Saluda River Basin Council

September 20, 2023 Meeting Minutes

RBC Members Present: Tate Davis, Kevin Miller, Rebecca Wade, Thompson Smith, Michael Waddell, David Coggins, Charlie Timmons, Josie Newton, Eddie Owen, KC Price, Robert Hanley, Katherine Amidon, Larry Nates, Jay Nicholson, Rett Templeton, Patrick Jackson, Rick Huffman, Ed Bruce, Kaleigh Sims, Melanie Ruhlman, & Paul Lewis

RBC Members Absent: Brandon Grooms (Barrett Willis, alternate, present), Jeff Boss (Jeff Phillips, alternate, present), Devin Orr (James Kilgo, alternate, present), David Lawrence, & Justin McGrady

Planning Team Present: John Boyer, Tom Walker, Scott Harder, Joe Koon, Leigh Anne Monroe, Kirk Westphal, Hannah Hartley, & Alexis Modzelesky

Total Present: 47

K.C. Price called to order the September 20th meeting of the Saluda RBC at 10.00 a.m. He introduced the meeting structure and reviewed the meeting objectives, including receiving recommendations for assessing flow-ecological health relationships, reviewing the results of the Unimpaired Flow, Current Use, and Permitted and Registered planning scenarios, and visiting the Lake Murray Dam and Saluda Hydropower Facility. He requested motions to approve the agenda, minutes, and summary documents from the previous meeting.
The Saluda RBC members unanimously approved the RBC meeting agenda – Michael Waddell – 1st and Kevin Miller – 2nd and the last meeting minutes and summary – Tate Davis – 1st and Eddie Owen – 2nd. The housekeeping items and Announcement include the parking lot, and some of the issues to be addressed include update and river water use projections with utilities, engagement of the public with this process and public officials, identify and engage stakeholders that are not involved in the basin council, but have an overlapping connection to our efforts, development, and maintenance of a public-facing data clearinghouse for all things water within the Saluda Basin, hydrological impairment of the Saluda, acknowledgment of this within the final report and our recommendation, funding for implementation, data gaps, report on watersheds based plans and status of those plans, and determine how and when we will coordinate with other basin councils.

There were no public or agency comments.

August RBC Meeting Review (John Boyer) 10:15–10:25

John Boyer facilitated this session and discussed Water Availability about Direct River Withdrawal (that water is limited to the flow in the stream at any point in time) and Reservoir Withdrawal-"Safe Yield" (the amount of water that can be continuously withdrawn from a reservoir through the period or record without depletion), that's the Accessible Water Volume.

Methods for Evaluating Water Availability:

He discussed concepts from the planning work in Chapter 4 of the planning framework, where some definitions of water availability such as physically Available Surface Water Supply, Surface Water Condition, Surface Water Supply, Surface Water Shortage, and Reach of Interest.

Physically Available Surface Water Supply: Maximum amount of water occurring 100% of the time at a location on a surface water body, with no defined conditions applied on the surface water body. 46 cfs described what the available surface water supply is.

Surface Water Supply (**26 cfs):** maximum amount of water available for withdrawal 100% of the time at a location on a surface water body without violating any applied surface water conditions on the surface water source and considering upstream demands.

Surface Water Scenarios (Base Scenarios):

- Current Surface Water Scenario (Uses most recent 10-year average withdrawals as reported by month.)
- Permitted and Registered Surface Water Use Scenario (Uses current fully permitted and registered amounts.)
- Moderate Water Demand Projection Scenario (fully water demand projection based on moderate growth and normal climate)
- High Water Demand Projection Scenario (Future water demand projection based on high growth and hot/dry climate.)

Additional scenarios may be identified and requested by the RBC.

Evaluating Projected Demands: here, we are looking at a period of record of 94 years, going back to 1925 during that time, we had a significant drought in the fifties, and we are applying our demand projections (2070 demand projections to the entire period of 94 years hydrologic record). We use historical hydrology records to know hydrologic conditions after we have accounted for the withdrawals.

Phase 1 RBC Survey Results and Review of Process Metrics (John Boyer) 10:25–10:45

Phase 1 Survey Results (15 Responses):

Question: Do you feel that you have an adequate understanding of how data, models, and other tools will be used to assess water availability, identify shortage, and explore surface water issues and concerns during Phase 2?

- Yes (10 responses)
- “Mostly, yes. SWAM Model training will be important and might be the biggest gap.”
- 100% say yes, and generally understand how the data, model, and other tools will be used.
- More emphasis on section 4 in the planning framework (methodologies for evaluation water availability).
- “visual perception of water volume is very critical in the general view of water availability.”

Question 3: Based on the RBC meetings held to date, do you have any suggestions for the Facilitators or Planning Team to consider that might improve the meetings or planning process?

Responses:

- There is a vast range of knowledge in the room. Therefore, you must start with the basics and bring everyone along together.
- We need a list of data gaps with quick explanations for why they exist and if there are solutions to improve upon those gaps.
- Two responses suggesting more interactive portions of the meeting and allowing time for "creative dialogue."
- Issues with being able to hear speakers at the Ridge/Laurens Meeting space. (multiple responses).
- "Better outreach to the general public to inform them of this planning process and to encourage public comments"

Suggestion (4): If you have any other thoughts, concerns, or feedback on the Saluda River basin planning process, please provide them below.

- "The emphasis on quantity vs. quality could be stressed more"
- " one item that we have barely touched is interbasin discussion. The Saluda has both gains and losses. As Greenville County grows, how much more water will be transferred to the Broad River basin?"
- "it might be a good idea to have examples of what other basin planning groups have accomplished."

Suggestion (5): The Saluda Planning Team is considering options for a field trip in the upper portion of the basin instead of a regular RBC meeting on Wednesday, October 18th. Some options being considered are listed below: Interest among responses are:

- 73.3% Canoe/Kayak trip, 11 responses, 14 responses (93.3%) – Kevin Miller mentioned that an adequate supply of canoes for the paddling trip would be important. Tour of an agricultural operation e,g Beechwood Farms on North Saluda River, 2 responses (13.3%) Tour of an upstate water treatment plant and 13 responses (86.7%) Visit to stream restoration and stormwater BMP sites.

John further stated getting feedback from members and preparing a 2 to 3-page summary report of the feedback, which would then be submitted to Catherine and KC for review.

Process Metrics Adopted:

- The process to select RBC members is well documented, transparent, and reflects broad-based outreach.
- RBCs develop a River Basin Plan by March of 2025
- RBC meetings adhere to timelines
- River Basin Plans are actionable, logical, and address or prevent challenges with a level of detail to be cost-accountable
- Information used and generated during the planning process is shared openly, publicly, and is easily accessible.

- RBC meeting agendas are focused and promote efficient and productive meetings
- RBC members can effectively consider, digest, and understand technical information through presentations, discussion, group learning, and self-study
- Decisions are guided by best available science.
- Information is presented in an unbiased manner.
- RBC members are provided equal opportunity to be heard and express their interests, ideas, and concerns
- The use and outcomes of models and other tools to assess water availability and evaluate strategies are appropriately documented.

Discussion:

C: Significant issue with water withdrawal across multiple basins

C: We should try and get someone from the state to discuss the timeline and the law and how it developed. Without the law there would be no law at all. Which is better or worse – this law or no law at all? An effort to get something passed vs nothing. GA/SC and NC/SC issues and being proactive.

C: Duke Energy had input into the FERC license and regulations-related part of the Surface Water Withdrawal law in an attempt to minimize conflict with dual permitting activities in FERC-licensed reservoirs. Water withdrawals from FERC-licensed reservoirs require an environmental assessment as part of the FERC authorization to withdraw the water.

1. **Recommendations for Assessing Flow-Ecological Health Relationships in the Broad Basin (Dr. Joe Mruzek and Dr. Brandon Peoples, Clemson)** **10:45–11:15**

Joe Mruzek facilitated this session on Flow-Ecology relationships.

Biotic Index: People cannot always be in the stream, but the fish are always living in the water, so we can let them inform us and further become a data point to study them and form water policies.

Species Richness: we have three species: Virgil Beck, Northern hogsucker, and yellowfin shiner.

Tolerant Species: these are species such as the Green Sunfish, and Common Carp that are tolerant to high levels of pollution or other disturbance to flow regimes. There are a lot of tolerant species in an area that could informed a highly impacted site.

Three mainstream types or classes :

- Perennial runoff streams are characterized by a moderately stable flow and some seasonal extremes.
- Stable baseflow- streams with high precipitation that have a consistent amount of water year-round; and
- Flashy- moderately stable flow with high flow variability.

Ecoregions: these flow metrics inform us on what is going on and further help us use that to predict possible impacts on stream communities and scenarios. These ecoregions include

- Blue Ridge-Mountainous
- Piedmont-Rolling hills
- Southeastern plains- Flatter, well-drained sandy soils.

Flow-ecology relationships: we have our biotic index as our response variable and flow metric to determine how much water is in the stream at a given time. In analyzing these two variables, we use a linear regression model, which is a mathematical model that describes the relationship between the biotic index and the flow metric.

Future Planning:

- Model future flow under 4 demand scenarios using SWAM (Unimpaired flow, Medium Development 2070, High Development 2070, and Permitted and registered "Full" Demand 2070.)
- Predict changes to biotic indices based on SWAM results.
- Consider a water use scenario with a 40% reduction in flow.

How will this work?

Step 1 has already been completed, which is DNR going out sampling and collecting flow data throughout the year and then putting it together to form our indices and flowing quality relationships.

Step 2: the working group to take all these relationships that we could look at and decide which ones of the Saluda Basin are most relevant based on the ecoregions for stream types.

Step 3: we apply the selected metrics to the SWAM scenarios.

Key to Understanding the Results of the Surface Water Modeling Scenarios:

We have our current Use Scenario. This is a mean daily flow. We have 220 CFU in the stream to reach the North Pacolet River. Under the 4 scenarios, we have predicted amount. Hence there is more room, more water in the river. % changes for each scenario are relative to the current use Scenario.

Questions:

Q: When predicting to 2070 – big impact on biotic systems and stormwater surges?

A: SWAM – magnitude and timing of flow and we can look at stormwater pulses.

C: Still stuck with past hydrology to model.

C: We are also guessing about use also.

C: Are we looking at this on a daily timestep?

C: Land development is too complicated for this planning effort.

C: Runoff will affect water quality in addition to volume.

C: Is the basin map not the revised basin? Will we use the new basin delineation?

Q: How many matrices will you look at?

A: We're looking at that now – strategic nodes.

C: 8 years ago 10,000 people were moving to Lexington Co per year. If stormwater is ignored it might bite us.

C: Depends on where the increase in population occurs.

Q: Stream Classes – Does SWAM use stream classes?

A: The flow-ecology study uses stream classes.

Q: Where do classifications comes from?

A: Study is from Oak Ridge Lab (30k foot level) national scale. Streams behave differently.

C: Max withdrawal HD scenario for 2070, high growth rates may be more over 50 years.

C: Hydro plants don't have a specific permit (DHEC) – based on reported use.

Q: #1 concern for species?

A: Water withdrawals in the context of this meeting and process.

Q: Making assumptions – are you also taking into consideration of what is going into the stream or only what is removed?

A: Coupled with projections are increases in discharges.

Q: Interbasin transfers?

A: Yes, they are in the model.

Some implications of this work: (Brandon Peoples)

Expected results: richness:

- 95 species collected at 29 sites in Saluda River basin
- Average 12 species per site
- Max 20 species per site
- Up to XX% biodiversity loss in some streams at a full allocation
- Replacement by common generalists and invasives.

Swap-listed fishes in Saluda River basin include Thinlip Chub, Santee Chub, Carolina Darter, Greenfin Shiner, Seagreen Darter, Fieryblack Shiner, Highback Chub, Carolina Fantail Darter, and eastern Brook Trout. These fishes only live in this area.

What this info is includes guidance based on the best available data and analysis tools and based on models with compounding statistical uncertainty.

And what this info is not include arbitrary recommendations from expert's advice, perfect and changing climate and land cover, which equals more uncertainty.

Flow Chart: we estimate these flow ecology relationships and these different steps with some uncertainty. Uncertainty here means variance. In other words, it means you catch more fish in some places than others.

What this info is:

- Guidances are based on best available data and analysis tools
- Based on models with compounding statistical uncertainty.
- Representative of overall (30-year) flow regime characteristics

What this info is not:

- Arbitrary recommendations from expert advice
- Perfect
- Changing climate and land cover= more uncertainty.
- One-time withdrawal thresholds.

Reedy River Near Greenville, SC-02164000: some of the flow regimes based on the model. Flows are variables, and this model accounts for that.

What this info is:

- Guidances are based on best available data and analysis tools
- Based on models with compounding statistical uncertainty.
- Representative of overall (30-year) flow regime characteristics
- Applicable to streams and small rivers (~86% of all SC waters)
- Relationship between organisms and flow

What this info is not:

- Arbitrary recommendations from expert advice
- Perfect
- Changing climate and land cover= more uncertainty.
- One-time withdrawal thresholds.
- Applicable to large rivers and reservoirs
- Parsing out other factors that affect organisms
- Land use affects floe, etc.

What this info is not:

- Arbitrary recommendations from expert advice
- Perfect
- Changing climate and land cover= more uncertainty.
- One-time withdrawal thresholds.

Questions:

Q: Inputting USGS gage data that is related (Dissolved Oxygen as an example).

C:: Work does include this and others but for this process we are focusing on fish.

Q: Physical chemical parameters?

A: Water quality is not papers – we wanted to maintain watershed effects.

Q: Flow in 50 years vs SWAM 96 years?

A: WaterFALL model was used and only done on available flow data. Most is 30 years or 15-30 year data range.

C: USGS gage mismatch between flow data and fish sites.

C: Small, medium, large where does the model end from medium to large streams?

C: DNR have species endemic to the Saluda River basin? State wildlife action plan?

may be a parking lot question

C: Curious about species richness.

A: We are looking into a future paper looking into traits and functions of those species, yes, 100%. Life history traits are looked at.

Work group next steps: selecting locations, look at stat relationships and those that are meaningful for management.

C: There is a concern if it is below a reservoir?

Suggestions: Tributaries?

Q; Separate North and South Rabon?

A: No.

Q: Anything on withdraws on the Middle Saluda?

A: No

C: There is merit in looking at nodes upstream of Lake Murray (Bush River?). We could for ag users and Clinton discharge.

Surface Water Availability Modeling – Results of Initial Planning Scenarios:

John Boyer facilitated this session; he highlighted the River Basin Planning Process, which includes:

Phase 2: Evaluate current and future water availability issues- Identify and quantify shortages, select surface water conditions, reaches of interest, and groundwater areas of concerns.

Phase 3: Develop and evaluate water management strategies and recommend and prioritize strategies.

Surface water Scenarios:

Base Scenarios:

- Current Surface Water use Scenario- (uses most recent 10-yr average as reported by month in most cases)
- Permitted and Registered (P&R) Surface Water Use Scenario- (uses current fully=permitted and registered amounts.)
- Moderate Water Demand Projection Scenario- (future water demand projection based on moderate growth and normal climate)

- High Water demand projection Scenario- (future water demand based on high growth and hot/dry climate.)

Additional Scenarios: Unimpaired Flow (UIF) Scenario- Naturalized conditions (no surface water withdrawals, discharges, or reservoirs).

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

Surface water use by sector where we have mining current use 0.1, permitted and registered 0.5, which amounts to 14% of current use of P&R, Agriculture is 2.7 current use, 15.2 registered and permitted resulting to 18% current use of P&R, Gold Courses is 55% current use of P&R with 0.6 current use and 10.1 P&R, Manufacturing is 55% current use of P&R with 24.9 current use and 44.9 P&R, Public Water Supply is 27% current use of P&R with 142.6 current use and 525.1 P&R and Thermoelectric with 171.2 current use, 502.0 at 34% current of P&R.

Surface Water Shortage: water user, for example, IR-Overbridge max shortage (MGD) is 0.03 with a frequency shortage of 0.2%, IR-Leslea max shortage of 0.02 with a frequency of shortage of 0.1%, Watson Jerrold Farm 0.9 max shortage with a frequency of shortage of 14% and Titan Farms max 1.5 with frequency of shortage of 9%.

Preliminary Planning Scenario Model Results: shortages are when there is a demand, but there is not enough water in the river or the reservoir to meet that demand. This might occur for one month or 94 years we are looking at.

Current use Scenario: (Physical Shortage) – if we withdraw the amount that we are withdrawing today, we would not see shortages except in a few instances, and it comes with a big asterisk.

Summary of Water Supply Shortages: Supply Shortage Metric-

Total basin annual mean shortage (MGD) with current use 0.09 and permitted and registered 121.2. Maximum water user shortage (MGD) with a 1.5 and 295.1 P&R. Total basin annual mean shortage as a percentage of total water demand with current 0.03% and 11% P&R. Percentage of surface water users experiencing a shortage with 10.5% current Use and 39% P&R. And, Average frequency of shortage with o.6% and 10% P&R.

Strategic Nodes: strategic nodes are located on all major streams and rivers downstream of most withdrawals and discharges. For wadable streams, they also represent potential locations to evaluate flow-ecology relationships.

Hydrologic Performance Measures at Strategic Nodes: This explains the lowest monthly flow over the entire period of record that we see at each location of the mean and median. Comparing scenarios between low flows and then 5, 10, and 20 percentile flow. This comparison helps us understand the flow difference between unpaired and current use scenarios.

Reservoir Storage:

Under the current use, Table Rock Lake drops to its dead pool and tries to satisfy its demand by withdrawing and switching to the North Saluda River. Table Rock Lake is the first source, and North Saluda as the second source. And Greenwood balances those withdrawals. The scenarios

reflected that they have a very large permitted control, and moving down to Saluda Lake, the withdrawal from it does not impact the storage under both scenarios. Lake Murray maintains certain storage depending on the time of the year. Under the permitted registered, we do see some significant drops.

RBC Considerations Moving Forward:

- Would the RBC like to revise or add to the list of **Strategic Nodes**…i.e., evaluate flows at different points in the basin?
- Would the RBC like to see how often simulated flow under each scenario drop below the **Minimum Recommended Instream Flows (**MIFs)?
- As additional information is presented, the RBC should continue to consider if there is reason to establish a **Surface water Condition** at any point location.
- As additional information is presented, the RBC should continue to consider if there is reason to establish one or more **Reaches of Interest**.
- Consider whether any additional scenario should be evaluated

Next Steps:

- Continue to review the preliminary modeling scenario results (CDM Smith, RBC, and SCDNR).
- Incorporate **Moderate** and **High Demand Projections** and present these Scenario Results at the November RBC Meeting.
- Select a location to apply **flow-ecology metrics,** then evaluate them using model daily timestep results for each planning scenario (RBC, CDM Smith, TNC, Clemson)
- Other actions, as identified by RBC.

Questions:

Q: Is there something that can be done for them as first withdrawer? Would we be able to help if needed?

A: We have some possible solutions.

C: We have called up shortage folks in other basins. We could call those in this basin and ask if they've had problems.

Q: Is that the case in every basin?

A: Yes, initial permits based on intake size.

C: There may be some merit to looking at what has been allocated.

Bush River strategic node

Yes, MIF modeling – daily timestep.

Q: Models for recreational needs?

A: We can use SWAM to some degree.

Q: Will we be able to see locations before the October meeting?

A: Can distribute a 1-pager to RBC ahead of time.

Upcoming Meeting Schedule and Topics: Saluda water Quantity model Training (John Boyer)

- Training for interested RBC members will occur on Wednesday, October 4, beginning at 10 a.m. at Greenville Water Community Room at 517 Washington Street, Greenville.
- We will provide a laptop with the Saluda model pre-loaded, Exercise to work through and lunch

Saluda RBC meeting Wed, October 18, 2023, (Field Trip):

- Short meeting at ReWa Headquarters
- Tour of ReWa Mauldin Road facility
- ReWa Stormwater BMP demonstration site
- Lake Conestee/ Conestee nature preserve

Meeting adjourned at 12:26 pm

Minutes: Iffy Ogbekene and Tom Walker

Approved: 10/18/23

RBC Chat:

10:13:21 From Thomas Walker To Everyone:

one sec as john gets back on

10:28:50 From Thomas Walker To Everyone:

one second ed

11:01:48 From Rick Huffman To Everyone:

Good presentation

12:02:30 From Ed Bruce To Everyone:

John is outlining what I was trying to say. I think the Duke one should be astericked to say what john just said. When we got the permit, we did not know how the plant would have been transformed to a Natural Gas and Combined Cyycle Plant. Therefore, the Permit does not represent what we do now.

12:02:59 From Ed Bruce To Everyone:

BTW, i was not muted so I am not sure why anyone could not hear me.

12:03:09 From Thomas Walker To Everyone:

ok i'll read it out loud Ed

12:03:14 From Thomas Walker To Everyone:

yes i'm not sure either

12:26:19 From Thomas Walker To Everyone:

meeting adjourned