Jordan Lake Water Supply Program

September 10, 2024

Western Intake Partnership

Agenda 1:30 – 3:00

- Western Intake Partnership program - What's new?
- PER Spotlight: Water Treatment Facility
- What to expect next
- Q & A
- Networking
- Adjourn

Briefly introduce yourself

Your name & company

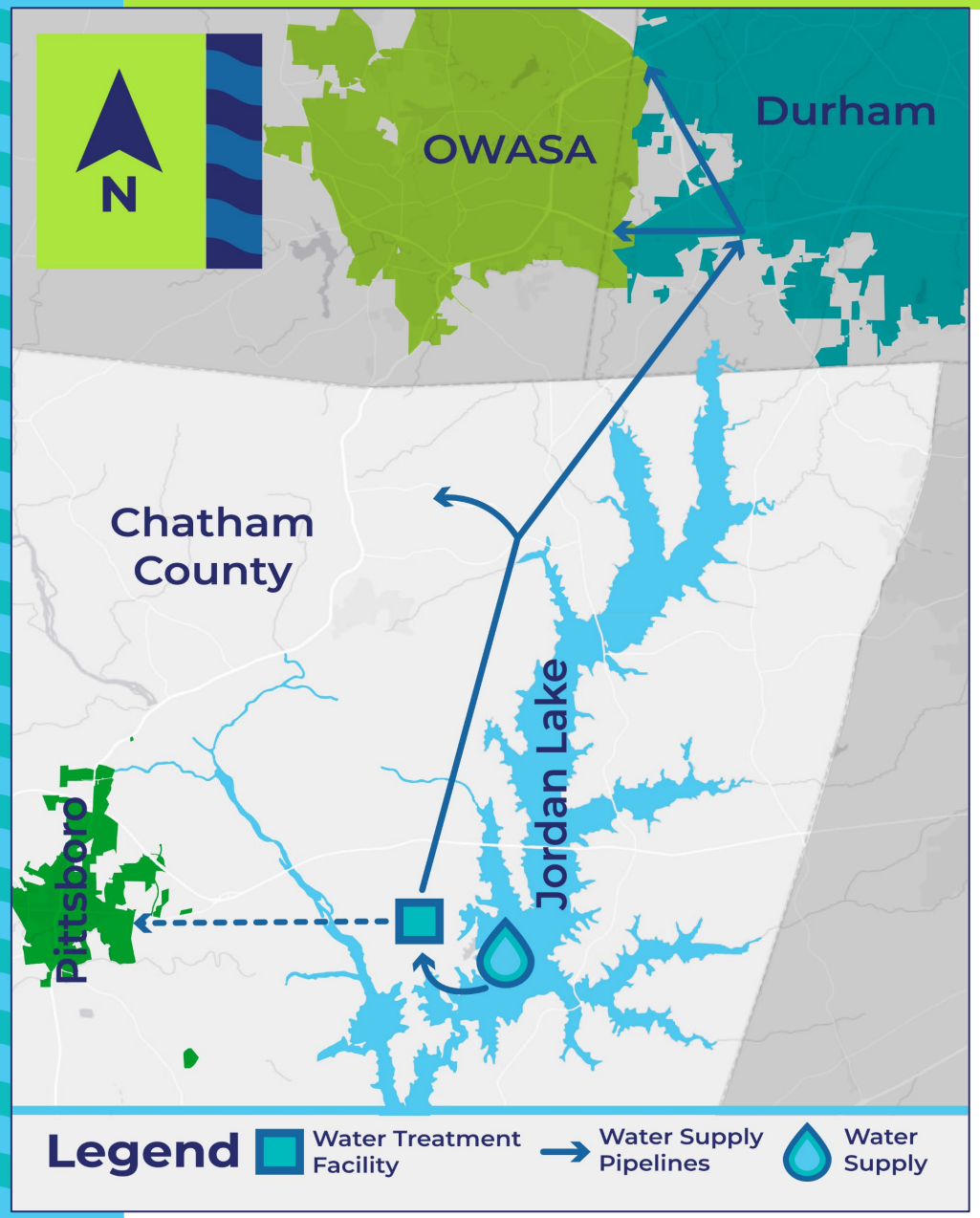
M/W UBE representatives – sentence on the services your company provides

Western Intake Partnership

- City of Durham - Contracting Entity
  - Project Manager – Sydney Miller
- HDR - Program Manager
  - Not eligible to be a design engineer on the Program
  - Supports Selection Committees, but not a voting member
- Direct all Meeting and/or Information Requests to HDR:
  - Jeff Adkins – Program Manager, jeff.adkins@hdrinc.com
  - Kip Kalisiak – Project Delivery Advisor, kip.kalisiak@hdrinc.com

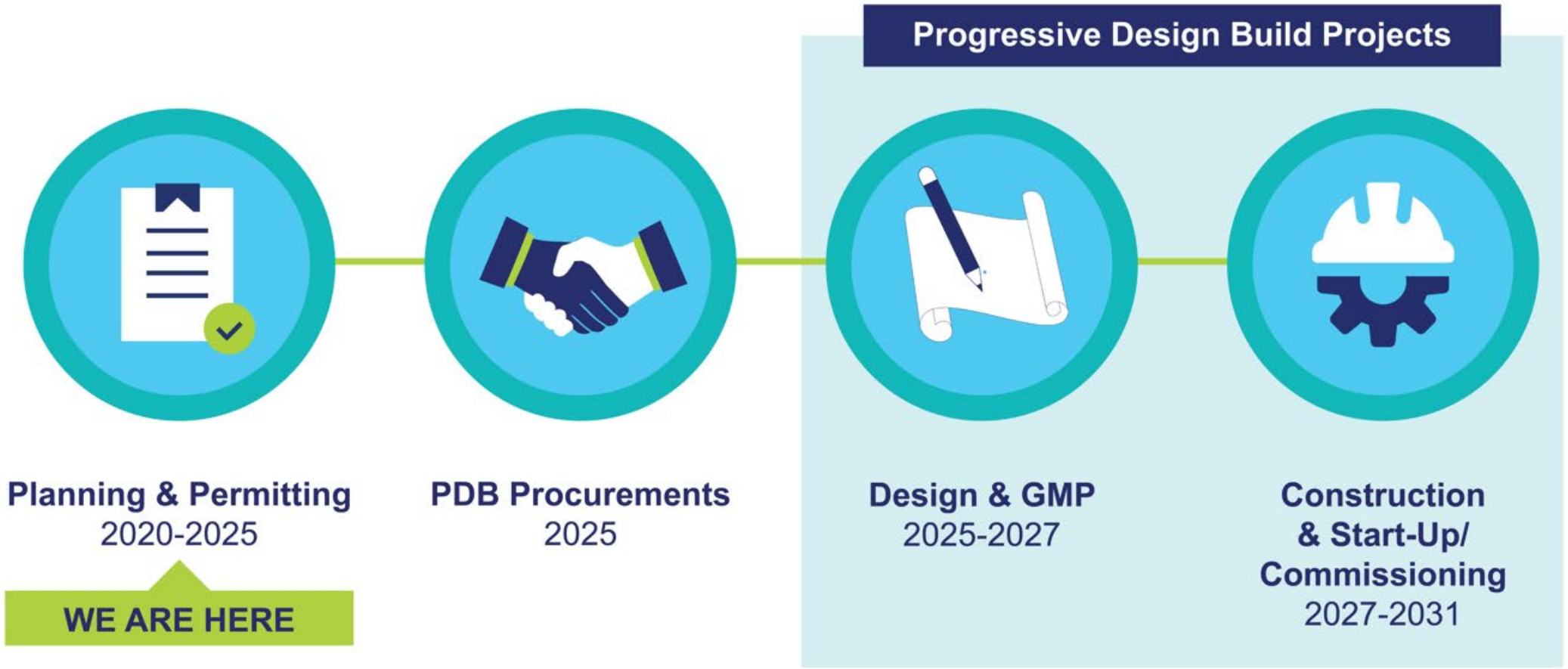
Western Intake Partnership program – what's new?

Western Intake Partnership Water Supply Project



- Initial phase to access Durham's Jordan Lake allocations, provide for all Partners eventually
- Plan, design, construct and operate:
  - *Jordan Lake Intake, Tunneled Raw Water Pipeline (~3/4 mile) & Pump Station*
    - **Progressive Design-Build Opportunity**
  - *Regional Water Treatment Facility (initial capacity 20 mgd, site plan for future expansions to 77 mgd)*
    - **Progressive Design-Build Opportunity**
  - *Finished Water Transmission Pipelines (16 miles WTF to Durham, interconnect with Chatham Co.; Pittsboro pipeline in future phase)*
  - *2 Elevated Water Storage Tanks*
    - **Traditional Design-Bid-Build**

Program Schedule



What's new since WIP May 2024 Outreach Event?

Western Intake Partnership

1. Further discernment on Partner participation, capacity allocations
2. Offered opportunities for PDB Teams to make presentations to Partners
3. Preliminary Engineering Reports
   - Surveys and preliminary geotech investigations complete
   - Raw Water Intake, Pump Station & Transmission PER – complete
   - Regional Water Treatment Facility PER – reviews completed, final late September
   - Finished Water Transmission PER – complete
     - Work continues on intermediate & northern elevated storage tank locations
4. Non-recreational outgrant applications submitted to USACE mid-August
   - Includes Environmental Assessment (EA)
   - Fieldwork for EA (wetlands, streams, species surveys, cultural & historic resources) mostly complete, some supplemental surveys over next month

Preliminary Construction Cost Estimate (2024 dollars)

Western Intake Partnership

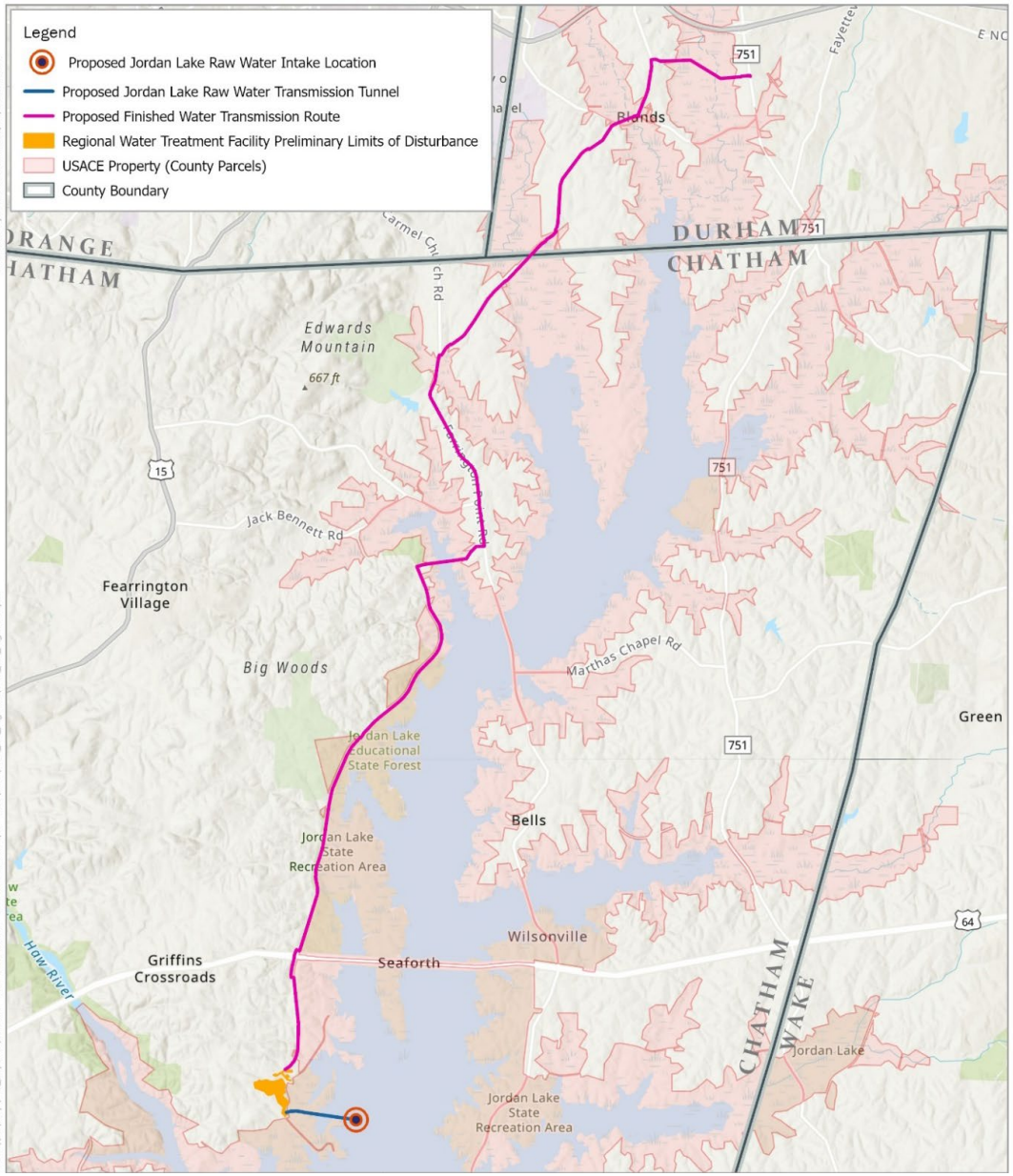
PDB Program Element	Prelim. Construction Cost	Prelim. Project Cost[1]
Intake, Raw Water Pumping & Transmission	$117M	$134M
Regional Water Treatment Facility	$445M	$500M

DBB Program Element	Prelim. Construction Cost	Prelim. Project Cost[1]
Finished Water Transmission	$152M - $190M (36-in vs 42-in)	$176M -$213M (36-in vs 42-in)
Two Elevated Storage Tanks	$21M	$24M

Total Program Estimate (PDB + DBB) = $735M-$773M Construction
= $834M-$871M Project[1]

[1]Project Costs including Design, Permitting, Land & Administration

Finished Water Transmission Pipeline



- Traditional Delivery project
- Transmission pipelines along roadways from Treatment Facility
- 16-mile transmission pipeline from Treatment Facility to Durham water distribution system
  - Chatham County interconnect near US 64
  - OWASA receives WIP water through existing Durham interconnects, emergencies only during initial phase
  - Future parallel pipeline
- Future 6-mile transmission pipeline to Pittsboro

PER Spotlight

Water Treatment Facility

Jordan Lake as a Water Source

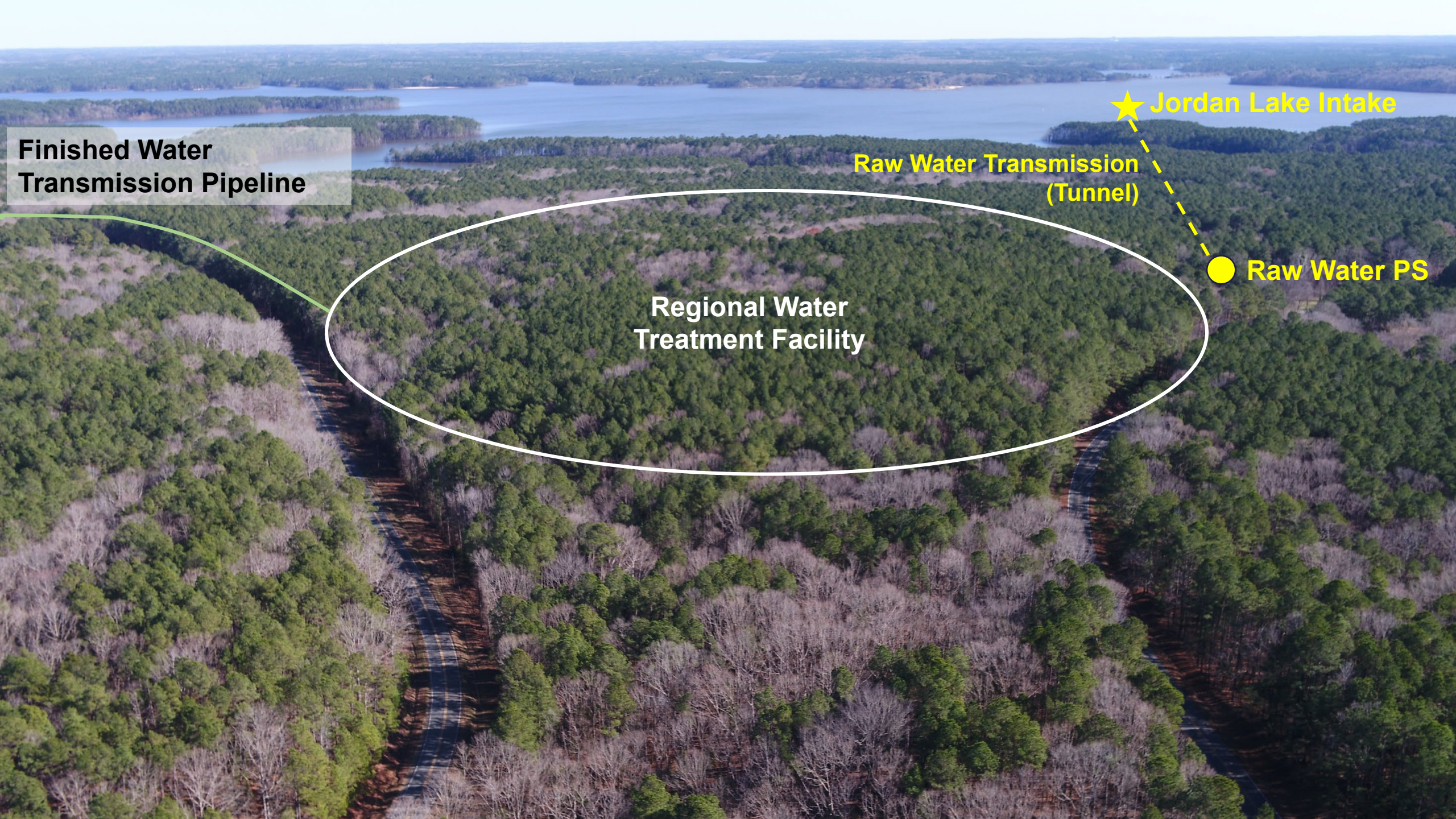
Western Intake Partnership

- Eutrophic lake conditions, seasonal taste & odor issues (MIB, Geosmin)
  - NC Collaboratory study late 2019
- Emerging contaminants (PFAS, 1,4-dioxane, Bromide)
- Intake WQ analysis 2021-present
  - WQ summary report available on request
- Proposed intake
  - Near Vista Point State Rec Area
  - Historic New Hope Creek

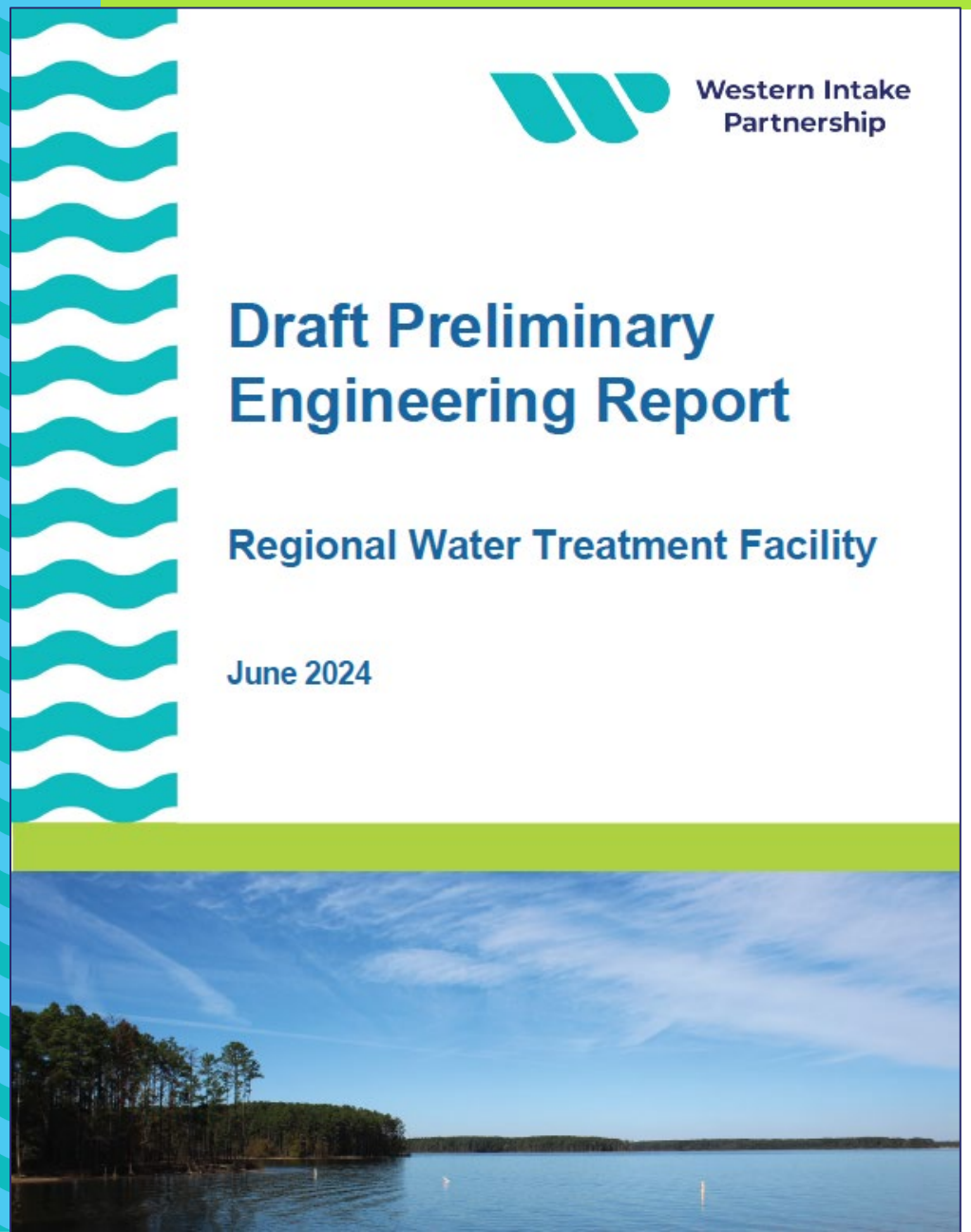
Proposed Raw Water Design Conditions

Parameter	Normal	Challenging
Turbidity, NTU	8.4	>20
Tot Manganese, mg/L	0.12	>1
Tot Iron, mg/L	0.23	>0.3
Bromide, µg/L	138.5	>200
MIB, ng/L	9.7	>150
Geosmin, ng/L	14.3	>100
1,4-Dioxane, µg/L	1.15	1.5
Tot Microcystins, µg/L	0.25	>1.2
PFOA, ng/L	6.6	7.4*
PFOS, ng/L	9.5	10.5*
PFBS, ng/L	5.8	6.3*

* 75th percentile of historic data


Finished Water
Transmission Pipeline
Jordan Lake Intake
Raw Water Transmission
(Tunnel)
Raw Water PS
Regional Water
Treatment Facility

Water Treatment Facility PER Overview



- Design criteria
- Proposed treatment & support facilities
- Master site layout
- Preliminary costs

- *Includes supporting tech memos and 100 preliminary drawings*
- *Final version available for review on request by early October*

Water Treatment Facility PER Overview

Western Intake Partnership

Sections:

1. Introduction & Background
2. Site Development & Hydraulic Profile
3. Treatment Processes
4. Chemical Systems
5. Residuals Handling
6. Process Instrumentation & Controls
7. Civil/Site Facilities & Site Mgmt Plan
8. Architectural Design Criteria
9. Structural Design Criteria
10. HVAC/Plumbing/Fire Protection Criteria
11. Electrical Service & Design Criteria
12. Geotechnical Evaluation
13. Permitting Requirements
14. Summary of Major Equipment & Recommended Vendors
15. Sustainable & Resilient Design
16. Cost Opinion & Implementation Schedule

PER Appendices

A. Raw Water Quality Summary TM
B. Preliminary Drawings
C. Recommended Treatment Processes, Technology Selections, Design Criteria, & Overall Control Strategy TM
D. Geotechnical Report
E. Envision Status Tables
F. Decision Documents

Water Treatment Facility – PER General Principles

Western Intake Partnership

- Process treatment, buildings and facilities meet design criteria, standards and code
- Comply with current federal and state drinking water standards at all times, including PFAS, possible future 1,4-Dioxane
- Comply with rezoning requirements, incl. undisturbed vegetated buffer, appearance requirements, native plantings
- Consider constructability, reliability, operability & maintenance
- Incorporate sustainability concepts throughout, incl. LEED Gold for Admin & Maintenance Buildings
- Minimize impacts to surrounding rural community during construction & operation
- Stream/wetland impacts eligible for 401/404 Nationwide Permit

WTF Rendering
Initial phase, with footprint of future phases

Western Intake Partnership

WTF Site Plan (initial phase)

Western Intake Partnership

KEY:

1. ADMIN/ OPERATIONS BUILDING
2. MAINTENANCE BUILDING
3. SUBSTATION / TRANSFORMERS
4. 7.5MG RAW WATER STORAGE TANK
5. RAW WATER OZONE INJECTION BUILDING, CONTACTORS
6. STATIC MIXERS VAULT AND RAPID MIX BASINS
7. FLOCCULATION
8. SEDIMENTATION BASINS WITH PLATE SETTLERS
9. OZONE GENERATORS AND SETTLED WATER CONTACTOR
10. FILTERS
11. FINISHED WATER PS AND ELECTRICAL ROOM
12. 4MG CLEARWELL
13. ELECTRICAL / GENERATORS BUILDING
14. CHEMICAL BUILDING
15. LOX STORAGE
16. GRAVITY THICKENERS
17. THICKENED SOLIDS PS
18. DEWATERING BUILDING
19. THICKENED SOLIDS STORAGE TANK
20. BW RECLAMATION AND RECYCLE FACILITY
21. RECLAMATION BASINS
22. SEPTIC DRAINAGE FIELD
23. RAW WATER PS
24. FUEL STORAGE FOR STANDBY GENERATORS
25. DEWATERED SOLIDS STORAGE BUILDING
26. RESIDUALS ELECTRICAL BUILDING
27. ADVANCED TREATMENT BUILDING
28. SURGE TANKS

Defining Key Criteria & Design Flows

Western Intake Partnership

- 121-acre site acquired by OWASA in 1989 – currently undeveloped, previous use agriculture/silviculture
  - Significant slope down to north, with non-contiguous portions separated by roads (elevation range ~100 ft across site)
  - Ephemeral stream along Seaforth Rd, intermittent stream through northern portion of site
- Phase 1 max day 20 MGD finished water capacity to system
  - Some Phase 1 elements will meet Phase 2 capacity (30 MGD)
  - Site plan for ultimate expansion to 77 MGD
- Raw water quality characterized with ongoing WQ sampling program at Jordan Lake intake site
- 12-month PFAS Pilot Study to evaluate treatment options

WTF Hydraulic Profile

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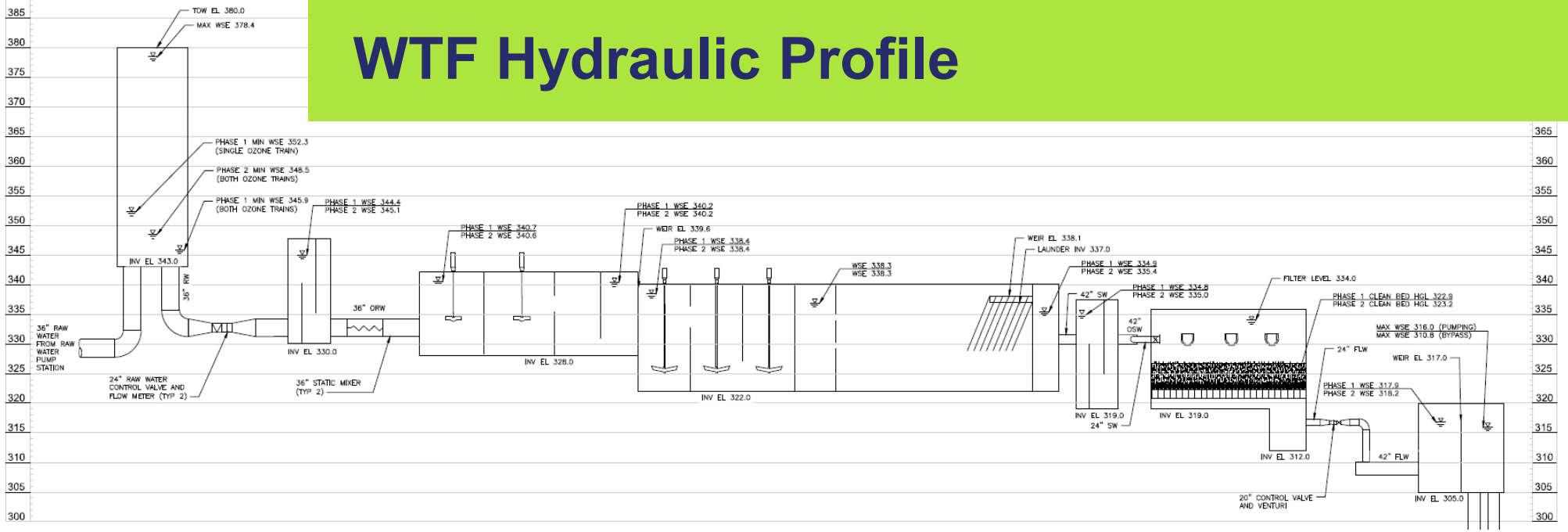
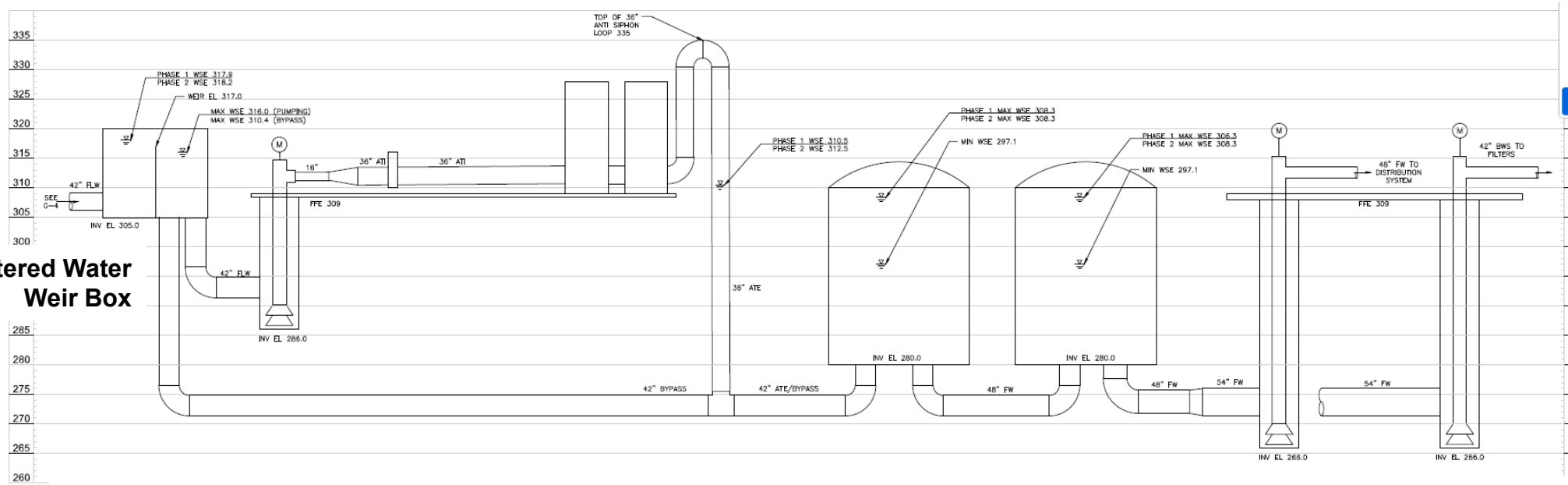


Raw Water Tanks | **Raw Water Ozone** | **Rapid Mix Basins** | **Flocculation Basins** | **Sedimentation Basins** | **Settled Water Ozone** | **Filters** | **Filtered Water Weir Box**



Filtered Water Weir Box

Adv Treatment Feed / Cartridge Filters / Adv Treatment Vessels | **Finished Water Clearwells** | **Finished Water PS**

WTF Support Facilities

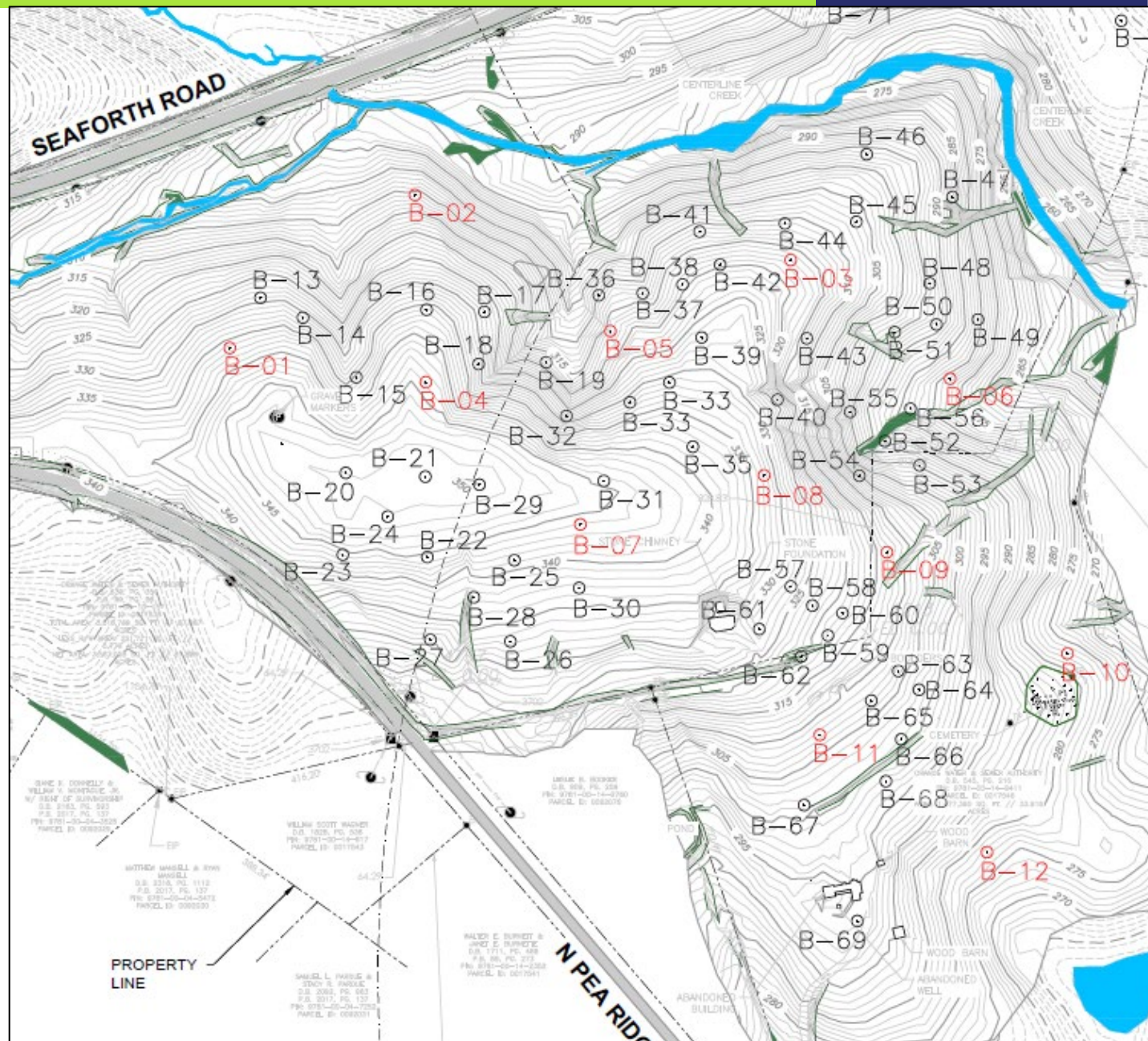
Western Intake Partnership

- 2 raw water storage tanks
- Chemical Building for treatment process chemicals
- Onsite residuals treatment
  - Gravity thickening
  - Belt Press dewatering
- 2 finished water clearwells
- 2 incoming Electrical feeds
  - Duke Energy Power supply upgrades needed along N Pea Ridge to deliver 3-phase power
- 3 standby power generators (space for 4th)

Geotechnical Evaluation

Western Intake Partnership

- Geotech investigations
  - Phase 1 (2022) – 12 borings, GPR to delineate cemetery
  - Phase 2 (2024) – 60 borings, 4 monitoring wells
- Geotech investigation report to be incorporated in final PER



Architecture: Administration & Maintenance Buildings

Western Intake Partnership

- Administration, operations, support, laboratory, meeting spaces
- Admin: ~29,200 gross SF over 2 levels; Maint: 10,600 gross SF
- Architecture to promote context-sensitive design that preserves the rural character of Chatham County (Zoning)
- ‘Natural modern’ aesthetic, complemented by woodland buffers

City of Durham's 'High Performance Building' Policy

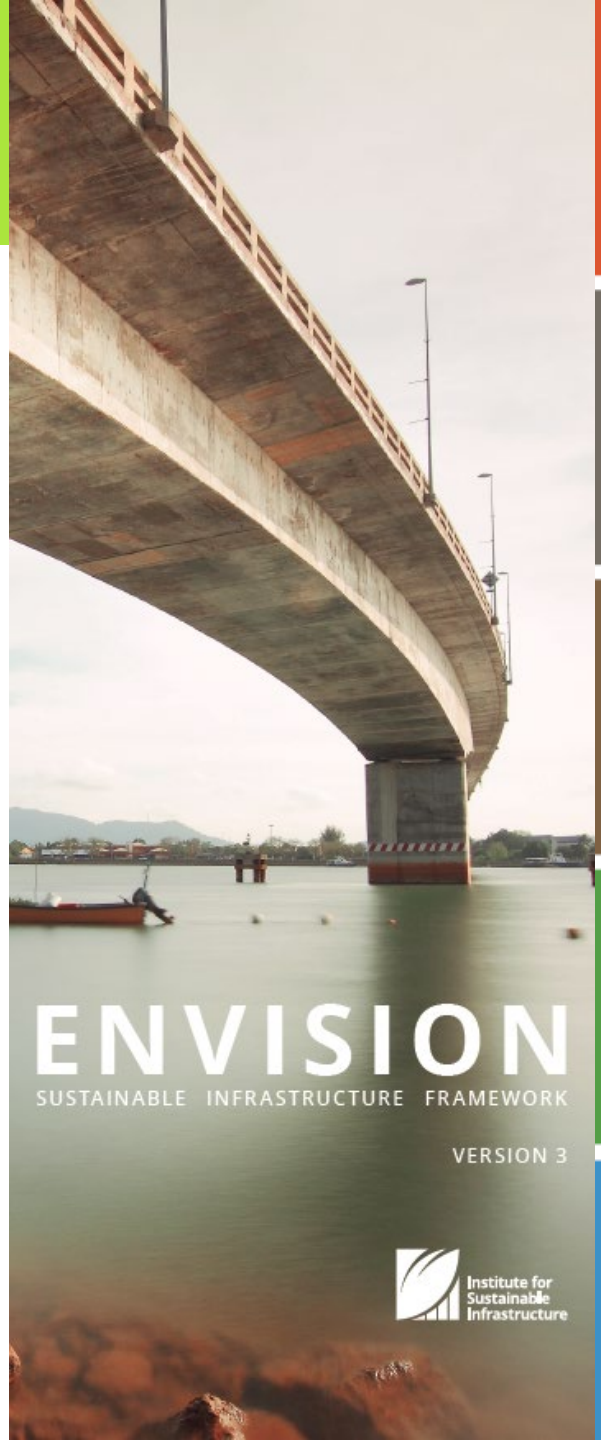
- Strive for LEED Gold qualifications
  - LEED complementary to Envision; energy performance criteria differ
  - Final design to include energy modeling
- Reduce energy usage
  - On-site renewable energy generation
  - Solar panels on building roofs (5% of energy use)
  - HVAC System provides energy use reduction
  - EV charging

WIP is using Envision to encourage Sustainability

Targeting Gold achievement level

Envision discussed in PER section 15

ENVISION



QUALITY OF LIFE

LEADERSHIP

RESOURCE ALLOCATION

NATURAL WORLD

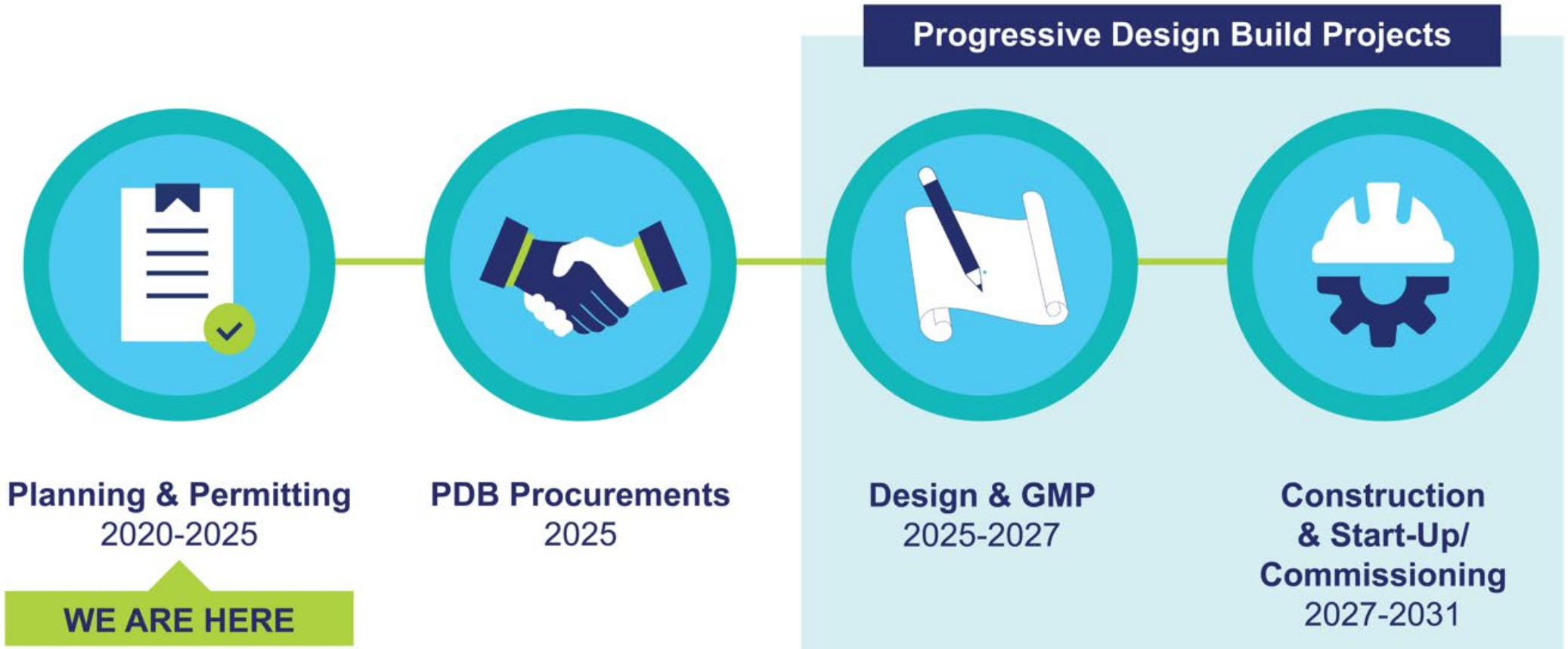
CLIMATE & RESILIENCE

Accessing PER information

- WIP PERs will be available to interested engineers and contractors
  - Final *Raw Water Intake, Pump Station & Transmission PER* finalized last week
  - *Water Treatment Facility PER* – draft submitted in June, expect to finalize late September
- Contact Jeff Adkins/HDR to request
- Other useful information and links for WIP projects available at
  - WIP website www.westernintakepartnership.com
  - Chatham County website www.chathamcountync.gov , 2024 rezoning page

What to expect next

PDB Delivery Schedule



Next 12 Months

Western Intake Partnership

By end of September

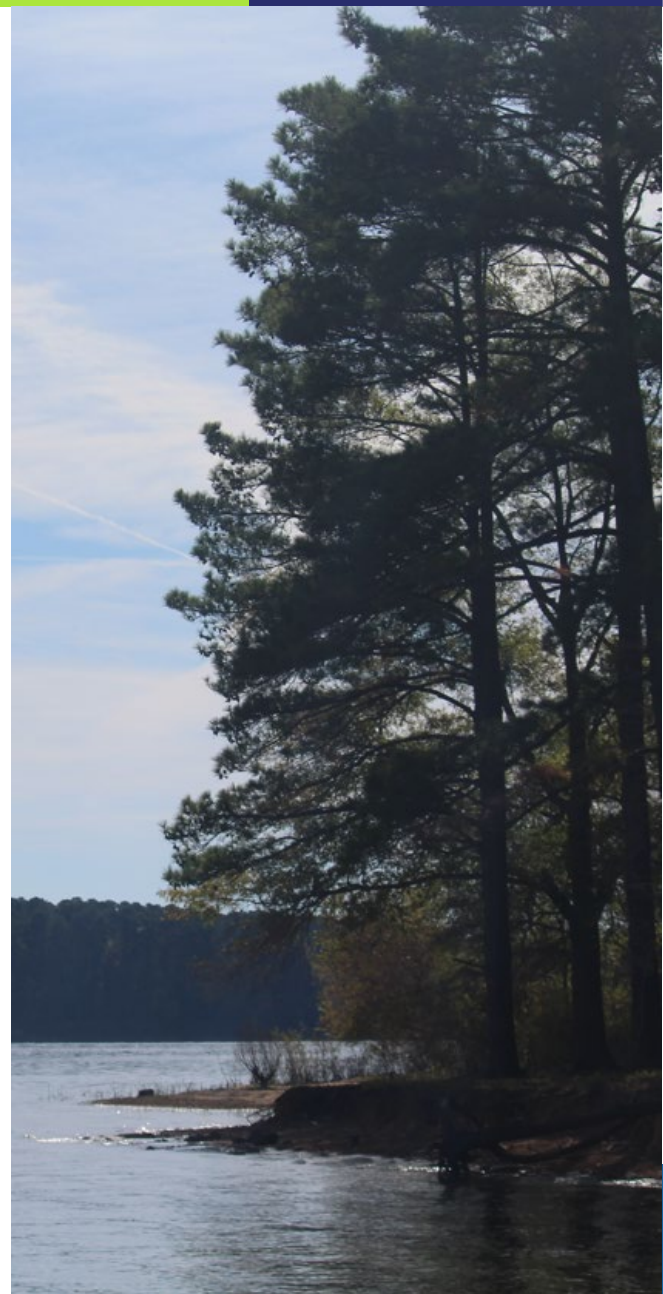
- Both Preliminary Engineering Reports complete
- Initial review of Non-Recreational Outgrant applications by USACE, may post EA for public input
- End of window for PDB Teams' presentations with WIP

By end of 2024

- Finished Water Transmission survey, easement requirements
- Outgrant applications prompt Agency EA review & opportunity for public input

1st half of 2025

- PDB RFQs



PDB Team Presentations with WIP

Western Intake Partnership

Non-mandatory opportunity for presentations ongoing, started late August, continue through Sept 19

Framework:

- 1.5 hr slots
- PDB Teams – not engineers or contractors individually
- Structured framework
  - Introductions
  - Overview
  - PDB Team approach to project delivery
  - PDB Lessons learned
  - Market conditions affecting WIP
  - Questions (submit ahead)

Progressive Design Build Procurements

Western Intake Partnership

- Working on DB contract documents and RFQs
- City of Durham is WIP's Contracting Agent; following Durham's procurement process
- Planning solicitations for PDB Contracts in 2025
  - 1st RFQ – Water Treatment Facility (Contract 2) – ~March
  - 2nd RFQ – Intake & Raw Water Facilities (Contract 1) – ~June
- Not planning to issue 2nd RFQ until selection made on 1st RFQ
- 2-stage selection – SOQ, Interviews
  - Structured evaluation – criteria will be in RFQ

Traditional Delivery Project – 16-mile Finished Water Transmission Pipeline – Hazen to continue to final design, anticipate bidding 2027

City of Durham UBE Requirements

Western Intake Partnership

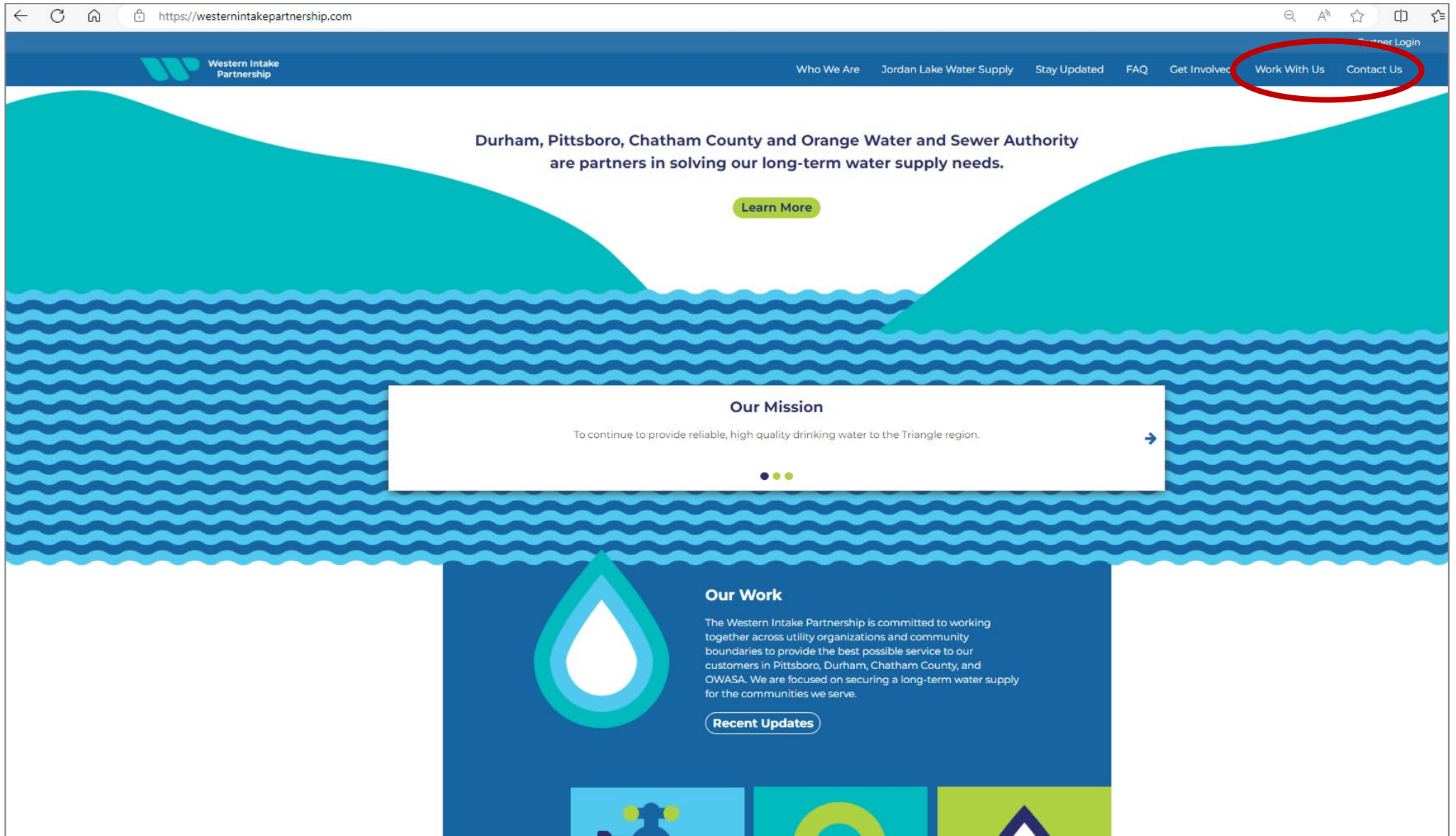
- All construction projects – PDB and Traditional - will have goals for Underutilized Business Enterprise (UBE) participation
  - % Minority-owned and % Women-owned UBE firms
- Underutilized Business Enterprise Compliance Division in Finance Department; requirements at City's website https://www.durhamnc.gov/4091/Underutilized-Business-Compliance-Divisi

  email: ubcfinance@durhamnc.gov
- RFQ will explain UBE requirements with forms all proposers are required to complete
  - UBE Participation Documentation
  - Consultant Workforce Diversity Questionnaire
  - Letter(s) of Intent to Perform as a Sub-Consultant

Partnership Website – sign up for updates & newsletter

Western Intake Partnership

westernintakepartnership.com



Meeting and/or Information Requests

Western Intake Partnership

Jeff Adkins – jeff.adkins@hdrinc.com

Kip Kalisiak – kip.kalisiak@hdrinc.com

Q & A

Networking