



# Strategic Planning

## Water Resources Technical Committee

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March 13, 2020



# Agenda

## Part I, Long Range/Integrated Planning

Pam Kenel, P.E.

Director of Water Resources

## Part II, Collection System Planning

Darrin Geldert, P.E.

Senior Planning Engineer

## Part III, Broad Run WRF Planning

Kendra Sveum, P.E.

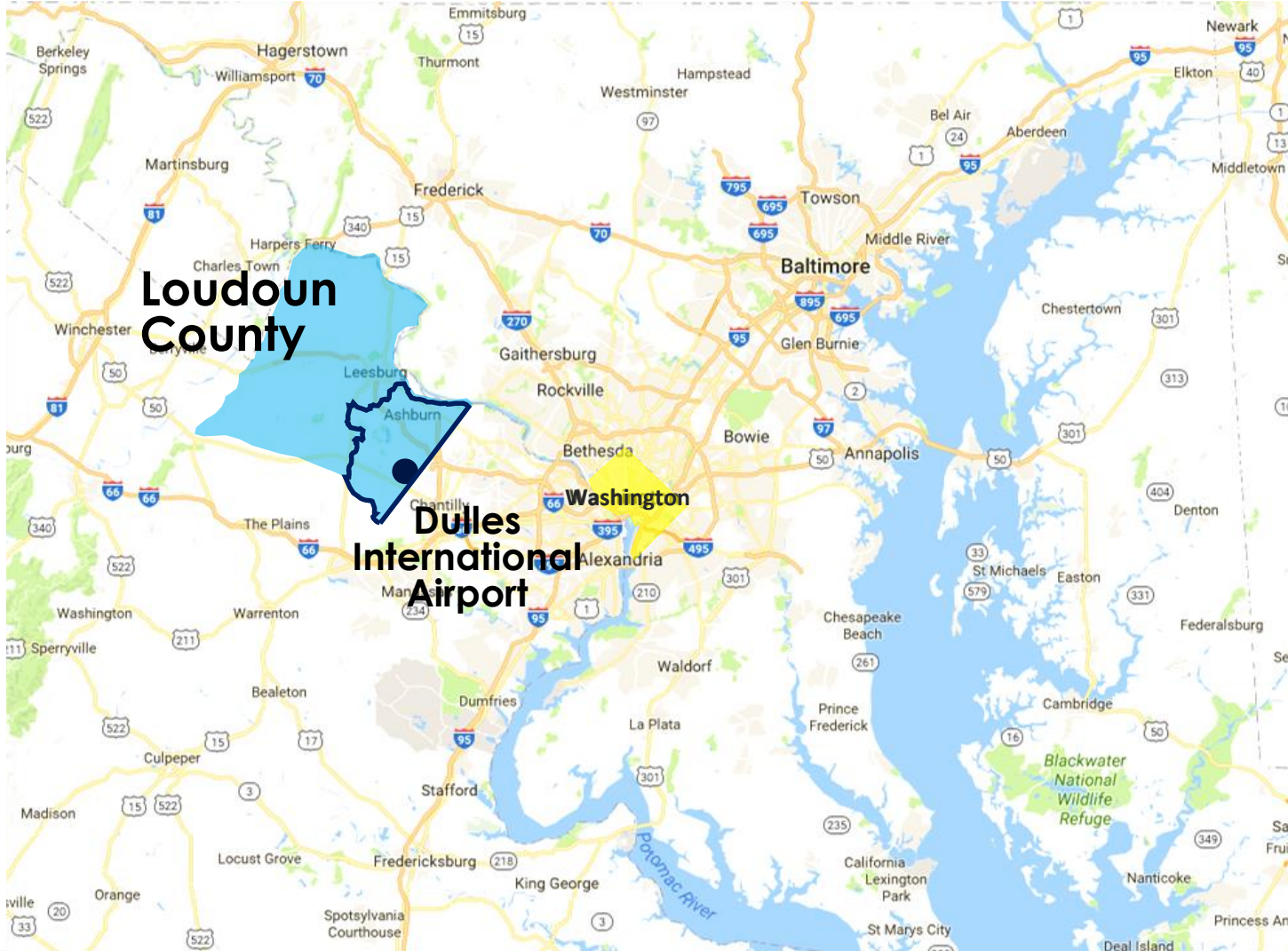
BRWRF Plant Engineer



# Long Range/Integrated Planning



# Loudoun Water - Loudoun County, VA



## Population (County)

2019



412,000

## Customers (Loudoun Water)

2019



310,000



142,000

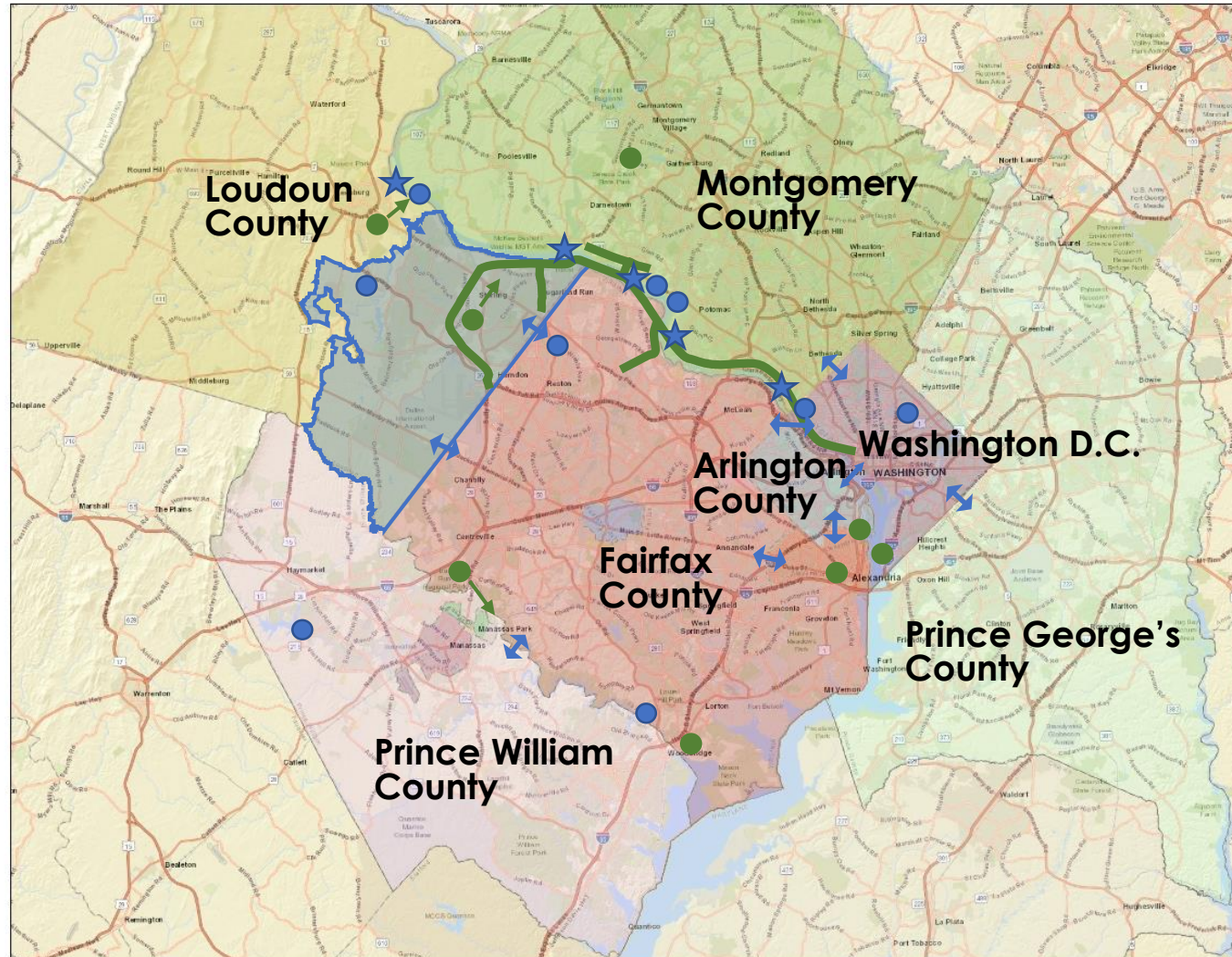


24 MGD (A)







43 MGD (M)



# We are Connected



## Legend

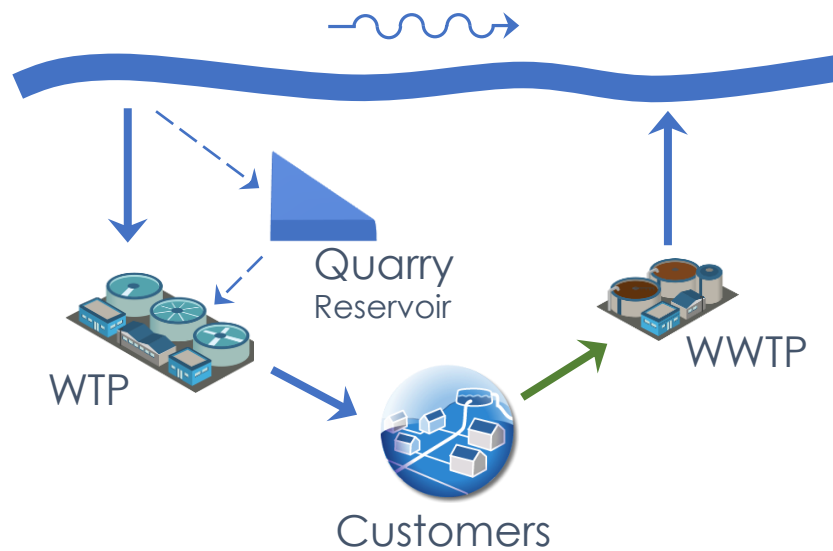
-  Loudoun Water Central Service Area
-  Connection to Neighboring System
-  Potomac River Raw Water Intake
-  Water Treatment Facility
-  Wastewater Treatment Facility
-  Potomac Interceptor



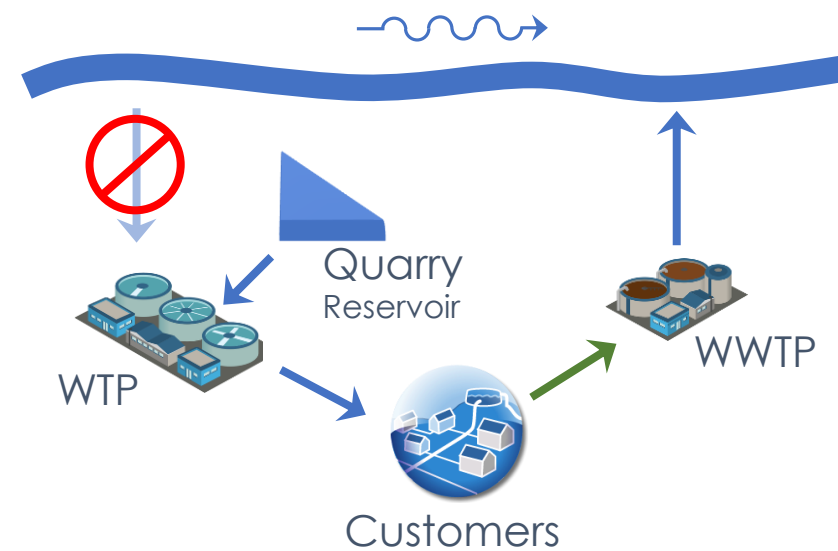
# Potomac River Withdrawal Conditions



Sufficient Flow in Potomac River



Low Flow in Potomac River

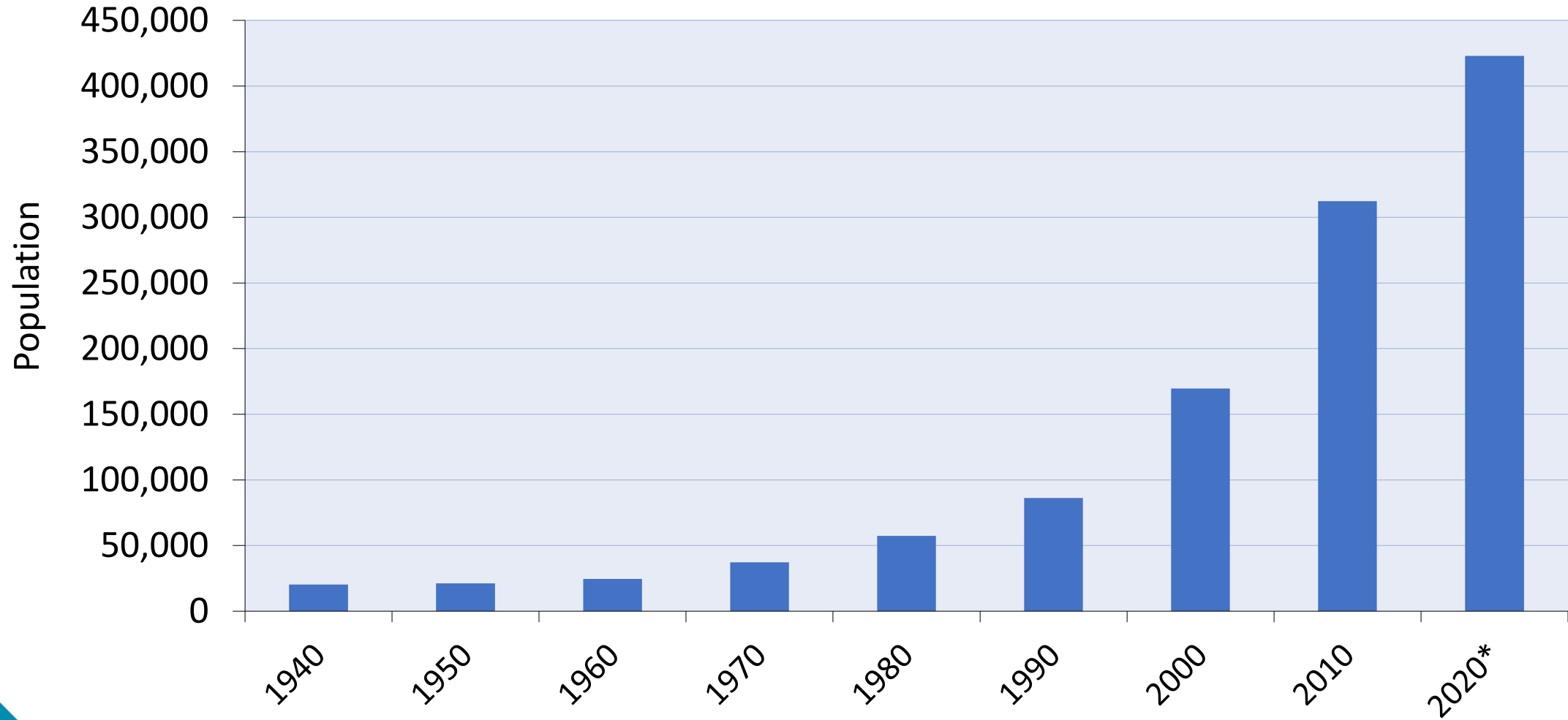




# Collection System Planning



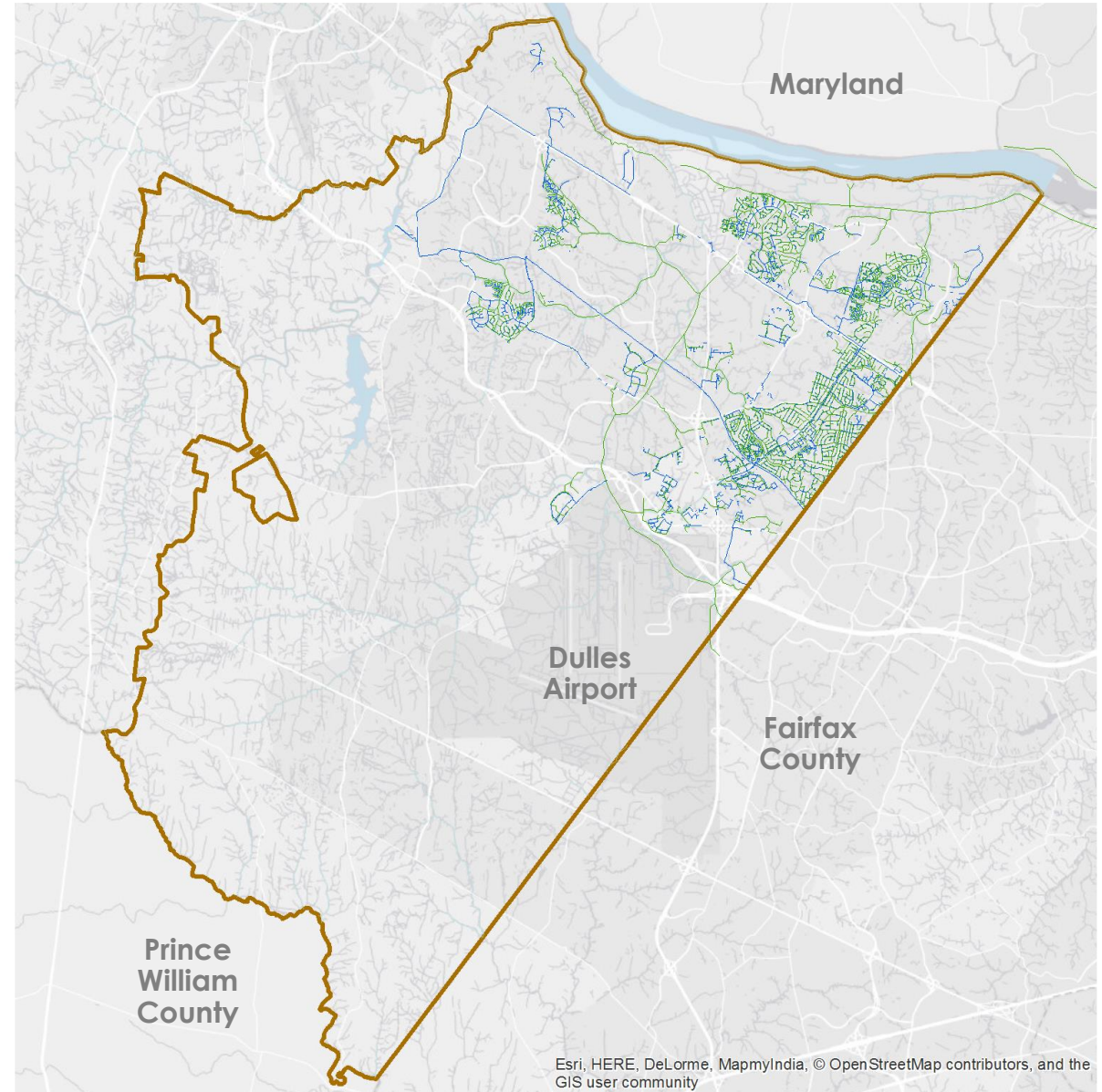
# Loudoun County – Historical Growth







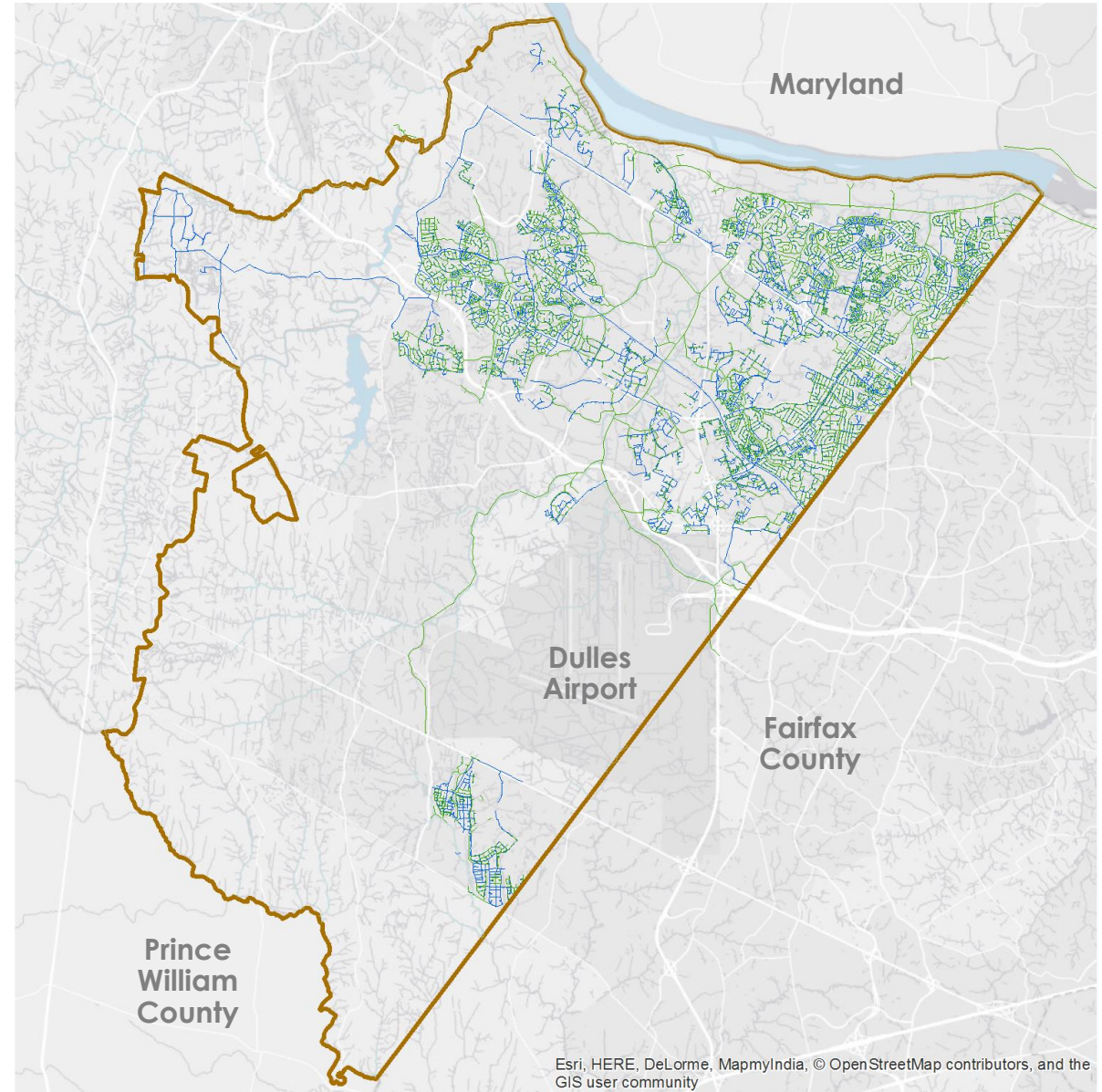
# 1990 Water & Sewer Systems



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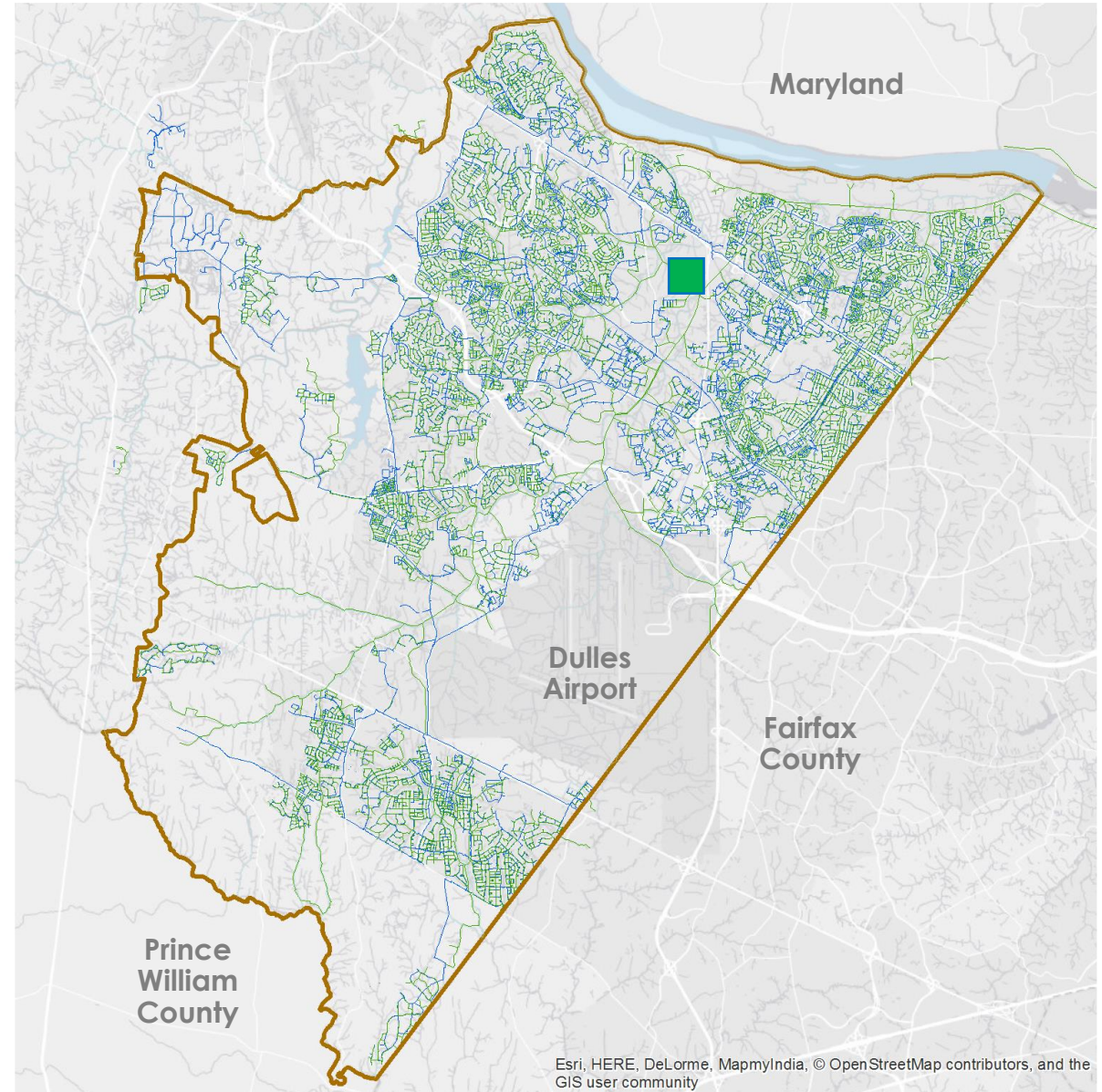


# 2000 Water & Sewer Systems



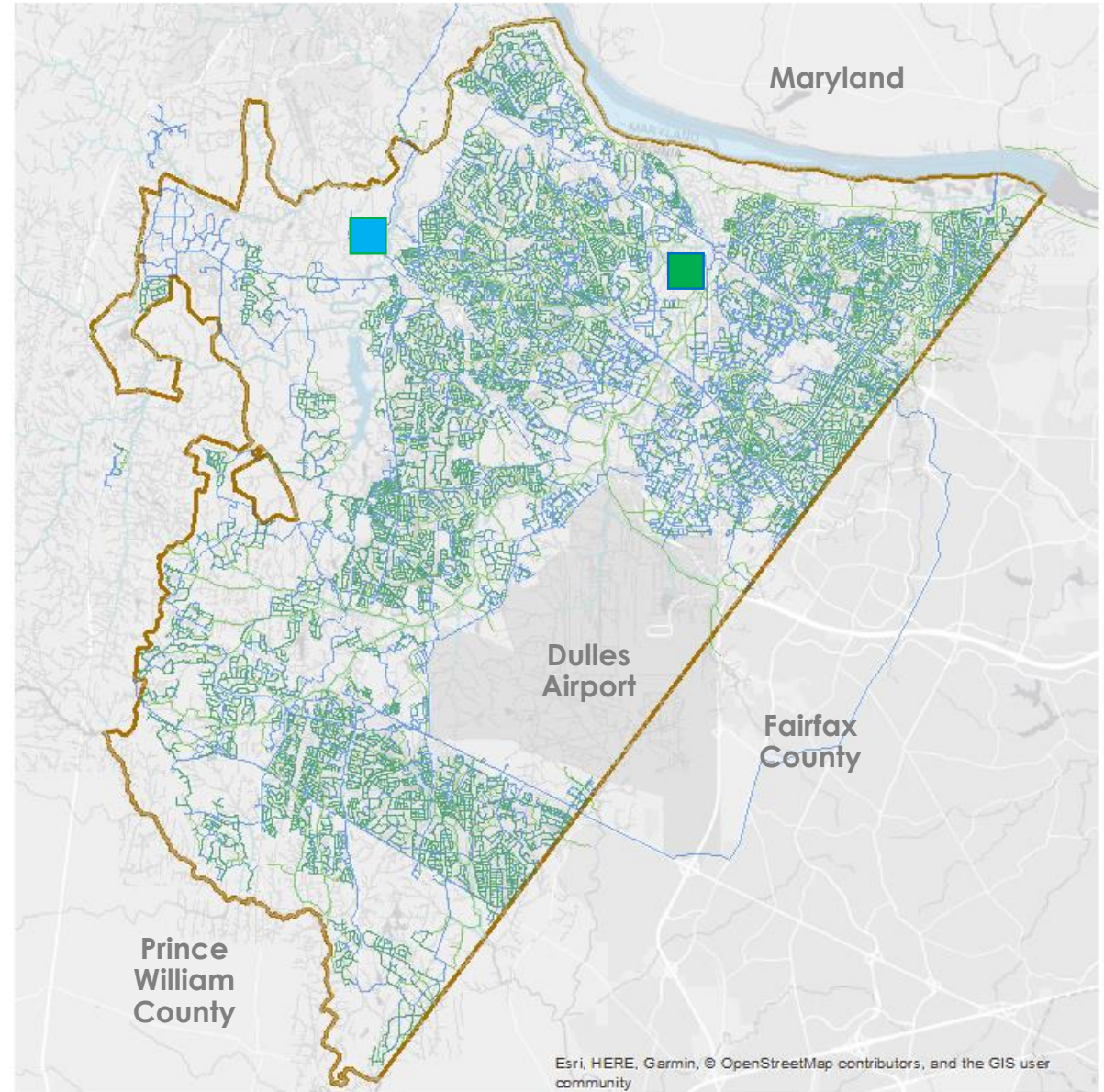


# 2010 Water & Sewer Systems



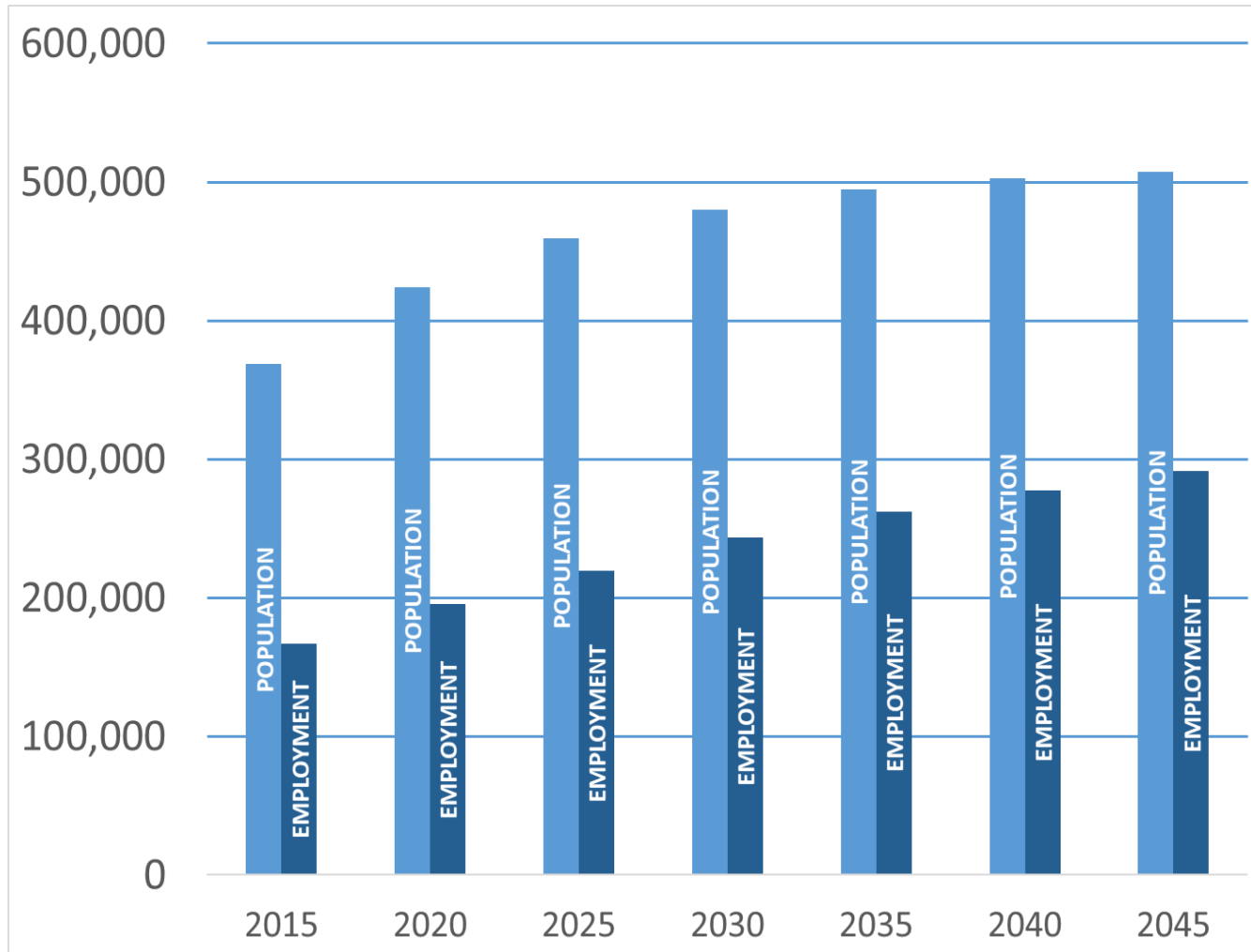


# 2019 Water & Sewer Systems





# Loudoun County – Projected Growth

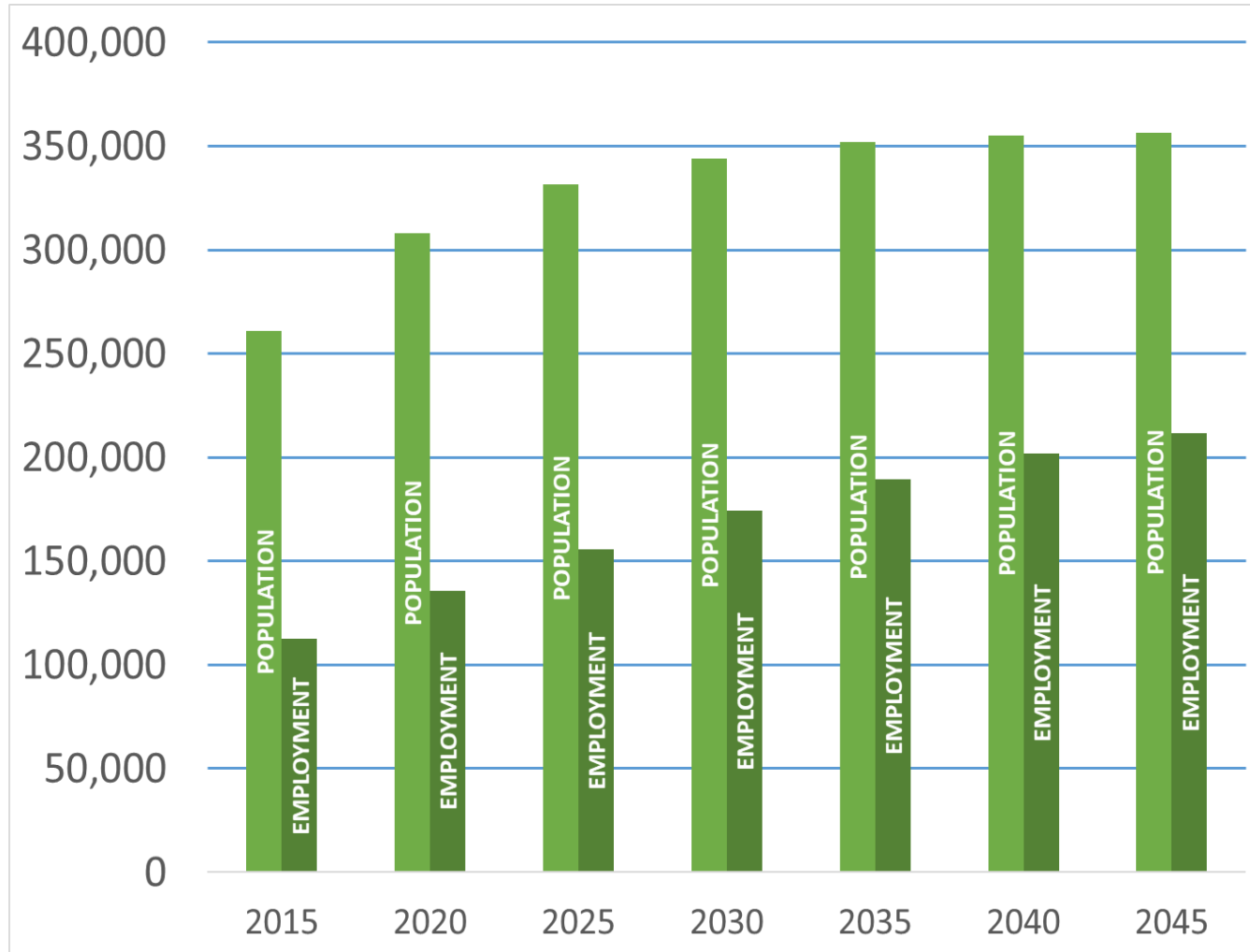


## LOUDOUN COUNTY POPULATION AND EMPLOYMENT ESTIMATES

2015 TO 2045  
**+ 139,000 PEOPLE**  
**+ 124,000 EMPLOYEES**



# Loudoun Water – Projected Growth



**LOUDOUN WATER WILL SERVE  
OVER 70% OF NEW GROWTH**

**2015 TO 2045**

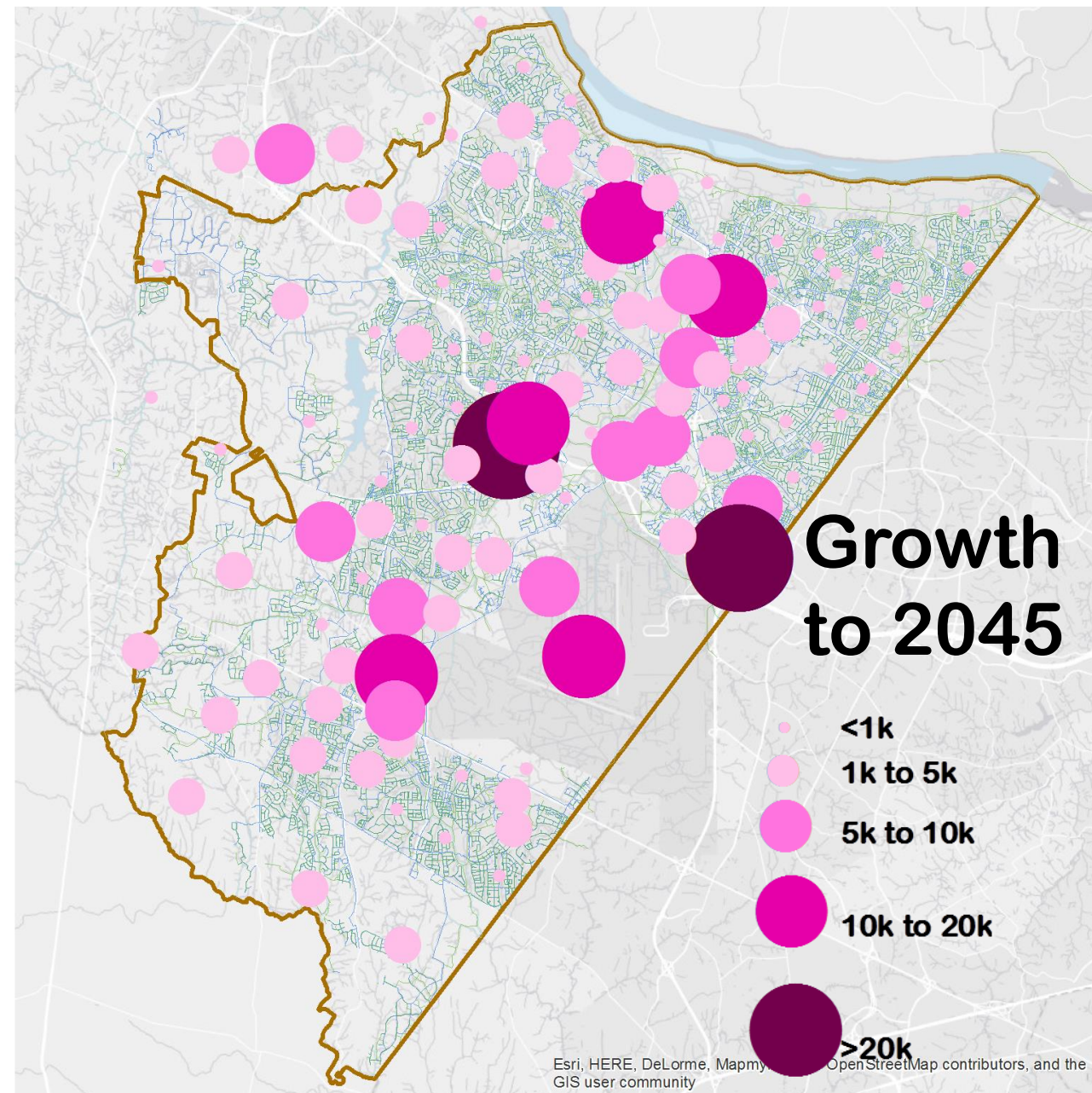
**LW CENTRAL SERVICE AREA  
GROWTH**

**+ 95,000 PEOPLE**

**+ 99,000 EMPLOYEES**

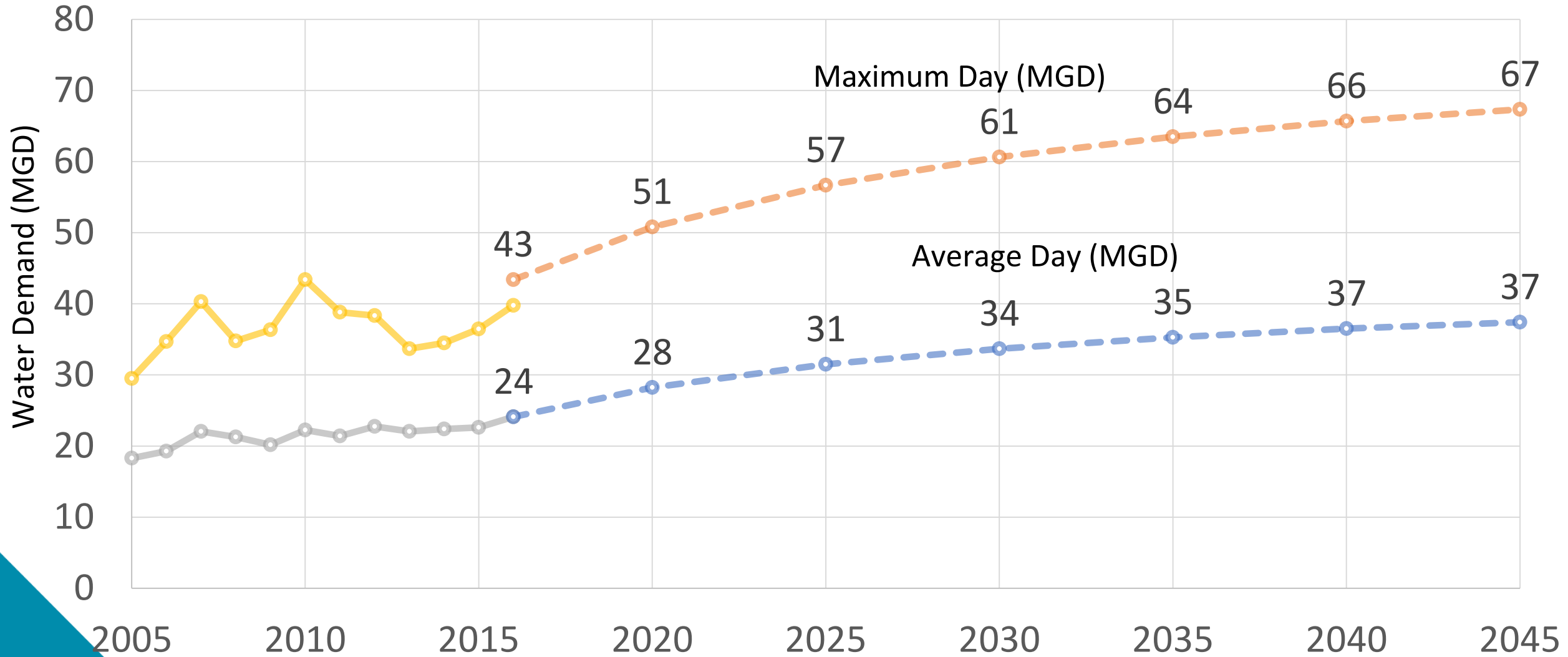


# Population and Employment Growth





# Water Demand Projections

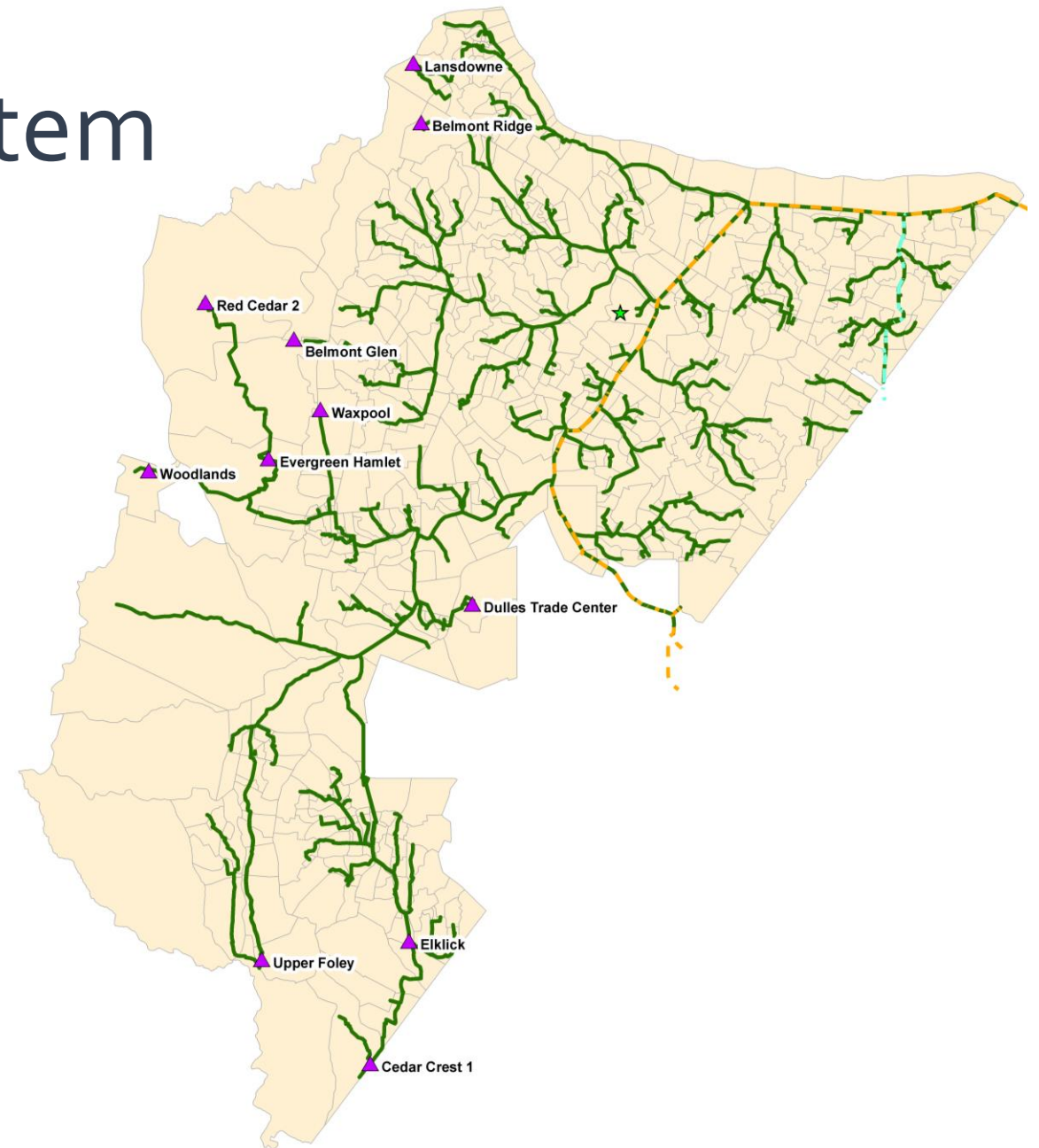






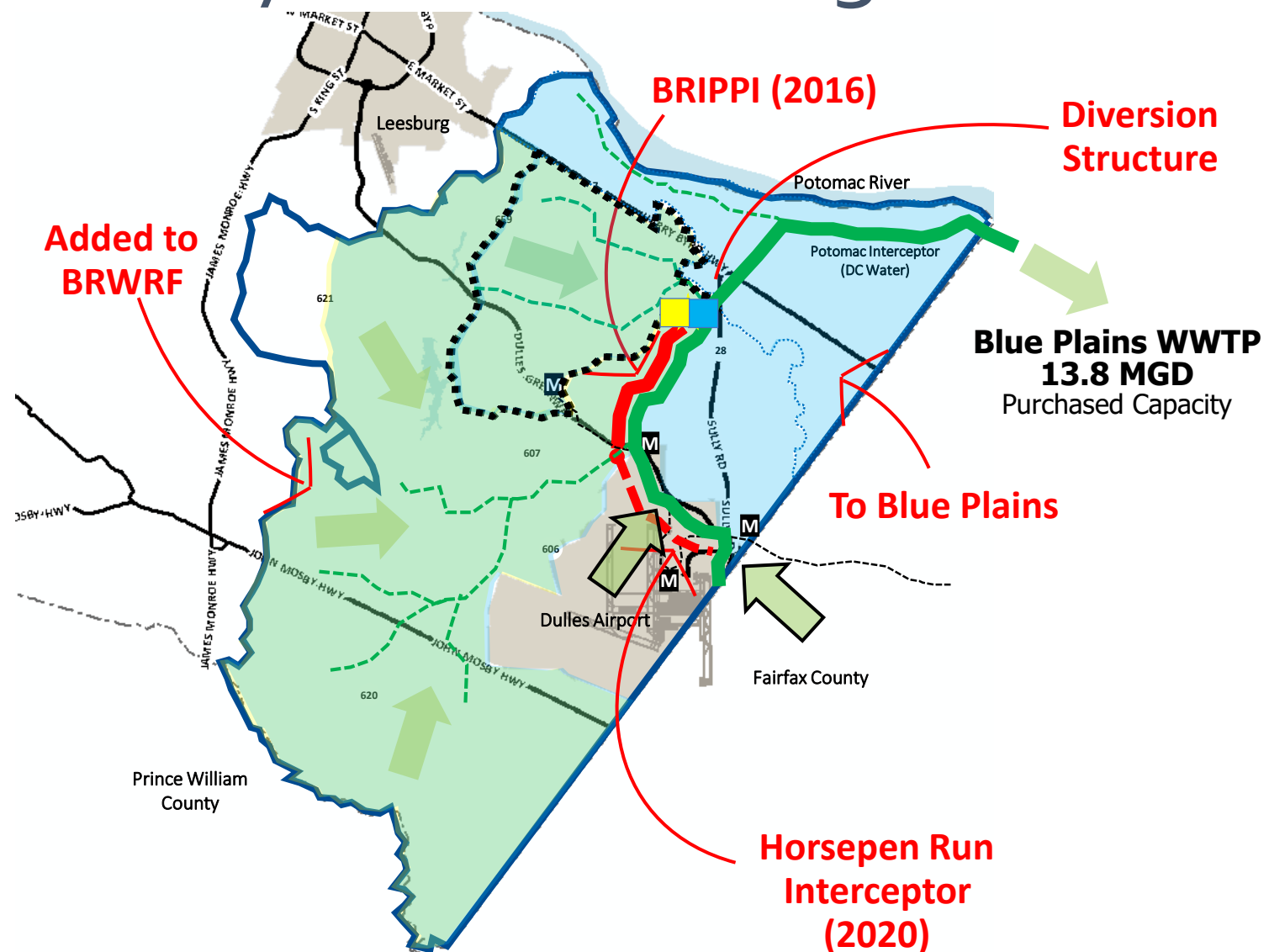
# 2016 Collection System Master Plan

- Flow Projections to 2040 (COG), extrapolated to 2070
- Multiple Design Storms



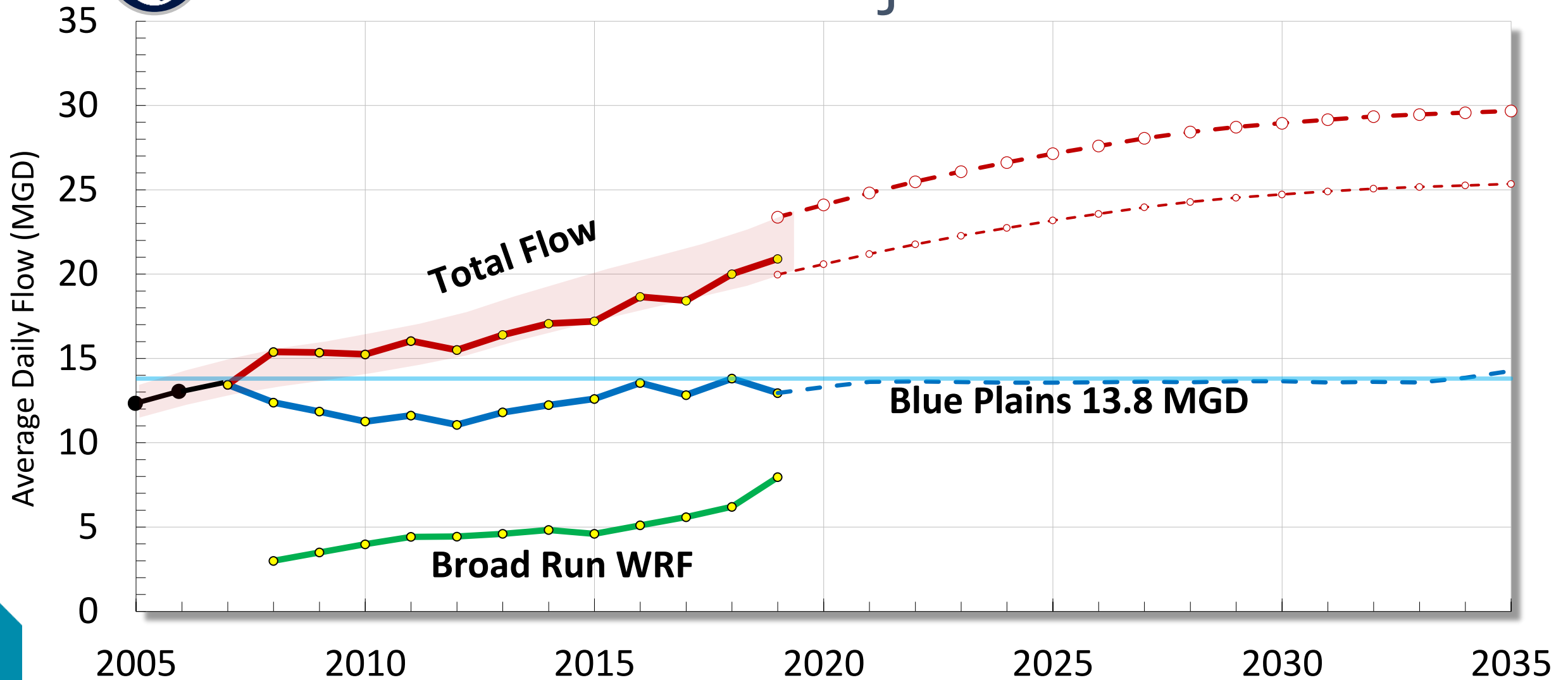


# Collection System Planning





# Wastewater Flow Projections





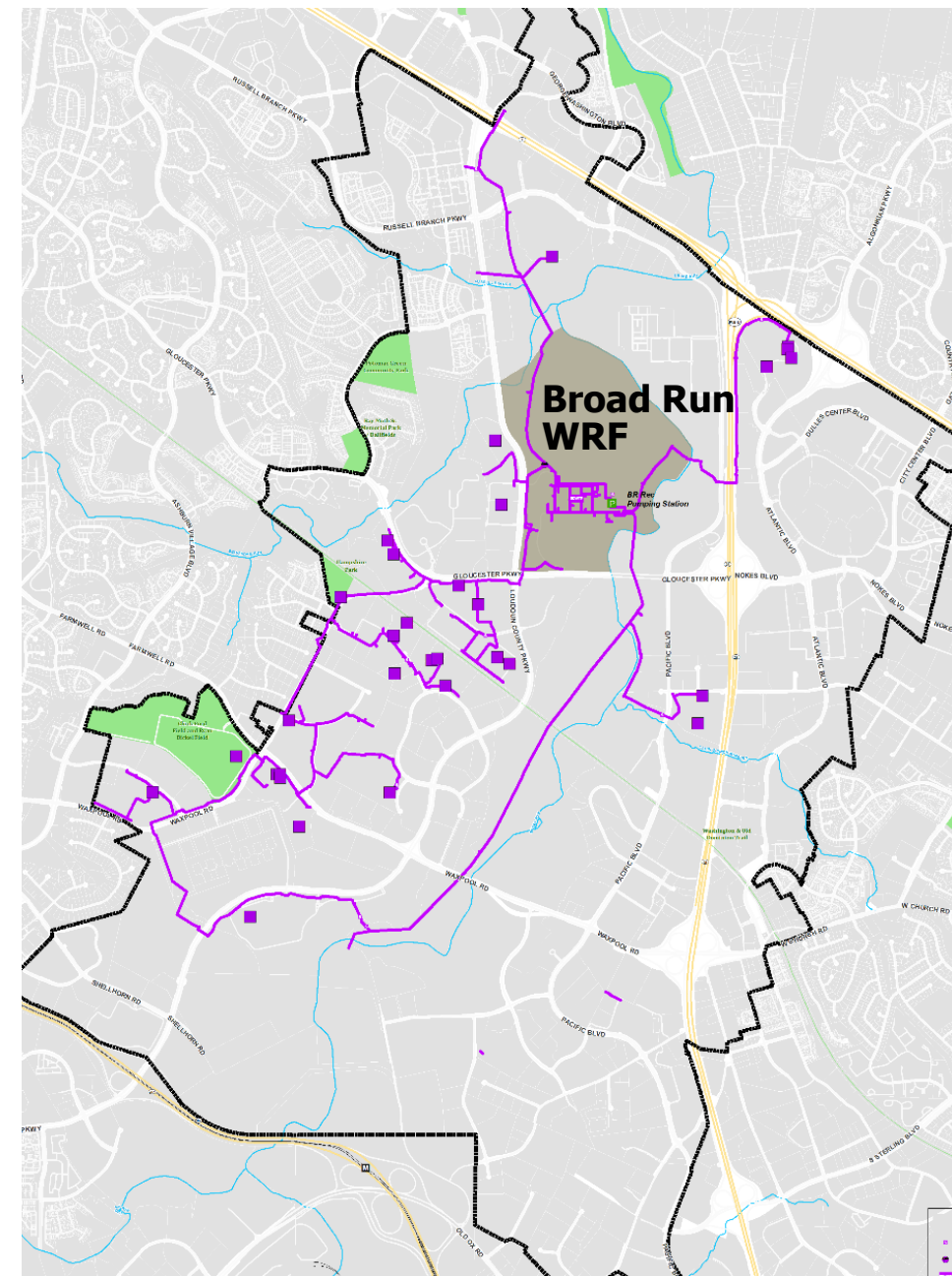
# Reclaimed Water

## Existing

- 2 MGD Average Day (2019)
- 3.5 MGD Max Day (2019)

## Projected

- 6.5 MGD Max Day (5-Year Growth)

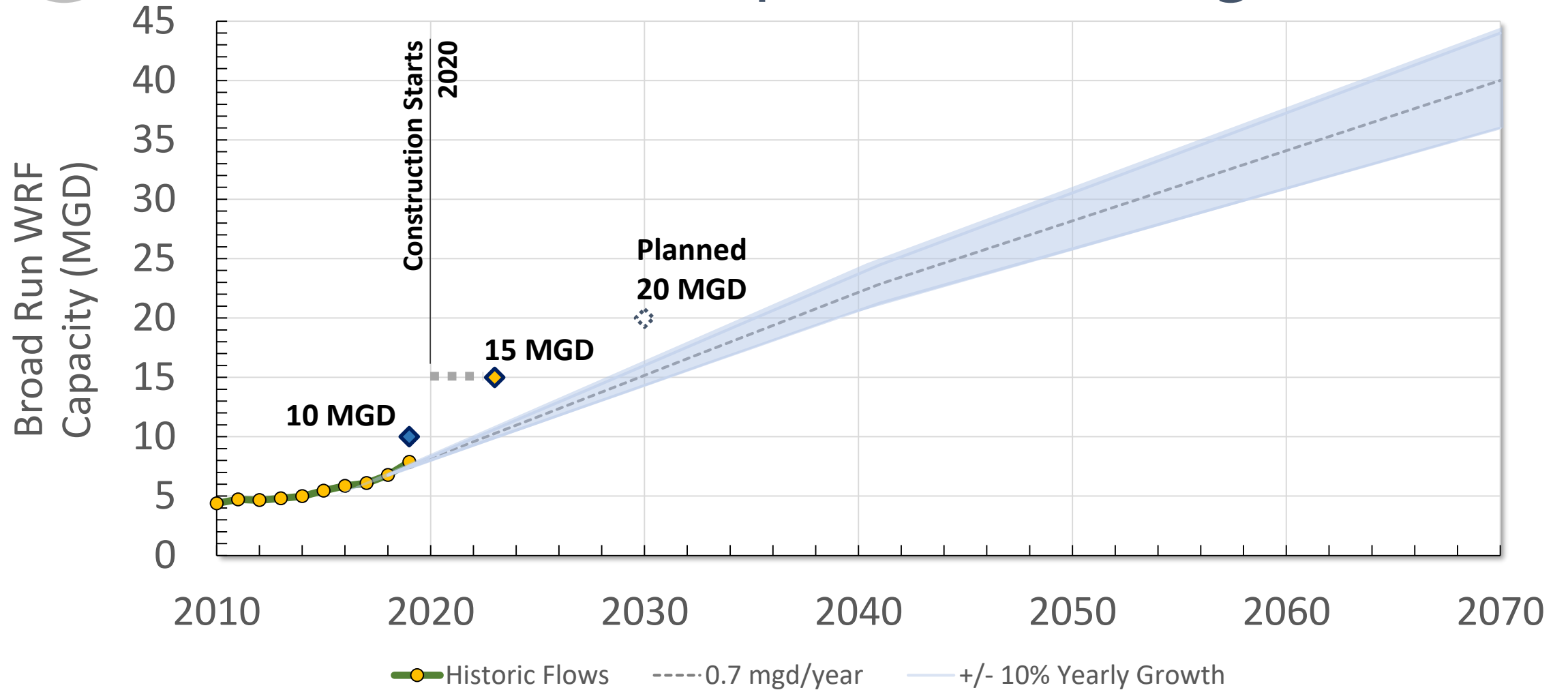




# Broad Run WRF Planning



# Broad Run WRF Expansion Timing





# Broad Run WRF and the Region





# Broad Run WRF Treatment Requirements

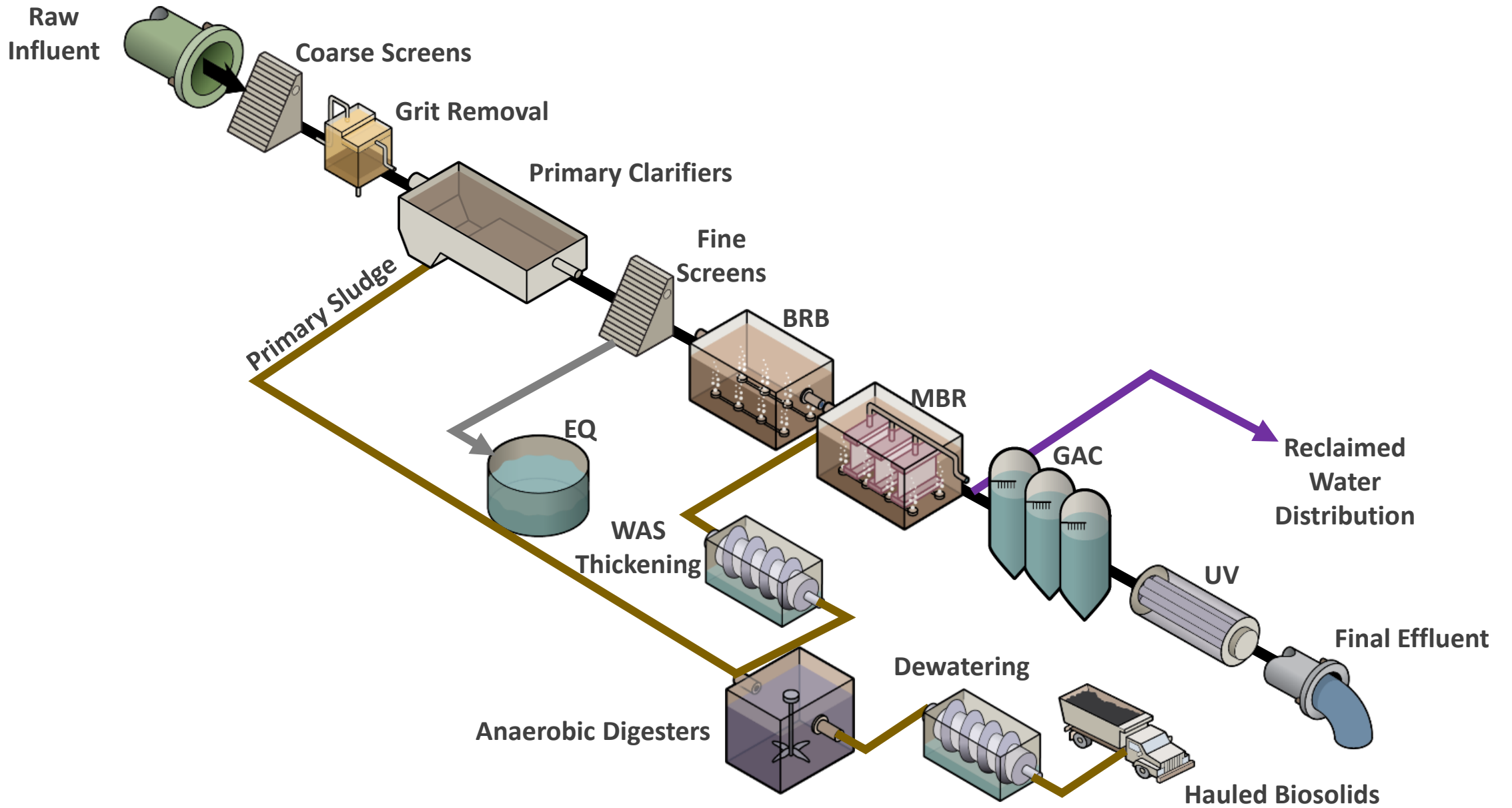
Water Quality Parameter	Monthly Average
Chemical Oxygen Demand (COD)	10 mg/L
Total Suspended Solids (TSS)	1.0 mg/L
Total Kjeldahl Nitrogen (TKN = DON + NH <sub>3</sub> )	1.0 mg/L
Total Nitrogen (TN) <i>Annual Concentration Limit</i>	4 mg/L
Total Phosphorus (TP)	0.1 mg/L
Turbidity	0.5 NTU
E. Coli	Less than 2 per 100 mL

***Chesapeake Bay TMDL – Annual TN and TP Waste Load Allocations***

***TN of 134,005 lbs./yr.***

***TP of 3,350 lbs./yr.***

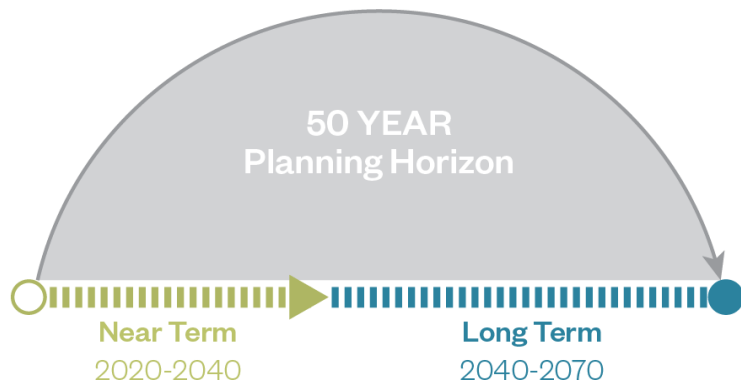
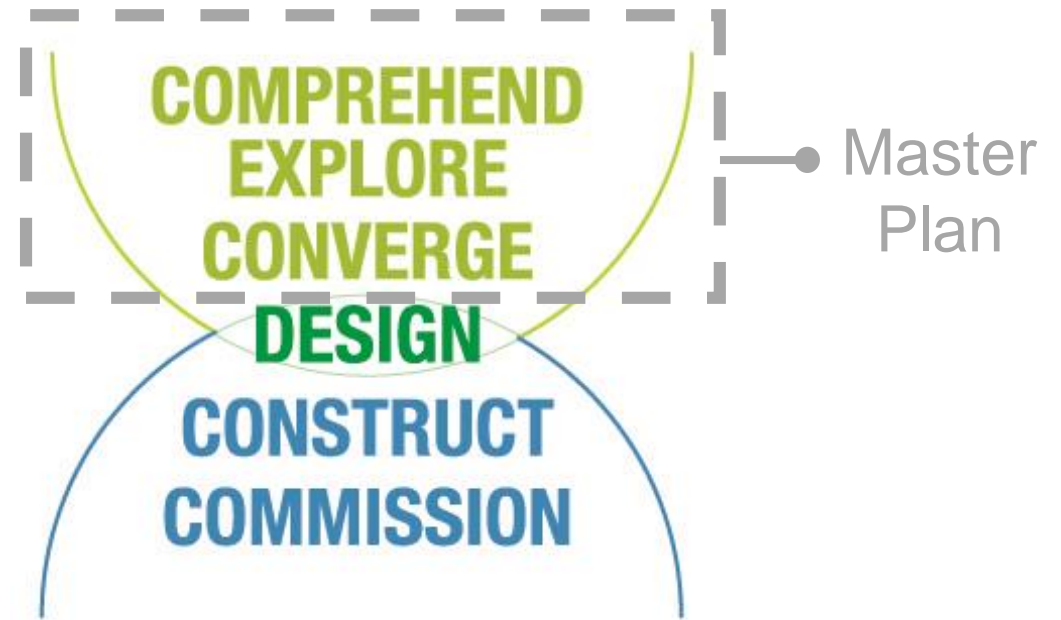






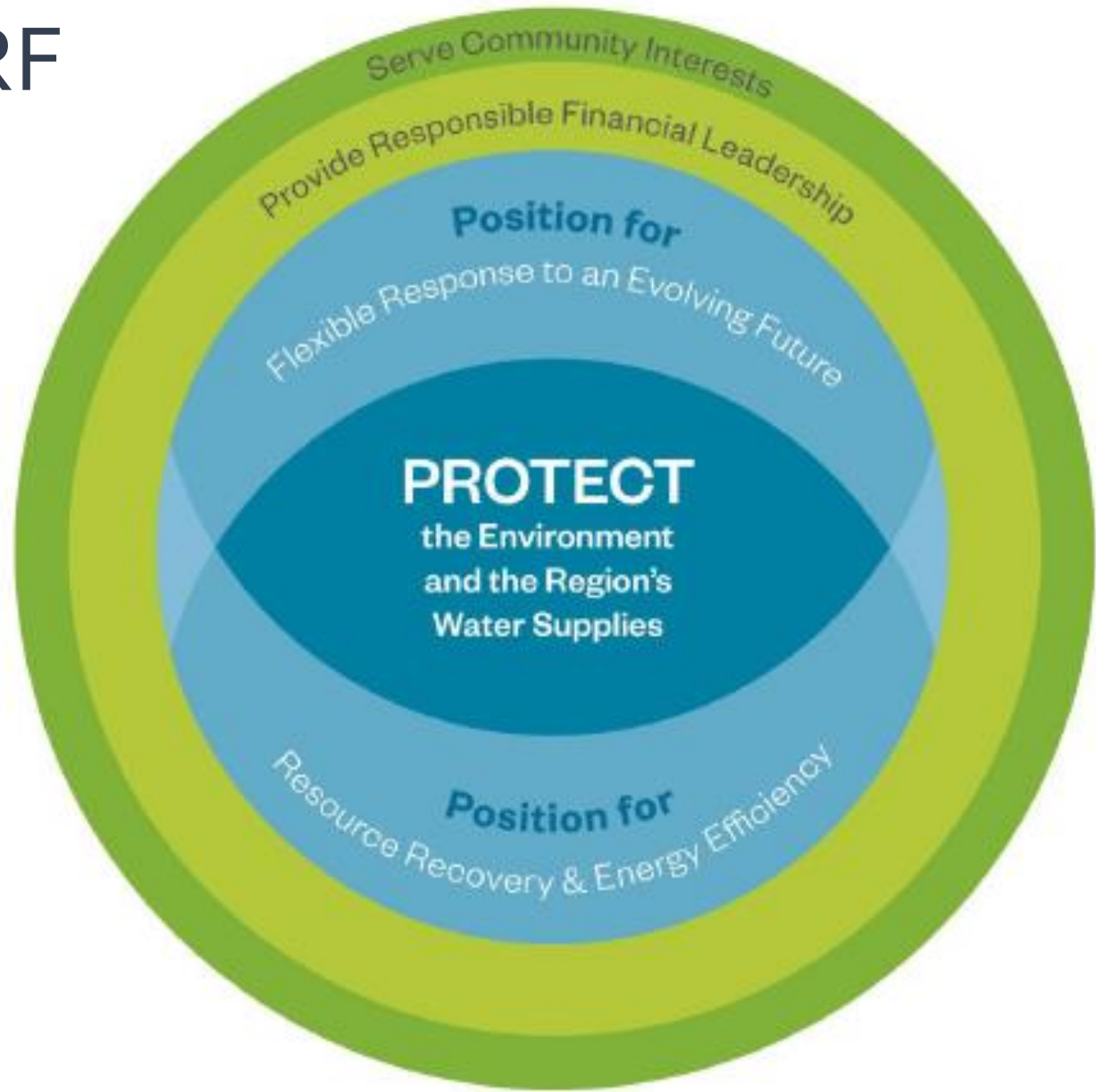
# BRWRF Master Plan

- Long term framework (50 years)
- Supporting short term projects
- Clear direction for a continuous process





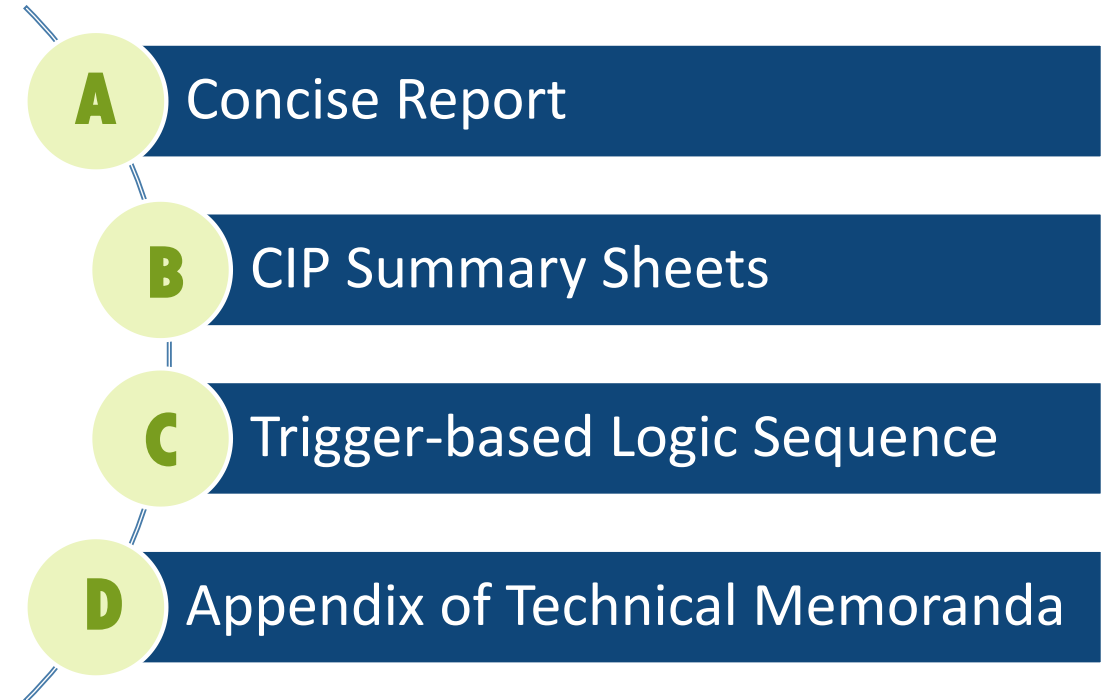
# Broad Run WRF Vision





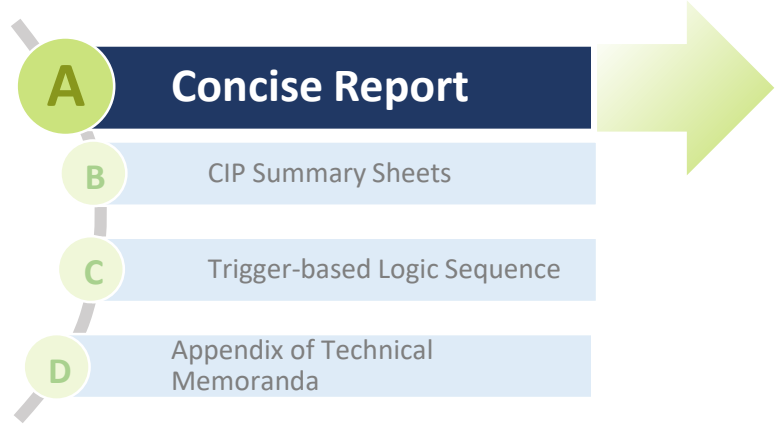
# Broad Run WRF Master Plan Outcomes

- Master plan of an integrated solution for the near-term (20 year) and long-term (50 year)
- Living document





# Concise Report with *Categorized Roadmaps*



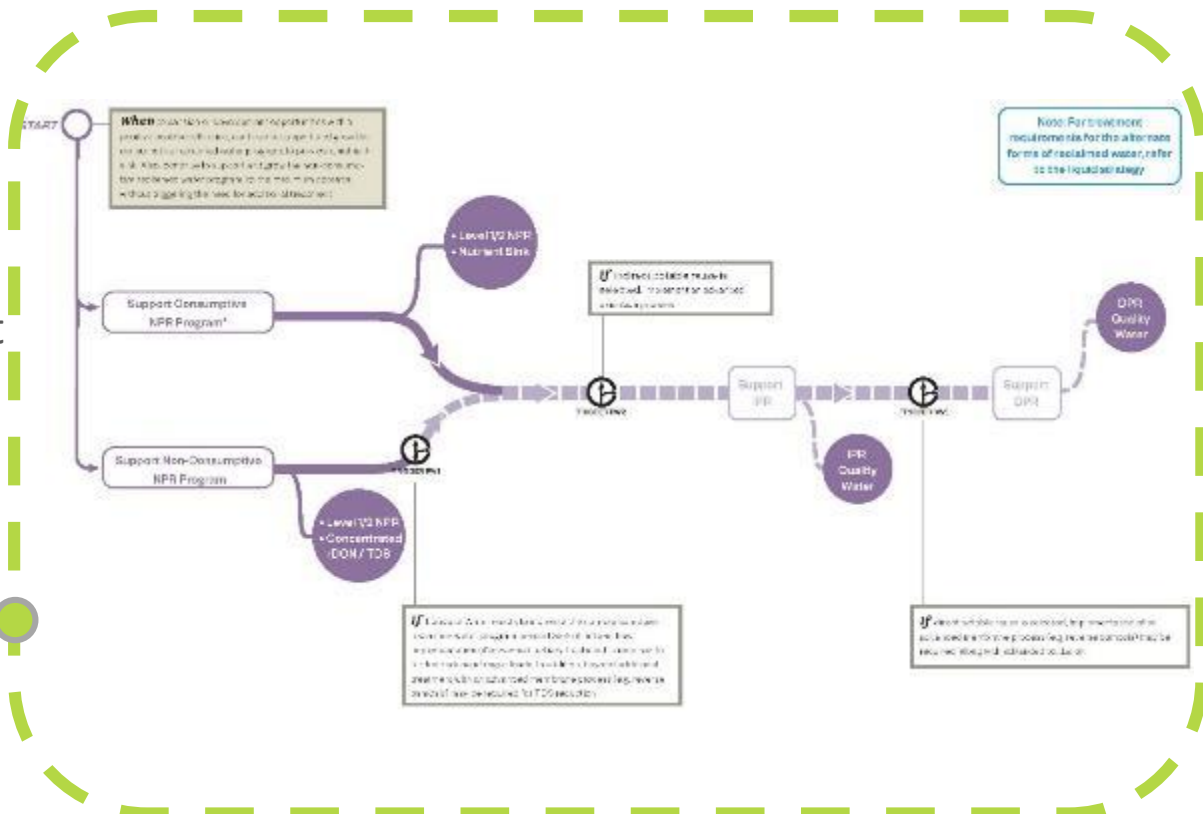
## Strategies

- Liquid Compliance
- Solids Compliance
- Reclaimed Water
- Resource Recovery
- Energy Management

### Format Benefit:

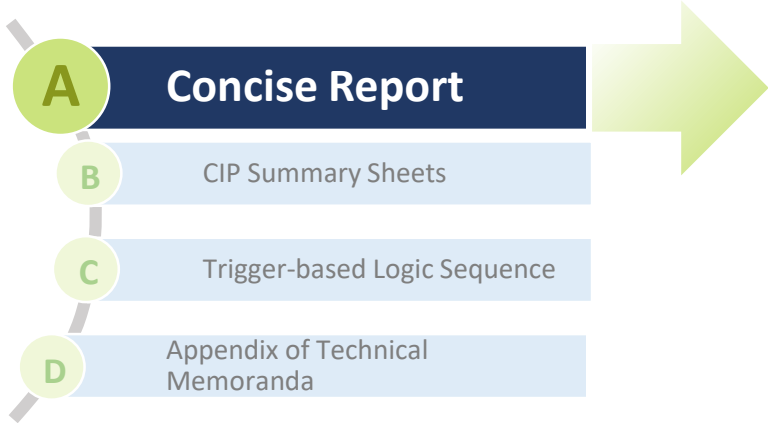
- Visualization of roadmap
- Manageable at all levels to understand/use

*WHAT*





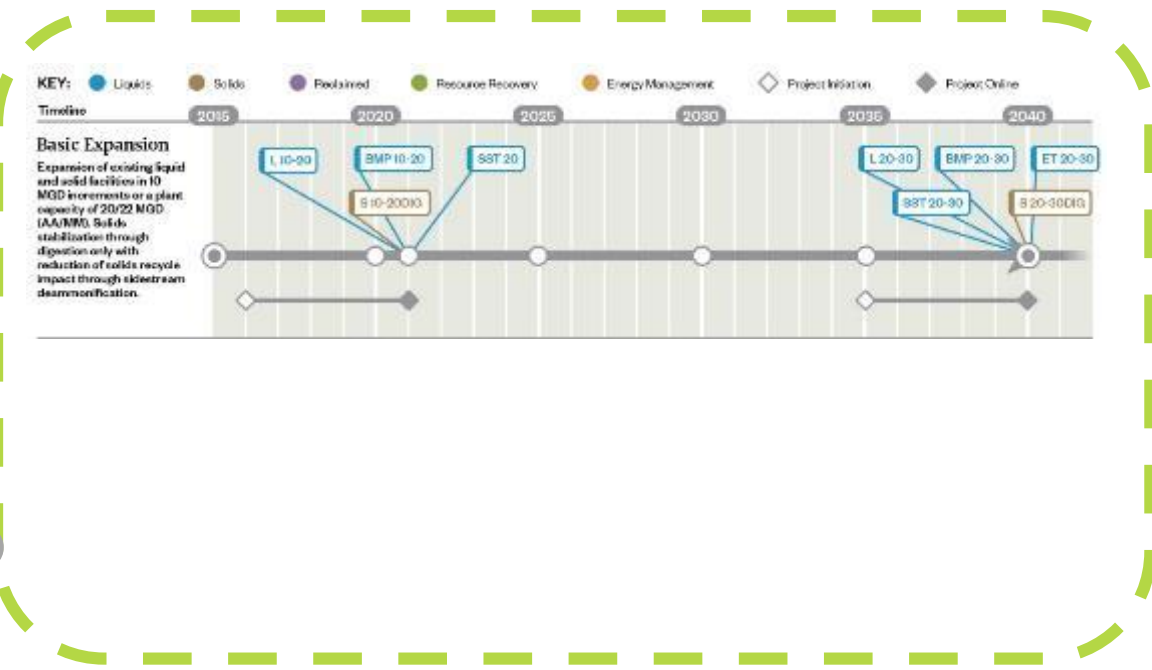
# Concise Report with *Implementation Plans*



## Implementation Plans

*WHEN*

- 10 mgd with Digestion
- 10 mgd with THP
- 5 mgd with Digestion or THP
- Resource Recovery/Energy Neutrality



### **Format Benefit:**

- Visualization of timeline
- When specific projects required



# Broad Run WRF 15 MGD Expansion Project







# Questions?



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