Additional Surface Water Analyses – Allocating Future Greenville Water Demands between the Saluda and Savannah River Basins, and Updated Scenario Results

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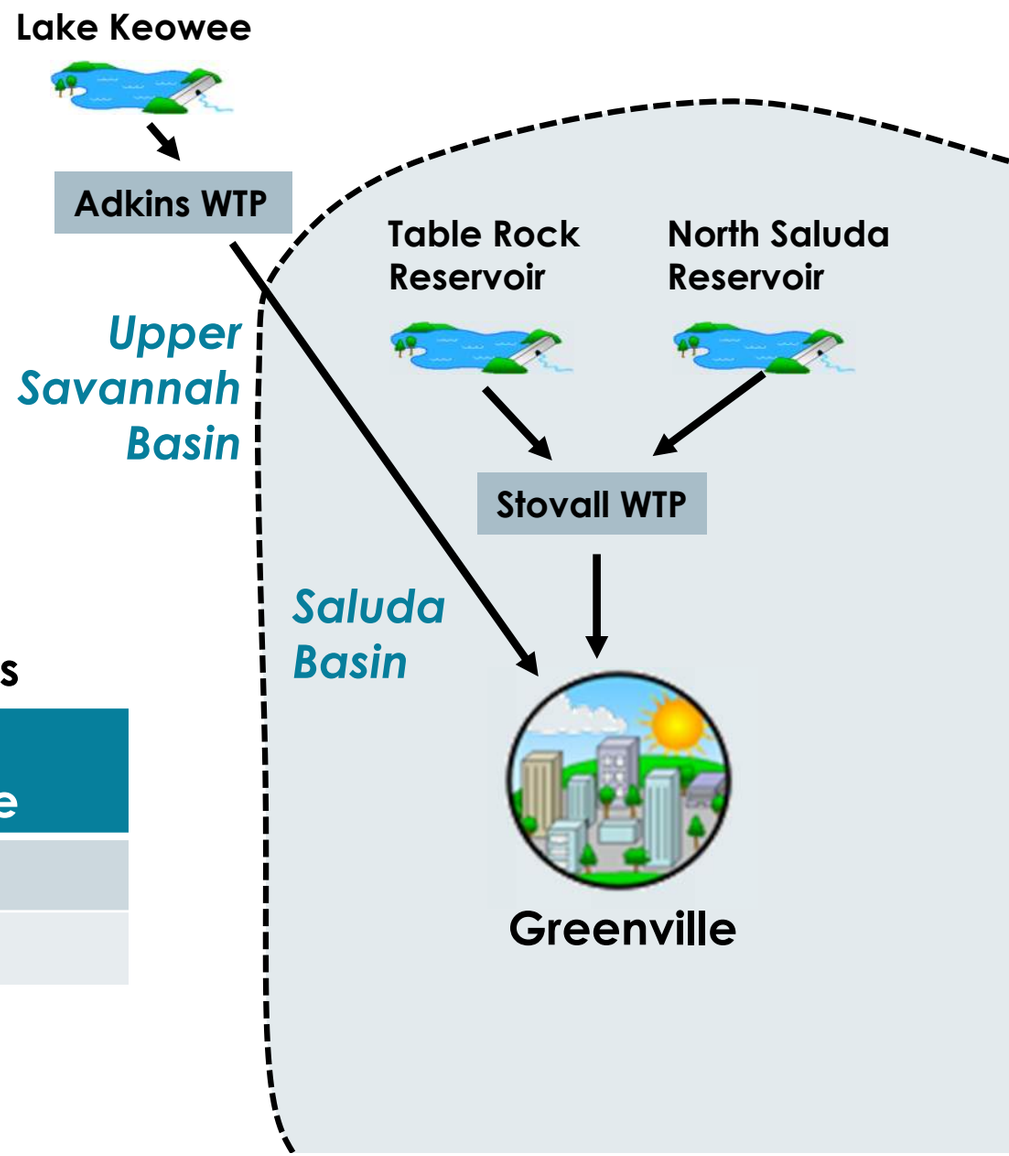
Agenda Item 5

Notes on Greenville Water Demands

Reservoir or Water Treatment Plant	Permitted Withdrawal	Current Firm Capacity	Planned Firm Capacity by 2070
Table Rock Reservoir	67		
North Saluda Reservoir	60		
Total	127		
Stovall WTP		75	75
Lake Keowee	150		
Adkins WTP		60	150
Total		135	225

All values in MGD

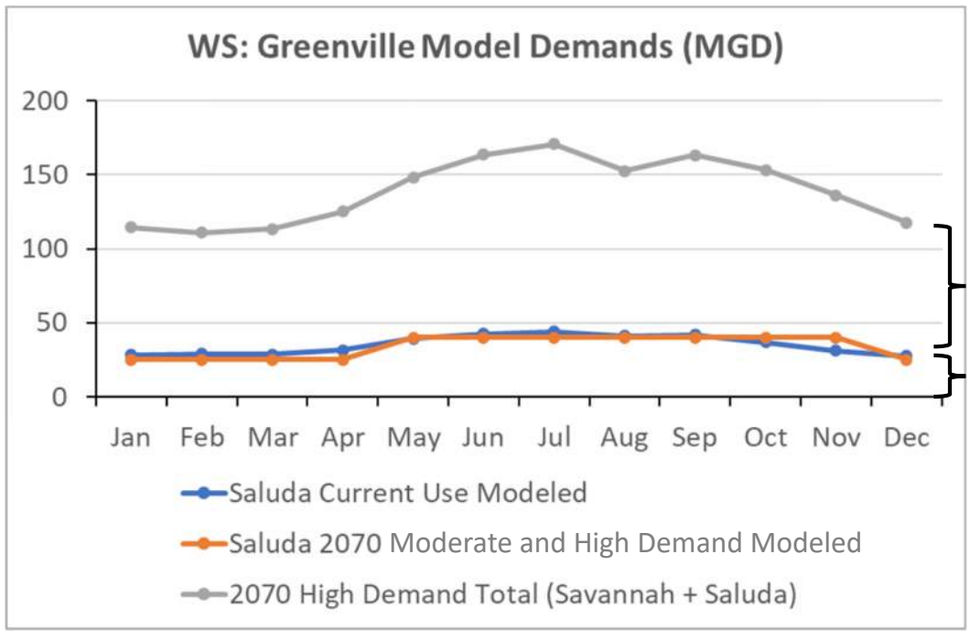


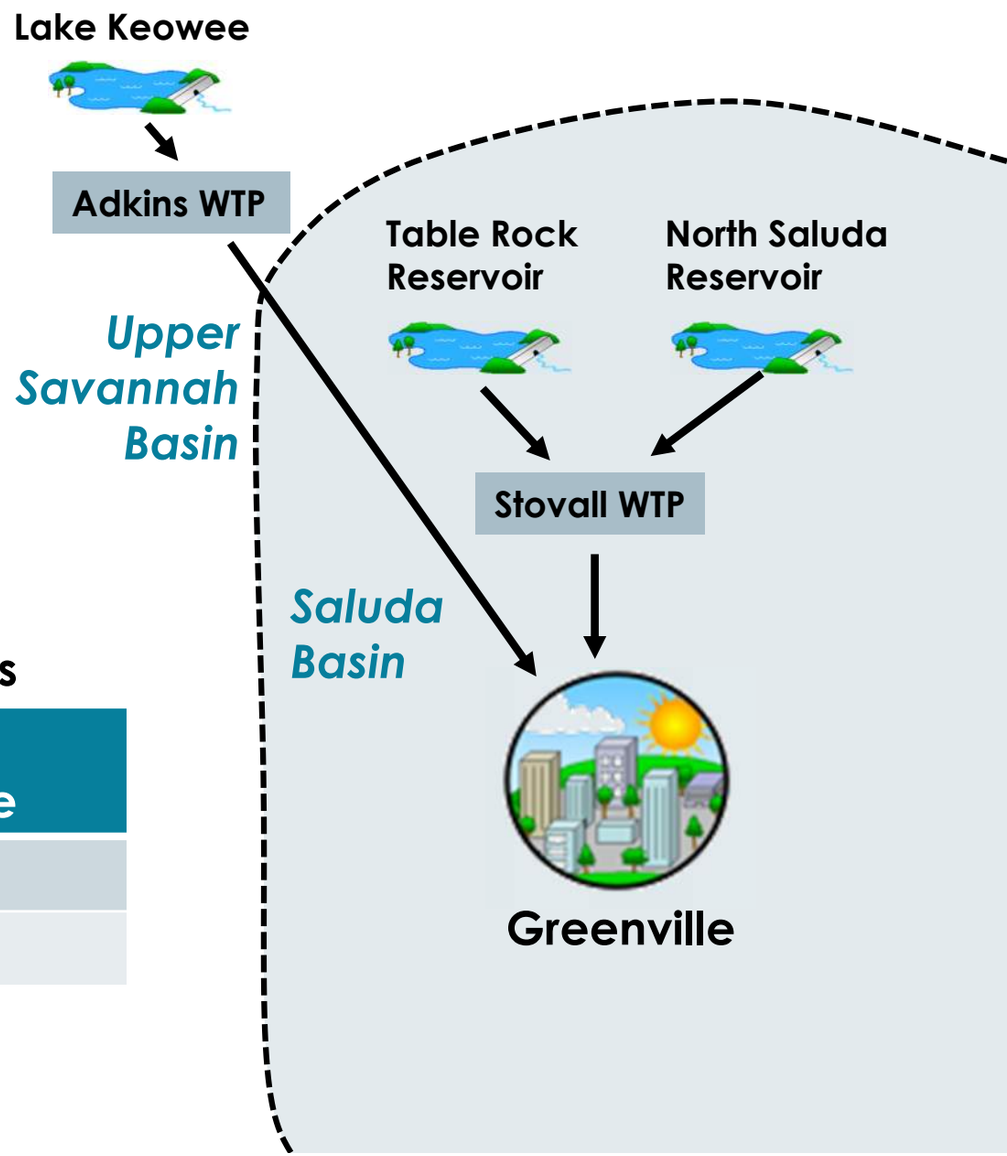
Average Annual Water Demand Projections

2070 Scenario	Total Greenville	Saluda Basin Reservoirs	Lake Keowee
Moderate	106.2	33.8	72.4
High	139.3	33.8	105.5

All values in MGD

Notes on Greenville Water Demands





Average Annual Water Demand Projections

2070 Scenario	Total Greenville	Saluda Basin Reservoirs	Lake Keowee
Moderate	106.2	33.8	72.4
High	139.3	33.8	105.5

All values in MGD

Summary of Average Annual Surface Water Demands by Scenario (in MGD)

Changed because of changes to Greenville projected demands

Surface Water Use Sector	Current Use	2070 Moderate Demand	2070 High Demand	Permitted & Registered
Mining	0.1	0.1	0.1	0.5
Agriculture	2.7	3.1	4.4	15.2
Golf Courses	0.6	0.5	1.1	10.1
Industrial/Manufacturing	24.9	56.0	91.6	44.9
Public Water Supply	142.6	159.3	223.1	525.2
Thermoelectric[1]	171.2	171.2	171.2	502.0
Total Demand all Sectors*	342	390	491	1,098
Scenario Demand as a % of P&R	31%	36%	45%	--
Total Demand without Thermoelectric*	171	219	320	596
Scenario Demand as a % of P&R without Thermoelectric	29%	37%	54%	--

* *Rounded to nearest MGD*

[1] *Approximately 76% of the thermoelectric withdrawals are returned*

The following 7 slides, which include:

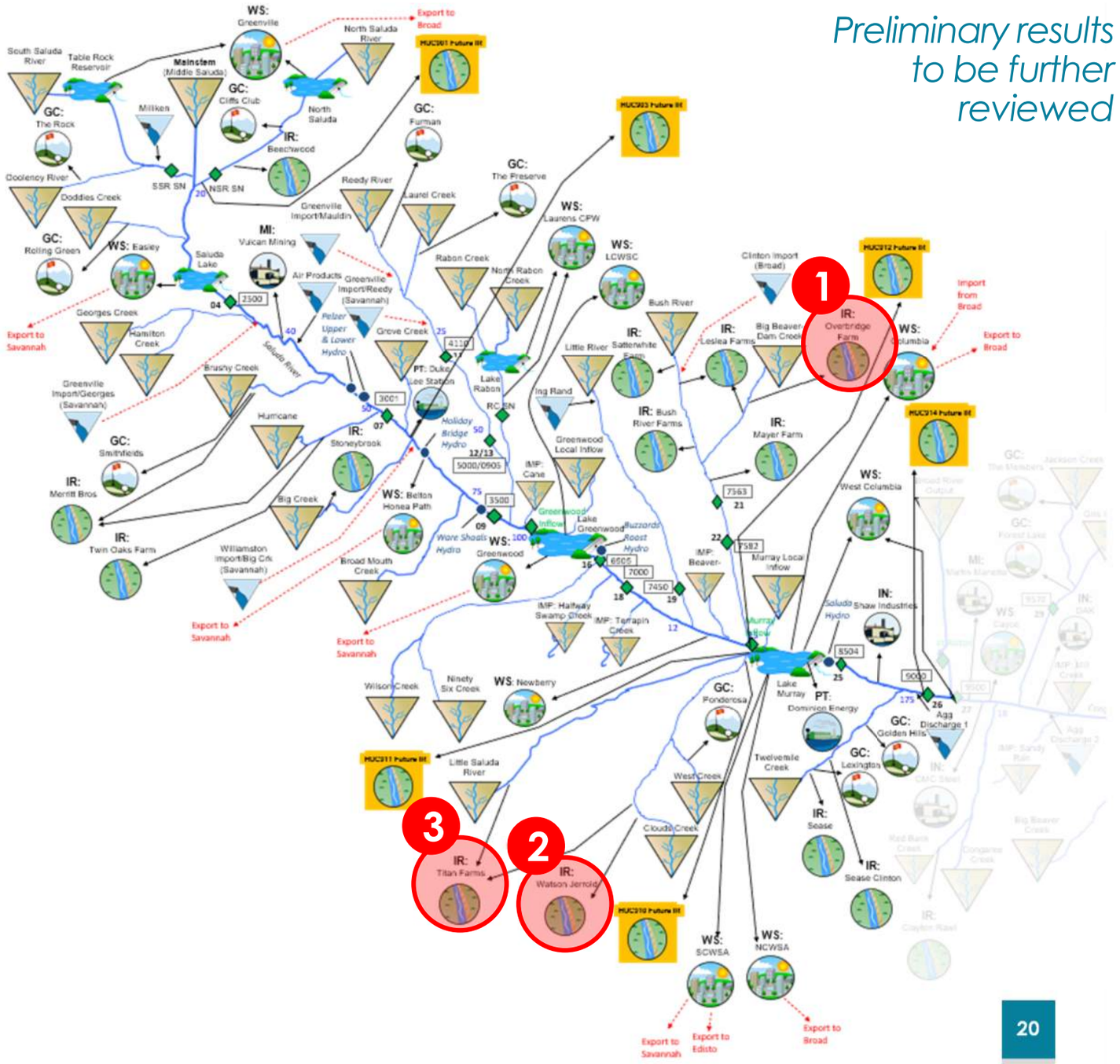
- shortage maps (2)
- reservoir level plots (2)
- comparisons of low flows (2), and
- comparisons to MIFs (1)

have been updated from what was presented in February, reflecting the change in Greenville demands for the **2070 Moderate** and **High Demand Scenarios.**

2070 Moderate Demand Scenario

Preliminary results to be further reviewed

1 **Physical Shortage**



Surface Water Shortage Table

Map ID	Water User	Max Shortage (MGD)	Frequency of Shortage
1	IR: Overbridge Farm	0.03	0.2%
2	IR: Watson Jerrold Farm	0.6	7%
3	IR: Titan Farms	1.9	10%

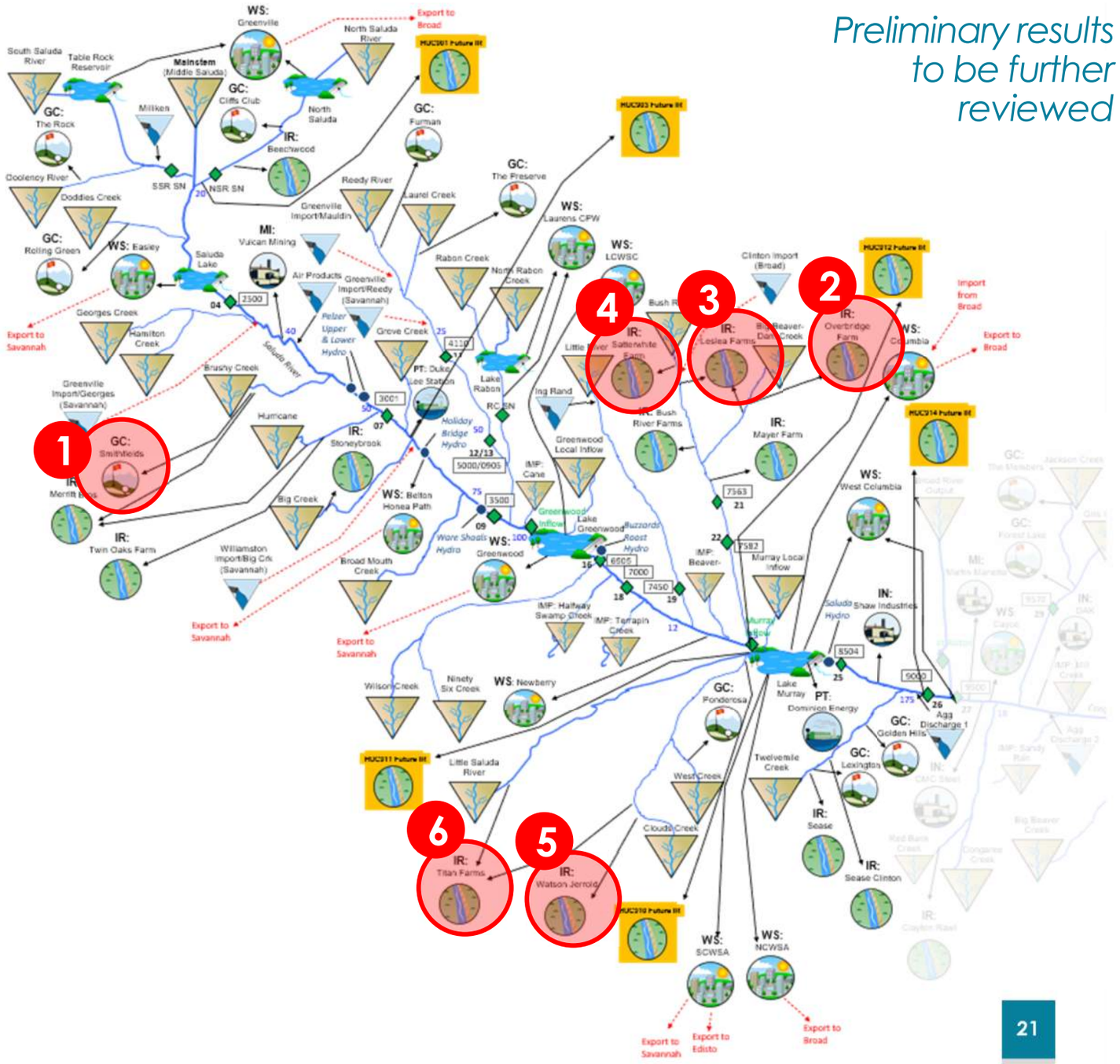
2070 High Demand Scenario

Preliminary results to be further reviewed

1 **Physical Shortage**

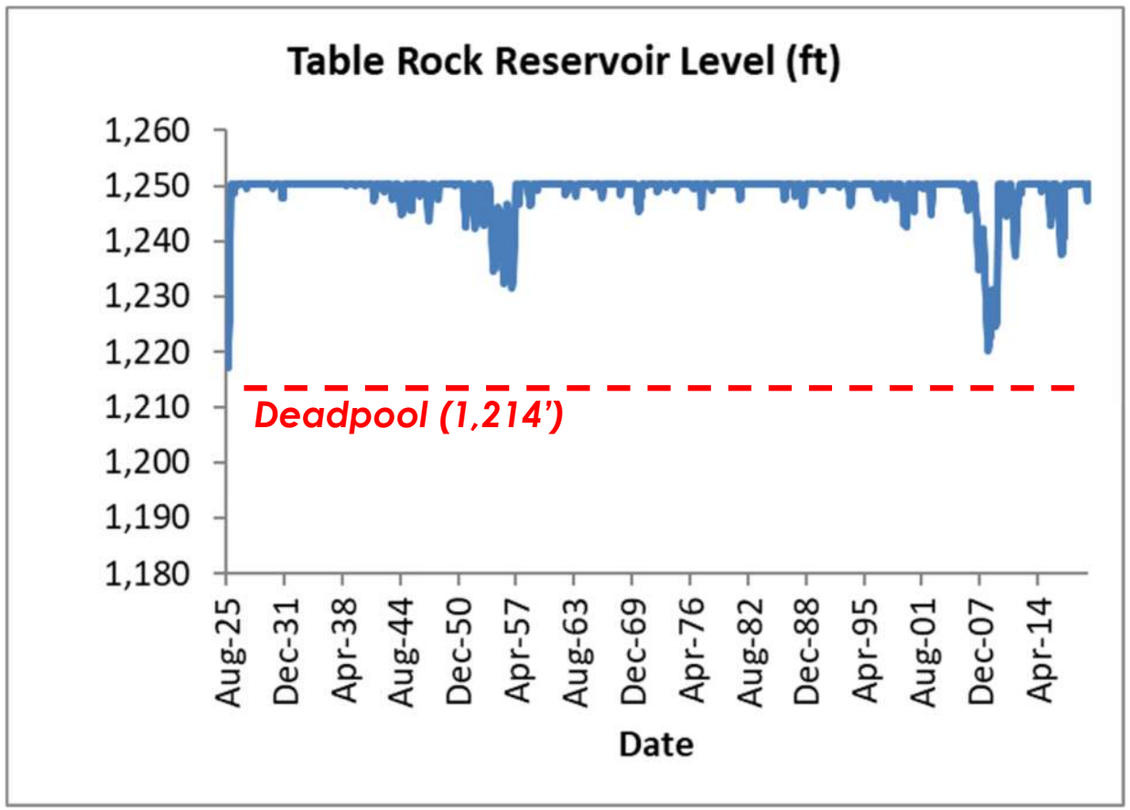
Surface Water Shortage Table

Map ID	Water User	Max Shortage (MGD)	Frequency of Shortage
1	GC: Smithfields	0.03	0.1%
2	IR: Overbridge Farm	0.03	0.2%
3	IR: Leslea Farms	0.1	0.3%
4	IR: Satterwhite Farms	0.04	0.1%
5	IR: Watson Jerrold Farm	0.8	12%
6	IR: Titan Farms	2.5	12%



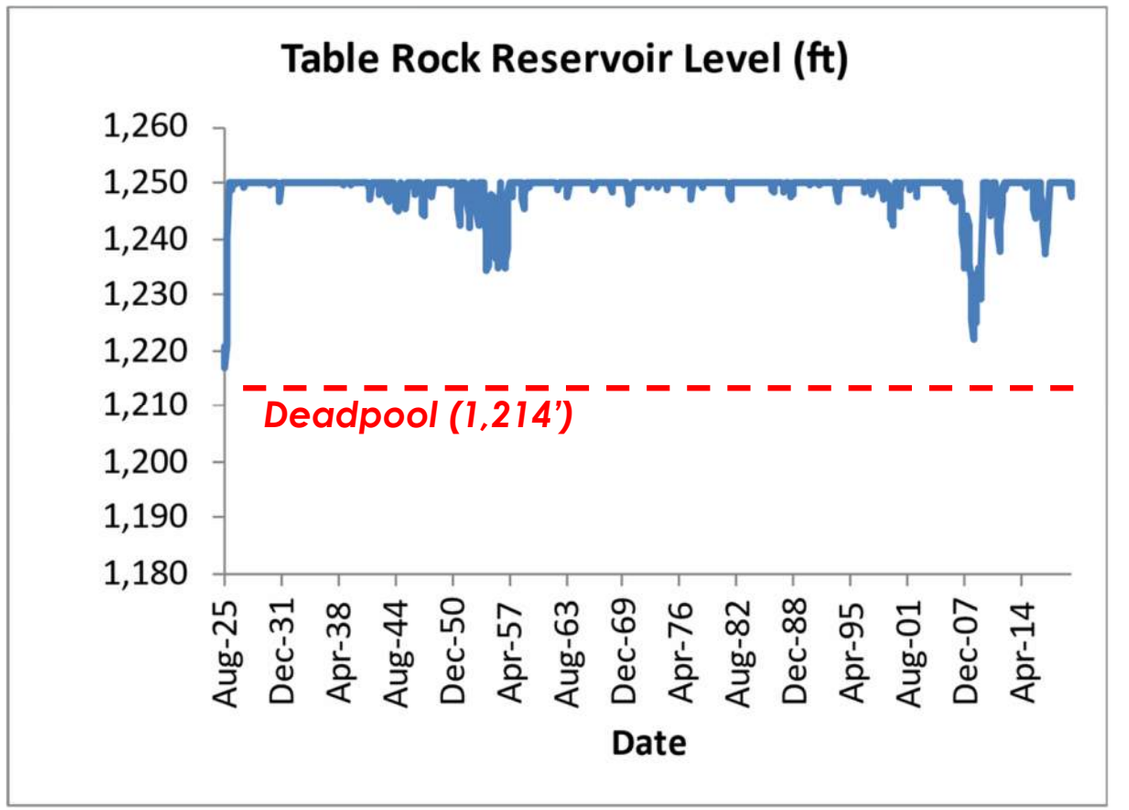
Reservoir Storage – Table Rock Lake

Current Use Scenario



Greenville Water Average Annual Demand for Saluda Reservoirs **35.2 MGD**

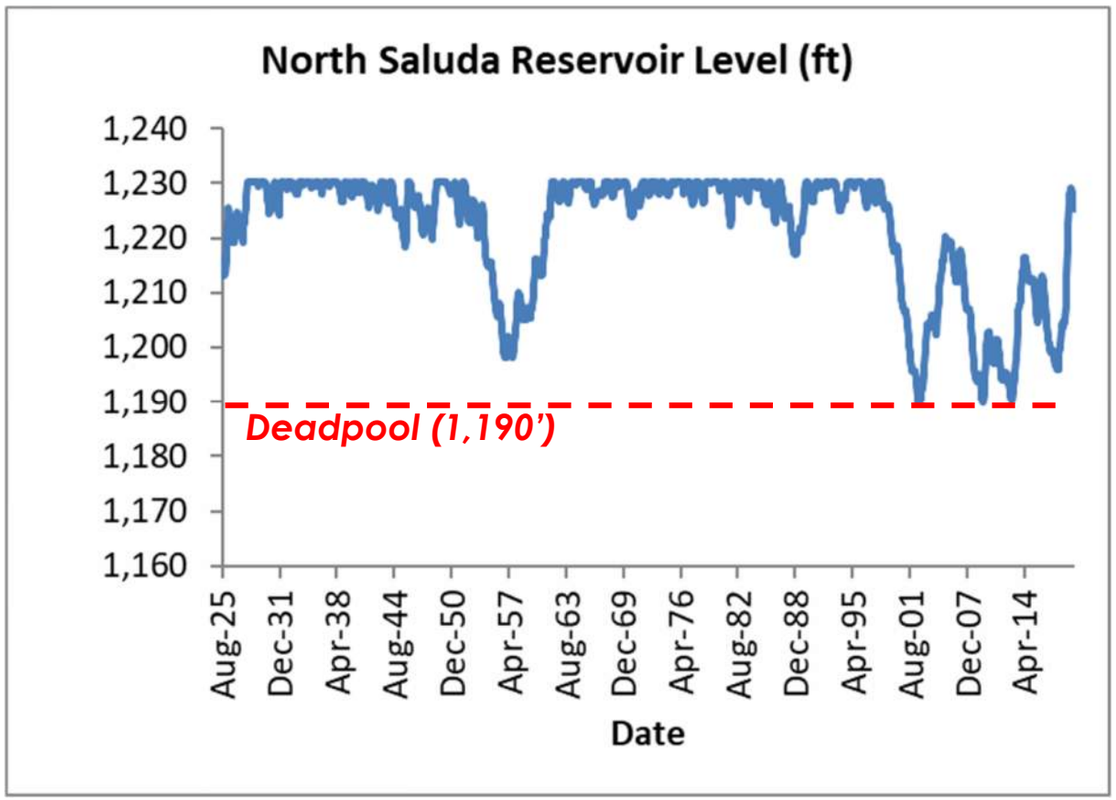
2070 High Demand Scenario



Greenville Water Average Annual Demand for Saluda Reservoirs **33.8 MGD**

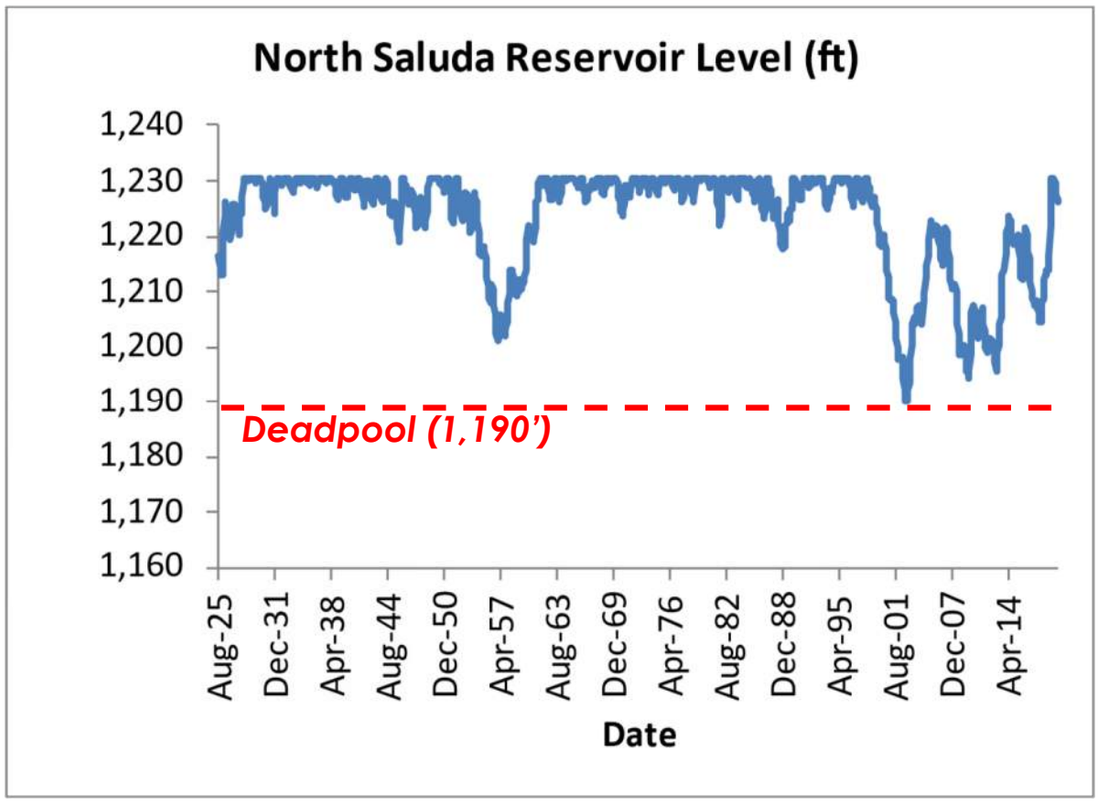
Reservoir Storage – North Saluda Reservoir

Current Use Scenario



Greenville Water Average Annual Demand for Saluda Reservoirs **35.2 MGD**

2070 High Demand Scenario



Greenville Water Average Annual Demand for Saluda Reservoirs **33.8 MGD**

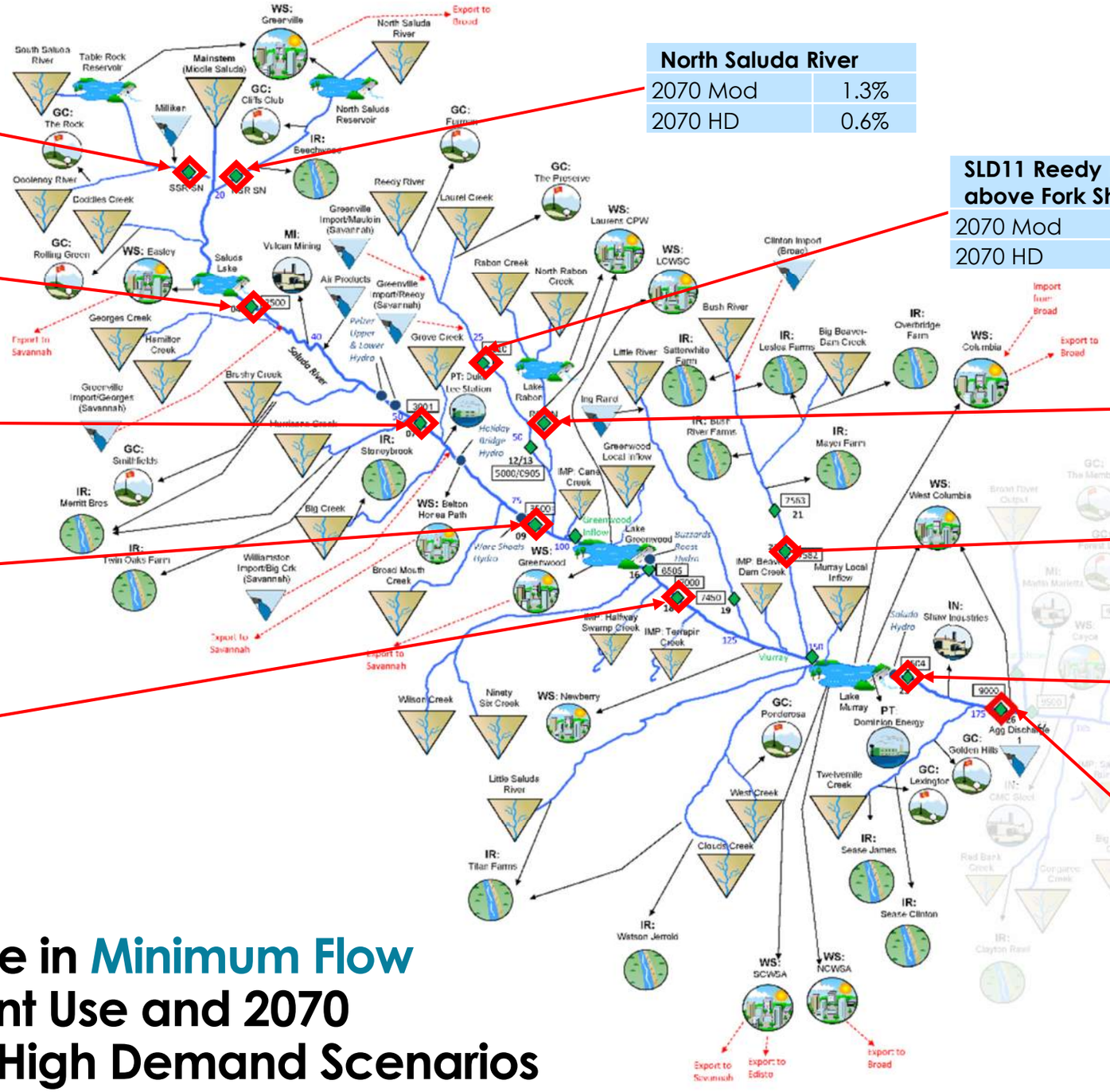
South Saluda River	
2070 Mod	0.1%
2070 HD	-0.4%

SLD04 Saluda River near Greenville	
2070 Mod	-3.0%
2070 HD	-12.0%

SLD07 Saluda River near Williamston	
2070 Mod	-1.7%
2070 HD	--7.2%

SLD09 Saluda River near Ware Shoals	
2070 Mod	-2.5%
2070 HD	-7.3%

SLD18 Saluda River at Chappells	
2070 Mod	-0.6%
2070 HD	-5.8%



North Saluda River	
2070 Mod	1.3%
2070 HD	0.6%

SLD11 Reedy River above Fork Shoals	
2070 Mod	-0.3%
2070 HD	-1.3%

Rabon Creek	
2070 Mod	-13.4%
2070 HD	-75.5%

SLD22 Bush River near Prosperity	
2070 Mod	-25.0%
2070 HD	14.4%

SLD25 Saluda River below L. Murray Dam	
2070 Mod	0.0%
2070 HD	0.0%

SLD26 Saluda River near Columbia	
2070 Mod	-0.4%
2070 HD	-1.3%

Percent Change in Minimum Flow between Current Use and 2070 Moderate and High Demand Scenarios

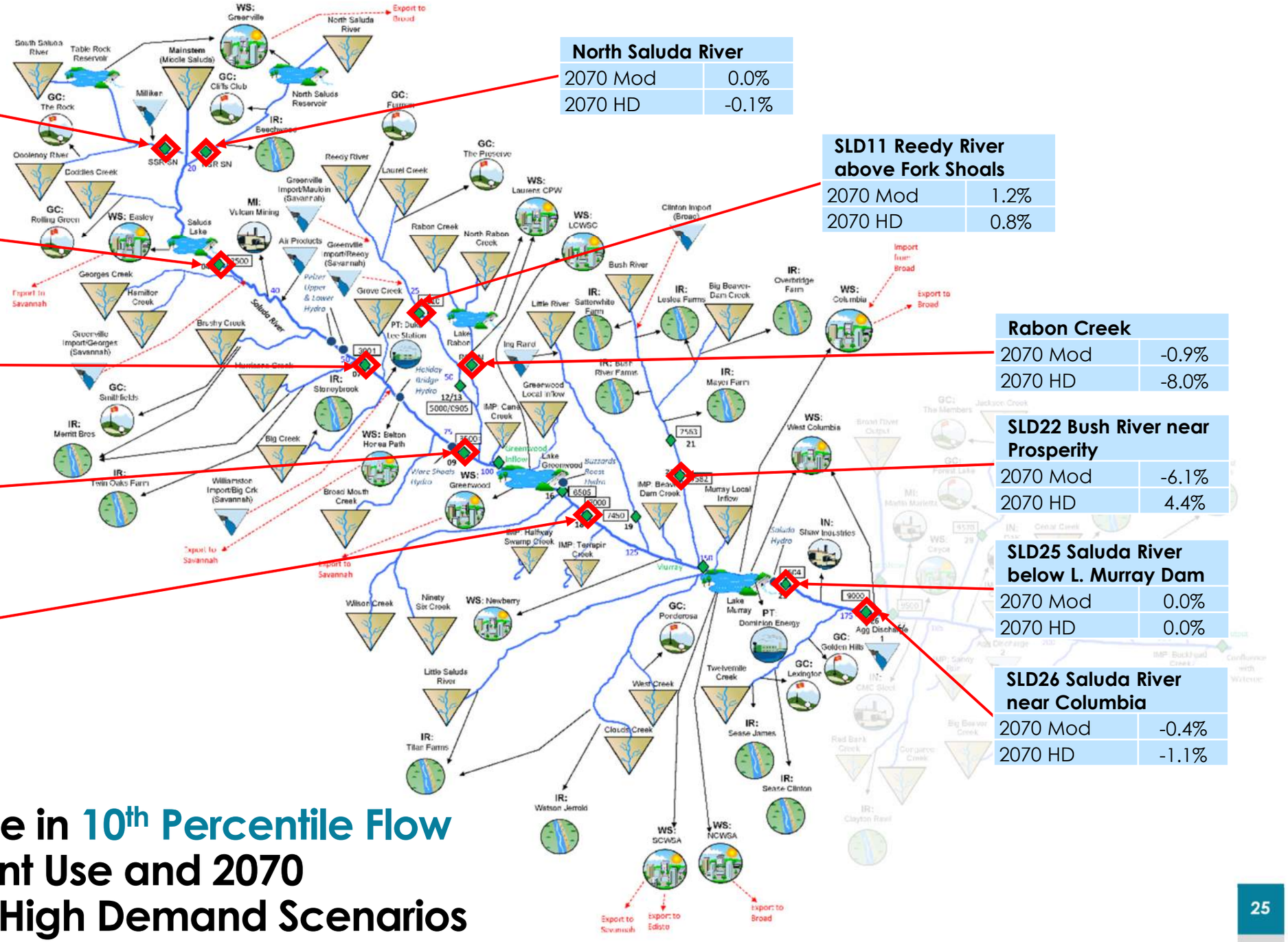
South Saluda River	
2070 Mod	0.0%
2070 HD	0.0%

SLD04 Saluda River near Greenville	
2070 Mod	-0.9%
2070 HD	-3.5%

SLD07 Saluda River near Williamston	
2070 Mod	-0.1%
2070 HD	-1.7%

SLD09 Saluda River near Ware Shoals	
2070 Mod	-0.9%
2070 HD	-1.8%

SLD18 Saluda River at Chappells	
2070 Mod	-0.1%
2070 HD	-2.3%



North Saluda River	
2070 Mod	0.0%
2070 HD	-0.1%

SLD11 Reedy River above Fork Shoals	
2070 Mod	1.2%
2070 HD	0.8%

Rabon Creek	
2070 Mod	-0.9%
2070 HD	-8.0%

SLD22 Bush River near Prosperity	
2070 Mod	-6.1%
2070 HD	4.4%

SLD25 Saluda River below L. Murray Dam	
2070 Mod	0.0%
2070 HD	0.0%

SLD26 Saluda River near Columbia	
2070 Mod	-0.4%
2070 HD	-1.1%

Percent Change in 10th Percentile Flow between Current Use and 2070 Moderate and High Demand Scenarios

Saluda River near Greenville (80 yrs)	
UIF	2
Current	4
2070 Mod	4
2070 HD	4
P&R	11

Saluda River near Williamston (27 yrs)	
UIF	1
Current	2
2070 Mod	2
2070 HD	3
P&R	5

Saluda River near Ware Shoals (83 yrs)	
UIF	2
Current	3
2070 Mod	3
2070 HD	4
P&R	59

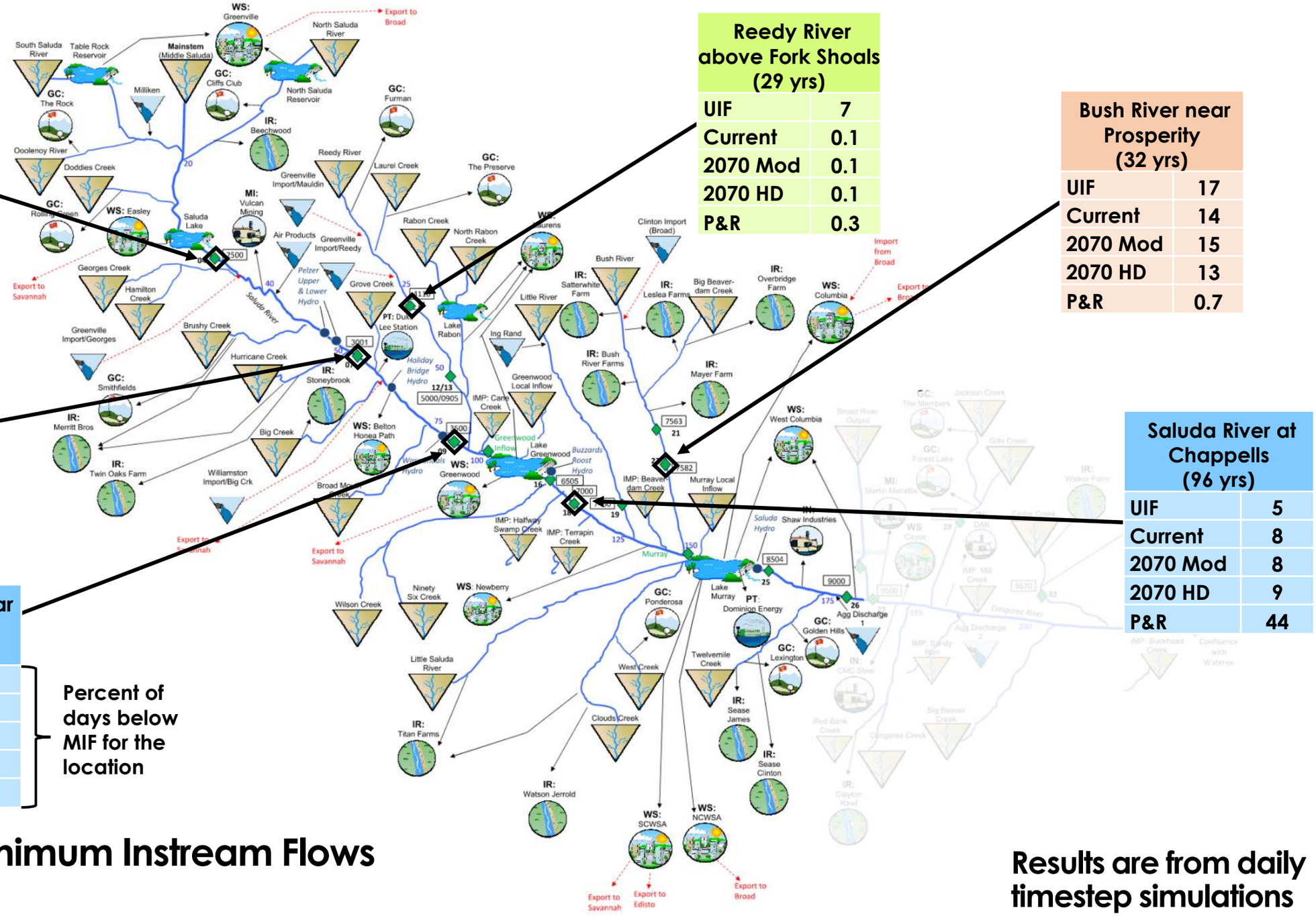
Years of gage data used to calculate the MIF

Percent of days below MIF for the location

Reedy River above Fork Shoals (29 yrs)	
UIF	7
Current	0.1
2070 Mod	0.1
2070 HD	0.1
P&R	0.3

Bush River near Prosperity (32 yrs)	
UIF	17
Current	14
2070 Mod	15
2070 HD	13
P&R	0.7

Saluda River at Chappells (96 yrs)	
UIF	5
Current	8
2070 Mod	8
2070 HD	9
P&R	44



Comparison to Minimum Instream Flows
Saluda River Basin

Results are from daily timestep simulations