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**RWSA BOARD OF DIRECTORS  
Minutes of Regular Meeting  
September 26, 2017**

A regular meeting of the Rivanna Water & Sewer Authority (RWSA) Board of Directors was held on Tuesday, September 26, 2017 at 2:15 p.m. in the 2<sup>nd</sup> floor conference room, Administration Building, 695 Moores Creek Lane, Charlottesville, Virginia.

**Board Members Present:** Mr. Mike Gaffney – Chair, presiding; Ms. Kathy Galvin (arrived at 2:17 p.m.); Ms. Lauren Hildebrand; Mr. Maurice Jones; Mr. Gary O’Connell; Dr. Liz Palmer; and Mr. Doug Walker.

**Board Members Absent:** None.

**Staff Present:** Ms. Miranda Baird, Mr. Tim Castillo, Ms. Victoria Fort, Dr. Richard Gullick, Mr. Doug March, Mr. Bill Mawyer, Ms. Betsy Nemeth, Ms. Michelle Simpson, Ms. Andrea Terry, Ms. Kathy Ware, and Ms. Jennifer Whitaker.

**Also Present:** Mr. Kurt Krueger, RWSA counsel, media representatives and members of the public.

**1.0 Call to Order**

The regular meeting of the RWSA Board of Directors was called to order by Mr. Gaffney on Tuesday, September 26, 2017 at 2:15 p.m.

**2.0 Minutes of Previous Board Meetings**

*a.) Minutes of Regular Board Meeting on August 22, 2017*

*b.) Minutes of Special Joint Meeting on August 31, 2017*

**Dr. Palmer moved to approve the RWSA Board meeting minutes of August 22, 2017 and August 31, 2017. Mr. Jones seconded the motion, which passed by a vote of 6-0. Ms. Galvin had not yet arrived and was absent from the meeting and the vote.**

**3.0 Recognition**

There were no recognitions.

#### **4.0 Executive Director's Report**

Mr. Mawyer reported that there would be a ribbon-cutting ceremony event, held rain or shine, for the new Rivanna Pump Station on October 5, 2017, from 10:30 to 11:30 a.m., to include Board members and anyone from the community who would like to attend. He stated that Rivanna would have some comments and then there would be a tour of the facility. Mr. Mawyer noted that there are 100 steps to the bottom, which would be the long tour and there would also be a shorter tour of 25-50 stairs. He mentioned that there is no elevator.

Mr. Mawyer reported that the RWSA has been busy with community outreach, and Wastewater Manager Tim Castillo had done a presentation two weeks earlier for the Virginia Joint Annual Meeting of the Virginia American Waterworks Association and the Virginia Water Environment Association. He stated that Ms. Andrea Terry would do a presentation on September 28 regarding the Moorman's River watershed for the Thomas Jefferson Chapter of Trout Unlimited. Mr. Mawyer noted that he had given a presentation the previous evening to the Pantops Community Advisory Committee on odor reduction from the wastewater treatment facility. He reported that he would be doing a presentation on Friday on water supply and reservoir management, as part of the Rivanna River Renaissance Conference held at the County Office Building on September 29.

Mr. Mawyer stated that Rivanna's strategic plan was moving forward, with vision, mission, and value statements drafted through the project steering committee. He noted there were currently six goal teams working on six draft goals, to flesh out those goals and what the implementation steps would be – with those goals brought back to the project steering committee on October 12 for a full-day workshop. Mr. Mawyer stated that if all proceeded as planned, they would have a draft strategic plan which would be brought back to both Rivanna boards for consideration at their regular meetings on November 14, with completion slated for their December 19 meetings.

Mr. Mawyer reported that Rivanna has been monitoring the reservoirs, and over the last 10 days the reservoir levels have dropped about 7%, with the urban reservoirs now at 77% full – holding about 2.1 billion gallons of stored water total, or 200 days of storage. He stated that the drought management plan addresses levels of 75% as a trigger for a drought watch, but that number is based on the hydrological model the consultants run. Mr. Mawyer noted that the consultants ran the model the previous week to evaluate if there was a 20% probability of being less than 75% full over the next 12 weeks, using data for the past 100 years and forward projections for the next three months. He noted that this uses the likelihood for rain, existing conditions, and reservoir levels, and the model predicted there is a 3% chance for the combined reservoir levels to be less than 75% after the next 12 weeks. Mr. Mawyer commented that they are in relatively good shape but would continue to monitor it.

Mr. Walker asked if Rivanna would wait for 12 weeks to determine where things stood, or continue to monitor it.

Mr. Mawyer responded that they would run the model weekly and get a new prediction through the model with each run to see what the probability is that they would be less than 75% after 12 weeks. He stated that they would monitor reservoir levels, which would likely

continue to decline unless there was some rain, and then monitor the model to establish the probability.

Mr. Walker asked if the 75% level automatically triggered the drought watch by policy, or if it just generated a conversation about it.

Mr. Mawyer responded that the drought management plan stipulates that when they run the model and the model says there is a greater than 20% chance of levels at less than 75%, after the next 12 weeks, drought management procedures would be implemented.

Mr. Walker commented that it was the threshold, timeframe, and probability.

Mr. Mawyer confirmed this.

Mr. Gaffney stated that if it was July 1<sup>st</sup> and they were at 77%, then looking out 12 weeks would probably trigger a drought watch, but here there is rain in the fall and sometimes a hurricane.

Mr. Mawyer emphasized that it is somewhat of a multi-component evaluation, and it took a while to read and re-read it to make sure they understood the model.

Mr. O'Connell commented that the City and County drought management plans were based upon Rivanna's determination.

Mr. Mawyer confirmed that if they did determine that a drought watch was necessary, Rivanna would ask its board to give the chairman authority to send a declaration to the Service Authority, the City, and the County to implement drought watch requirements. He mentioned that the Service Authority has a set of all-voluntary drought watch requirements, but the City did not until the second phase of drought warning. Mr. Mawyer noted that the City did conservation all the time, so the voluntary conservation measures were already in place. He stated that at the drought watch stage, there were all voluntary measures requested of the community.

Mr. O'Connell commented that they were typically outdoor measures.

Mr. Mawyer agreed, stating that this included watering lawns at night rather than during the day and similar measures.

Mr. Mawyer stated that another data point was that prior to RWSA deciding to build the new Ragged Mountain Dam, there was 1.1 billion gallons of water available, and the 30 feet of water added with the new dam added 1 billion gallons to storage providing a 200-day supply instead of a 100-day supply, which would have put the reservoir at 65% capacity rather than the current 77%.

Mr. Gaffney commented that this would have put them in drought warning rather than just a watch.

Dr. Palmer stated that this also took into consideration that they can only use the Ragged Mountain water at the smaller water treatment plant.

Ms. Whitaker confirmed that they could only use water from the Ragged Mountain Reservoir at the Observatory Water Treatment Plant.

Dr. Palmer noted that this was the second smallest water treatment plant, as she had ignored the North Fork.

Mr. Mawyer emphasized that the 77% capacity mentioned was the collective volume of Sugar Hollow, Rivanna, and Ragged Mountain – the three urban reservoirs – not just Ragged Mountain, although it did add 1 billion gallons to that total sum.

Mr. Gaffney pointed out that it had been six weeks since Wintergreen had water restrictions on all uses.

Mr. Mawyer stated that 10 days ago, Rivanna levels were at 84% capacity and now they were at 77%. He noted that they also monitor the state drought information online, and the drought management plan had a regional drought response committee that could be called together to talk about a plan should it become an issue.

Mr. Mawyer stated that Rivanna was also moving forward with a number of capital projects, design and construction, and staff had been doing a good job on that.

Dr. Palmer stated that she would like to have more information from Andrea Terry on her talk to Trout Unlimited.

Ms. Terry responded that the RWSA has had a good relationship with Trout Unlimited for a long time and they have asked her to attend their meetings in the past to talk about concerns and agreements that were in place with respect to a lease. She stated that they would discuss a little bit of everything.

Dr. Palmer asked if they had concerns about the water levels.

Ms. Terry replied that they had not mentioned it, but she was prepared to talk about it.

## **5.0 Items from the Public**

There were no items from the public presented.

## **6.0 Responses to Public Comments – No Responses This Month**

There were no responses to public comments this month.

## **7.0 Consent Agenda**

*a.) Staff Report on Finance*

- b.) *Staff Report on Operations*
- c.) *Staff Report on Ongoing Projects*
- d.) *Recommendation to Award Construction Contract – MCAWRRF Digester #1 Coating*
- e.) *Recommendation to Award Construction Contract – MCAWRRF Roof Replacements*
- f.) *Request for Additional Construction Change Order Authorization – MCAWRRF Odor Control Phase 2*
- g.) *Recommendation to Award Engineering Services – Crozet WTP Expansion*

**Dr. Palmer moved to approve the Consent Agenda as presented. Ms. Galvin seconded the motion, which passed by a vote of 7-0.**

## **8.0 Other Business**

- a.) *Presentation and Recommendation to Award Engineering Services Contract - South Fork Rivanna Reservoir to Ragged Mountain Reservoir Water Line Right-of-Way*

Ms. Whitaker presented on the status of the South Fork to Ragged Mountain waterline right-of-way project, noting that there was a report in the board packet that addressed the current work trying to be accomplished, with the right-of-way design and acquisition process ready to get underway.

Ms. Whitaker stated that the project purpose emerged from the community water supply plan. It was a 50-year plan adopted in 2012 with implementation intended to be in phases over time and each phase coming into effect as needed. She said the idea was that the plan would increase the safe yield of the urban reservoir system from 12.8 to 18.7 million gallons per day. Ms. Whitaker stated that phase one of the plan was building the Ragged Mountain Dam, which was completed in 2014.

Ms. Whitaker explained that the community water supply plan did not define which came first in terms of the next two phases, but the intent is that at a future point in order to meet the ultimate designed safe yield, Rivanna needed to raise the water level at Ragged Mountain. She noted that project was simply a clearing at the rim of the reservoir, unbolting a gate and bolting it at an alternate location, and allowing the water to rise.

Ms. Whitaker stated that the second project was to connect the South Fork Rivanna Reservoir to the Ragged Mountain Reservoir, and there were several things that drove the increase in safe yield and it was not simply that there is a pipeline. Ms. Whitaker said that the pipeline allowed the reservoir at Ragged Mountain to be filled five times faster than it currently did, which was part of the safe yield increase, as it allowed them to quickly draw and refill. She noted that the other benefit of the pipeline project was that it connected all the urban water sources to all the urban water treatment plants – which allowed RWSA to utilize multiple plants, allowed for redundancy and resiliency, and tied those facilities together. She noted that this meant they didn't have to build as large a plant at each facility as if it were treating 100% capacity, as RWSA would be able to split the load and get the raw water to where the

finished water needs to be. Ms. Whitaker stated that if Rivanna is able to connect facilities, it increases the safe yield.

Mr. O'Connell recalled that there was a specific formula in the agreement related to the 12-foot rise in the Ragged Mountain Dam pool level.

Ms. Whitaker responded that the agreement says the water level will be increased when demand reaches 85% of safe yield, and confirmed that it was a mathematical calculation.

Dr. Palmer noted that it didn't necessarily have to be what was done first if they decided the other pipeline benefits were worthwhile.

Ms. Whitaker stated that the agreement could be interpreted in two different ways, and the 85% trigger was there – but the question was whether the pipeline was in place before or after that, which was still a lingering question in her view.

Mr. O'Connell pointed out that the agreement didn't provide a formula for the pipeline as to when it would occur.

Ms. Whitaker confirmed this.

Mr. Mawyer clarified that it says the pipeline is part of the project, along with building the dam and all the associated work. He stated that in terms of raising the water level 12 feet, the agreement says they need to reach 85% of the safe yield. Mr. Mawyer stated that they are doing bathymetric studies to evaluate how much water is in the Rivanna Reservoir, and then checking the demand, so when they reach 85% that's when the agreement says either the City or Service Authority could ask Rivanna to move forward with raising the water level 12 feet, without needing the concurrence of the other public body.

Mr. O'Connell asked if the bathymetric work was done annually.

Mr. Mawyer responded that it was every 10 years.

Mr. O'Connell noted that 2020 would be the next hard look in terms of safe yield.

Ms. Whitaker explained that there are five reservoirs and they are budgeting the bathymetrics for every other year, so they are getting current data with the idea that by 2020 they would have the demand projection, all the new bathymetry, and be able to run the safe yield model to determine where they are on the spectrum that was envisioned.

Dr. Palmer stated that in the meantime, they were depending upon a 100-year-old pipeline to fill Ragged Mountain.

Ms. Whitaker responded that the upper Sugar Hollow pipeline was the transmission between the two reservoirs, and it was built in 1920.

Mr. Gaffney stated that if it's 85% to raise it 12 feet, the assumption the board made was that the pipe would be in place before that.

Mr. O'Connell stated that the Service Authority board's assumption was that the 12 feet would occur first.

Dr. Palmer commented that she was on the ACSA Board at that time.

Ms. Galvin commented that it was a logistical problem then, because the new pipeline would be needed to raise the 12 feet.

Ms. Whitaker explained that part of their analysis has been to really lay out what the demand vs. safe yield curve is, and they have run the safe yield model under 10 different scenarios – with the idea being to plot the new demand number and all safe yield scenarios out and show the sequences that indicate when pieces needed to be built. She stated that at that point, they can bring all the information out and make a more informed decision as to how and when the dollars come into play, and what it means for the water treatment plants. Ms. Whitaker noted that part of the scope of this work and the upcoming work on the bathymetry is to better define that exact question and establish when those projects need to get built.

Mr. O'Connell commented that they were also looking at the Observatory and South Fork Rivanna water treatment plants in terms of expansion needed.

Ms. Whitaker confirmed this.

Mr. Mawyer stated that this was a very big puzzle and they were looking at all of the pieces collectively. He noted that 600 million gallons is the 12 feet, and with the Sugar Hollow pipe they can get 4 million gallons per day – so that would take 150 days if they were only using that pipeline. He explained that they took about 5 months, from January to May, to fill what was used from Ragged Mountain last year over the winter. Mr. Mawyer stated that they would never want to bring Sugar Hollow way down as it was in the past, so he did not think they could use it for hundreds of days to fill Ragged. He noted that they could also fill that extra 12 feet over several years, if they so choose.

Dr. Palmer noted that it wasn't just the Sugar Hollow Reservoir they were concerned about, because they were also concerned downstream about water going in there. She recognized that there were instream flow requirements, but she thought of those as the minimum requirements for the health of the river.

Ms. Whitaker clarified that if the reservoir was not spilling, that's what was going into the river – so if it was 1 foot down or 15, what went into the river above the dam was what went into the stream release. She emphasized that it was a question of whether they were spilling or not spilling that drove the stream number.

Mr. O'Connell asked if this was also the case for the Rivanna River in terms of instream flow, as he had received concerns from people trying to reach the river, and asked if there was a requirement for a certain release once the level was down.

Ms. Whitaker confirmed this, stating that the number was based off of the Mechums River gauge and a scaling factor, and in looking back over the last few weeks and months, they were releasing the cap – which was 20 million gallons per day downstream – and as the influent streams and Mechums gauge have gone down, Rivanna has been tapering its release to match the decrease seen on the raw water influent side.

Ms. Whitaker reported that the waterline project was more than just a waterline and was composed of five separate pieces of the project: an intake at the South Fork Rivanna Reservoir that can pull in as much as 41 million gallons per day; a pretreatment facility at South Fork; a booster pump station that can transmit 25 MGD from South Fork to Ragged Mountain; the pipe itself at approximately 9 miles in length; and a return pump station on the Ragged Mountain side that can return up to 16 MGD back to the South Fork plant or the South Fork reservoir.

Dr. Palmer noted that there had been some discussion about moving the intake, which could affect the pretreatment.

Ms. Whitaker confirmed that there had been some discussions about that. She explained that the South Fork Reservoir has a big “U” shape, and the last leg of the reservoir itself was probably about 10% of the length of the project. She stated that one idea that had emerged was moving the intake from the dam and water treatment plant up the reservoir into an alternate location, and whether they could shorten the pipe by about 10%. Ms. Whitaker stated that there were several issues related to that, including the fact there was permitting in place to be in the reservoir at the dam and water treatment plant site, so that intake structure was a significant piece of this permit.

Mr. O'Connell asked if that was the deepest part of the South Fork reservoir.

Ms. Whitaker confirmed that it was, stating that this was where the highest velocities typically occurred. She noted that as you head up the reservoir, you get into some of the tributary streams such as Ivy Creek and a few other areas. Ms. Whitaker pointed out that staff have concerns about water quality, potential sediment, etc. – so for the moment the plan is to bring the facilities all the way to the water treatment plant. She noted that the other factor is that they need to be able to get the water from Ragged Mountain to the South Fork plant, so they could put it back in the reservoir and allow it to go downstream or bring it into the pretreatment facility. Ms. Whitaker stated that the current thinking is to bring it to its original location at the South Rivanna treatment plant, and then evaluate whether alternatives are needed as a cost-saving measure.

Dr. Palmer pointed out that there is a significant cliff and big elevation for a large portion of that.



Ms. Whitaker responded that there were elevation changes and permitting changes also, and putting an intake structure in a run-of-the-river reservoir was no small undertaking – so having to move the permit location could present some challenges.

Mr. Gaffney asked for clarification that there would just be one point going both directions.

Ms. Whitaker confirmed this, adding that there would be a pump station at both ends that allow water to be moved from one direction or another.

Dr. Palmer stated that one direction was predominately downhill, with some gravity feed from Ragged Mountain to South Fork.

Ms. Whitaker stated that at the lower portion of the alignment, there was a series of hills or small mountains, so in either direction the water must be pumped. She stated that the other benefit to be discussed was that the pump station at the southern end near Ragged Mountain also had the potential to replace the Royal and Stadium Road Pump Stations currently used. She noted that Royal Pump Station was built with the 1920s pipeline, so it had some age and capacity issues, and that would allow them to bring more water from Ragged Mountain to the Observatory Treatment Plant as well as bringing it to the South Fork plant.

Mr. O'Connell asked about the options for pretreatment, as there was some question about the original assumption that there would have to be pretreatment – and he asked whether this would be studied.

Ms. Whitaker responded that it would be studied, stating that staff looked at it in some length with this scope of work, and stated that with this project they are simply trying to secure right-of-way. She noted that the pretreating question was a follow-up question that was specific to water quality and treatment specialties, which were typically addressed by different contractors than those who do pipeline assignments and design. She added that at some point they would have water quality specialists come in and really examine what needed to be done to secure the water quality going forward, including any pretreatment needs. Ms. Whitaker pointed out that this was built into the budget and the project but was not built into the piece of the project before them.

Mr. O'Connell asked if the pretreatment facility would follow from the intake and if it would just be set in there once the intake was decided, which would also decide their alignment.

Ms. Whitaker confirmed this, noting that sizing it and developing it and making sure it fit within the processes of the rest of the treatment facility.

Ms. Whitaker stated that the project before the board today was to secure the location of the waterline itself and a location for the raw water return pump station on the Ragged Mountain end of the project. She noted that the reason they were interested in trying to secure that location was that it drives the southern terminus of the cross-country alignment, and setting that location would alter where they were going to and from. Ms. Whitaker stated that the facility was fairly important on their ability to use that facility in the future, to ensure they

have access to it from east/west as well as north/south, and that would drive pipeline alignment.

Mr. Mawyer asked for confirmation that the first three components would be on property RWSA already owns.

Ms. Whitaker responded that this would be the case, if they go at South Fork.

Ms. Whitaker explained that the scope of the current project was to do several things, including looking at a waterline routing study, and she referenced a map created when they were working through the water supply plan. She stated that the original thought was that the water main would follow the proposed western bypass alignment, but the bypass ceased as a project. Ms. Whitaker stated that they looked at the two ends and logical corridor for the water main, and she pointed out the likely routing for the pipeline with some specific properties they would like to go across. She stated that they would be doing a routing study and an alternatives analysis on some of the routes, as well as site selection, which included costs to provide power and other services to this location at the Ragged Mountain end of the project. Ms. Whitaker noted that they would also be looking at a preliminary engineering report and working with the health department on getting it approved, and then taking the project through about a 30% design and cost estimate. She stated that this would give them a more refined idea of true costs, and from there would do easement plat preparation, with an estimate of about 70 parcels for easements. Ms. Whitaker noted that they would need to coordinate with government and commercial owners as well as individuals.

Ms. Whitaker stated that Rivanna was proposing to use the Michael Baker Engineering firm for the project, with a fee of approximately \$528,000, with a total project budget of about \$2.295 million. She noted that the project would require a fair amount of design work and coordination work, and then work with the easement acquisition process.

Mr. O'Connell asked if the estimate included funding for easements.

Ms. Whitaker responded that the original total project budget estimate did include that, and they have done escalation factors based on current assessment rates – knowing that it was subject to change.

Mr. Walker asked if they had evaluated the total budget estimate based on the fee proposal from Baker on this part of the work, and whether staff still felt good about that number.

Ms. Whitaker responded that they had, and stated that staff estimates the project itself at about \$63 million – so \$528,000 was about 2.5% of the pipeline cost. She said that while this seems like a large percent of the project budgeted at the moment, but looking at 30% design of the total project budget it was actually fairly reasonable.

Dr. Palmer recalled that Rivanna had done a lot of public outreach and preliminary design on the route, with community meetings and a facilitator, and she asked if any of that information was still valuable or if it was completely dated.

Ms. Whitaker responded that to some degree it was dated because different parcels had been developed and there were different priorities in the community as well as a different generation of property owners. But there were a lot of detailed notes because staff spent a lot of time out in the field walking the area. She stated that there were four or five key properties along the route that would drive the rest of the alignment, and once they started talking to those property owners and confirming that the line would cross specific parcels, it would help drive some of the other questions. Ms. Whitaker presented a project schedule, stating that they were kicking off the work now and would anticipate discussing property acquisition in 2019 and 2020 with the idea of having it secured by 2021. She acknowledged that there was significant work to be done as well as significant property owner discussion to take place.

**Ms. Galvin moved to award the engineering services contract for the South Fork Rivanna Reservoir to the Sugar Hollow Reservoir as presented. Mr. Walker seconded the motion, which passed by a vote of 7-0.**

*b) Presentation "Wastewater 101"*

Dr. Gullick stated that there were four wastewater plants or water resource recovery facilities, with Moores Creek processing about 10 MGD, Glenmore processing about 100K gallons per day, Scottsville processing about 50K gallons per day, and Stone Robinson Elementary School processing about 3K gallons per day when it was open. He referenced an aerial view of the Moores Creek facility, stating that all of the wastewater from the Charlottesville, Albemarle and Crozet metro areas coming in through the intakes and going through the equalization basins that also help settle off grit. He noted that they were building grit removal facilities at the headworks as part of the odor control project, and from there the particles settle out and go through the biological process that's the heart of the treatment plant. Dr. Gullick stated that the effluent would then cross the campus up to the sand filters, go through ultraviolet disinfection, and then be discharged to the river. He noted the rest of the facilities included digesters and centrifuges for solids handling.

Mr. Gaffney asked if the photo was up to date.

Dr. Gullick responded that it was not, and explained that there were new covers now on the Moores Creek site, and there was also one empty tank that was having a pipeline being built in it.

Mr. Gaffney asked if Dr. Gullick could show the before and after when they finished the odor control project.

Dr. Gullick stated that he could. He explained that in terms of a process schematic, the wastewater came in and he pointed out the liquid train, which took out some of the suspended solids and took some of the organic matter – biochemical oxygen demand, which took oxygen out of the river when bacteria degraded it, and that needed to be removed for fish. He stated that it then went through a biological treatment that addressed the oxygen demand and also took care of the phosphorous and nitrogen, which are nutrients of concern to the Chesapeake

Bay specifically. Dr. Gullick explained that they then settle out the bacteria used and return it, with cleaner water going through sand filters and disinfection with ultraviolet light. He noted that they didn't use chlorine at Moores Creek, Glenmore, or Scottsville, so there was no chemical usage and no need to dechlorinate. Dr. Gullick stated that Rivanna's permits are based on that treated water, although there are some requirements for composting, but the digesting requirements from the state DEQ come for the treated water.

Dr. Gullick stated that staff reports to the board some of this information but not all, noting that they report on flow, biochemical oxygen demand, suspended solids, ammonia, and phosphorous and nitrogen levels. He stated that they did not have plots for pH levels or bacteria counts after disinfection, or dissolved oxygen. He noted that they have a variety of requirements whether it's a weekly or monthly average, minimums and maximums, and the monitoring requirements change from whether it's a grab sampling or a single or composite sampling over a day, and at what intervals it needed to be done over days, weeks, or months. Dr. Gullick stated that the removal efficiencies have been excellent, and Moores Creek was getting 99% removal rates because of the improvements previously done to the plant for enhanced nutrient removal. He noted that they would normally remove 2/3 of suspended solids and 1/3 of the biochemical oxygen demand just in the primary settlers alone, so they would be removing 90%+ in a normal process, and noted that he could show the Board what was removed at the other plants that don't have the biological process. He noted that the parts per million permit limits for biochemical oxygen demand were around 10-22, and Rivanna was down around 1 as an average for the year of 2016. Dr. Gullick stated that they were getting out ammonia to a level of about 0.26 ppm, and the requirement was 2, and they were also well below the nutrient limits.

Mr. Gaffney asked if he could find out what "best in class" measures were.

Dr. Gullick responded that it would be mid to upper-90s for the suspended solids and the biochemical oxygen demand and ammonia at a lot of plants, but where Moores Creek stood out was with the nitrogen and phosphorous nutrient removal.

Mr. Gaffney asked if he could get figures from other plants in Virginia or the U.S.

Dr. Gullick responded that he could get some numbers.

Ms. Galvin commented that this was a small community that had invested a lot in water quality, and she would like to see how they compared to larger, more sophisticated systems.

Mr. Mawyer stated that many systems have a 5 ppm nitrogen, 0.5 phosphorous total, and the state's Water Quality Improvement Fund helps Rivanna and other entities around the state lower nutrient outputs to those levels. He noted that 3 for nitrogen and 0.1 for phosphorus was touted as the limit of technology, and the concern is that as regulatory requirements become more stringent, they will require more plants to reduce nitrogen from 5 to 3 ppm and phosphorous from 0.5 to 0.1.

Dr. Gullick stated that both the state and federal government realize that this would make little or no impact to the Bay, because of nonpoint sources, but they were simply squeezing as much out of water authorities as possible – and he has asked this question of EPA officials.

Dr. Palmer noted that this had been a complaint for years.

Dr. Gullick referenced a table in their report, stating that the first column showed the flows with 10 MGD from Moores Creek, Glenmore at 94K, Scottsville at 42K, and Stone Robinson barely registering at 1K because it wasn't yet open. He stated that the biochemical oxygen demand was about 2, with a limit of 11, and the limits were higher at Glenmore and Scottsville because the plants weren't as advanced and were smaller facilities. Dr. Gullick stated that they were not required to monitor for ammonia at Glenmore or Scottsville, but did because it was important to remove. He noted that Moores Creek's ammonia level had changed with the new permit. Dr. Gullick stated that in addition to the mass per volume concentrations, the state required the concentration to be taken and multiplied by the permitted capacity of the plants to establish a mass per time or mass per day loading in kilograms per day. He referenced the permit requirement for suspended solids and for the biochemical oxygen demand – the latter of which had become stricter under the new permit in July 2016 when it was renewed. Dr. Gullick pointed out Rivanna's performance in comparison to regulatory standards going back to early 2016. He noted that the ammonia limits change seasonally, as the chemical is more toxic in warmer water and thus had a lower limit. Dr. Gullick noted that the limit changed in July 2016 with the new permit, and that standard had actually relaxed – so the summer limit was at 2 and the winter limit was 7, with Rivanna's levels being consistently low for ammonia removal regardless of season.

Dr. Gullick referenced a table showing the level of nutrient removal, stating that it was not a toxicity issue with streams but was more of a chronic issue as nutrients were discharged into the James River down into the Chesapeake Bay and built up over time. He stated that the state was concerned with nutrient loads on an annual basis, but for tracking purposes they took the limit of 283,000 pounds and divided it by 12 to provide a monthly approximation. Dr. Gullick stated that they have just under 24,000 pounds per month allowed, with about 3,700 pounds discharged – so they were at about 16% of what the allocation is and even lower on phosphorous. He noted that the monthly allocation was not a permit requirement, as you could be well above it in a given month without exceeding the annual limit.

Dr. Gullick referenced the legal requirement under Rivanna's permit, with up to 282,994 pounds per year, and pointed out the allowable amount via the enhanced nutrient removal funding which necessitated a stricter limit. He explained that instead of 6 mg per liter nitrogen, it would be 5 mg per liter, and 0.3 instead of a 0.5 for phosphorous. He stated that they don't get a permit violation if they exceed those limits, but would have to pay some money back because they used those funds. He referenced Rivanna's total cumulative nitrogen pounds over the course of the year, stating that they should end up at a good level if they continue with their performance and thus would end up with some credits. Dr. Gullick explained that there as a nutrient trading group within the state whereby entities can trade or sell credits, so Rivanna could take the difference and sell their credits into a pool for other industries and wastewater plants to buy. He noted that the prices were set in advance by the

nutrient credit organization and then allocated out of the money spent to buy them, and he stated that they might end up selling zero credits if there aren't enough buyers, but in the three years he has been with Rivanna the average has been about \$100,000 per year. He noted that there were not nearly as many nitrogen credits on the market, so they do well with those versus phosphorous and about 90% of the income from the differential comes from nitrogen. Dr. Gullick added that they do not show dissolved oxygen, pH, or e-coli.

Dr. Palmer stated that there had been a lot of talk about planning for hundred-year floods and 50-year floods, and asked what they were designed for in terms of handling large quantities.

Mr. Castillo responded that they were designed to hold 21 million gallons in all storage basins, with a total plant peak flow rate of 85 MGD – with as much going through the plant as possible and anticipation that the storm would recede and allow for pump back out of storage.

Dr. Gullick stated that they can treat 45 MGD, and the rest needed to go to the holding ponds, which were much bigger than the equalization basins shown. He noted that with a very big flood, that would fill up very quickly, but they did not see those high rates very often.

Dr. Palmer asked if they had ever had one since this was put in.

Mr. Castillo responded that there was a very high level one of the first weeks the new Rivanna Pump Station was put in, with about 53 million gallons put through.

Dr. Gullick mentioned that when you get that big of a flood, the rainwater ends up more dilute and they will bypass the ammonium and use the nutrient removal process in an effort to save the bacteria that will remove the ammonia and biochemical oxygen demand. He noted that this is known as a “step feed,” and it was not possible to store all the water from very high rain levels – although large metropolitan areas have constructed facilities to try to contain it. Dr. Gullick stated that there have been no overflows into streams that he was aware of in the three years since he had been here.

Ms. Whitaker stated that since they upgraded the wet weather capacity of the plant, the Rivanna Pump Station upgrade has eliminated the last issues in that regard.

Dr. Gullick stated that standard operating procedure with certain rain conditions means they check the first manholes going up from there, and if there is a problem they go to the next set that are sensitive.

Mr. Gaffney asked if there could be an update on the I&I [inflow and infiltration] – where they were at the worst point and what it currently is.

Dr. Palmer stated that when she first took the tour of the new wastewater plant, she recalled an employee saying they were planning for a three-year rain event.

Dr. Gullick and Ms. Whitaker confirmed that they plan for a two-year statistical recurrence,

and Dr. Gullick stated that this was an overall long-term statistic, not an actual annual realization.

Mr. Gaffney commented that a two-year rain does not cause flooding.

Dr. Palmer acknowledged this, but noted they have greater than two-year rain events all the time.

Ms. Hildebrand pointed out that a two-year rain event was about four inches over 24 hours.

Dr. Palmer stated that it seemed like they have them every year.

Ms. Galvin stated that they were nowhere near 4 inches in 24 hours.

Dr. Gullick stated that was a pretty heavy requirement in terms of this system.

Ms. Whitaker commented that with this system specifically, it was highly dependent on antecedent moisture condition so they can take a 7 to 10-inch rain without any problems, but also have a 4-inch rain create big problems. She noted that it depended on how saturated the soils are, and the Rivanna system seemed to be much more sensitive than others, due to the topography and soil composition.

Mr. O'Connell asked what would trigger any additional projects once the current ones were completed, and asked what the next level of capital improvements would be pending particularly at Moores Creek.

Dr. Gullick responded that they might want to change how the thickeners operate, but other than that were working on the digesters for some leakage, but until flows increased the plant was in fairly good shape. He stated that the focus had been on wastewater, so now the focus was on the water plants needing rehabilitation.

Ms. Whitaker added that there was some work needed on the Crozet pump stations in terms of facility maintenance, but not from a capacity standpoint.

#### **9.0 Other Items from Board/Staff not on Agenda**

There were no additional items presented

#### **10.0 Closed Meeting**

There was no closed meeting held.

#### **11.0 Adjournment**

There was no closed meeting held.

#### **12.0 Adjournment**

**At 3:16 p.m., Mr. O'Connell moved to adjourn the RWSA Board meeting. Mr. Jones seconded the motion, which was approved by a vote of 7-0.**

There being no further business, the meeting adjourned at 3:16 p.m.

**Respectfully submitted,**

  
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Mr. Maurice Jones  
RWSA Secretary-Treasurer