Objectives:
1. Review and discuss additional water resource assessment results
2. Review and discuss management practices and recommendations
3. Consider recommendations from Plan Review & Inter-Council Coordination Committees
4. Learn about recent studies on water system interconnectivity and biosolids management

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<td>Welcome, Agenda Review, Check-In with New Members</td>
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<td>Next Steps in Plan Review and Revision</td>
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<td>Resource Assessment Results</td>
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<td>Information Items: GEFA Study and Biosolids Report</td>
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<td>Management Practices Review</td>
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<td>Recommendations Review</td>
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**Agenda**
Regional Water Plan Update

Regional Water Plan Review and Revision Schedule

Meeting One
4th Quarter 2021

Meeting Two
1st Quarter 2022

Meeting Three
2nd Quarter 2022

Meeting Four
3rd Quarter 2022
Draft Plan Review

Meeting 4.5
3rd Quarter 2022
If needed to approve Draft Plan (virtual)

Meeting Five (Final)
4th Quarter 2022
Incorporate Comments

EPD targeted date of adoption of revised Regional Water Plan by December 2022
### Introductions

<table>
<thead>
<tr>
<th>Name</th>
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<tr>
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<td>Council Chair for: Upper Flint</td>
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</tr>
<tr>
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<tr>
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Resource Assessment Results
Regional Water Planning Models

Water Planning Model Recap

1. Groundwater Availability
2. Surface Water Availability
3. Surface Water Quality
Regional Water Planning Models

Groundwater Availability
• Results presented at last meeting: March 16, 2022

Surface Water Availability
• Previously we focused on how the model works and how we measure results (*metrics*)
• Results will be shared today

Surface Water Quality
• Some model results were discussed at last meeting and more results will be discussed today
Regional Water Planning Model Results

**Metrics** are used to evaluate the results relative to outcomes of interest.

**Surface Water Availability**
Do we have enough water to...
- meet demands?
- assimilate wastewater?
- support recreation?

**Groundwater Availability**
How does groundwater use affect our aquifers?
Does groundwater use cause adverse impacts?
(to users, aquifers, instream flows)

**Surface Water Quality**
Is water quality adequate to support uses?
(drinking water, recreation, fishing)
How do wastewater discharges affect water quality (dissolved oxygen)?

*Sustainable Yield*
Resource Assessment
Results: Water Quality and Surface Water Availability
Presentation Outline

• Introduction and Model Settings

• Model Results Baseline Scenarios
  • Water Supply Challenges, Examples (water supply PMs)
    • City of Warm Springs
    • Roosevelt Warm Springs Institute
  • Wastewater assimilation Challenges, Example (wastewater assimilation PMs)
  • Carsonville Flow Results

• Additional Performance Measures to consider?
Upper Flint Region and ACF Model Domain
BEAM Node Types

- Upstream Junction 1090
- Return Node 1098
- Inflow 1099
- Junction Node 1100
- Agricultural Node 1102
- USGS Gage Node 1101
- Withdrawal Node 1103-1105
- Downstream Junction 1110

Map with various node types:
- Yellow: Junction
- Light blue: USGS Gage
- Red: Reservoir
- Brown: Routing Reservoir
- Blue: Municipal/Industrial Withdrawal or Thermal Net Consumptive Use
- Brown: Agricultural Withdrawal
- Light brown: Runoff Inflow
- Dark brown: Municipal or Industrial Discharge
- Light green: Overbank/Overland Flooding Loss
- Black: Flow Arc
ACF BEAM Model Baseline and Future Scenarios Settings

• Simulation Period (various hydrologic conditions): 1939-2018

• Withdrawal and Discharge amount: baseline: average of period 2010-2018 (i.e. marginally dry conditions);

• Instream Flow Protection Thresholds: per permit conditions

• Reservoir physical and operational data: from reservoir owner or EPD
Water Supply Settings: Facilities Analyzed in BEAM Model for Upper Flint Region

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Note: Energy withdrawals are expressed as consumptive uses in modeling.
Example 1: Permit 099-1106-07 (BEAM Node 6885)

- Permit holder: City of Warm Springs
- Withdrawal limits: 0.33 mgd (daily)/0.24 mgd (monthly)
Permit 099-1106-07 Withdrawal Amount Setting-average of 2010-2018 and 2060 projection
Water Supply Challenge in 2000

Shortage at node 6885 -- 099-1106-07: City of Warm Springs

Month / Year

Shortage (AF)
Water Supply Challenge in 2007

Shortage at node 6885 -- 099-1106-07: City of Warm Springs
Water Supply Shortage Frequency in 1939-2018

Shortage at node 6885 -- 099-1106-07: City of Warm Springs

Percent of simulated time steps
Example 2: Permit 099-1106-04 (BEAM Node 6884)

- Permit holder: Roosevelt Warm Springs Institute
- Withdrawal limits: 0.144 mgd (daily/monthly)
- Cascade Creek IFPT of 0.3 cfs (0.19 mgd)
 Permit 099-1106-07 Withdrawal Amount Setting-average of 2010-2018 and 2060 projection
Water Supply Challenge in 2007

Shortage at node 6884 -- 099-1106-04: Roosevelt Warm Springs Institute
Water Supply Challenge in 2011

Shortage at node 6884 -- 099-1106-04: Roosevelt Warm Springs Institute
Water Supply Shortage Frequency in 1939-2018

Shortage at node 6884 -- 099-1106-04: Roosevelt Warm Springs Institute
Wastewater Assimilation Challenge

• Wastewater increases with population growth, which may also bring challenge to water resource management.

• Effluent limitation is determined by two factors:
  • Available technology – technology based effluent limitations
  • Water quality standards – upholding water quality standards in the receiving water body - 7Q10 flow is usually used as low flow threshold for determining wastewater assimilation and NPDES permit limitations
Wastewater Assimilation Challenge Example 1: Permit GA 0020729 (BEAM Node 7318)

- Permit holder: City of Reynolds (Reynolds WPCP)
- Permitted monthly discharge flow: 0.4 mgd
- 7Q10 Flow at discharge location: 33.39 cfs
Simulation Results at GA 0020729 Location
Flow Frequency

![Graph showing flow frequency distribution](image-url)
Simulation Results at GA 0020729 Location
Flow Frequency (low end) (7Q10 = 33.39 cfs)
Simulation Results at GA 0020729 Location
Flow in 1986

7Q10
Simulation Results at GA 0020729 Location
Flow in 2000

7Q10
Carsonville Flow Condition (BEAM Node 7281)
Simulation Results at USGS 02347500 Location
Flow in 1986-1988

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE

100 CFS
Simulation Results at USGS 02347500 Location
Flow in 1999-2002

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE

100 CFS
Simulation Results at USGS 02347500 Location
Flow in 2007-2008

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE

Flow in 2007-2008

100 CFS
Simulation Results at USGS 02347500 Location
Flow in 2011-2012

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE

Flow in 2011-2012

100 CFS
Simulation Results at USGS 02341500 Location
Flow Frequency
Simulation Results at USGS 02341500 Location
Flow Frequency (low end)
Simulation Results at USGS 02347500 Location
Flow in 1986-1988

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE

Flow in 1986-1988

600 CFS
Simulation Results at USGS 02347500 Location
Flow in 1999-2002

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE

Graph showing the total arc outflow (CFS) from 01/99 to 12/02. The average flow in 1999-2002 is indicated as 600 CFS.
Simulation Results at USGS 02347500 Location
Flow in 2007-2008

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE

Total Arc Outflow (CFS)

01/07 07/07 12/07 06/08 12/08

Month / Year

600 CFS
Simulation Results at USGS 02347500 Location
Flow in 2011-2012

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE

Flow in 2011-2012

600 CFS
Simulation Results at USGS 02341500 Location
Flow Frequency

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE
Simulation Results at USGS 02341500 Location
Flow Frequency (low end)

Total Arc Outflow at node 7281 -- 02347500: FLINT RIVER AT US 19, NEAR CARSONVILLE

Total Arc Outflow (CFS)

Percent of simulated time steps

600 CFS
Summary

- Moderate water supply challenges under baseline water use conditions
- Moderate wastewater assimilation challenges under baseline water use conditions
- Flow at Carsonville under baseline water use conditions
- Additional evaluation can be added according to stakeholders’ inputs
- RA team will provide updates in Tech Memo and presentations as additional results become available
Questions?

Contact Information:

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Manager, Water Supply Program
Watershed Protection Branch, Georgia EPD
470-251-4897 (Zoom Phone) New!
470-898-3891 (Cell)

Wei.Zeng@dnr.ga.gov
Water Quality Resource Assessment

Results under Future Conditions
Watershed Modeling

- These models are not updated at this time, but updates are underway
  - Time-varying landuse inputs
  - Updated meteorological conditions
- Current Conditions:
  - dischargers at 2014 permit limits
- Future Conditions:
  - 2050 assumed permit limits based on previous forecasted flows
Dissolved Oxygen Modeling

- **Future Conditions addressed in Plan Section 5.3**

  *Figure 5-1* shows the modeled assimilative capacity at assumed future (2050) permitted flow and effluent limits.

- **Figure 5-1**: Results from Upper, Middle & Lower Flint Basin
Dissolved Oxygen Modeling

- **Current Conditions**
  - 2019 Permit Limits

- **Future Conditions**
  - 2060 Assumed Permit Limits

- **DOSAG and Riv-1 Models:**
  - High temp, low flow conditions

- **Assimilative Capacity**
  - How DO levels compare to water quality standard of 5.0 mg/L (or natural conditions)
DO Conditions: Upper Flint Basin

Current Conditions

Future Conditions

Legend
Available Assimilative Capacity
- Very Good
- Good
- Moderate
- Limited
- None or Exceeded
- Unmodeled Lakes and Streams
DO Conditions: Middle Flint Basin

Current Conditions

Future Conditions

 Legend
Available Assimilative Capacity
Very Good
Good
Moderate
Limited
None or Exceeded
Unmodeled Lakes and Streams
DO Conditions: Lower Flint Basin

**Current Conditions**

- Bay Branch
- Baptist Branch
- Dry Creek
- Blue Creek
- Spring Creek
- Ichawaynochaway Creek
- Mill Creek
- Town Branch
- Kinchafoonee Creek
- Chickasawhatchee Creek
- McEliece C.

**Future Conditions**

- Bay Branch
- Baptist Branch
- Dry Creek
- Blue Creek
- Spring Creek
- Ichawaynochaway Creek
- Mill Creek
- Town Branch
- Kinchafoonee Creek
- Chickasawhatchee Creek
- McEliece C.

Legend:
- **Very Good**
- **Good**
- **Moderate**
- **Limited**
- **None or Exceeded**
- **Unmodeled Lakes and Streams**

Scale: 0 6 12 18 24 Miles

1:600,000
Management Practices Review
Small Group Discussions: Management Practices Review

1. Demand and Returns Management Practices
2. Supply and Flow Augmentation Management Practices

- Which Management Practices are most important to you? (And why?)
- Are there any that should be added/removed?
- Which Management Practices need to be updated? (Committee work)
Plan Review Committee Report
Gordon Rogers
Plan Review Committee Members

- Donald Chase
- Adam Graft
- Raines Jordan
- Brant Keller
- Gordon Rogers
Plan Review Committee Activity

• Meeting: May 5, 2022
• Reviewed Draft Sections 1, 2, & 4
• Committee meeting notes and edited plan sections in pre-meeting packet
• Major topics discussed:
  • Upstream (Metro) influence on region
  • Population projections
  • Graphs/charts (Section 4)
• Committee recommendation – Approve these sections (as edited by committee) as current working drafts
• Note: Further edits to these sections are expected. Any substantial edits will be reviewed by committee/Council.
Inter-Council Coordination Committee Report

Brant Keller
Inter-Council Coordination Committee

Members

• Donald Chase
• Brant Keller
Inter-Council Coordination Committee

April 19, 2022
Metro Water District Presentation
• Attended and Reviewed Plan

May 5, 2022
Inter-Council Coordination Meeting
• Discussed the Metro Water District Plan Update
• Discussed Council’s Letter to Metro Water District

June 2022
Inter-Council Coordination Meeting
• Include Councils of:
  • Upper Flint
  • Lower Flint – Ochlocknee
  • Middle Chattahoochee
• Currently Scheduling
Inter-Council Coordination Committee Report

Meeting on May 5, 2022

1. Discussed the Metro Water District Plan Update
   - Big question is what do resource models say about the area
   - Continuing concern over consumptive use related to septic tanks (Fayette, Coweta in MNGWPD and Spalding in UFL)
   - Coosa North Georgia (CNG) Council received a seed grant to study raising summer pool
   - Acknowledgement that City of Atlanta converting Bellwood Quarry as raw water storage

2. Recommendations to Metro Water District Plan Update
   - Need to work drought response and resiliency into the letter
   - ARC high level language: water recharge to the Flint (special committee), empty quarry in Griffin (supplied by reuse, river intake). Other opportunities
Letter to Metro Water District – Recommendation to Council

May 9, 2022 (DRAFT TO COUNCIL AND METRO WATER DISTRICT)

Chairman Glenn Page
Metropolitan North Georgia Water Planning District International Tower
229 Peachtree Street, NE
Suite 100
Atlanta, GA 30303

Dear Mr. Page:

Thank you for the opportunity to review the Metropolitan North Georgia Water Planning District/Metro Water District draft Water Resource Management Plan (Plan). The Upper Flint Regional Water Council (the Council) appreciated your staff hosting an informational meeting on the topic, and our Intergovernmental Coordinating Committee has reviewed the draft plan. As the council as the Council is submitting this letter to you and the Council to communicate the Council’s comments on the draft Plan.

First, the Council would like to acknowledge the ongoing coordination between the Metro Water District and the Council during the current regional water planning. Our joint meetings and mutual commitment to coordination have set the foundation for better water planning in our shared water resources. We look forward to building on that foundation.

The Council would like to offer comments on a few areas of the Metro Water District’s draft Plan. The Council’s comments focus on areas of the Plan where we think more coordinated management is needed to sustain shared resources and protect downstream users and increase needs. Our comments apply especially in the Apalachicola-Chattahoochee-Flint (ACF) Basin, which we share with the Metro Water District as well as the Middle Chattahoochee and Lower Flint-Chickamauga Water Councils.

The Council is concerned about the ability of our shared water resources to support all needs — instream and affluents, upstream and downstream — in the future, as increased water demand will place further strain on the quality and quantity of shared water resources. The impacts could adversely affect water storage capacity and streamflow, particularly in the ACF Basin. To address these concerns, we suggest the following for the Metro Water District draft Plan:

- Add more recognition of the need for regional water storage to improve water resource management. The Metro Water District’s draft Plan does not address additional future regional water storage capacity. The Council believes that water storage is an especially critical issue in the ACF Basin, where competing and increasing demands on the system,

including those demands reflected in your plan, will exceed the capacity of the system to provide for basinwide needs. We commend the City of Atlanta in its effective utilization of the Beulahwood Quarry for additional 2.4 billion gallons of emergency water supply, and other similar initiatives to improve water supply reliability, as well as the MNGDF Integrated-13 Action Item to encourage return flows to the system. However, the previously discussed concept of increasing the Lake Lanier full pool elevation by 2 feet to increase regional water storage is not in the draft plan. We understand that the Cola North Georgia Water Planning Council received a seed grant to conduct a study of this concept. We support this effort and would appreciate the Metro Water District’s support of this initiative in its plan.

We encourage the consideration and support for additional water storage in the Metro Water District:

- Acknowledge the need for coordination with downstream regional water councils on regional water storage capacity. We commend the Metro Water District for its continued coordination with downstream regional water councils in the ACF (Upper Flint, Middle Chattahoochee, and Lower Flint-Chickamauga) to evaluate and support the development of regional water storage capacity. Coordination will strengthen our efforts and ensure that needs across the basin are considered and addressed. By working together to evaluate and support expansion in regional water storage capacity, we can improve our shared capability to meet instream and affluents needs on a system-wide basis.

- Ensure that implementation of the Metro Water District policies provide for increased return of wastewater. The Council requests that the Metro Water District implement policies that will decrease the net consumptive use from septic systems and reclaimed wastewater. The stated principles in the draft Plan sets a preference for return flows to local water supplies. Integrated-13 Action Item applies specifically to Lake Lanier and Lake Allatoona water users, and Integrated-5 and Integrated-8 through Integrated-12 action items address septic systems and decentralized systems. However, these action items encourage, rather than require, minimizing wastewater practices that reduce return flows, such as use of septic systems and land application systems. Return flows are a critical priority for downstream needs and users, especially in the ACF System.

- Coordination of drought response and resiliency. The Council commends the Metro Water District on its emphasis on resiliency as a planning principle and increased efforts concerning drought response included in the Plan’s Action Item Integrated-2 and the Local Drought Response and Water Waste Ordinance/Policy (WS2C-13). We encourage the Metro Water District to continue coordination and implementation of policies that continue to support drought response and resiliency.

If you have any questions about the Council’s comments, please let me know. I look forward to our continued work together.

Sincerely,

Donald Chase, Chair
Upper Flint Regional Water Council
Inter-Council Coordination Committee

Next meeting will be coordinated with Lower Flint – Ochlocknee and Upper Flint in June 2022

Discussion Topics:

1. Review 2017 Plans - Section 7.4 Recommendations to the State: Coordinated Recommendations with Neighboring Councils
2. Develop Updated Coordinated Recommendations with Neighboring Councils
3. Present to Council at August Meeting
Recommendations
Review
Kristin Rowles
Recommendations to the State
Section 7.4 of 2017 Plan

• Information Needs
• Water Policy Recommendations
• Coordinated Recommendations with Neighboring Councils
Information Needs

1) Incorporate more *actual* water use/resource conditions data into forecasts and resource assessments
   • Ag meter data – good improvements have been made
   • Make use of data collected by local governments and water & wastewater utilities in region

2) Evaluate impacts of *low flow conditions* in model results for Bainbridge
   • Determine low flow thresholds below which adverse ecosystem impacts are predicted

3) Evaluate additional *low flow statistics* for use in water availability resource assessment (20% AAD, stratified 7Q10, one-day minima, 3Q30, others)

4) Improve *energy sector* water use forecasts
   • Not geographically specific
   • Need to account for greater cooling tower efficiency, energy conservation, power production forecasts, water quality
Information Needs

5) Increase the number of nodes in surface water availability model to support more detailed understanding of conditions (e.g., new node between Montezuma and Bainbridge)

6) Cooperatively review Unimpaired Flows dataset for ACF (GA, FL, AL, USACE)
   - Account for impacts from land use change, water withdrawals, returns, net evaporation, other human influences

7) Improve groundwater assessment to support better understanding of:
   - Impacts of aquifer use on aquifers and streamflow
   - How to support protection of aquifer recharge areas

8) Evaluate costs & benefits of reducing minimum threshold for water withdrawal permits (surface and groundwater)
Information Needs

9) Conduct comprehensive assessment of baseline water conservation and water quality *Best Management Practices* by agricultural producers
   • Expand survey of water efficiency equipment adoption in Lower Flint River Basin to whole basin
   • Georgia Forestry Commission BMP implementation tracking is a model

10) Evaluate full *water cycle impacts* of irrigation and evaporative water loss from reservoirs

11) Improve *agricultural water meter* program
   • Comprehensive installation of meters
   • Maintenance inspections
   • More data: monthly use, crops, inputs
   • Continue to report aggregate results
   • Continue to prepare data for use in resource assessments
Information Needs

12) Evaluate *water conservation* practices – implementation and effectiveness
   • Conservation = priority focus of this plan
   • Difficult to measure progress/impact
   • Need more information to assess implementation and benefits

13) Evaluate impacts of small/medium *impoundments* on stream flows (intercepted drainage, evaporative loss, water quality) to assess their impacts

14) Improve how *farm pond withdrawals* are incorporated into resource assessments

15) Evaluate *water quality use designations* in Upper Flint Region (through the Triennial Review) to reflect actual conditions (use, quality)
Water Policy Recommendations

1) General Assembly should provide **funding for Regional Water Planning** to:
   - Continue regional water planning
   - Monitor plan implementation
   - Refine resource assessments

2) General Assembly and implementing agencies should explore all possible sources of **funding for Regional Water Plan implementation**
   - Funding for implementation is the Council’s highest priority.
   - Financial incentives and reimbursement for plan implementation will expedite progress toward the Plan’s goals

3) EPD and other agencies should design **water conservation** policies/regulations to:
   - Recognize and credit water users for conservation practices that they have already implemented
   - Prioritize addressing consumptive over non-consumptive uses
   - Emphasize cost effectiveness
Water Policy Recommendations

4) **Inter-basin Transfer (IBT)**
   - State policy should not preclude IBT as an option for future water management, as needed and following thorough scientific and economic evaluation
   - 2011 DNR Board Rules guide thorough **evaluation**
   - Evaluate feasibility of **reversing** existing IBTs that affect the Flint River Basin with cost/benefit analysis (e.g., City of Griffin analysis from 2016)

5) **Irrigation suspension** during drought
   - Should be a last resort, voluntary, and with notification by March 1
   - Earlier notification better to inform planting decisions; better drought prediction tools will help
   - Reliable funding needed

6) General Assembly should clarify regulatory definition of **stream buffer** for consistent application (also in MP WQ-3)
Water Policy Recommendations

7) General Assembly should legislate *authority to the regional water planning councils* to manage, plan, and provide oversight of water resources and provide funding from State appropriations for this purpose.

8) Council urges timely resolution of *interstate conflict in ACF*
   - Develop a tristate framework to address interstate management and include the regional water councils in this framework.
   - Council requests support to make changes in plan as needed to address settlement/resolution/decision in interstate litigation or similar events that might change how the Basin is managed.

9) Continue *coordination and cooperation among water planning regions* (Middle Chattahoochee, Lower Flint Ochlockonee, Metro District)
Coordinated Recommendations with Neighboring Councils

1) More water storage capacity in the ACF (e.g., better use of existing, additional new storage)
2) Use of actual/current data in resource assessments
3) Interstate planning organization for ACF (consider transboundary institution recommendation of the ACF Stakeholders)
Next Steps in Plan Review and Revision

Kristin Rowles
Regional Water Plan Update

Regional Water Plan Review and Revision Schedule

Meeting One
4th Quarter 2021

Meeting Two
1st Quarter 2022

Meeting Three
2nd Quarter 2022

Meeting Four
3rd Quarter 2022
Draft Plan Review

Meeting 4.5
3rd Quarter 2022
If needed to approve Draft Plan (virtual)

Meeting Five (Final)
4th Quarter 2022
Incorporate Comments

EPD targeted date of adoption of revised Regional Water Plan by December 2022
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Regional Water Plan Update – Before Today

Regional Water Plan Review and Revision Schedule

Meeting One
4th Quarter 2021

Meeting Two
1st Quarter 2022

Meeting Three
2nd Quarter 2022

Meeting Four
3rd Quarter 2022

Meeting Five (Final)
4th Quarter 2022

Incorporate Comments

Plan Review Committee
Regional Water Plan Update – Today’s Discussion

Regional Water Plan Review and Revision Schedule:

- **Meeting One**: 4th Quarter 2021
- **Meeting Two**: 1st Quarter 2022
- **Meeting Three**: 2nd Quarter 2022

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GEORGIA WATER PLANNING

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Regional Water Plan Update – Next Steps

Regional Water Plan Review and Revision Schedule

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EPD Report

Johanna Smith, GA EPD
Information Items:
GEFA Georgia Water Supply and Redundancy Study and GEFA Biosolids Report

Amanda Carroll, Georgia Environmental Finance Authority
Steve Simpson, Black & Veatch
Georgia Water Supply Redundancy Study

Upper Flint Water Planning Region

Georgia Environmental Finance Authority

See full report for details: Wood, April 14, 2022

May 2022
Study Objectives

- For qualified water systems (i.e., public system usually serving over 3,300 people):
  - Evaluate drinking water supply, demand, treatment, storage, distribution, and interconnectivity
  - Identify redundant water supply sources
  - Emergency supply and deficit under existing (2015) and future (2050) conditions
  - Evaluate potential projects
  - Recommend projects using decision-based prioritization tool
Water Withdrawals by Type

- **Groundwater (GW)**
  - 57% of region’s 2010 water supply

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<tr>
<th>Withdrawal Category</th>
<th>Withdrawal (MGD)</th>
<th>Percentage (%)</th>
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<td>Agriculture</td>
<td>68</td>
<td>75%</td>
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<td>Municipal</td>
<td>12</td>
<td>13%</td>
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<tr>
<td>Domestic/self-supply</td>
<td>7</td>
<td>8%</td>
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<tr>
<td>Mining</td>
<td>2.8</td>
<td>3%</td>
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<tr>
<td>Industrial</td>
<td>1.4</td>
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- **Surface Water (SW)**
  - 43% of region’s 2010 water supply

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<th>Percentage (%)</th>
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<td>Agriculture</td>
<td>41</td>
<td>61%</td>
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<td>Municipal</td>
<td>15</td>
<td>22%</td>
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<td>Industrial</td>
<td>11</td>
<td>17%</td>
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Values from: *Upper Flint Regional Water Plan. June 2017.*
### Region Qualified Water Systems

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<th>Qualified Water System</th>
<th>Raw Water Sources</th>
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<td>Sumter</td>
<td>Americus</td>
<td>Groundwater Wells (6)</td>
</tr>
<tr>
<td>Crisp</td>
<td>Cordele</td>
<td>Groundwater Wells (6)</td>
</tr>
<tr>
<td>Spalding</td>
<td>Griffin</td>
<td>Surface Water (3)</td>
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<tr>
<td>Crisp</td>
<td>Lake Blackshear</td>
<td>Groundwater Wells (2)</td>
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<td>Meriwether</td>
<td>Manchester</td>
<td>Surface Water (2)</td>
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<tr>
<td>Marion</td>
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<td>Groundwater Wells (3)</td>
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<td>Macon</td>
<td>Montezuma</td>
<td>Groundwater Wells (4)</td>
</tr>
<tr>
<td>Macon</td>
<td>Oglethorpe</td>
<td>Groundwater Wells (3)</td>
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<td>Schley</td>
<td>Schley County</td>
<td>Groundwater Wells (2)</td>
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<tr>
<td>Spalding</td>
<td>Spalding County</td>
<td>Wholesale Purchase</td>
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<td>Talbot</td>
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<td>Wholesale Purchase</td>
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<td>Upson</td>
<td>Thomaston</td>
<td>Surface Water (3)</td>
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<td>Dooly</td>
<td>Unadilla</td>
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<td>Upson</td>
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<tr>
<td>Dooly</td>
<td>Vienna</td>
<td>Groundwater Wells (6)</td>
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Identify Redundant Water Supply Sources

• Redundancy is valuable in this context
  • Excess capacity or duplicate parts that perform if other parts fail
• Three sources of redundancy considered:
  1. Excess capacity
    • Sufficient excess capacity for 13/13 systems in 2015 and 12/13 systems in 2050
  2. Raw and potable water sources
    • EPD’s groundwater and surface water resource availability models indicate varying levels of sufficiency or insufficiently for aquifers and surface water nodes
    • Potential surface water source/storage options identified (e.g., expanded reservoirs, watershed dams, quarries)
  3. Interconnections
    • Some systems have the potential to interconnect
Emergency Planning Benchmarks

- Reliability targets: 100%, 65%, and 35% of average daily demand
- Each reliability target applied to 2015 and 2050 total demand to give an overview of water availability
Water Supply Risk Evaluations

Evaluate system capability to supply sufficient water to customers during a given emergency

Available Water Supply - Reliability Target Demands = Deficit

Peak Day Design Capacity + Maximum Possible Purchased Water + Stored Water (Scenarios A1, B, D1, D2) - Capacity Loss Due to Emergency
# Water Supply Risks and Emergency Scenarios

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<th>Water Supply Risk</th>
<th>Emergency Scenario</th>
<th>Type</th>
<th>Duration (Days)</th>
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<td>A. Failure of largest water treatment plant (WTP)</td>
<td>A1. Power supply failure of largest WTP</td>
<td>Short-term</td>
<td>1</td>
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<tr>
<td></td>
<td>A2. Critical asset failure at largest WTP (e.g., loss of clearwell, loss of chemical treatment)</td>
<td>Short-term</td>
<td>30</td>
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<tr>
<td>B. Short-term catastrophic failure of a water distribution system</td>
<td>Critical transmission main failure from largest WTP or interconnection</td>
<td>Short-term</td>
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<tr>
<td>C. Short-term contamination of a water supply within distribution system</td>
<td>Contamination of distribution system triggers a boil water notice</td>
<td>Short-term</td>
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<td>D. Short-term contamination of a raw water source</td>
<td>D1. Biological contamination of largest raw water source</td>
<td>Short-term</td>
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<td>D2. Chemical contamination of largest raw water source</td>
<td>Short-term</td>
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<td>E. Full unavailability of major raw water sources due to federal or state government actions</td>
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<td>Long-term</td>
<td>&gt;365</td>
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<td>F. Reduced availability of major raw water sources due to federal or state government actions</td>
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<td>Long-term</td>
<td>&gt;365</td>
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<td>G. Failure of an existing dam that impounds a raw water source</td>
<td>Dam failure for largest impoundment</td>
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<td>H. Water supply reduction due to drought</td>
<td>Raw water supply available is 40% of ADD due to drought</td>
<td>Short-term</td>
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Water Supply Risks: Evaluation Results

- 2015 deficits:

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<th>100% ADD</th>
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<th>35% ADD</th>
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- 2050 deficits:

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<tr>
<td>Manchester</td>
<td>◊</td>
<td>◊</td>
<td>◊</td>
</tr>
<tr>
<td>Schley County</td>
<td>◊</td>
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- Surface water systems generally perform less favorably because their often single water treatment plant (WTP) design lacks inherent redundancy.

- Groundwater systems generally perform well because their multi-well, multi-WTP design offers inherent redundancy.
Schematic of Key System Data
Potential Project Development

- Scenario(s) rendering systems with less water supply were further evaluated
  - Logical, implementable projects retained for systems with less available supply
    - Not all systems have projects
- Potential conceptual-level redundancy projects developed
- For this region, four project types:
  1. New interconnection
  2. Upgrade existing interconnection
  3. Restore existing interconnection
  4. New well and GW WTP (includes backup generator) (internal project)
## Potential Projects

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<th>Qualified Water System(s) Benefitted</th>
<th>Potential Project Description</th>
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<td>Americus-Schley County</td>
<td>Interconnection: Americus-Schley County 50 feet along Lacross Road</td>
</tr>
<tr>
<td>2</td>
<td>Griffin-Spalding County</td>
<td>Upgrade existing interconnection: Clayton County</td>
</tr>
<tr>
<td>3</td>
<td>Griffin-Spalding County</td>
<td>Upgrade existing interconnection: Henry County</td>
</tr>
<tr>
<td>4</td>
<td>Griffin-Spalding County</td>
<td>Upgrade existing interconnection: Butts County/Jackson/Jenkinsburg</td>
</tr>
<tr>
<td>5</td>
<td>Manchester</td>
<td>Restore existing interconnection: Manchester-Warm Springs</td>
</tr>
<tr>
<td>6</td>
<td>Montezuma-Oglethorpe</td>
<td>Interconnection: Montezuma-Oglethorpe 1 mile along Riverview Dr/Walnut St</td>
</tr>
<tr>
<td>7</td>
<td>Unadilla</td>
<td>New Well and WTP</td>
</tr>
</tbody>
</table>
Prioritization Criteria and Weighting

• Potential projects prioritized based on performance under weighted quantitative and qualitative criteria
  
  • 8 criteria
    - E.g., population benefitted; cost; potential environmental, system, and community impacts
  
  • 4 scores (1 through 4)
  
  • 3 weights (1 through 3)
## Potential Projects Sorted by Final Rank Order

<table>
<thead>
<tr>
<th>Project Number</th>
<th>Systems Benefitted</th>
<th>Potential Project Description</th>
<th>Cost ($)</th>
<th>Final Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Americus Schley County</td>
<td>Interconnection: Americus-Schley County 50 feet along Lacross Road</td>
<td>$47,600</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Griffin Spalding County</td>
<td>Upgrade existing interconnection: Henry County</td>
<td>$760,300</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Manchester</td>
<td>Restore existing interconnection: Manchester-Warm Springs</td>
<td>$50,000</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>Unadilla</td>
<td>New Well and WTP</td>
<td>$2,130,800</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Griffin Spalding County</td>
<td>Upgrade existing interconnection: Clayton County</td>
<td>$3,573,500</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Griffin Spalding County</td>
<td>Upgrade existing interconnection: Butts County/Jackson/Jenkinsburg</td>
<td>$5,322,200</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Montezuma Oglethorpe</td>
<td>Interconnection: Montezuma-Oglethorpe 1 mile along Riverview Dr/Walnut St</td>
<td>$1,846,700</td>
<td>7</td>
</tr>
</tbody>
</table>
Conclusion

• Upper Flint Region has one 2015 deficits and three 2050 deficits
• Potential projects identified can assist Councils and systems in understanding the types of upgrades that could benefit the Water Planning Region
• Interconnection redundancy projects highlight the potential for systems to interconnect
• Internal infrastructure redundancy projects highlight the potential for a future management practice: encourage public water systems to enhance their water supply redundancy and treatment/unit process redundancy
Questions?
GEFA Biosolids Assessment and Prepared Study

May 2022
Biosolids Management: Drivers and Trends

Photos courtesy of GA EPD, Presentation to MNGWPD WW TCC Meeting, January 24, 2019
Key Trends for Solids Management

- Landfilling
  - HMCW concerns dominate
  - Tip fees likely to remain high
  - Potential limited biosolids acceptance
- Land application
  - Class B field storage logistics
  - Local jurisdiction resistance
  - PFAS-based restrictions
- Incineration
  - Permitting, cost may limit potential use
Current and Projected Solids Production Estimates

![Graph showing current and projected solids production estimates for different regions in Georgia. The graph includes data for Atlanta Regional Commission, Central Savannah River Area, Coastal Regional Commission, Heart of Georgia, Altamaha, Middle Georgia, Northeast Georgia, Northwest Georgia, River Valley, Southern Georgia, Southwest Georgia, and Three Rivers. The x-axis represents annual average solids production, measured in dry tons per year, ranging from 0 to 160,000. The y-axis represents the percent change in solids production, ranging from -20% to 100%. The graph includes data for 2019 solids production data, 2060 solids projections, and change in solids production.]
Comparison of Solids Production and Landfill Capacity* for Biosolids

- Landfill capacity diminishing
- Few new landfills currently in progress

* Based on estimated closure dates from EPD, and assumes biosolids acceptance ratios remain constant
Survey Update: Biosolids End Use in Georgia

![Proportion of biosolids reported, based on dry tons](chart)

- Landfilling: 63% (GAWP Survey 2018), 65% (GEFA Survey 2020)
- Land Application: 11% (GAWP Survey 2018), 11% (GEFA Survey 2020)
- Composting: 7% (GAWP Survey 2018), 5% (GEFA Survey 2020)
- Incineration: 18% (GAWP Survey 2018), 19% (GEFA Survey 2020)
- Other: 19% (GAWP Survey 2018), 11% (GEFA Survey 2020)
Survey Update: Biosolids End Use or Disposal Cost

- **Biosolids Disposal Cost per wet ton, USD**

  - **2018**
  - **2019**
  - **2020**

  - **Maximum**
  - **75 percentile**
  - **50 percentile**
  - **25 percentile**
  - **Minimum**
Utility Interest in Implementing Alternative Solids Treatment Processes

Ranked in order of highest interest (1=little to 5=high)
Technology Cost Evaluation

Regionalization for smaller plants could result in scale efficiencies
Market Assessment

1. Rotary Drum Heat Dried Biosolids
   - Uniform hard pellet or grain
   - 0.5-4 mm diameter
   - Density 40-45 lb/ft³

2. Granular Belt Heat Dried Biosolids
   - Somewhat uniform and hard granule
   - 0.5-4 mm diameter
   - Density 40-45 lb/ft³

3. Extruded Belt Heat Dried Biosolids
   - Irregular shape, somewhat friable
   - 2-8 mm diameter
   - Density 20-25 lb/ft³

4. Paddle Heat Dried Biosolids
   - Somewhat uniform and hard granule
   - 0.5-4 mm diameter
   - Density 40-45 lb/ft³

5. Biosolids Compost
   - Mulch-like appearance
   - Size varies (bulking agents used and screening)
   - Density 25-35 lb/ft³

6. Lime Stabilized Biosolids (Class A)
   - High pH product
   - Consistency of wet dirt, but can be dried
   - Density 70-100 lb/ft³
Market Assessment

2% market penetration required to make use of all biosolids in GA

<table>
<thead>
<tr>
<th>Solids Production</th>
<th>198,200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sod Production</td>
<td>53,400</td>
</tr>
<tr>
<td>Golf Courses</td>
<td>67,600</td>
</tr>
<tr>
<td>Parks &amp; Rec.</td>
<td>739,200</td>
</tr>
<tr>
<td>Silviculture</td>
<td>2,113,600</td>
</tr>
<tr>
<td>Total Ag.</td>
<td>5,570,000</td>
</tr>
</tbody>
</table>

State wide solids production / potential demand estimate (dtpy)

Agriculture
Large volume market, familiarity with biosolids, cost/ease of use matter

Silviculture
Potentially large market, potential impacted by market forces, demos/education needed

Sod Farms
Small market, mixed reception, positive lime-stabilized biosolids experience

Golf Courses
Familiarity with biosolids, dried pellets/compost of greatest interest, cost/uniformity/size matter

Parks & Recreation
Potential for dried pellets and compost, cost critical

General Urban Uses
Some familiarity (pellets/compost), compost market not expanding, education needed.
Gap Analysis Summary

- GA solids production is increasing
- More than half of existing GA MSW landfills may fill within next 30 years
- Capacity issues potentially exacerbated by HMCW restrictions

Concerns
- Landfilling dominant practice in GA
- Solids production will exceed available landfill capacity

Addressing the Gap
- Consider new processes/alternative outlets for up to 77,000 dt/yr solids
  - Class B land application
  - Class A product for agricultural or urban uses
GEFA Funding Available for Biosolids Projects

<table>
<thead>
<tr>
<th>Georgia Fund</th>
<th>Clean Water SRF</th>
</tr>
</thead>
<tbody>
<tr>
<td>State funded</td>
<td>Federally funded</td>
</tr>
<tr>
<td>Water, wastewater, and solid waste infrastructure projects</td>
<td>Wastewater infrastructure and pollution prevention projects</td>
</tr>
<tr>
<td>$3 million per year maximum loan amount</td>
<td>$25 million per year maximum loan amount</td>
</tr>
<tr>
<td>Interest rate of 1.63% for a 20-year loan</td>
<td>Interest rate of 1.13% for a 20-year loan</td>
</tr>
<tr>
<td></td>
<td>Scoring criteria not well aligned to biosolids drivers</td>
</tr>
</tbody>
</table>

**Notes and Recommendations to GEFA**

- Consider potential biosolids specific funding initiative
- Provide additional guidance for utilities seeking biosolids funding
- The Water Infrastructure Finance and Innovation Act of 2014 (WIFIA) can also provide funding for biosolids projects (EPA administered)
Questions?

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drouhardB@bv.com

Amanda Carroll
acarroll@gefa.ga.gov
Public Comment
Next Steps
Next Steps

• Next Meeting: August 24 – Draft Plan Review
• Committees to work on plan revisions
  • Inter-Council Coordination – Joint meeting with neighboring Councils
  • Plan Review
  • Others…
Thank You
Upper Flint