
George W. Shannon Wetlands at Richland-Chambers

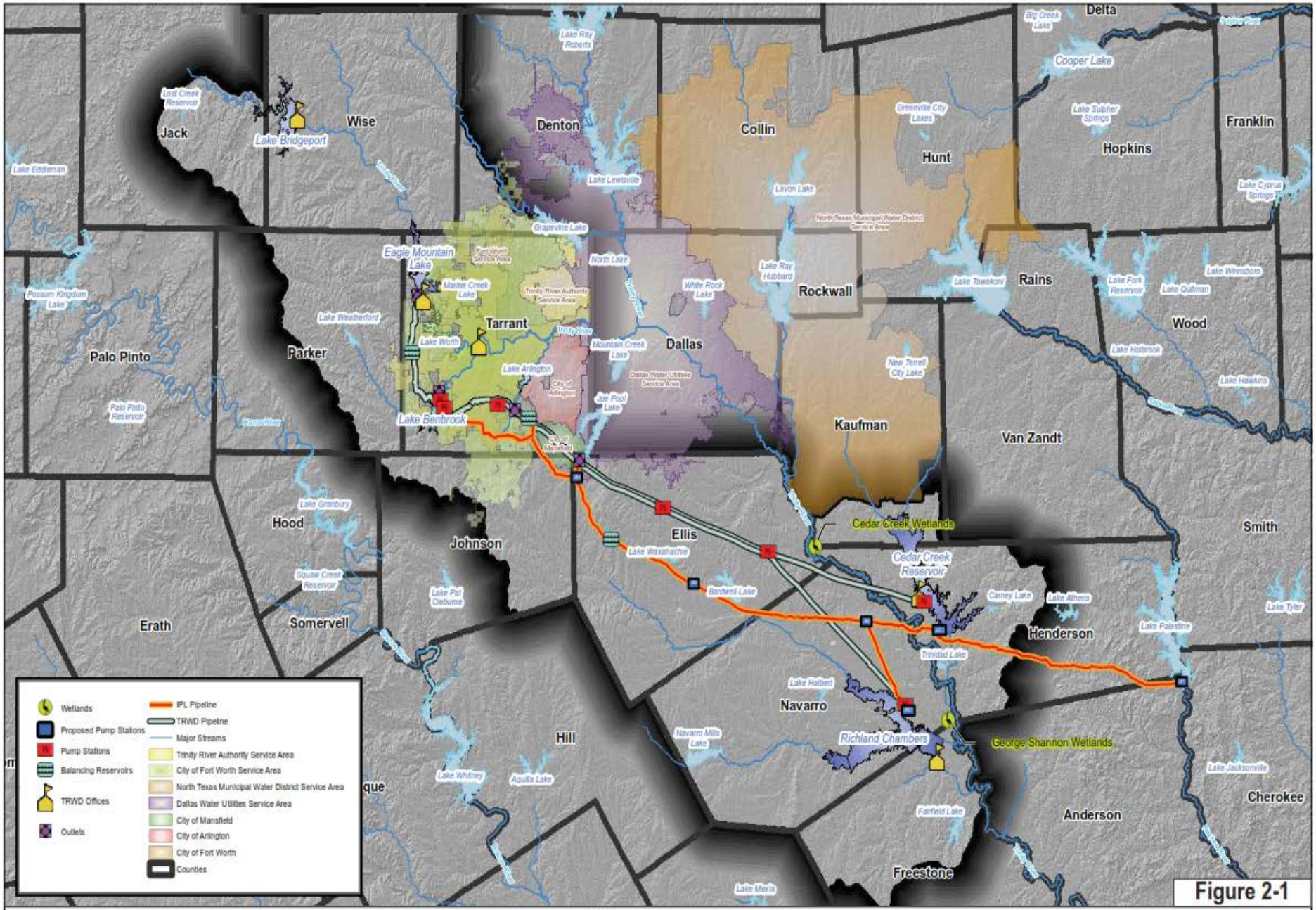

Figure 2-1

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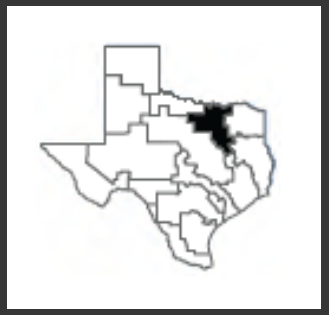
Tarrant Regional Water District
WATER SUPPLY SYSTEM

Disclaimer:
This data is an approximation based upon the best information available at the time of printing. Information contained on this map is intended for general planning level use only and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and only represents approximate relative locations. The Tarrant Regional Water District is not liable for misuse of this information or derivative products resulting from this map.

0 5 10 20 Miles

N W E S

Region C: 2060 Long-Range Water Management Strategies



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1990 Long-Range Plan concluded that the District should pursue the option to divert water from the Trinity into its reservoirs

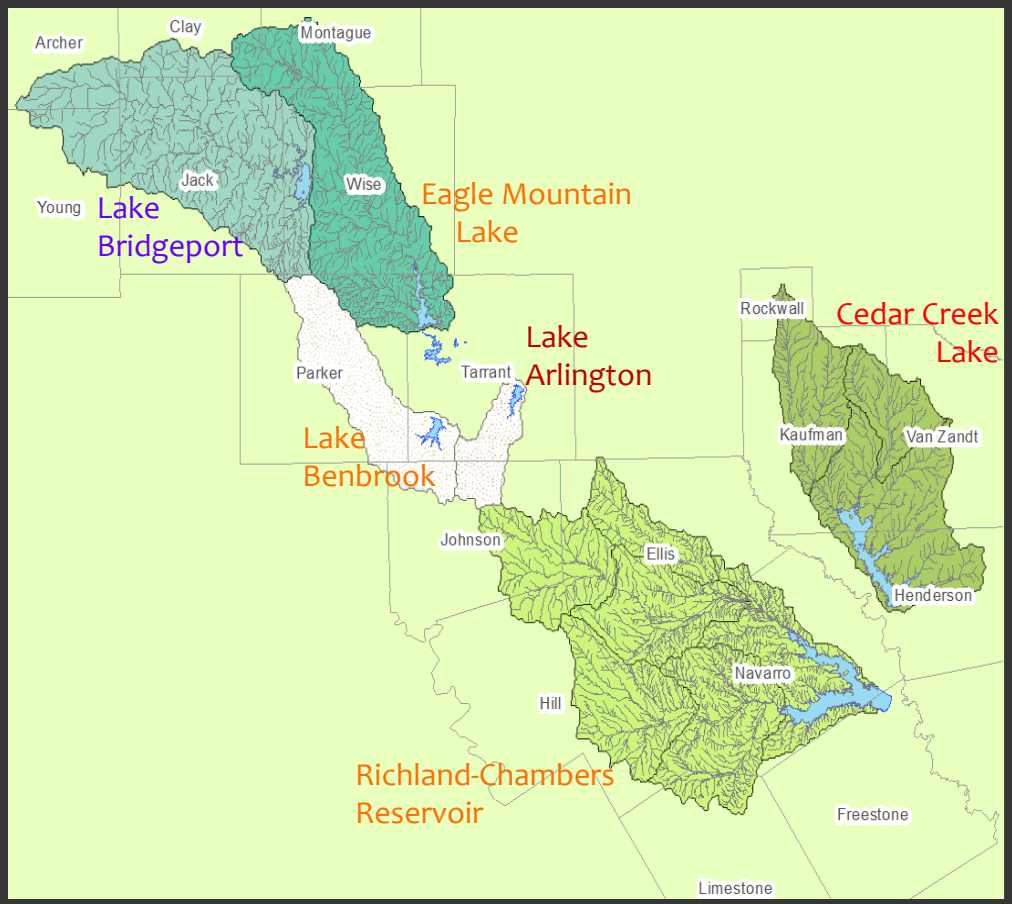
Water Resource Challenges

Water Quality: Eutrophication

20-Year Trend Study

Chlorophyll-*a*

Lake	Median (u/gL)	⇧ Trend (%APR)
Arlington	27.5	6.23
Cedar Crk	20.0	3.60
Eagle Mtn	18.8	2.84
Richland	11.4	2.70
Benbrook	16.7	2.48
Bridgeport	3.5	1.79



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3 Types of Reuse Considered by TRWD

Wetlands

Chemical Treatment

Aquaculture

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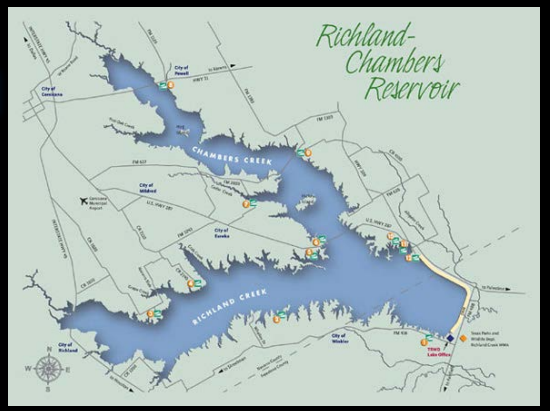
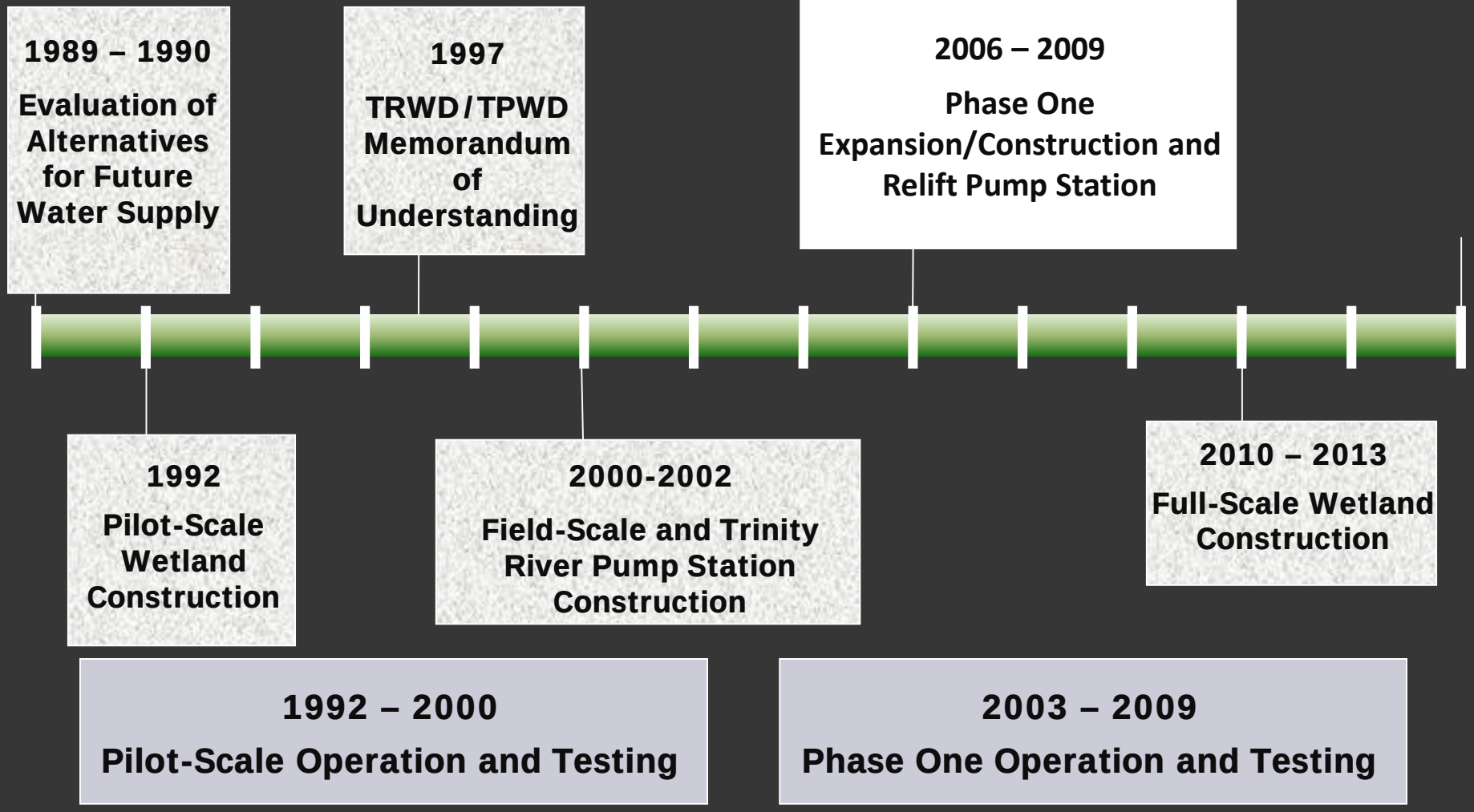
Constructed Wetlands for Water Reuse



TRWD WETLANDS

Project Timeline



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TRWD Pilot-Scale Wetland Project

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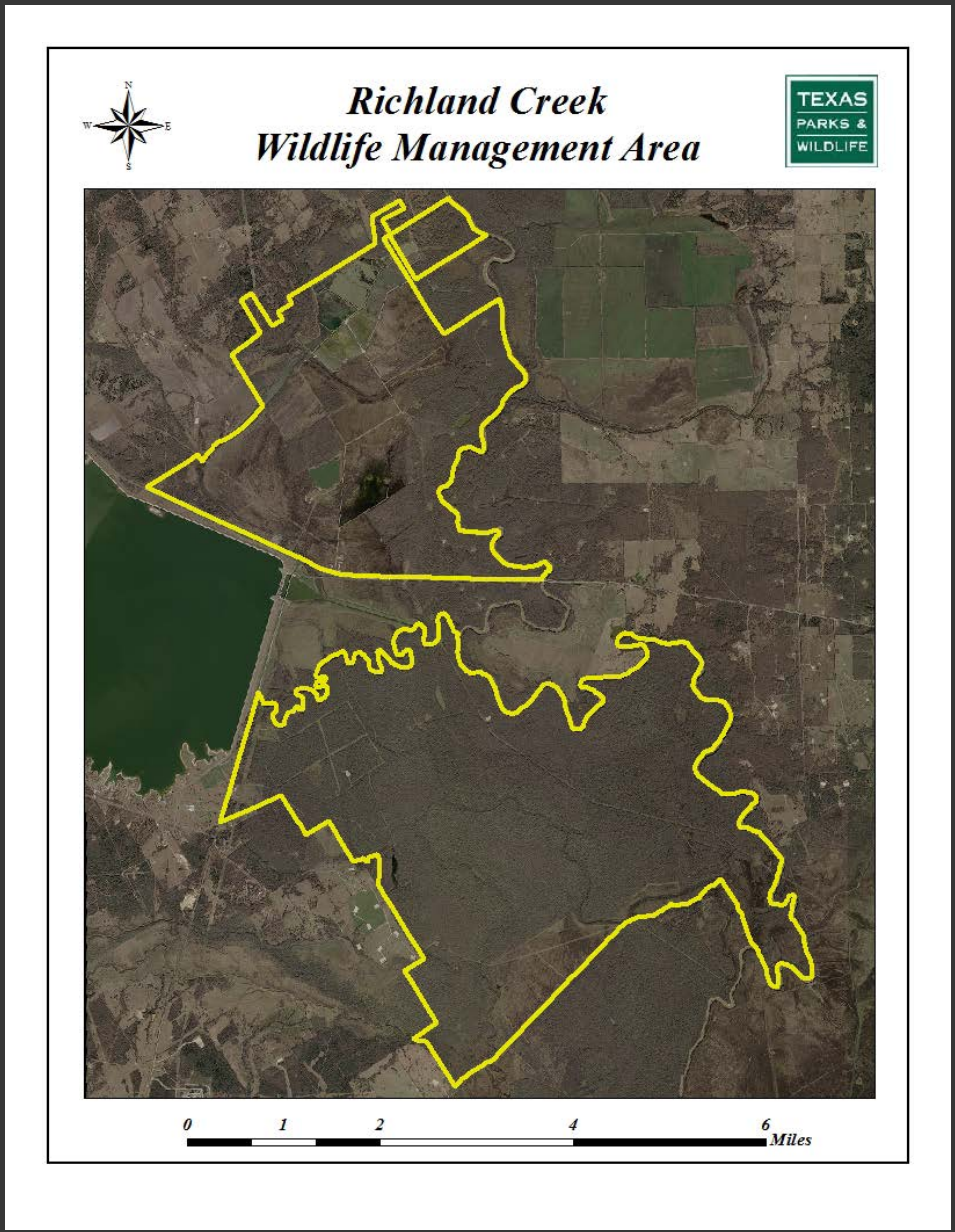
RC Reservoir Construction Mitigation

TPWD RCWMA
North Unit: 5,000 acres
South Unit: 8,000 acres



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Field Scale Construction 2000-2003

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Full Scale Wetland Operation October 2013

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Constructed Wetlands

- 5 major components:
  - River Pump Station
  - Sedimentation Basins
  - Conveyance Canals
  - Wetland Cells
  - Relift Pump Station

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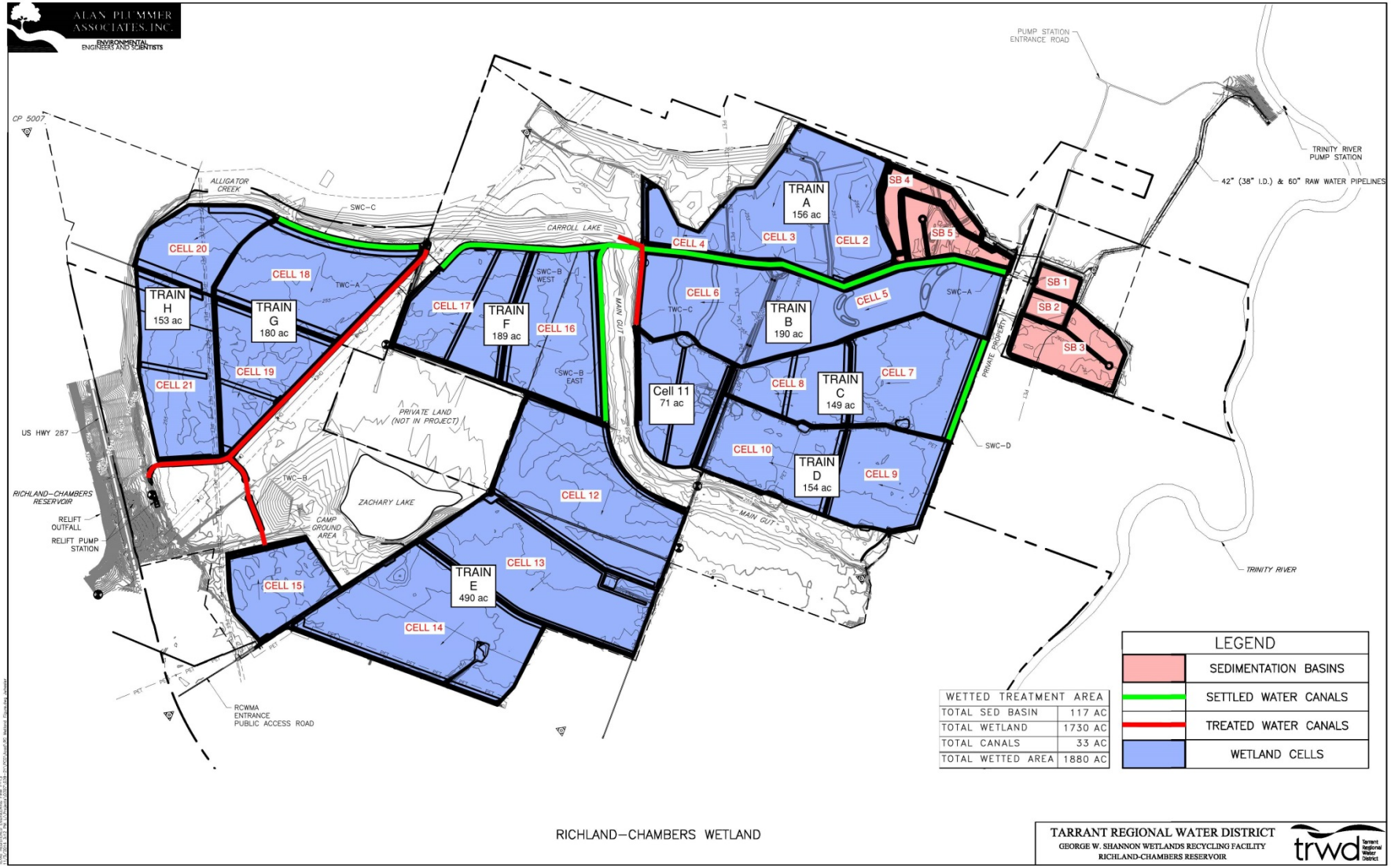

WETLAND LAYOUT

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SED. BASINS 1 - 5

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TYPICAL WETLAND CELL

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WETLAND SYSTEM STRUCTURES

SB3, 4, & 5 INFLOW STRUCTURE

COLLECTION POOL OUTFLOW STRUCTURE

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WETLAND SYSTEM STRUCTURES

TYP. PH II INTERMEDIATE STRUCTURE

TYP. FIELD SCALE OUTFLOW STRUCTURE

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- Wetland Plants Play a Key Role in Wetland Treatment Performance by:
  - Shading the water column
  - Providing media for microbial growth
  - Aiding in cycling organic carbon and nutrients
- Wetland Plant Types
  - Emergent vegetation
  - Submerged Aquatic Vegetation (SAV)
- A diverse mixture of emergent and submerged aquatic species is desirable to provide robust water quality improvement.

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EMERGENT VEGETATION

FIELD-SCALE AND PHASE I

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SUBMERGED AQUATIC VEGETATION

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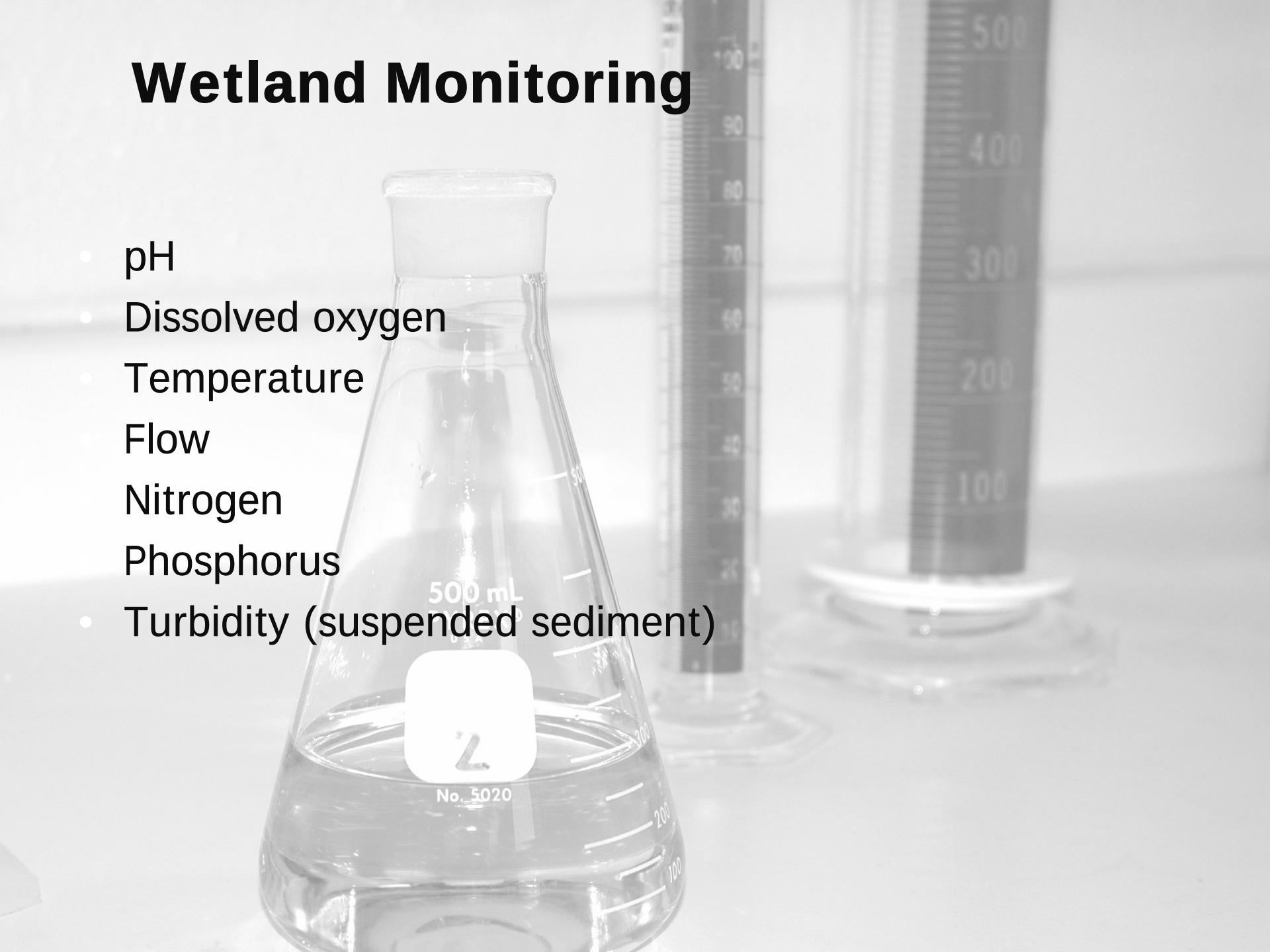
Wet Cell 14 Summer 2014

Wetland Monitoring



- pH
- Dissolved oxygen
- Temperature
- Flow
- Nitrogen
- Phosphorus
- Turbidity (suspended sediment)

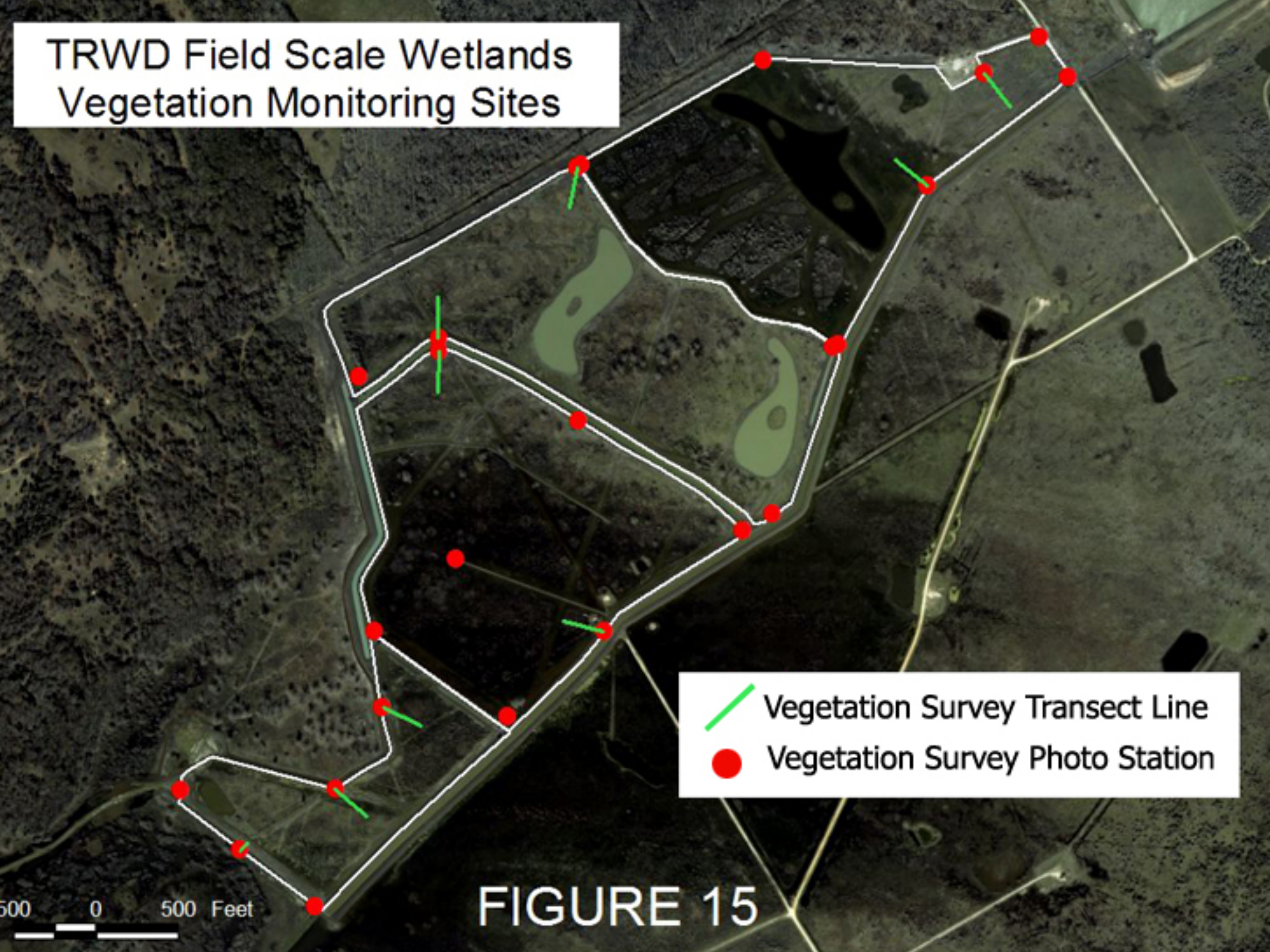
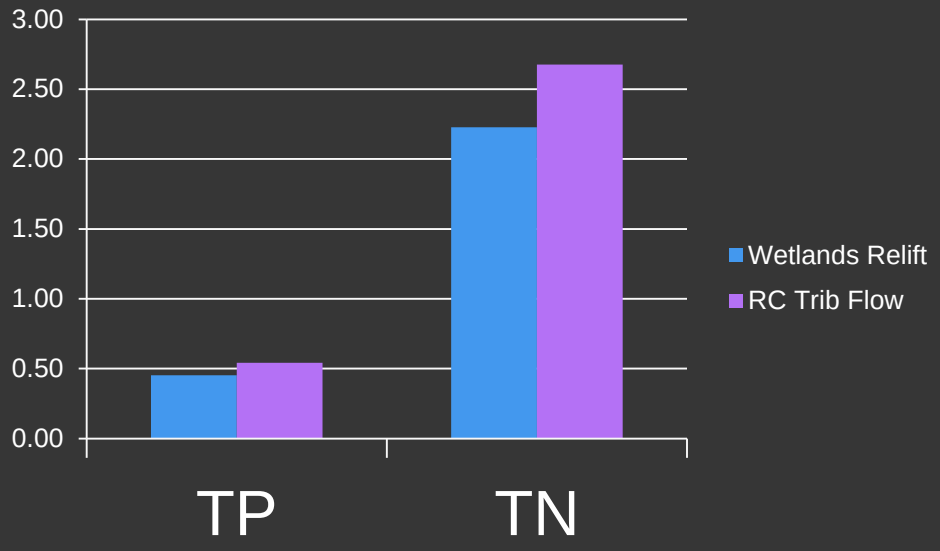
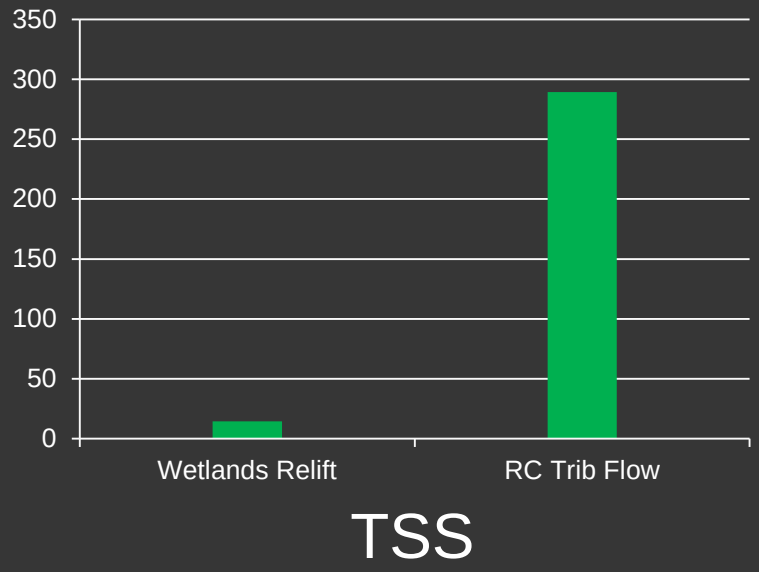

TRWD Field Scale Wetlands
Vegetation Monitoring Sites
Vegetation Survey Transect Line
Vegetation Survey Photo Station
500 0 500 Feet

FIGURE 15

Wetland vs. RC Tributary: Water Quality
(April 2015)





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Wetland Treatment Performance Full Scale Operation

Full Scale Operation Oct 2013 – March 2015 (n=45)									
	Average Concentration In (mg L^{-1})			Average Concentration Out (mg L^{-1})			Percent Concentration Reduction		
Location	TSS	TN	TP	TSS	TN	TP	TSS	TN	TP
Sed Basins	139.10	8.53	1.03	35.27	8.03	0.94	75%	6%	8%
Wetlands	35.27	8.03	0.94	15.30	2.27	0.44	57%	72%	53%
Overall System	139.10	8.53	1.03	15.30	2.27	0.44	89%	73%	57%

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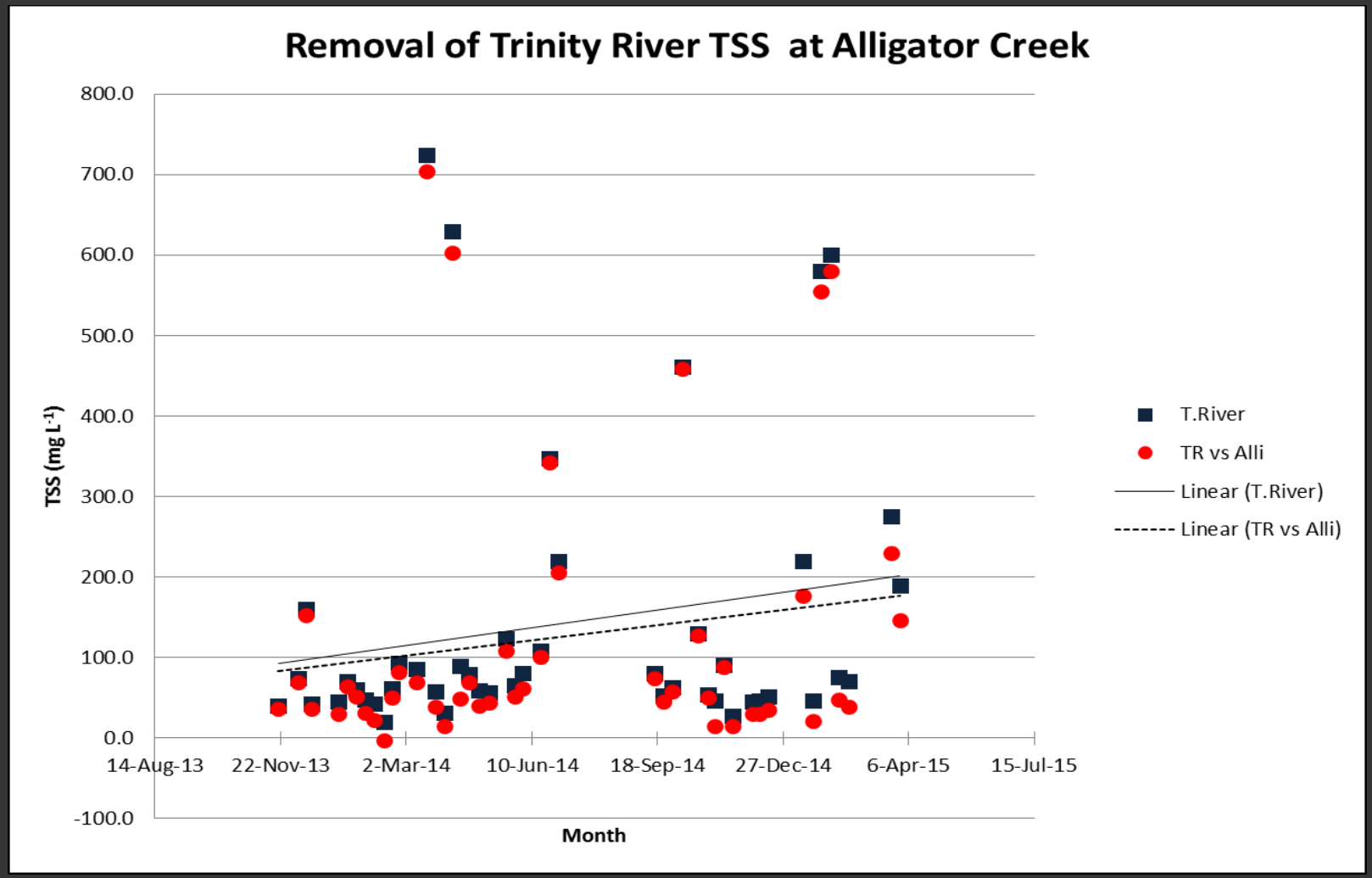
Wetland Treatment Performance Full Scale Operation



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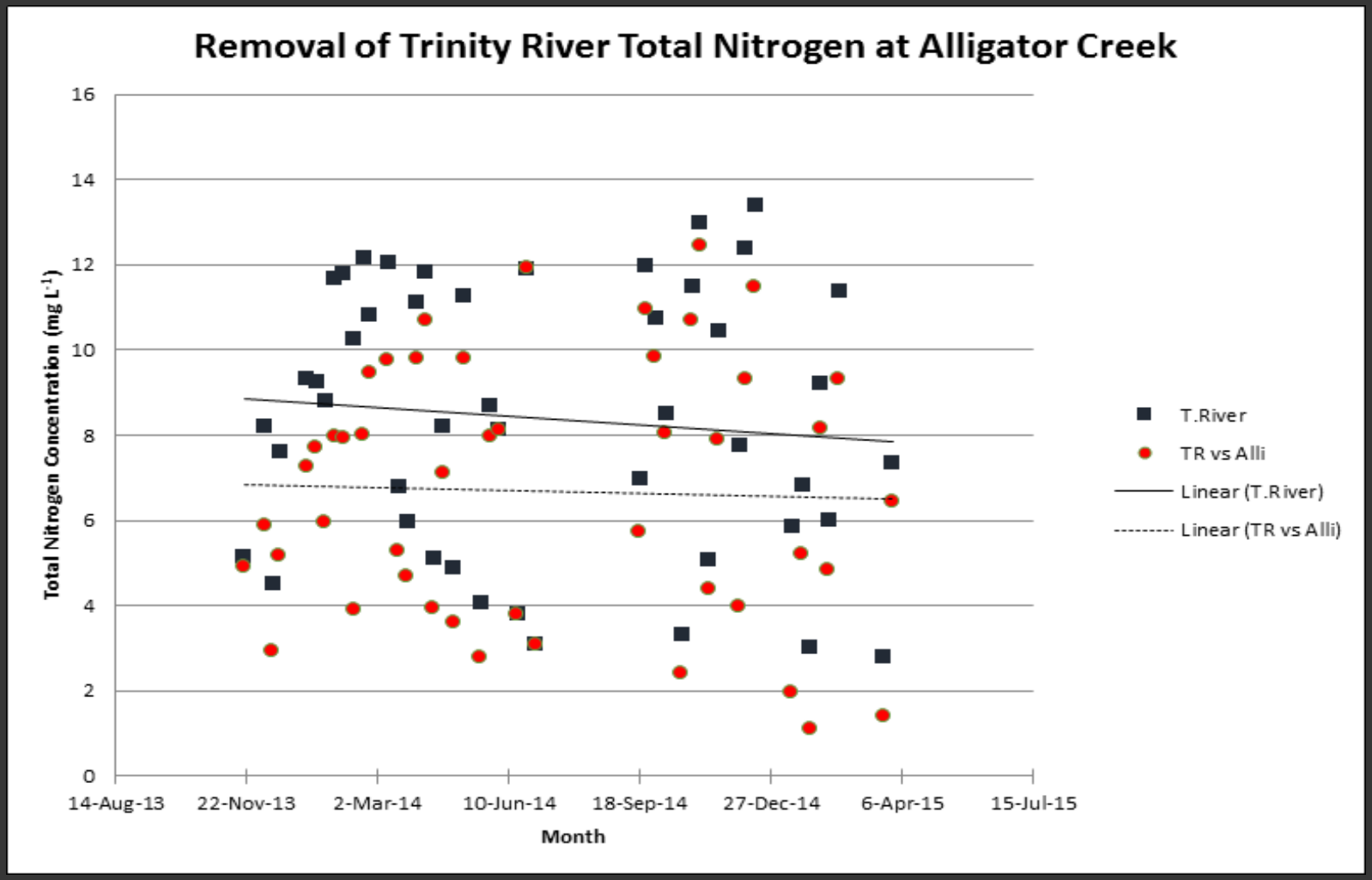
Wetland Treatment Performance Full Scale Operation



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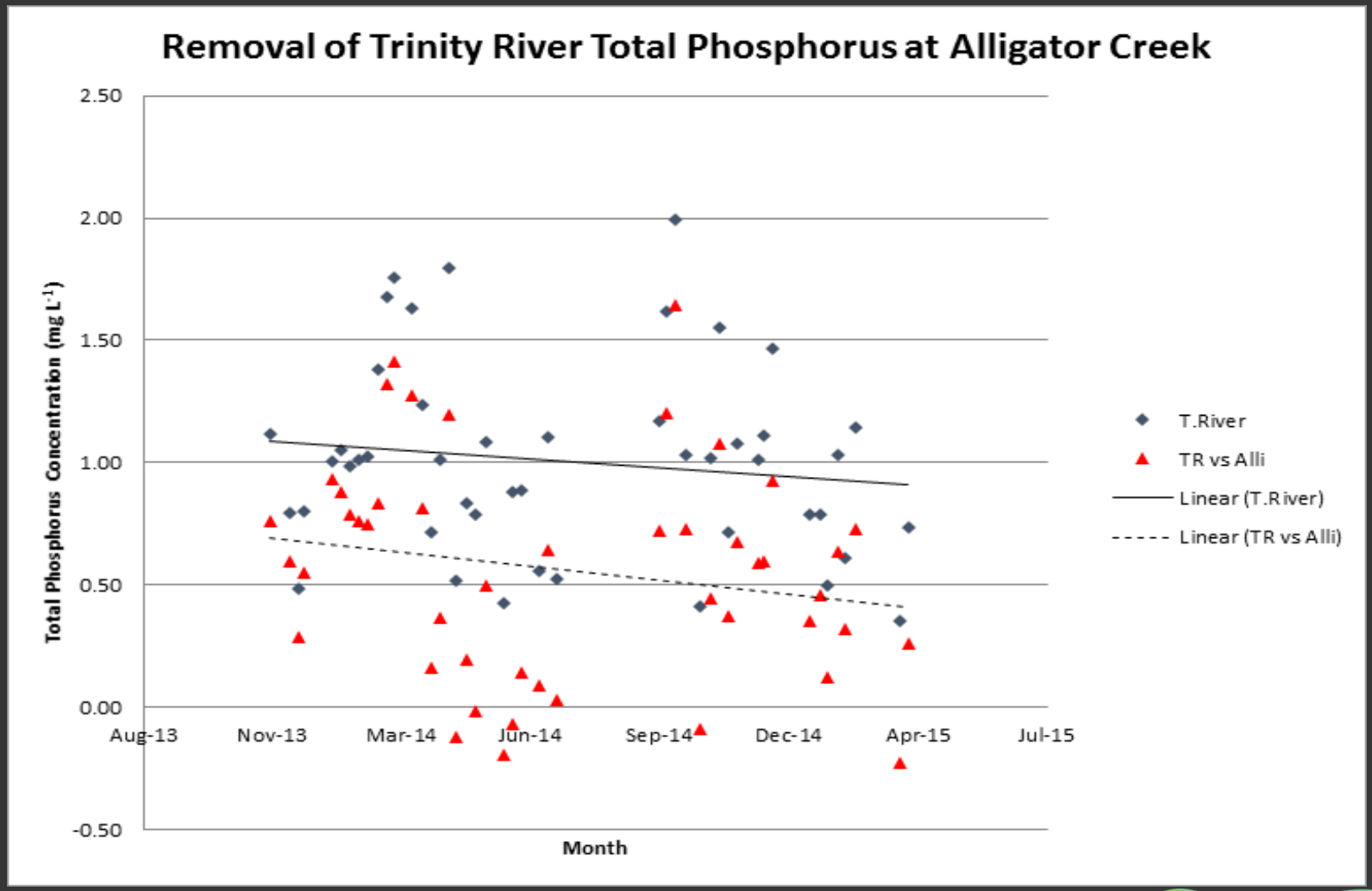
Wetland Treatment Performance Full Scale Operation



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Outreach and Education


Questions?
chris.zachry@trwd.com