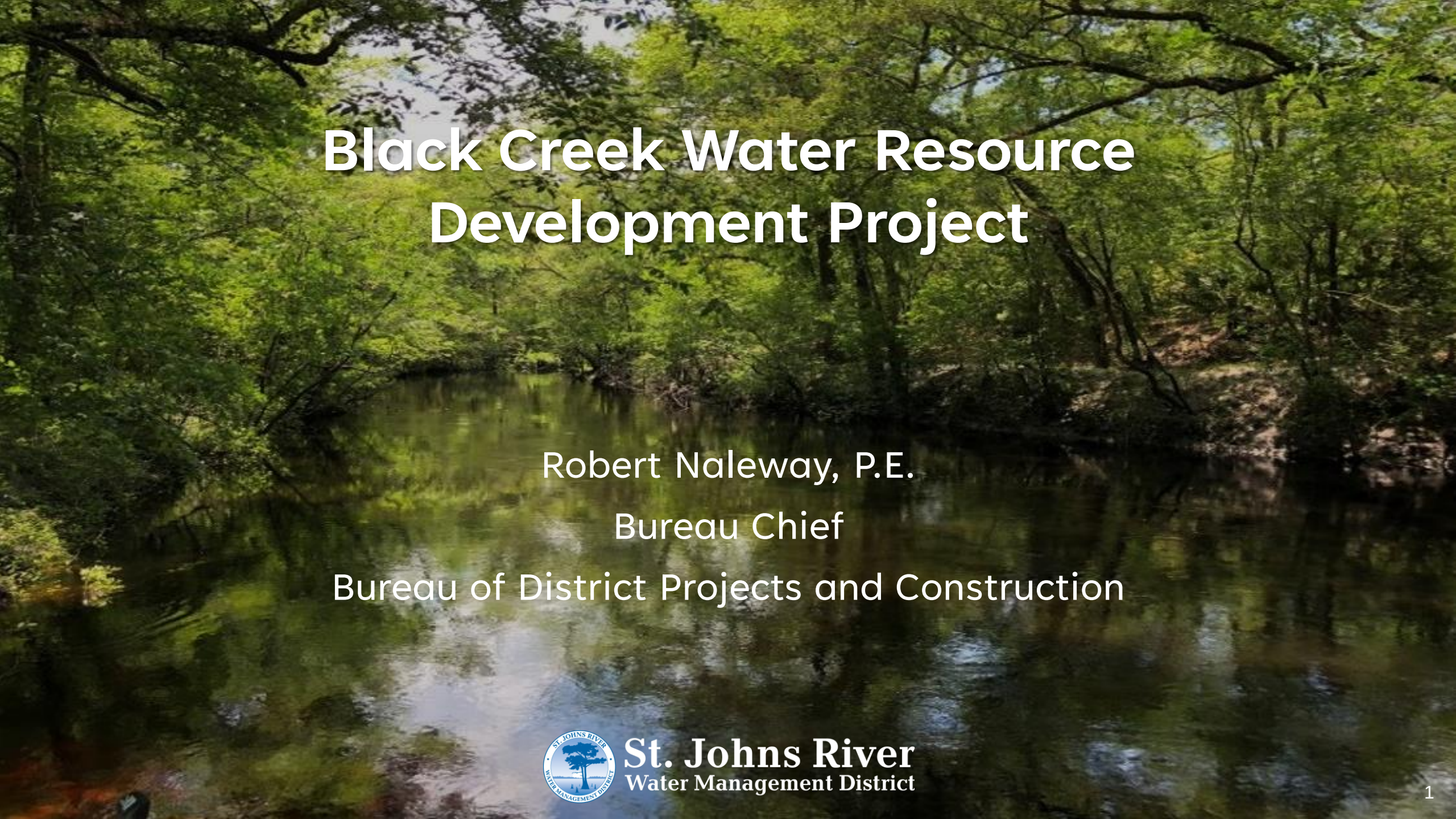

Black Creek Water Resource Development Project

Robert Naleway, P.E.
Bureau Chief
Bureau of District Projects and Construction

St. Johns River
Water Management District

Agenda

- Project Overview and Objectives
- Permitting
- Design
- Construction
- Start-up and Testing

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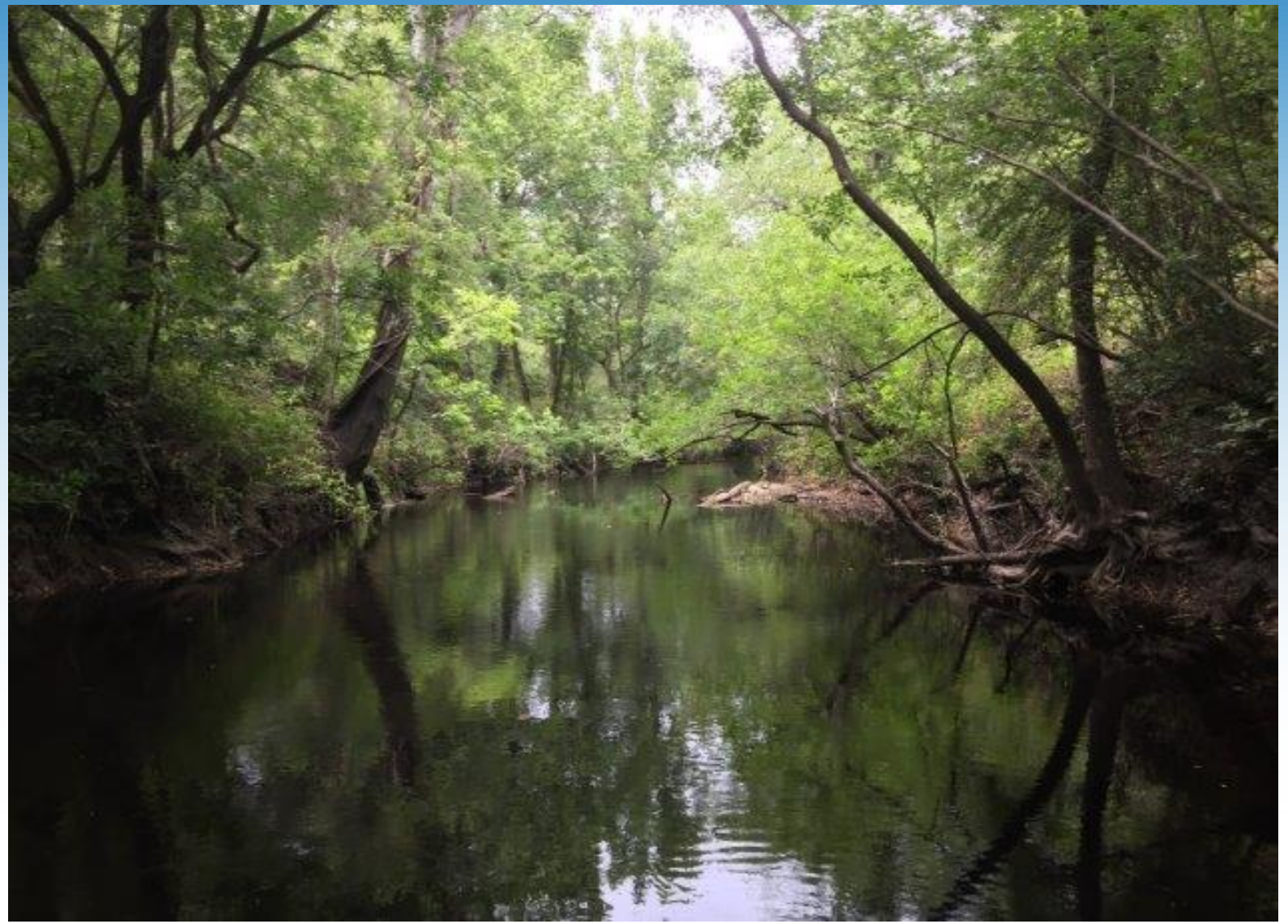
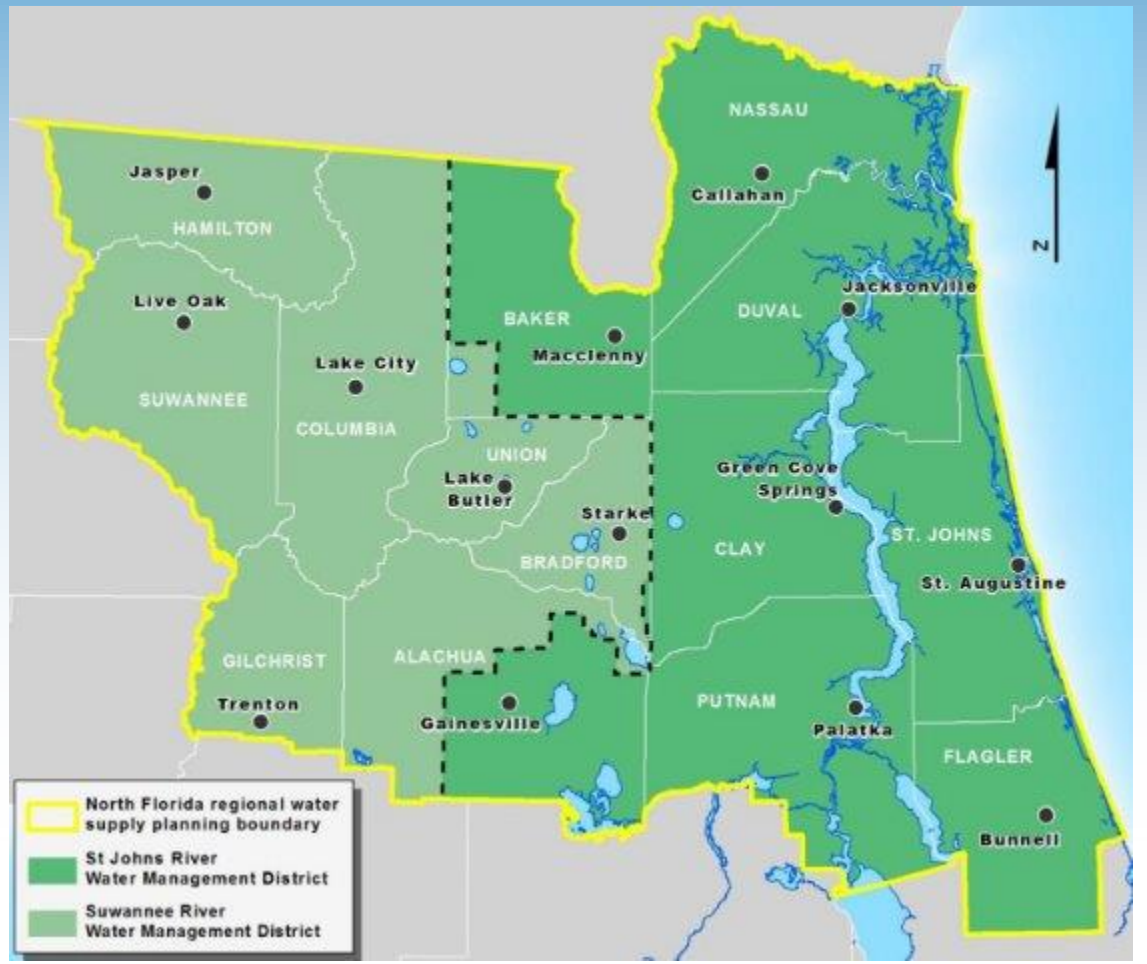
Water Management District

Project Overview and Objectives



North Florida Regional Water Supply Planning

- Joint initiative with FDEP, SRWMD and SJRWMD that started in 2011
- Planning region covers 14 counties in North Florida and more than 8,000 square miles
- Jointly approved by both WMD governing boards on January 17, 2017, and recently updated in 2023



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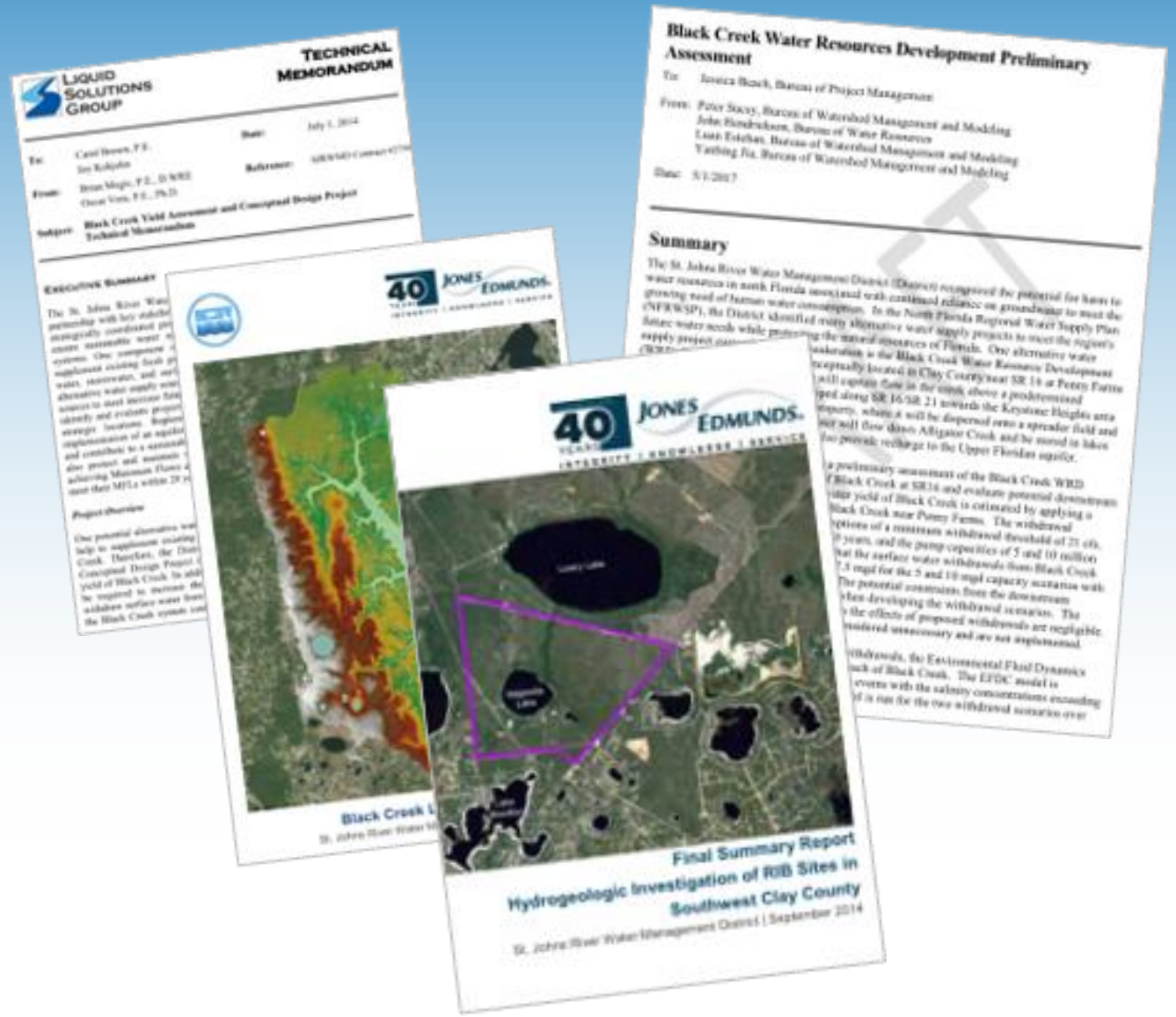
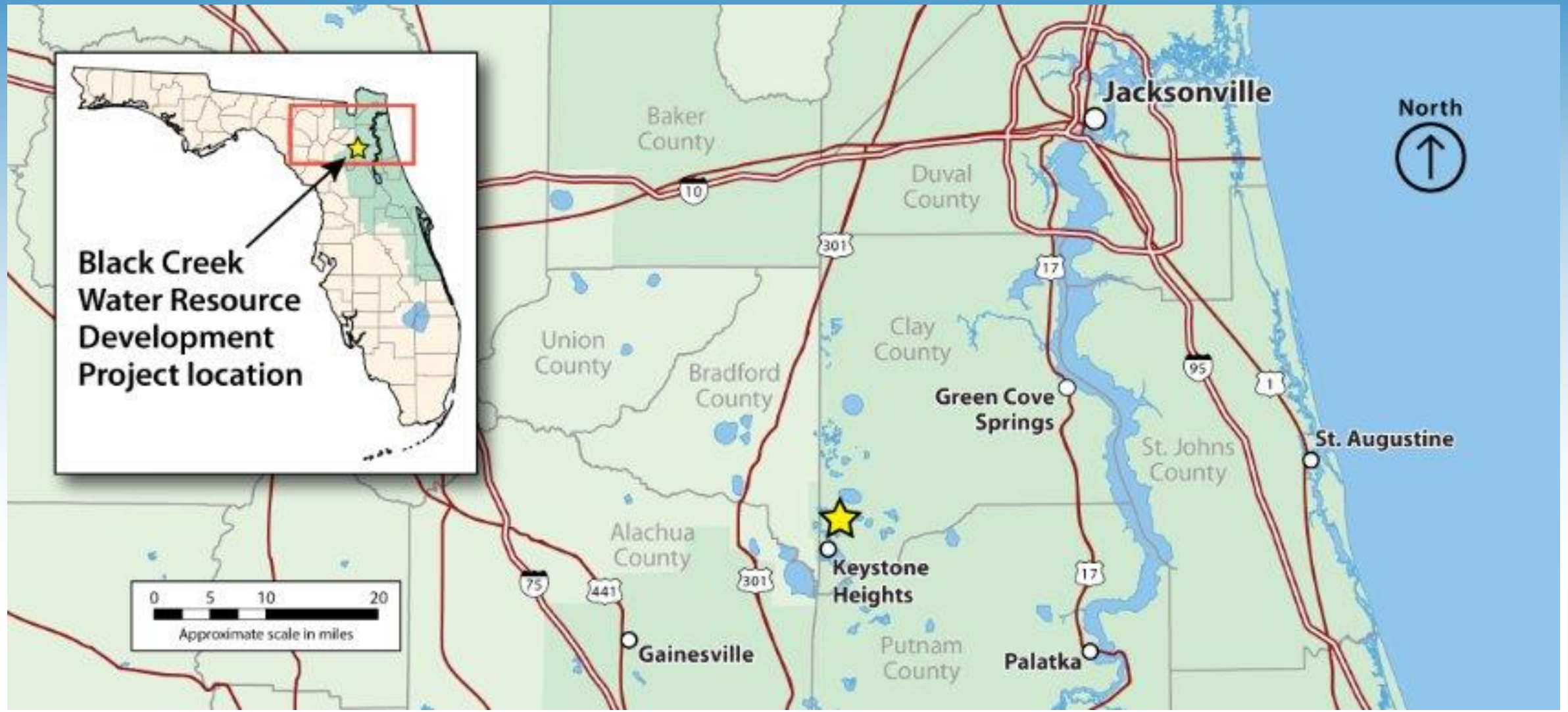
Black Creek WRD Project Background

- Several preliminary studies predated the conceptualization of the project
- Final project conceptualization included up to 10 million gallons per day (mgd) and would support both water supply development and MFL recovery for both Lake Brooklyn and Lake Geneva

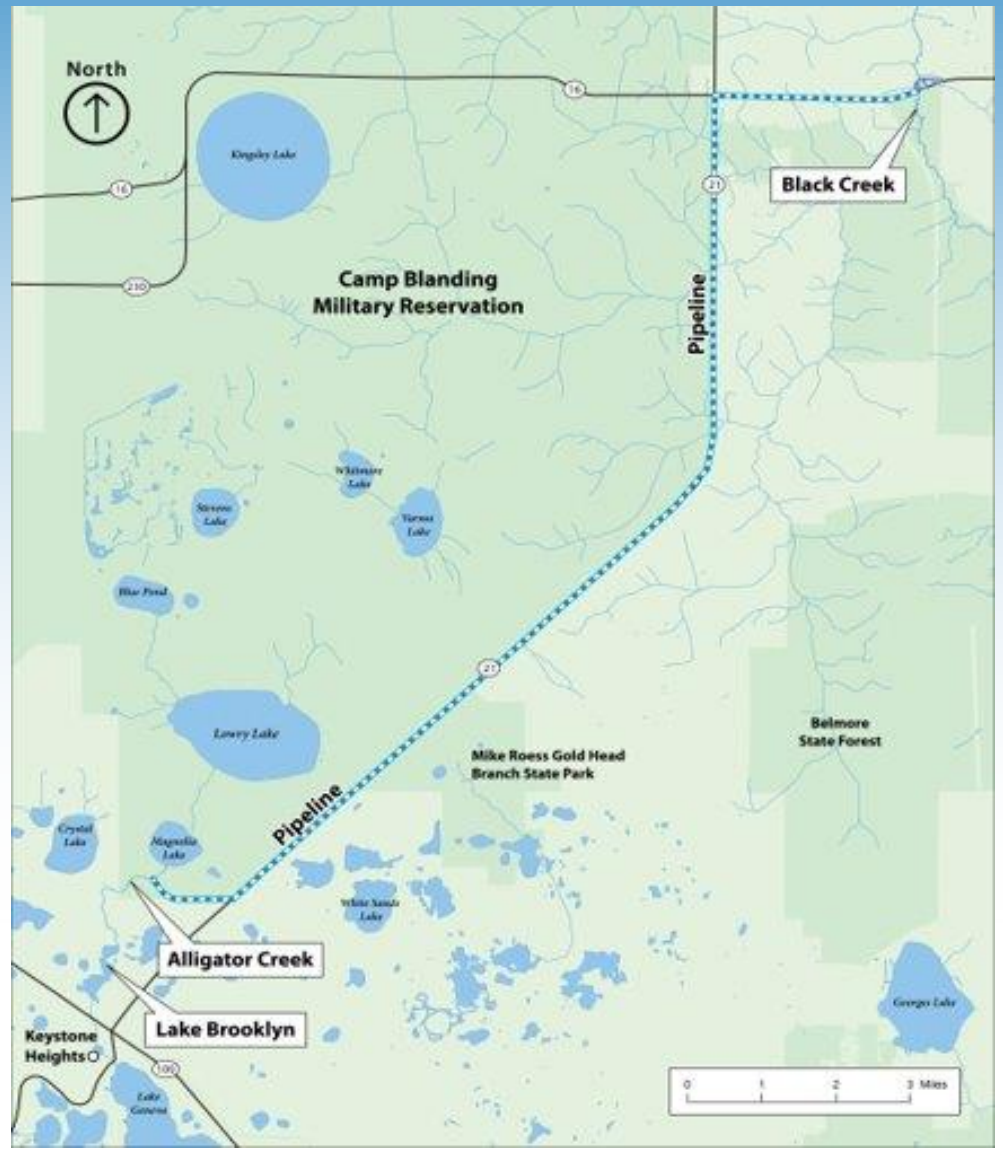


Black Creek WRD Project Location



Black Creek WRD Project Overview

- Provides regional aquifer recharge and lake restoration for Lake Brooklyn and Lake Geneva
- Project components includes
- 10 mgd intake pump station
- 17-mile raw water transmission main
- Passive treatment system to remove color from the source water prior to discharge into Alligator Creek



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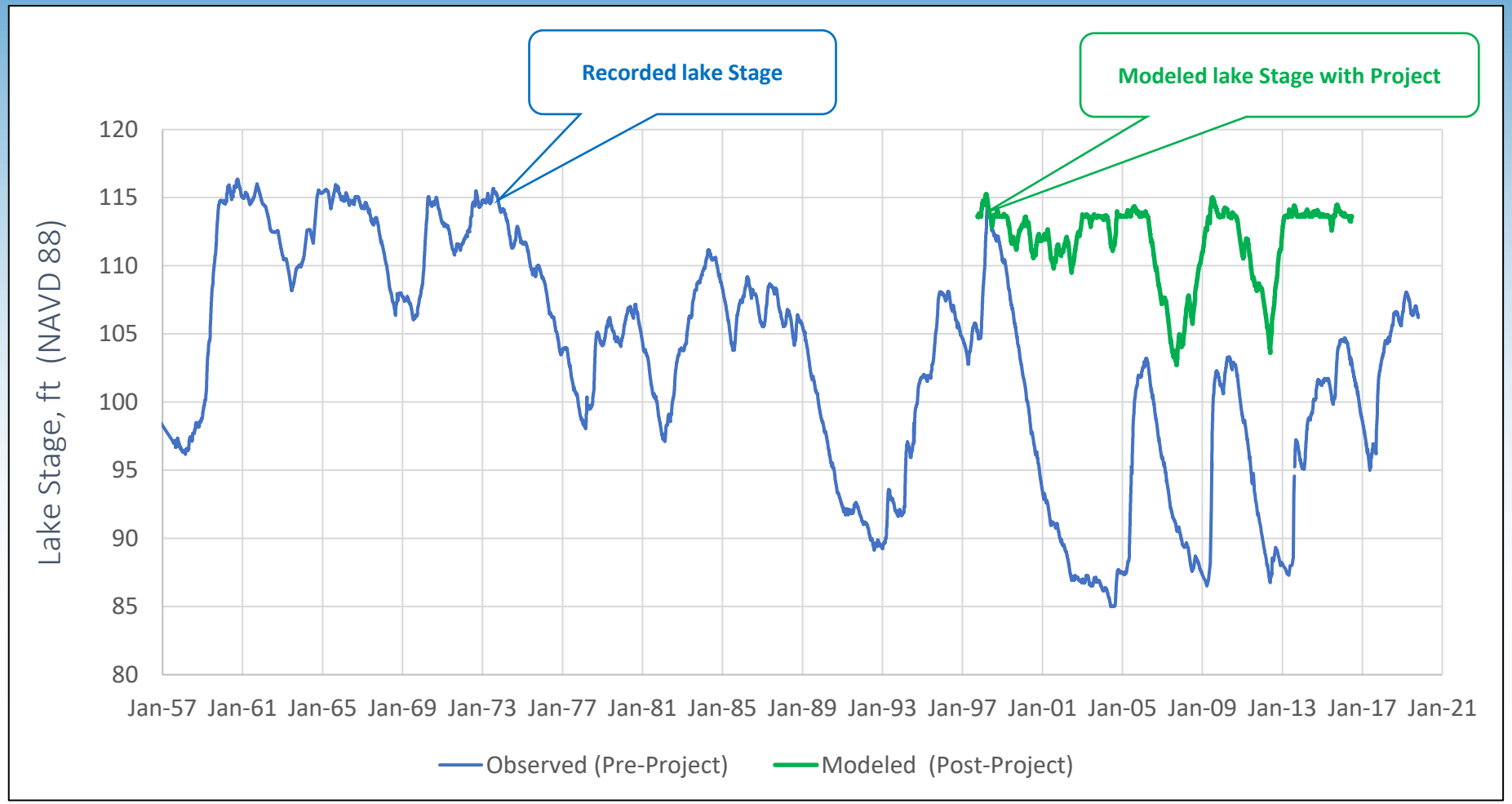
Black Creek WRD Project Benefit

- Lake Brooklyn Restoration



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Black Creek WRD Project Benefit

- Lake Brooklyn Restoration

Water Elevation = 110.43 in February 1999

Water Elevation = 89.53 in January 2008

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Permitting, Design, and Construction

Black Creek WRD Project – Permitting Species of Concern

- **Black Creek Crayfish:** State protected species that inhabits tannic streams. This species can be found in St. Johns, Duval, Clay, and Putnam counties in Florida

- **Gopher Tortoise:** State protected species that occupy upland habitat throughout Florida

- **Eastern Indigo Snake:** Federally protected species that is the largest native snake in North America, growing up to 9 feet long and considered an apex predator

Black Creek WRD Project – Permitting

- **Treatment System evaluation**: We considered Coagulation, Oxidation, Adsorption, Ion Exchange, Biologic, and Membrane treatment

- **Bench Testing and Pilot Testing**: After bench testing and an extended pilot test, we selected a biological/adsorptive media-based passive treatment system

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Black Creek WRD Project – Permitting

- **FDEP Environmental Resource Permit:** Minimized impacts to wetlands, performed water quality modeling and hydraulic modeling to show no flooding impacts around the lakes – established pump controls and shut off values
- **U.S. Army Corps of Engineers Permit**: Individual permit acquired. Not eligible for a nation-permit
- **FDOT ROW Permit:** For the raw water transmission main along SR-16 and SR-21
- **FDEP NPDES Permit:** Once we were required to add treatment to remove color, this required us to acquire an NPDES permit

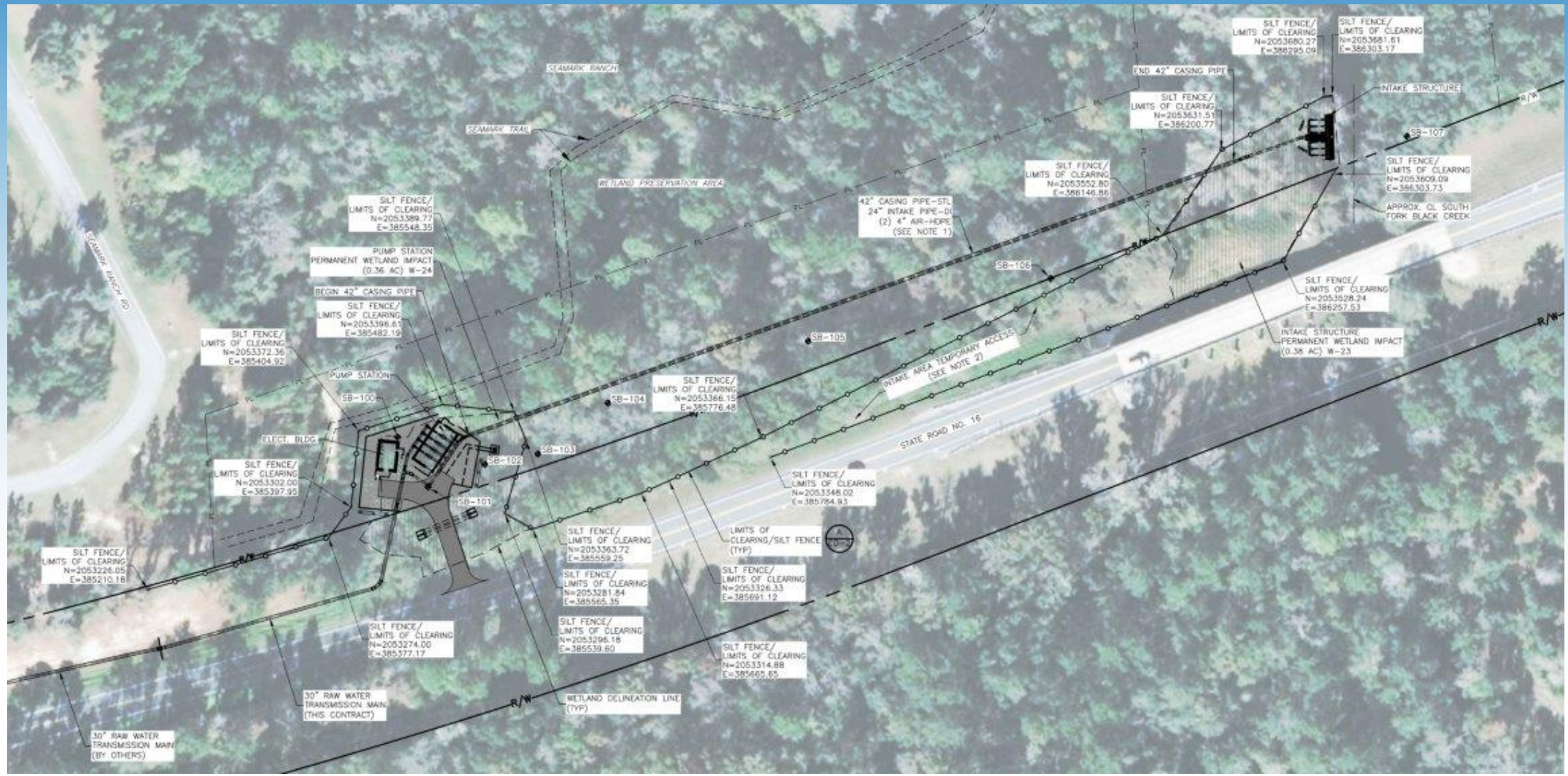
Black Creek WRD Project – Project Design Components

- **Intake Pump Station:** Four 2.5 mgd vertical “can” style pumps. Intakes are half-cylindrical stainless steel wedgewire screens (2 mm openings).

- **Raw Water Transmission Main:** 17.2-miles of 30-Inch Ductile Iron Pipe. We evaluated PVC and HDPE – timing, pricing, market conditions and long-term O&M were all factors in this evaluation.

- **Passive Treatment System:** Media based and includes wetland plants. Six 2-acre cells that will be alternated with water from Black Creek, each cell will have flows applied for two to three hours. Design includes a 500,000-gallon surge tank and a modulating valve to evenly apply water to each cell through a riser system.

Black Creek WRD Project – Intake Pump Station Design



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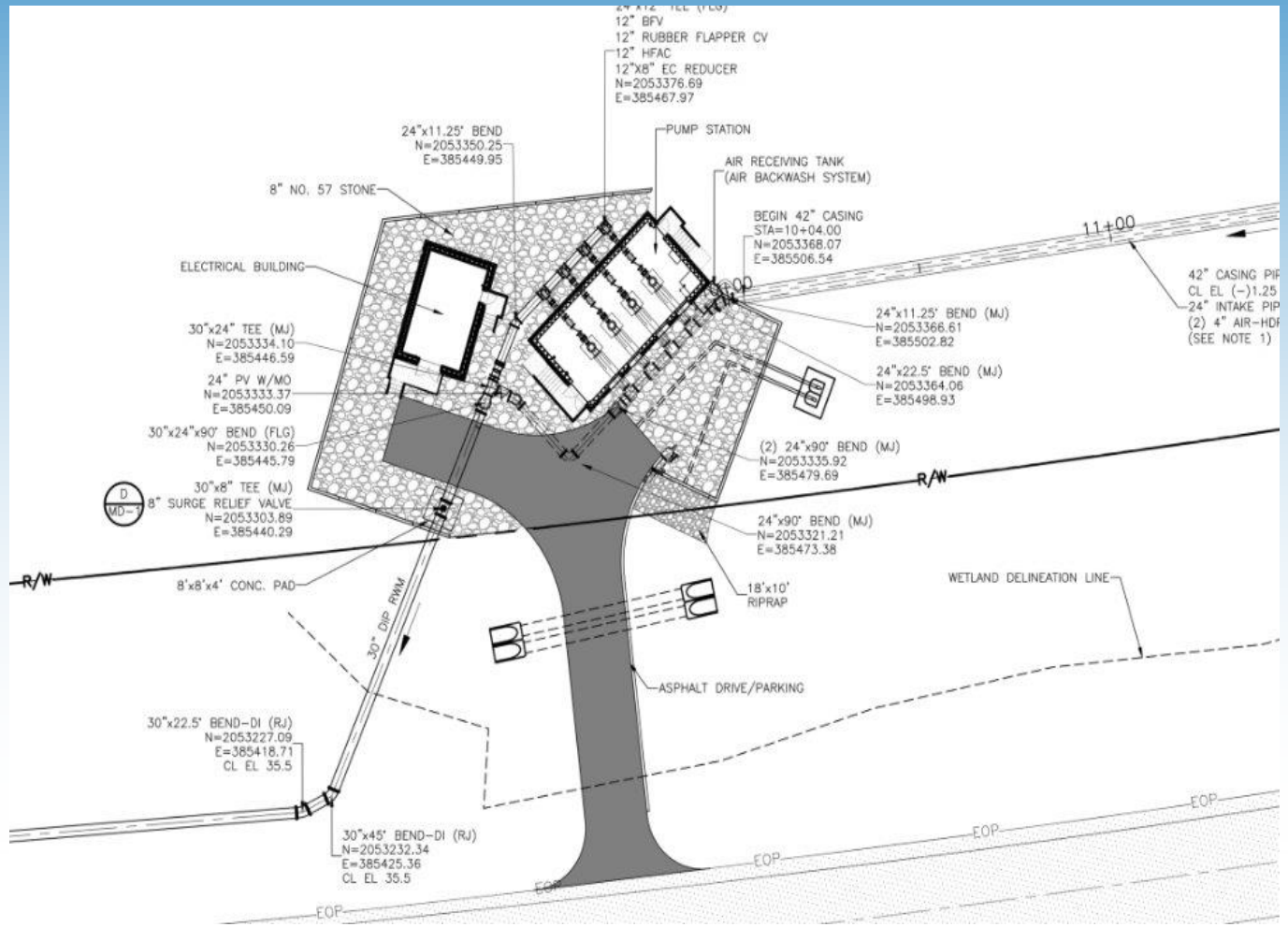
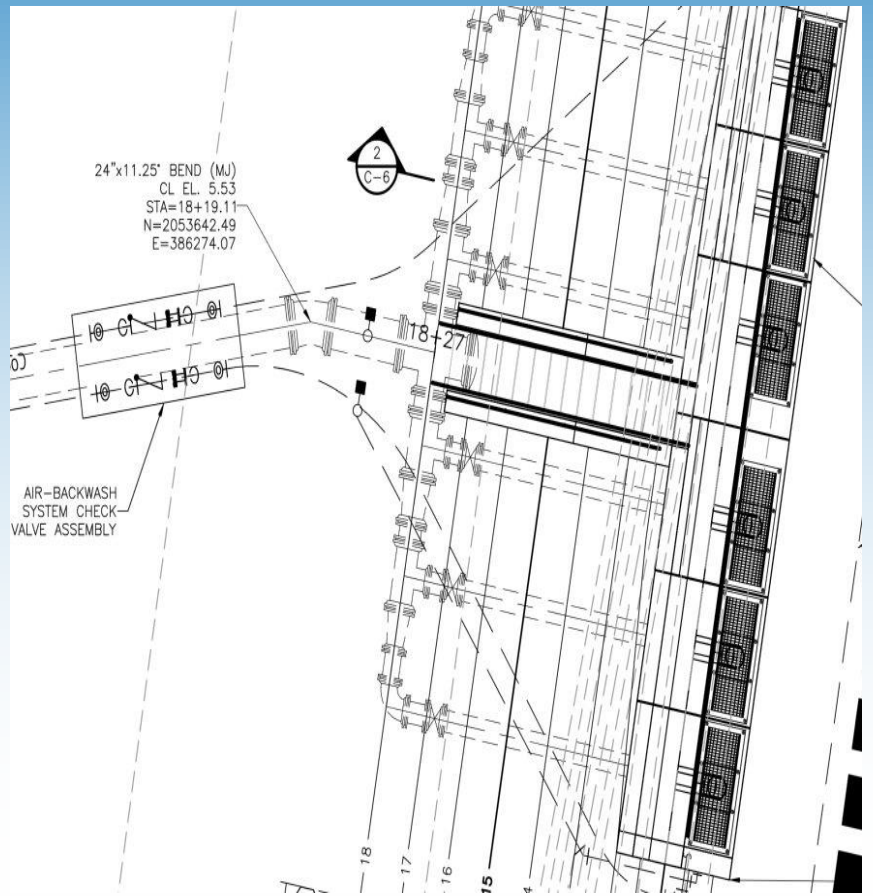
Black Creek WRD Project – Intake Pump Station Design





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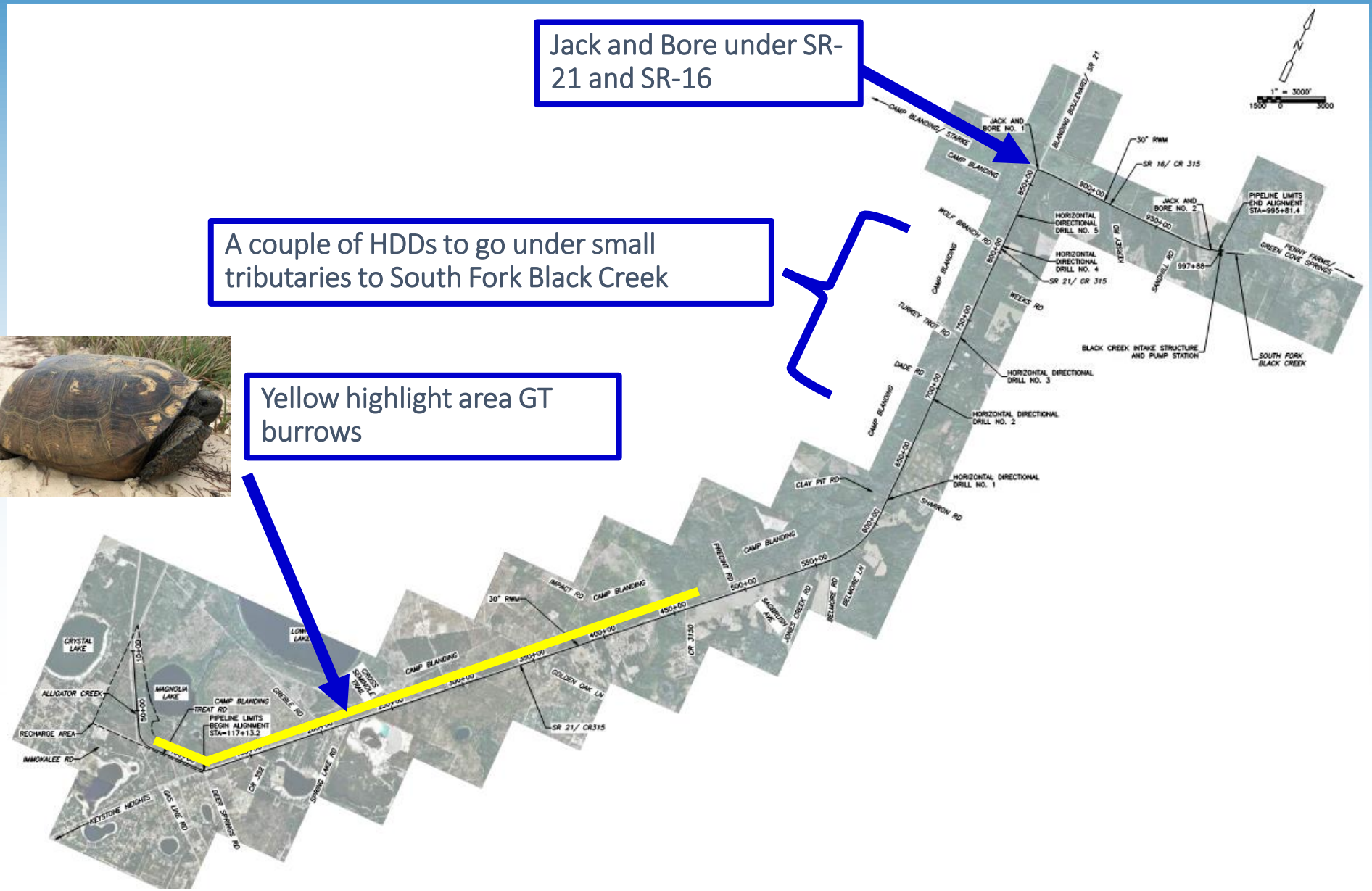
Black Creek WRD Project – Raw Water Transmission Design

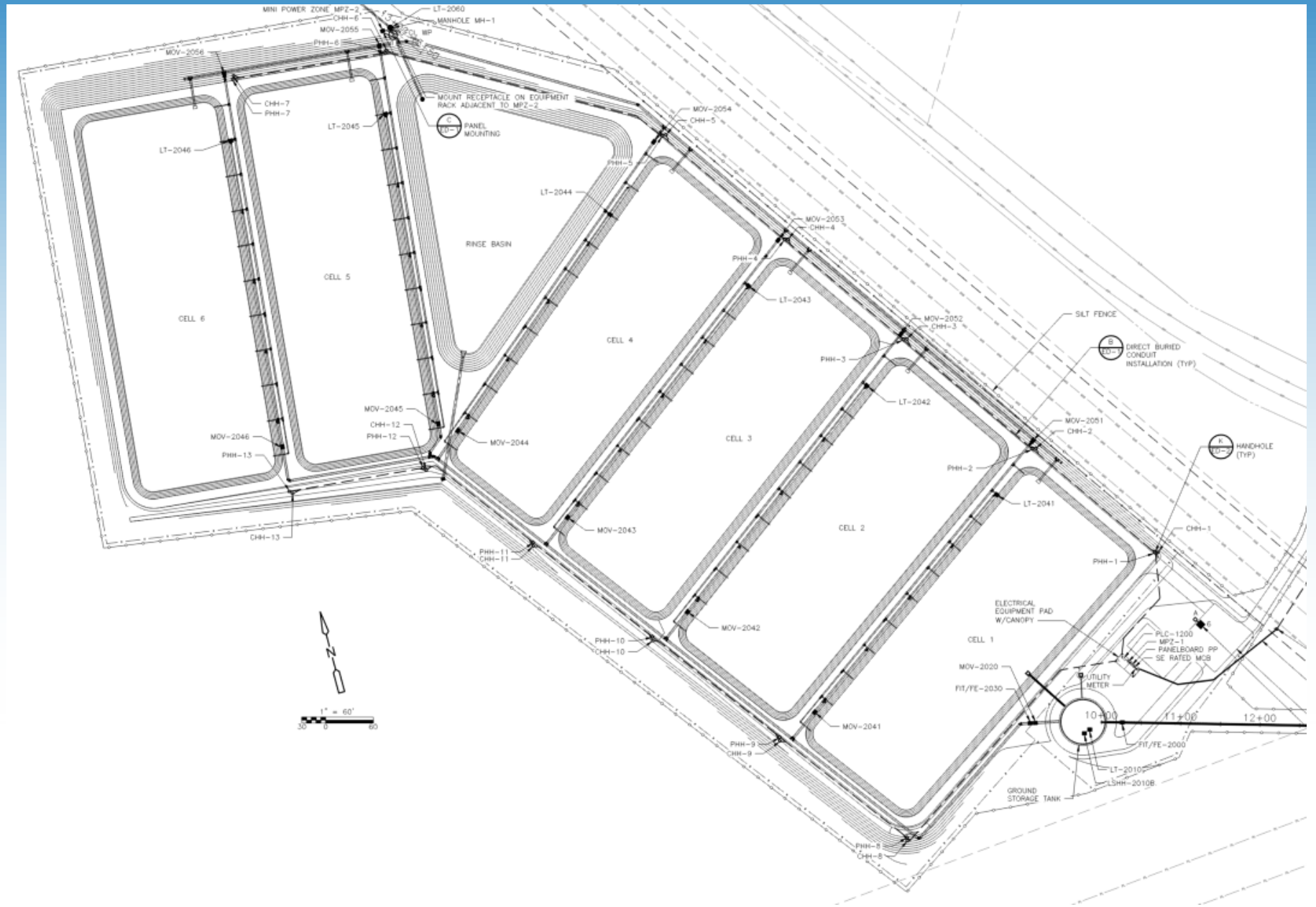
Jack and Bore under SR-21 and SR-16

A couple of HDDs to go under small tributaries to South Fork Black Creek

Yellow highlight area GT burrows



Black Creek WRD Project – Treatment System Design



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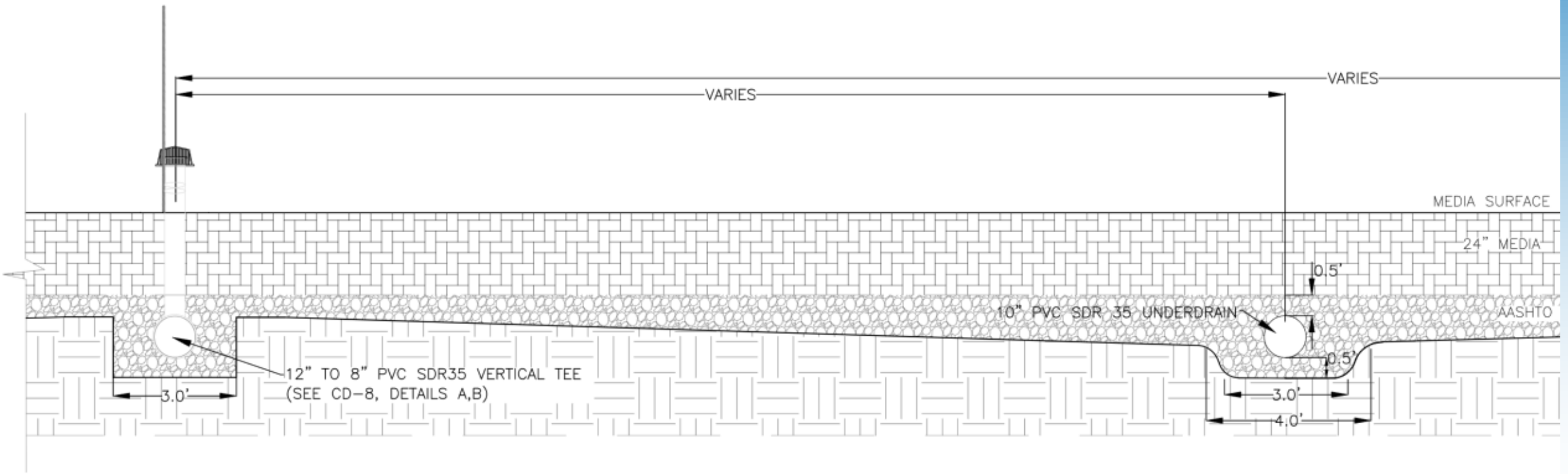
Black Creek WRD Project – Treatment System Design

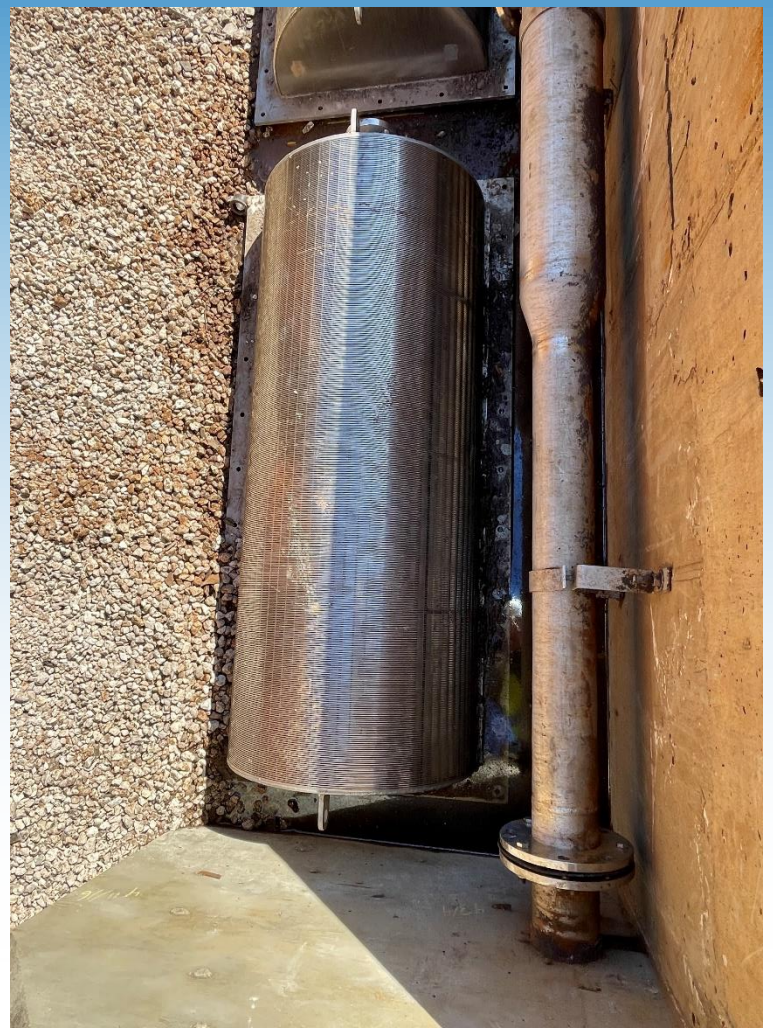


TYPICAL CELL SECTION

SECTION 1

1/2" = 1" C-10

Black Creek WRD Project – Intake Construction



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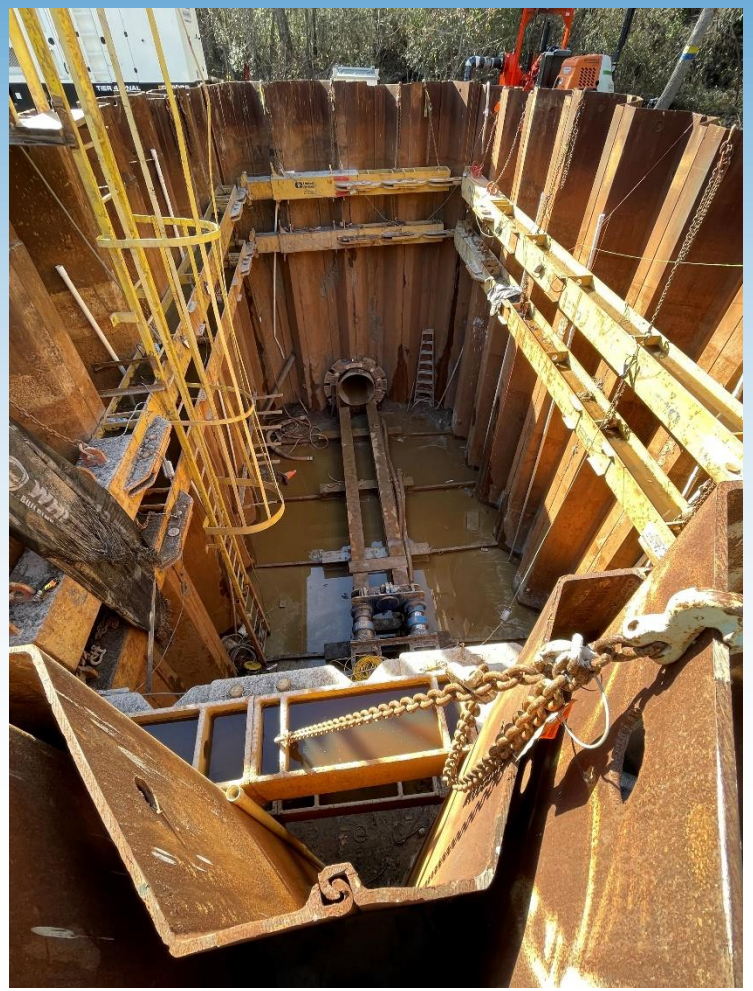
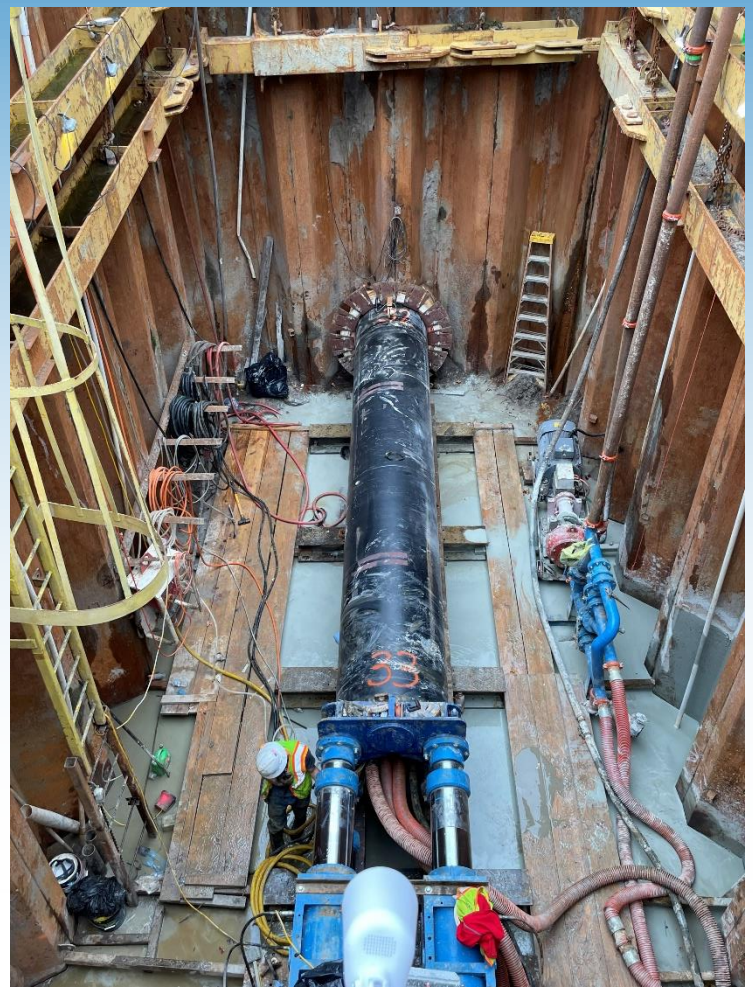
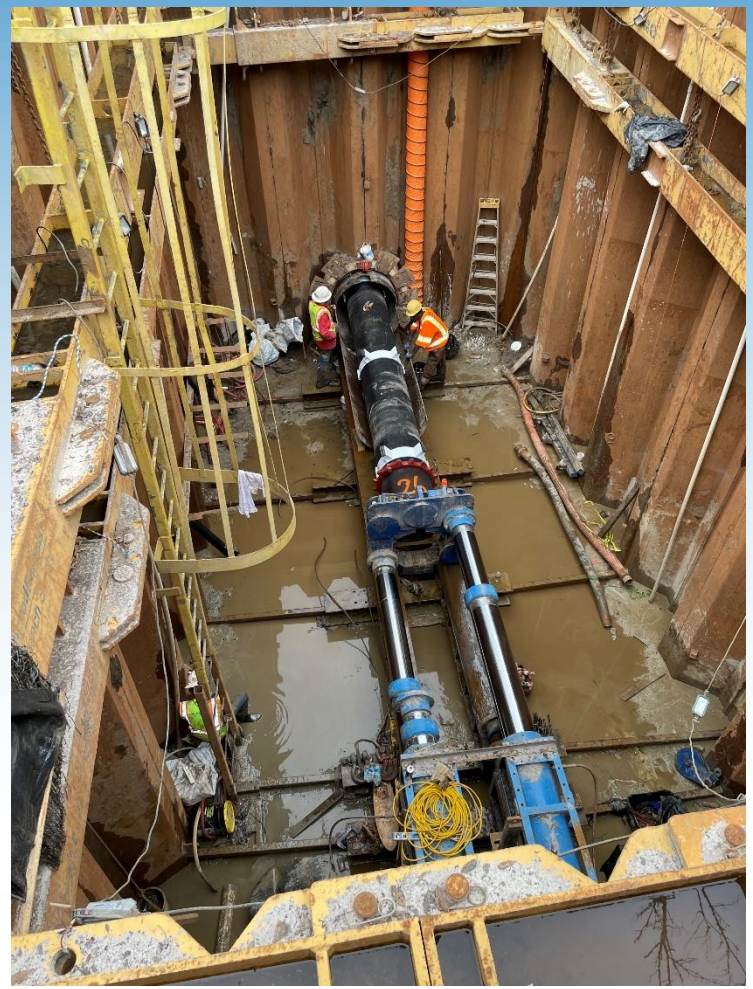
Black Creek WRD Project – Microtunnel Construction







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Black Creek WRD Project – Microtunnel Construction

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Black Creek WRD Project – Pump Station Construction

Black Creek WRD Project – Pump Station Construction

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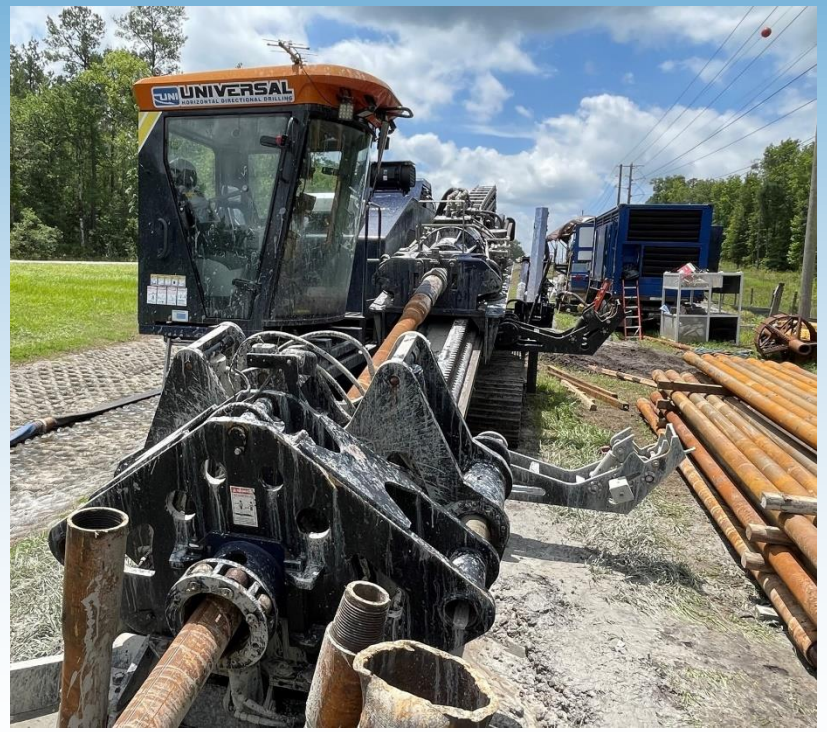
Black Creek WRD Project – Raw Water Transmission Main Construction



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Black Creek WRD Project – Treatment System Construction

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Black Creek WRD Project – Treatment System Construction

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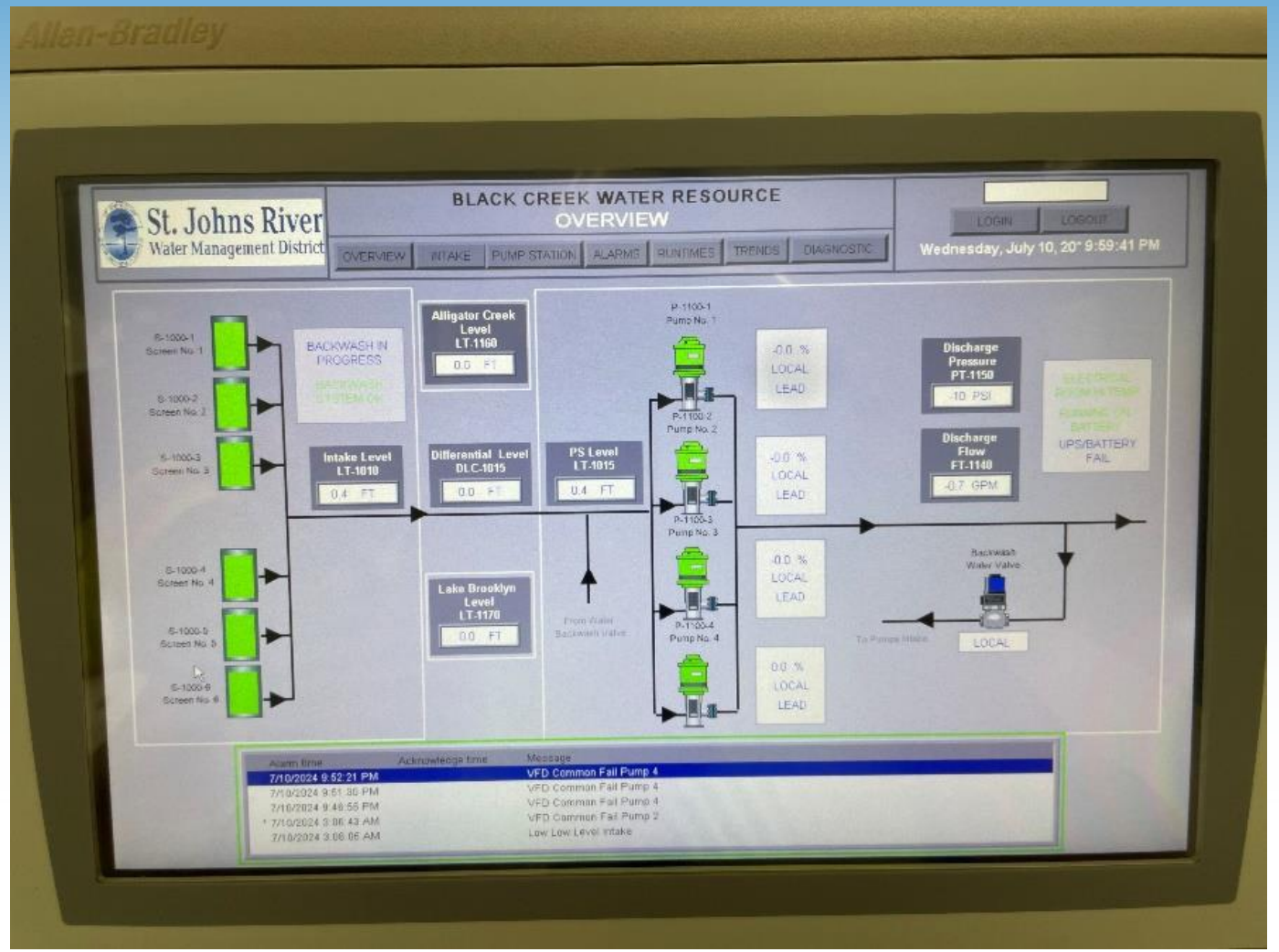
Start-Up and Testing

Black Creek WRD Project – Pump Station and Pipeline Start-Up and Testing



Black Creek WRD Project – Treatment System Start-Up and Media Testing

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Schedule for Start-up and Testing

- February 2025 — Pump Station and Pipeline Start-Up
- March 2025 — Cell 1 Rinsing and Testing
- June 2025 — Cells 2-3 on-line
- December 2025 — Cells 4–6 on-line
- April 2026 — Project Turnover to SJRWMD

Acknowledgements

Questions

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