



Special Town Council Meeting

August 2023 Work Session

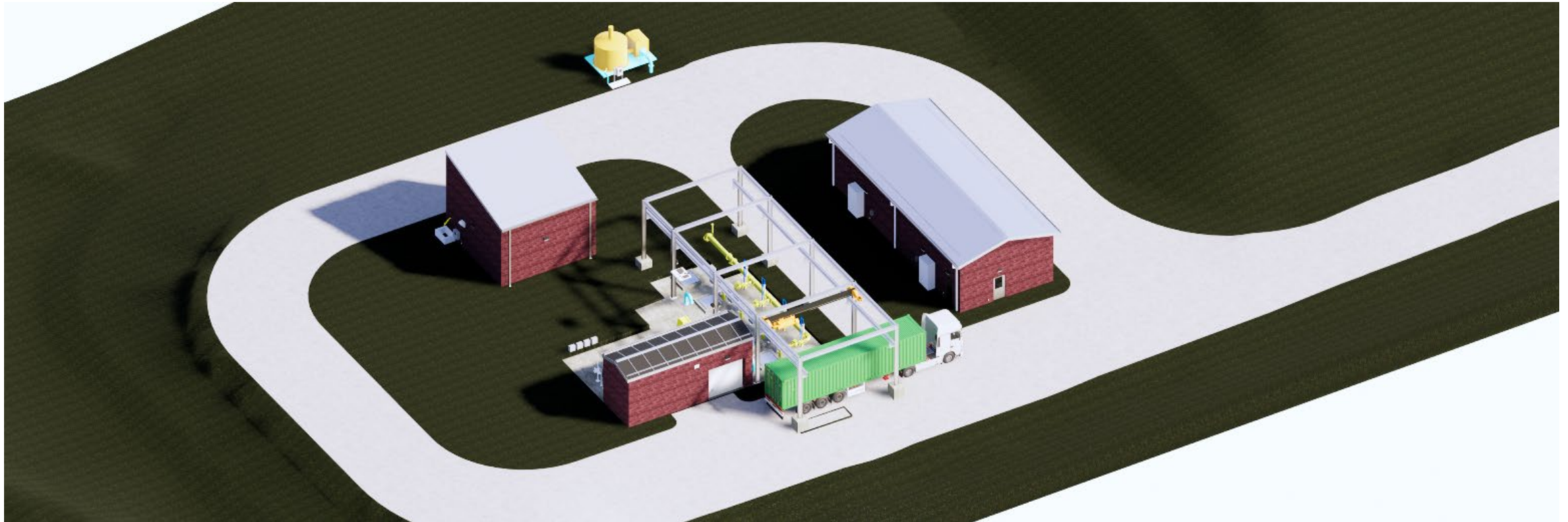
August 15, 2023 | 4:30 PM
Apex Town Hall | 73 Hunter Street, Apex, NC

- 1. Call to Order | Pledge of Allegiance**
Mayor, Jacques K. Gilbert
- 2. Big Branch Force Main (BB2) Update**
Michael Deaton, Director, Water Resources Department
- 3. Long-Range Water and Sewer Capacity Discussion**
Michael Deaton, Director, Water Resources Department
- 4. Q & A**
- 5. Adjournment**

ANNOUNCEMENTS

Members of the public can access and view the meeting on the Town's YouTube Channel <https://www.youtube.com/c/TownofApexGov> or attend in-person.

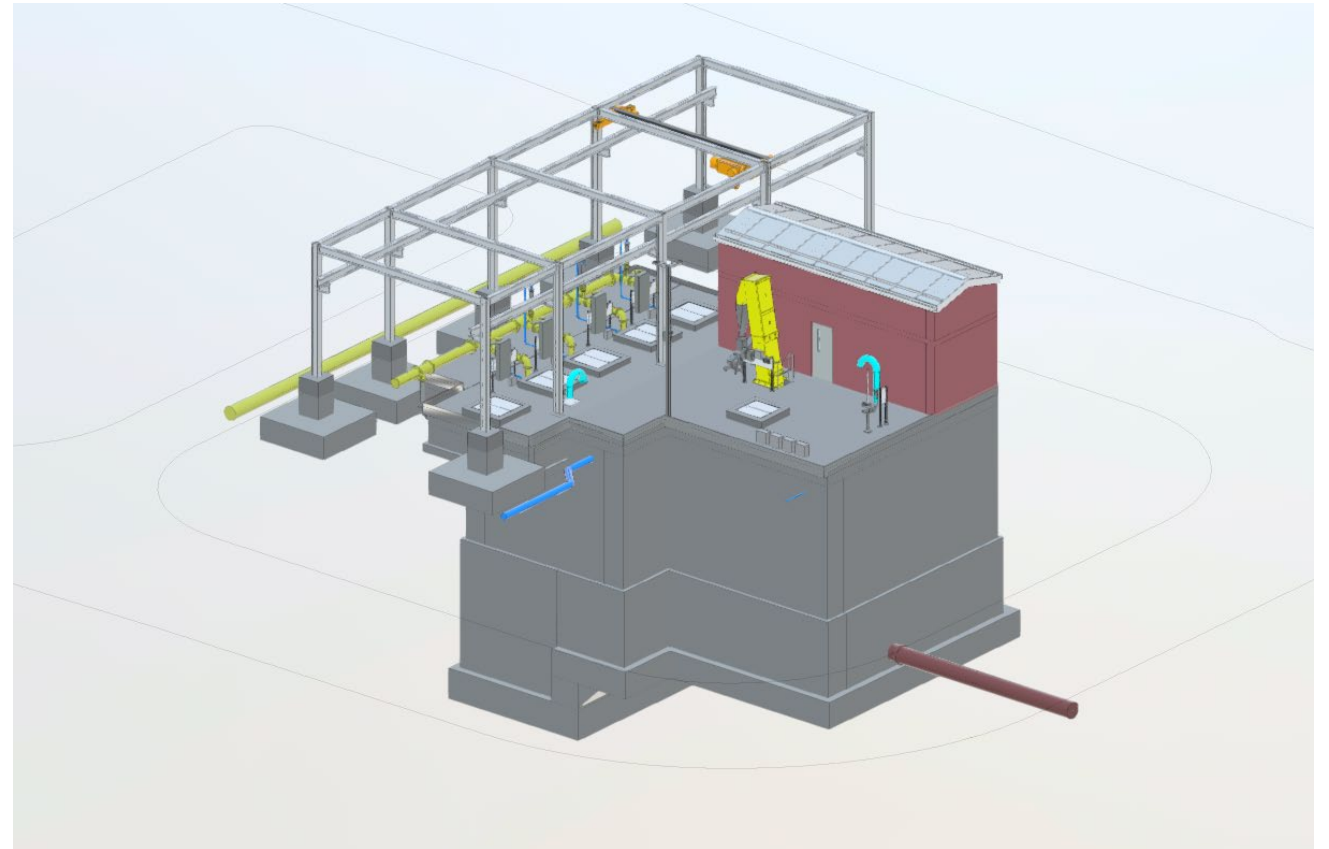
Accommodation Statement: Anyone needing special accommodations to attend this meeting and/or if this information is needed in an alternative format, please contact the Town Clerk's Office. The Town Clerk is located at 73 Hunter Street in Apex Town Hall on the 2nd Floor, (email) allen.coleman@apexnc.org or (phone) 919-249-1260.



Big Branch 2 Pump Station and Pipeline Project Town Council Work Session

Agenda

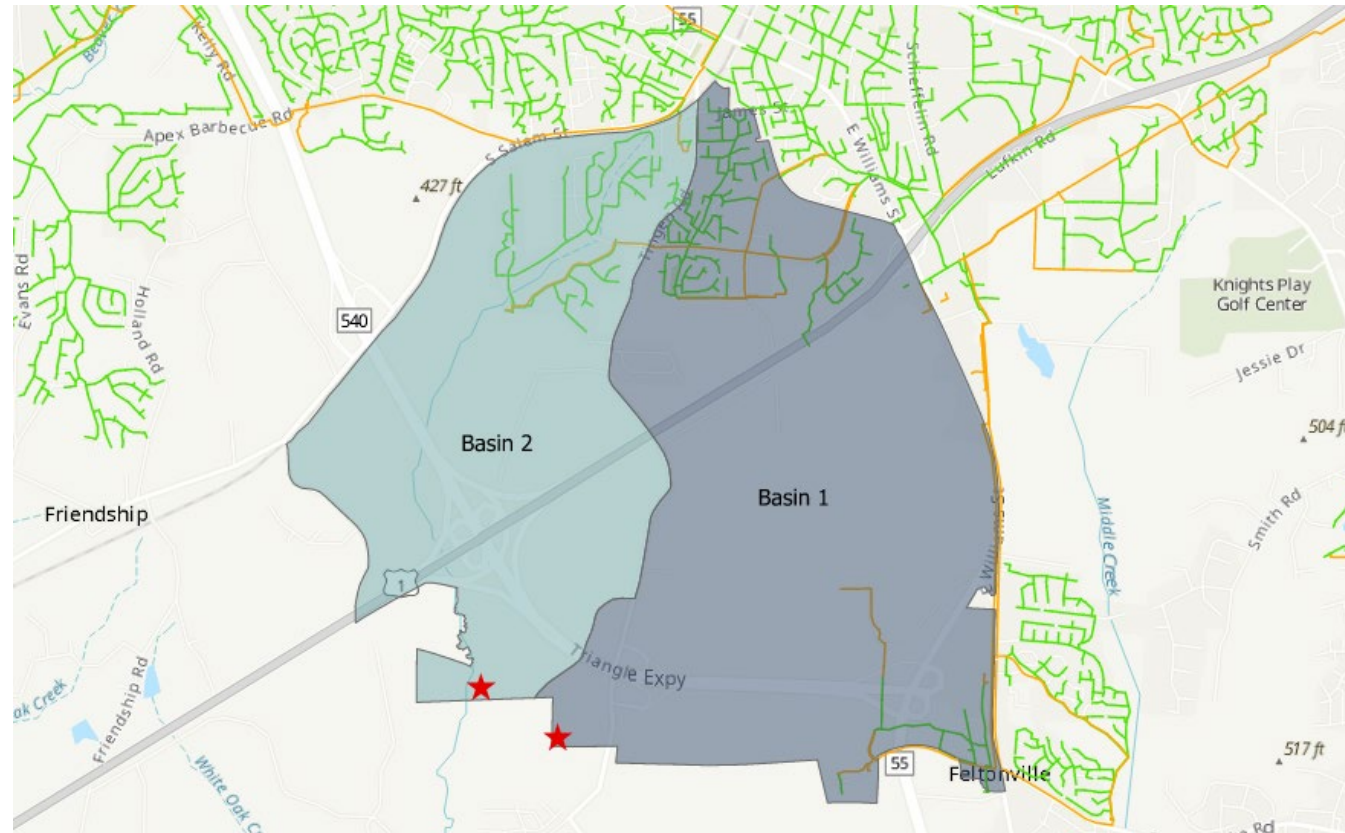
- Project History
- PER Study
- Pump Station Design Update
- Force Main Design Update
- Communications
- Q&A



Project History

Project History – Purpose

- Need for regional sewer solution for the Big Branch Basin
 - **Avoids a inter basin transfer (IBT)**
 - The Town is heavily invested in Western Wake WRF
 - **Economic development potential**
 - **Eliminate older, less-reliable pump stations per the Town's master plan**



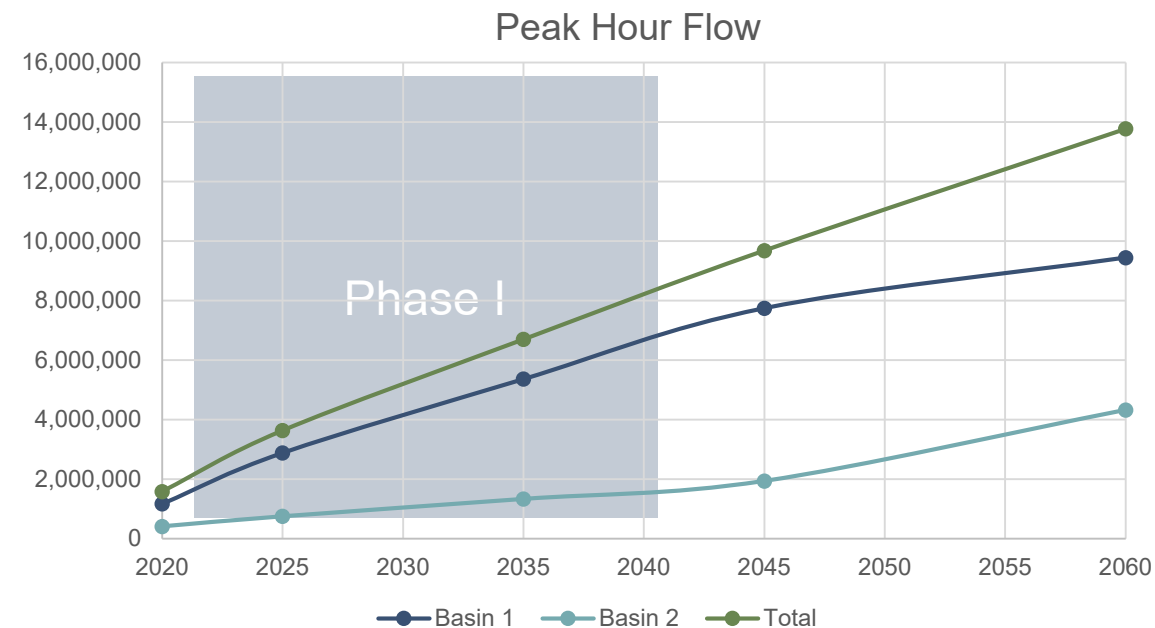
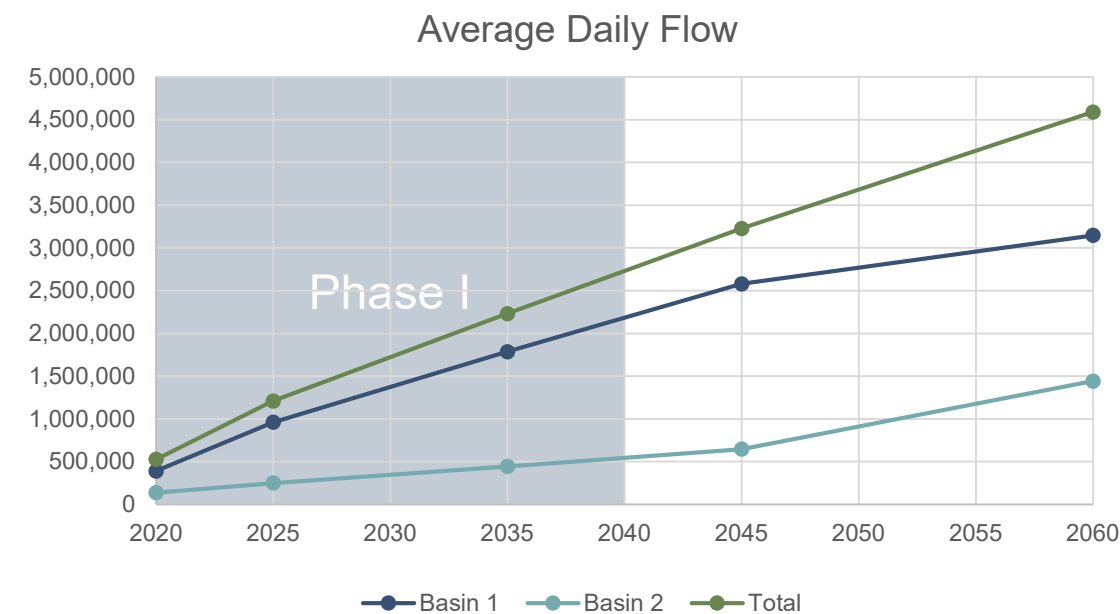
Big Branch Service Area

Project History – Preliminary Design Timeline



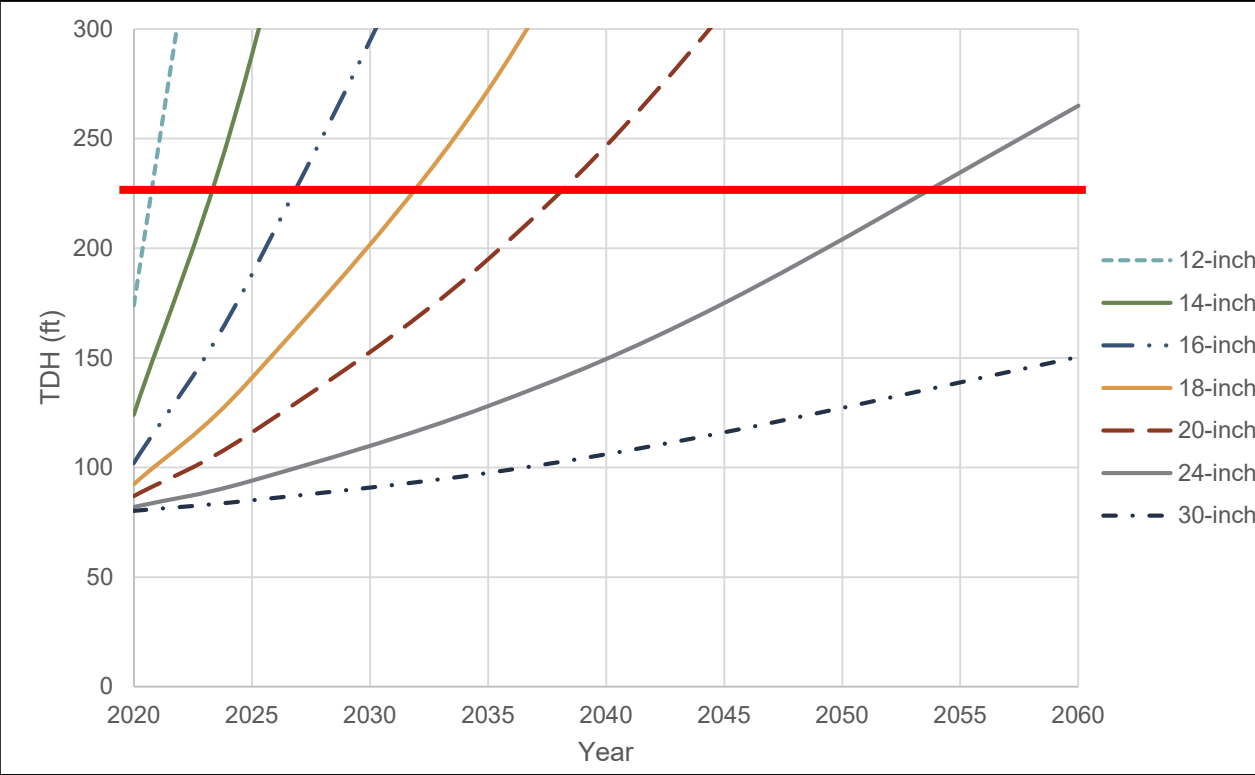
Pump Station PER Study

Flow Projections

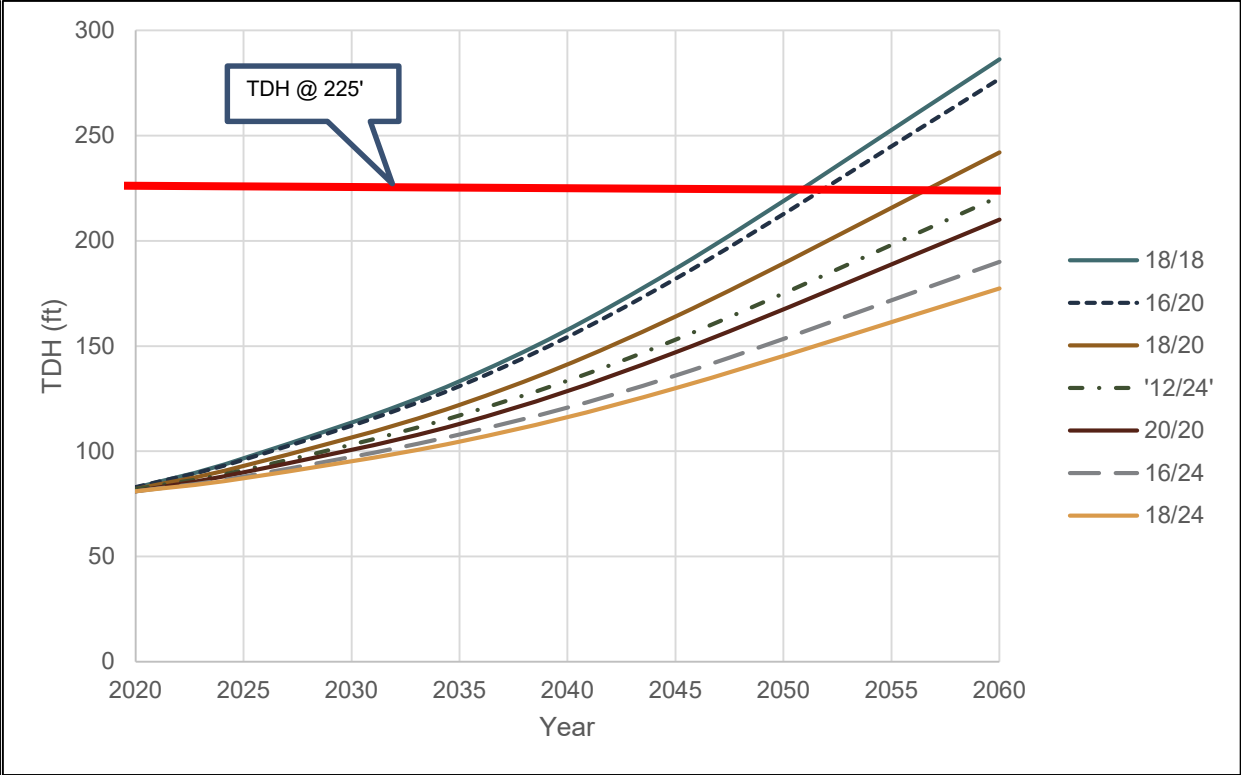


Basin	Phase I		Buildout	
	Average Day	Peak Hour	Average Day	Peak Hour
BB1	2.2 MGD	6.5 MGD	3.2 MGD	9.4 MGD
BB2	0.5 MGD	1.5 MGD	1.4 MGD	4.3 MGD
Total	2.7 MGD	8.0 MGD	4.6 MGD	13.7 MGD

Force Main Sizing & Hydraulics



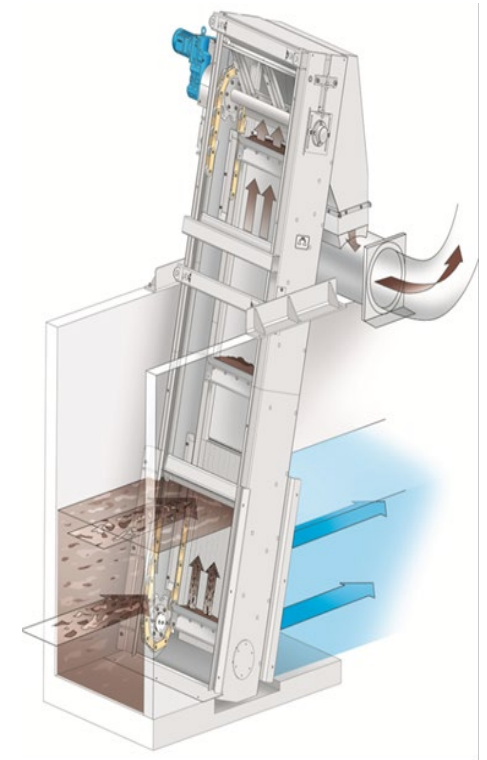
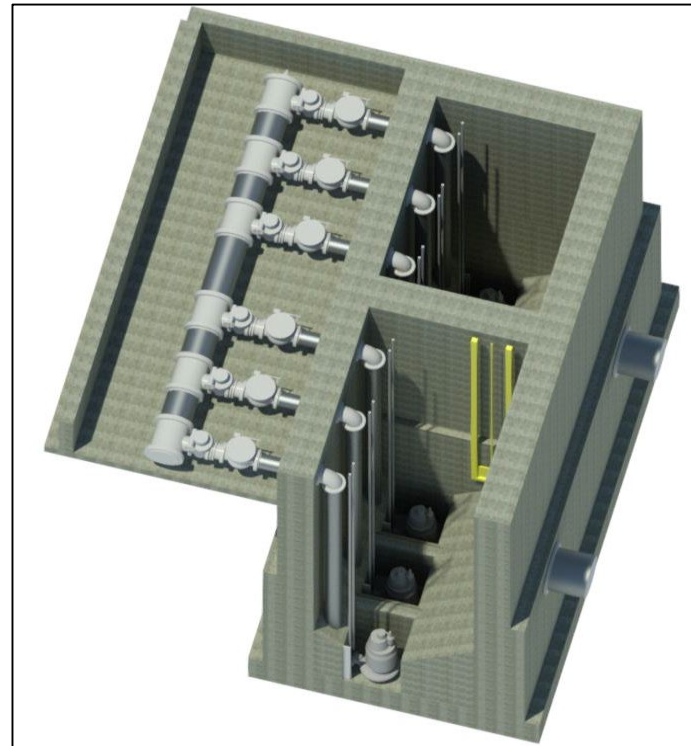
Single Force Main
System Head Conditions



Parallel Force Main
System Head Conditions

Pump Station Arrangement & Appurtenances Recommendations

- Wet Well Type
 - Confined Inlet
- Pump Type
 - Submersible
- Channel Arrangement
 - Primary Channel – Multi-rake Mechanical Screen
 - Bypass Channel – Channel Grinder



Pump Station Recommendations (cont.)

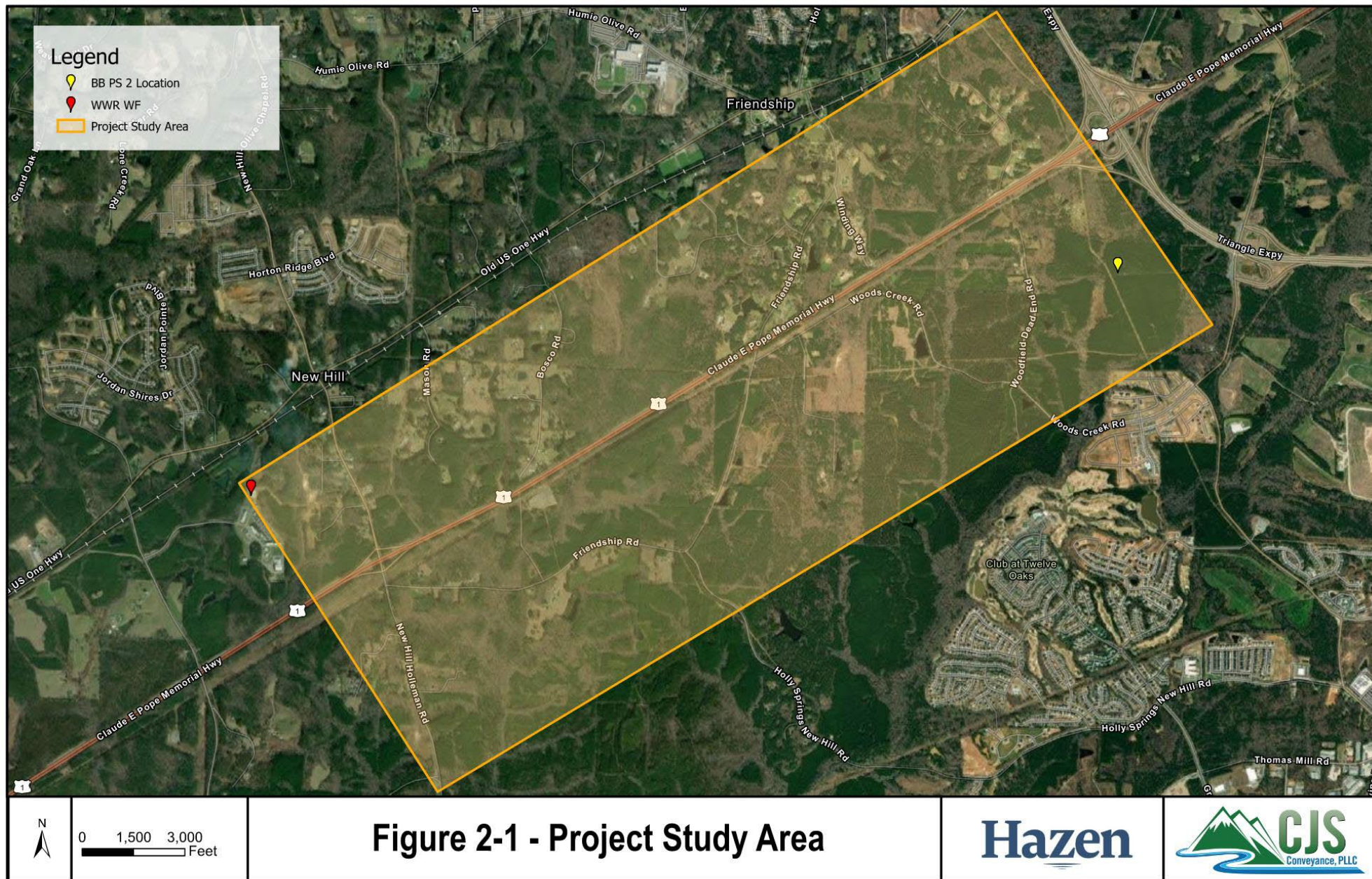
- Odor Control
 - Vapor Phase (For Onsite Odors)
 - *Dry Media Adsorber*
 - Liquid Phase (For Force Main Air Release Valves)
 - *Bioxide*
- Electrical Generator
- VFDs
 - w/ bypass starters
 - Housed in electrical building



Pipeline PER Study

General Force Main Routing Process

1. Identify Begin and End Points Required by Project
2. Identify the Routing Study Area
3. Identify Critical Features within Study Area
 - Areas that could support routing
 - Areas where routing is undesirable/not allowed
4. Develop Multiple Routes for Consideration
5. Assess Developed Routes to Determine Most Suitable Option

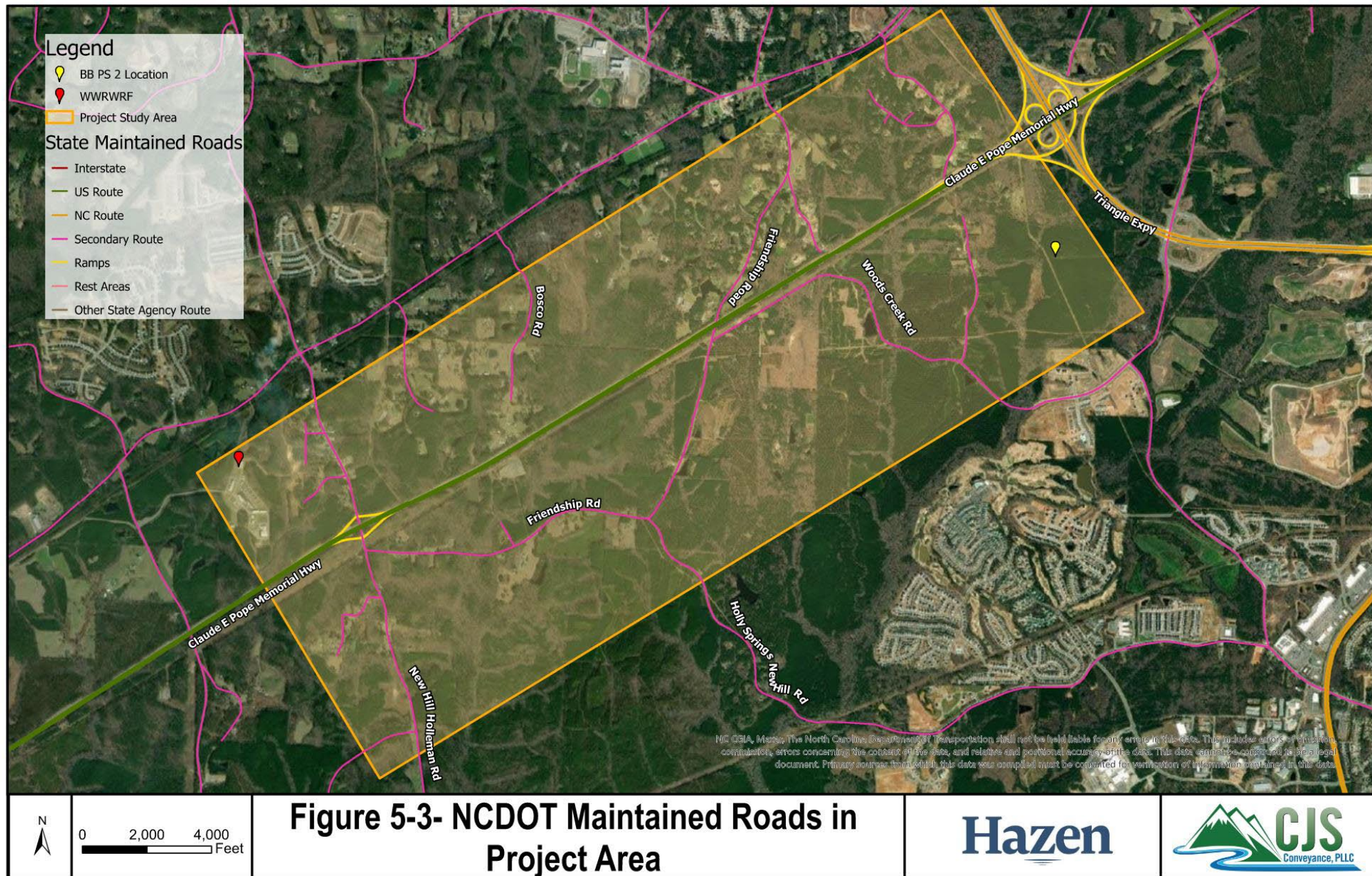


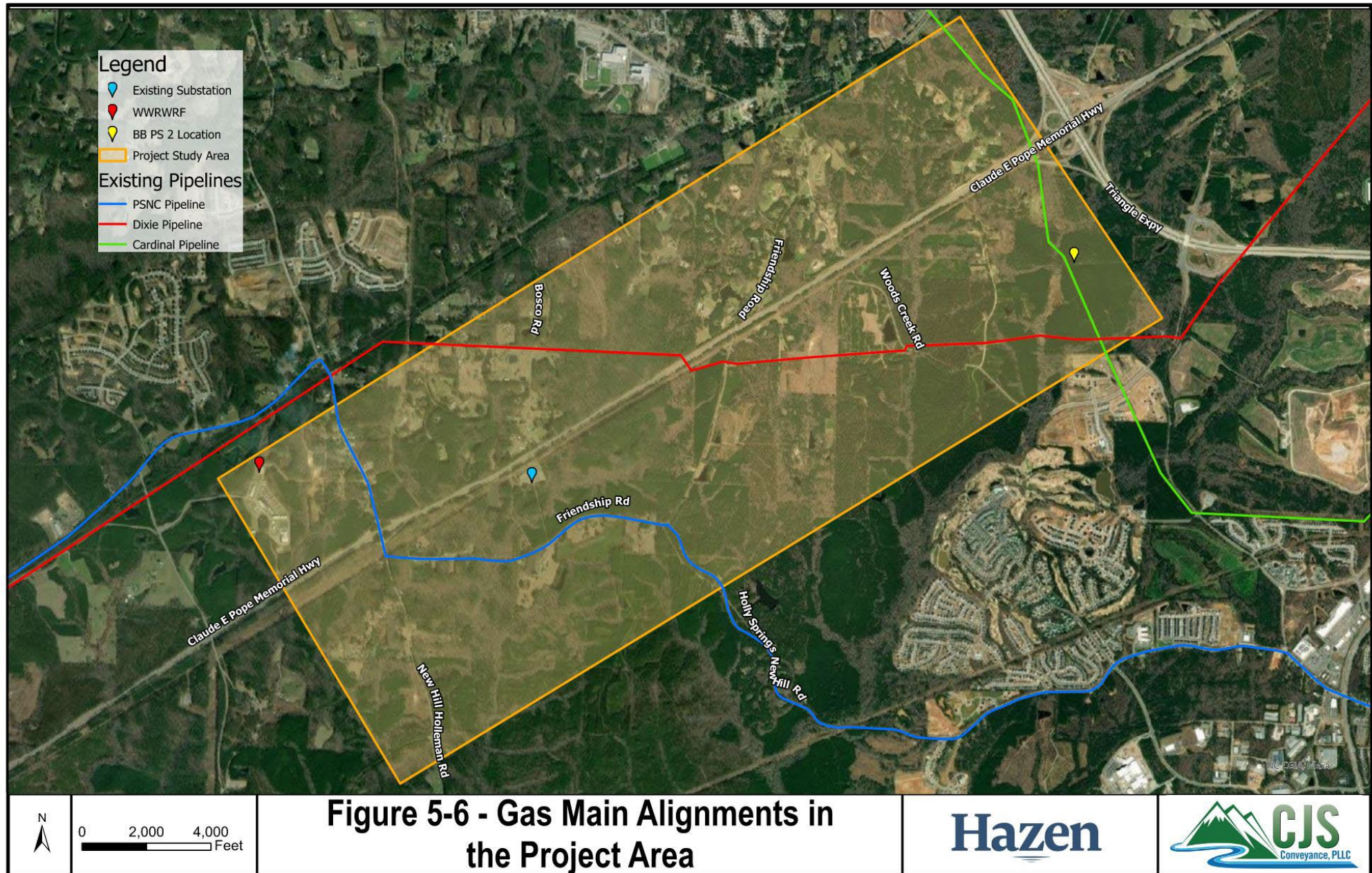
Considerations for Development of Force Main Routes

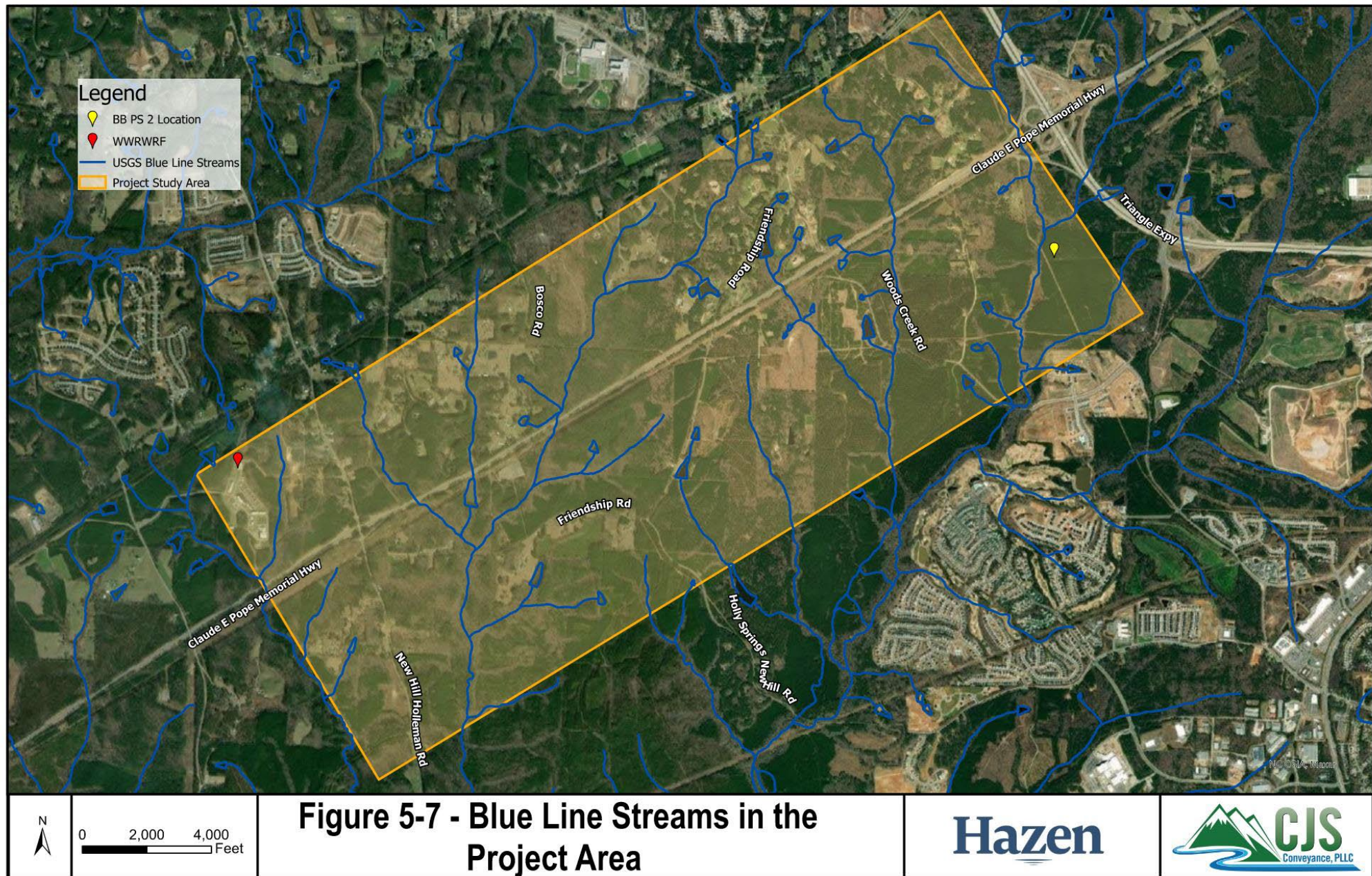
- Municipal Boundary
 - North of US 1 is predominantly Town of Apex and Wake County
 - South of US 1 is predominantly Town of Holly Springs and Wake County
- Out of Jurisdiction Coordination Complexity
- Avoid Bisecting Parcels
- Approved and Pending Developments
- Minimize Environmental Impacts
- Utilize Existing Road/Easement Corridors Where Possible

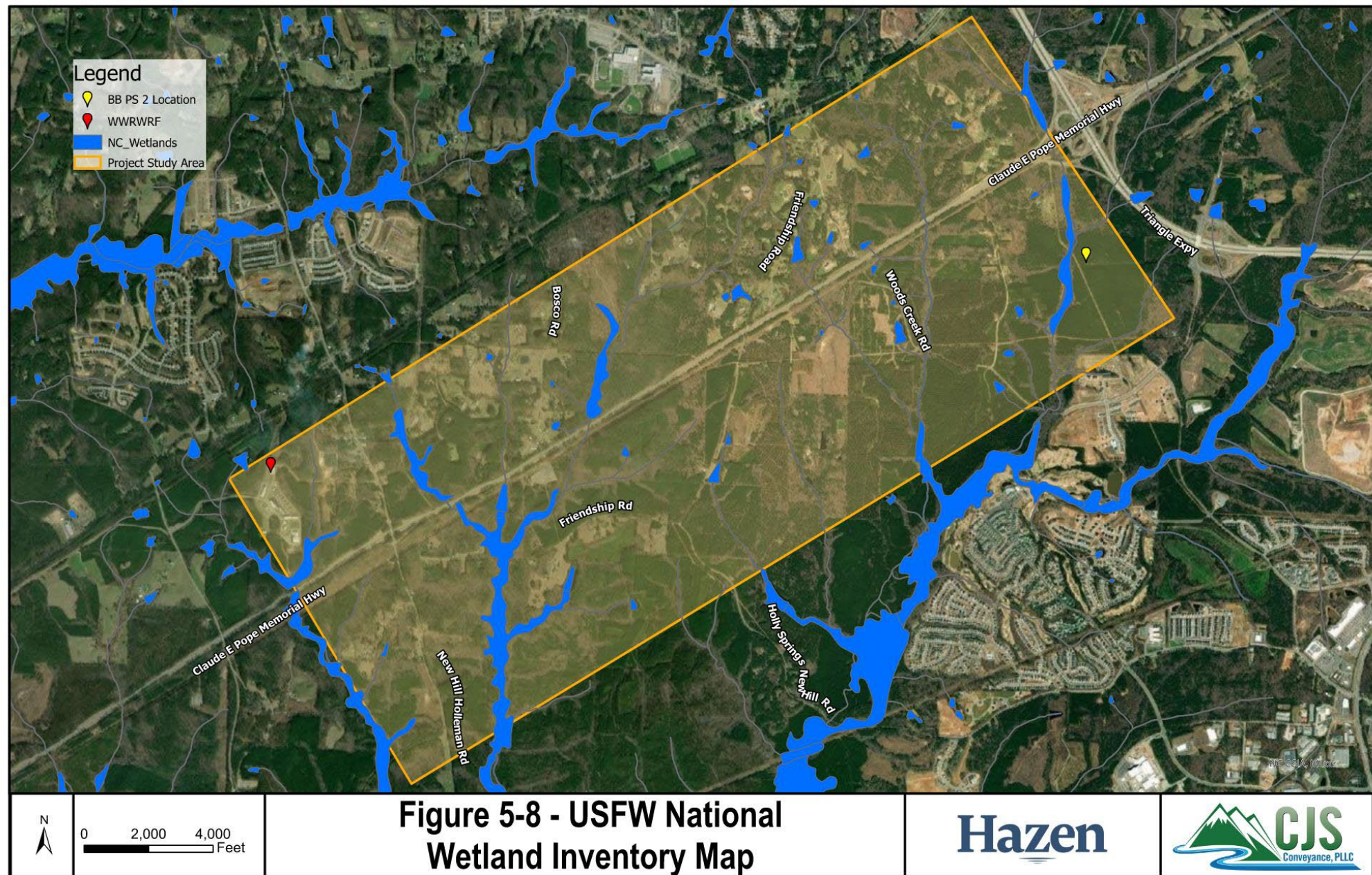
Road / Easement Routing Considerations

- Secondary Road Encroachment is Possible
- Encroachment in US 1 Not Allowed (controlled access)
- Parallel Installation in Gas Easements Not Allowed
- Parallel Installation in Duke Transmission Easements Not Allowed

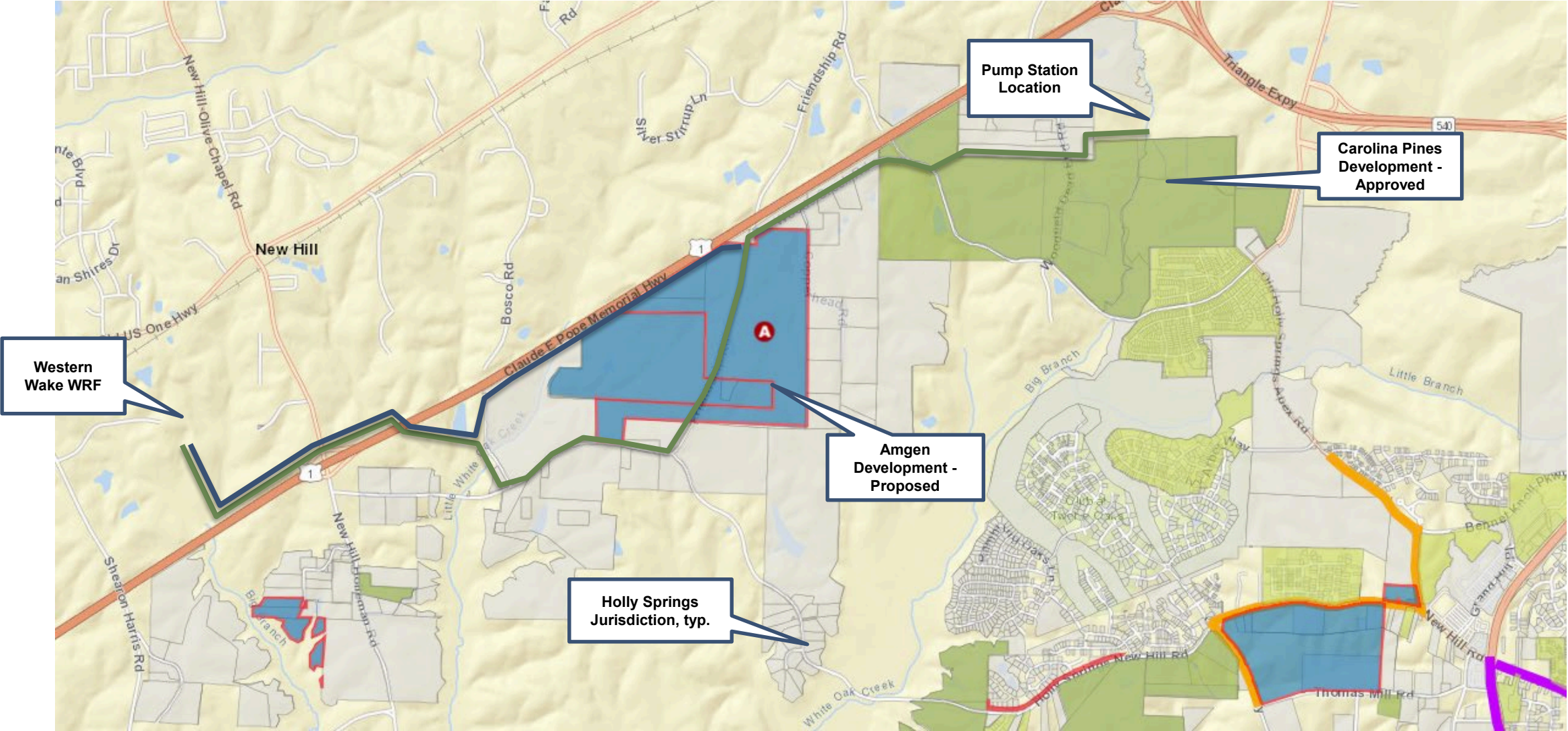




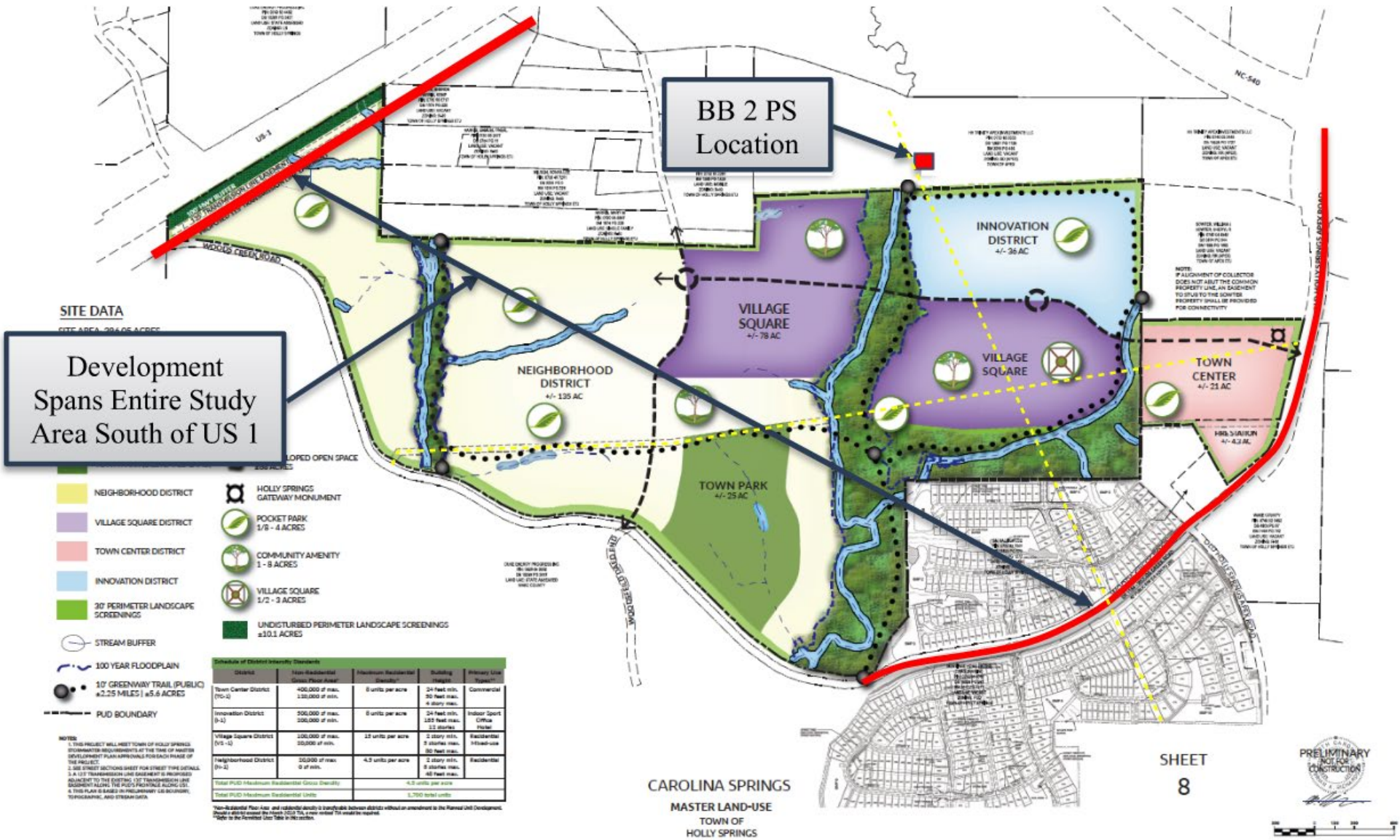


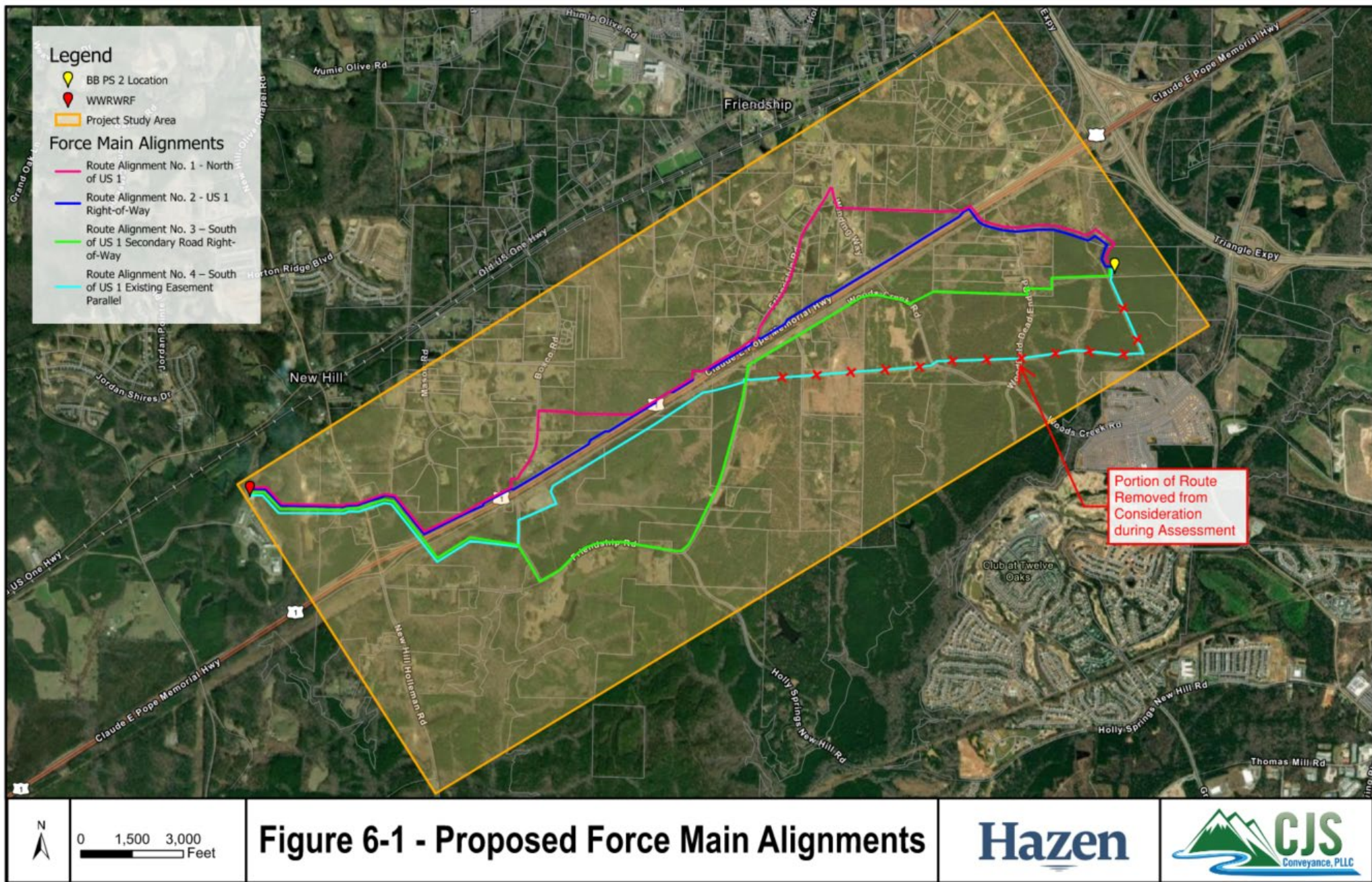


Holly Springs Proposed Development South of US 1



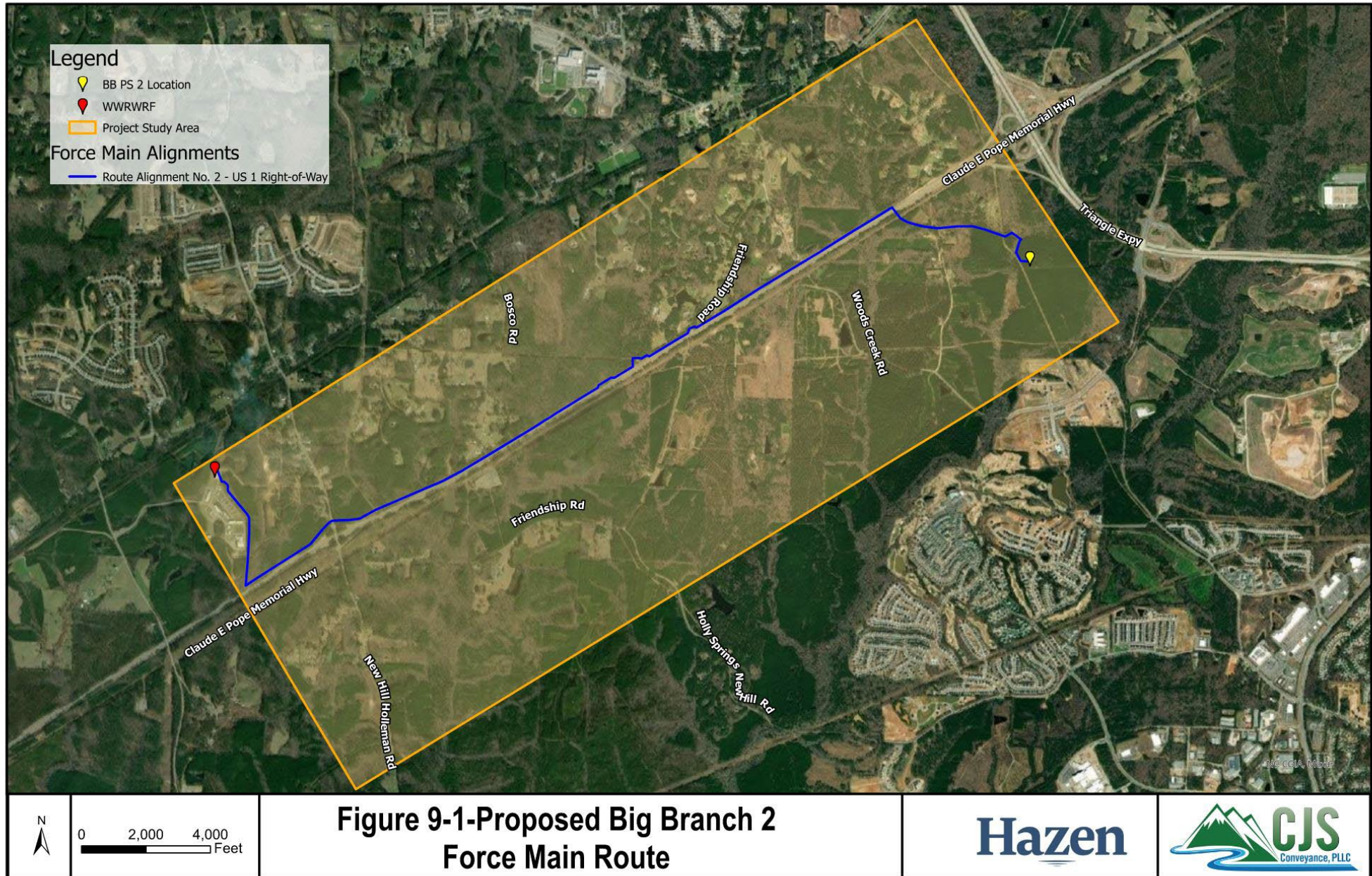
Holly Springs Development – North End of Study Area





Force Main Alignment Option Highlights

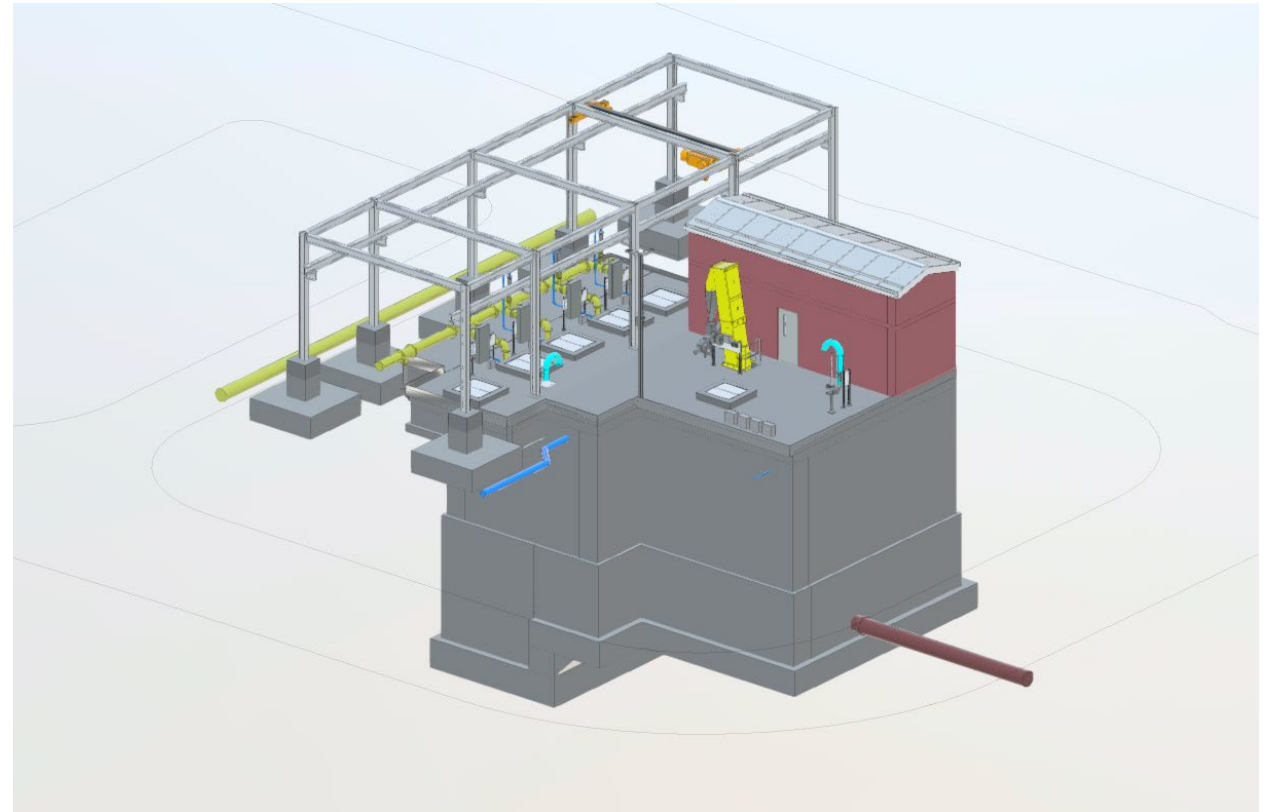
- **Alignment 1**
 - Predominantly on West Side of US-1
 - Uses a Mix of Roadways, Cross-Country and Adjacency to US-1 Right-of-Way
 - Entirely Within the Town of Apex
- **Alignment 2**
 - Adjacent to US 1 Right-of-Way Corridor
 - No Impact to Carolina Springs / Avoids Holly Springs Impacts
- **Alignment 3**
 - Maximizes Parallel of Existing Roadways
 - Impacts Holly Springs, perimeter of Carolina Springs
- **Alignment 4**
 - Maximized Parallel of Existing Easements
 - Most impact to Holly Springs parcels
 - Crosses Carolina Springs, Proposed School Parcels, and Amgen



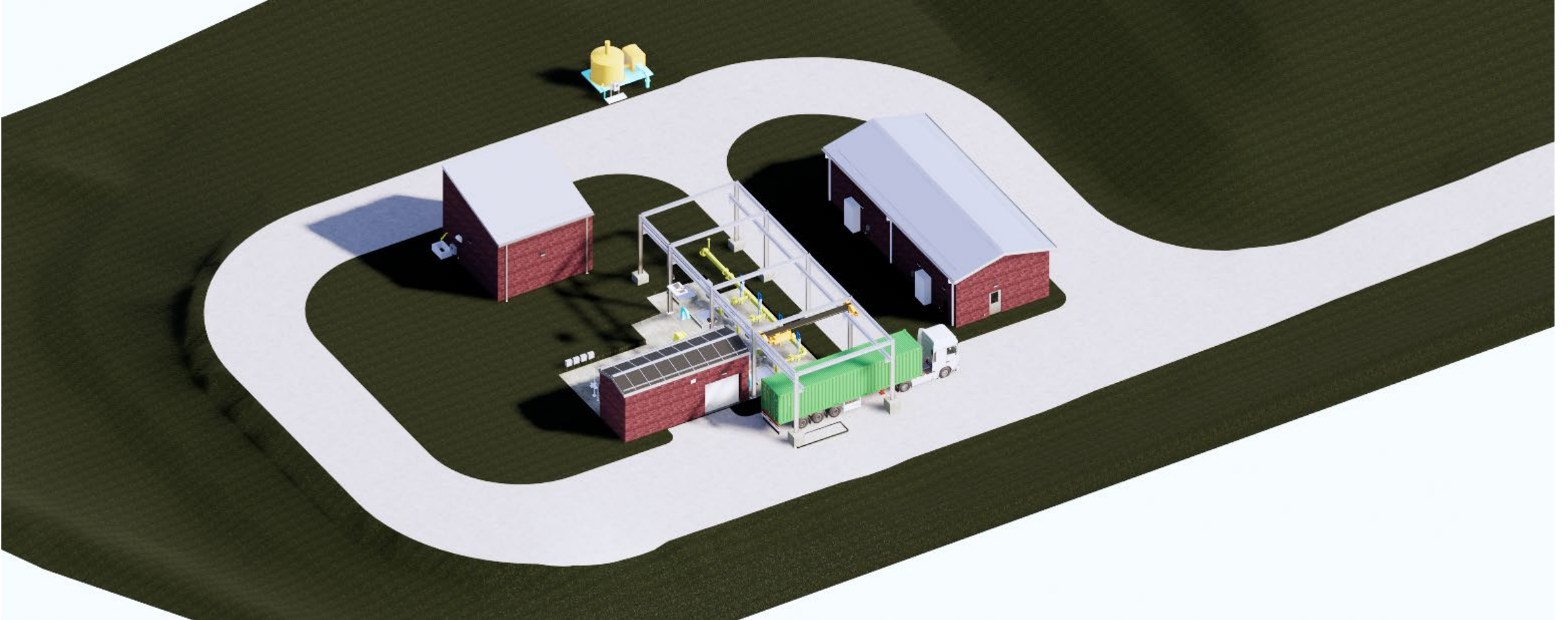
Pump Station Design Update

Final Design Pump Station Arrangement & Appurtenances

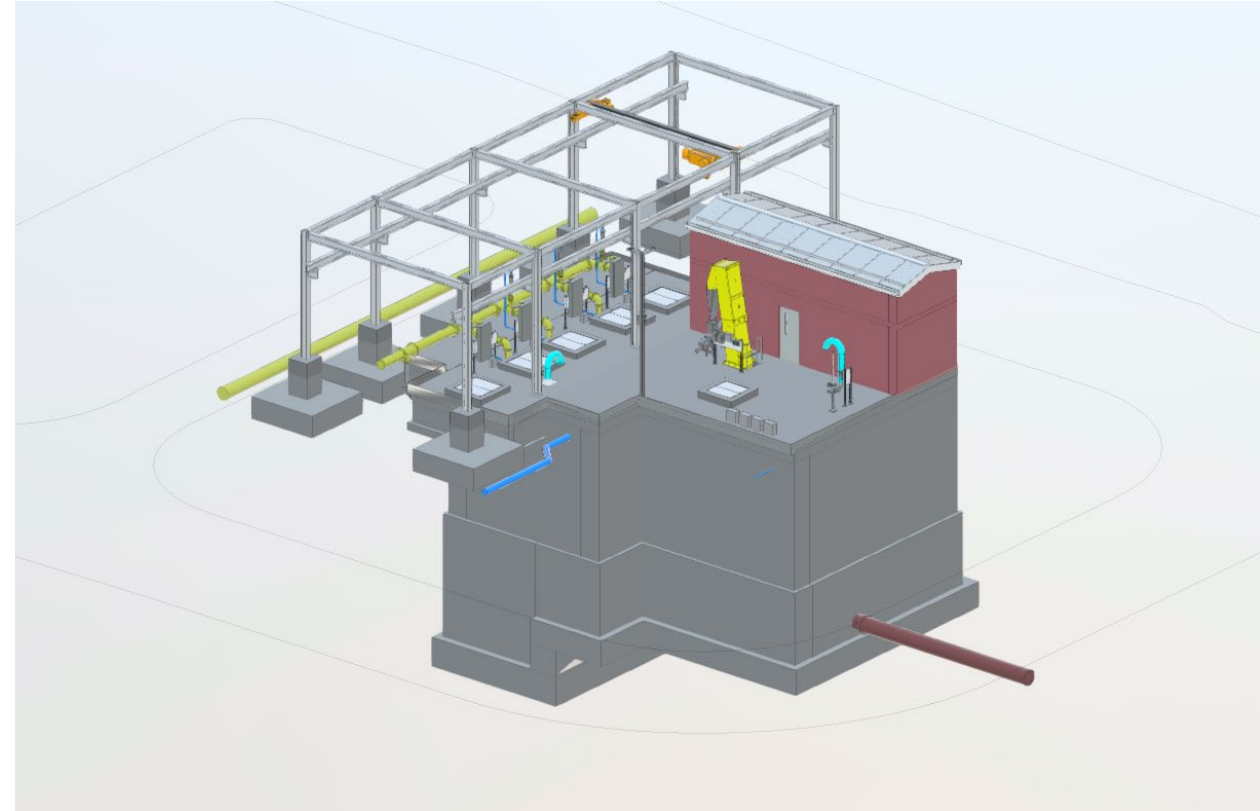
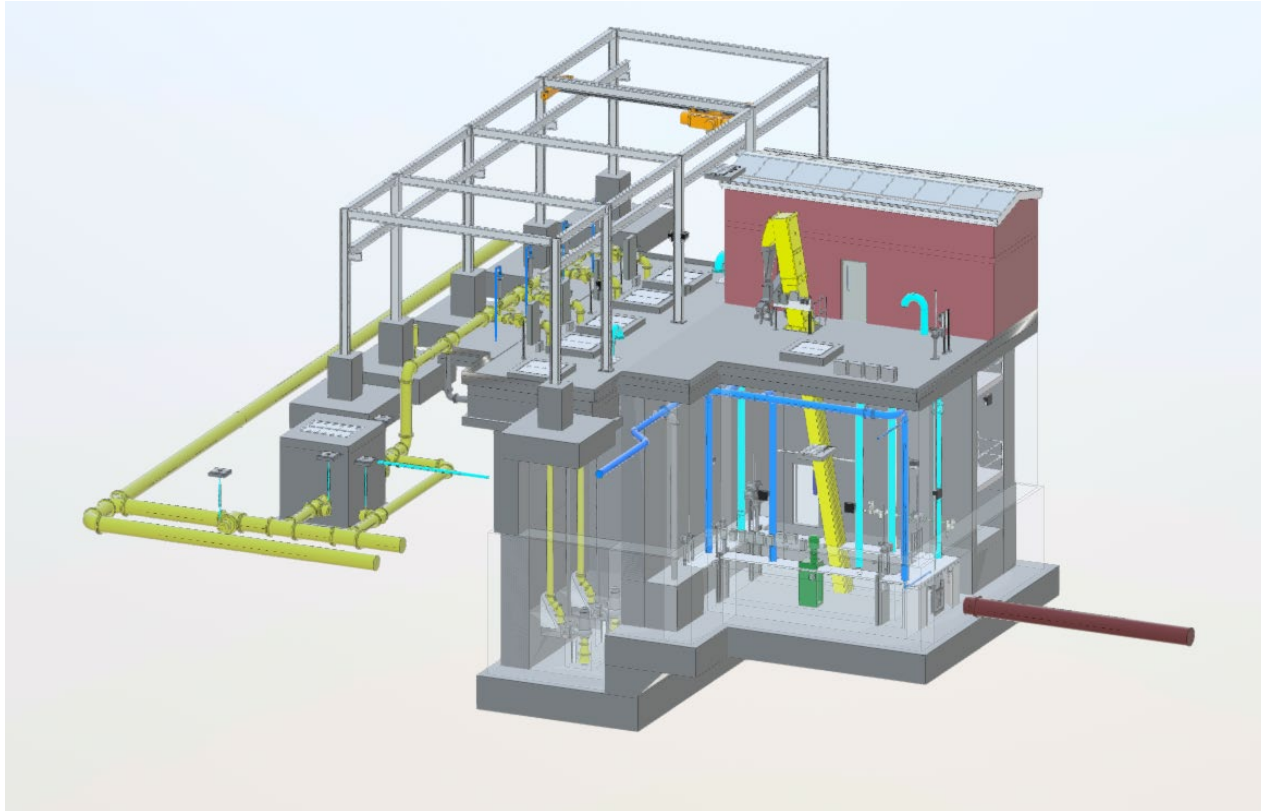
- 4.3 MGD Firm Capacity
 - Four (4) 135 HP submersible pumps
 - *Three Duty/One Standby*
- Odor Control
 - Dry media (carbon) adsorption system (vapor phase treatment)
 - Bioxide chemical feed system (liquid phase treatment)
- Pump Protection
 - Primary Channel – Multi-rake Mechanical Screen
 - Bypass Channel – Channel Grinder
- Backup Power
 - 800 kW standby generator



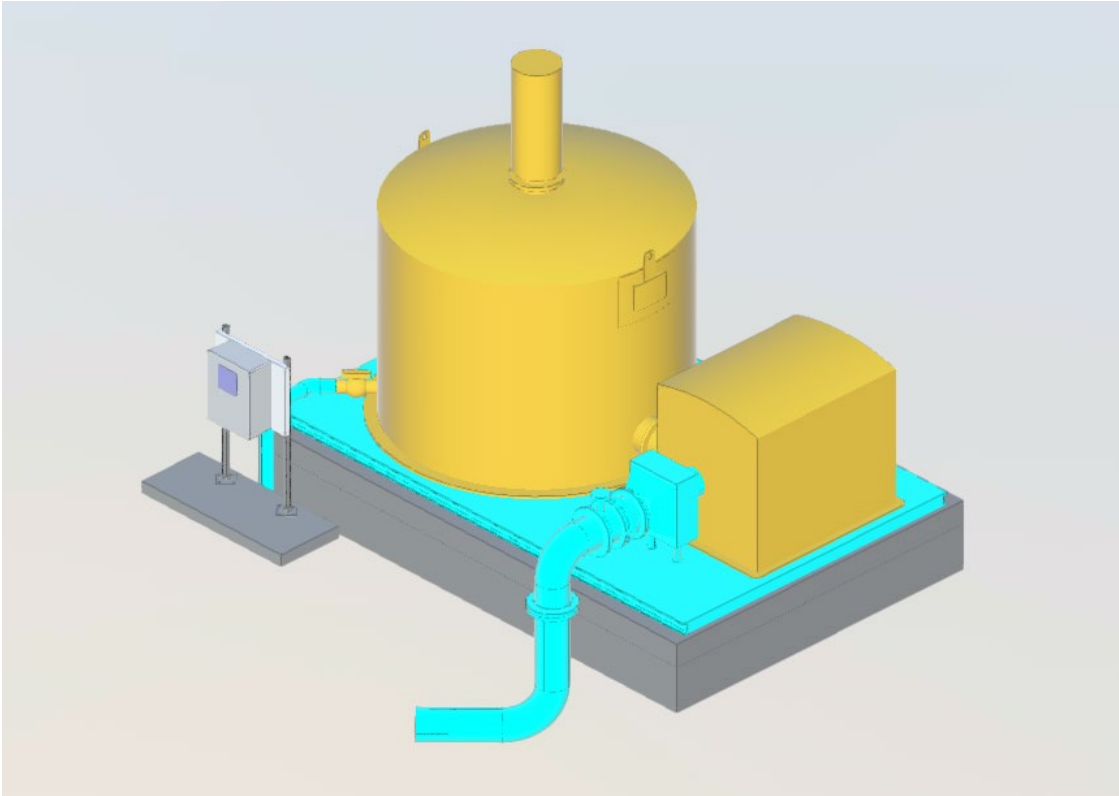
Site Overview



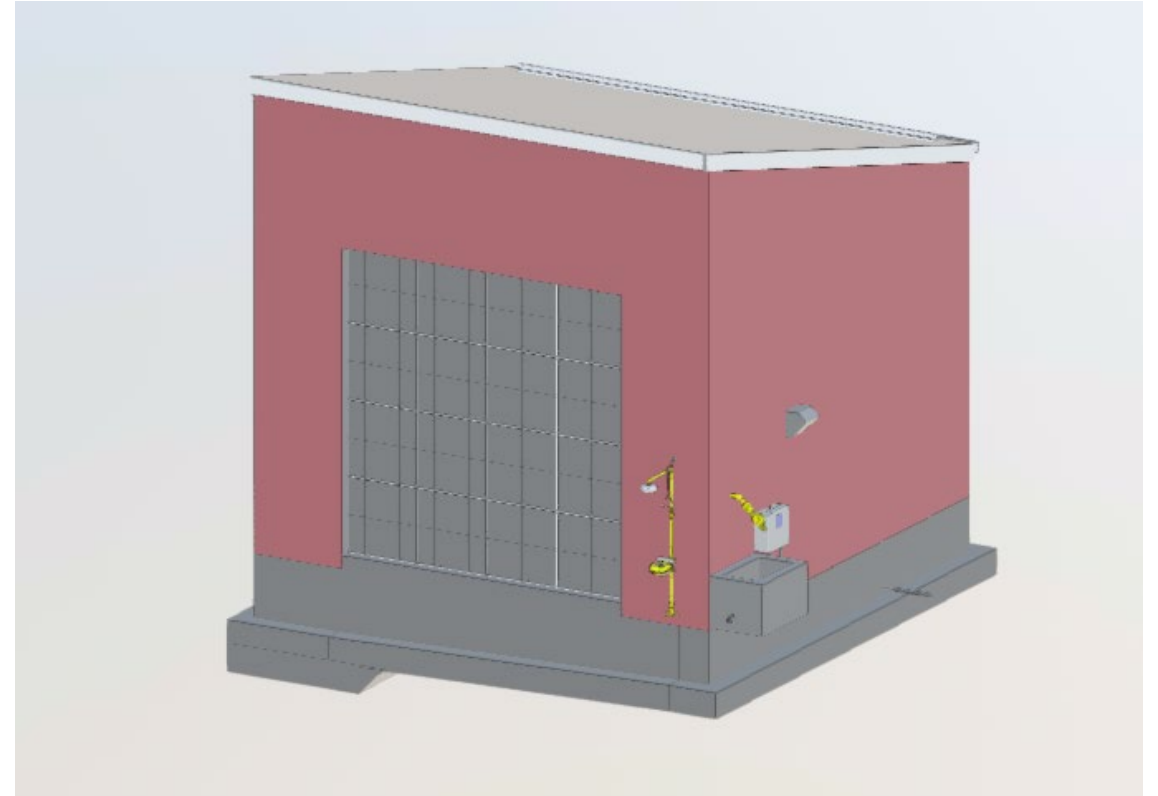
Pump Station Design Update



Odor Control Measures

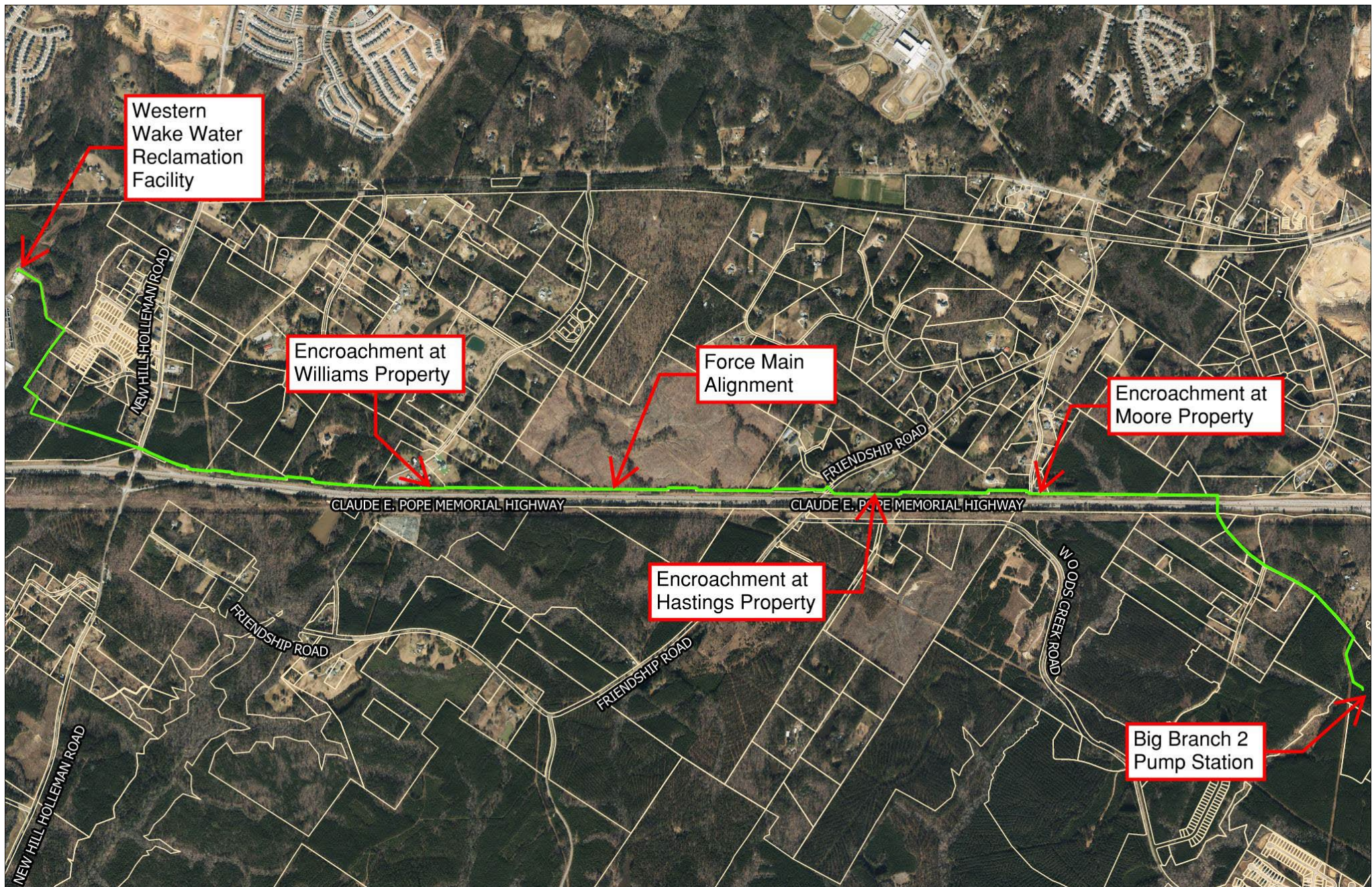


Vapor Phase Treatment
Carbon Scrubber



Liquid Phase Treatment
Chemical Tank Facility (Bioxide)

Force Main Design Update



Evolution of NCDOT US 1 Encroachment

1. Initial Design – All Outside of R/W per NCDOT Policy
2. Requested Installation Into R/W at Constrained Locations
 - *Request Denied, Subsequent Appeal Denied*
3. Meeting w/ NCDOT and Veridea to Request Encroachments
 - *Request approved for encroachments at Moore, Hastings, and Williams properties*
4. Request for Expanded Encroachments at Williams, Olive, and Hastings
 - *Request denied*

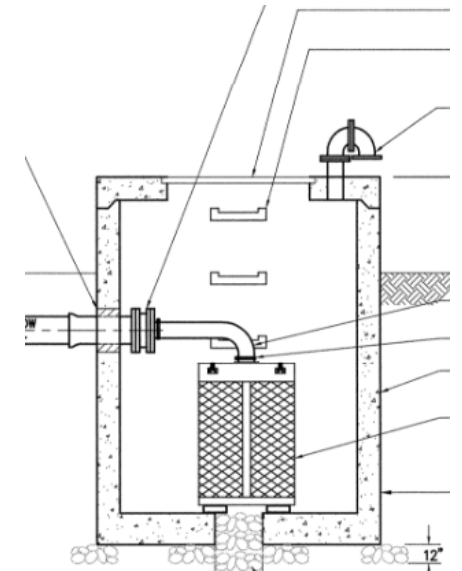
Evolution of NCDOT US 1 Encroachment

- 1. Initial Design – All Outside of R/W per NCDOT Policy
- 2. Requested Installation Into R/W at Constrained Locations
 - *Request Denied, Subsequent Appeal Denied*
- 3. Meeting w/ NCDOT
 - *Request approved*
- 4. Request for Expanded Encroachments at Williams, Olive, and Hastings
 - *Request denied*

<u>Approved Encroachments</u>	
Hastings Property	- 992 Linear Feet
Moore Property	- 296 Linear Feet
Williams Property	- 1,115 Linear Feet

Force Main Odor Control

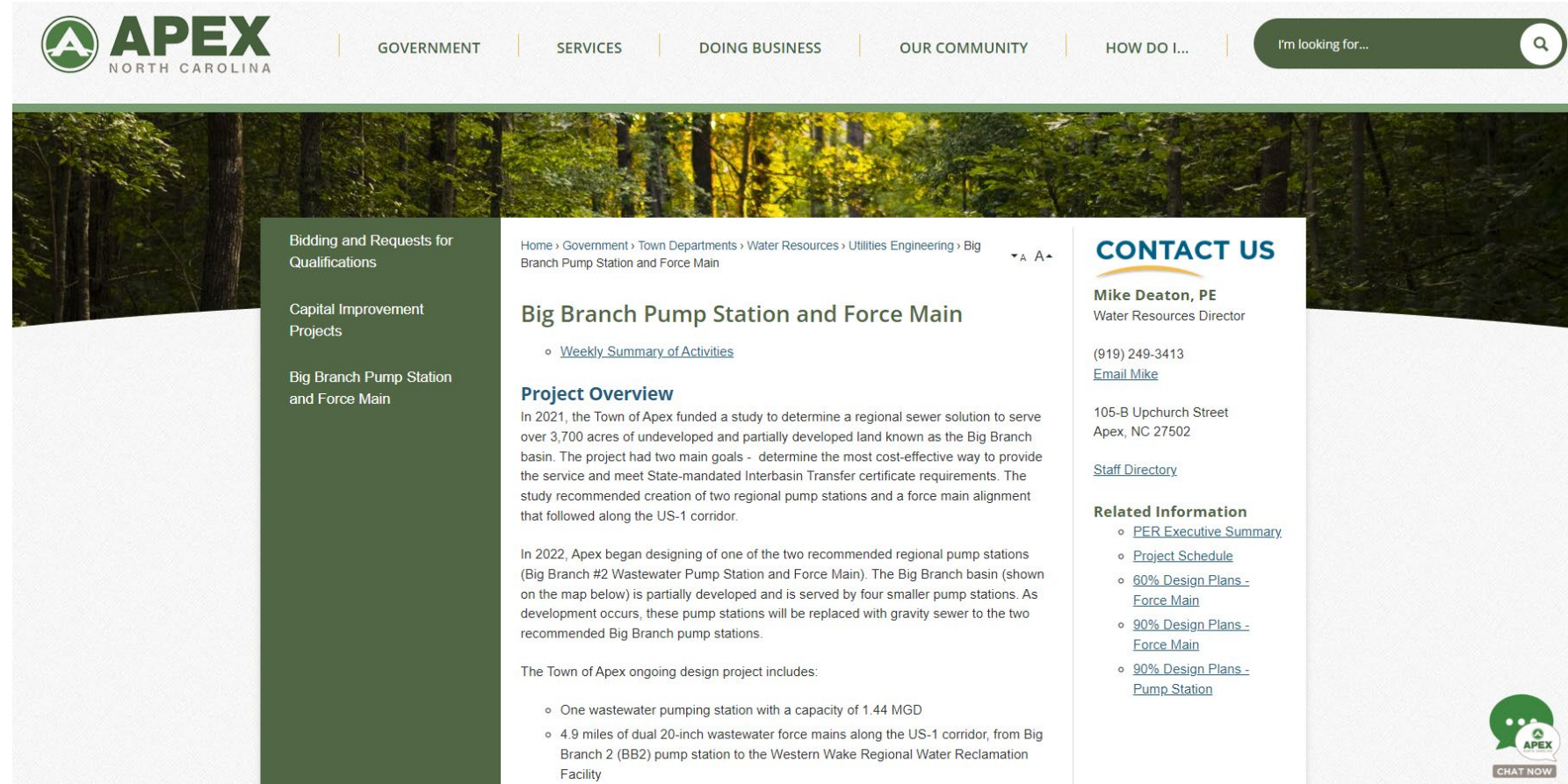
- Provisions for Odor Control will be Provided at All Air Release Valves
- Provide Options for Exterior or Interior Odor Control
- Size is Dependent Upon Anticipated Exhaust Rate



Communications

Communication

- Town Website
- Property Owner Coordination
- Neighborhood Meetings
- Weekly Updates



Q&A





Town of Apex Long Range Water Resources Plan (LRWRP)

Town Council Work Session

August 15, 2023



Agenda


- . What is a Long Range Water Resources Plan?
- . Why does the Town of Apex need one?
- . What types of data were evaluated?
- . What were the results?
- . What are the Town of Apex's future capacity needs?
- . Questions

What is a Long Range Water Resources Plan?

- Gain an updated understanding of the Town's customer water use and wastewater flows
- Develop strategies to meet future water and wastewater capacity requirements
- Identify tactical steps to advance the Town's LRWRP



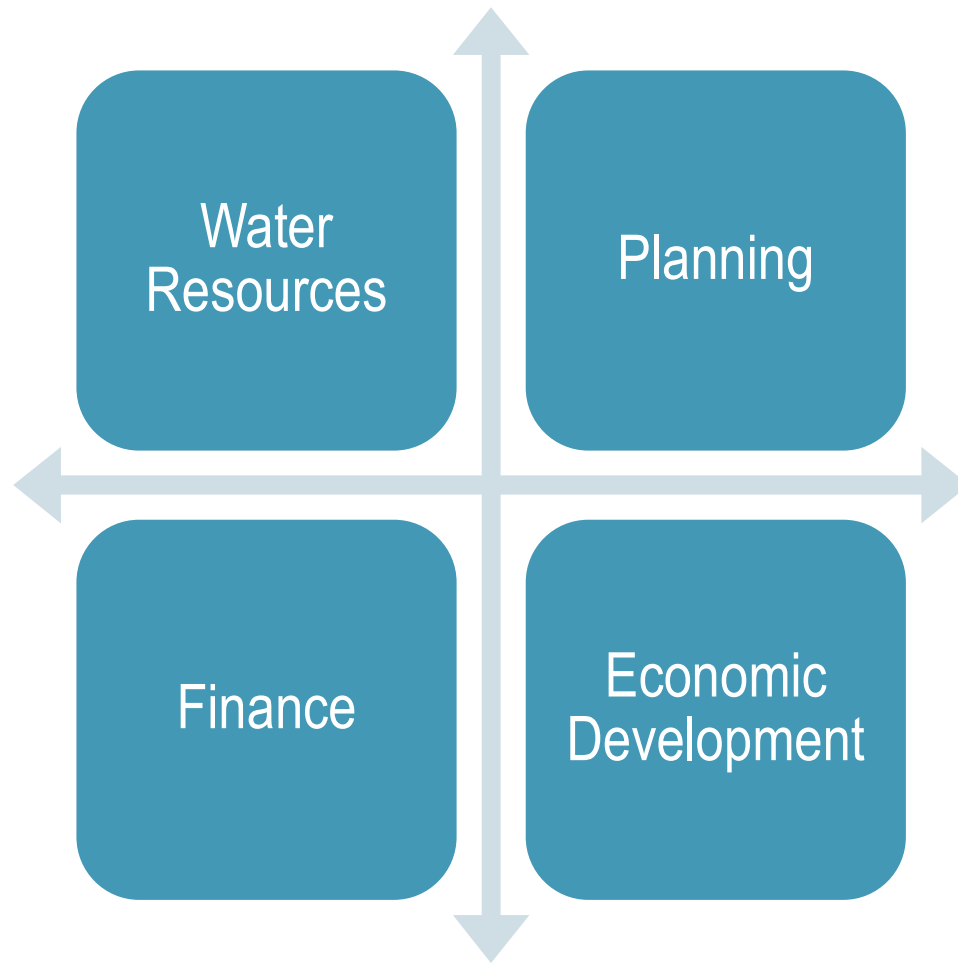
Why does the Town of Apex need a LRWRP?

- Assurance that capacity will be available to meet growth needs
 - Water supply – Jordan Lake
 - Water treatment
 - Wastewater treatment
 - Interlocal agreements
 - Regional partnerships
 - Ability to effectively plan financing to meet those needs
- 

LRWRP Project Approach



Collaboration





Data analysis included:

- Water distribution and wastewater collection systems
 - Existing facilities
 - Capital Improvement Plan
 - GIS
- Water and Wastewater Operations
 - Geospatial water meter data
 - CAWTF demands
 - MCWRF and WWRF flows
- Land Use Planning
 - Advance Apex
 - CAMPO CommunityViz
 - Planning Staff – near term growth perspective

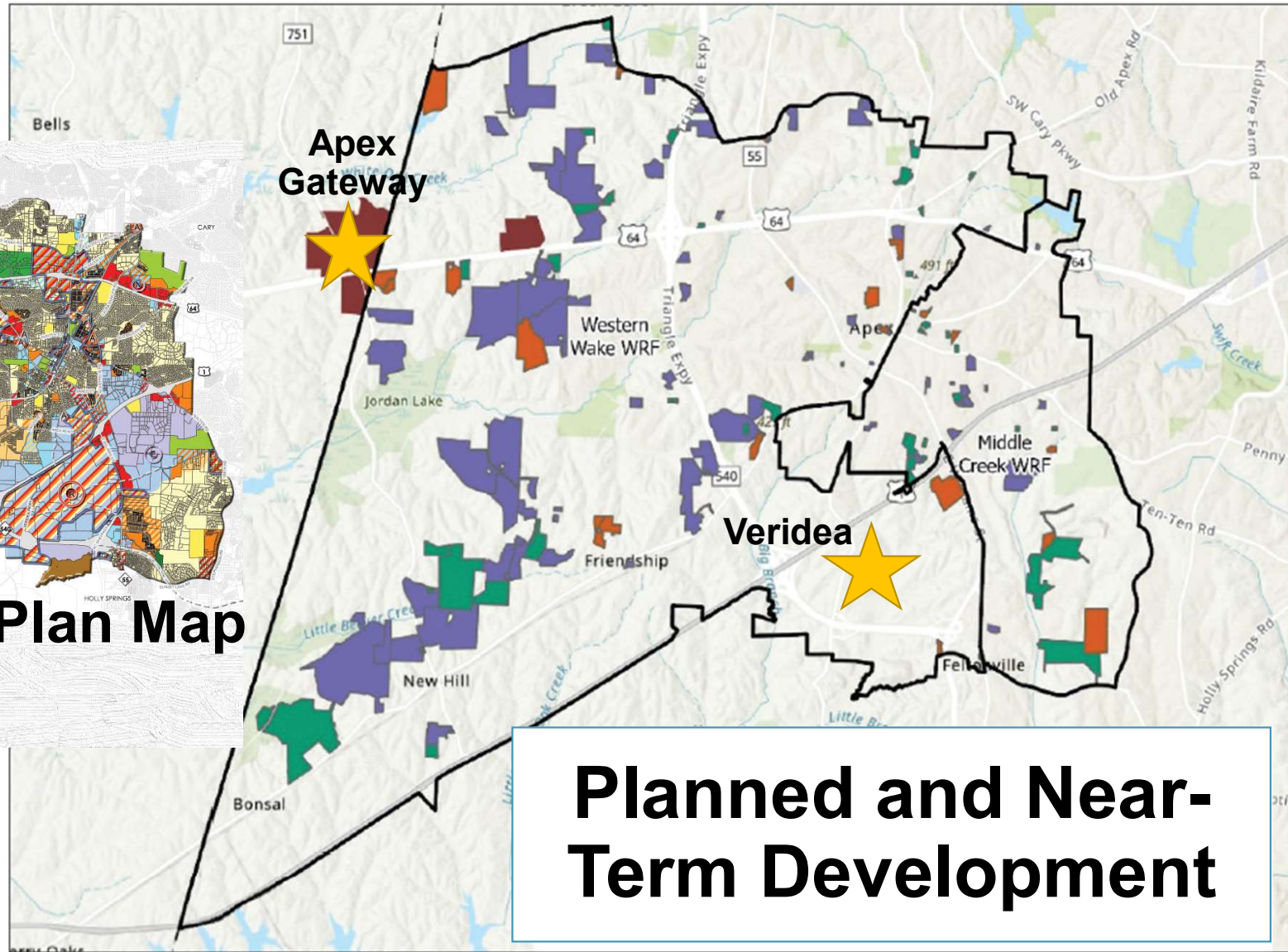
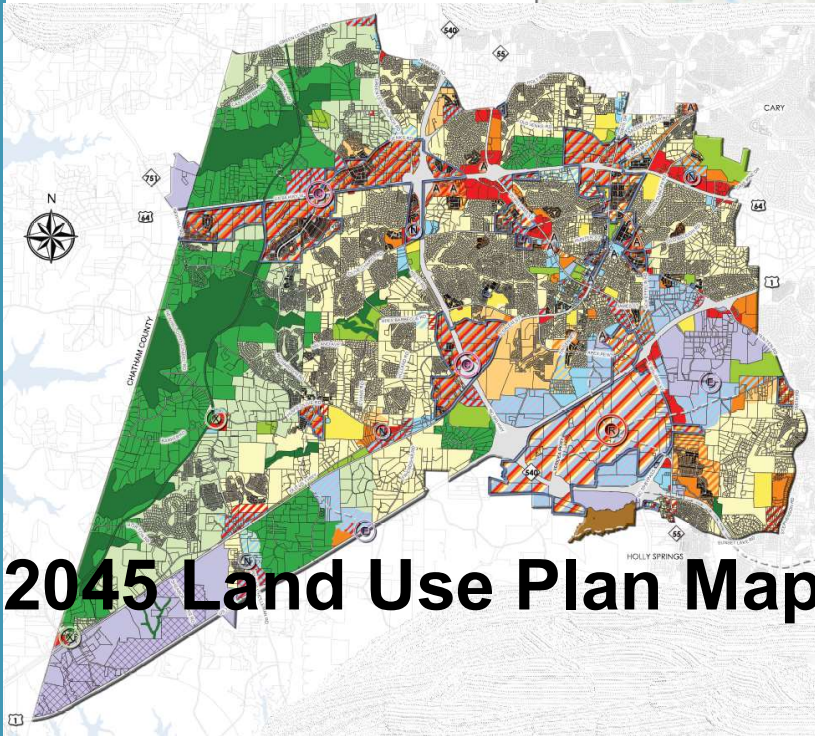
Takeaways from recent history (2016 to 2021)

- Water demand is increasing at a lower rate than population is
 - Population + 55% Residential demand + 50% Finished water supply + 34%
 - Residential per capita water use continues to decrease, down 4.2%
 - Annualized growth rate = 9.1%
- Single family residential is the primary driver of increased demand
- Flows are increasing primarily in the western service areas
- Little change in irrigation demand
- New development is more water efficient than older development was

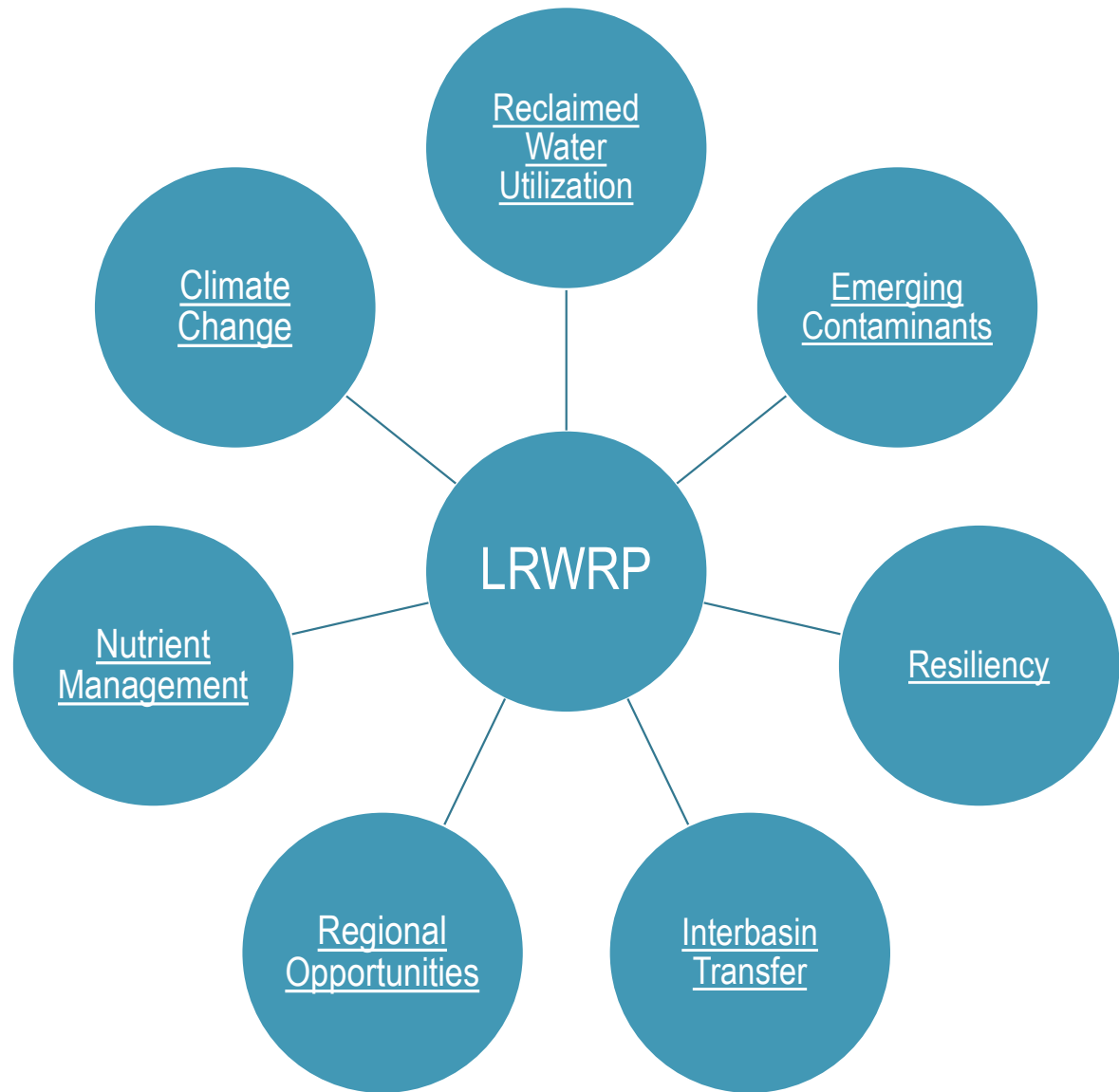
Forecast Method Overview

Three datasets to capture future growth



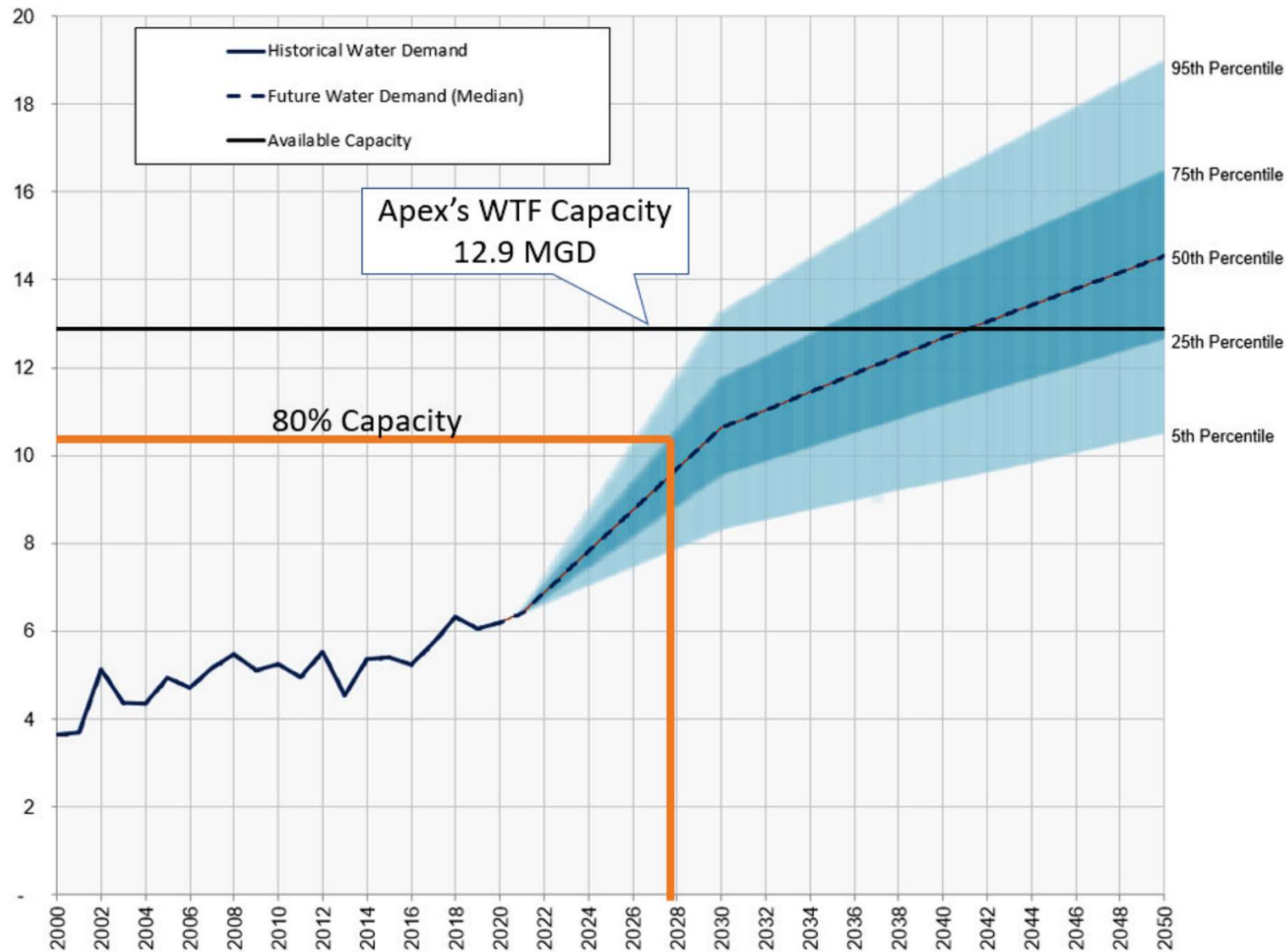


Qualitative Considerations

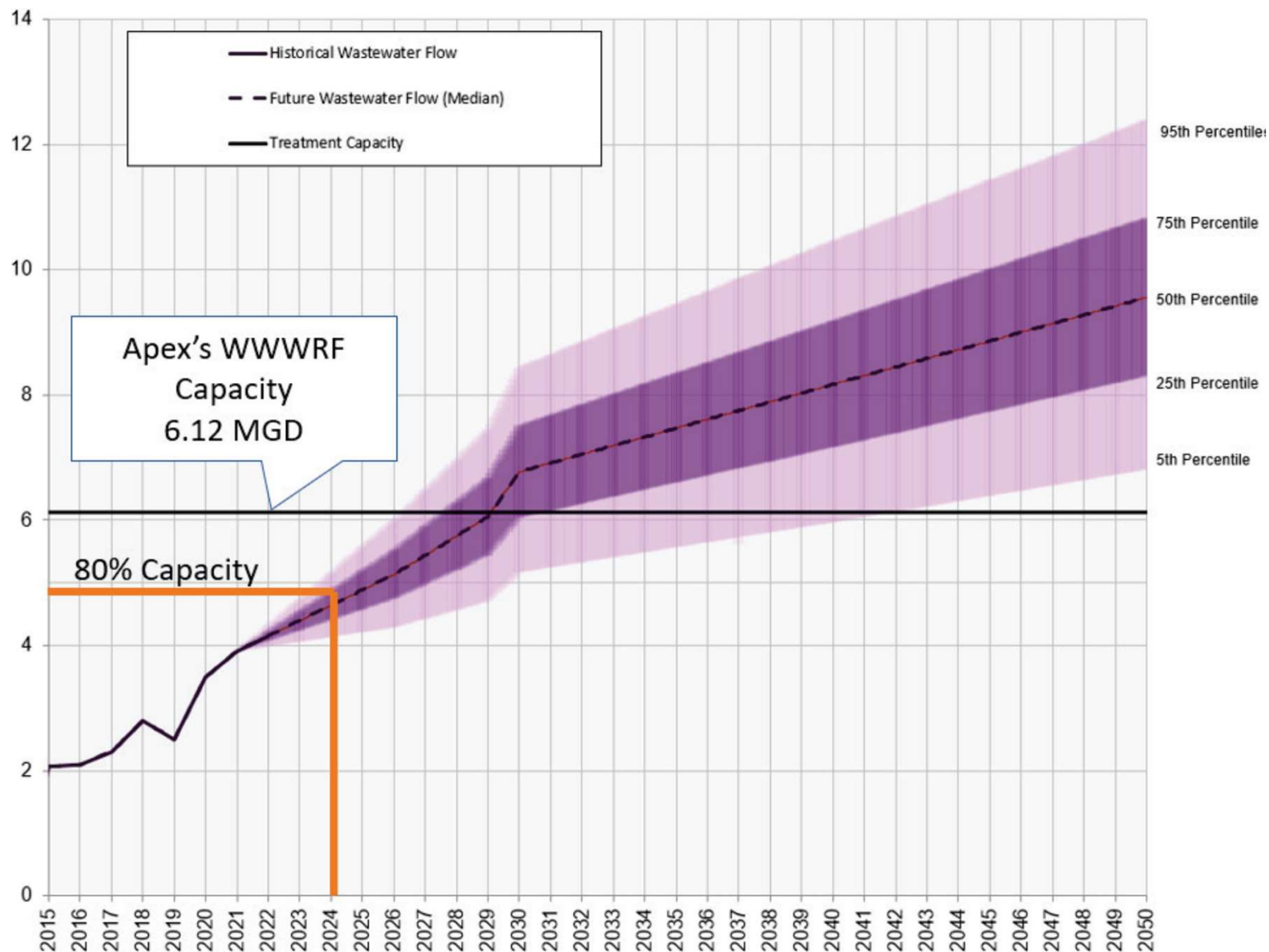


Results

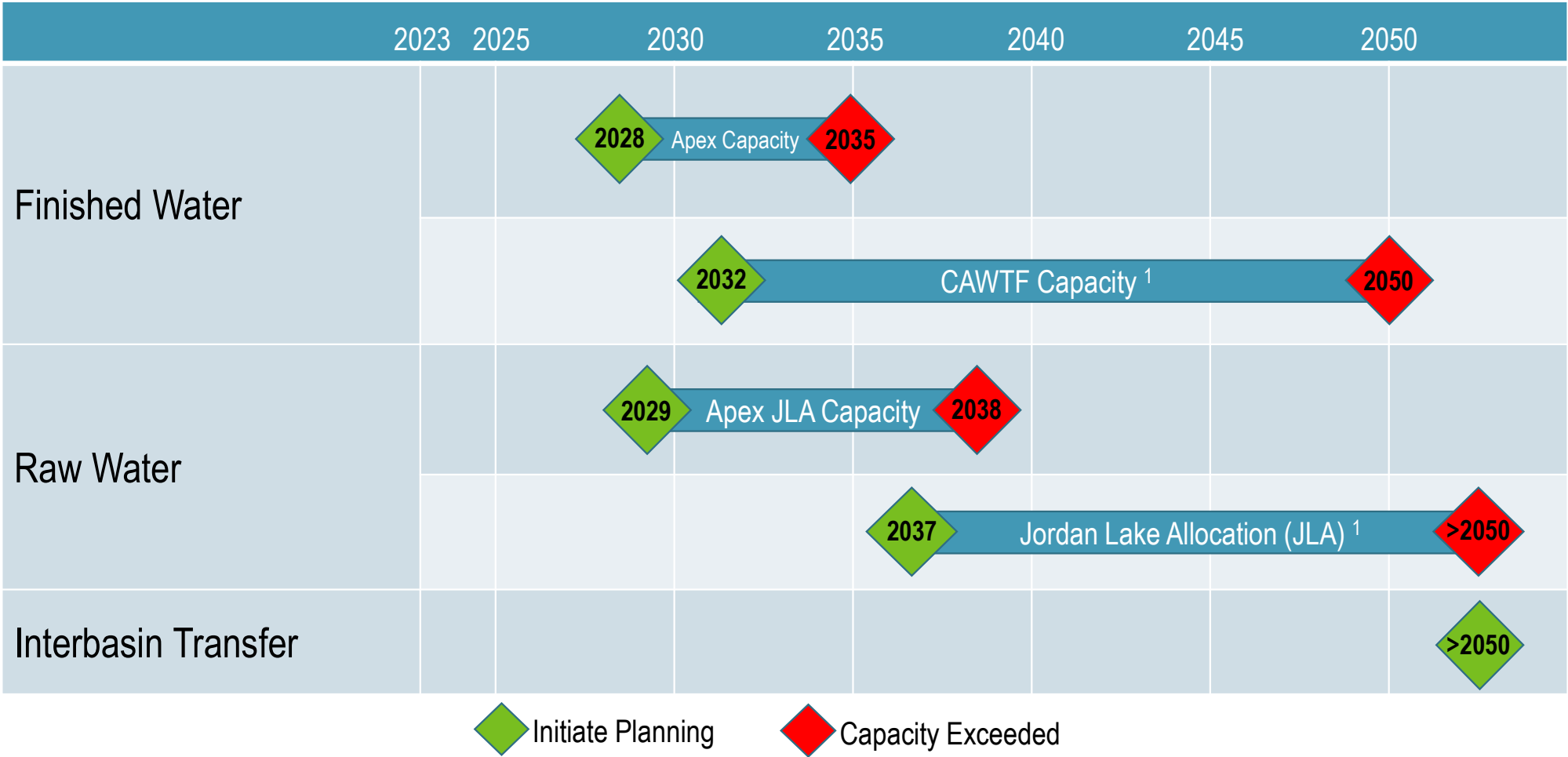
CAWTF Finished Water Maximum Day Demand (MGD)



Western Wake WRF Max. Month Average Daily Flow (MGD)

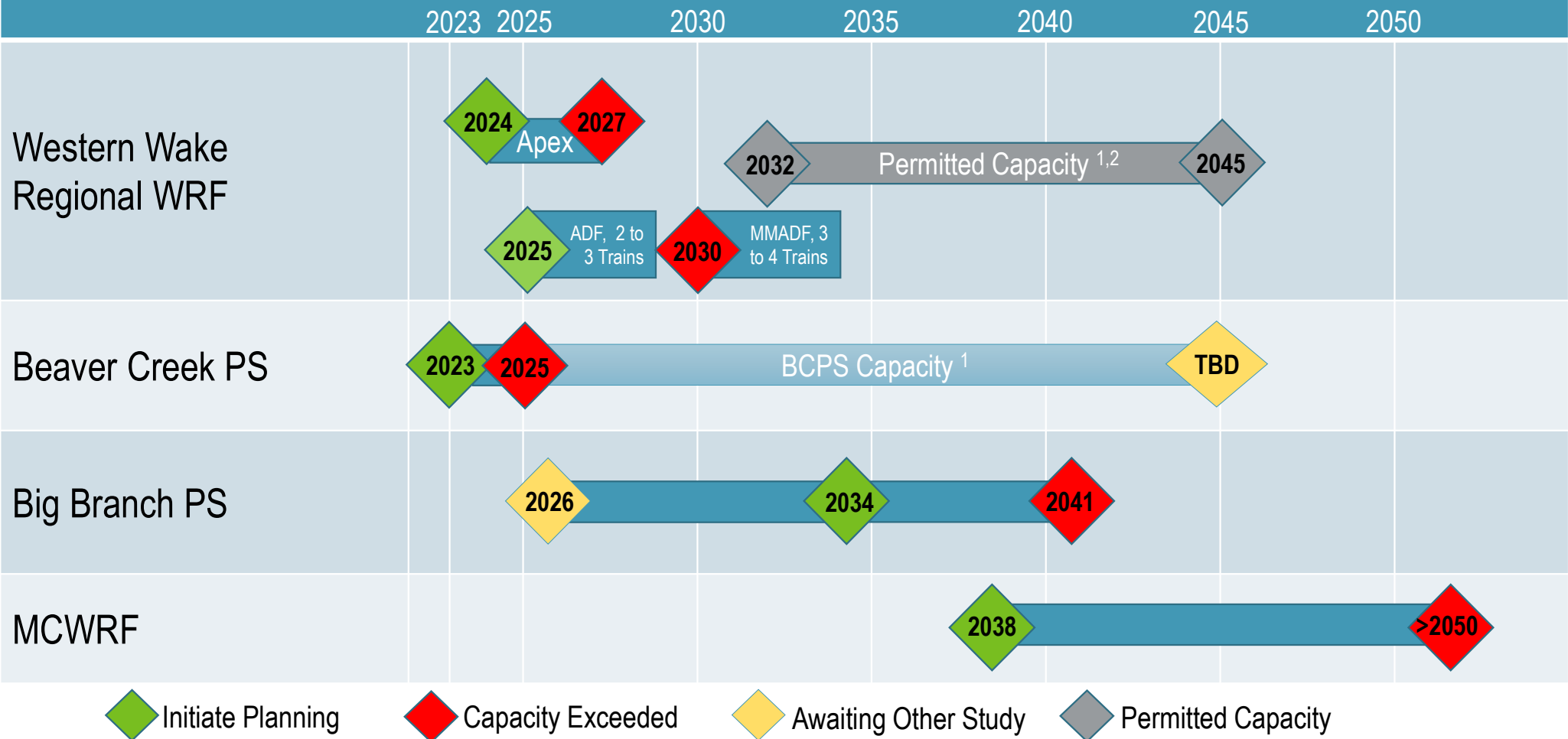


Water Capacity Planning Timeline (75th %ile forecast basis)



¹ Forecast based upon 2023 Apex and 2018 Cary forecast results, 75th Percentile

Wastewater Capacity Planning Timeline (75th %ile forecast basis)



¹ Forecast based upon 2023 Apex and 2018 Cary forecast results, 75th Percentile

² Dates based on permitted capacity, not operational performance targets

Key LRWRP Takeaways:

- It is time for Apex to initiate water and wastewater capacity allocation conversations with Cary
 - 2023: Beaver Creek PS (2025)
 - 2024: Western Wake WRF (2027)
 - 2027: CAWTF Finished Water (2035)
 - 2029: Raw Water Allocation (2038)
- Interbasin Transfer is adequate > 2050



Questions?

