RWSA BOARD OF DIRECTORS
Minutes of Regular Meeting
July 24, 2018

A regular meeting of the Rivanna Water & Sewer Authority (RWSA) Board of Directors was held on Tuesday, July 24, 2018 at 2:15 p.m. in the 2nd floor conference room, Administration Building, 695 Moores Creek Lane, Charlottesville, Virginia.

Board Members Present: Mr. Mike Gaffney, Chair; Ms. Kathy Galvin; Ms. Lauren Hildebrand; Mr. Gary O’Connell; Dr. Liz Palmer; and Mr. Jeff Richardson.

Board Members Absent: Mr. Maurice Jones.

Staff Present: Mr. Wayne Barnes, Mr. Tim Castillo, Ms. Victoria Fort, Mr. Tom Freeman, Mr. Austin Marrs, Mr. Bill Mawyer, Ms. Katie McIlwee, Mr. Bill Morris, Ms. Betsy Nemeth, Ms. Jamie Orrell, Ms. Angela Ott, Ms. Courtney Ott, Mr. Scott Schiller, Ms. Michelle Simpson, Ms. Andrea Terry, Mr. David Tungate, Ms. Jennifer Whitaker, Mr. Lonnie Wood, and Ms. Devon Yi.

1. CALL TO ORDER

Mr. Gaffney called the regular meeting of the Board of Directors of the Rivanna Water and Sewer Authority at 2:14 p.m.

2. MINUTES OF PREVIOUS BOARD MEETINGS
   a. Minutes of Regular Board Meeting on June 26, 2018

Mr. Gaffney stated that he had left early from the June 26, 2018 meeting during the closed session, but he had read the closed meeting certification resolution and approved it with respect to the portion of the closed meeting he attended.

Mr. O’Connell noted that he had been absent from the last meeting and thus would abstain from approval of the minutes.

Mr. Mawyer reported that at the last meeting, there had been a presentation on the storm event of May 30, and Dr. Palmer had asked a question about what would constitute a dam safety issue. He
stated that staff had answered at that time that it would be 12 feet of water going over the dam, but had since updated it to 18 feet (line 413).

Mr. O’Connell mentioned that the storm event caused those levels to rise to about 8 feet.

Mr. Mawyer confirmed that it was 7+ feet.

Dr. Palmer moved to approve the minutes of June 26, 2018 as amended. Mr. Richardson seconded the motion, which passed 5-0-1. Mr. O’Connell abstained from the vote as he had been absent from that meeting. Mr. Jones was absent from the meeting and the vote.

3. RECOGNITION

a. Joint Resolution of Appreciation for Maurice Jones

Mr. Gaffney read the following resolution into the record for Maurice Jones:

WHEREAS, Mr. Jones has served as a member of the Rivanna Water & Sewer Authority and Rivanna Solid Waste Authority Boards of Directors since 2010; and

WHEREAS, over that same period Mr. Jones has demonstrated leadership in water and sewer, solid waste and recycling services; and has been a valuable member of the Boards of Directors and a resource to the Authorities; and

WHEREAS, Mr. Jones’s understanding of the water, sewer, solid waste and recycling operations of the City of Charlottesville, the Water & Sewer Authority and the Solid Waste Authority has supported a strategic decision-making process that provided benefits to the customers served by the City of Charlottesville as well as the community as a whole. During Mr. Jones’s tenure and through his efforts, major projects were completed including:

- a Community Water Supply Plan, to ensure an adequate water supply for the next 50 years
- the Expanded Ragged Mountain Reservoir Dam
- the Rivanna Sewer Pumping Station
- Odor Control Improvements at the Moores Creek Advanced Water Resource Recovery Facility
- Granular Activated Carbon Filters for the water treatment plants
- a Strategic Plan for both Authorities; and

WHEREAS, the Water & Sewer Authority and Solid Waste Authority Boards of Directors are most grateful for the professional and personal contributions Mr. Jones has provided to both Authorities and to the community; and

NOW, THEREFORE, BE IT RESOLVED that the Rivanna Water & Sewer Authority and the Rivanna Solid Waste Authority Boards of Directors recognizes, thanks, and commends Mr. Jones for his distinguished service, efforts, and achievements as a member of the Rivanna Water & Sewer Authority and the Rivanna Solid Waste Authority.
Authority, and presents this Resolution as a token of esteem, with its best wishes in his
future endeavors.

BE IT FURTHER RESOLVED that this Resolution be entered upon both the
permanent Minutes of the Rivanna Water & Sewer Authority and the Rivanna Solid
Waste Authority.

Dr. Palmer moved to adopt the resolution of appreciation as presented. Ms. Hildebrand
seconded the motion, which passed unanimously (6-0). Mr. Jones was absent from the
meeting and the vote.

Ms. Galvin thanked the Board for acknowledging Mr. Jones' efforts and for noting his many
accomplishments.

Mr. Mawyer indicated that Rivanna would be sending a plaque to Mr. Jones along with a copy of
the resolution. Mr. Mawyer mentioned that Mr. Jones had a legal meeting to attend and was
therefore not present at the Board meeting.

4. EXECUTIVE DIRECTOR'S REPORT

Mr. Mawyer reported that Thomas Corrice had completed his wastewater operator class four
license and had moved up from trainee. Mr. Mawyer stated that Wayne Barnes was promoted to
assistant water manager, having served Rivanna for more than 39 years.

Mr. Mawyer stated that there had been three interns working with Rivanna over the summer, and
they would be gone before the August meeting so he wanted to recognize Jamie Orrell, Courtney
Ott, and Devon Yi at this point. He asked the interns to highlight what they had done to support
Rivanna.

Ms. Jamie Orrell, a rising 4th year environmental science student at UVA, stated that she was
interning with RWQA and had been doing sampling at the reservoirs and the water treatment
plant, as well as in the community. Ms. Orrell stated that had been doing condition reports for the
reservoirs and had also been working in the lab on different tests, now being certified to test for
orthophosphate.

Ms. Courtney Ott, the administration intern, stated that she would be transferring to UVA in the
fall to study psychology. Ms. Ott stated that she had worked at Rivanna with the accountant and
had been involved with record retention and organization, and this had been a good learning
experience for her.

Ms. Devon Yi, a rising 4th year student at UVA, stated that she was the IT intern and had been
updating and configuring routers and working with the network, as well as researching various
documents and writing up documentation for them.

Mr. Mawyer recognized Betsy Nemeth for organizing the intern program and having another
successful year.
Mr. Mawyer reported that several Rivanna staff members had recently attended an emergency operations center function at UVA, which included a hypothetical scenario in which a plane carrying hazardous materials crashed into the South Rivanna Reservoir and contaminated the water. He stated that the scenario involved a regional exercise with the City, County, FEMA, and the emergency management agency. Mr. Mawyer stated that the water supply was big issue in the exercise, and he had made the point that the proposed Rivanna to Ragged Mountain waterline would have provided duplication and allowed for water to be piped from Ragged Mountain Reservoir to the South Rivanna Water Treatment Plant – thus lessening the severity of the incident and not having to put the South Rivanna Treatment Plant out of service because of the water.

Mr. Mawyer reported that Rivanna staff had also attended their first annual facilities coordination meeting with UVA Facilities Management, which hosted it, the UVA Foundation, the Albemarle County Service Authority, the County’s Community Development department, and City representatives from their utility and Neighborhood Development Services. He stated they had all done presentations on upcoming projects for the coming years to help one another coordinate and to foster their work as a connected network.

Mr. Mawyer stated that Andrea Terry had given a presentation on “Optimizing System Performance in our Reservoirs” at the American Waterworks Association conference in Richmond. He stated that Ms. Terry’s presentation had included information about Rivanna’s utilization of DiNatale reservoir consultant and a water sampling program, with upcoming plans for a hypolimnetic system in the Beaver Creek Reservoir.

Mr. Mawyer reported that our Director of Solid Waste, Phil McKalips, had given Lafayette School students a tour of the recycling center, and our Wastewater Manager, Tim Castillo, gave one of the Moores Creek Wastewater Plant – as well as a tour to the Environmental Biology class from PVCC.

Mr. O’Connell thanked Mr. Castillo for a tour of Moores Creek for members of the ACSA Board and staff, stating that the odor control project was quite impressive.

Mr. Mawyer reported that with the addition of FY19 projects, there were now 34 projects in our report – with the construction list dwindling as odor, GAC, and other projects have been completed. He stated that planning and studies for the urban finished water system, urban water demand, safe yield analysis, etc. were underway and were setting the table for the next round of construction projects.

Mr. Mawyer stated that they continue to appreciate the outstanding performance that the new GAC system is providing in lowering disinfection byproducts in the system, and staff had provided a graph to the Board in June that showed the reduction in each of the water treatment plants. He stated that as a follow-up and continuation of our review of water restrictions the previous fall, we are assessing issues with the Mechums River gauge that the USGS owns and DEQ manages, which indicate how much water is coming into the South Fork Rivanna reservoir. He stated that Rivanna met with DEQ in Richmond on July 23 and took Hydrologics, our
watershed modeler, adding that they started discussing the correlation between the gauge and how much water was coming into the reservoir, in an effort to make the data more accurate. Mr. Mawyer stated that the correlation calculated what was actually flowing into the reservoir versus what the gauge indicated was coming in. He stated they read the gauge one day and adjust the gate to ensure that the outflow is no less than 70% of the inflow – but DEQ will sometimes come back days or weeks later with a recalibration of the gauge that may indicate Rivanna’s readings and releases were not accurate.

Mr. Mawyer commented that this encouraged Rivanna to look at the watershed modeling and the last 100 years of rainfall, along with how it was being recorded over the drought of record – and they were having a discussion with DEQ of whether they would update the correlation formula, which Ms. Whitaker would discuss in her presentation.

Mr. Mawyer clarified an item from a Cville Weekly in July, as the article quoted him as saying the DEQ gauge was broken. He emphasized that the gauge was not broken, but when DEQ came back and wanted to recalibrate and adjust it, Rivanna had already let the water out of the reservoir – so the original information from the gauge may have caused them to release more than necessary. He added that he expressed his apologies to DEQ for stating that the gauge was “broken.”

Mr. Mawyer reported that in the Board’s discussion of Beaver Creek Dam and the labyrinth spillway, they had asked how tall the spillway would be from ground level to the bottom – and the answer is about 16 feet.

Mr. O’Connell stated that typically the labyrinth would be dry.

Mr. Mawyer confirmed this, stating that this was trying to address significant amounts of storm water – up to 31 inches a day, which was 3 to 4 times worse than the May 30, 2018 storm. He stated that this was when the water level would be high enough, when it would go through the spillway, but ordinarily it would not and was below the normal pool of the reservoir at the bottom of the spillway.

Mr. Richardson applauded staff for managing the intern program and making it successful.

Mr. Mawyer thanked him and stated that two interns had previously been hired onto Rivanna staff once they graduated from college, adding that the program is a good investment.

5. ITEMS FROM THE PUBLIC

Mr. Gaffney opened the floor to items from the public.

Mr. Richard Collins addressed the Board, stating that he had been a resident of Charlottesville since 1971 and was at the meeting to talk about the report in Cville Weekly entitled “Leaky gate: RWSA official resigns in protest.” Mr. Collins stated that this caught his attention, as he had some experience and knowledge with this issues, having once served as chair of RWSA and
having been a professor at UVA, where he taught resource planning. He noted that he had also
been an active opponent to the current water supply plan.

Mr. Collins stated that he had never met Dr. Richard Gullick, the subject of the article, and
explained that he called Dr. Gullick and asked him what the most important issue was that led
him to resign. Mr. Collins stated that Dr. Gullick had relayed his version of what he felt was an
unfair public disclosure, particularly related to the demand/supply function and what he believed
were erroneous particulars of this event. He stated that Dr. Gullick indicated that if the public felt
the planning for the water supply restrictions was due to decreased rainfall or limited capacity,
they had an incomplete account of the issues — the most important being safe yield that came
from the figures of the 1990s when there was a high increase in water consumption, versus the
reduced consumption patterns since.

Mr. Collins commented that he was very impressed with Dr. Gullick and had read his
documents, although he did not necessarily agree with everything he stated and wrote. Mr.
Collins emphasized that this was a very important issue that could have great implications for the
community, and he was skeptical that anything he could do would make it more likely to change
the strategic planning process. He stated that he would come to this meeting and express his
interest in the potential for the planning process Rivanna would be undergoing in the next year,
and would encourage them to make the process more translatable, visible, — and something of
this important would thus be widely distributed to the public.

Mr. Collins stated that he would inform Dr. Gullick of what happened at this meeting, as he had
been unable to attend. Mr. Collins stated that Dr. Gullick was very cordial and was impressed
with Rivanna’s work in general, but he felt that the planning process was confused and he did not
want to get into internal issues. Mr. Collins noted that it was evident to him that Dr. Gullick was
interested in those things. He added that he and the public in general would be interested in how
the next year and strategic planning would proceed.

Ms. Dede Smith addressed the Board and commended Rivanna on its minutes, particularly those
from the June meeting. Ms. Smith stated that years ago, she had been at a public water meeting
and a DEQ official — in response to a question she had about sediment in the South Fork — had
stated that the real problem was during a storm because that reservoir became a huge mixing
bowl that threw sediment over the dam. She stated that the minutes were the first time she had
ever seen it quantified, and it was incredible to her to see the numbers put to the volume of
sediment versus what normally went over the dam. Ms. Smith stated that this also illustrated an
environmental issue that came with that reservoir, and Dr. Gullick’s pipeline concerns were often
framed in terms of environmentalism.

Ms. Smith stated that she has a question as to whether the pipeline was being put in for water
supply or for environmental reasons. She also stated that she had recalled that it was illegal to
plan beyond 50 years, and there were 40 years left in the community’s 50 years, with the premise
that you could only build up for 50 years and could not hoard water. Ms. Smith commented that
this spoke very directly to the issues that were brought up, particularly to the pipeline as it related
to demand and the upcoming demand study. She stated that she was also very concerned about
who would pay for the pipeline, and if it was going to be put in for reasons other than being
required for the water supply and the 50-year timeframe, she had questions as to whether the
urban ratepayer should get the bill. Ms. Smith stated that if it was being put in for other reasons,
the question was, shouldn’t everyone be paying.

6. RESPONSES TO PUBLIC COMMENTS

Mr. Mawyer stated that there had been a speaker in June (Dr. Richard Gullick) who made
comments about misinformation, a coverup, a conspiracy, a deception equal to malfeasance, etc.
He stated that he found those terms to be very concerning and disappointing to him, as he felt
that staff and the Board had tried to be very open and up front with all the reasons the project
was being contemplated, the purpose and what the benefits were. He stated that Rivanna had
been to many meetings with City Council, the Board of Supervisors, and the ACSA Board – as
well as holding a public meeting with people in the Hydraulic Road area, as they were along the
path of the project. Mr. Mawyer noted that there was also information on Rivanna’s website and
he had done interviews with several reporters, adding that he found it disappointing that the
information was either not getting out there or was getting out as misinformation.

Mr. Mawyer stated that over the past several weeks, Rivanna staff compiled five pages of
information to supplement the one-page project overview, which was posted online in April. He
stated that some of the key points to note were that the purpose of the waterline project was to
ensure the community had an adequate drinking water supply for the next 50 years, and the
process the community went through was extensive. He stated that in 2001 and 2002 there was a
“harsh and extensive” 18-month drought that generated mandatory water restrictions on residents
and businesses – even to the extent of restaurants serving food on paper plates and car washes
needing to be shut down. Mr. Mawyer stated that there had even been anecdotal discussion of
asking UVA to send its students home, and the drought was now considered the drought of
record back to the 1960s or even the 1930s.

Mr. Mawyer stated that when the drought was over in 2002, the community demanded that the
water providers fix the problem and come up with a plan so they didn’t have to go through the
severe restrictions again. He stated that elected and appointed officials all worked collectively
with the community, with 10 years of public meetings and planning, to develop the community
water supply plan that was to address the supply of water for the next 50 years. Mr. Mawyer
stated that the minutes provide insight into the vast breadth of opinions and views of what the
solutions were, adding that there were 33 alternatives discussed in the community – from
dredging the South Rivanna Reservoir to bringing water from the James River to expanding the
Ragged Mountain Reservoir. He noted that the Upper and Lower Ragged Mountain Dams were
rated insufficient and unsafe by the dam safety agencies, and work had to be done on them, and
the Ragged Mountain Reservoir was filled with a pipe from Sugar Hollow that was almost 100
years old.

Mr. Mawyer explained that ultimately, the community devised a community water supply plan
and stated they would build a new Ragged Mountain Dam, with a pipeline from the Rivanna
Reservoir over to Ragged Mountain so they could fill the new, larger reservoir; and even though
they were going to build a dam at a certain height, they were not going to fill it fully. He stated
that the City had been insistent that the natural area around Ragged Mountain be maintained and
not inundated with water until the community needed it. Mr. Mawyer stated that the Ragged Mountain Dam agreement was written between the City, the County, the Service Authority, and Rivanna — and it directed the RWSA to put the pipeline in and raise the water level in Ragged Mountain Reservoir only when the demand equaled 85% of the supply.¹

Mr. Mawyer stated that regarding the question of why they just can’t add the 12 feet of water now, the answer is that contractually they cannot do that. Mr. Mawyer stated that they have an agreement with the City and the ACSA that Rivanna would only do it when one of them asked that it be done, when the demand equaled 85% of the safe yield. Mr. Mawyer stated that this further required Rivanna to assess safe yield and demand with the first assessment being completed by the year 2020 and every 10 years thereafter. He stated that Rivanna’s staff was currently in the process of doing a new demand study and safe yield study of South Rivanna Reservoir and Ragged Mountain, with safe yield measuring how much siltation had come in, what volume was left, and what safe yield they have. He noted that safe yield measured how much water could be taken out of the reservoir every day during the drought of record without depleting the water in the reservoir. Mr. Mawyer emphasized that Rivanna has an obligation to follow that contract.

Mr. Mawyer stated that the community water supply plan was also very specific about safe yield and about achieving other community values, including using existing infrastructure and replacing aging infrastructure, and was specific about regaining the natural conditions in the Moormans River and the South Rivanna watershed. He stated that while the plan was formally approved in 2012, it and was practically completed in 2006, because Rivanna applied to the Army Corps and the VDEQ in 2006 for the permit to build the new dam and the pipeline. Mr. Mawyer stated that the community had already effectively already approved it, City Council had endorsed it and had held two additional years of hearings about the issue but ultimately approved the plan in 2008.

Mr. Mawyer reported that the permits had been issued from the Army Corps and DEQ in 2008, with the Corps permit expiring in 2018 but being renewed for five more years and the DEQ permit expiring in 2023. He stated that Rivanna had met with DEQ the previous day and asked when they anticipated the pipeline to be built, and their response was in the 15-year timeline of the permit, practically speaking. Mr. Mawyer stated there was some literature indicating the pipeline was expected to be built by 2021 — but that was clearly not possible, and Rivanna had asked the Board in the capital improvement program to consider four separate schedules of when they might want to build the pipeline, so they could put it into the financial planning model and help the Service Authority and the City with their financial models and funding devices to strategically plan for project.

Mr. Mawyer emphasized that there had been a huge amount of discussion for 10 years in the community, from 2002 to 2012, to come up with the plan that included building the dam and the pipeline. He stated that when people say the drought of 2017 was being used as an excuse to build the pipeline, he wanted it to be clear that the pipeline had been planned since 2006 and was

¹ Editor’s Note: Section 3 of the Ragged Mountain Dam Project Agreement specifically provides this 85% trigger for increasing the water level of the Ragged Mountain Dam. Section 2(d) of the Agreement, providing for the SRR-RMR pipeline has no such trigger requirement.
not a result of the water restrictions in 2017. Mr. Mawyer stated that people had questions about why the water went out of the reservoir in 2017, and Rivanna has consistently been transparent with its response.

He stated that there were three primary reasons, including leaking gates that leaked about 3 million gallons a day for about two months, which accounted for approximately 180 million gallons of the almost 500 million gallons that went out of the reservoir. Mr. Mawyer stated they had always been up front about it and had never tried to conceal that information. He stated they had also had concerns about the USGS DEQ gauge, which indicated that 70% of the water was being released – and DEQ came back and stated those readings were too high. He noted that the third reason was that the community was in drought conditions, and the Virginia Drought Monitoring Task Force issued a press release October 11, 2017 that stated the Middle James region (includes Albemarle and Charlottesville) was in a drought watch condition, with low rainfall and stream flows. Mr. Mawyer stated that comments have been made that from August to September 2017 our area had more rain than the three prior years. But for the year 2017, rainfall was 11 inches low. He stated that even though they may have had rain over a short period, 2017 was not a high rain year.

Mr. Mawyer commented that he had done an interview in November 2017 about the leakage from the gates and the possibility that Rivanna could have released less from one gate had the release been monitored more closely. He stated that one person had suggested that switching operations away from South Rivanna to Observatory Water Treatment Plant in August instead of doing it in October, that would have saved a lot of water – but the reservoir had been 77% full on September 17, and the community had been expecting multiple tropical storms coming up the coast. Mr. Mawyer stated that Rivanna had always acknowledged that the reservoir dropped from 77% full to 42% full between September 17 and October 3, with the gates, drought-like conditions, the USGS/DEQ gauge, and possibly other items being factors. He emphasized that Rivanna has always been transparent with that data to anyone who asked.

Mr. Mawyer stated that the community water supply plan and the drought of 2001-2002 were the drivers for where they were now in building a pipeline. He noted that the RWSA Board would get the demand study and safe yield study in a year or so, and in their routine annual process of reviewing the CIP and the 34 projects within it, they would prioritize those. Mr. Mawyer stated that the plan was to build the pipeline in the timeframe of 2027 to 2040, with an estimated eight years needed to build it – and it could accelerate or decelerate in the future, with the Board having an opportunity to look at reliability and other factors. He stated that the current permit states that in the Sugar Hollow Reservoir, they release 100% of the inflow from Sugar Hollow to the Moormans River below, and the new permit stated that after the pipeline was built only 90% must be released. Mr. Mawyer stated that this had been discussed with the implication of the pipeline being bad for the river. He stated that four million gallons per day were currently transferred out of Sugar Hollow to fill Ragged Mountain, which would no longer be required after the pipeline was built, so the reservoir level as a whole would stay higher and there would be more water to release to the river. Mr. Mawyer added that the 90% was more reflective of natural flow in the Moormans, which was an objective of the original community water supply plan dating to 2006.
Mr. Mawyer reported that the Ragged Mountain Dam was completed in 2014, and 1 billion additional gallons had been added for a total capacity of 1.5 billion of water storage in the reservoir, which was a big part of the water supply solution. He stated that they were in the process of designing a construction upgrade to the Observatory Water Treatment Plant, which takes water out of the Ragged Mountain Reservoir, and to increase that capacity from 5-6 million gallons per day treatment capacity to 10 MGD. Mr. Mawyer emphasized that the water supply must be treated, piped, and distributed for someone to use it at the tap, which was the ultimate destination. He noted that it was expected for Observatory to be upgraded to more capacity within the next five years, adding that Rivanna had been working on the nine-mile pipeline for the Rivanna to Ragged Mountain route – as well as updating the water demand studies that predicted more water would be needed by 2040.

Mr. Mawyer mentioned that Rivanna’s graphs support the claim that water demand had slowed down in the community, and in 2006 the demand was 9-12 MGD, with the average monthly demand over the 12 months leading to July 2018 being 9.1 MGD. He noted that the former study had predicted that they would need 14.5 MGD by 2025, but Rivanna felt that this would likely not be the case once the new study was completed. Mr. Mawyer stated that the new data would be brought before the Board, which would make the decision as to when the project would occur, but no one had committed to shovels in the ground at this point. He emphasized that the community water supply plan involved 10 years of discussion, agreement, and disagreement, which yielded the plan on which Rivanna was proceeding.

Dr. Palmer thanked him for the comprehensive review, and clarified that no one had committed to a time for the shovels in the ground – but that was not the case for whether or not to do the project, as the pipeline was part of the community water supply plan.

Mr. Mawyer agreed, stating that he meant the timing of when the shovels went in the ground.

Dr. Palmer stated that during the drought in the fall of 2017, the decision to decrease the release into the South Fork required Rivanna to go to the DEQ, who in turn stated that in order to decrease the release from the reservoir they must place water restrictions on the public drinking water customers.

Mr. Mawyer explained that DEQ was charged with protecting the environment of the state and allocating those resources, such as drinking water supply, so DEQ would say they control all the waters of the state – including the Rivanna River. He stated that when the RWSTA asked to withdraw water from the Rivanna River and Rivanna Reservoir, they were required to get a permit to do that.

Dr. Palmer added that to preserve the water in the reservoir, the DEQ must grant permission because Rivanna would be altering permit conditions.

Mr. Mawyer clarified that when Rivanna applied for the permit to build the new dam, take more water out of the local streams, the Rivanna Reservoir, and the Ragged Mountain Reservoir, DEQ agreed but stated this was a sharing agreement between the environment and the community – with each getting water. He stated that part of Sugar Hollow’s permit requirement is that 100%
of water coming in had to be released to the stream, with 70% of water coming into Rivanna Reservoir having to be released to the stream. He explained that when the reservoir level started to decline from September 17 to October 3, they were looking at where all the water was going as they were taking 8 MGD to be treated at the water treatment plant with 3 MGD leaking out through gates – with the level dropping much quicker than anticipated.

Mr. Mawyer stated that Rivanna called DEQ immediately and stated they needed to stop releasing so much water into the river until they could get the reservoir refilled, and DEQ agreed but stated it was a “balancing situation” that would require the community to share some of the reduced flow into the river by going into mandatory water restrictions. He added that it was DEQ’s requirement prior to granting Rivanna a variance to have the release reduced from 70% down to 10% of inflow, and the RWSA held a special meeting on October 5 to address the issue and the pending water restrictions. Mr. Mawyer added that all three parties – the City, County, and ACSA – approved the mandatory restrictions as required by the DEQ.

Mr. O’Connell asked what the timeframe was for the demand study that included a bathymetric survey of the reservoirs – particularly the public comment timeframe.

Mr. Mawyer responded that it would be 12 to 15 months, with a boat to be put on the reservoirs with a device that measured at the bottom, then calculations done to assess the reservoirs’ volumes. He stated that there would also be a separate consultant studying population growth and trends over the last few years, what may happen in the future, and the County and City’s information regarding building permits and trends that planning groups use to project growth over the next 50 years. He stated that the reservoir studies would look at how much siltation occurred since the last measurement of the reservoirs, and those studies would be completed and combined to create two graphs that show demand trends and projected future water usage.

Mr. Mawyer stated that this would also include analysis of water conservation measures, low-flow toilets, low-flow shower heads, and other things that are contemporary within a water conservation regimen of what water demand would be and how much water would be available. He noted that they would need to make sure that the water available at least exceeded the water demand; otherwise, they would be at much higher risk for mandatory water restrictions if there were another extended drought. Mr. Mawyer mentioned that he had been at a conference where a speaker stated, “The next drought of record could start tomorrow,” especially given unpredictable long-term weather patterns.

Mr. Mawyer emphasized that they needed to be prepared, and as engineers, they wanted to have the facilities in place beforehand – not afterward – and the community would not likely embrace extended mandatory restrictions due to RWSA not being able to fulfill those needs.

7. CONSENT AGENDA

a. Staff Report on Finance

b. Staff Report on Ongoing Projects
c. Staff Report on Operations

d. Recommendation: Award Construction Contract for the Crozet Interceptor System Pump Station Improvements Project; Anderson Construction, Inc.

Dr. Palmer moved to approve the Consent Agenda as presented. Ms. Galvin seconded the motion, which passed unanimously (6-0). Mr. Jones was absent from the meeting and the vote.

8. OTHER BUSINESS

a. Presentation: South Rivanna Dam Update - Gates and Meter: Jennifer Whitaker, Director of Engineering & Maintenance

Ms. Whitaker reported that she would spend time walking through some of the history of the September/October 2017 event and how it ties into the bigger picture and some of the discussions held to date. She stated that she wanted to present all of the work Rivanna had been doing on the downstream side of that equation, and in August she would return to address the upstream side, USGS gauges, inflow, and all the information that is upstream from the dam. Ms. Whitaker stated that the information presented at this meeting would include everything investigated in the dam itself – things that Rivanna largely controlled and would continue to have operational control over.

Ms. Whitaker stated that the South Fork Dam was built in the mid-1960s and was about 70 feet tall and 700 feet long, and it was under federal jurisdiction because there was a small hydroelectric power plant. She noted that there had been a question about inspection after the flood and there was as FERC inspection, and they came and looked at that facility as part of their routine annual review. She stated that the dam and reservoir were part of the urban water supply, with almost 1,300 million gallons of total storage and just over 880 million gallons of usable storage.

Ms. Whitaker presented a photo and stated that the reservoir was on the left side, with the raw water pump station being integral to the dam facility itself. She noted that the boat ramp was on the upstream side, hydroelectric went down the slope, and she presented a photo that showed the north and south mud gates and a pipe running from the reservoir side adjacent to the raw water pump station through the bank down to the hydroelectric facility and into the river. Ms. Whitaker presented a photo showing the north tower and north side, south tower and south side, the raw water pump station, the apron, and the hydropower facility. She stated that the picture showed typical dry summer conditions, and that the face of the dam only dried up every several years.

Ms. Whitaker stated that the tower and gate were the points of control, with the outlet being where water exited the structure – and there were two different locations in all facilities where the gate was controlled and the water exited. Ms. Whitaker noted that in the south tower and south gate, the tower sat on top of the dam and the south mud gate was where the water actually exited. She stated that there was a 36-inch pipe that traveled thru the dam and the top picture was the north mud gate outlet, which was in the bottom of the stairs where the pipe came out to the roller
bucket. She noted that the gate was discharging water into the trough, which took water from the top of the dam and directed into the center channel so the embankments were not overflooded.

Dr. Palmer asked which ones had been a problem in the drought in 2017.

Ms. Whitaker responded that it was both gates, noting that there were three penetrations in the dam; all of them were an issue.

Ms. Whitaker referenced the hydropower side of the dam, noting the location of the hydropower outlet in the picture, the south mud gate outlet, and the tower and the gate – which were separate from the outlet points. She presented photos showing the reservoir, the drop in elevation, and the recovery. She stated that Rivanna had implemented a few mitigation measures: reducing demand through water restrictions, and they switched in October between the South Rivanna and Observatory water treatment plants from the typical 8 Rivanna/2 Observatory mgd production to a 5/5. Ms. Whitaker stated that on any given day, the numbers were slightly up or down from there. She stated that staff identified the leaks from the gates and was able to reduce it to about a 0.5 million-gallons per day, and in the process found a flaw in the SCADA system which was registering flow in the meter and corrected it – coordinating extensively with DEQ through the whole process.

Ms. Whitaker stated that she talked about the three penetrations: north, by Miller’s Cottage Lane; south, where the meter is; and the hydropower penetration. She stated that with the north mud gate and hydropower facility, the gates were constructed in 1966, and Rivanna was releasing about 3 MGD. Ms. Whitaker referenced a picture taken during the drought and stated that the water coming out plus what was leaking out of the hydropower facility was about 3 MGD. She stated that in looking at that, it may not seem like a lot of water – but over time, it created a problem. Ms. Whitaker stated that there was a brand new leaf screen with a flow meter on the raw water pump station, and the water coming out dumped into the roller bucket on the south side. She stated that they have visual observations on the roller bucket on the north side and were able to compare a known quantity of water to a known quantity of water on the other side, and make an estimation of how much they were actually releasing. Ms. Whitaker emphasized that it was not a precise measurement but was a comparison to a known measurement, which was how staff was able to estimate it.

Ms. Whitaker stated that Rivanna had brought in some industrial divers who spent a lot of time working at dams around the Mid-Atlantic region, and they confirmed there were leaking gates – because typically gates around water supplies leaked and were not intended to be completely leak proof. She stated that they looked at ways to address it, and it was recommended by them to put a mix of material in that basically caused a seal. Ms. Whitaker stated that the dive team suggested that Rivanna use a combination of cypress mulch, which doesn’t degrade as badly as hardwood mulch or other types of material, and a natural kitty litter comprised of ground clay with some bentonite in it. She explained that the kitty litter was safe for the water supply and was put in on the upstream side, then sucked against the gates to seal them off.

Mr. O’Connell asked when that happened.
Ms. Whitaker responded that it was early October 2017 and confirmed that it happened soon after staff realized what was going on in the South Rivanna Reservoir.

Ms. Whitaker reported that in each of the towers at all three of the penetrations, there was a chamber that revealed the reservoir on the upstream side, with flow coming into the chamber from the reservoir through the concrete in the dam through the bulkhead gate. She explained that a bulkhead gate was a slide gate that sat on rails and had the ability to go up and down, normally sitting in the up position, and the chamber was fairly deep within a confined space.

Dr. Palmer asked if it was currently open or closed.

Ms. Whitaker responded that it was open, with water coming into the bottom, and she noted that it was believed to have been open since 1966. She noted the location of the actual mud gate. She indicated that there was a pipe stem attached to the wall that went down into the wall, and before the meeting there was a question about the piece that was actually moving – so she pulled up a picture of what was put in at Ragged Mountain, as she wanted the Board to get a feel for what was underwater at the end of the valve stem. Ms. Whitaker explained that what was at the end of the valve stem was a gate that covered the hole, as pictured, with the stem holding the gate up and the gate being pushed down or pulled up as the stem was activated. She stated that the issue was having to go into the dam structure, as there was a bulkhead, a gate underwater, and confined space. Ms. Whitaker stated that when the clay bentonite and cypress mulch material were put in, it could go against the chamber and be sucked against the gate or put in the reservoir and sucked through the bulkhead opening and into the gate.

Dr. Palmer asked if the divers went into that area.

Ms. Whitaker responded that they could go either into the reservoir side or into the mud gate side.

Ms. Galvin asked if the bentonite and cypress mulch were just sucked in to plug the holes through some divets.

Ms. Whitaker confirmed that this was the case. She explained that water was moving slowly and approached the opening then sped up, and it was a little faster so the material was just sucked in to plug those holes.

Ms. Galvin asked how often the material must be replaced.

Ms. Whitaker noted that the north mud gate and hydropower had not leaked at all since the material was put in, in October 2017, as the clay expands and binds with the mulch to create a seal material.

Ms. Galvin asked if there was resin on the cypress mulch that created the seal.

Ms. Whitaker responded that it wasn’t really resin, it just bonded like concrete – in the same way yard mud and mulch might mix together to form a wet seal.
Dr. Palmer commented that they would have to go into that side for it to be sucked up against the gate.

Ms. Whitaker replied that it could also be on the reservoir side, as the water was moving from the reservoir along the flow arrow into the chamber and along the flow arrow into the gate. She confirmed that it needed to be sucked up against the gate, not against the open bulkhead — which would come into play when they began discussing what to do in the future.

Dr. Palmer commented that it seemed that it would be more difficult to get it to the gate on the other side.

Ms. Whitaker confirmed that there were some logistical issues that would be mentioned when they discussed diving.

Mr. O'Connell asked if she was going to cover the permanent fix in this presentation.

Ms. Whitaker confirmed that they would be.

She reported that the south mud gate was also constructed in 1966, but Rivanna installed a new meter in 2016 as part of the water supply plan — a band meter that went inside the pipe and was installed by the manufacturer onsite and certified as properly functional. She stated that they started with a theoretical investigation of what was going on in the outlet structure through the meter, shortly after October 2017, and they had people come out and do some measurements and look at the meter and setup. Ms. Whitaker stated that what became quickly obvious was that this was not a theoretical exercise, and from the study they could tell they had reasonable flow measurements at low levels — but high levels, the hydraulics were not performing as a theoretical engineering flow. She stated that they had done all they can do on paper and needed to find another approach, so staff began talking to Rivanna's consulting reservoir specialist and ended up talking to DEQ's stream gauging staff, who also calibrated all of the stream gauges and helped with prior issues at Sugar Hollow.

Ms. Whitaker stated that in April, the DEQ crew brought all of their equipment and worked with Andrea Terry and Victoria Fort of Rivanna staff: running the meter in the south mud gate, taking stream flow measurements, and developing conclusions from that information. She stated the team worked in several places in the stream to set up a cross-section, taking stream flow measurements, reading the SCADA data to see what the meter indicated about what was being released versus what was being physically measured in the stream. She stated that they were able to take different flow readings, what DEQ was able to read, and the percent difference — and at about 9 MGD, with the flow meter currently reading very reasonably.

Ms. Whitaker noted that they also found that between the 9 and the 20-million per day cap, the higher the velocity the more the meter was off. She stated that they plotted that information and created a calibration curve that showed when the meter read a certain level, what was actually coming out of it. Ms. Whitaker explained that the hydraulics were not going to change in the dam. The idea of drilling or boring another type of discharge structure in the dam was a cost-
prohibitive approach, and physically it was challenging to see how they would do that. She emphasized that they needed to use existing facilities and find a way to use those facilities. Additionally, they were working with DEQ to reestablish a river gauging station just under the Berkmar bridge. Ms. Whitaker noted that DEQ approached Rivanna as well as both City and County parks and recreation departments to consider the river gauge, and the Rivanna River Company along with other recreational river users were interested in it.

Ms. Whitaker stated that RWSA indicated that they would like to partner and offered to pay for the capital and reinstatement costs, which would allow DEQ to have a permanent flow meter in this location. Ms. Whitaker stated that the reason it mattered was because it provided an opportunity to calibrate the meter coming out of the dam and provide a clear picture of what was necessary to keep it calibrated. She explained that one of the findings of the process was that there were times they just stopped spilling over the South Fork spillway – and they were required to release 70% of inflow or a 20 MGD cap. Ms. Whitaker stated that they found that the early phases of the dry period or drought when they were required to release 20 MGD, there were several days when they were releasing more than 30 – 35 MGD. She noted that as they got closer to the 10 MGD release rate, they got increasingly more accurate, so it impacted the beginning of the drought and was cited as one of the reasons the reservoir plummeted so quickly.

Ms. Whitaker explained that in an effort to get a feel for the gates and what should be done long-term, RWSA contracted with Schnabel Engineering, who brought in an industrial diver to come in and dive the facilities and look at the condition of the gates and bulkheads. She stated that they have estimated a cost of $300-325K to replace the two gates, which was basically to lower the bulkheads in and remove the gates – with some opportunity to refurbish them possible. Ms. Whitaker presented photos of the dive rig, noting that the chambers were very deep and went under the height of the normal reservoir pool. She stated that it would require a full dive rig to do that work. Ms. Whitaker reported that the hydropower facility was currently sealed, with plans to relinquish the exemption – which would require a decommissioning plan. She explained that there was a 72-inch plate that sat in the chamber on the other end of the actuator at 65 feet deep, and that would all come out, with plates and gaskets then permanently sealed.

Ms. Whitaker summarized her report that the hydropower facility was no longer leaking downstream, there was no water seen or heard coming out of it; the north mud gate was temporarily sealed, the south mud gate meter had been calibrated and would be adjusted via the calibration curve. They determined in the SCADA a more accurate method of calculating the daily total flow coming out of the meter. They were working with DEQ to reestablish the South Rivanna River gauging station, and they were discussing about the cost benefit of going in and physically replacing the two mud gates. She pointed out that they knew that this was a big component of what the problem was and had spent the last nine months deep diving into the causes and the solutions.

Mr. Gaffney commented that the Board had heard parts of this over the last nine months, but her detailed report had provided great information.

Ms. Whitaker responded that the reassurance for staff was that they knew they had much more control and knowledge about how all of this worked going forward, so the second the water
stopped spilling over the reservoir, there were actionable items in place that would prevent this from being an issue going forward.

Mr. O'Connell asked when she envisioned the funding or project being in place to make all the repairs.

Ms. Hildebrand noted that staff would need to come back to the Board with a request for funding, and asked when they anticipated coming back to them with a permanent solution.

Mr. Mawyer responded that staff would likely have a recommendation for the Board in August, noting that the release requirement only applied when the flow was not going over the reservoir – so it did not happen often. He stated they knew currently that they had a certain amount leaking out of the gates, but that was subtracted out of the amount they were required to release and took credit for it, so in that respect it did not hurt anything. He stated that staff wanted to have that discussion with the Board as to whether they wanted to spend the money to fix a half-million gallon “leak”, or just account for it every day and continue as we are, as it was questionable as to how much that amount could be reduced.

Ms. Whitaker added that even a brand new gate would have some leakage, and Rivanna’s permit allowed that amount to be subtracted out.

Mr. Mawyer stated that in October 2017, when they came to the realization that there were leaks, staff began subtracting that from the required release immediately once it was quantified.

Mr. O'Connell asked if DEQ had agreed with all the math they were using.

Mr. Mawyer confirmed that they had.

Ms. Whitaker stated that it was important with raw water supply gates to remember that the whole point of them was to hold back 800 million gallons of water. She stated that it did a very good job with that, but with metal sitting in the water over time, there was some deterioration at the edges – and the dive showed there had been a little bit of deterioration, which was where the leak was coming through. She noted that they would never leave a gate that was questionably functional, but this one was completely functional from a dam safety perspective and the question was whether it had served its life and needed to be replaced.

Mr. Gaffney stated that staff would return with options as opposed to a specific solution.

Ms. Hildebrand asked if there was concern that the repairs to the north mud gate would not be long term since they were temporarily sealed, but she understood that staff was watching it.

Mr. O'Connell asked if her question was how long the kitty litter would last.

Ms. Whitaker clarified that staff was watching it and did work with the divers, who provided a procedure and where to buy the material, and there were other ways to plug it on a temporary basis. She added that there were valid questions as to whether the 1/2 MGD was worth repairing.
Dr. Palmer asked if they could plug it without diving.

Ms. Whitaker responded that the divers had done it originally but it could be plugged without diving, noting that the facility was highly dependent on weather so if they were having very high flows, it was hard to get in and around the dam for safety reasons. She explained that bringing the divers in made it much faster because they had all the protective equipment and were able to tie off, with water done from the surface not as effective as subaqueous work. She added that over the course of several days, they could mitigate a leak.

b. Presentation: Capital Construction Update: Scott Schiller, Engineering Manager, Engineering & Maintenance

Mr. Schiller reported that Rivanna had been installing GAC systems at the five water treatment plants and had some other general improvements to the plants as well, such as a new chlorine contact tank and new lime feed at South Rivanna, and new chemical feed systems in Crozet. He stated that the GAC project was substantially complete in May 2018, and there were already good indications of reductions of DBPs in the system as a result of that. He stated that the work had been performed by Ulliman Schutte, at a budget of $29 million, with final completion expected in the next few weeks.

Mr. O’Connell asked if there had been a delivery to Observatory.

Mr. Schiller responded that the material had been delivered, and it was a matter of getting it to the vessels that was a challenge.

Mr. Mawyer noted that it would be installed either this week or next.

Mr. Schiller added that all of the other facilities were in place and operating.

Mr. O’Connell asked if it was fair to say that all the others were at 100% operation.

Mr. Mawyer responded that they were, but North Rivanna had a pressure disk that activated and they were putting in a new disk, so that was technically down but it was being repaired by installation of the new disk.

Mr. Schiller reported that the Moores Creek odor control project had new grit facilities with covers over headworks and primary clarifiers, and he noted the location of a grit collector in the structures, with the facility actually washing the grit before its discharge.

Mr. Mawyer asked him to point to the gate on the wastewater system that was up, noting that it could be lowered to cut off flow from going into the wastewater treatment process, so it was similar to the reservoir gate.

Mr. Schiller reported that it also included a new bio-scrubber, as pictured, and they were able to bypass the EQ tank, which was part of the process as well and was a fairly large source of odors.
He stated that the work was substantially complete in May 2018 and had a budget of about $10.4 million.

Mr. Schiller stated that the Crozet Finished Water Pump Station project replaced the existing pump station, which dated to the 1960s and had served its useful life. He stated the new station would have a higher capacity and was designed to be expanded. He stated that there were VFDs included so there were a number of different improvements beyond what was there previously. He stated the work was being done by Anderson Construction, and he referenced an image of the new facility and the new generator that would power the entire treatment plant. Mr. Schiller stated that the project was about 90% complete, with final completion scheduled for September and an overall budget of $2.6 million.

Mr. Schiller reported that the next project was the roofing project at the Moores Creek facility, with the majority of the roofs being part of the facilities expansion in the early 80s and the administration building being upgraded a few years ago. He stated that the maintenance facilities and pump stations at the plant, as well as the blower building, would be part of this project. Mr. Schiller stated that the work was being done by Triangle Roofing, who also did the administration building, and they would be installing roofs and lightning protection systems at all the structures. He noted that they were about 95% complete at this point, with a few downspouts and work on exhaust fans to be done, but the roof system was pretty much intact.

Mr. Gaffney asked about the expected lifespan for these roofs.

Mr. Schiller responded that there was a 20-year watertight warranty on them, with the previous ones lasting close to 40 years. He added that the project was estimated to be completed in September, with an overall budget of $1.2 million.

Mr. Schiller reported that the Ivy Transfer Station project involved a new solid waste transfer facility of 11,600 square feet, and he referenced a view of the front entrance and the big collection hopper where the container would be located. He stated the contractor was Lantz, and the project was about 85% complete, with work currently being done on the access roads in that facility — with plan for substantial completion and operation in August. Mr. Schiller noted that once the new facility was up, there would be demolition of the old facility and some additional work onsite, with a total project budget of $3.06 million.

Mr. Mawyer mentioned that Rivanna planned for the ribbon-cutting to be held August 23rd.

Mr. Schiller reported that the wholesale water metering project consisted of 25 new meter vaults to be located at City and County boundaries, with 23 of the 25 vaults installed but some of them having reporting errors, so they were working with the manufacturer to get them resolved. He noted that the two remaining vaults were to be completed, one being worked on by Faulconer Construction. He stated that Linco did the majority of the facilities, but Faulconer had been brought in to do the more difficult site. He noted that the overall project was about 95% complete,

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2 Editor's Note: VFD's are variable frequency drives.
with construction work to be done and the program to be in place in September 2018, with a budget of $3.6 million.

Mr. Schiller reported that the project to install a second centrifuge in the solids handling building at Moores Creek was intended to take the place of the old filter press that backed up to the existing centrifuge, which would help improve redundancy, operational efficiency, and odor control. He stated that this was done as a change order to the odor control project, with MEB Contractors doing the work – with the project completed in May 2018 and having a budget of $1.29 million. He noted that this was above the floor where the containers collected dewatered solids.

Mr. Schiller reported that the digester coating project was complete at digester #1 to better seal the inside of the structure and contain the methane within the structure itself. He stated the pilot testing of the coatings in digester #1 was successful, with more methane collected and improved odor control, gas collection, and structural integrity of the new basins themselves. He stated that this was done through Lytilc Utilities, with digester #1 finished in April 2018 and work begun on digester #2, with plans to move forward with digester #3 in the near future. Mr. Schiller mentioned that the total overall budget was $1.54 million.

Mr. Gaffney asked if there was an estimate on money saved by using the methane versus the gas.

Mr. Schiller responded that he was not aware of that.

Mr. Castillo stated that they were capturing about 40% more at digester #1, but they had not yet figured out what that equated to in savings.

Mr. Mawyer mentioned that they were preparing to do an assessment of that because some of the equipment was due for replacement and they wanted to make sure there was value there before they proceeded.

Mr. Schiller stated they were moving into a number of design and study projects, but there was also the expansion of the Crozet Water Treatment Plant and the Crozet flow equalization tank coming up in Spring 2019, at the same time as Observatory and South Rivanna improvements.

9. OTHER ITEMS FROM BOARD/STAFF NOT ON AGENDA

There were no other items presented.

10. CLOSED MEETING

There was no closed meeting held.

11. ADJOURNMENT
Mr. O’Connell moved to adjourn the meeting. Dr. Palmer seconded the motion, which passed 5-0. Mr. Jones was absent from the meeting and the vote. Ms. Galvin had left the meeting and was not present for the vote.

The RWSA Board adjourned the meeting at 3:50 p.m.

Respectfully submitted,

[Signature]

Mr. Jeff Richardson  
Secretary-Treasurer