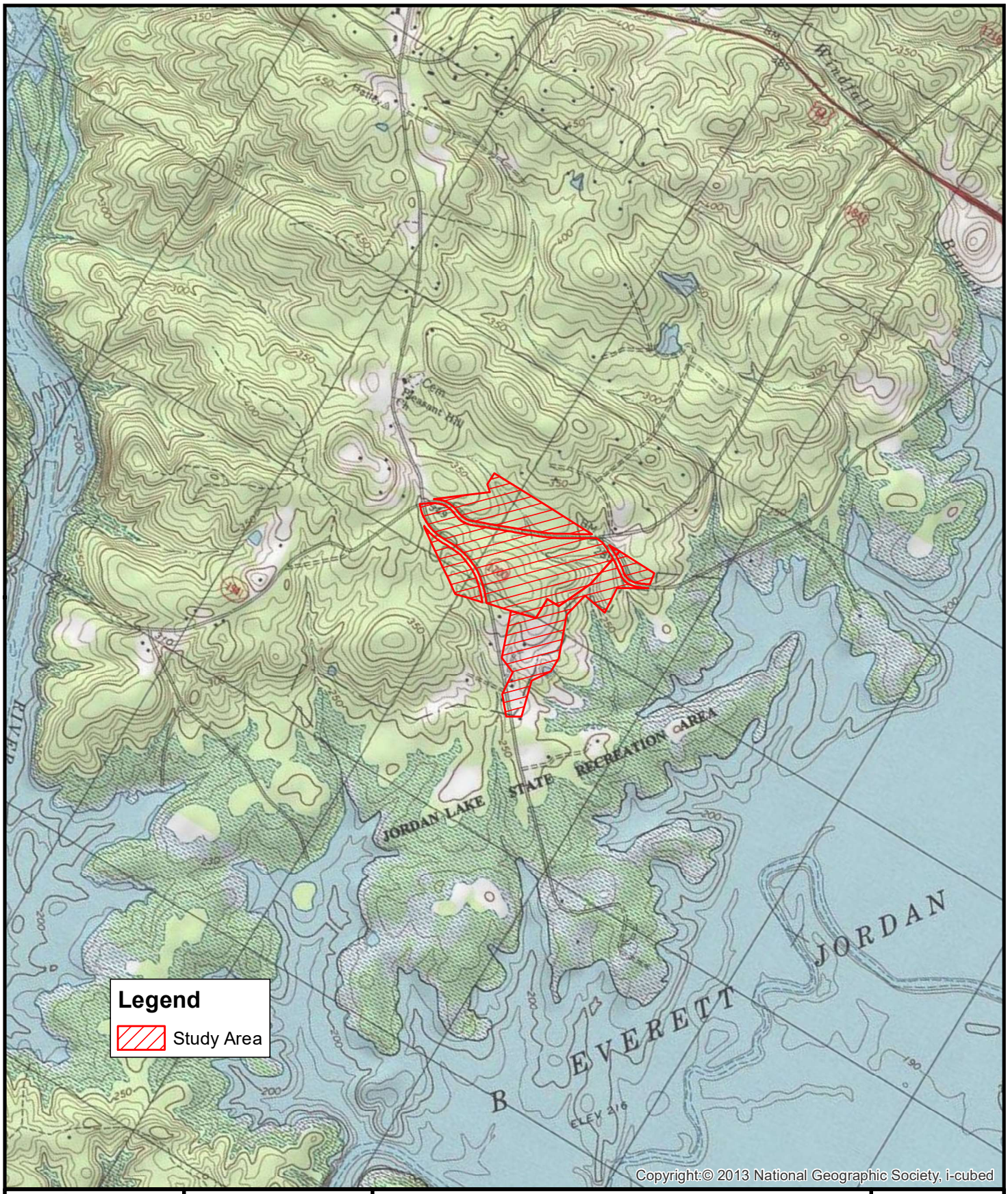
The following supporting documentation follows this request:

- Vicinity Map
- Representative Photographs

The preliminary site evaluation identified onsite structures that were in excess of 50-years old; however, the observed structures do not appear to meet the Criteria for Eligibility for a National Historic Place. We would appreciate NCSHPO's concurrence or opinion otherwise. Additionally, we would appreciate any information your office has about previous surveys or known resources within the study area. If additional information or clarification is needed, please feel free to contact me at bbelcher@drambyenv.com and 757.288.2212.

Sincerely,
Dramby Environmental Consulting, Inc.

Robert T. Belcher, PWS, CSE
Senior Project Manager / Senior Environmental Scientist




DRAMBY ENVIRONMENTAL CONSULTING

0 500 1,000 2,000 Feet

SCALE : 1 in = 2,000 ft

WESTERN INTAKE PARTNERSHIP
JORDAN LAKE WATER SUPPLY, CHATHAM COUNTY, NC

# VICINITY MAP

APRIL 2022

FIGURE 1

**Photo No. 1**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** Remnants of a partially collapsed stone chimney.

**Photo No. 2**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** Remnants of a partially collapsed stone chimney.

**Photo No. 3**

**Date:** 3/10/2022
**Photographer**: RTB
**Notes:** Remnants of a partially collapsed stone chimney.

**Photo No. 4**

**Date:** 3/10/2022
**Photographer**: RTB
**Notes:** A large pile of stone observed on the opposite end of the structure.

**Photo No. 5**

**Date:** 3/10/2022
**Photographer**: RTB
**Notes:** Foundation stones observed running between the chimney and the other stone structure.

**Photo No. 6**

**Date:** 3/10/2022
**Photographer**: RTB
**Notes:** Foundation stones observed running between the chimney and the other stone structure.




**Photo No. 7**

**Date:** 3/10/2022
**Photographer**: RTB
**Notes:** Lemul and Tilitha Ellis' headstone.



**Photo No. 8**

**Date:** 3/10/2022
**Photographer**: RTB
**Notes:** A footstone labeled "L.E." (Lemuel Ellis), and a footstone with no initials, which may belong to Tilitha Ellis.



**Photo No. 9**

**Date:** 3/10/2022
**Photographer**: RTB
**Notes:** Headstones of Ralph Ellis.

**Photo No. 10**

**Date: 3/10/2022**
**Photographer**: RTB
**Notes:** Fieldstone with no legible inscription.

**Photo No. 11**

**Date:** 3/10/2022
**Photographer**: RTB
**Notes:** Fieldstone with no legible inscription.

**Photo No. 12**

**Date:** 3/10/2022
**Photographer**: RTB
**Notes:** Fieldstone with no legible inscription.

**Photo No. 13**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** Tobacco barn.

**Photo No. 14**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** Tobacco barn.

**Photo No. 15**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** Tobacco barn.



**Photo No. 16**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** Tobacco barn.

**Photo No. 17**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** A large eye bolt and an iron ring in one of the logs.



**Photo No. 18**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** Piping, filter, and copper tubing associated with a tobacco curer.

**Photo No. 19**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** A house on the southeastern portion of the property.

**Photo No. 20**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** A house on the southeastern portion of the property.

**Photo No. 21**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** A small cover well located north of the house.

**Photo No. 22**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** A barn in the vicinity of the house.

**Photo No. 23**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** An unidentified log outbuilding.

**Photo No. 24**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** An unidentified log outbuilding.

**Photo No. 25**

**Date:** 3/10/2022
**Photographer**: JSD
**Notes:** An unidentified log outbuilding.