



Technical Memorandum

To: Western Intake Partnership

From: CDM Smith

Date: October 2023

Subject: Conditional Use Rezoning Application - Five Findings Report

The Western Intake Partnership, or WIP, (Chatham County, City of Durham, Orange Water and Sewer Authority and Town of Pittsboro) proposes to construct a new regional drinking water treatment plant to meet the Partners' long-term water supply needs. The regional water treatment facility (RWTF) is proposed to be constructed on a site near the intersection of Pea Ridge Road and Seaforth Road and will treat water withdrawn from Jordan Lake. The water supply facilities are needed to support the Partners' anticipated future growth.

This report documents the Five Findings information required by Chatham County as part of the Conditional Use rezoning process. The report is organized to follow the County requirements and provides responses to each of the five topics.

1. The alleged error in this Ordinance, if any, which would be remedied by the proposed amendment with a detailed explanation of such error in the Ordinance and detailed reasons how the proposed amendment will correct the same.

There is no alleged error in the Ordinance.

2. Changed or changing conditions, if any, of the area or in the County generally, which make the proposed amendment reasonably necessary to the promotion of the public health, safety and general welfare.
 - A. Need and Desirability <Required> The application should describe why there is a need for the proposed use in the area being applied for. Describe how this was determined (for example, an analysis of present or projected demands on existing similar uses). This is an opportunity for the applicant to establish the benefit to the County that will result from approval of this permit. Why is the proposed use more desirable than other uses permitted under the existing zoning?

The Western Intake Partnership, or WIP, (Chatham County, City of Durham, Orange Water and Sewer Authority and Town of Pittsboro) proposes to construct a new RWTF to meet the Partners' long-term water supply needs. The RWTF is proposed to be constructed on a site near the intersection of Pea Ridge Road and Seaforth Road and will treat water withdrawn from Jordan Lake. The project is needed to support the Partners' 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.

Improvements in the reliability of the County water supply will be a great benefit to the County in terms of both public health and fire protection. Additionally, the WIP have agreed to add a fire hydrant near the intersection of North Pea Ridge Road and Seaforth Road for use by the local fire department. This will improve access to a reliable water supply for the County's fire response teams.

- B. Survey of Similar Uses <Required> How many other instances of this use are currently in Chatham or within an adjacent County? Are there similar uses already approved for the requested use on adjacent properties? Provide summary of existing similar uses. If there are already a number of such uses allowed in the County or another similar use in reasonably close proximity to the new requested site, why is this new instance of this use essential? Are these other instances currently in operation and successful?

Other publicly owned water treatment plants in Chatham County include Chatham County Utilities' Jordan Lake Water Treatment Plant (North Chatham Water System) and the Town of Pittsboro WTP. The RWTF is needed to support the anticipated future growth of the Western Intake Partnership (WIP) (Chatham County, City of Durham, Orange Water and Sewer Authority and Town of Pittsboro). The project will allow the WIP Partners to access their portions of the Jordan Lake water supply allocations made by the NC Environmental Management Commission.

- C. Public Provided Improvements <Required> Identify any public improvements, services, etc., that the county would be required to provide in support of this site if the use is approved. If no additional public improvements are needed, then state this as the case.

Chatham County is a member of the Western Intake Partnership (WIP). The RWTF project is a public utility improvement project. No additional public improvements or services are needed. Electrical power and natural gas infrastructure improvements will be needed to support this project, but public improvements and services will not be required to be provided by the County.

- D. Tax considerations <Optional> If appropriate, or of advantage to the application, provide an estimate of the tax revenue (direct and indirect) to the County that this use would provide. Describe how this estimate was determined. What is the net result of expenditure of County services and facilities required vs. the tax revenue generated?

The project will not provide direct tax revenue. All of the members of the Western Intake Partnership (WIP) are public entities. The RWTF will be owned and operated by the WIP. Increased water supply is apt to provide indirect tax revenue, but the amount is not known.

- E. Employment <Optional> Discuss the number of jobs that would be created by this use. Designate these positions as full time or part time. If possible, describe the salary ranges of the employees.

The project will indirectly provide jobs during construction and operation. Construction contracts will create opportunities for qualified construction contractors to provide job opportunities. Operation of the facility will require continual oversight by qualified professional water treatment plant operators and other staff. The facility will be staffed by employees of the City of Durham. It is anticipated that 2-3 employees may be hired per shift to operate and maintain the new facility plus a plant superintendent, an administrative assistant, a lab manager and a maintenance manager for a total of 10 to 20 on a typical day.

- 3. The manner in which the proposed amendment will carry out the intent and purpose of any adopted plans or part thereof. (I.e., Comprehensive Plan, Chatham/Cary Joint Land Use Plan, etc.) You must note specifics from the plan/s giving reference to page number and section. In support of the Comp Plan, include the following references at a minimum:

- A. CHAPTER TWO: (begins on page 13)

- 1. Issues and Opportunities

The Western Intake Partnership's RWTF will support the issues identified in the Chatham Comprehensive Plan (Plan Chatham). Chapter 2 of the Plan outlines the issues of economics and growth, land use, housing and demographic trends, agriculture, infrastructure, environment, and parks and health. The RWTF will directly support the utility needs of the County as well as the other Partners. The facility will indirectly support economics and growth by helping to provide utility infrastructure to support growth per the County's plans.

B. CHAPTER THREE: (begins on page 39)

1. Goals and Objectives

The Western Intake Partnership's RWTF will directly support several of the goals listed in Chapter 3 of the Chatham Comprehensive Plan (Plan Chatham):

Goal #1. Preserve the rural character and lifestyle of Chatham County. The RWTF will preserve and restore cultural and historic resources that contribute to the identity of the County by avoiding impacts to a cemetery on the site. The WIP have worked with the staff from the State Historic Preservation Office and the Chatham County Historical Association and have undertaken an extensive survey of the graves using field work and ground penetrating radar to identify grave sites. The facility site plan has been developed to avoid impacts to the graves by allowing a 30-meter buffer between the Ellis Cemetery and the water treatment facility and a 10-meter buffer between the single "AB" grave and the water treatment facility.

Goal #3. Promote a compact growth pattern by developing in and near existing towns, communities, and in designated, well planned, walkable, mixed-use centers. The RWTF will directly support the utility needs of the County as well as the other Partners. The facility will support the County's desired growth pattern by helping to provide utility infrastructure to support growth per the County's plans.

Goal #5. Conserve natural resources. The RWTF will help conserve natural resources by avoiding streams and wetlands on the site as much as possible. The site will also conserve natural resources by following a stormwater management plan for the facility. A natural vegetated buffer will be left undeveloped. Approximately 56 acres of natural forested vegetation will remain on site.

Goal #7. Provide infrastructure to support desired development and support economic and environmental objectives. The RWTF will directly support the utility needs of the County as well as the other Partners. The facility will support the County's desired growth pattern by helping to provide utility infrastructure to support growth per the County's plans.

Goal #8. Become more resilient by mitigating, responding and adapting to emerging threats. The RWTF will directly and positively impact the County's and other Partners' resiliency. The project will provide a state-of-the-art drinking water facility for the Partners' planned water supply needs into the future.

Goal #10. Foster a healthy community. Access to clean and safe drinking water is essential to meeting the County's goal to foster a healthy community. The RWTF will support this goal by providing clean, safe drinking water to the County's and other Partners' current and future customers.

2. Land Use Descriptions – select the correct designation for your submittal and support the various bullet points as outlined.

The proposed RWTF site is within the Rural Land Use area described in Plan Chatham. This area is designed for low-density development outside the Centers and Compact Residential areas, with 1- and 2-story buildings, preservation and conservation areas, and rural two-lane roads per Chapter 3 of the Plan Chatham document.

- C. CHAPTER FOUR: (begins on page 51) The minimum strategies to address are the following. You may include others as you deem supportive of your application.

The proposed RWTF will directly support the Plan Chatham element of utilities and public services described in Chapter 4. The RWTF will enable the Western Intake Partnership to access their allocations of the water supply pool of Jordan Lake, meeting the primary goal to “provide infrastructure to support desired development and support economic and environmental objectives.” Figure 29 in the Plan Chatham document depicts the approximate location of the RWTF. The proposed RWTF will help the County achieve the policies and strategies described in the Plan. This project will specifically achieve Utilities and Public Services Action Item 02 (“expand public services (including police, fire, health and other County services) concurrent with demands”) and Action Item 05 (“partner with municipalities to serve economic development priorities with water and wastewater”).

1. Economic Development (page 53)

The RWTF will directly support the utility and infrastructure needs of the County as well as the other Partners. The facility will support the County's desired growth pattern by helping to provide utility infrastructure to support growth per the County's plans. The RWTF will provide water through each Partner's

distribution system so that the individual Partner communities will be able to manage and distribute water according to their own growth and demand needs.

The project will also indirectly provide jobs during construction and operation. Construction contracts will create opportunities for qualified construction contractors to provide job opportunities. Operation of the facility will require continual oversight by qualified professional water treatment plant operators and other staff. The facility will be staffed by employees of the City of Durham. It is anticipated that 2-3 employees per shift may be hired to operate and maintain the new facility.

2. Land Use (page 61)

The RWTF will directly support the utility needs of the County as well as the other Partners. The facility will support the County's desired land use and growth patterns by helping to provide utility infrastructure to support growth per the County's plans.

3. Natural Resources (page 103)

The RWTF will help conserve natural resources by avoiding streams and wetlands on the site as much as possible. The site will also conserve natural resources by following a stormwater management plan for the facility. A natural vegetated buffer will be left undeveloped. Approximately 56 acres of natural forested vegetation will remain on site. The RWTF will enable the Western Intake Partnership to access their portions of the Jordan Lake water supply allocations made by the NC Environmental Management Commission.

4. Parks and Recreation (page 117)

The RWTF will support the Plan Chatham's goals related to Parks and Recreation by protecting historic assets and preserving open space. A historic cemetery (Ellis Cemetery) on the RWTF will be preserved in place. The Western Intake Partnership (WIP) have worked with staff from the State Historic Preservation Office and the Chatham County Historical Association and have undertaken an extensive survey of the graves using field observations and ground penetrating radar to identify grave sites. The facility site plan has been developed to avoid impacts to the cemeteries by allowing a

30-meter buffer between the Ellis Cemetery and the water treatment facility and a 10-meter buffer between the single “AB” grave and the water treatment facility. The WIP have also committed to preserving a natural tree and vegetation buffer around the perimeter of the facility with direct connectivity to Jordan Lake land under the jurisdiction of the US Army Corps of Engineers and the NC Division of Parks and Recreation. The WIP support Chatham County’s planned and future greenways and have expressed willingness to work with County Parks and Recreation staff on exploring ways to utilize WIP pipeline easements to support greenway and recreational access where mutually acceptable.

5. The requested amendment is either essential or desirable for the public convenience or welfare. (i.e., tell how and for what purpose/s the amendment would provide to the County as a whole)

The proposed RWTF would allow Chatham County and its Partners to meet their long-term water supply needs. The project is needed to support the Partners’ anticipated future growth and allow the WIP members to access their portions of the Jordan Lake water supply allocations made by the NC Environmental Management Commission. Additionally, the WIP have agreed to add a fire hydrant near the intersection of North Pea Ridge Road and Seaforth Road for use by the local fire department. This will improve access to a reliable water supply for the County’s fire response teams.

- D. Traffic <Required> Document projected traffic generated by the use. Document current capacity for the road that serves this site (available for all/most roads from NCDOT). What kinds of traffic will this be (car, bus, truck, etc.) and what will be the peak time of day for the traffic? Do you anticipate changes to the speed limit on the principal service road for this site? Are modifications to the road system needed (e.g., a turning lane)? How will these road improvements be financed? A letter of opinion from NCDOT would be required if introduction of significant new traffic loads were expected or there is already a high accident rate at this location. Will the road(s) included in the County Thoroughfare Plan accommodate these anticipated requirements?

The Western Intake Partners have coordinated with NCDOT for guidance in meeting requirements. Construction is expected to last 3 years. The bulk of the construction traffic will occur in the middle 2 years of construction. At the peak of construction, approximately 100-150 construction staff will be working on site. Construction traffic will support concrete work, delivery of materials and equipment, and hauling of excess fill material as required. Transmission pipelines will be constructed along

Seaforth Road to convey the drinking water to the Partners' service areas. After construction, when the facility is operating, a small number of employees (approximately 2-3 staff per shift) will visit and work at the facility. Deliveries and service vehicles will infrequently visit the site during weekday daytime hours.

- E. Visual Impact & Screening <Required> Describe the visual presentation of the completed project in context with the adjoining properties. How will fencing and/or plantings alter the future visual presentation?

Views into the RWTF site will be shielded by preserving existing wooded buffers around the majority of the perimeter of the site. A minimum 50-foot but typically 100-foot vegetated buffer is planned. Supplemental plantings will be used for additional screening beyond the natural tree buffer where needed to achieve an opaque vegetative screen. The heights of the proposed structures at the facility will be below the tops of the trees.

- F. Lighting <Required> Will there be lights associated with the use? This includes but is not limited to pole lights whether for security or decorative post mounted lights, lights on buildings/structures, landscape lighting, flood lights, etc. If so, describe the wattage, type, method of support (if on poles, give height of pole), and times of night the lights would be in use. What considerations and methods have been considered to the shielding of the light from adjacent properties? Are similar lights in use elsewhere that can be evaluated?

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, including supplemental plantings to increase the screening of RWTF lighting offsite, 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-premises 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.

- G. Noise <Required> Will there be noise generated by the use? If so, what will be the source of this noise? Provide an estimate of the level of noise in decibels at the property lines of the site. Provide the basis for this estimate. If the noise generated is anticipated to exceed the County Noise Ordinance, a permit must be requested and approved to exceed the ordinance requirements.

Noise will be generated by equipment such as pumps and equipment at the facility. Vegetated buffers around the perimeter of the site will help mitigate off-site noise. Equipment such as pump motors that creates noise will be specified with noise limits to mitigate noise impacts. Pumps and emergency generators will be placed in buildings designed with sound attenuation to mitigate noise. A noise study will be conducted if needed during the design phase of the project. The project will meet the County Noise Ordinance requirements.

Notifications of significant vibration during construction or operation of the facility will be sent to immediate neighbors of the site and will be measured. The Contractor will be responsible for complying with County requirements and submitting updated requests as required.

Once operation of the RWTF begins, the RWTF will operate in compliance with the County Noise Ordinance.

- H. Chemicals, Biological and Radioactive Agents <Required>. Identify types and amounts of chemicals, explosives, biological and radioactive materials that will be utilized by the requested use. What is the estimated amounts of these agents that will be generated as waste; how will they be disposed? Identify the possible biochemical or radioactive hazards that may be associated with this use; how will these be handled? Identify the potential for emissions into the air. Identify the potential for discharges or runoff of liquids that would pollute the surface and/or groundwater sources.

No detectable odors are expected offsite. No biochemical or radioactive hazards will be associated with the facility.

A preliminary list of the chemicals to be used at the facility is as follows:

- Powdered Activated Carbon – to assist with taste and odor control
- Coagulant (such as alum or ferric sulfate) – to help remove particulates and some natural organic matter
- Caustic and/or lime – for adjusting pH
- Polymer – to help remove particulates
- Sodium Hypochlorite for disinfection
- Fluoride – for dental benefits
- Corrosion Inhibitor – to lessen corrosion
- Ozone – for oxidation of some contaminants
- Liquid Oxygen (used to make ozone)
- Permanganate – for oxidation of manganese
- Aqua Ammonia – for reacting with chlorine to form a residual disinfectant
- Calcium thiosulfate or bisulfite (for dechlorination)

Chemicals used at the facility will be stored in accordance with County and State Building Codes. For example, secondary containment for chemical storage areas will be used as required by the Codes. All chemicals will be liquid (except ozone, which is generated as a gas as needed, liquid oxygen, powdered activated carbon (dry) and possibly also a dry polymer) and stored in tanks in a building. Most chemicals will be over 6,000 gallons stored so that chemicals can be purchased in truckloads to reduce truck traffic from deliveries. A fuel tank will be required for the storage of fuel for the generators. No chlorine gas will be used at the site.

Residuals (waste) from the treatment process will be stored, dewatered, and handled on site at the residuals storage and treatment facilities on the south side of the site. Water from the treatment process will be discharged through the use of an NPDES permit from NCDEQ, which will be obtained during the design phase of this project.

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.

Stormwater runoff will be controlled during construction using a Sediment and Erosion Control Plan. Additionally, there will be five proposed stormwater control measures to act as permanent stormwater devices to remove pollutants from stormwater runoff before the water reaches streams and other surface water.

- I. Signs <Required> Will the use include the display of a sign (advertisement or identification)? If so, describe the method of display, lighting, color, size, number and location on the site.

A sign with dimensions of approximately 12 feet wide by 6.5 feet high will be installed at the primary entrance to the site. Directional and road signs will be used as needed inside the site to direct the flow of traffic and convey information. Signs required for State and County Code compliance such as security and chemical notification signs will be used as needed.

- J. Emergency Services <Optional>

The proposed facility is not expected to significantly impact the Fire Department, Sheriff's Department, or Rescue 911. Fire protection at the site will be provided by drinking water mains in the interior of the site with hydrants for access inside the site. Fire alarms and sprinklers will be provided as required by County and State Building Codes. Emergency access will be provided by driveways providing access to all buildings. As required by Chatham County, the access roads will be at least 20 feet wide and will provide a vertical clearance of 13'-6". The access roads will be able to support a 75,000- pound load. Access will be provided within 150 feet of all points of the buildings.

As requested during the July 20, 2023 meeting with adjacent property owners, the WIP have determined that the proposed RWTF is within the Raleigh Regional Response Team area for hazardous materials emergency response.

- K. Impact to surrounding Land Values <Optional> What will be the impact to surrounding land values as a result of the proposed use? Is this impact anticipated to change with time or create possible changes in use of the surrounding properties? Note that if the applicant does choose to provide this information to support the application, then the basis for the information must be provided. For example, if a real estate appraiser's opinion is presented, then the opinion is expected to be derived from an analysis of comparison sites with requested use, some other real estate study or survey.

This project is not expected to impact surrounding land values. Based on the mitigative measures proposed at this facility, the project will not have a significant effect on surrounding properties.

4. All other circumstances, factors and reasons which the applicant offers in support of the proposed amendment. (i.e. watershed classification, impervious surface, utilities, infrastructure, etc.)
- A. Water Source and Requirements <Required>. How much water will the use require? What is the source of the water (County water or private well)? If the supply is to be supplied by the County, then with the help of the Public Works Dept. (542-8270) identify how the water connections are to be provided.

As this facility will produce drinking water, no water will be required to be provided by the County. The facility will withdraw water from Jordan Lake to be treated and conveyed to the Partners' service areas. No wells will be required.

- B. Wastewater Management <Required>. What is the wastewater capacity needs for this use? Specify the treatment and disposal methods to be used. WWTP, public (i.e. Aqua of NC), or private septic. If individual septic, provide septic improvements permit letter from the Chatham County Environmental Health Department. If other than individual septic systems are to be used, submit a plan for wastewater management. If system requires approval from NCDENR or Aqua of NC or any other state or public source, please provide preliminary approval towards getting approval.

Domestic wastewater at the facility will be treated using a septic system. Septic system permits will be requested from the Chatham County Environmental Health Department once more detailed design allows proper sizing of the facilities. An NPDES permit will be requested from the NC Department of Environmental Quality

for discharge of the process wastewater from the filter backwash and sedimentation basin drains.

- C. Water/Sewer Impact Statement <Required>. All applications where a public utility is to be utilized, (water or sewer) must state clearly the amount of usage that is anticipated. The usage estimate must be validated by the County Public Works Director, along with an updated usage vs. capacity statement. The impact statement should provide a projection of the demand after the site is fully developed.

The facility will not require public water or sewer.

- D. Access Roads <Required>. Describe the access to and from the site to public highways or private roadways. If the requested use will require a new driveway or enhancement to existing highway(s), address the following questions. If a new driveway access is part of the proposal, has NCDOT approved this access (include copy of the preliminary approval for a commercial driveway permit)? If the site is located on a road designated as a “major collector”, is the site accessed by an existing or proposed service road? Describe any upgrades of public or private roads necessary to serve the property.

Four new driveways are proposed for the facility – two on Seaforth Road (primary entrance and entrance to septic fields) and two on North Pea Ridge Road (secondary entrance and entrance to raw water pump station at south end of site). The preliminary driveway entrances have been submitted to NCDOT for review, and NCDOT provided feedback on the locations and sight distances. No upgrades to public or private roads are proposed.

- E. Stormwater Runoff <Required>. Detail the methods and various structures that will be used to control stormwater runoff. (If disturbing more than 20,000 square feet of area, a stormwater management plan must be submitted with this application) This information will detail all points of offsite discharge with design techniques used and projected impact on neighboring properties.

Stormwater will be controlled during construction using temporary sediment and erosion control devices as outlined in a sediment and erosion control plan that will be submitted to the North Carolina Department of Environmental Quality. After construction, stormwater will be managed using five stormwater control measures around the site. Stormwater permit applications for these measures will be submitted to Chatham County. The preliminary stormwater management plan is shown on the grading plans that are part of the site plan package.