

Groundwater Management and Regional Water Supply Impacts

HRPDC

March 15, 2018

Whitney S. Katchmark

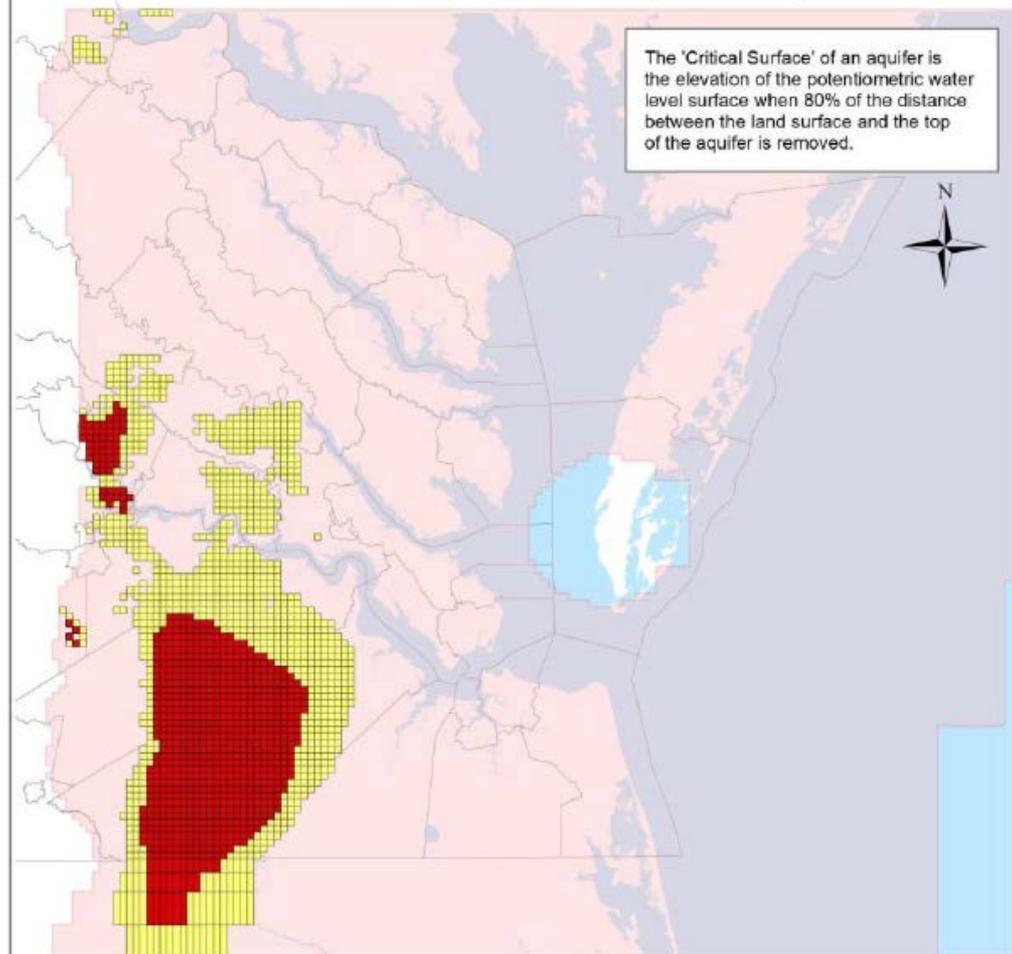
In 2014, Department of Environmental Quality determines Coastal Plain Aquifer is Over Allocated

- Declining water levels
- Land subsidence and loss of storage
- Reversal of groundwater flow leads to salt water intrusion

Proposed solution was to reduce 14 largest permits

- What happened?
- Problem solved?
- Impacts to Hampton Roads

2015 Total Permitted Simulation - Potomac Aquifer Simulated Water Levels Below the Critical Surface and Below the Aquifer Top



- Cells that simulate water levels below the top of the aquifer
- Cells that simulate water levels below the Critical Surface
- Potomac Aquifer Model Boundary

0 15 30 60
Miles

Prepared by Aquaveo, LLC for the
Virginia DEQ, Office of Water Supply
September 1, 2015



14 largest permits

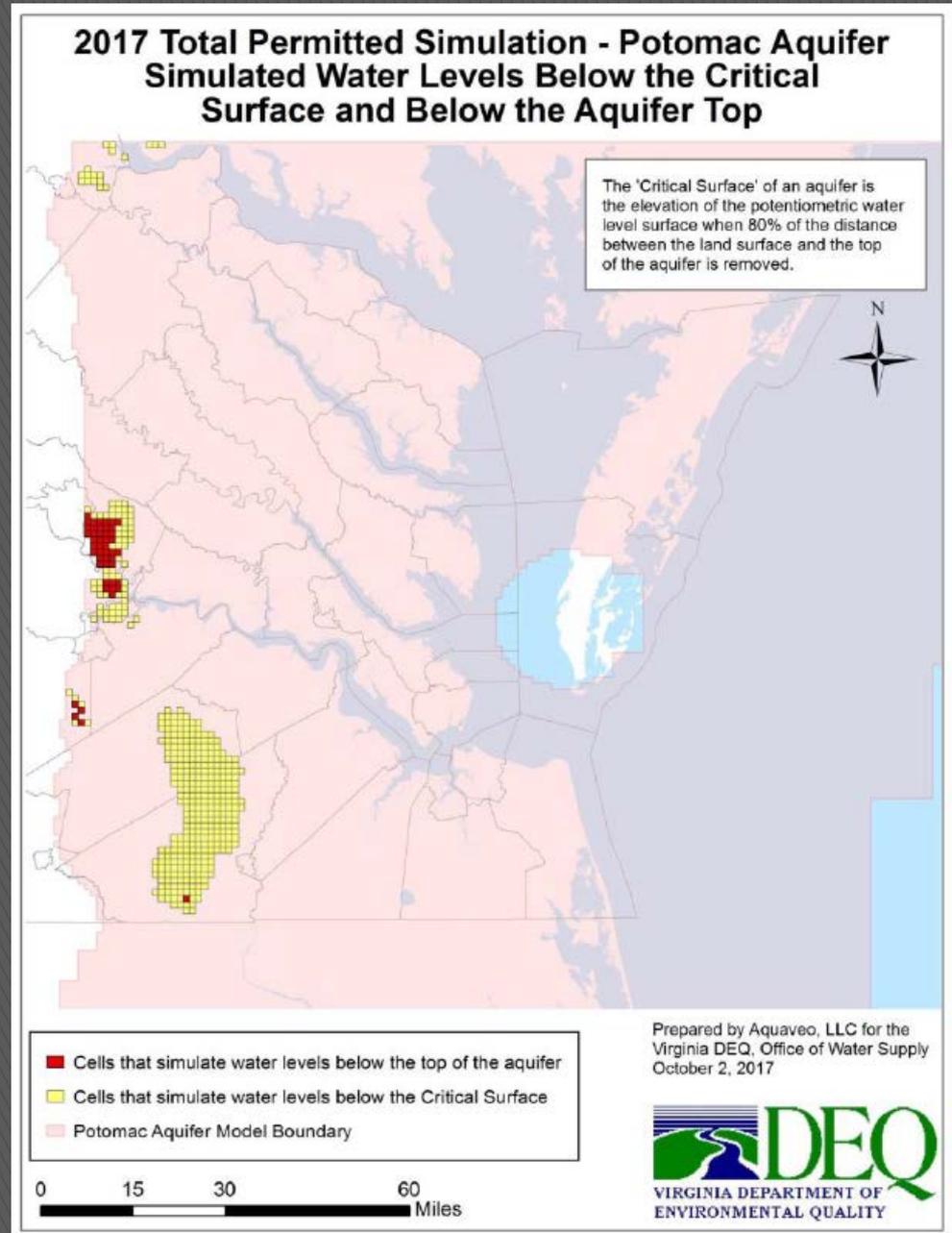


	2017 Permits		2014 or earlier		
Permit Holder	Permitted Withdrawal (MGD)	% Cut Below Previous Permit	Previous Permitted Withdrawal (MGD)	DEQ Target (MGD)	Reported Use (MGD)
City of Franklin	1.4	51%	2.88	.93 – 1.3	0.93
City of Chesapeake	3.51	68%	11	3.5	3.5
International Paper - Franklin Mill	16.0 (Y1) to 14.0 (Y10)	56% (Y1) to 62% (Y10)	36.68	10.0 – 12.0	13.71
WestRock - West Point Mill	20.0 (Y1) to 16.0 (Y10)	13% (Y1) to 31% (Y10)	23.03	9.0 – 10.0	17.79
City of Portsmouth	5.0	67%	15.42	3.49	2.91
Solenis - formerly Hercules Inc	3.2	52%	6.67	3	2.74
Western Tidewater Water Authority (Suffolk & Isle of Wight)	4.2	50%	8.34	3.5 – 3.9	3.51
Virginia Renewable Power - formerly Cogentrix	1.2	53%	2.60	1.0 – 1.2	0.18
James City Service Authority	6.0	32%	8.83	3.8 - 4.0	5.41
Newport News Waterworks	2.96	58%	7.00	1.53	1.53
Colonial Williamsburg	1.12	39%	1.84	1.2	1.4
Smithfield Farmland Corp	2.60	35%	4.01	2.6	1.65
Town of Smithfield	1.28	8%	1.4	1.27	0.86
City of Norfolk	3.74	77%	15.94	3.74	0.06
Totals	72.3 to 66.3	50%	145.6	48.6 to 52.7	56.2

Problem solved?

No: permitted withdrawals still result in violations of regulatory criteria created to protect the aquifer

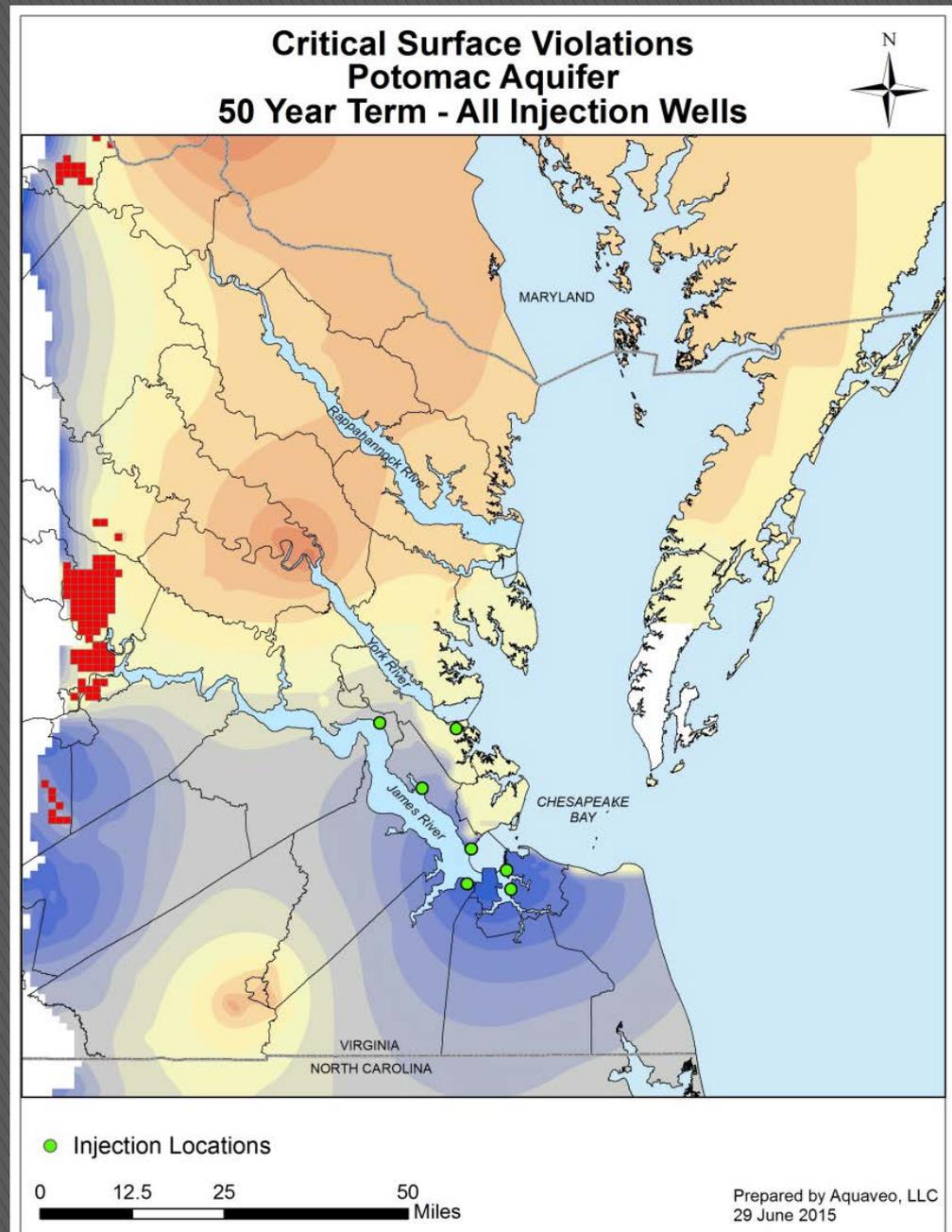
Additional Challenge: anticipate more unregulated withdrawals from private wells



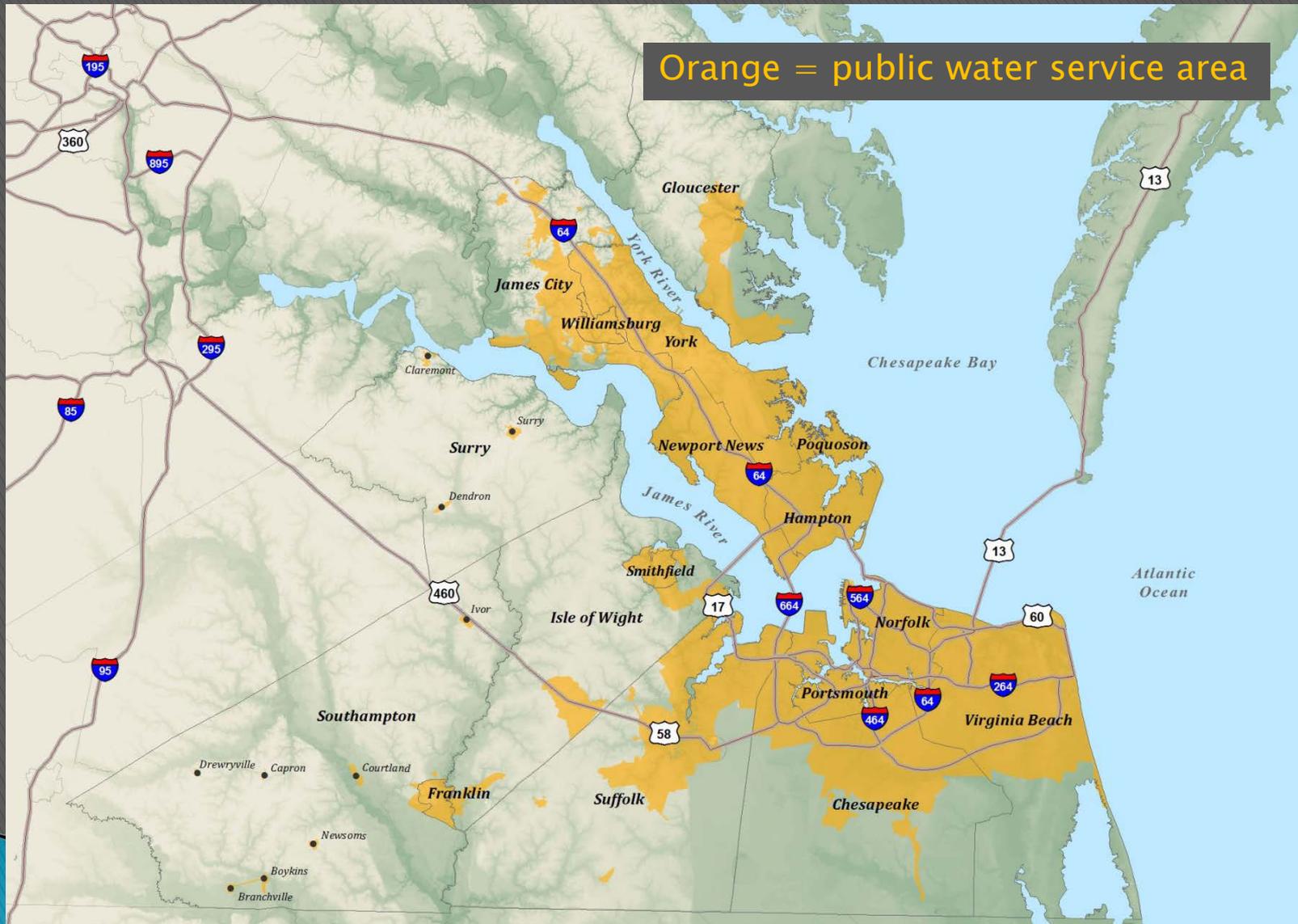
Why didn't DEQ solve the problem?

Expensive and contentious to cut permits and find other sources of water

SWIFT proposal to inject water might make the problem disappear



Groundwater management impacts both our public water systems & areas that rely on individual wells

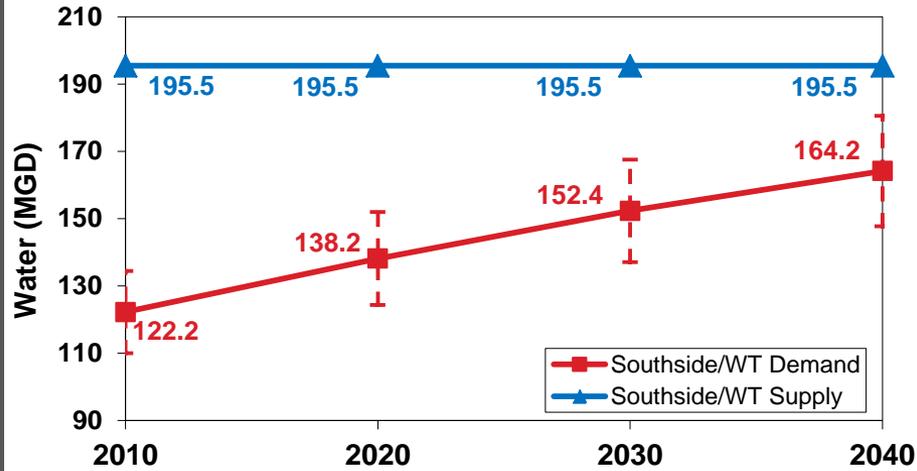


Public Systems Water Supply & Demand

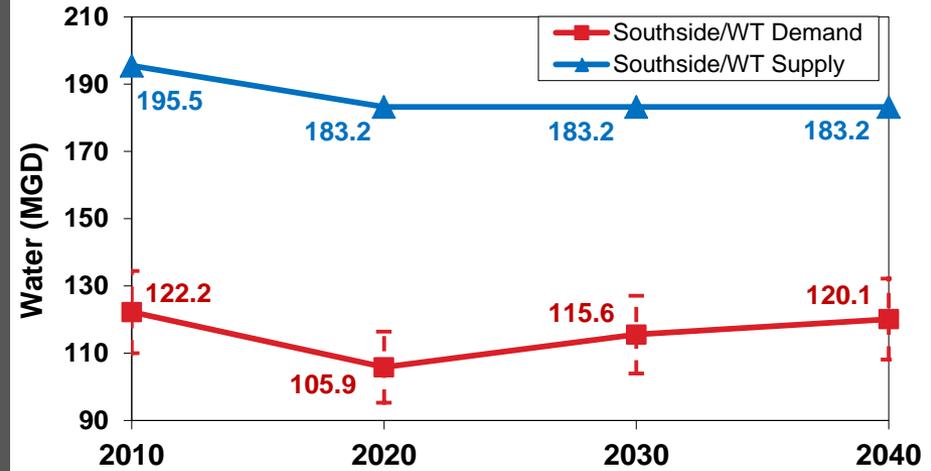
2011 Projections

2018 Draft Projections

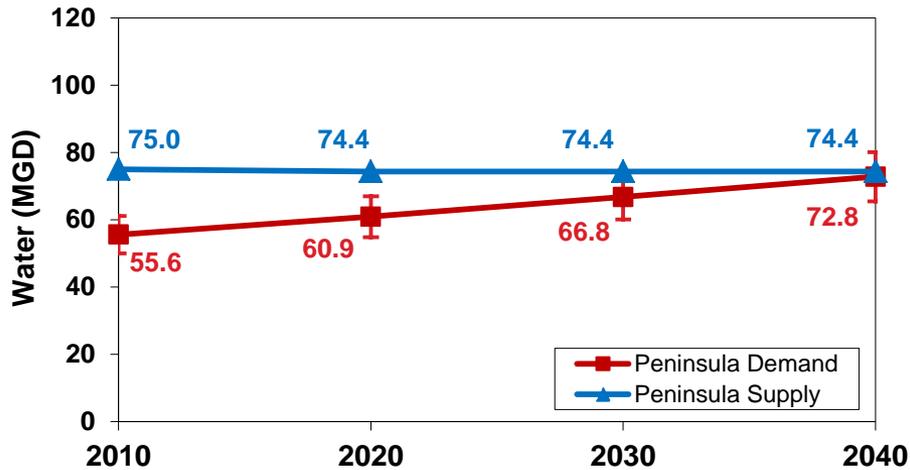
Southside and Western Tidewater



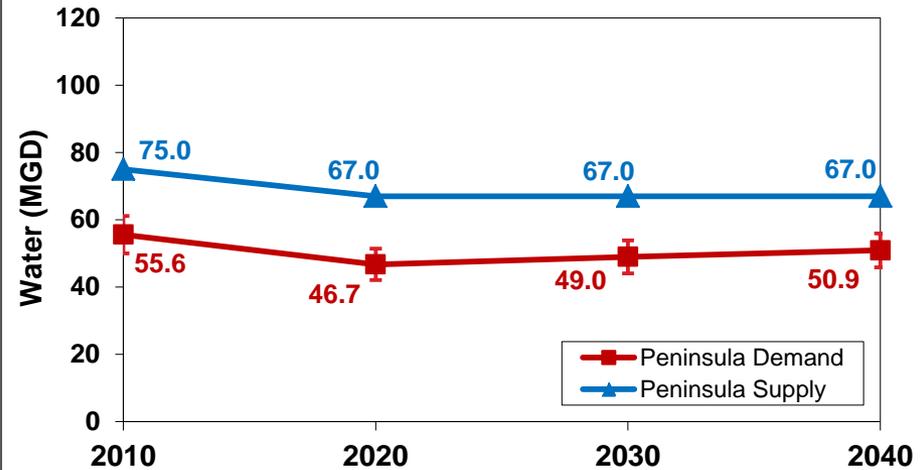
Southside and Western Tidewater



Peninsula

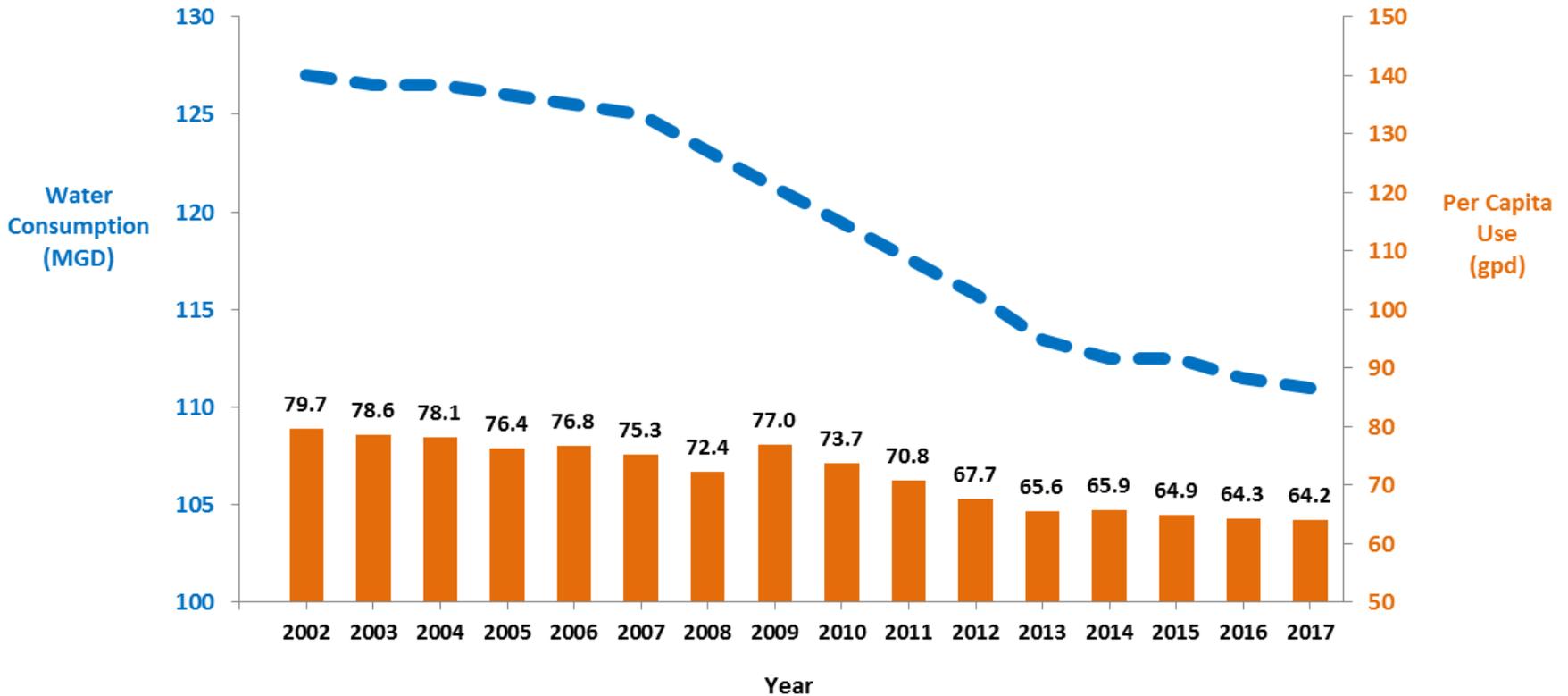


Peninsula



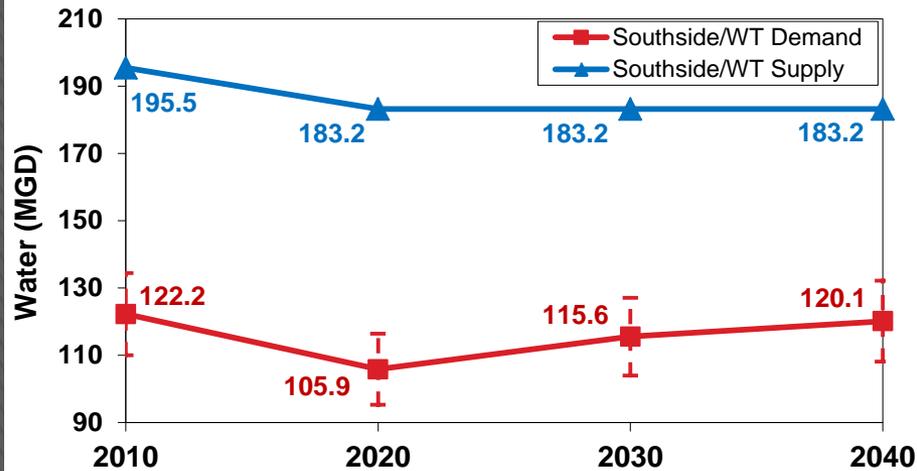
Region is using less water

Regional Water Consumption (2002-2016)



How much water is enough?

Southside and Western Tidewater



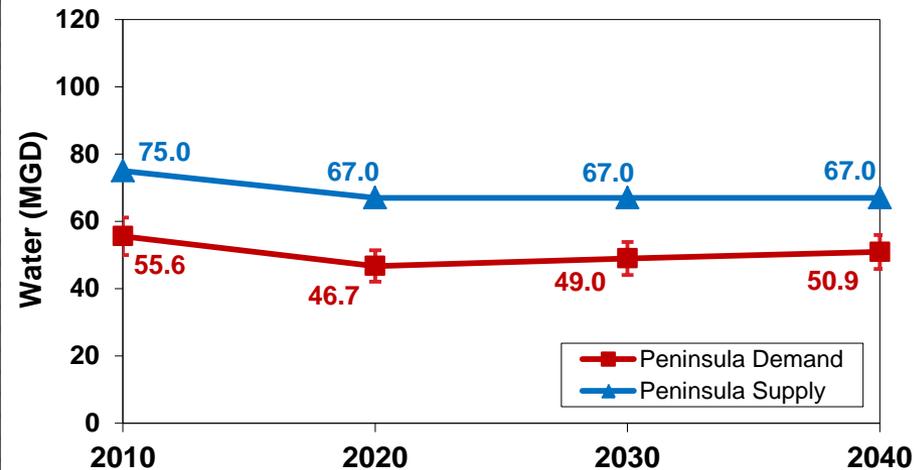
Industrial Groundwater Users = 41 MGD

Anheuser Busch = 1.8 MGD

Ford Plant = 1.8 MGD

Google data center, SC = 4 MGD

Peninsula



Impacts on rural Hampton Roads

- Future growth limited: DEQ does not expect to issue any significant new groundwater permits.



***SWIFT could make
Hampton Roads water rich...***

Unresolved Issue: Need aquifer replenishment for groundwater use to be sustainable at current permitted level and to allow rural development.

SWIFT is unique – only replenishment project where entity injecting water doesn't want to use or sell the water.

Virginia needs regulations that provide the legal framework to incentivize aquifer replenishment.

HB 1036 requires DEQ to convene workgroup to develop banking system by July 1, 2019.



Map 1-10 Southside Sub-Region Community Water Systems Service Areas and Sources

Public Purveyor Service Areas *

- City of Chesapeake
- City of Norfolk
- City of Portsmouth
- City of Suffolk
- City of Virginia Beach
- Future Public Service Areas
- Purchase Water from Public Systems

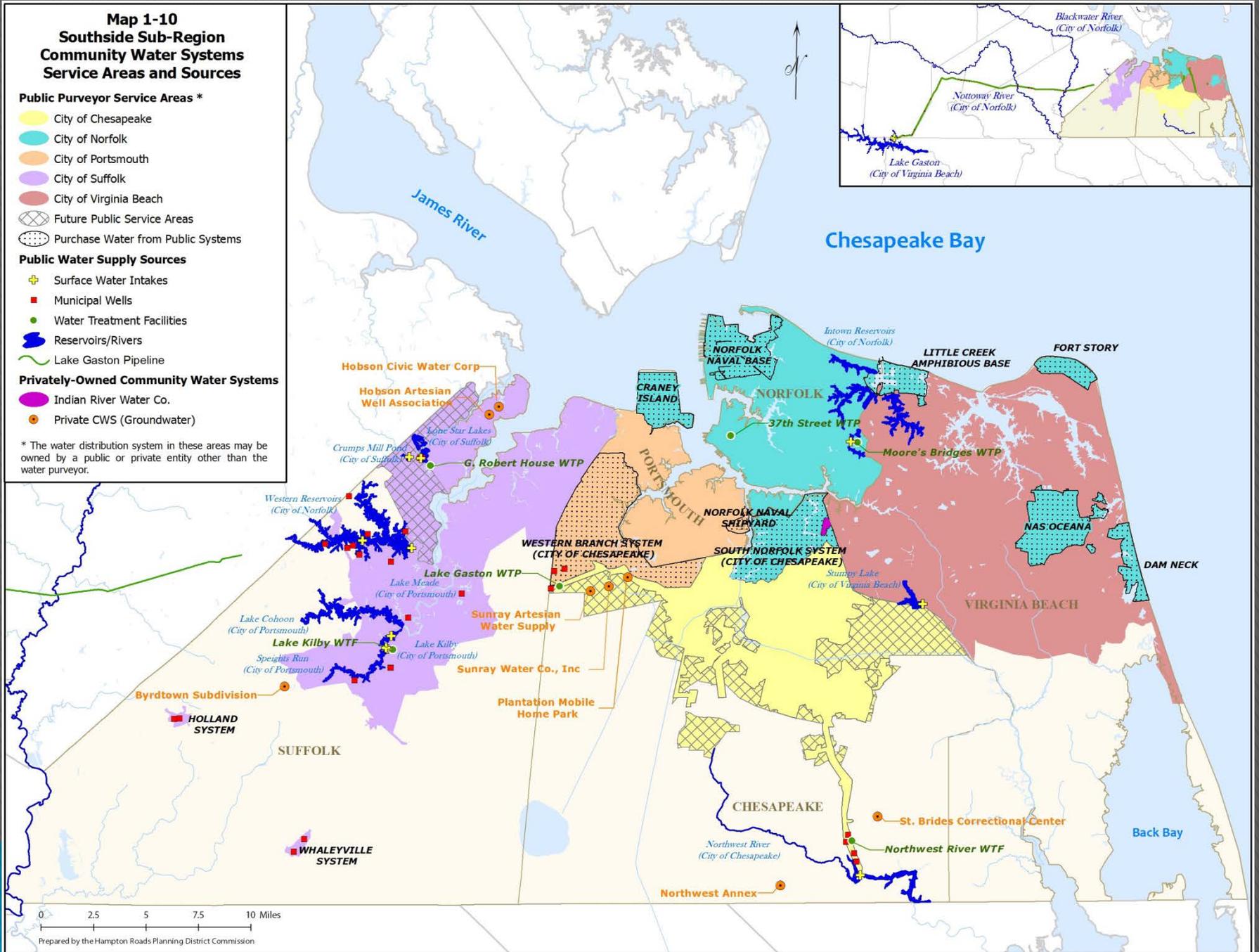
Public Water Supply Sources

- Surface Water Intakes
- Municipal Wells
- Water Treatment Facilities
- Reservoirs/Rivers
- Lake Gaston Pipeline

Privately-Owned Community Water Systems

- Indian River Water Co.
- Private CWS (Groundwater)

* The water distribution system in these areas may be owned by a public or private entity other than the water purveyor.



0 2.5 5 7.5 10 Miles

Prepared by the Hampton Roads Planning District Commission

Map 1-20 Western Tidewater Sub-Region Community Water Systems Service Areas and Sources

Public Purveyor Service Areas *

- Town of Capron
- Town of Claremont
- Town of Courtland
- Town of Dendron
- City of Franklin
- Isle of Wight County
- Town of Ivor
- Town of Smithfield
- Southampton County
- Town of Surry
- Town of Windsor
- Isle of Wight CWS (Groundwater)

- Future Public Service Areas
- Purchase Water from Public Systems

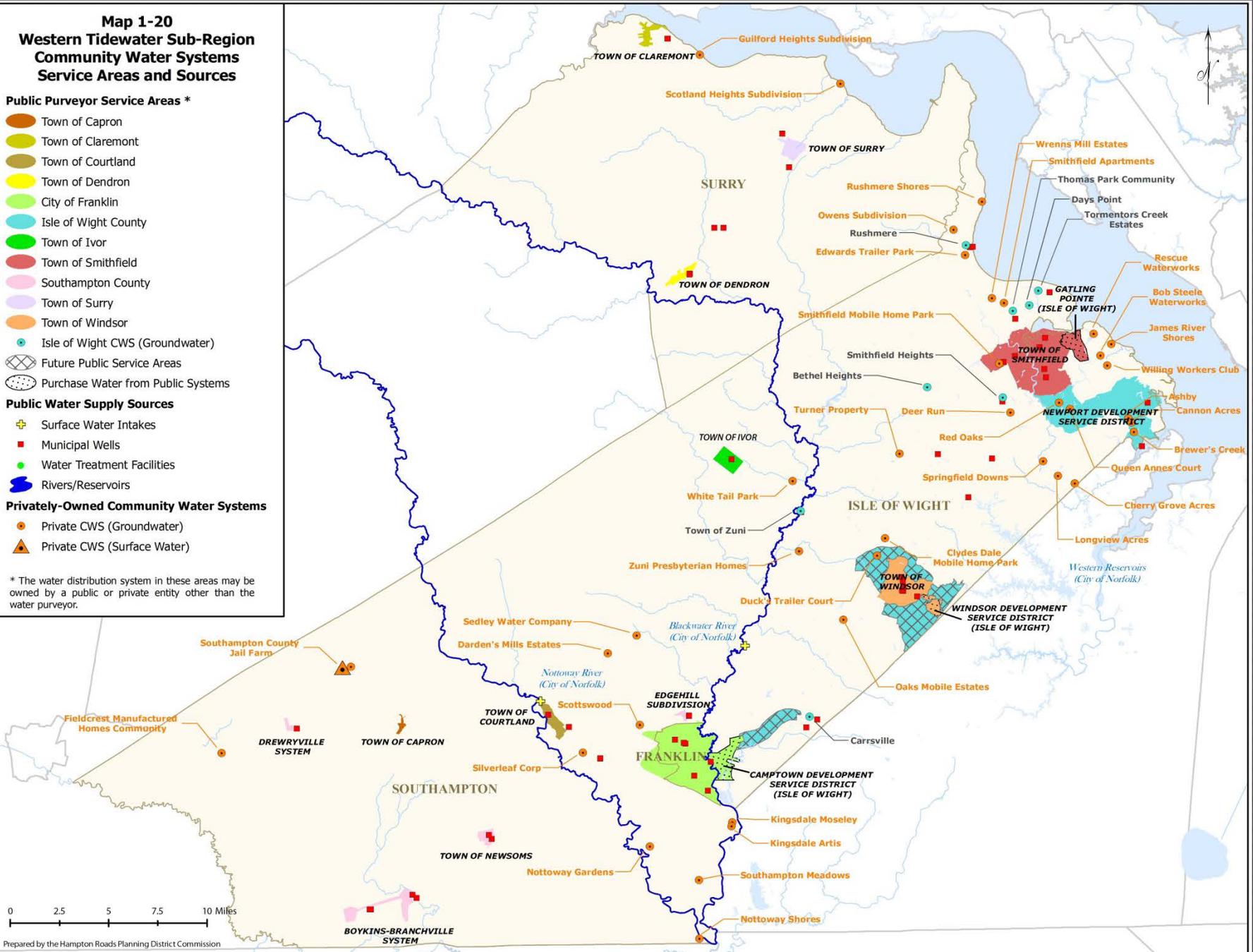
Public Water Supply Sources

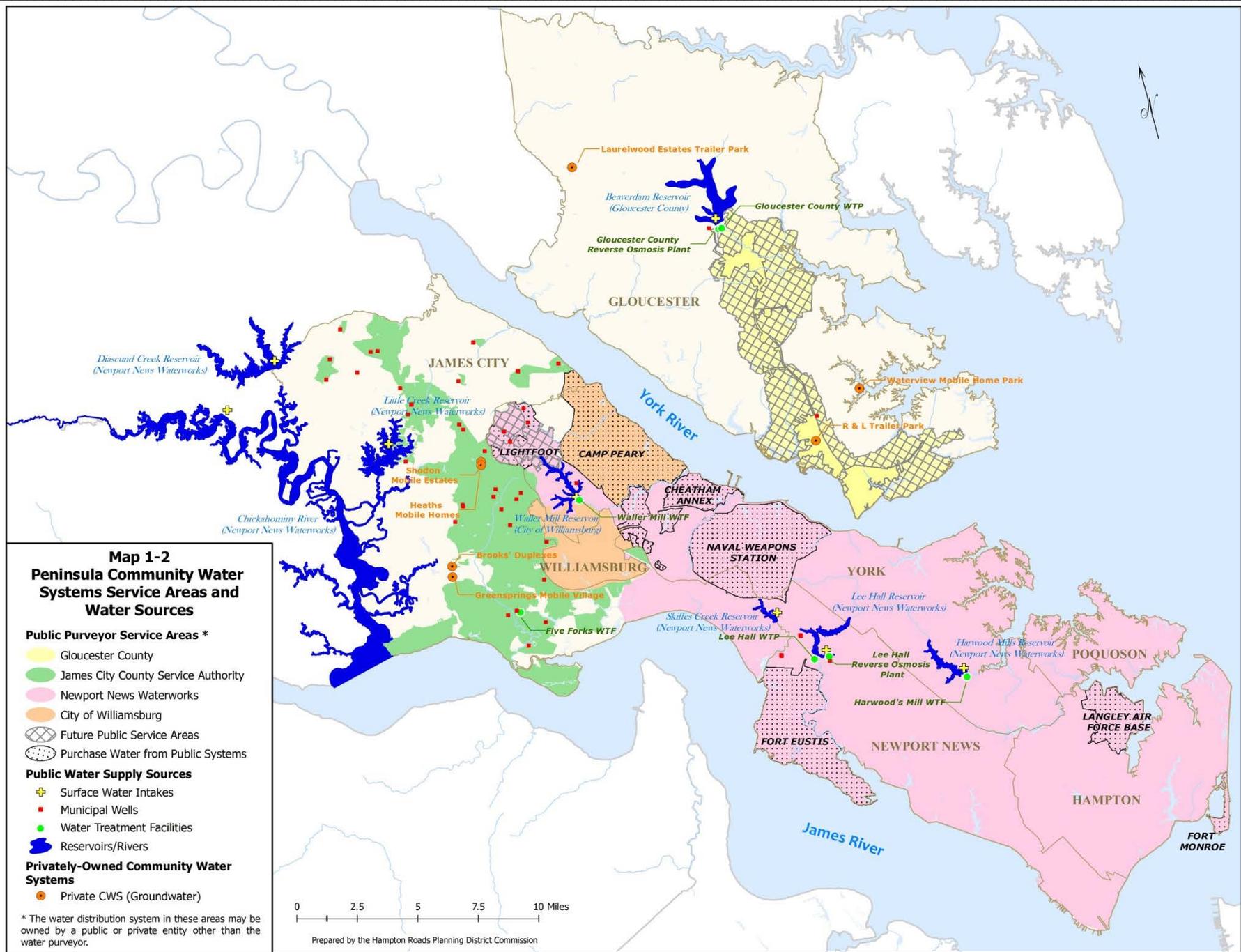
- Surface Water Intakes
- Municipal Wells
- Water Treatment Facilities
- Rivers/Reservoirs

Privately-Owned Community Water Systems

- Private CWS (Groundwater)
- Private CWS (Surface Water)

* The water distribution system in these areas may be owned by a public or private entity other than the water purveyor.





**Map 1-2
Peninsula Community Water
Systems Service Areas and
Water Sources**

Public Purveyor Service Areas *

- Gloucester County
- James City County Service Authority
- Newport News Waterworks
- City of Williamsburg
- Future Public Service Areas
- Purchase Water from Public Systems

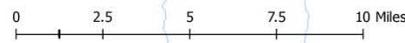
Public Water Supply Sources

- Surface Water Intakes
- Municipal Wells
- Water Treatment Facilities
- Reservoirs/Rivers

**Privately-Owned Community Water
Systems**

- Private CWS (Groundwater)

* The water distribution system in these areas may be owned by a public or private entity other than the water purveyor.



Prepared by the Hampton Roads Planning District Commission