



**RWSA BOARD OF DIRECTORS
Minutes of Regular Meeting
December 14, 2021**

A regular meeting of the Rivanna Water and Sewer Authority (RWSA) Board of Directors was held on Tuesday, December 14, 2021 at 2:15 p.m. via Zoom.

Board Members Present: Mike Gaffney; Jeff Richardson; Lauren Hildebrand; Gary O’Connell; Dr. Liz Palmer; Lloyd Snook; Samuel Sanders, Jr.

Board Members Absent: none.

Rivanna Staff Present: Bill Mawyer, Lonnie Wood, Deborah Anama, Betsy Nemeth, Victoria Fort, Scott Schiller, David Tungate, John Hull.

Attorney(s) Present: Carrie Stanton.

1. CALL TO ORDER

Mr. Gaffney called the December 14, 2021, regular meeting of the Rivanna Water and Sewer Authority to order at 2:16 p.m.

2. STATEMENT FROM THE CHAIR

Mr. Gaffney read the following statement aloud:

“This is Mike Gaffney, Chair of the Rivanna Water and Sewer Authority.

“I would like to call the December 14, 2021, meeting of the Board of Directors to order.

“Notwithstanding any provision in our Bylaws to the contrary, as permitted under the City of Charlottesville’s Continuity of Government Ordinance adopted on March 25, 2020, Albemarle County’s Continuity of Government Ordinance adopted on April 15th, 2020, and revised effective October 1, 2020 and Chapter 1283 of the 2020 Acts of the Virginia Assembly effective April 24, 2020, we are holding this meeting by real time electronic means with no board member physically present at a single, central location.

“All board members are participating electronically. This meeting is being held pursuant to the second resolution of the City’s Continuity of Government Ordinance and Section 6 of the County’s revised Continuity of Government Ordinance. All board members will identify themselves and state their physical location by electronic means during the roll call which we will hold next.

“I note for the record that the public has real time audio-visual access to this meeting over Zoom as provided in the lawfully posted meeting notice and real time audio access over telephone, which is also contained in the notice. The public is always invited to send questions, comments, and suggestions to the Board through Bill Mawyer, the Authority’s Executive Director, at any time.”

47 Mr. Gaffney called the roll.

48

49 Ms. Lauren Hildebrand stated she was located at 305 4th Street Northwest in Charlottesville.

50

51 Mr. Gary O'Connell stated he was located at the ACSA offices at 168 Spotnap Road,
52 Charlottesville.

53

54 Dr. Liz Palmer stated she was located at 2958 Mechum Banks Drive in Ivy.

55

56 Mr. Jeff Richardson stated he was located at the County Office Building at 401 McIntire Road in
57 Charlottesville.

58

59 Mr. Samuel Sanders stated he was located at 605 East Main Street in Charlottesville.

60

61 Mr. Lloyd Snook stated he was located at 408 East Market Street in Charlottesville.

62

63 Mr. Mike Gaffney stated he was located at 449 Washington Street, Marco Island, Florida.

64

65 Mr. Gaffney stated the following Authority staff members were joining the meeting electronically:
66 Bill Mawyer, Lonnie Wood, David Tungate, Victoria Fort, Deborah Anama, Betsy Nemeth, and
67 Scott Schiller.

68

69 Mr. Gaffney stated they were also joined electronically by Ms. Carrie Stanton, Counsel to the
70 Authority.

71

72 **3. ACCEPTANCE OF RESIGNATION AND ELECTION OF SECRETARY-TREASURER**

73 *a. Chip Boyles, former City Manager, resigned from the Rivanna Boards on October 19, 2021.*
74 *This election will be for the term ending April 30, 2022.*

75

76 Mr. Gaffney stated there would not be an election for Secretary-Treasurer at this time and that
77 this would be done in January. He stated a vote was not needed on this item, so if there were any
78 comments, he would ask for those to be made but otherwise, they would move on to the next
79 agenda item.

80

81 No comments were made.

82

83 **4. MINUTES OF PREVIOUS BOARD MEETINGS**

84 *a. Minutes of Regular Board Meeting on November 16, 2021*

85

86 Mr. Gaffney asked if there were any comments or changes to the minutes.

87

88 **Dr. Palmer moved that the Board approve the minutes of the November 16, 2021 meeting.**
89 **The motion was seconded by Mr. O'Connell and passed unanimously (7-0).**

90

91 **5. RECOGNITIONS**

92 *a. Resolution of Appreciation for Mr. Steven Miller*

93 Mr. Gaffney read the resolution aloud:

94

95 “WHEREAS, Mr. Miller has served as an Information Technology Administrator for the
96 Rivanna Water and Sewer Authority since April of 1999; and

97

98 “WHEREAS, over the same period in excess of 22 years, Mr. Miller has provided significant
99 contributions in his field and served as a valuable resource to the Authority; and

100

101 “WHEREAS, Mr. Miller’s dedication and loyalty to the Authority have positively impacted the
102 Authority, its customers and its employees; and

103

104 “WHEREAS, the Board of Directors is most grateful for the professional and personal
105 contributions Mr. Miller has provided to the Rivanna Water and Sewer Authority.

106

107 “NOW, THEREFORE, BE IT RESOLVED that the Board of Directors recognizes and thanks
108 Mr. Miller for his distinguished service, efforts and achievements as a member of the Rivanna
109 Water and Sewer Authority, and presents this Resolution as a token of esteem, with its best
110 wishes in his retirement.

111

112 “BE IT FURTHER RESOLVED that this Resolution be entered upon the permanent Minutes of
113 the Rivanna Water and Sewer Authority.”

114

115 **Dr. Palmer moved that the Board approve the resolution. The motion was seconded by Mr.
116 O’Connell and passed unanimously (7-0).**

117

118 *b. Resolution of Appreciation for Dr. Liz Palmer*

119 Mr. Gaffney noted that this was the joint resolution heard in November at the Rivanna Solid
120 Waste Authority Board meeting, but it certainly deserved repeating.

121

122 Mr. Gaffney read the resolution aloud:

123

124 “WHEREAS, Dr. Palmer has served as a member of the Rivanna Solid Waste Authority and the
125 Rivanna Water & Sewer Authority Boards of Directors since 2016; and

126

127 “WHEREAS, since 1998 Dr. Palmer has been an active and valuable contributor and has
128 demonstrated leadership in solid waste, recycling, drinking water and wastewater services as a
129 member of the community and as a member of the Boards of Directors; and

130

131 “WHEREAS, Dr. Palmer’s understanding of solid waste and recycling as well as drinking water
132 and sewer operations of Albemarle County and the Rivanna Authorities has supported a strategic
133 decision-making process that provided benefits to the customers served by Albemarle County as
134 well as the community as a whole. During Dr. Palmer’s tenure and through her efforts, major
135 projects were completed including:

136

136 - a modern refuse Transfer Station at the Ivy Material Utilization Center

137

137 - the first recycling and refuse Convenience Centers located at the Ivy MUC as well as in Keene

138

138 - a Community Water Supply Plan to ensure an adequate water supply for the next 50 years

- 139 - the regional “Wastewater Projects Cost Allocation Agreement”
- 140 - Odor Control Improvements at the Moores Creek Advanced Water Resource Recovery Facility
- 141 - Granular Activated Carbon Filters for the water treatment plants
- 142 - a Strategic Plan for both Authorities; and

143
144 “WHEREAS, the Solid Waste Authority and Water & Sewer Authority Boards of Directors are
145 most grateful for the professional and personal contributions Dr. Palmer has provided to both
146 Authorities and to the community.

147
148 “NOW, THEREFORE, BE IT RESOLVED that the Rivanna Solid Waste Authority and Rivanna
149 Water & Sewer Authority Boards of Directors recognize, thank, and commend Dr. Palmer for
150 her distinguished service, efforts, and achievements and present this Resolution as a token of
151 esteem, with their best wishes in her future endeavors.

152
153 “BE IT FURTHER RESOLVED that this Resolution be entered upon both the permanent
154 Minutes of the Rivanna Solid Waste Authority and the Rivanna Water & Sewer Authority.”

155
156 **Mr. Snook moved that the Board approve the resolution. The motion was seconded by Mr.**
157 **O’Connell and passed unanimously (7-0).**

158
159 Mr. Gaffney thanked Dr. Palmer for all her efforts over the past 20-plus years in Water and
160 Sewer and Solid Waste.

161
162 Dr. Palmer thanked Mr. Gaffney. She stated she plans to keep watching and has a personal goal
163 to live long enough to see the Sugar Hollow Pipeline be commissioned. She stated she will
164 continue to watch the water supply plan. She stated it has been a great learning experience, and
165 she has met many wonderful people along the way. She stated she collaborated with a lot of
166 people she disagreed with on a lot of other things. She expressed thoughts about some turbulent
167 times and that she is happy that things are quieter now. She stated she hopes they are able to keep
168 things running along smoothly and reasonably as they have over the last several years. She stated
169 the Authority has grown a lot and is very impressive.

170
171 Mr. Gaffney agreed. He thanked Dr. Palmer for her help in those many years. He stated the
172 board looks forward to seeing her and hopefully, they would be able to meet in person again
173 when Dr. Palmer comes out to advocate and talk during public comment sections.

174
175 Dr. Palmer expressed her disappointment about not having her last meeting in person.

176
177 **6. EXECUTIVE DIRECTOR’S REPORT**

178 Mr. Mawyer stated the Authority was pleased to recognize Ms. Mary Rad Morris, who came to
179 work for Water and Sewer in January of 2021 as an unlicensed water operator and has already
180 completed the testing requirements to achieve her Water Operator Class II rank, which is next to
181 highest (with Class I being next). He stated she was able to do so quickly because Ms. Morris has
182 a master’s degree in chemistry from UVA, along with another bevy of bachelor’s degrees. He
183 stated those degrees take the place of some of the experience requirements. He stated Ms. Morris
184 is a star in the group, and they are pleased to have her. He congratulated her for achieving her

185 new license.

186

187 Mr. Mawyer stated the Authority continues to monitor COVID and vaccinations, and they did
188 start to require weekly testing for unvaccinated employees last Tuesday. He stated today is the
189 second week they are taking testing, which are self-administered tests where the swab is put in a
190 tube and mailed, with results returned in two days. He stated they hope this program will
191 continue to go positively.

192

193 Mr. Mawyer stated the Authority did put out a caution and requirement to its staff over the
194 holidays that if they travel out of the country or have guests from out of the country (as he
195 himself would), that they have a return-to-work plan to make sure the Omicron variant is not
196 affecting any of that process. He stated they hope all of their employees have a nice holiday, but
197 the Authority did have to put this requirement in place.

198

199 Mr. Mawyer stated that overall, the Authority still stands at about 89% of its staff being fully
200 vaccinated.

201

202 Mr. Mawyer stated drinking water supply and drought are recent topics on television. He stated
203 that when he wrote his update the prior week, all of the reservoirs (except Ragged Mountain)
204 were 100% full. He stated that since then, over the last few days, Sugar Hollow dropped down
205 below the top of the dam, and it is about 96% full. He stated they are transferring from Sugar
206 Hollow to Ragged Mountain now to try to get Ragged full during the winter months. He stated
207 they have about 78 million gallons to go, which they expect would be able to top off Ragged
208 Mountain in about one month. He stated they plan to continue to transfer from Sugar Hollow and
209 then, as they get some rain, Sugar Hollow typically will refill very quickly.

210

211 Mr. Mawyer stated the Authority is watching the statewide drought monitor report, which had
212 put the area in a warning for low precipitation and a watch for stream flows. He stated
213 groundwater levels and reservoir levels, however, are normal in Central Virginia. He stated they
214 are still doing fairly well and much better than what one will see when watching the national
215 news, as there are major drought issues in California. He stated California is going into their
216 third year of a drought, and their second-largest reservoir (Lake Oroville) is currently at 30%
217 capacity whereas normally, it is at 60%. He stated there are dire straits in Northern California
218 which fortunately, RWSA does not have.

219

220 Mr. Mawyer stated the Authority has completed a draft of its upcoming FY 23-27 Capital
221 Improvement Program, and they will meet with Mr. O'Connell and Ms. Hildebrand on January 7
222 to review the \$200-million five-year Capital Construction Plan. He stated they will bring a final
223 proposed plan to the board in February.

224

225 Mr. Mawyer stated they continue to monitor federal funding opportunities. He stated the
226 Authority did submit six projects to Albemarle County, requesting consideration for some of the
227 local fiscal recovery funds as a part of the American Rescue Plan Act. He stated their projects
228 total about \$7.2 million. He stated they do not expect the County to fund all of this, but they tried
229 to give them a variety of water, wastewater, and sustainability projects they can consider.

230

231 Mr. Mawyer stated the Authority is also closely watching the Bipartisan Infrastructure Law of
232 2021, which passed in November. He stated they understand Virginia is getting \$126.3 million in
233 the first-year allocation, so the Authority is monitoring and looking for application forms to get
234 its projects proposed for any and all of these federal funding opportunities.

235
236 Mr. Mawyer stated they continue to work on the Central Water Pipe, which is the project of a
237 new finished waterline that would go significantly through the southern part of the City. He
238 stated they did put together an information page that was posted to the Authority's website and
239 that day, they added what they call the "Route Study" their consultant completed, which
240 considers all of the routes they considered (northern, central, southern, and railroad routes) and
241 all the criteria they used to evaluate those routes. He stated they plan to bring the proposed route
242 to the RWSA Board in January for their review and any comment. He stated the information is
243 now on the webpage for all to read.

244
245 Mr. Mawyer stated the Authority had planned to shut down Observatory Water Treatment Plant
246 to work on the renovation during the Christmas break at UVA this year, but due to supply chain
247 issues and getting materials they need at the South Rivanna Plant so that it could carry the entire
248 urban system while Observatory was not operational, South Rivanna was not ready to take on the
249 full load of the entire urban system. He stated therefore, they will delay the shutdown of the
250 Observatory Treatment Plant until December 2022. He stated they do not expect this to have any
251 major impact on the completion of the overall project, which was a renovation of both plants. He
252 stated they appreciate the efforts of the one Engineering Manager, Mr. Scott Schiller, and his
253 staff for managing the major project.

254
255 Mr. Mawyer stated the Authority continues to have success in gaining the easements for the
256 Rivanna-to-Ragged Pipeline, which he mentioned earlier. He stated there was a map to show the
257 board what easements had been obtained.

258
259 Mr. Mawyer stated a utility in Ashland, Kentucky requested to tour RWSA's wastewater
260 treatment plant, as they are considering a similar wastewater process to that of RWSA. He stated
261 the Authority was happy to host them for a tour.

262
263 Mr. Mawyer stated in the board's packet were pictures of the new signs at Totier Creek
264 Reservoir and the North Fork Rivanna River Reservoir, which are "Drinking Water Protection
265 Area" signs the Authority obtained through a grant from the Virginia Department of Health. He
266 stated they also have similar signs at Beaver Creek Reservoir.

267
268 Mr. Mawyer concluded his report.

269
270 Mr. Gaffney asked if there were questions.

271
272 Dr. Palmer stated it was a shame that Mr. Mawyer could not bring up the map, as she was
273 somewhat confused about the one private property that has not yet been acquired, which was
274 noted to be on Barracks Road.

275
276 Mr. Mawyer stated the property is located between Barracks Road and Albemarle High School.

277 He stated Sugarday Farm is the property they are talking about. He stated the Authority is having
278 intermittent communications with that owner.

279
280 Staff were able to present the map on the screen.

281
282 Dr. Palmer stated it now made more sense to her that it was Sugarday Farm, as she had
283 previously been confused from the packet.

284
285 Mr. Mawyer stated they also have the property on Reservoir Road to get from the Regents
286 School. He stated they did recently obtain easements on Woodburn Road from two private
287 owners. He stated they are down to Sugarday Farm, two properties with the UVA Foundation
288 that are shown in blue on the map, one private property at Regents School on Reservoir Road,
289 and with UVA as it traverses around Observatory Mountain. He stated they did get the easement
290 finalized with the Virginia Department of Forestry.

291
292 Dr. Palmer asked if the one for the UVA Foundation with the pump station on it is delayed
293 because of identifying exactly where the pump station will go.

294
295 Mr. Mawyer stated this was somewhat the case. He stated UVA Foundation has explored several
296 of their sites, and the Authority is working with them on several different locations and how the
297 pump station would be sited. He stated they are making progress, but it seems as though it is inch
298 by inch sometimes.

299
300 Dr. Palmer stated this was the case all the time.

301
302 **7. ITEMS FROM THE PUBLIC**

303 Mr. Gaffney opened the meeting to the public. He asked Mr. Hull if there were any members of
304 the public who wished to speak.

305
306 Mr. Hull replied there was no one from the public who indicated that they wished to speak.

307
308 Mr. Gaffney closed Items from the Public.

309
310 **8. RESPONSES TO PUBLIC COMMENT**

311
312 Mr. Gaffney stated that as there were no items from the public, there were no responses.

313
314 **9. CONSENT AGENDA**

- 315
316 a. *Staff Report on Finance*
317
318 b. *Staff Report on Operations*
319
320 c. *Staff Report on Ongoing Projects*
321
322 d. *Staff Report on Wholesale Metering*
323

324 e. *Approval of Work Authorization for the Beaver Creek Raw Water Pump Station and Intake*
325 *Project – Subsurface Investigation – Hazen and Sawyer Engineers*

326
327 f. *Approval of Property Transfer to Albemarle County Public Schools – Albemarle-Berkeley*
328 *Wastewater Pump Station Storage Basin Site*

329 Mr. Gaffney asked if there were any items Board members wanted to pull for comments or
330 questions.

331
332 Mr. O’Connell asked if the work authorization with Hazen and Sawyer for the Beaver Creek
333 Pump Station was the normal course of events.

334
335 Mr. Mawyer replied yes. He stated the Authority has a term contract with them, which allows the
336 Authority to issue work authorizations, but he and staff can only issue up to \$200,000 and above
337 that, they need to come to the board. He stated it is just part of the normal process of doing the
338 subsurface evaluation for the pump station and the intake structure on the west side of the
339 reservoir, which is the site that the board looked at and concurred with (called “Site #1”).

340
341 **Dr. Palmer moved that the board approve the Consent Agenda. Mr. O’Connell seconded**
342 **the motion, which passed unanimously (7-0).**

343
344 **10. OTHER BUSINESS**

345 a. *Presentation: Plan for Urban Utilities, Northern Areas; Bill Mawyer, Executive Director and Scott*
346 *Schiller, Engineering Manager*

347
348 Mr. Mawyer stated he and Mr. Schiller wanted to talk to the board about an important aspect of
349 what they do. He stated they have a very positive and productive relationship with both the
350 City’s and County’s Economic Development Authorities and Planning Departments, the Service
351 Authority, UVA, and UVA Foundation. He stated this is very important as the community
352 collectively plans for its growth. He stated there is a lot of talk and interest in zoning and those
353 types of issues, but projects cannot proceed if the utilities are not available to them. He stated it
354 is very important that they continue to have these relationships to provide the planning and
355 coordination.

356
357 Mr. Mawyer stated recently, there has been discussion about projects on 29 North, around the
358 UVA Research Park and otherwise. He stated he did not know if it was the federal dollars
359 driving the interest (adding that this was a great thing), but he wanted to remind everyone that
360 these projects have to be coordinated with the RWSA. He stated for RWSA and the Service
361 Authority, there is a CIP they bring to the board every year that has a strategic and affordable
362 approach to providing infrastructure and capacity for water and wastewater, for which he would
363 mention a few of those projects.

364
365 Mr. Mawyer stated he wanted to emphasize this with the RWSA Board as well as with the Land
366 Use and Environmental Planning Committee (LUEPC), where he would be meeting with them
367 that Friday to give them the same discussion. He stated RWSA had the same discussion with the
368 Service Authority, as they partner very closely with them, particularly on projects that are on 29
369 North.

370

371 Mr. Mawyer displayed a graphic to show the board the urban area served by RWSA. He stated
372 the pink color on the map showed the urban area, which covers the entire City of Charlottesville
373 and extends to the Greene County line on Route 29 North, across the South Rivanna River as
374 well as the North Rivanna River.

375

376 Mr. Mawyer presented another map and stated similarly, the same area serves as the Urban
377 Wastewater System, with the addition of Crozet. He stated Crozet wastewater is piped back to
378 Moores Creek for treatment, and Crozet is part of the Urban Wastewater System, and as the
379 expenses are allocated annually to the City and Service Authority, Crozet is included in that
380 calculation. He stated the wastewater flow (shown in yellow) comes into the newer Rivanna
381 Wastewater Pump Station, and the blue flow comes in through what they call the Moores Creek
382 Wastewater Pump Station, with both flows treated at Moores Creek.

383

384 Mr. Mawyer stated that back in June of 2020, he gave a presentation to the RWSA Board that
385 talked about available water supply versus demand. He stated this was a part of the 50-year
386 projection of water availability in the community. He stated one of the primary charges is
387 making sure there is adequate water in the community for 50 years in advance. He presented a
388 graph, explaining the graph shows that in 2060, the water supply (at 13.7 million gallons per day
389 (mgd)) would equal the water demand. He stated if the board would recall, the Ragged Mountain
390 Dam project agreement says that they should start the pipeline when a demand is equal to 85% of
391 the supply. He stated doing this calculation, this comes back to about 2035.

392

393 Mr. Mawyer stated the big picture is that as major development projects are considered in the
394 community – whether at the Research Park (on the northern perimeter) or Emmet Street (which
395 has a lot of ongoing development with UVA) – and as the City and County consider rezonings
396 that will densify neighborhoods and create more demand, this has to be done in a collective
397 matter with utilities to make sure they can serve those developments when they need to be
398 served. He stated the Authority has a 10- to 15-year plan that Mr. Schiller would talk to the board
399 about to accommodate that growth.

400

401 Dr. Palmer asked if she could ask a quick question about the Available Water Supply vs.
402 Demand chart that was on the screen, for clarity. She asked if this available supply is the supply
403 that is actually usable.

404

405 Mr. Mawyer stated this was correct. He stated last year, they called it the “operational yield,”
406 which is slightly different than safe yield. He stated “safe yield” is a term that has to do with how
407 much a reservoir can supply, but RWSA has coined the term “operational yield” because they
408 not only have to supply the water, but they have to treat, distribute, and deliver it to faucets. He
409 stated to say that they have a 50-mgd supply really has no purpose or value if they cannot get it
410 to the faucets.

411

412 Mr. Mawyer stated the graph on the screen with the gray bars showed the operational yield as the
413 RWSA has calculated it, as the combination of reservoir supply, treatment capacity, and piping
414 distribution capacity – in other words, how much they can get to customers. He stated those were
415 the numbers seen at the top of the gray bars.

416
417 Mr. Mawyer stated that in 2020, they had 12.8 mgd as an operational, available water supply. He
418 stated that in 2023, this will increase to about 15 mgd with the completion of the Observatory
419 Water Treatment Plant upgrade, which will make it fully capable of treating up to 10 mgd, along
420 with South Rivanna WTP treating 12 mgd. He stated then, the Central Waterline kicks in that
421 they need to be able to distribute the treated water from the plants to the faucets. He stated it is a
422 triplicate of data points they integrate to come up with what they call the “operational yield.”

423
424 Mr. Mawyer stated the green line on the graph is the demand that they estimate based on the
425 projections they receive from the City, County, and UVA and how much water the community
426 may need.

427
428 Mr. Snook asked why the operational yield declines decade over decade.

429
430 Mr. Mawyer replied that this is due to siltation of the reservoirs, which is why the yield starts
431 going down on the gray bars. He stated siltation is predicted in the reservoirs and at one time, it
432 was predicted they would lose 15 million gallons a year out of the South Rivanna Reservoir. He
433 stated that when RWSA did the bathymetric study a year or so ago, they did not find this to be
434 true in recent history. He stated this is why they update the bathymetric studies, which measure
435 how much water is in the reservoir every 10 years to get better information. He stated this
436 determines if a big storm washed in (or washed out) a lot of silt.

437
438 Mr. Mawyer stated that clearly over time, with farm ponds, erosion wants to fill the depression,
439 and the same is true for the reservoirs. He stated the quantities at the top of the gray bars on the
440 chart declined with the decades due to predicted siltation in the reservoirs.

441
442 Mr. Snook asked if a critical limiting factor, at that point, is the capacity of the reservoir. He
443 stated it was clearly not the pipelines, as they saw a couple of slides later.

444
445 Mr. Mawyer replied that they combine two things: the capacity of the reservoirs as the water
446 supply, and comparison to the demand as the community grows. He stated this is what the green
447 line on the chart is predicting. He stated they cross at 2060, which is where available supply
448 equals demand. He stated they want to make sure they have available water beyond that quantity
449 well in advance of 2060 because when everyone turns on their faucets, everyone expects to have
450 water come out. He stated this is why the Ragged Mountain agreement talks about putting the
451 pipeline in place when the demand equaled 85% of the supply. He stated 85% is the threshold
452 RWSA is working with, and Mr. Schiller would be speaking more about that.

453
454 Mr. Mawyer asked if there were other questions and heard none. He added that in 2020, the chart
455 shows there is a demand of 10.4 mgd and a supply of 12.8 mgd. He stated the whole point of this
456 discussion is if there is a major project coming in that says it needs 1.5 mgd, while the RWSA
457 could meet the demand in theory, this would put them at almost 12 mgd and cut in half their
458 contingency. He stated it would expedite the construction schedule Mr. Schiller would speak
459 about regarding when they need to get the facilities in place to serve that type of additional
460 demand to the system.

461

462 Mr. Schiller stated that over the next 10-15 years, there are a number of projects planned to allow
463 RWSA to better supply water to the North Rivanna Pressure Zone as well as the Urban Pressure
464 Zone. He stated initially, at least for the North Rivanna Pressure Zone, the most significant
465 project is the Airport Road Pump Station and waterline construction project, which will be the
466 primary source of water for the North Rivanna Pressure Zone as opposed to the North Rivanna
467 Water Treatment Plant.

468
469 Mr. Schiller stated once this becomes the primary method of providing water, they want to make
470 sure the components that connect this to the system are reliable, so they have a second river
471 crossing scheduled for both the South Rivanna River and the North Rivanna River to make sure
472 the single crossings do not become a bottleneck, should they have an incident with one of the
473 waterlines.

474
475 Mr. Schiller stated that at that point, the Urban Pressure Zone will be the source of water for the
476 North Rivanna Pressure Zone, so they want to make sure they have done some improvements in
477 the Urban System to also make sure this is reliable. He stated as Mr. Mawyer mentioned, some
478 major projects associated with this are the improvements to the Observatory Water Treatment
479 Plant as well as the Central Waterline, which will help get the water out of the treatment plants
480 and into the distribution system.

481
482 Mr. Schiller stated that from a long-term reliability standpoint, many of the raw water piping
483 improvement projects include Ragged Mountain to Observatory Treatment Plant, the Raw Water
484 Pump Station Waterline (which has begun design), and the transfer system that connects the
485 South Rivanna Reservoir to the Ragged Mountain Reservoir. He stated these improvements will
486 allow the Authority to more efficiently use the capacity contained within those two reservoirs
487 and apply the safe yield to the treatment plant and the system that needs it.

488
489 Mr. Schiller stated once they have the Airport Road Pump Station constructed and the second
490 South Rivanna River crossing in place, in coordination with the Service Authority, RWSA
491 determined that at that point, they would feel secure with decommissioning the North Rivanna
492 Water Treatment Plant with the intent of having a secure, reliable water supply to that system.

493
494 Mr. Schiller stated as demand increases throughout the system, there are a few other
495 miscellaneous improvements related to some of the pump stations and storage tank sites. He
496 stated that over the next 10 to 15 years, these are the main projects they have programmed in to
497 make sure they have a reliable source of water for both northern pressure zones.

498
499 Mr. Schiller stated the chart presented on the screen relates back to the one Mr. Mawyer showed
500 previously, where the blue line is the safe yield and the green line is the demand. He stated as
501 they approach 2035, they begin to hit the 80-85% criteria that is established in the agreement. He
502 stated that at this point, their plan would be to have both the South Rivanna Reservoir to Ragged
503 Mountain Reservoir transfer system in place and to also have increased the pool level of the
504 Ragged Mountain Reservoir which, as seen on the chart, gives a significant increase in
505 operational safe yield.

506
507 Mr. Schiller stated based on the siltation process and the current anticipated demand, they would

508 have an adequate water supply until 2120.

509
510 Mr. Schiller stated that as Mr. Mawyer mentioned, they do not want supply to meet demand right
511 at 85%, so they want to beat this somewhat to make sure they have accounted for a factor of
512 safety, which is why they have the 80-85% criteria set up.

513
514 Mr. Schiller stated the next slide provided charts showing what can happen if they add additional
515 demand beyond what is planned for. He stated as seen on the last chart, they were at roughly
516 80% in 2035, so as additional demand is added to the system, the percentage begins to increase
517 faster than previously planned for. He stated at 0.5 a mgd, they end up at 82.5% of system
518 capacity. He stated at 1 mgd, they will have already exceeded 85% (to 86%) in 2035. He stated
519 at 1.5 mgd, they are at 86% in 2030, and should they have projects which increase the demand
520 all the way up to 2 mgd, they would find themselves in excess of 85% of system capacity 2025.
521 He stated they begin to significantly increase the schedule at which those projects would have to
522 occur to make sure they have the supply when it is required.

523
524 Mr. Schiller stated he wanted to show the impact overall to the system, adding that one-half an
525 mgd is not that unusual when it comes to some of the larger developments being discussed.

526
527 Mr. Schiller stated as a general summary, RWSA has been working with ACSA and the City to
528 have a plan to systematically improve the drinking water infrastructure in both the North
529 Rivanna Pressure Zone and the Urban Pressure Zone over the next 10 to 15 years. He stated Mr.
530 Mawyer had showed a map of the sewer infrastructure as well, and they did a study on the sewer
531 system back in 2016, which identified that many of the major improvements were not really
532 required, at least in the Northern Albemarle area, until the 2050-2060 timeframe. He stated
533 should there be additional sewer demand, this could advance some of those improvements as
534 well.

535
536 Mr. Schiller stressed the importance of making sure that any future projects with additional
537 significant utility demands are properly coordinated with infrastructure planning schedules to
538 make sure they can get water to people when they need it. He asked the board if there were
539 questions.

540
541 Dr. Palmer stated she had a question, adding that she was having technical issues. She asked
542 about the status of Phase 2 of the pre-treatment study for the South Fork to Ragged Mountain
543 Reservoir.

544
545 Mr. Schiller replied that as far as the pre-treatment study of South Rivanna to Ragged Mountain,
546 they are at the point of doing the first phase of the modeling, which is more of a desktop, one-
547 dimensional study where they are looking at the impacts of transferring up to 25 mgd out of
548 South Rivanna and sending it to the Ragged Mountain Reservoir, to see what the impact of
549 phosphorus is on that reservoir over a period of time.

550
551 Mr. Schiller stated they have finalized some scenarios that need to be analyzed in that model,
552 with the intent of a big-picture analysis or complete-mix scenario where they are not controlling
553 it, but trying to see what the worst-case scenario is as far as the phosphorus impact to Ragged

554 Mountain so they can see what this is before they progress with a more significant two-
555 dimensional model, where they will get more into the transport of phosphorus within the
556 reservoir and areas where they might be able to sequester it so that it is not leaked out as
557 frequently for turnover, hypolimnetic systems, etc. He stated they are in the middle of the first
558 phase of the modeling process.

559
560 Dr. Palmer stated she thought she saw in the board materials that the second phase started in June
561 of 2021.

562
563 Mr. Schiller clarified that they are in the first phase of the modeling, which is in the second phase
564 of the program.

565
566 Mr. Gaffney asked the board if there were any other questions for Mr. Mawyer or Mr. Schiller on
567 the urban utilities.

568
569 Mr. Snook stated he had one question. He stated they have estimates of continued population
570 growth of roughly 1% per year going into the future for some time. He asked if the only thing
571 they are doing is providing household water for another 1,500 to 2,000 people per year, what this
572 does to the demand for water.

573
574 Mr. Schiller replied they have gone through a number of population and flow projection
575 analyses, and they went through one just recently for some of the safe yield information that Mr.
576 Mawyer had just showed as well as the demand projections. He stated this accounted for not only
577 residential growth, but also commercial and industrial, based on known developments and
578 buildout capabilities within currently zoned locations in both the City and the Service
579 Authority's distribution area. He stated he believed this had all been taken into account when
580 looking at those demand projections.

581
582 Mr. Snook stated the reason he was asking was although he was not trying to question the data
583 from the Weldon Cooper center, they have given very different estimates over the last couple of
584 years. He stated he was not quite sure he knew what he thought would really be happening. He
585 stated he does think it is likely they will see this growth of a couple thousand people a year (from
586 1%, up to about 2%) in Albemarle County. He stated Mr. Schiller had talked about what it meant
587 if they had 0.5 mgd more a day and 1 mgd. He asked if there is a rule of thumb of how many
588 people equal how much demand for water.

589
590 Mr. Schiller replied yes. He stated one could take a certain population projection and show what
591 the unit increase in demand would be. He stated he would have to look back to some of the
592 numbers to better determine what that is. He stated it is based off per capita use, which is how
593 they are coming up with the values.

594
595 Mr. Schiller stated as far as how it tracks, he is not a population prognosticator, so he prefers to
596 deal with the subject of water going in and out of pipes. He stated they generally do work off the
597 Weldon Cooper information as well as the information provided by various planning agencies of
598 both the City and the County. He stated they look at the Weldon Cooper information as well as
599 how they have seen things progress in the past, and how they think it will progress in the future.

600

601 Mr. Mawyer told Mr. Snook that the Virginia Department of Health has requirements on how
602 many gallons per person for different types of facilities (e.g., hotels, residential) as a guide. He
603 stated they specify 100 gallons per person per day, so when RWSA gets the population
604 projections from various sources (City Planning, County Planning, and UVA) on how they will
605 grow, they can take and objectively convert that into a quantity of water.

606

607 Mr. Mawyer stated if a community is able to prove that the VDH estimate is too high or too low
608 by its historical usage, then many times the Health Department will allow localities to use their
609 own data. He stated in June of 2020, the per-capita usage in the community had reduced from
610 110 gallons per person per day down to almost 60 gallons per person per day. He stated between
611 those two numbers of 100 and 60 gallons per person is what RWSA would use to estimate
612 increased water demand based on the population increase predicted.

613

614 Mr. Mawyer expressed that things become more involved when, for example, UVA staff says
615 they will increase the student population, but they will continue to decrease the per-capita usage
616 until the year 2035, when they predict their efficiency methods are going to be overcome by the
617 sheer quantity increase. He stated RWSA took what UVA gave them for their projections, which
618 resulted in the curve that he showed the board. He stated this is one reason they do the update
619 every ten years, to see how well these projections are tracking, to see if UVA's usage is going
620 down per capita, if the City's and County's usage continues to go down, or if the plumbing code
621 requirements for efficient fixtures and similar changes essentially maxed out the efficiency,
622 resulting in a rising demand because the number of people is increasing.

623

624 Mr. O'Connell stated the ten-year update in the Water Supply Plan is a check of what Mr. Snook
625 was talking about of missing some part, whether it is development being faster or slower
626 (depending on what is happening with the economy or population projections) is off, or it is the
627 density projected by the Planning Departments' changes over time. He stated looking at this
628 every ten years gives them the ability to readjust from what has actually happened.

629

630 Mr. Mawyer agreed. He stated they would not debate the data predicted by other organizations,
631 but they will do a check in ten years to see whether the data are holding true.

632

633 Mr. Snook stated the important thing from all of this is it sounds like if they are adding 1-2% to
634 the population every year, this would work out to about a 0.1-0.2 mgd per year. He stated he was
635 trying to get a sense of the order of magnitude of what some of the pressures might be. He stated
636 if it turns out they are a little off on the population growth, it will not be a fatal problem – at least
637 not before they can correct for it.

638

639 Mr. Mawyer stated this was correct. He stated this is why they use the 85% criteria. He stated
640 they do not want to go right to the point where they are running out of water before they build
641 the infrastructure to supply the water capacity needed, so they are using 85% as the standard
642 criteria. He stated the Health Department uses this quite a bit because when the wastewater plant
643 starts receiving 85% of capacity to treat wastewater, for example, this is when the Health
644 Department tells RWSA they need to start planning, designing, and building to increase the
645 capacity once they get to the 85% level. He stated this is a fairly common threshold.

646

647 Dr. Palmer stated she had one more question. She stated UVA has obviously been doing a
648 tremendous amount of work on their buildings over the last several years with heating, cooling,
649 and reducing the water needs of the buildings. She asked how these numbers are showing up in
650 the demand, or if they are big enough to show up.

651

652 Mr. Mawyer replied that he could not quote any of the numbers, but he would say that one of the
653 key components to UVA's strategy to reducing the per-capita water demand is in their HVAC
654 system and how much water they use with cooling towers and other mechanical equipment. He
655 stated shower heads, low-flow toilets, and other improvements have basically been maxed out,
656 and now they are having to look for other ways to reduce the per-capita usage. He stated they
657 have to find another avenue to make those improvements such as in the HVAC systems, and
658 UVA has done a lot in trying to economize that equipment.

659

660 Mr. Mawyer stated this is the key to UVA's strategy to having a lower per capita water demand,
661 even though they are adding 200,000 square feet and hundreds of students every year, along with
662 staff. He stated UVA is the City's single-largest user of water in the whole community. He stated
663 UVA's changes can have a major increase to the overall community demand. He stated they
664 work with RWSA to foretell these projects, but with the development at Emmet Street and Ivy
665 Road, and with the proposed 1,500 housing units, RWSA needs to know about these projects
666 well in advance so that they can integrate those demands into their infrastructure plans and CIP.

667

668 Mr. Mawyer stated the whole point of this discussion is to refresh the board's thinking and
669 remind them that utilities are a part of the community's growth equation. He stated it is more
670 than just the politics and zoning, the utilities have to be available for a project to be feasible. He
671 stated they heard what ended up not being true a few months ago, it was stated that there is a
672 project coming to 29 North which needs 2 mgd. He stated this tended to spur this discussion and
673 while it did not turn out to be correct, when the community currently uses 10 mgd and if a single
674 project needed 2 mgd, it would be a 20% increase and huge stress on the infrastructure, and it
675 could put them in a position for RWSA to say that they cannot supply water and sewer at that
676 level. He stated they do not want to have to do that.

677

678 Ms. Hildebrand added that the proposed strategy by UVA is still yet to come and it is not in
679 place yet. She stated this is being monitored.

680

681 *b. Presentation: Dam Safety Program Overview; Victoria Fort, Senior Civil Engineer*

682

683 Ms. Victoria Fort, Dam Safety Program Coordinator, stated she would discuss the importance of
684 dam safety and give an overview of the Dam Safety Program.

685

686 Ms. Fort stated a dam or impounding structure is a manmade structure and its appurtenant works
687 that retain or store waters or other materials. She stated these enable the storage of water for
688 drinking water, hydroelectric generation, flood control, and recreation. She stated they can also
689 improve wildlife habitat and provide food for migratory birds.

690

691 Ms. Fort stated all dams in Virginia are subject to the VDCR dam safety regulations except for

692 small dams or lakes; any dams that are owned or licensed by the federal government; and any
693 dams that are operated for mining, agriculture, or canals. She stated these regulations provide for
694 proper and safe design, construction, operation, and maintenance of dams to promote public
695 safety.

696
697 Ms. Fort stated that while they understand that dams should be well-maintained and safely
698 operated, it becomes apparent when these dam failures are covered in the news just how huge the
699 impact of these dam failures can be, both on public safety and health, as well as from a financial
700 perspective. She stated just last year, they heard about the failures of the Edenville and Sanford
701 dams in Central Michigan, which resulted in flash flooding, the destruction of over 2,500
702 properties, and over \$250 million in damage. She stated luckily, they were able to evacuate about
703 11,000 residents from their homes, so they were able to prevent any loss of life from that event.
704

705 Ms. Fort stated similarly, in 2017, the Oroville Dam in California which, ironically, Mr. Mawyer
706 mentioned earlier is currently experiencing a drought, was not the case in 2017 when they had
707 some significant rains early in the year, which caused rising flood waters to overtop the dam's
708 emergency spillway and caused substantial damage to the dam's concrete primary spillway, as
709 shown in the picture on the screen. She stated luckily, a breach of that dam was avoided when
710 the flood waters receded, but the dam required repairs in excess of \$1.1 billion.
711

712 Ms. Fort stated one last example was closer to home. She stated that in 2018, the College Lake
713 Dam in Lynchburg, Virginia overtopped following a six-inch rain event, which caused damage
714 to the road that traversed the dam as well as to the embankment. She stated thankfully,
715 downstream areas were evacuated, and the dam itself did not breach. She stated it has since been
716 determined, however, that the dam would be removed rather than rehabilitated, and the bridge
717 that crosses it will need to be relocated downstream at a fairly substantial cost to that community.
718

719 Ms. Fort stated with that context, she would cover the major components of the Dam Safety
720 Program. She stated this program is fairly broad and involves a lot of staff time and resources.
721 She stated the major components of the program include permitting and regulatory compliance;
722 Emergency Action Plan updates, distribution, and training; annual staff training; dam emergency
723 practice exercises; maintenance and vegetation control; repairs and upgrades to the dams and
724 related structures; installation and maintenance of public safety features which can include, for
725 example, fencing, signage, and buoys; preparation of studies and reports; regular (monthly and
726 annual) inspections and surveys of the dams, and regular surveys of the reservoirs; regular
727 monitoring; and operations.
728

729 Ms. Fort stated dam safety emergencies are very low-probability events, but since they have the
730 potential for extremely high impact, they are designed with a very high level of conservatism to
731 minimize the potential for failure. She stated potential causes of dam emergencies include
732 rainfall in excess of the dam's design, material failure, vandalism, terrorism, and accidents.
733

734 Ms. Fort stated to put this all in context to talk about how the Authority's dams are classified, the
735 state has a system for classifying dams according to their hazard potential. She stated hazard
736 potential is assigned according to the severity of consequences from the failure or maloperation
737 of the dam. She stated it does not reflect the physical condition of the dam. She stated if a high-

738 hazard dam were to fail, it would likely cause loss of life and severe economic damage, whereas
739 a low-hazard dam's failure would not likely lead to any loss of life or significant economic
740 damage.

741
742 Ms. Fort stated the hazard classification of a dam dictates its design criteria and the required
743 capacity of the spillway, which comes into play when talking about a few of the Authority's
744 dams in the presentation.

745
746 Ms. Fort stated another term the board may hear when talking about dam safety is the "probably
747 maximal precipitation," or PMP. She stated this refers to the theoretically greatest amount of
748 rainfall that would occur in a given watershed. She stated this is relevant because dams with a
749 high hazard potential (which several of their dams are) must be designed to withstand the
750 flooding from a PMP rainfall event. She stated this flooding is also referred to as the "probable
751 maximum flood," or PMF.

752
753 Ms. Fort presented a graph of rainfall for the Sugar Hollow Dam. She stated to give a sense of
754 how extreme a PMP rainfall event is, a two-year storm would produce just under four inches of
755 rain in a 24-hour period. She stated a 100-year storm would produce over nine inches of rain in
756 that same 24-hour period. She stated when talking about a PMP rainfall, the theoretical greatest
757 rainfall one could expect in a watershed, this represents about 34 inches of rain in a 24-hour
758 period, which is significant. She noted the PMP rainfall event is different for every watershed, so
759 each one of the dams has a different PMP rainfall event it needs to be designed for, which range
760 from 23 to 34 inches.

761
762 Ms. Fort stated while this sounds fairly improbable, there have been two reported incidences of
763 PMP rainfall in the United States – once in Colorado in 1935, and in Pennsylvania in 1942. She
764 stated more recently, in 2017, Hurricane Harvey produced rainfall in excess of 90% of the PMP
765 over a 72-hour period.

766
767 Ms. Fort stated as the board might recall, in Central Virginia, they have seen their fair share of
768 fairly extreme rainfall events including Hurricane Camille, which produced over 27 inches of
769 rain overnight back in 1969, which represents over 81% of the probable maximum precipitation.
770 She stated in 1995, in Madison County, there was a storm that produced between 25 and 30
771 inches of rain in about 16 hours, which was about 86% of the PMP. She stated while these
772 storms seem rare, they are possible, and the dams need to be designed to handle these extremely
773 large storm events.

774
775 Ms. Fort stated the Authority currently operates six regulated dams. She stated four of these
776 (which include the Sugar Hollow Dam, South Fork Rivanna Dam, Beaver Creek Dam, and
777 Ragged Mountain Dam) are classified as high-hazard dams. She stated the Totier Creek Dam in
778 Scottsville and the Lickinghole Creek Dam in Crozet are two low-hazard dams. She stated they
779 also operate several small dams, which are unregulated due to their size and include low head
780 dams at the North Rivanna Water Treatment Plant and on the Mechums River just west of town.
781 She stated there is also a small pond dam at the Ivy Material Utilization Center, which is actually
782 owned by the Solid Waste Authority. She stated there is an unnamed dam on the Buck Mountain
783 property.

784
785 Ms. Fort stated some other dams in the region the board may be familiar with that are not
786 operated by RWSA include state dams like Lake Albemarle, private dams like Key West and
787 Clover Lake, County dams like Walnut Creek Lake and Chris Greene, and Lake Anna (which is
788 operated by Dominion Power).

789
790 Ms. Fort stated she would give more information on all of the RWSA's regulated dam facilities.
791 She stated the South Rivanna Dam is currently a federally regulated dam, which is due to the
792 presence of a hydropower facility. She stated the dam itself was built in 1965, and the
793 hydropower facility was built in the 1980s. She stated the hydropower facility is set for
794 decommissioning in 2022, at which point the dam will revert to state regulation. She stated it is a
795 concrete gravity dam measuring 700 feet long and 47 feet tall.

796
797 Ms. Fort stated the Ragged Mountain Dam was built between 2012 and 2014, and it replaced two
798 historical dams upstream that were built in 1885 and 1908. She stated it is an earth filled dam
799 that measures 785 feet long and 125 feet tall.

800
801 Ms. Fort stated the Sugar Hollow Dam was originally built in 1948, then underwent major
802 upgrades in the late 1990s, which included the installation of the rubber crest gate. She stated this
803 followed massive flooding in Madison County that caused some damage to the dam facilities and
804 required an update to the gate system on the crest. She stated it is a concrete gravity dam that
805 measures 77 feet tall. She stated the rubber gate was just recently replaced in 2021 as it had
806 reached the end of its useful life.

807
808 Ms. Fort stated the last high-hazard dam is Beaver Creek Dam, which was built in 1963 as a
809 flood control and water supply reservoir. She stated it is an earthfill dam that measures 60 feet
810 tall. She stated the site also serves as a County park. She stated Browns Gap Turnpike runs along
811 the crest of the dam, as seen in the photo on the slide. She stated the dam is currently undergoing
812 a planning study funded by the Natural Resources Conservation Service (NRCS) for necessary
813 upgrades to its spillway. She stated it was reclassified in 2012 from a significant hazard dam to a
814 high-hazard dam. She stated when it was built in the 1960s, it was only meant to pass about 60%
815 of the probable maximum precipitation, and RWSA is now doing a study to determine how the
816 spillway needs to be reconfigured in order to pass the full PMP rainfall.

817
818 Ms. Fort stated the last two dams are low-hazard dams, which are the Totier Creek Dam in
819 Scottsville and Lickinghole Creek Dam in Crozet. She stated Totier Creek Dam was built in
820 1971 and measures 35 feet tall. She stated this area serves as another County park. She stated the
821 Lickinghole Creek Dam was built in 1995 and is a concrete dam measuring 32 feet tall. She
822 stated this is a sediment storage basin for the South Rivanna Reservoir. She stated Lickinghole
823 Creek Dam is the only regulated dam in RWSA's system that does not provide water supply
824 storage.

825
826 Ms. Fort stated RWSA plans for emergency situations through its Dam Safety Program policies,
827 internal training, good design, and round-the-clock maintenance and monitoring. She stated they
828 keep emergency action plans for their four high-hazard dams to allow for the coordination with
829 emergency response and planning agencies in the event of an emergency. She stated RWSA also

830 trains its staff every year and performs drills on at least an annual basis. She stated they maintain
831 signage, fencing, and other features in order to promote public safety around the dams.

832
833 Ms. Fort stated in closing, she wanted to provide more information on emergency action
834 planning since some board members are EAP plan holders. She stated these plans provide a set
835 of preplanned actions that minimize or alleviate emergency conditions at a dam during an
836 emergency or large rainfall event. She stated these contain procedures and information that
837 assists in issuing notifications in order to minimize the loss of life and property damage during a
838 dam-related emergency. She stated these plans require coordination with outside agencies which
839 include the Virginia Department of Emergency Management, public safety agencies such as
840 police and fire rescue, local government, and the Department of Transportation.

841
842 Ms. Fort stated RWSA's responsibilities under the EAPs are to assess the emergency conditions
843 at the dam, then report it out to the emergency management agencies. She stated they are also
844 responsible for taking corrective actions at the facility, so they may decide to release water to
845 take pressure off the dam or make emergency repairs. She stated the local Emergency
846 Communications Center and local government are responsible for notifying the public of what
847 the dangers are, coordinating evacuations as needed, and allocating the necessary resources to
848 handle the emergency.

849
850 Ms. Fort stated there is a lot in EAPs, but she would touch on two components quickly. She
851 stated each EAP binder (there is one for each of the four high-hazard dams) contains three
852 different notification charts for different failure scenarios. She stated these scenarios indicate
853 whether there is a risk of imminent failure, a possibility of a developing failure situation, or if
854 there is a nonemergency failure, which essentially would mean a large rain event, which would
855 cause severe flooding but not necessarily a failure of the dam.

856
857 Ms. Fort stated each flowchart outlines the contacts that are necessary to notify in order to
858 deploy the resources to deal with the appropriate level of emergency. She stated that for each of
859 the scenarios, there are three different alert stages, and it outlines who needs to be calling which
860 individuals in order to deploy those resources.

861
862 Ms. Fort stated lastly, another important component of the EAPs are the inundation maps, which
863 show areas that would flood. She stated most of the maps show failure and non-failure scenarios
864 and the impacts of failure during a dry weather event (called a "sunny day breach" of the dam) or
865 during a large rain event. She stated if there is a huge PMP rainfall, they will have a lot of
866 flooding and if the dam breaches on top of that, it will be extensive.

867
868 Ms. Fort stated the maps show the different scenarios and flood areas, and they allow staff and
869 outside agencies to identify the evacuation areas and any of the critical road crossings that they
870 may need to close in order to protect the public in the event of a failure.

871
872 Mr. Mawyer stated the map was for Ragged Mountain and shows Interstate 64 inundated if the
873 Ragged Mountain Dam would failure.

874
875 Ms. Fort replied yes. She stated all of the maps have those callouts (in slightly different color

876 schemes) that show major intersections – whether roads or railroad crossings – and they call out
877 the time of arrival of the flood wave and the maximum flood elevation. She stated this gives the
878 Authority the ability to plan out how much time they have to react at different places along the
879 flood path.

880
881 Dr. Palmer asked if it did actually top I-64 there. She stated she knew it would to the bypass, but
882 she wondered if it would actually go up high enough to go over I-64.

883
884 Ms. Fort replied that according to the inundation modeling, it would. She stated both the South
885 Fork Rivanna Dam and the Ragged Mountain Dam, if they were to fail, would flood significant
886 amounts of the central part of the City, which is why RWSA takes this so seriously and why it is
887 so important.

888
889 Ms. Fort stated she would answer any other questions.

890
891 Dr. Palmer stated she had a couple of questions. She stated that in 1995, when the Madison flood
892 happened, there was significant flooding at Sugar Hollow. She stated luckily, there was no loss
893 of life there and no dam failure, but there was a reasonable amount of property damage. She
894 asked Ms. Fort if she had the numbers on that. She stated she could not recall but believed it was
895 24 inches in 16 hours.

896
897 Ms. Fort replied that she did not know exactly what the rainfall was at the dam, but she did find
898 that in Madison County, there was somewhere between 25 and 30 inches of rain in a single day.

899
900 Dr. Palmer stated there were two storms that came together and as she remembered, it was a little
901 less in Sugar Hollow. She stated her other question was about agricultural dams. She stated she
902 knows RWSA does not have much to do with them, but the area has a lot of agricultural lakes
903 and dams, and some people tell her that they are regulated. She asked Ms. Fort if she had any
904 information on how they are regulated, though obviously, they are not regulated as the RWSA's
905 dams are. She asked how this works and what the definition is of an "agricultural dam." She
906 asked if it is on rural land.

907
908 Ms. Fort replied that this is dictated by the Department of Conservation and Recreation, and she
909 did not know that she was well versed on what the requirements are to be exempt from state
910 regulation. She stated it has to do with the size, so if they exceed a certain size (whether or not
911 they are used for agricultural reasons), they will still fall under the same regulations as RWSA
912 dams that are regulated by the state. She stated if they fall below the size criteria, and they can be
913 shown to be used for specifically agricultural purposes (e.g., irrigation), one must show a certain
914 amount of revenue, and perhaps land use factors in as well. She stated the state regulations would
915 speak to that more specifically.

916
917 ***11. OTHER ITEMS FROM BOARD/STAFF NOT ON AGENDA***

918 There were no other items presented.

919
920 ***12. CLOSED MEETING***

921 There was no reason for a closed meeting.

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934

13. ADJOURNMENT

At 3:32 p.m., Mr. Snook moved to adjourn the meeting of the Rivanna Water and Sewer Authority. Dr. Palmer seconded the motion, which passed unanimously (7-0).

Respectfully Submitted,



**Mr. Lonnie Wood
Assistant Secretary - Treasurer**

