



Rivanna Water and Sewer Authority

Board of Directors Meeting

February 26, 2019

2:15pm



695 MOORES CREEK LANE
CHARLOTTESVILLE, VA 22902-9016
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BOARD OF DIRECTORS

Regular Meeting of the Board of Directors of the Rivanna Water & Sewer Authority

DATE: February 26, 2019

LOCATION: Conference Room, Administration Building
695 Moores Creek Lane, Charlottesville, VA

TIME: 2:15 p.m.

AGENDA

1. CALL TO ORDER

2. MINUTES OF PREVIOUS BOARD MEETINGS

a. Minutes of Regular Board Meeting on January 22, 2019

3. RECOGNITION

a. Resolution of Appreciation for Larry Perkins

4. EXECUTIVE DIRECTOR'S REPORT

5. ITEMS FROM THE PUBLIC

6. RESPONSES TO PUBLIC COMMENTS

7. CONSENT AGENDA

- a. Staff Report on Finance
- b. Staff Report on Ongoing Projects
- c. Staff Report on Operations

8. OTHER BUSINESS

(JOINT SESSION WITH THE RSWA; RECONVENE THE RSWA MEETING)

- a. Presentation: Quarterly Strategic Plan Update; Katie McIlwee, Executive Coordinator and Communications Manager

(RECESS RSWA TO COMPLETE THE RSWA MEETING)

(RECONVENE THE RSWA MEETING)

- b. Presentation: Proposed CIP FY 2020 – 2024; Bill Mawyer, Executive Director & Jennifer Whitaker, Director of Engineering and Maintenance

9. OTHER ITEMS FROM BOARD/STAFF NOT ON AGENDA

10. CLOSED MEETING

11. ADJOURNMENT

GUIDELINES FOR PUBLIC COMMENT AT RIVANNA BOARD OF DIRECTORS MEETINGS

If you wish to address the Rivanna Board of Directors during the time allocated for public comment, please raise your hand or stand when the Chairman asks for public comments.

Members of the public requesting to speak will be recognized during the specific time designated on the meeting agenda for "Items From The Public." Each person will be allowed to speak for up to three minutes. When two or more individuals are present from the same group, it is recommended that the group designate a spokesperson to present its comments to the Board and the designated speaker can ask other members of the group to be recognized by raising their hand or standing. Each spokesperson for a group will be allowed to speak for up to five minutes.

During public hearings, the Board will attempt to hear all members of the public who wish to speak on a subject, but it must be recognized that on rare occasion presentations may have to be limited because of time constraints. If a previous speaker has articulated your position, it is recommended that you not fully repeat the comments and instead advise the Board of your agreement. The time allocated for speakers at public hearings are the same as for regular Board meetings, although the Board can allow exceptions at its discretion.

Speakers should keep in mind that Board of Directors meetings are formal proceedings and all comments are recorded on tape. For that reason, speakers are requested to speak from the podium and wait to be recognized by the Chairman. In order to give all speakers proper respect and courtesy, the Board requests that speakers follow the following guidelines:

- Wait at your seat until recognized by the Chairman.
- Come forward and state your full name and address and your organizational affiliation if speaking for a group;
- Address your comments to the Board as a whole;
- State your position clearly and succinctly and give facts and data to support your position;
- Summarize your key points and provide the Board with a written statement, or supporting rationale, when possible;
- If you represent a group, you may ask others at the meeting to be recognized by raising their hand or standing;
- Be respectful and civil in all interactions at Board meetings;
- The Board may ask speakers questions or seek clarification, but recognize that Board meetings are not a forum for public debate; Board Members will not recognize comments made from the audience and ask that members of the audience not interrupt the comments of speakers and remain silent while others are speaking so that other members in the audience can hear the speaker;
- The Board will have the opportunity to address public comments after the public comment session has been closed;
- At the request of the Chairman, the Executive Director may address public comments after the session has been closed as well; and
- As appropriate, staff will research questions by the public and respond through a report back to the Board at the next regular meeting of the full Board. It is suggested that citizens who have questions for the Board or staff submit those questions in advance of the meeting to permit the opportunity for some research before the meeting.

The agendas of Board meetings, and supporting materials, are available from the RWSA Administration office upon request or can be viewed on the Rivanna website(s)



1
2
3
4 **RWSA BOARD OF DIRECTORS**
5 **Minutes of Regular Meeting**
6 **January 22, 2019**
7
8

9 A regular meeting of the Rivanna Water & Sewer Authority (RWSA) Board of Directors was
10 held on Tuesday, January 22, 2019 at 2:15 p.m. in the 2nd floor conference room, Administration
11 Building, 695 Moores Creek Lane, Charlottesville, Virginia.
12

13 **Board Members Present:** Mike Gaffney, Mike Murphy, Liz Palmer, Kathy Galvin, Lauren
14 Hildebrand, and Gary O’Connell
15

16 **Board Members Absent:** Jeff Richardson
17

18 **Staff Present:** Bill Mawyer, Miranda Baird, Liz Coleman, Scott Schiller, Lonnie Wood, Phil
19 McKalips, Victoria Fort, Tim Castillo, Austin Marrs
20

21 **Also Present:** Kurt Krueger, RWSA counsel, members of the public and media representatives.
22

23 **1. CALL TO ORDER**
24

25 Mr. Gaffney called the regular meeting of the Board of Directors of the Rivanna Water and
26 Sewer Authority at 2:15 p.m.
27

28 **2. MINUTES OF PREVIOUS BOARD MEETINGS**
29

30 *a. Minutes of Regular Board Meeting on December 11, 2018*
31 There were no changes to the minutes presented.
32

33 **Dr. Palmer moved to approve the RWSA Board meeting minutes of December 11, 2018.**
34 **Ms. Galvin seconded the motion, which passed 6-0. Mr. Richardson was absent from the**
35 **meeting and the vote.**
36

37 **3. RECOGNITION**
38

39 There were no recognitions presented.
40

41 **4. EXECUTIVE DIRECTOR’S REPORT**

42
43 Mr. Mawyer congratulated Mr. Gaffney on his reappointment to the RWSA Board for his ninth
44 term. He wished the Board a Happy New Year and stated that 2019 would be a dynamic year
45 with a lot happening at both Authorities.

46
47 He recognized employee Thomas Barger, who had successfully completed his Water Operator
48 Class 2 license, moving up from a Class 3 to a Class 2 license.

49
50 Mr. Mawyer reported that the RWSA had received a letter from the DEQ the previous week that
51 terminated the consent order put in place on August 5, 2011 for sanitary sewer overflows. He
52 noted that the letter stated RWSA had completed the requirements contained in the August 5
53 letter and thus the DEQ terminated the consent order, noting that they still needed to move
54 forward with Schenks Branch for functional reasons.

55
56 Mr. Mawyer stated that Rivanna was also moving forward with the Birdwood waterline, and
57 pipes had been delivered to the site over the last few days, with the installation of 36-inch ductile
58 iron pipe slated to begin this week. He stated that they had met with the UVA Foundation
59 regarding procurement of easements to the north and south of Birdwood, noting the easement
60 areas on a map. Mr. Mawyer stated the Foundation had suggestions about the proposed water
61 line alignment. The Foundation has a conservation easement on the property south of Birdwood,
62 indicating that they preferred for Rivanna to go through the conservation easement if possible.
63 Dr. Palmer asked if the UVA Foundation's lawyers would determine whether Rivanna could go
64 through the conservation easement.

65
66 Mr. Mawyer clarified that both the Foundation's attorneys and Mr. Krueger would be
67 determining what the language of the easement is and whether it allowed a utility to go across it -
68 - but the Foundation had a preference for going in that direction and seemed to think it was
69 allowable.

70
71 Mr. Mawyer reported that Rivanna had been meeting with UVA about the Observatory Water
72 Treatment Plant lease, and the previous week had met with the University facilities staff and
73 architect staff regarding some of the details and materials for the building, including lighting,
74 fencing, and storm water. He stated that it was a good meeting, and they all committed to having
75 the easement signed by this summer -- so there would be two leases: one for the plant and one
76 for Alderman Road pump station, and an easement for piping across the grounds.

77
78 Mr. Gaffney asked about the Colthurst easement.

79
80 Mr. Mawyer responded that Rivanna expected to talk to some of the larger property owners
81 within the next month, with Colthurst to the north of Barracks Road, and with the Albemarle
82 County School Board behind Jack Jouett Elementary and Lambs Road. He noted that they would
83 also meet with VDOT because the alignment comes along Colthurst Drive through Colthurst,
84 and along Rio Road through the VDOT right of way there. He mentioned that there were some
85 other private property owners at Route 250, such as Piedmont Tractor [now Virginia Tractor]--
86 and Ms. Fort was managing that effort, with meetings expected to happen in the coming month.

87

88 Dr. Palmer asked for clarification of the Colthurst easement and if it was a private road there.
89
90 Mr. Mawyer explained that it would be in the right of way, and stated that he did not think it was
91 a private road.
92
93 Mr. Gaffney commented that the last piece just before getting onto the UVA property, there was
94 a 50-foot section of road that could be private.
95
96 Ms. Fort noted that there was also a large section through Ingleridge Farm, adjacent to the
97 County Schools property that would be approached once Rivanna finalized a few pieces of the
98 alignment. She stated that they would embark on those discussions in the next month, but they
99 initiated some discussions with the Foundation and the professional center across from Birdwood
100 since they were time sensitive.
101
102 Mr. O'Connell asked if they met early on with the School Board discussion.
103
104 Mr. Mawyer replied that Rivanna had met with the school facilities staff and would go back to
105 show them the updated plan, and from there go to the School Board.
106
107 Mr. Gaffney asked if they would work with the schools to build a trail on top of the easement.
108
109 Mr. Mawyer and Ms. Fort confirmed that it was part of the discussion.
110
111 Mr. Mawyer stated that the Foundation also had an interest in furthering a trail.
112
113 Ms. Fort pointed out that it was for a greenway along Maury Creek, adding that there were a lot
114 of things up in the air that they were trying to get nailed down, so they would keep those
115 discussions moving forward.
116
117 Mr. Mawyer reported that a Boy Scout had taken a tour of the Moore's Creek plant to get more
118 information about how they treat wastewater.
119
120 Mr. Mawyer reported that the RWSA Board would review the CIP on February 26, which would
121 cover what was proposed for the FY 20-24 CIP. He stated that in March, they would review the
122 Operating Budget and would be seeking authorization for a May public hearing on the budget.
123
124 Dr. Palmer stated that she would like to hear more about the functional reasons for the Schenks
125 Branch consent order, noting that she had always been curious about the engineering rationale
126 for it.
127
128 Mr. Mawyer explained that the City had the 14th/15th Street Interceptor that provides
129 wastewater flow through the Schenks Branch line along McIntire Road, leading to the plant -- so
130 it's a matter of capacity, City and UVA growth and more flow coming through the connector.
131
132 Mr. O'Connell emphasized that the pipe was just too small.

133
134 Mr. Mawyer stated that with a certain sized rain, there could be sewer overflows that lead to the
135 consent orders.

136
137 Ms. Hildebrand stated that the City system was not in very good shape and they had done
138 analysis on it that revealed a rehab -- with no capacity increase -- would require replacing about
139 85% of the pipe system from the County Building through 14th/15h Street. She commented that
140 once you get into that, you are looking at just replacing pipe because it is not cost-effective to
141 rehab it. She stated that there were pipe variances from small to large and back to small, and the
142 system needed significant attention.

143
144 Ms. Hildebrand confirmed that once Schenks Branch was replaced, the City would move
145 forward with their project, as the Schenks Branch pipe needed to be larger to accommodate the
146 City's expected sewer flow needs. She emphasized that the City could not do its piece first, but
147 ultimately would increase it by two pipe sizes -- with the idea being that the City was working
148 cooperatively with Rivanna to install the next sections of pipe. She added that they wanted to go
149 through the City Yard for the next phase and the City was working with Rivanna for that, then
150 would go up to 14th/15th Street. She clarified that the alignment was generally between the
151 McDonald's and Wendy's property in that location.

152
153 Mr. Mawyer noted that the CIP subcommittee, consisting of Ms. Hildebrand and Mr. O'Connell,
154 would meet with Rivanna staff the last week of January, with a presentation to the full RWSA
155 Board in February.

156
157 **5. ITEMS FROM THE PUBLIC**
158 There were no items from the public.

159
160 **6. RESPONSES TO PUBLIC COMMENTS**
161 There were no responses to public comments.

162
163 **7. CONSENT AGENDA**
164 *a. Staff Report on Finance*

165
166 *b. Staff Report on Ongoing Projects*

167
168 *c. Staff Report on Operations*

169
170 *d. Approval of Capital Improvement Plan Amendment and Contract Award – Valve Repair-*
171 *Replacement (Phase 2) - Garney Companies*

172 *e. Approval of Term Contract for Safety and Industrial Hygiene Services - Circle Safety and Health*
173 *Consultants*

174
175 Mr. O'Connell asked to pull items d and e. He thanked Rivanna for working with the ACSA on a
176 valve replacement on Route 29 North, which was a last-minute addition to that project.

177
178 Mr. O'Connell stated that he had sent Mr. Mawyer several items on the safety program,
179 commenting that they had seen the first round of the CIP with Crozet, which was 100% ACSA,
180 and some of the other projects yielding close to a double-digit rate increase. He stated that he
181 would encourage Rivanna staff to look for good value and cost-effective or even free
182 alternatives. He added that he had some concerns about getting into a term contract with a safety
183 consultant, although he did not want to micromanage -- but they needed to be cognizant of the
184 impact on customers, especially since the initiatives were multi-year increases.

185
186 Dr. Palmer asked if he was requesting a change.

187
188 Mr. O'Connell responded that he was deferring to Mr. Mawyer to manage it, but hoped they
189 used free resources like insurance companies. He added that he would bring this up at the budget
190 meeting, and Mr. Mawyer already had this information.

191
192 Mr. Mawyer stated that Rivanna would explore this, adding that they tried to get the best
193 financial optimization with all programs, including using internal staff. He pointed out that safety
194 was a big program, and there were about 20 topics that required staff training, procurement of
195 equipment, and procedural steps -- which was an extensive program. He stated they were using
196 their safety manager as much as possible, but it was challenging for her to do all the training and
197 write all the procedures, which was why consultant help was suggested.

198
199 Mr. Mawyer noted that when they had the OSHA inspection at the end of 2017, Rivanna got 38
200 citations^[A1] -- and OSHA had only looked at a few of the 42 buildings. He mentioned that some
201 of the comments were that plans were out of date, one being 10 years out of date, and there was
202 clearly some catching up to do. He stated that within the budget allowances, they may need
203 consultant help to speed up the process.

204
205 Mr. O'Connell suggested that some of the training could be shared with ACSA, such as confined
206 space, fire extinguishment, etc.

207
208 Mr. Murphy stated that in looking at this list and considering a risk management and safety
209 coordinator for the City budget, they are launching a training platform called "Target Solutions"
210 throughout a number of the departments -- and it seemed like there could be opportunities for
211 collaboration.

212
213 Mr. Mawyer responded that Rivanna tried to do as much joint safety training as possible with the
214 City and ACSA, including the "Lock Out/Tag Out" program, which involves writing a procedure
215 to instruct staff on how to shut down a piece of equipment appropriately and safely -- and there
216 were 2,000 pieces of equipment that required those procedures. He stated there were also 1,100
217 chemicals dealt with in water/wastewater treatment, and there were material safety data sheets
218 for all of them that had to be kept up to date. He reiterated that they would try to use available
219 resources but did not want to fall too far behind.

220
221 Mr. Mawyer stated that they would start with a safety master plan to solicit feedback on where
222 efforts should initially be focused, similar to a strategic plan -- and it did fit into the strategic

223 plan goal of providing a safe environment for staff and customers. He added that there were 92
224 confined spaces that people had to be specially trained to enter.

225
226 Mr. Mawyer explained that with the Lock Out/Tag Out procedure, if there is a pump or motor,
227 they go to the piece of equipment, photograph it, label it, and tell staff how to shut it down safely
228 -- then they have to test it to make sure it is de-energized before they start working on it. He
229 stated that they have to figure that out anyway when they are going to do the work, and they
230 want a procedure that tells them how to do it each time.

231
232 Mr. O'Connell asked if Lock Out/Tag Out was one of the tasks for the treatment plant design
233 engineers, and completion of their projects.

234
235 Mr. Mawyer responded that they currently did not, but with upcoming projects Rivanna planned
236 to get Lock Out/Tag Out procedures through the construction process, so they would not have to
237 invent them after it was over. He stated they were already evolving to get caught up and put
238 those procedures on new pieces of equipment.

239
240 Mr. Mawyer presented a slide of a sewer manhole, with a person entering it needing to be trained
241 and having a tripod for fall protection -- as well as the ability to get them out of the hole if they
242 encountered problems. He stated that there needed to be a person above the opening to get them
243 out, and it was a process they took seriously. He added that they have used a trainer from PVCC,
244 which was a paid service, and invited ACSA and City staffs on confined space entry training.

245
246 **Mr. O'Connell moved to approve the Consent Agenda as presented. Dr. Palmer seconded**
247 **the motion, which passed 6-0. Mr. Richardson was absent from the meeting and the vote.**

248
249 **8. OTHER BUSINESS**

250
251 *a. Presentation: Value Engineering for CIP Projects; Bill Mawyer, Executive Director*

252 Mr. Mawyer reported that they were poised to start discussion of CIP projects, and one
253 component of this was value engineering. He explained that the Code of Virginia talks about it
254 being a systematic process wherein an independent group comes in and reviews the design, then
255 makes suggestions on how to improve the value and reduce the costs.

256
257 He stated that it was required for all state capital projects with a value greater than \$5 million --
258 but there was some latitude for exemption of projects where the VE process was done as an
259 integral component of project design or if they did design-build or construction management at
260 risk, which Rivanna had not yet explored. Mr. Mawyer stated that they also provided latitude to
261 the Director of General Services to use judgement as to whether the VE would be worthwhile, as
262 the process itself came with a cost.

263
264 Mr. Mawyer reported that in 2014, the RWSA Board reviewed the topic and provided some
265 guidance regarding when Rivanna would have a VE process, and they stated that they would use
266 an independent third-party firm for projects exceeding \$5 million -- but also authorized the
267 Executive Director to exercise latitude if there was potential for other cost savings and benefits.
268 He stated that in 2004, Rivanna did a VE study on the GAC project, which cost about \$207,000

269 but reported a \$2.8-million savings -- largely because the number of GAC vessels was reduced
270 from 3 to 2 at Observatory and 2 to 1 at North Rivanna treatment plants. He noted that also in
271 2014, staff did a VE study on the odor control project, which cost about \$116,000 for the process
272 but yielded about \$900,000 in savings by changing the way scrubbers and grit facilities were
273 done.

274
275 Mr. Mawyer stated that there had not been a VE project done since 2014, but the Observatory
276 Water Treatment Plant renovation and expansion, a \$20-million project, and the South Rivanna
277 Water Treatment Plant renovation at \$15 million, would be candidates. He stated that if they held
278 their places in the CIP, Rivanna planned to combine the two projects into one construction
279 project to interest larger contractors to come into the area for the \$30-million project. He noted
280 that this could yield volume-based cost savings, consistency from the contractor buying the same
281 materials for both plants, and reduction of administration costs by bundling.

282
283 Mr. Mawyer explained that they would start with South Rivanna and get that substantially
284 completed, then go to Observatory and finish that plant. He added that the design plans would be
285 30% complete by February, at which time the VE study could begin. Mr. Mawyer stated that
286 Rivanna included in the design engineer's contract that they do an integral VE process in the
287 design. He stated that everyone in Rivanna who would use and maintain the facility had met with
288 the consultant to review the systems and establish project parameters. Mr. Mawyer stated that at
289 this point, they planned to proceed in that fashion and not have the third party come in and do the
290 VE evaluation.

291
292 Mr. Mawyer emphasized that these were renovation projects that were primarily upgrades to
293 better technology equipment, and they were not changing the treatment process, as was the case
294 with the GAC project. He added that through the process, the design engineer would need to
295 write a written report on what VE considerations were made and what the decisions were. He
296 stated that they already determined that more surface area was needed to do more settling at the
297 Observatory Treatment Plant, so they were putting inclined plate settlers -- steel plates put in the
298 existing sediment basins. He stated that this increased the surface area and the rate of sediment
299 removal without having to build larger basins, which was a prime VE candidate.

300
301 Mr. O'Connell asked if there was another engineering firm that reviewed that.

302
303 Mr. Mawyer responded that they currently did not have another firm, and SEH was the
304 engineering firm -- which designed Crozet and was the designer of both South Rivanna and
305 Observatory. He stated that SEH had internal quality assurance and Rivanna would then meet
306 with them.

307
308 Ms. Hildebrand asked if they had the same design engineer through the VE process or if they
309 brought in separate engineers from the projects to look at it.

310
311 Mr. Schiller responded that it would probably be the same design team, although they may have
312 an opportunity to pull people from offices Rivanna wasn't currently working with.

313
314 Mr. O'Connell suggested that they do that to get some fresh eyes to look at it.

315
316 Mr. Mawyer agreed that it was helpful to have extra eyes.
317
318 Mr. Gaffney asked what the cost would be to have an outside firm do it if they could not.
319
320 Mr. Mawyer responded that the history shows \$100,000+, with a cost of \$200,000^[A2] for GAC --
321 which included design engineering changes stemming from the review. He added that value
322 engineering included stability and longevity of projects, not just cost savings, so facilities had a
323 longer life. He added that they were trying to generally improve and increase operations at
324 Observatory and South Rivanna.
325
326 Mr. Mawyer stated that the rest of the VE candidates in the CIP included Beaver Creek Dam,
327 with a pump station that would be eligible for VE, and that project was about \$20 million. He
328 stated that the raw water pump station and pipe from Ragged Mountain to Observatory was
329 about \$16 million and was already pushed out to FY25. He stated that the South Rivanna River
330 crossing and transmission main would provide a second pipe from the S. Rivanna treatment plant
331 to the north and was just over \$5 million.
332
333 Mr. O'Connell asked if long-term maintenance costs were a consideration in VE.
334
335 Mr. Mawyer confirmed that they were, adding that they were a standard within Rivanna
336 consultant contracts -- and they always had an eye to efficiency and effectiveness, with life cycle
337 being a major consideration.
338
339 Dr. Palmer asked what the timeline was for the Observatory Treatment Plant.
340
341 Mr. Mawyer responded that it was slated for FY20-24, and after that the pipeline from Ragged
342 Mountain to Observatory would be started, as currently programmed in the CIP. He noted that
343 Rivanna had met with the ACSA and had already been through a revised CIP effort to try to
344 lower customers' rates. He stated that the pipeline project had initially been concurrent with
345 Observatory, but it was pushed out of the five-year CIP to reduce costs to the ACSA.
346
347 Mr. O'Connell stated that the ACSA had asked for that, with critical projects up front and others
348 pushed back, in an effort to spread the cost average out over a longer period of time, as there
349 were double-digit increases expected over the next several years -- which was not sustainable.
350 He added that this was the case even without the RMR-SRR pipeline, which represented another
351 leap.
352
353 Mr. Mawyer stated that the RMR-SRR pipeline had a FY27-40 timeline. He stated that the
354 Observatory Treatment Plant renovation and pipe on the raw water side from the plant back to
355 the reservoir and pump station were deferred outside of 2024, so they would be moved to 2025.
356 He added that the finished water pipe historically known as the Southern Loop had a master plan
357 study and was slated for deferral to 2025. He stated that they were doing a master plan now to
358 see where the water line needed to be located, either through the City central or around the
359 southern perimeter as it was originally envisioned.
360

361 Mr. O'Connell commented that it's basically how you get water from Observatory to Pantops,
362 and the original plan was to go south -- but that did not work for a variety of reasons, and it was
363 an expensive project. He stated that to get out of the five-year cycle, it would need to be pushed
364 out of that and into the sixth year, which was what they were doing.

365
366 **9. OTHER ITEMS FROM BOARD/STAFF NOT ON AGENDA**

367
368 Dr. Palmer stated that the Ivy Transfer Station, since lowering the rates this year, had more than
369 doubled the average daily trash coming in.

370
371 Mr. Gaffney mentioned that he had received a call from a commercial hauler several weeks ago,
372 and he stated it was outstanding how they had lowered the rates -- but he was disappointed that
373 the facility was closed on Mondays.

374
375 Dr. Palmer commented that she hoped she could justify that to the County.

376
377 Mr. Mawyer mentioned that it would come to the RSWA in February, and at that point they
378 would have six weeks of data. He added that they would also discuss the master plan and
379 convenience center, and would have a joint RWSA/RSWA meeting to review the strategic plan
380 update, as well as holding CIP discussions.

381 .
382 **10. CLOSED MEETING**

383 There was no closed meeting held.

384
385 **11. ADJOURNMENT**

386
387 **Ms. Galvin moved to adjourn the meeting. Dr. Palmer seconded the motion, which passed**
388 **6-0. Mr. Richardson was absent from the meeting and the vote.**

389
390 The RWSA Board adjourned its meeting at 2:56 p.m.

391



**RIVANNA WATER AND SEWER AUTHORITY
BOARD OF DIRECTORS**

Resolution of Appreciation for Larry Perkins

WHEREAS, Mr. Perkins has served in a number of positions, most recently as a Mechanic for the Rivanna Water and Sewer Authority and the Rivanna Solid Waste Authority since December, 2001; and

WHEREAS, over the same period in excess of 17 years, Mr. Perkins has demonstrated leadership in his field and has been a valuable resource to the Authority and its employees; and

WHEREAS, Mr. Perkins's understanding of the Authority's operation and dedication and loyalty to the Authority has positively impacted the Authority, its customers and its employees; and

WHEREAS, the Rivanna Water and Sewer Authority Board of Directors is most grateful for the professional and personal contributions Mr. Perkins has provided to the Rivanna Water and Sewer Authority and to its customers and its employees; and

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

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

Michael Gaffney, Chairman
Kathleen Galvin
Lauren Hildebrand
Michael Murphy
Gary O'Connell
Liz Palmer
Jeff Richardson

MEMORANDUM

**TO: RIVANNA WATER & SEWER AUTHORITY
BOARD OF DIRECTORS**

FROM: BILL MAWYER, EXECUTIVE DIRECTOR

SUBJECT: EXECUTIVE DIRECTOR'S REPORT

DATE: FEBRUARY 26, 2019

STRATEGIC PLAN GOAL: WORKFORCE DEVELOPMENT, OPERATIONAL OPTIMIZATION

Safety Training

We recently coordinated and hosted 3 training sessions to certify staff in safe Confined Space Entry procedures. Instruction was provided by a qualified PVCC trainer. These sessions also included employees from the City and ACSA. This training certified staff to safely enter and work in confined spaces (tanks, vaults, and manholes). In addition, we will offer Lock Out/Tag Out safety training in March along with Fall Protection training in April.

STRATEGIC PLAN GOAL: INFRASTRUCTURE AND MASTER PLANNING

Birdwood Water Line

Construction is underway. Over 2,000 linear feet of 36" water piping have been delivered to the site, and approximately 400 linear feet of piping have been installed. Staff is participating with UVAF staff in a monthly project update meeting with the residents of the Bellair subdivision.

South Rivanna to Ragged Mountain Water Line

Meetings are in progress with the UVA Foundation, VDOT, City staff and Albemarle School Board staff about locations for the water line easements. We will contact private property owners along the alignment from March - May.

Observatory Water Treatment Plant Lease

Meetings are in progress with UVA staff to determine the terms of the leases and easements, including architectural, lighting, fencing and stormwater components of the plant renovation and upgrade. Updated lease and easement documents will be forwarded to UVA for review this month. Our goal is to complete these documents and obtain signatures this summer.

FY 2019 – 2020 Budget Schedule

FY 20 – 24 CIP Review	February 26, 2019
FY 20 Operating Budget Review	March 26, 2019
Public Hearing and Approval of the FY 20 – 24 CIP and FY 20 Budget	May 28, 2019

STRATEGIC PLAN GOAL: COMMUNICATION AND COLLABORATION

Community Outreach

Mr. David Tungate, Director of Operations, along with Mr. Konrad Zeller, Water Treatment Plant Supervisor, and Mr. Rob Haacke, Wastewater Department Assistant Manager, gave a presentation to Crozet Elementary School’s fifth grade team that focused on water and wastewater treatment.

On February 28, 2019, Rivanna will host a NW Central Virginia Utility Managers Networking Meeting. Managers from Amherst County Service Authority, Augusta Service Authority, Culpeper County, Culpeper Town, Louisa Water Authority and Aqua Virginia Water are expected to attend, along with managers from the City and ACSA.



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MEMORANDUM

**TO: RIVANNA WATER & SEWER AUTHORITY
 BOARD OF DIRECTORS**

**FROM: LONNIE WOOD, DIRECTOR OF FINANCE AND
 ADMINISTRATION**

REVIEWED: BILL MAWYER, EXECUTIVE DIRECTOR

SUBJECT: JANUARY MONTHLY FINANCIAL SUMMARY – FY 2019

DATE: FEBRUARY 26, 2019

Urban Water flows and rate revenues are 2% under budget estimates for the first seven months of this fiscal year, and Urban Wastewater flows and rate revenues are 42% over budget. Revenues and expenses are summarized in the table below:

	Urban Water	Urban Wastewater	Total Other Rate Centers	Total Authority
Operations				
Revenues	\$ 4,118,240	\$ 6,396,451	\$ 1,263,944	\$ 11,778,635
Expenses	<u>(4,658,963)</u>	<u>(4,869,018)</u>	<u>(1,341,045)</u>	<u>(10,869,026)</u>
Surplus (deficit)	<u>\$ (540,723)</u>	<u>\$ 1,527,433</u>	<u>\$ (77,101)</u>	<u>\$ 909,609</u>
Debt Service				
Revenues	\$ 3,753,022	\$ 5,115,135	\$ 681,982	\$ 9,550,139
Expenses	<u>(3,732,936)</u>	<u>(5,022,292)</u>	<u>(679,148)</u>	<u>(9,434,376)</u>
Surplus (deficit)	<u>\$ 20,086</u>	<u>\$ 92,843</u>	<u>\$ 2,834</u>	<u>\$ 115,763</u>
Total				
Revenues	\$ 7,871,262	\$ 11,511,586	\$ 1,945,926	\$ 21,328,774
Expenses	<u>(8,391,899)</u>	<u>(9,891,310)</u>	<u>(2,020,193)</u>	<u>(20,303,402)</u>
Surplus (deficit)	<u><u>\$ (520,637)</u></u>	<u><u>\$ 1,620,276</u></u>	<u><u>\$ (74,267)</u></u>	<u><u>\$ 1,025,372</u></u>

Despite overall operating revenues being \$1.86 million higher than budget estimates, operating expenses are running \$988,000 over budget as well resulting in a net surplus of \$909,600 for the operating category. This is mostly related to the significant amount of flow resulting from record amounts of rainfall and the related revenues from Urban Wastewater, as noted above. Overall, debt service revenues are higher than projected due to interest earnings being greater related to the rising interest rate environment causing a net surplus of \$115,800 for the debt service category.

- A. Professional Services (Urban Water, Scottsville Water, Urban Wastewater – pages 2, 4, 5) – The Urban Water rate center incurred some unbudgeted expenditures for Engineering and Technical Services related to safe yield modeling. This rate center has also spent \$23,000 more than the annual budget for legal fees related to the Observatory plant lease. Scottsville Water has exceeded the prorated budget for work done for the Red Hill Community Water System, but ACSA was billed for these costs in January. Urban Wastewater paid \$35,200 for an analysis of the Moores Creek AWRRF Cogeneration System that was not budgeted.
- B. Other Services & Charges (Urban Wastewater, Engineering – pages 5 and 11) – July’s payment of the annual property and liability insurance premium (\$120,700) is causing Urban Wastewater to be over budget in this category. Urban Wastewater is also over budget on the cost of hauling biosolids to Waverly, Va. to be composted. Urban Wastewater is over budget on odor control costs for the Crozet Interceptor/Pump Stations, and utilities are running high. The Engineering department is over budget due to late posting of an ACSA invoice for modeling services for the quarter ending in June 2018.
- C. Equipment Purchases (Urban Water, Scottsville Water – pages 2, 4) – Scottsville Water spent \$50,000 in October for the unbudgeted purchase of a replacement flocculator, and Urban Water is over the prorated budget in this category.
- D. Operations & Maintenance (Urban Water, Crozet Water, Scottsville Water, Urban Wastewater, Glenmore Wastewater, Lab, Maintenance, Engineering – pages 2-6, 9-11) – Urban Water paid about \$200,000 for June’s North Rivanna Waterline emergency repairs, and the annual lease payment for the Observatory WTP property (\$32,313) was paid in September. Urban Water has spent \$431,000 more than the prorated budget for chemicals, related to underbudgeting for GAC chemical purchases. Crozet Water is \$48,600 over the prorated budget on the chemical algae treatments of the Beaver Creek Reservoir and \$82,000 over the prorated budget for other chemicals, largely due to the \$58,400 purchase of GAC chemicals in January. Chemical cost overages are the main reason the Operations & Maintenance expense category is \$143,000 over budget. Urban Wastewater is \$103,000 over the prorated budget for chemical purchases related to the significant flows for the year, and Glenmore Wastewater went over the prorated budget on pump repairs. The January payment to renew annual service contracts for instrumentation pushed Urban Wastewater over its annual budget for instrumentation costs by \$10,000 and the Lab department by \$5,000. The Lab and Engineering departments are over the prorated budget on vehicle and equipment repairs, and the Maintenance department has spent more than the total budget for the year. Scottsville Water purchased unbudgeted instrumentation equipment for the Red Hill Community Water System in October for about \$10,000, which pushed this category over the annual budget, but this cost has been billed to ACSA and recorded as revenue for this rate center.

E. Communications (Urban Water – page 2) -The annual payment to the County of Albemarle for Rivanna's share of the radio system maintenance cost (\$20,567) was made in September.

Attachments

Rivanna Water & Sewer Authority
 Monthly Financial Statements - January 2019
 Fiscal Year 2019

Consolidated
Revenues and Expenses Summary

<i>Budget</i>	<i>Budget</i>	<i>Actual</i>	<i>Budget</i>	<i>Variance</i>
<i>FY 2019</i>	<i>Year-to-Date</i>	<i>Year-to-Date</i>	<i>vs. Actual</i>	<i>Percentage</i>

Operating Budget vs. Actual

Notes

Revenues

Operations Rate Revenue	\$	16,387,174	\$	9,559,185	\$	11,253,273	\$	1,694,088	17.72%
Lease Revenue		100,000		58,333		58,223		(110)	-0.19%
Admin., Maint. & Engineering Revenue		462,000		269,500		291,331		21,831	8.10%
Other Revenues		528,084		308,049		440,130		132,081	42.88%
Interest Allocation		28,050		16,363		27,008		10,645	65.06%
Total Operating Revenues	\$	17,505,308	\$	10,211,430	\$	12,069,965	\$	1,858,535	18.20%

Expenses

Personnel Cost	\$	8,429,784	\$	4,878,154	\$	4,622,271	\$	255,883	5.25%
Professional Services	A	710,250		414,313		444,899		(30,586)	-7.38%
Other Services & Charges	B	2,814,735		1,641,929		1,989,488		(347,559)	-21.17%
Communications	E	143,105		83,478		103,670		(20,192)	-24.19%
Information Technology		341,450		199,179		176,528		22,651	11.37%
Supplies		43,920		25,620		28,504		(2,884)	-11.26%
Operations & Maintenance	D	3,719,660		2,169,802		3,013,012		(843,211)	-38.86%
Equipment Purchases	C	459,400		267,983		290,233		(22,250)	-8.30%
Depreciation		843,000		491,750		491,750		-	0.00%
Reserve Transfers		-		-		-		-	
Total Operating Expenses	\$	17,505,304	\$	10,172,208	\$	11,160,356	\$	(988,149)	-9.71%
Operating Surplus/(Deficit)	\$	4	\$	39,222	\$	909,608			

Debt Service Budget vs. Actual

Revenues

Debt Service Rate Revenue	\$	14,852,531	\$	8,663,976	\$	8,663,970	\$	(6)	0.00%
Use of Reserves for 2016 Bond DS		300,000		175,000		175,000		-	0.00%
Septage Receiving Support - County		109,440		63,840		109,441		45,601	71.43%
Buck Mountain Surcharge		118,600		69,183		65,600		(3,583)	-5.18%
Buck Mountain Lease Revenue		1,600		933		-		(933)	-100.00%
Trust Fund Interest		46,400		27,067		102,338		75,271	278.10%
Reserve Fund Interest		344,000		200,667		433,790		233,124	116.17%
Total Debt Service Revenues	\$	15,772,571	\$	9,200,666	\$	9,550,139	\$	349,473	3.80%

Debt Service Costs

Total Principal & Interest	\$	12,295,400	\$	7,172,317	\$	7,172,317	\$	-	0.00%
Reserve Additions-Interest		344,000		200,667		433,790		(233,124)	-116.17%
Debt Service Ratio Charge		725,000		422,917		422,917		-	0.00%
Reserve Additions-CIP Growth		2,408,175		1,404,769		1,404,769		-	0.00%
Total Debt Service Costs	\$	15,772,575	\$	9,200,669	\$	9,433,792	\$	(233,124)	-2.53%
Debt Service Surplus/(Deficit)	\$	(4)	\$	(2)	\$	116,347			

Summary

Total Revenues	\$	33,277,879	\$	19,412,096	\$	21,620,104	\$	2,208,008	11.37%
Total Expenses		33,277,879		19,372,876		20,594,149		(1,221,272)	-6.30%
Surplus/(Deficit)	\$	0	\$	39,220	\$	1,025,955			

Rivanna Water & Sewer Authority
Monthly Financial Statements - January 2019

Urban Water Rate Center
Revenues and Expenses Summary

Budget FY 2019	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
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Operating Budget vs. Actual

Notes

Revenues

Operations Rate Revenue	\$ 7,034,788	\$ 4,103,626	\$ 4,035,169	\$ (68,457)	-1.67%
Lease Revenue	70,000	40,833	41,282	448	1.10%
Miscellaneous	-	-	30,316	30,316	
Interest Allocation	12,000	7,000	11,473	4,473	63.90%
Total Operating Revenues	\$ 7,116,788	\$ 4,151,460	\$ 4,118,240	\$ (33,220)	-0.80%

Expenses

Personnel Cost	\$ 1,903,779	\$ 1,102,251	\$ 1,049,240	\$ 53,012	4.81%
Professional Services	A 329,250	192,063	278,424	(86,362)	-44.97%
Other Services & Charges	B 582,700	339,908	343,029	(3,121)	-0.92%
Communications	E 64,200	37,450	48,360	(10,910)	-29.13%
Information Technology	65,300	38,092	36,938	1,153	3.03%
Supplies	5,000	2,917	5,125	(2,208)	-75.71%
Operations & Maintenance	D 1,570,660	916,218	1,463,800	(547,582)	-59.77%
Equipment Purchases	C 106,600	62,183	96,670	(34,487)	-55.46%
Depreciation	300,000	175,000	175,000	-	0.00%
Reserve Transfers	-	-	-	-	
Subtotal Before Allocations	\$ 4,927,489	\$ 2,866,082	\$ 3,496,587	\$ (630,504)	-22.00%
Allocation of Support Departments	2,189,298	1,267,909	1,162,376	105,533	8.32%
Total Operating Expenses	\$ 7,116,787	\$ 4,133,991	\$ 4,658,963	\$ (524,972)	-12.70%
Operating Surplus/(Deficit)	\$ 1	\$ 17,468	\$ (540,723)		

Debt Service Budget vs. Actual

Revenues

Debt Service Rate Revenue	\$ 5,863,271	\$ 3,420,241	\$ 3,420,242	\$ 1	0.00%
Trust Fund Interest	18,000	10,500	35,102	24,602	234.30%
Reserve Fund Interest	184,000	107,333	232,078	124,744	116.22%
Buck Mountain Surcharge	118,600	69,183	65,600	(3,583)	-5.18%
Lease Revenue	1,600	933	-	(933)	-100.00%
Total Debt Service Revenues	\$ 6,185,471	\$ 3,608,191	\$ 3,753,022	\$ 144,830	4.01%

Debt Service Costs

Total Principal & Interest	\$ 4,190,796	\$ 2,444,631	\$ 2,444,631	\$ -	0.00%
Reserve Additions-Interest	184,000	107,333	232,078	(124,744)	-116.22%
Debt Service Ratio Charge	400,000	233,333	233,333	-	0.00%
Reserve Additions-CIP Growth	1,410,675	822,894	822,894	-	0.00%
Total Debt Service Costs	\$ 6,185,471	\$ 3,608,191	\$ 3,732,936	\$ (124,744)	-3.46%
Debt Service Surplus/(Deficit)	\$ -	\$ -	\$ 20,086		

Rate Center Summary

Total Revenues	\$ 13,302,259	\$ 7,759,651	\$ 7,871,261	\$ 111,610	1.44%
Total Expenses	13,302,258	7,742,183	8,391,899	(649,716)	-8.39%
Surplus/(Deficit)	\$ 1	\$ 17,468	\$ (520,637)		
Costs per 1000 Gallons	2.09		2.39		
Thousand Gallons Treated or Flow (MGD)	3,397,700	1,981,992	1,949,357	(32,635)	-1.65%
	9.309		9.067		

Rivanna Water & Sewer Authority
Monthly Financial Statements - January 2019

Crozet Water Rate Center
Revenues and Expenses Summary

Budget FY 2019	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
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Operating Budget vs. Actual

Notes

Revenues

Operations Rate Revenue	\$ 957,384	\$ 558,474	\$ 558,474	\$ -	0.00%
Lease Revenues	30,000	17,500	16,941	(559)	-3.19%
Interest Allocation	1,700	992	1,624	632	63.72%
Total Operating Revenues	\$ 989,084	\$ 576,966	\$ 577,039	\$ 73	0.01%

Expenses

Personnel Cost	\$ 288,389	\$ 166,977	\$ 158,521	\$ 8,456	5.06%
Professional Services	30,000	17,500	1,925	15,575	89.00%
Other Services & Charges	126,960	74,060	69,657	4,403	5.94%
Communications	4,450	2,596	3,531	(935)	-36.01%
Information Technology	14,200	8,283	280	8,003	96.62%
Supplies	620	362	1,022	(660)	-182.45%
Operations & Maintenance	D 261,150	152,338	295,425	(143,087)	-93.93%
Equipment Purchases	26,450	15,429	8,890	6,539	42.38%
Depreciation	30,000	17,500	17,500	-	0.00%
Reserve Transfers	-	-	-	-	
Subtotal Before Allocations	\$ 782,219	\$ 455,045	\$ 556,751	\$ (101,706)	-22.35%
Allocation of Support Departments	206,863	119,805	109,772	10,033	8.37%
Total Operating Expenses	\$ 989,082	\$ 574,850	\$ 666,523	\$ (91,674)	-15.95%
Operating Surplus/(Deficit)	\$ 2	\$ 2,116	\$ (89,484)		

Debt Service Budget vs. Actual

Revenues

Debt Service Rate Revenue	\$ 995,568	\$ 580,748	\$ 580,748	\$ -	0.00%
Trust Fund Interest	1,800	1,050	3,582	2,532	241.13%
Reserve Fund Interest	6,700	3,908	8,617	4,709	120.49%
Total Debt Service Revenues	\$ 1,004,068	\$ 585,706	\$ 592,947	\$ 7,241	1.24%

Debt Service Costs

Total Principal & Interest	\$ 426,071	\$ 248,541	\$ 248,541	\$ -	0.00%
Reserve Additions-Interest	6,700	3,908	8,617	(4,709)	-120.49%
Reserve Additions-CIP Growth	571,300	333,258	333,258	-	0.00%
Total Debt Service Costs	\$ 1,004,071	\$ 585,708	\$ 590,417	\$ (4,709)	-0.80%
Debt Service Surplus/(Deficit)	\$ (3)	\$ (2)	\$ 2,530		

Rate Center Summary

Total Revenues	\$ 1,993,152	\$ 1,162,672	\$ 1,169,986	\$ 7,314	0.63%
Total Expenses	1,993,153	1,160,558	1,256,940	(96,383)	-8.30%
Surplus/(Deficit)	\$ (1)	\$ 2,114	\$ (86,954)		
Costs per 1000 Gallons	5.02		5.62		
Thousand Gallons Treated	196,946	114,885	118,625	3,740	3.26%
Flow (MGD)	0.540		0.552		

Rivanna Water & Sewer Authority
 Monthly Financial Statements - January 2019

Scottsville Water Rate Center
 Revenues and Expenses Summary

Budget FY 2019	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
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Operating Budget vs. Actual

Notes

Revenues

Operations Rate Revenue	\$ 443,328	\$ 258,608	\$ 258,608	\$ -	0.00%
Red Hill	-	-	32,978	\$ 32,978	
Interest Allocation	750	438	728	291	66.44%
Total Operating Revenues	\$ 444,078	\$ 259,046	\$ 292,315	\$ 33,269	12.84%

Expenses

Personnel Cost	\$ 153,885	\$ 89,104	\$ 83,645	\$ 5,460	6.13%
Professional Services	A 20,000	11,667	18,143	(6,476)	-55.51%
Other Services & Charges	28,680	16,730	19,260	(2,530)	-15.12%
Communications	3,210	1,873	2,512	(640)	-34.17%
Information Technology	7,000	4,083	6,428	(2,345)	-57.42%
Supplies	750	438	-	438	100.00%
Operations & Maintenance	D 66,570	38,833	50,572	(11,740)	-30.23%
Equipment Purchases	C 14,000	8,167	56,567	(48,400)	-592.66%
Depreciation	20,000	11,667	11,667	(0)	0.00%
Reserve Transfers	-	-	-	-	
Subtotal Before Allocations	\$ 314,095	\$ 182,560	\$ 248,793	\$ (66,233)	-36.28%
Allocation of Support Departments	129,988	75,287	69,046	6,241	8.29%
Total Operating Expenses	\$ 444,083	\$ 257,848	\$ 317,840	\$ (59,992)	-23.27%
Operating Surplus/(Deficit)	\$ (5)	\$ 1,198	\$ (25,525)		

Debt Service Budget vs. Actual

Revenues

Debt Service Rate Revenue	\$ 129,280	\$ 75,413	\$ 75,411	\$ (2)	0.00%
Trust Fund Interest	400	233	1,023	790	338.59%
Reserve Fund Interest	3,300	1,925	4,315	2,390	124.13%
Total Debt Service Revenues	\$ 132,980	\$ 77,572	\$ 80,749	\$ 3,177	4.10%

Debt Service Costs

Total Principal & Interest	\$ 129,680	\$ 75,647	\$ 75,647	\$ -	0.00%
Reserve Additions-Interest	3,300	1,925	4,315	(2,390)	
Reserve Additions-CIP Growth	-	-	-	-	
Total Debt Service Costs	\$ 132,980	\$ 77,572	\$ 79,961	\$ (2,390)	-3.08%
Debt Service Surplus/(Deficit)	\$ -	\$ -	\$ 788		

Rate Center Summary

Total Revenues	\$ 577,058	\$ 336,617	\$ 373,064	\$ 36,446	10.83%
Total Expenses	577,063	335,419	397,801	(62,382)	-18.60%
Surplus/(Deficit)	\$ (5)	\$ 1,198	\$ (24,738)		
Costs per 1000 Gallons	23.70		33.02		
Thousand Gallons Treated or Flow (MGD)	18,738	10,931	9,627	(1,304)	-11.93%
	0.051		0.045		

Rivanna Water & Sewer Authority
 Monthly Financial Statements - January 2019

Urban Wastewater Rate Center
 Revenues and Expenses Summary

<i>Budget FY 2019</i>	<i>Budget Year-to-Date</i>	<i>Actual Year-to-Date</i>	<i>Budget vs. Actual</i>	<i>Variance Percentage</i>
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Operating Budget vs. Actual

Notes

Revenues

Operations Rate Revenue	\$ 7,277,082	\$ 4,244,965	\$ 6,007,510	\$ 1,762,546	41.52%
Stone Robinson WWTP	28,084	16,382	12,890	(3,492)	-21.32%
Septage Acceptance	410,000	239,167	258,995	19,828	8.29%
Nutrient Credits	90,000	52,500	104,060	51,560	98.21%
Miscellaneous Revenue	-	-	891	891	
Interest Allocation	12,500	7,292	12,105	4,813	66.01%
Total Operating Revenues	\$ 7,817,666	\$ 4,560,305	\$ 6,396,451	\$ 1,836,146	40.26%

Expenses

Personnel Cost	\$ 1,282,792	\$ 742,517	\$ 705,280	\$ 37,237	5.01%
Professional Services	A 54,000	31,500	44,925	(13,425)	-42.62%
Other Services & Charges	B 1,816,225	1,059,465	1,409,924	(350,459)	-33.08%
Communications	10,430	6,084	7,938	(1,853)	-30.46%
Information Technology	57,250	33,396	26,921	6,475	19.39%
Supplies	2,700	1,575	919	656	41.62%
Operations & Maintenance	D 1,408,900	821,858	961,661	(139,802)	-17.01%
Equipment Purchases	74,500	43,458	36,589	6,869	15.81%
Depreciation	470,000	274,167	274,167	(0)	0.00%
Reserve Transfers	-	-	-	-	
Subtotal Before Allocations	\$ 5,176,797	\$ 3,014,020	\$ 3,468,322	\$ (454,302)	-15.07%
Allocation of Support Departments	2,640,868	1,529,493	1,400,695	128,798	8.42%
Total Operating Expenses	\$ 7,817,665	\$ 4,543,514	\$ 4,869,018	\$ (325,504)	-7.16%
Operating Surplus/(Deficit)	\$ 1	\$ 16,792	\$ 1,527,433		

Debt Service Budget vs. Actual

Revenues

Debt Service Rate Revenue	\$ 7,854,820	\$ 4,581,978	\$ 4,581,976	\$ (2)	0.00%
Use of Reserves for 2016 Bond DS	300,000	175,000	175,000	-	0.00%
Septage Receiving Support - County	109,440	63,840	109,441	45,601	71.43%
Trust Fund Interest	26,200	15,283	62,528	47,245	309.13%
Reserve Fund Interest	148,000	86,333	186,189	99,856	115.66%
Total Debt Service Revenues	\$ 8,438,460	\$ 4,922,435	\$ 5,115,135	\$ 192,700	3.91%

Debt Service Costs

Total Principal & Interest	\$ 7,539,261	\$ 4,397,902	\$ 4,397,902	\$ -	0.00%
Reserve Additions-Interest	148,000	86,333	186,189	(99,856)	-115.66%
Debt Service Ratio Charge	325,000	189,583	189,583	-	0.00%
Reserve Additions-CIP Growth	426,200	248,617	248,617	-	0.00%
Total Debt Service Costs	\$ 8,438,461	\$ 4,922,436	\$ 5,022,292	\$ (99,856)	-2.03%
Debt Service Surplus/(Deficit)	\$ (1)	\$ (1)	\$ 92,843		

Rate Center Summary

Total Revenues	\$ 16,256,126	\$ 9,482,740	\$ 11,511,586	\$ 2,028,845	21.40%
Total Expenses	16,256,126	9,465,949	9,891,309	(425,360)	-4.49%
Surplus/(Deficit)	\$ (0)	\$ 16,791	\$ 1,620,276		
Costs per 1000 Gallons	2.31		1.74		
Thousand Gallons Treated or Flow (MGD)	3,390,400	1,977,733	2,799,399	821,666	41.55%
	9.289		13.020		

Rivanna Water & Sewer Authority
 Monthly Financial Statements - January 2019

Glenmore Wastewater Rate Center
 Revenues and Expenses Summary

<i>Budget FY 2019</i>	<i>Budget Year-to-Date</i>	<i>Actual Year-to-Date</i>	<i>Budget vs. Actual</i>	<i>Variance Percentage</i>
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Operating Budget vs. Actual

Notes

Revenues

Operations Rate Revenue	\$ 372,720	\$ 217,420	\$ 217,420	\$ -	0.00%
Interest Allocation	600	350	593	243	69.47%
<i>Total Operating Revenues</i>	\$ 373,320	\$ 217,770	\$ 218,013	\$ 243	0.11%

Expenses

Personnel Cost	\$ 94,490	\$ 54,694	\$ 52,151	\$ 2,543	4.65%
Professional Services	3,000	1,750	-	1,750	
Other Services & Charges	39,510	23,048	22,527	521	2.26%
Communications	2,600	1,517	2,070	(553)	-36.46%
Information Technology	3,350	1,954	-	1,954	100.00%
Supplies	100	58	-	58	100.00%
Operations & Maintenance	121,450	70,846	63,510	7,336	10.36%
Equipment Purchases	2,900	1,692	1,400	292	17.24%
Depreciation	5,000	2,917	2,917	0	0.00%
<i>Subtotal Before Allocations</i>	\$ 272,400	\$ 158,475	\$ 144,574	\$ 13,901	8.77%
Allocation of Support Departments	100,915	58,455	53,800	4,655	7.96%
<i>Total Operating Expenses</i>	\$ 373,315	\$ 216,929	\$ 198,374	\$ 18,555	8.55%
<i>Operating Surplus/(Deficit)</i>	\$ 5	\$ 841	\$ 19,639		

Debt Service Budget vs. Actual

Revenues

Debt Service Rate Revenue	\$ 1,586	\$ 925	\$ 924	\$ (1)	-0.13%
Trust Fund Interest	-	-	-	-	
Reserve Fund Interest	1,000	583	1,301	718	123.09%
<i>Total Debt Service Revenues</i>	\$ 2,586	\$ 1,509	\$ 2,225	\$ (1)	-0.08%

Debt Service Costs

Total Principal & Interest	\$ 1,586	\$ 925	\$ 925	\$ -	0.00%
Reserve Additions-Interest	1,000	583	1,301	(718)	-123.09%
<i>Total Debt Service Costs</i>	\$ 2,586	\$ 1,509	\$ 2,227	\$ (718)	-47.60%
<i>Debt Service Surplus/(Deficit)</i>	\$ -	\$ -	\$ (1)		

Rate Center Summary					
Total Revenues	\$ 375,906	\$ 219,279	\$ 220,239	\$ 960	0.44%
Total Expenses	375,901	218,438	200,600	17,837	8.17%
Surplus/(Deficit)	\$ 5	\$ 841	\$ 19,638		
Costs per 1000 Gallons	8.60		6.05		
Thousand Gallons Treated or Flow (MGD)	43,412	25,324	32,773	7,449	29.42%
	0.119		0.152		

Rivanna Water & Sewer Authority
 Monthly Financial Statements - January 2019

Scottsville Wastewater Rate Center
 Revenues and Expenses Summary

<i>Budget FY 2019</i>	<i>Budget Year-to-Date</i>	<i>Actual Year-to-Date</i>	<i>Budget vs. Actual</i>	<i>Variance Percentage</i>
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Operating Budget vs. Actual

Notes

Revenues

Operations Rate Revenue	\$ 301,872	\$ 176,092	\$ 176,092	\$ -	0.00%
Interest Allocation	500	292	485	193	66.32%
Total Operating Revenues	\$ 302,372	\$ 176,384	\$ 176,577	\$ 193	0.11%

Expenses

Personnel Cost	\$ 94,515	\$ 54,708	\$ 52,151	\$ 2,557	4.67%
Professional Services	2,000	1,167	-	1,167	100.00%
Other Services & Charges	28,400	16,567	13,077	3,490	21.06%
Communications	2,630	1,534	2,450	(915)	-59.67%
Information Technology	2,350	1,371	-	1,371	100.00%
Supplies	100	58	446	(387)	-663.73%
Operations & Maintenance	57,850	33,746	28,531	5,215	15.45%
Equipment Purchases	3,200	1,867	1,400	467	25.00%
Depreciation	18,000	10,500	10,500	-	0.00%
Subtotal Before Allocations	\$ 209,045	\$ 121,518	\$ 108,554	\$ 12,963	10.67%
Allocation of Support Departments	93,328	54,059	49,754	4,305	7.96%
Total Operating Expenses	\$ 302,372	\$ 175,577	\$ 158,308	\$ 17,268	9.84%
Operating Surplus/(Deficit)	\$ (0)	\$ 807	\$ 18,269		

Debt Service Budget vs. Actual

Revenues

Debt Service Rate Revenue	\$ 8,006	\$ 4,670	\$ 4,669	\$ (1)	-0.02%
Trust Fund Interest	-	-	102	102	
Reserve Fund Interest	1,000	583	1,290	706	121.08%
Total Debt Service Revenues	\$ 9,006	\$ 5,254	\$ 6,061	\$ 808	15.37%

Debt Service Costs

Total Principal & Interest	\$ 8,006	\$ 4,670	\$ 4,670	\$ -	0.00%
Reserve Additions-Interest	1,000	583	1,290	(706)	
Estimated New Principal & Interest	-	-	-	-	
Total Debt Service Costs	\$ 9,006	\$ 5,254	\$ 5,960	\$ (706)	-13.44%
Debt Service Surplus/(Deficit)	\$ -	\$ -	\$ 101		

Rate Center Summary					
Total Revenues	\$ 311,378	\$ 181,637	\$ 182,638	\$ 1,001	0.55%
Total Expenses	311,378	180,830	164,268	16,562	9.16%
Surplus/(Deficit)	\$ (0)	\$ 807	\$ 18,370		
Costs per 1000 Gallons	15.14		8.73		
Thousand Gallons Treated or Flow (MGD)	19,966	11,647	18,129	6,482	55.66%

Rivanna Water & Sewer Authority
Monthly Financial Statements - January 2019

Administration

<i>Budget FY 2019</i>	<i>Budget Year-to-Date</i>	<i>Actual Year-to-Date</i>	<i>Budget vs. Actual</i>	<i>Variance Percentage</i>
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Operating Budget vs. Actual

Notes

Revenues

Payment for Services SWA	\$ 460,000	\$ 268,333	\$ 268,333	\$ (0)	0.00%
Miscellaneous Revenue	2,000	1,167	7,217	6,050	518.61%
Total Operating Revenues	\$ 462,000	\$ 269,500	\$ 275,550	\$ 6,050	2.25%

Expenses

Personnel Cost	\$ 1,796,150	\$ 1,038,791	\$ 1,002,423	\$ 36,368	3.50%
Professional Services	228,000	133,000	93,230	39,770	29.90%
Other Services & Charges	140,980	82,238	63,392	18,847	22.92%
Communications	20,280	11,830	13,344	(1,514)	-12.80%
Information Technology	138,500	80,792	73,386	7,406	9.17%
Supplies	21,000	12,250	13,194	(944)	-7.71%
Operations & Maintenance	60,400	35,233	22,286	12,947	36.75%
Equipment Purchases	27,500	16,042	7,292	8,750	54.55%
Depreciation	-	-	-	-	
Total Operating Expenses	\$ 2,432,810	\$ 1,410,176	\$ 1,288,546	\$ 121,631	8.63%

Department Summary

Net Costs Allocable to Rate Centers \$ (1,970,810) \$ (1,140,676) \$ (1,012,995) \$ (127,681) 11.19%

Allocations to the Rate Centers

Urban Water	44.00%	\$ 867,157	\$ 501,898	\$ 445,718	\$ 56,180
Crozet Water	4.00%	78,832	45,627	40,520	5,107
Scottsville Water	2.00%	39,416	22,814	20,260	2,554
Urban Wastewater	48.00%	945,989	547,525	486,238	61,287
Glenmore Wastewater	1.00%	19,708	11,407	10,130	1,277
Scottsville Wastewater	1.00%	19,708	11,407	10,130	1,277
	100.00%	\$ 1,970,810	\$ 1,140,676	\$ 1,012,995	\$ 127,681

Rivanna Water & Sewer Authority
 Monthly Financial Statements - January 2019

Maintenance

Budget FY 2019	Budget Year-to-Date	Actual Year-to-Date	Budget vs. Actual	Variance Percentage
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Operating Budget vs. Actual

Notes

Revenues

Miscellaneous Revenue	-	-	1,534	1,534
Total Operating Revenues	\$ -	\$ -	\$ 1,534	\$ 1,534

Expenses

Personnel Cost	\$ 1,304,247	\$ 754,737	\$ 680,573	\$ 74,164	9.83%
Professional Services	-	-	-	-	
Other Services & Charges	17,500	10,208	11,418	(1,210)	-11.85%
Communications	17,325	10,106	12,944	(2,838)	-28.08%
Information Technology	6,500	3,792	3,025	767	20.22%
Supplies	2,000	1,167	361	806	69.09%
Operations & Maintenance	D 64,300	37,508	46,291	(8,782)	-23.41%
Equipment Purchases	105,650	61,629	56,090	5,539	8.99%
Depreciation	-	-	-	-	
Total Operating Expenses	\$ 1,517,522	\$ 879,148	\$ 810,702	\$ 68,446	7.79%

Department Summary

Net Costs Allocable to Rate Centers		\$ (1,517,522)	\$ (879,148)	\$ (809,168)	\$ (66,912)	7.61%
Allocations to the Rate Centers						
Urban Water	30.00%	\$ 455,256	\$ 263,744	\$ 242,750	\$ 20,994	
Crozet Water	3.50%	53,113	30,770	28,321	2,449	
Scottsville Water	3.50%	53,113	30,770	28,321	2,449	
Urban Wastewater	56.50%	857,400	496,718	457,180	39,539	
Glenmore Wastewater	3.50%	53,113	30,770	28,321	2,449	
Scottsville Wastewater	3.00%	45,526	26,374	24,275	2,099	
	100.00%	\$ 1,517,522	\$ 879,148	\$ 809,168	\$ 69,980	

Rivanna Water & Sewer Authority
 Monthly Financial Statements - January 2019

Laboratory

<i>Budget FY 2019</i>	<i>Budget Year-to-Date</i>	<i>Actual Year-to-Date</i>	<i>Budget vs. Actual</i>	<i>Variance Percentage</i>
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Operating Budget vs. Actual

Notes

Revenues

N/A

Expenses

Personnel Cost		\$ 301,100	\$ 174,229	\$ 169,748	\$ 4,481	2.57%
Professional Services		-	-	-	-	
Other Services & Charges		14,230	8,301	1,695	6,606	79.58%
Communications		800	467	1,324	(857)	
Information Technology		2,500	1,458	-	1,458	100.00%
Supplies		2,150	1,254	549	705	56.22%
Operations & Maintenance	D	53,500	31,208	50,200	(18,992)	-60.85%
Equipment Purchases		72,100	42,058	10,951	31,107	73.96%
Depreciation		-	-	-	-	
<i>Total Operating Expenses</i>		\$ 446,380	\$ 258,975	\$ 234,467	\$ 24,509	9.46%

Department Summary

Net Costs Allocable to Rate Centers		\$ (446,380)	\$ (258,975)	\$ (234,467)	\$ (24,509)	9.46%
<u>Allocations to the Rate Centers</u>						
Urban Water	44.00%	\$ 196,407	\$ 113,949	\$ 103,165	\$ 10,784	
Crozet Water	4.00%	17,855	10,359	9,379	980	
Scottsville Water	2.00%	8,928	5,180	4,689	490	
Urban Wastewater	47.00%	209,799	121,718	110,199	11,519	
Glenmore Wastewater	1.50%	6,696	3,885	3,517	368	
Scottsville Wastewater	1.50%	6,696	3,885	3,517	368	
	100.00%	\$ 446,380	\$ 258,975	\$ 234,467	\$ 24,509	

Rivanna Water & Sewer Authority
Monthly Financial Statements - January 2019

Engineering

<i>Budget FY 2019</i>	<i>Budget Year-to-Date</i>	<i>Actual Year-to-Date</i>	<i>Budget vs. Actual</i>	<i>Variance Percentage</i>
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Operating Budget vs. Actual**Revenues**

Payment for Services SWA	\$	-	\$	-	\$	14,246	\$	14,246
<i>Total Operating Revenues</i>	\$	-	\$	-	\$	14,246	\$	14,246

Expenses

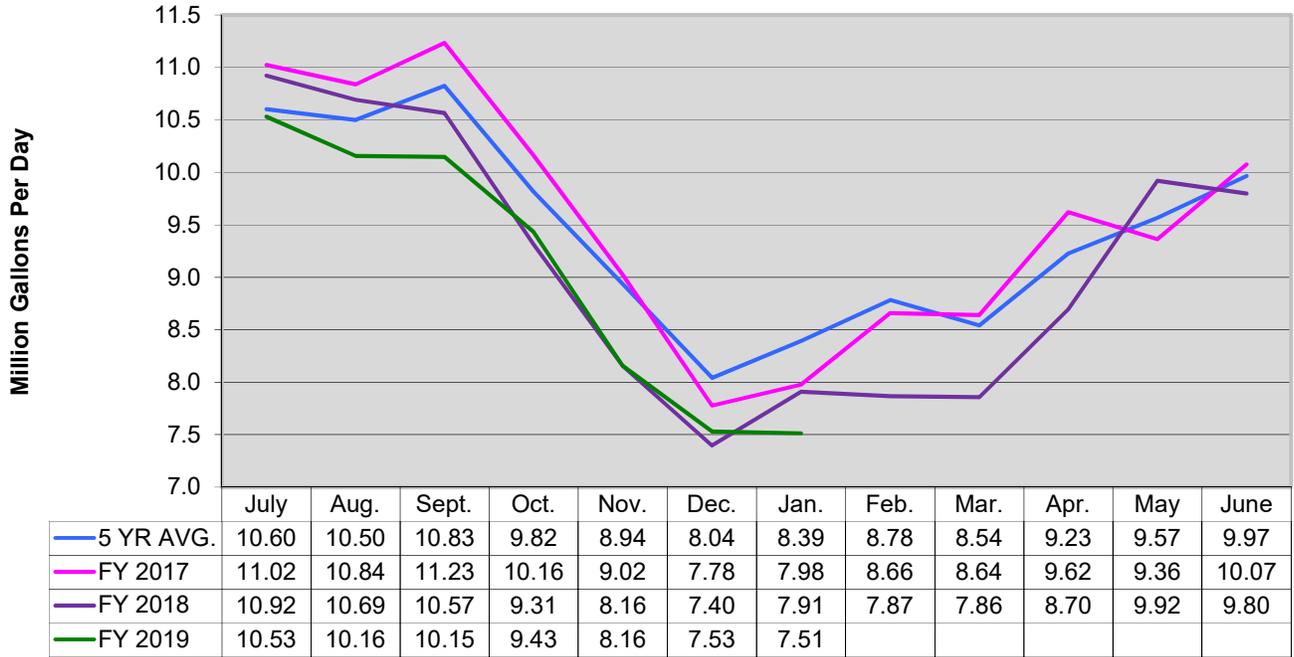
Personnel Cost	\$	1,210,438	\$	700,145	\$	668,539	\$	31,606	4.51%
Professional Services		44,000		25,667		8,252		17,414	67.85%
Other Services & Charges	B	19,550		11,404		35,510		(24,106)	-211.38%
Communications		17,180		10,022		9,199		823	8.21%
Information Technology	C	44,500		25,958		29,551		(3,593)	-13.84%
Supplies		9,500		5,542		6,889		(1,348)	-24.32%
Operations & Maintenance		54,880		32,013		30,738		1,276	3.99%
Equipment Purchases		26,500		15,458		14,383		1,075	6.96%
Depreciation & Capital Reserve Transfers		-		-		-		-	
<i>Total Operating Expenses</i>		\$ 1,426,548		\$ 826,209		\$ 803,061		\$ 23,148	2.80%

Department Summary

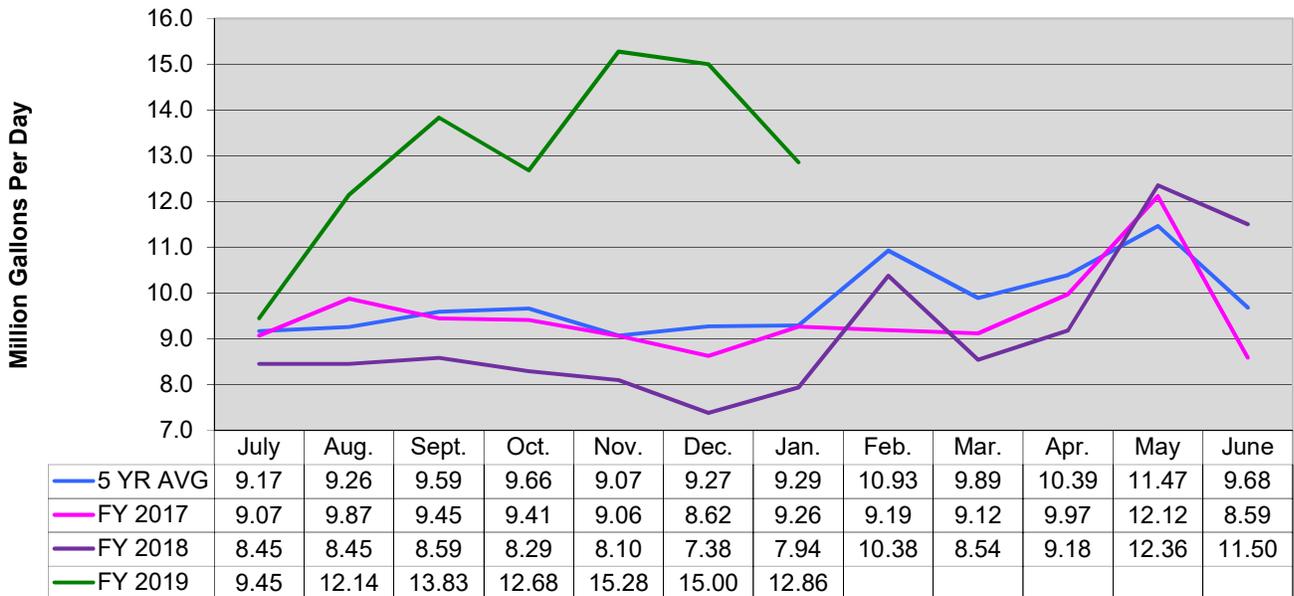
Net Costs Allocable to Rate Centers		\$ (1,426,548)		\$ (826,209)		\$ (788,815)		\$ (8,902)	1.08%
<u>Allocations to the Rate Centers</u>									
Urban Water	47.00%	\$ 670,477	\$	388,318	\$	370,743	\$	17,575	
Crozet Water	4.00%	57,062		33,048		31,553		1,496	
Scottsville Water	2.00%	28,531		16,524		15,776		748	
Urban Wastewater	44.00%	627,681		363,532		347,078		16,454	
Glenmore Wastewater	1.50%	21,398		12,393		11,832		561	
Scottsville Wastewater	1.50%	21,398		12,393		11,832		561	
	100.00%	\$ 1,426,548	\$	826,209	\$	788,815	\$	37,394	

**Rivanna Water and Sewer Authority
Flow Graphs**

Urban Water Flows



Urban Wastewater Flows



MEMORANDUM

**TO: RIVANNA WATER & SEWER AUTHORITY
BOARD OF DIRECTORS**

**FROM: JENNIFER WHITAKER, DIRECTOR OF ENGINEERING &
MAINTENANCE**

REVIEWED BY: BILL MAWYER, EXECUTIVE DIRECTOR

SUBJECT: STATUS REPORT: ONGOING PROJECTS

DATE: FEBRUARY 26, 2019

This memorandum reports on the status of the following Capital Projects as well as other significant operating, maintenance and planning projects.

Under Construction

1. Birdwood Raw Water Main
2. Crozet Water Treatment Plant Expansion
3. Crozet Interceptor Pump Stations Bypass & Isolation Valves
4. Wholesale Water Master Metering
5. Sugar Hollow Reservoir to Ragged Mountain Reservoir Transfer Flow Meter
6. Crozet Finished Water Pump Station
7. Interceptor Sewer & Manhole Repair
8. Urgent and Emergency Repairs
9. Piney Mountain Tank Rehabilitation

Design and Bidding

10. Observatory Water Treatment Plant Expansion
11. South Rivanna Water Treatment Plant Improvements
12. Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line and Raw Water Pump Station
13. Crozet Flow Equalization Tank
14. Beaver Creek Dam Alterations
15. Beaver Creek Raw Water Pump Station
16. Crozet Interceptor Pump Station Rebuilds
17. Buck's Elbow & Crozet Waterball Tank Painting
18. Valve Repair – Replacement (Phase 2)

19. MCAWRRF Digester Sludge Storage Improvements
20. MCAWRRF Aluminum Slide Gate Replacements
21. Glenmore Secondary Clarifier Coating
22. Sugar Hollow Dam – Rubber Crest Gate Replacement and Intake Tower Repairs
23. Scottsville WTP – Finished Water Metering Improvements
24. South Rivanna Dam – Gate Repair

Planning and Studies

25. Avon to Pantops Water Main (on hold until completion of the Urban Water Master Plan)
26. South Fork Rivanna Reservoir to Ragged Mountain Reservoir Water Line Right-of-Way
27. Urban Water Demand and Safe Yield Study
28. Urban Finished Water Infrastructure Master Plan
29. South Rivanna River Crossing and North Rivanna Transmission Main
30. Route 29 Pump Station
31. South Rivanna Hydropower Plant Decommissioning
32. Security Enhancements
33. Upper Schenks Branch Interceptor, Phase II
34. Engineering and Administration Building
35. Asset Management Plan

O&M Related Projects

36. NRWTP Raw Metering Improvements
37. NRWTP Sludge Lagoon Study and Needs Assessment
38. NRWTP High Service Pump Replacement
39. MCAWRRF Cogeneration System Analysis
40. SRWTP Future Site Development Analysis

1. Birdwood Raw Water Main

Design Engineer:	Michael Baker International (Baker)
Construction Contractor:	E.C. Pace (Roanoke)
Construction Start:	November 2018
Percent Complete:	10%
Base Construction Contract + Change Orders to Date = Current Value:	\$2,593,726
Expected Completion:	October 2019
Total Capital Project Budget:	\$4,000,000

Current Status:

A Notice to Proceed was issued to the contractor on November 26, 2018. Equipment mobilization, clearing, installation of the Route 250 construction entrance and staging area, surveying and installation of erosion control measures are complete. Over 2,000 linear feet of 36” water line has been delivered to the site and approximately 400 linear feet of water line has been installed.

History:

RWSA and the UVA Foundation decided to expedite construction of the portion of the 36-inch raw water main through the Birdwood property. This would enable pipeline work to proceed just ahead of the golf course reconstruction project to prevent subsequent disruption to the property and adjacent neighbors, as well as increased water line construction costs. The golf course reconstruction project started in November 2018. Our work includes installation of approximately 6,100 linear feet of 36-inch raw water main along the eastern property boundary of the golf course.

2. Crozet Water Treatment Plant Expansion

Design Engineer:	Short Elliot Hendrickson (SEH)
Construction Contractor:	Orders Construction Co. (WVA)
Construction Start:	December 2018
Percent Completion:	0%
Base Construction Contract + Change Order to Date = Current Value:	\$7,170,000
Expected Completion Date:	December 2020
Total Capital Project Budget:	\$8,500,000

Current Status:

A Notice of Award was issued and a preconstruction meeting was held on November 15, 2018. A Notice to Proceed was issued on December 13, 2018 and the contractor has begun mobilizing to the site this month.

History:

This project was created to increase the supply capacity of the existing Crozet WTP by modernizing plant systems. The goal was to not drastically increase the plant footprint in regard to the existing filter plant, flocculation tanks, and sedimentation basins. By modernizing the outdated equipment within these treatment systems, the plant discharge capacity will be improved by approximately 100% (from 1 to 2 mgd). SEH completed a Preliminary Engineering Report (PER); watershed data collection; raw water jar testing; pilot scale testing, as well as preliminary and final design.

3. Crozet Interceptor Pump Stations Bypass and Isolation Valves

Design Engineer:	Johnson, Mirmiran & Thompson (JMT)
Construction Contractor:	Anderson Construction
Construction Start:	September 2018
Percent Completion:	80%
Base Construction Contract + Change Order to Date = Current Value:	\$361,820
Expected Completion Date:	February 2019
Total Capital Project Budget:	\$720,000

Current Status:

The contractor has completed piping connections and valve installations at two of the pump stations (with restoration work remaining) and begun excavation work at the two remaining pump stations. Piping work is expected to be completed by the end of this month with restoration work taking place in March.

History:

There are four pump stations located in the Crozet Interceptor system that help convey flow from the Crozet Area into the Morey Creek Interceptor and the rest of the urban collection system. These pump stations were constructed in the 1980s and provided no means of isolating each pump station from its downstream force main. This condition complicates maintenance-related activities as each time a pump station component needs to be serviced or replaced, the volume of wastewater within the force main must be addressed at the pump station as it drains back to the wet well. In addition, the Crozet Interceptor pump stations also have limited storage within their wet wells, and any reduction of down time as a result of dealing with the impacts of no isolation valves, decreases the amount of time available to work on the equipment. In order to alleviate this condition, temporary valves called “line stops” will be temporarily installed on the force mains downstream of the pump stations to allow enough time for a new isolation valve to be installed. Isolation valves will be located in order to provide the maximum amount of down time available based on current system conditions for future pump station maintenance activities. While line stops are in place, bypass connections will also be provided at each pump station. These will allow staff the option of bringing in bypass pumps for more significant pump station shutdowns required for maintenance activities or repairs for which the isolation valves alone cannot account. Contract Documents were advertised for bidding and bids were opened on July 10, 2018. A Notice of Award was provided to Anderson Construction on August 6, 2018.

4. Wholesale Water Master Metering

Design Engineer:	Michael Baker International (Baker)
Construction Contractor:	Linco, Inc.
Construction Start:	January 2016
Percent Complete:	97%
Base Construction Contract + Change Orders to Date = Current Value:	\$2,228,254 - \$284,104.24 = \$1,944,149.76
Expected Completion Date:	April 2019
Total Capital Project Budget:	\$3,200,000

Current Status:

Three water treatment plant flow meters, and all 25 distribution system flow meters have been installed. Of those 25 meters, 21 are currently functional and 4 are experiencing reporting errors due to hardware or other issues. Our consultant, meter representatives and staff are continuing to troubleshoot these issues. Three nonfunctioning meter registers will be replaced, and have been ordered. Following meter calibration by an independent consultant in March 2019, staff hopes to have a fully functioning metering system by the end of April 2019.

History:

In January 2012, a Water Cost Allocation Agreement was signed by the City of Charlottesville (City) and ACSA designating how the two agencies would share in the financing of the New Ragged

Mountain Dam project. Within the agreement is a general provision developed by the ACSA and City to enhance measurement of the water usage by each of the distribution agencies.

The Board authorized staff in August of 2012 to enter into an agreement with Michael Baker International, Inc. (Baker) to complete an engineering study on metering plan alternatives. Baker's study identified several alternatives for a metering plan based on combinations of metering and estimating methodologies. Based on feedback from ACSA, the City, and RWSA, Baker recommended a Jurisdictional Approach which included installation of water meters at 34 locations at the City/County corporate boundary and at each of the three urban water treatment plants at an estimated cost of \$6.4 million. At its September 2013 meeting, the RWSA Board of Directors requested staff to proceed with the Jurisdictional Coverage Approach. In February 2014, the Board of Directors authorized Baker to complete preliminary and final design for the project and to provide bid-phase services. The final design includes construction of 25 metering systems in underground vaults and required acquisition of twenty (20) permanent water line easements and one (1) permanent access easement.

In May 2018, a final version of the *Wholesale Metering Administration and Implementation Policy* was completed and forwarded to the ACSA and the City. RWSA terminated the construction contract with Linco, Inc. on April 2, 2018 and is coordinating the remaining work in-house.

5. Sugar Hollow to Ragged Mountain Reservoir Transfer Flow Meter

Design Engineer:	Michael Baker International (Baker)
Construction Contractor:	G.L. Howard
Construction Start:	October 2018
Percent Complete	70%
Base Construction Contract + Change Orders to Date = Current Value:	\$354,905
Expected Completion:	April 2019
Total Capital Project Budget:	\$383,241

Current Status:

All onsite above-ground structures, including the Gatekeeper's House, existing sheds, Chlorine Contact Building, and existing Meter House, have been demolished. Improvements to the Sugar Hollow to Ragged Mountain Reservoir transfer line have begun, and the contractor was able to replace a 90+ year-old gate valve. With this valve replaced, the contractor has transitioned to the other improvements, which include a new flow meter and automated control valve. This project requires the Sugar Hollow to Ragged Mountain Reservoir transfer line to be out of service.

History:

RWSA staff has worked with the design engineers to complete plan and profile design drawings for this project. The project will include installation of a flow meter on the 18-inch diameter Sugar Hollow Reservoir discharge pipe and a control valve that can be operated remotely through the Observatory WTP SCADA system. The control valve will modulate the amount of flow being transferred between the two reservoirs, the flow meter will record data, and staff will be able to remotely monitor the data through the SCADA system. Additional work has been added to this project including replacement of an existing, original gate valve at the site, demolition of four existing small utility structures and sheds that have not been used in many years, demolition of the

existing Gatekeeper’s House, and a separate control valve vault that will optimize the accuracy of the new flow meter by creating adequate separation distance between the meter and modulating control valve. The structures to be demolished and removed have been inspected and tested for asbestos containing materials and lead based paint. As a result, there will be some special abatement work required. Several long lead items were purchased by the contractor as a result of the initial Work Authorization. A subsequent Work Authorization covering the purchase of all remaining materials, construction and demolition was issued to the contractor on September 28, 2018.

The Notice to Proceed (NTP) was issued to the contractor on October 1, 2018. A Demolition Permit was issued for the Sugar Hollow Gatekeeper’s House by Albemarle County during the week of November 12, 2018. Demolition of the Sugar Hollow Gatekeeper’s House began during the week of November 26, 2018 and was completed during the week of December 3, 2018. All other site demolition was completed by the week of January 14, 2019. Installation of the new gate valve was completed on February 5, 2019.

6. Crozet Finished Water Pump Station

Design Engineer:	Short Elliot Hendrickson (SEH)
Construction Contractor:	Anderson Construction, Inc.
Construction Start:	May 2017
Percent Complete:	95%
Base Construction Contract +	
Change Orders to Date = Current Value:	\$1,949,386
Expected Completion Date:	May 2019
Total Capital Project Budget:	\$2,600,000

Current Status:

Start-up and testing of equipment continues. Operations and Maintenance Manuals have been distributed and training has been completed. The demonstration period was restarted on February 5, 2019. Once this 30 day period is completed without any additional equipment malfunctions, the new pump station will be put into service, the existing pump station will be demolished, and any remaining final completion items will be performed. Plantings and seasonal items will be completed this Spring.

History:

As part of the FY 2016 CIP, the Crozet Water Treatment Plant was studied to expand the treatment capacity to secure future demand needs of the Crozet community. Prior to any plant expansion, it was determined that the finished water pumping facilities were in need of replacement. The existing pump station was very small and was constructed as part of the original plant construction in the late 1960s. The pumping equipment and controls are outdated and reduce operational reliability and efficiency. The pump house was located in a low, poorly drained area near the ground storage clearwell, and drainage issues exist. Due to the age and condition of pumps, electrical systems, building systems and controls, it has been determined that a full station replacement is necessary. An Alternatives Analysis Report was completed in June 2016.

Bids were received and opened for the project on March 7, 2017. The apparent low bidder was Anderson Construction, Inc. from Lynchburg, VA. The Board of Directors approved the contract bid award of \$1,941,000 at the March 2017 meeting, a Notice of Award was issued on April 10, 2017,

and a Notice to Proceed was issued on May 3, 2017.

7. Interceptor Sewer and Manhole Repair

Design Engineer: Frazier Engineering
 Construction Contractor: IPR Northeast
 Construction Start: November 2017
 Percent Complete: 20%
 Base Construction Contract +
 Change Orders to Date = Current Value: \$1,244,337.19
 Expected Completion: 2020
 Total Capital Project Budget: \$1,941,000

Current Status:

Frazier Engineering continues to conduct condition assessment activities and has begun a review of CCTV results from investigation activities performed by IPR Northeast. The results from these investigations and previous investigations are being compiled into an initial construction work authorization for rehabilitation work on portions of the Crozet and Morey Creek Interceptor. Some additional CCTV work will also be performed following the cleaning of certain sections of the interceptor system. Additional investigation and rehabilitation work will follow after the initial round of CCTV investigations.

History:

Results from sewer flow monitoring and modeling under the Comprehensive Sanitary Sewer Study provided awareness to specific inflow and infiltration (I&I) concerns in the collection system and resulted in strengthened commitments from the City, ACSA and RWSA to continue professional engineering services to aid in the rehabilitation and repair of the sewer collection system. Engineering services will be used for sewer infrastructure condition assessments and the development of a sewer rehabilitation bid package for the procurement of a contractor to perform the recommended rehabilitation work.

8. Urgent and Emergency Repairs

Staff is currently working on several urgent repairs within the water and wastewater systems as listed below:

Project No.	Project Description	Approx. Cost
2019-01	Pantops Water Line River Bank Repair	\$160,000
2018-07	Moore's Creek Interceptor Stream Bank Repair	\$150,000
2017-03	Crozet Sewer Force Main Air Release Valve Repair	\$135,000
2018-01	Rivanna Interceptor – RVI-MH-32 Erosion Repair	\$50,000
2018-06	South Rivanna Dam Apron and River Bank Repairs	\$200,000

- Pantops Water Line River Bank Repair

RWSA was made aware by a local resident of an eroded section of the river bank along the Rivanna River that has exposed a section of the Pantops water line. This eroded section is near

a previously repaired section of the river bank. RWSA personnel visited the site and plans have been made to support the area with sandbags as a project to restore the river bank is initiated. This issue was identified as an emergency and an on-call contractor has mobilized to the site to repair the bank and protect it from additional erosion.

- Moores Creek Interceptor Stream Bank Repair

An exposed section of the Moores Creek Interceptor (between MCI-MH-40 to MCI-MH-41) was found along Moores Creek. The area was supported by sandbags as permitting was acquired to access the area as necessary for a formal repair. RWSA worked with an on-call contractor to rebuild the stream bank using imbricated stone. Work to repair the bank has been completed.

- Crozet Sewer Force Main Air Release Valve Repair

During routine inspections of the sewer force main, the Maintenance Department identified that the saddle for one of the air release valves was loose and needed to be repaired. Due to the profile of the force main however, it is not possible to dewater the force main and take pressure off the pipe at this location without the installation of line stops. As a result, a contractor was contacted to begin development of a method to address the issue and a site meeting was conducted. The contractor has provided estimated pricing and a work authorization is being developed. Coordination with the property owner is underway and this repair will be scheduled sequentially with the Rivanna Interceptor manhole repair this winter/spring.

- Rivanna Interceptor – RVI-MH-32 Erosion Repair

During routine inspections of the Rivanna Interceptor, the Maintenance Department observed some significant erosion around RVI-MH-32. A site meeting was held with the contractor and the City of Charlottesville to confirm the cause of the erosion and determine the preferred method of repair, as the repair will impact a section of the Rivanna Trail. The contractor has provided estimated pricing and a work authorization is being developed. This repair will be scheduled sequentially with the Crozet Sewer Force Main repair this winter/spring.

- South Rivanna Dam Apron and River Bank Repairs

Intense rainfall between May 30-31, 2018 resulted in extensive flooding throughout Charlottesville and parts of Albemarle County, with flows over the South Fork Rivanna Dam reaching more than 7 feet over the spillway crest at its peak. Staff has inspected the dam and abutments to determine the extent of damage resulting from the extreme flooding. Although there is no discernible damage to the dam itself, staff found erosion damage to the north downstream river bank and substantial displacement of large stone downstream of the dam to form a rock dam and pool below the north apron. Additionally, some damage to concrete structures on both aprons was noted, including possible creation of voids beneath the concrete and loss of concrete joint filler. Repairs to the river bank and removal of the rock dam will take place in spring of 2019 under RWSA's on-call construction contract. Repairs to the north and south concrete aprons will be designed by Schnabel Engineering and those services will be procured separately from the on-call contract.

9. Piney Mountain Tank Rehabilitation

Design Engineer:

Johnson, Mirmiran & Thompson (JMT)

Construction Contractor:	Utility Service Co, Inc.
Construction Start:	April 2019
Percent Complete:	0%
Base Construction Contract + Change Orders to Date = Current Value:	\$251,700 + \$12,585 = \$264,285
Expected Completion:	July 2019
Total Capital Project Budget:	\$500,000

Current Status:

Coordination for the upcoming shutdown is ongoing between RWSA and ACSA, and the tank is expected to be taken offline in late March for an April 1, 2019 construction start.

This project will require a shutdown of the tank for approximately three months. Due to unforeseen complications with an extended tank shutdown and other ongoing construction activities in the North Rivanna Water System in spring of 2018, construction of the Piney Mountain Tank repairs was postponed to spring of 2019. Utility Service Co., Inc will remain the general contractor for this project.

History:

The 700,000 gallon Piney Mountain Tank serves the North Rivanna pressure zone. A routine inspection of the Piney Mountain Tank in April of 2012 revealed several deformed roof rafters, indicating the potential for structural deficiency. An in-depth structural inspection was performed in May of 2013 and a list of recommended roof repairs provided. This project includes consultant services for design and bidding of necessary roof repairs and other ancillary items, as well as construction, construction administration, and inspection services. Long term plans for the Rt. 29 service area include the modification or elimination of this facility. The current recommended improvements are needed in order to maintain the existing tank in service for at least the next 10 years.

The project was advertised for bid on November 28, 2017 and bids were opened on January 9, 2018. At its January 2018 meeting, the RWSA Board of Directors approved staff's recommendation of award to Utility Service Co., Inc., the apparent low bidder on the project.

10. Observatory Water Treatment Plant Expansion

Design Engineer:	Short Elliot Hendrickson, Inc. (SEH)
Project Start:	October 2017
Project Status:	30% Design
Construction Start:	December 2019
Completion:	2023
Approved Capital Budget:	\$18,630,000
Current Project Estimate:	\$19,700,000

Current Status:

A project kickoff meeting with staff was held on November 14, 2018. Following submission of 30% design documents by the end of this month, a value engineering process will be conducted with any

agreed upon results incorporated into the project. Design documents will be completed by June 2019.

History:

This project will consider the design and costs for upgrading the plant systems to achieve a consistent 7.7 MGD plant capacity, as well as consider the costs involved with upgrading the plant to 10 or 12 MGD capacity. Much of the Observatory Water Treatment Plant is original to the 1953 construction. In an effort to better understand the needed future improvements, a Condition Assessment Report was completed by SEH in October of 2013. The approved Capital Improvement Plan project was based on the findings from this report. A portion of this project was expedited in order to repair and replace old, existing equipment that was not functional. The flocculator systems have been replaced and upgraded as part of the Drinking Water Activated Carbon and WTP Improvements project (GAC). The second flocculator system was started up in May 2017, and both systems are currently in full service. The PER has been finalized, as well as a Work Authorization with the design engineer for design, bidding and construction administration services.

11. South Rivanna Water Treatment Plant Improvements

Design Engineer:	Short Elliot Hendrickson (SEH)
Project Start:	October 2017
Project Status:	30% Design
Construction Start:	December 2019
Completion:	December 2022
Approved Capital Budget:	\$7,500,000
Current Project Estimate:	\$15,000,000

Current Status:

A project kickoff meeting with staff was held on November 13, 2018. Following submission of 30% design documents by the end of this month, a value engineering process will be conducted with any agreed upon results incorporated into the project. Design documents will be completed by June 2019. Project scope and budget have increased to address treatment system and building needs identified during the PER phase.

History:

The South Rivanna Water Treatment Plant is currently undergoing significant upgrades as part of the Granular Activated Carbon Project. Several other significant needs have also been identified and have been assembled into a single project. The projects herein include: expansion of the coagulant storage facilities; installation of additional filters to meet firm capacity needs; the addition of a second variable frequency drive at the Raw Water Pump Station; the relocation for the electrical gear from a sub terrain location at the Sludge Pumping Station; a new building on site for additional office, lab, control room and storage space; improvements to storm sewers to accept allowable WTP discharges; and the construction of a new metal building to cover the existing liquid lime feed piping and tanks.

The scope of this project will not increase plant treatment capacity. The PER has been finalized, as well as a Work Authorization with the design engineer for design, bidding and construction administration services.

12. Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line and Raw Water Pump Station

Design Engineer:	Michael Baker International (Baker)
Project Start:	August 2018
Project Status:	Prelim Engineering in Progress
Construction Start:	2022
Completion:	2025
Approved Capital Budget:	\$6,526,000
Current Project Estimate:	\$18,000,000

Current Status:

A Work Authorization was executed in December 2018 with Michael Baker International for the raw water line routing study, preliminary design, plat creation and the easement acquisition process for this portion of the project. A site evaluation study to recommend a location for the raw water pump station is currently being conducted under the South Rivanna River to Ragged Mountain Reservoir Water Line Right-of-Way Work Authorization with Baker. The construction schedule is currently under review as part of the FY 2020 - 2024 CIP update.

History:

Raw water is transferred from the Ragged Mountain Reservoir (RMR) to the Observatory Water Treatment Plant by way of two 18-inch cast iron pipelines, which have been in service for more than 110 and 70 years, respectively. The increased frequency of emergency repairs and expanded maintenance requirements are one impetus for replacing these pipelines. The proposed water line will be able to reliably transfer water to the expanded Observatory plant, which may eventually have the capacity to treat 10 million gallons per day (mgd). The new pipeline is expected to be constructed of 36-inch ductile iron and will approximately 14,000 feet in length. The opportunity to integrate the Observatory WTP raw water supply line with the proposed South Rivanna Reservoir to RMR raw water main project is currently being investigated as part of the approved 50-year Community Water Supply Plan.

The RMR to Observatory WTP raw water pump station is planned to replace the existing Stadium Road and Royal pump stations, which have exceeded their design lives or will require significant upgrades with the Observatory WTP expansion. The pump station will pump up to 10 million gallons per day (mgd) of raw water to the Observatory WTP. Integration of the new pump station with the planned South Rivanna Reservoir (SRR) to RMR pipeline is being considered in the interest of improved operational and cost efficiencies. An integrated pump station would also include the capacity to transfer up to 16 mgd of raw water from RMR back to the SRR WTP.

13. Crozet Flow Equalization Tank

Design Engineer:	Schnabel Engineering
Project Start:	October 2016
Project Status:	35% Design
Construction Start:	December 2019
Completion:	2021
Approved Capital Budget:	\$3,300,000

Current Project Estimate: \$4,860,000

Current Status:

A geotechnical analysis and report, field survey work, and existing pump station evaluation have all been completed as part of the design process. Design documents will be completed by June 2019.

History:

A 2016 update to the 2006 model was completed which evaluated the I&I reduction goals previously established and future capital project needs. Based on the results of that study, it was determined that the Crozet Interceptor system and namely the existing Crozet Pump Stations (1 through 4) have adequate capacity to handle the 2015 peak wet weather flow from the Crozet Service Area during a two-year storm. However, as projected growth in the service area occurs, peak wet weather flows in the area under the storm conditions established in the updated model will begin to exceed the firm capacities of the pump stations by 2025. Additional I&I reductions in order to reduce flows enough to not exceed the pump station firm capacities are not feasible and as a result, the construction of a flow equalization tank was identified as the best method to alleviate wet weather capacity issues.

While the study indicates that capacity should not be an issue until 2025, a flow equalization tank would also provide a significant benefit to the maintenance of the Crozet Pumping Station system which currently lacks system storage necessary to allow adequate time to perform repairs on the pumps and the associated force mains while the system is down. As a result, it is important to progress into the siting study for the flow equalization tank to ensure that it can be constructed in time for the 2025 flow targets but also to facilitate less complicated and more thorough maintenance on the system that has not been possible previously.

Greeley and Hansen completed a siting study to determine the location for the flow equalization tank based on the results of the comprehensive model update. The results of the siting study were reviewed with ACSA and a final tank location was determined.

A work authorization with Schnabel Engineering was finalized and a Project Kick-off Meeting was held on July 12, 2018. A data collection period has begun which includes a wetlands investigation of the project site and a topographic survey of the site has also been completed. An inspection of the existing Pump Station No. 4 is scheduled for September 20, 2018 where information on the control and electrical systems will be gathered.

14. Beaver Creek Dam Alterations

Design Engineer:	Schnabel Engineering
Project Start:	February 2018
Project Status:	5% Design
Construction Start:	TBD
Completion:	TBD
Approved Capital Budget:	\$8,830,000
Current Project Estimate:	\$15,000,000

Current Status:

A Preliminary Engineering Report has been completed for the selected design alternative. Final

design of the dam improvements is underway. The construction schedule is currently under review as part of the FY 2020 - 2024 CIP update.

History:

RWSA operates the Beaver Creek Dam and reservoir as the sole raw water supply for the Crozet Area. In 2011, an analysis of the Dam Breach inundation areas and changes to Virginia Department of Conservation and Recreation (DCR) *Impounding Structures Regulations* prompted a change in hazard classification of the dam from Significant to High Hazard. This change in hazard classification requires that the capacity of the spillway be increased. This CIP project includes investigation, preliminary design, public outreach, permitting, easement acquisition, final design, and construction of the anticipated modifications. Work for this project will be coordinated with the new relocated raw water pump station and intake and a reservoir oxygenation system project.

Schnabel Engineering developed three alternatives for upgrading the capacity of the Beaver Creek Dam Spillway in 2012. Following the adoption of a new Probable Maximum Precipitation (PMP) Study on December 9, 2015 and the release of DCR guidelines for implementing the PMP study in March of 2016, RWSA determined it would proceed with an updated alternatives analysis and Preliminary Engineering Report for upgrading the dam spillway. In 2017, RWSA entered into a term contract with Schnabel Engineering for dam-related engineering services. The design work for this project is being completed under Schnabel’s term contract.

Following the completion of an updated alternatives analysis by Schnabel Engineering, staff met with members of Albemarle County and ACSA staff to discuss the preferred alternative. It was determined that staff would proceed with design of a labyrinth spillway and chute through the existing dam with a bridge to allow Browns Gap Turnpike to cross over the new spillway.

15. Beaver Creek Raw Water Pump Station and Intake

Design Engineer:	Hazen & Sawyer
Project Start:	August 2018
Project Status:	Work Authorization Under Negotiation
Construction Start:	TBD
Completion:	TBD
Approved Capital Budget:	\$6,100,000
Current Project Estimate:	\$8,000,000

Current Status:

Staff is negotiating a Work Authorization (scope and fee) with Hazen and Sawyer for site selection work for the new Raw Water Pump Station and permitting for the Pump Station, Intake, and Beaver Creek Dam Upgrades. The overall project schedule is currently under review as part of the FY 2020-2024 CIP update.

History:

The Drinking Water Infrastructure Plan for the Crozet water service area, developed by Hazen and Sawyer, recommends installation of a new Raw Water Pump Station and Intake at the Beaver Creek Dam in order to meet new minimum instream flow requirements and provide adequate raw water pumping capacity to serve the growing Crozet community for the next 50 years. The pump station will be moved out of its existing location at the toe of the dam to a new location, to be determined

during design. The new intake structure will include enhanced controls to allow for access to the best quality water at any given time.

16. Crozet Interceptor Pump Station Rebuilds

Design Engineer:	TBD
Project Start:	July 2018
Project Status:	25% Design
Construction Start:	2019
Completion:	2023
Total Capital Project Budget:	\$525,000

Current Status:

The Maintenance Department has begun pump replacement work associated with this overall project. Staff is reviewing the overall scope of work for the project and will be coordinating other items with the Maintenance Department regarding schedule and preferred equipment and materials. Work will be performed via quote packages and the need for consultant assistance is being determined.

History:

The Crozet Interceptor Pump Stations were constructed in the 1980's and many of the components are still original. The project will include the replacement of pumps and valves at Pump Station No. 2 in order to improve pumping capabilities at this location and provide spare parts for the pumps at Pump Station No. 1. This work will also include roof replacements at all four pump stations, siding replacement for the wet well enclosure at Pump Station No. 3, and installation of a new water well at Pump Station No. 3. Components of this project will be coordinated and timed to properly coincide with the Crozet Flow Equalization Tank project.

17. Buck's Elbow & Crozet Waterball Tank Painting

Design Engineer:	TBD
Project Start:	Summer 2019
Project Status:	Work Authorization Under Negotiation
Construction Start:	Spring 2021
Completion:	Summer 2021
Approved Capital Budget:	\$1,200,000
Current Project Estimate:	\$1,340,000

Current Status:

Following selection of a consultant to complete the work, staff will begin negotiation of the first work authorization for design services for this project. Construction for this project is scheduled to begin in Spring 2021, following completion of the Crozet WTP Expansion in late 2020.

History:

The two million-gallon Bucks Elbow Ground Storage Tank provides finished water storage for the Crozet Area while the 50,000 gallon Crozet Waterball Tank serves as filter backwash storage at the Crozet Water Treatment Plant. Routine inspections of these tanks in 2012 indicated that the tanks would require recoating by 2020. The project includes recoating the interior and top-coating the exterior of both tanks as well as installation of an active mixing system at the Bucks Elbow Tank to

decrease stratification and improve overall water quality in the Crozet area. Minor repairs and improvements to both tanks will also be included in this work. Construction of the tank improvements are expected to begin in spring of 2021.

18. Valve Repair – Replacement (Phase 2)

Design Engineer:	N/A
Project Start:	July 2018
Project Status:	Contract Documents Under Negotiation
Construction Start:	Spring 2019
Completion:	Summer 2019
Total Capital Project Budget:	\$882,914

Current Status:

RWSA staff sent a Notice of Award to Garney Companies, Inc. on February 6, 2019, and the two parties are negotiating the Contract Documents. Construction is anticipated to start in Spring 2019.

History:

Isolation valves are critical for normal operation of the water distribution system and timely emergency response to water main breaks. Staff continuously reviews results from an ongoing Valve Exercising and Condition Assessment Program. This project will replace the highest-priority valves that are identified during the condition assessment as not operable and not repairable. In addition, valves that are identified in the condition assessment as being inoperable and repairable will be repaired as a part of the project. Phase 1 of the Valve Repair-Replacement Project replaced several inoperable and unrepairable valves in the North Rivanna Finished Water System. Phase 2 will continue replacing inoperable and unrepairable valves in the North Rivanna Finished Water System, but it will also replace (and potentially repair) valves on the South Rivanna, Crozet, Pantops, and Southern Loop Finished Water Systems. Once all specified valves have been repaired/replaced in Phase 2, the focus will shift to replacing older isolation valves in subsequent phases. Numerous valves in the North Rivanna and South Rivanna Finished Water Systems are 50+ years old and replacing these valves will enhance the resiliency and reliability of the two systems.

A Request for Bids (RFB) was issued on November 6, 2018. A Pre-Bid Conference was held on November 19, 2018. The first (and only) Addendum was issued on November 30, 2018. RWSA staff opened bids for the project on December 11, 2018. The RWSA Board of Directors approved the bid award recommendation and Capital Improvement Plan Budget Amendment on January 22, 2019.

19. MCAWRRF Digester Sludge Storage Improvements

Design Engineer:	TBD
Project Start:	Winter 2018-2019
Project Status:	Preliminary Design
Construction Start:	Spring 2019
Completion:	Fall 2019
Total Capital Project Budget:	\$265,000

Current Status:

Preparation of construction documents will begin this Winter. Implementation of this work will

commence after Digesters No. 2 and No. 3 are both coated and back in service. Cleaning of Digester No. 3 has just begun with coating completion anticipated in May 2019.

History:

With the second centrifuge installation, additional capacity for storage of digested sludge would provide the Authority operational flexibility it does not currently have. Additionally, the sole sludge storage tank at the MCAWRRF was constructed in 1959 of reinforced concrete and is in need of repairs. This project would convert one of the three existing anaerobic digesters (Digester No. 1) into a sludge storage tank through piping modifications, and would provide redundancy to the existing sludge storage tank so it can be removed from service, cleaned, inspected, and repaired with minimal impact to the existing sludge dewatering operations. The piping configuration would also allow flexibility for the anaerobic digester to be used as either an anaerobic digester or sludge storage tank as needed for operations. The scope of work would include piping modifications, hydraulic improvements, tank safety improvements such as handrail and lights, and structural improvements to the existing sludge storage tank roof.

20. MCAWRRF Aluminum Slide Gate Replacements

Design Engineer:	Hazen and Sawyer
Project Start:	November 2018
Project Status:	50% Design
Construction Start:	May 2019
Completion:	July 2019
Total Capital Project Budget:	\$470,000

Current Status:

A project kick-off meeting was held in November and preliminary design is underway. Staff is currently reviewing the design package for the UV Facility Slide Gate Replacement Project for which a quote package will be advertised.

History:

Several large aluminum slide gates are located at the influent side of the Moores Creek Pump Station. These gates allow staff to stop or divert flow to perform maintenance activities. After repeated attempts to access and repair the gates, it is now necessary to replace and modify the gate arrangement. The replacement includes new gates for greater flexibility and resiliency as well as significant influent flow bypass pumping. Likewise, there are several gates at the Ultraviolet disinfection facility that leak water, causing a reduced capacity of the facility. Replacement of these gates will restore the process to full capacity.

21. Glenmore Secondary Clarifier Coating

Design Engineer:	Short Elliot Hendrickson (SEH)
Project Start:	Fall 2018
Project Status:	Preliminary Design
Construction Start:	April 2019
Completion:	July 2019
Approved Capital Budget:	\$50,000
Current Project Estimate:	\$110,000

Current Status:

Engineering staff has developed specifications and is negotiating a fee with Lyttle Utilities for a change order to their MCAWRRF Digester Coating project for blasting and coating both clarifiers.

History:

The secondary clarifiers at the Glenmore facility were painted over 10-years ago. The clarifier environment is a particularly harsh environment subject to corrosive gases, grit abrasion and mechanical wear. Based on observations by operations staff, the coating system is in need of replacement to prevent deterioration and failure of the underlying metal superstructure. This project includes the cleaning and full coating of the clarifier.

22. Sugar Hollow Dam – Rubber Crest Gate Replacement and Intake Tower Repairs

Design Engineer:	Schnabel Engineering
Project Start:	January 2019
Project Status:	Work Authorization Under Negotiation
Construction Start:	2020
Completion:	2021
Approved Capital Budget:	\$940,000
Current Project Estimate:	\$1,140,000

Current Status:

Design will begin in early 2019 with construction to begin in 2020.

History:

In 1998, the Sugar Hollow Dam underwent a significant upgrade to improve structural stability and spillway capacity. The original metal spillway gates were replaced with a manufactured five-foot-high inflatable rubber dam that is bolted to the existing concrete structure. This rubber dam allows for the normal storage of water in the reservoir with the ability to be lowered during extreme storm events. The rubber dam has an approximate service life of twenty years and is therefore now due for replacement. The aging intake tower structure will be inspected and evaluated. Recommended repairs may include issues relating to the intake gate valves and tower walls, including repair or replacement of intake trash racks, and sealing/grouting of minor concrete wall cracks.

23. Scottsville WTP – Finished Water Metering Improvements

Design Engineer:	Short Elliot Hendrickson (SEH)
Project Start:	September 2018
Project Status:	75% Design
Construction Start:	May 2019
Completion:	July 2019
Total Capital Project Budget:	\$145,000

Current Status:

SEH is completing final design documents and bidding is anticipated for April.

History:

The Scottsville WTP is permitted to provide up to 0.25 MGD of potable drinking water to RWSA customers in the Scottsville service area. After water has been treated in the plant it is collected in an existing clearwell, which was constructed with the original facility. From the clearwell, the water is pumped into the distribution system by one of the two high service pumps. The flow from these pumps is not metered. In order to keep a record of the total flow entering the Scottsville system, plant operators must periodically conduct draw-down tests to verify the pumping rate of each of the two pumps. The total flow is then calculated based on the run time of each pump. This method of measuring flow is not accurate, as the pumping rate will vary based on the clearwell level and the hydraulic grade line of the distribution system. In addition, the Virginia Department of Health has indicated that the flow should be metered during recent conversations related to the disinfection profile calculation throughout the plant. The purpose of this project is to install a finished water meter at the plant.

24. South Rivanna Dam – Gate Repairs

Design Engineer:	Schnabel
Project Start:	July 2019
Project Status:	Work Authorization Development
Construction Start:	Unknown at this time
Completion:	2020
Total Capital Project Budget:	\$900,000

Current Status:

Design will begin in July 2019 with construction in 2020, pending preliminary findings.

History:

The South Rivanna Dam, originally constructed in 1965, is equipped with two 36” diameter slide gates and conduits, one each on the north and south abutments of the dam, which can be utilized to dewater the facility or to meet minimum instream flow (MIF) requirements when the dam is not spilling. These gates are original to the dam and while they are operable and are exercised regularly, they can no longer provide a complete seal, therefore allowing some leakage through the dam. RWSA has protocols in place to temporarily stop leakage through the gates when necessary to conserve water; however, there is a desire to repair or replace the gates and components as needed to restore full functionality. The project includes other repairs to the facility, including improvements to the concrete wall adjacent to the Raw Water Pump Station as well as improvements to the north dam tower to provide safer access by staff while still discouraging access by the general public.

25. Avon to Pantops Water Main (on hold until completion of the Urban Water Master Plan)

Design Engineer:	Michael Baker International (Baker)
Project Start:	August 2017
Project Status:	Preliminary Engineering Report
Construction Start:	2020
Completion:	2022
Total Capital Project Budget:	\$13,000,000

Current Status:

Route alignment determination, hydraulic modeling, and preliminary design were underway. Due to the complicated nature of our finished water systems, it was decided at the August 2018 Board meeting that a more comprehensive approach is warranted and we should complete the Finished Water Master Plan prior to moving forward with final design and construction of the Avon to Pantops Water Main. This project is on hold.

History:

The focus of this project is on the southern half of the urban area water system which is currently served predominantly by the Avon Street and Pantops water storage tanks. The Avon Street tank is hydraulically well connected to the Observatory Water Treatment Plant while the Pantops tank is well connected to the South Rivanna Water Treatment Plant. The hydraulic connectivity between the two tanks, however, is less than desired, creating operational challenges and reduced system flexibility. In 1987, the City and ACSA developed the Southern Loop Agreement which laid out two key phases (with the first being built at the time). The 1987 Agreement and planning efforts will service as a starting point for this current project. An engineering contract has been negotiated and was approved by the Board of Directors in July 2017.

26. South Fork Rivanna Reservoir to Ragged Mtn. Reservoir Water Line Right-of-Way

Design Engineer:	Michael Baker International (Baker)
Project Start:	October 2017
Project Status:	Preliminary Engineering Report
Completion:	2021
Total Capital Project Budget:	\$2,295,000

Current Status:

A Draft PER was completed in January 2019 and is currently under review. Easement acquisition negotiations with all of the property owners are expected to begin by May 2019. Many of the properties are owned by the VDOT, Albemarle School Board, UVA Foundation and the City of Charlottesville.

History:

The approved 50-year Community Water Supply Plan includes the future construction of a raw water line from the South Fork Rivanna Reservoir to the Ragged Mountain Reservoir. This water line will replace the existing Upper Sugar Hollow Pipeline along an alternative alignment to increase raw water transfer capacity in the Urban Water System. The preliminary route for the water line followed the proposed Route 29 Charlottesville Bypass; however, the Bypass project was suspended by VDOT in 2014, requiring a more detailed routing study for the future water line. This project includes a routing study, preliminary design and preparation of easement documents, as well as acquisition of water line easements along the approved route.

Baker is now completing the routing study. Preliminary design, plat creation and the acquisition of easements will take place as soon as the final route determination has been made. Property owners have been contacted to request permission to access properties for topographical surveying which will take place following completion of the PER. A recommendation for a tentative final alignment was presented at a community information meeting in June 2018.

27. Urban Water Demand and Safe Yield Study

Design Engineer:	Hazen and Sawyer
Project Start:	November 2018
Project Status:	20% complete
Completion:	August 2019
Total Capital Project Budget:	\$154,000

Current Status:

A work authorization with Hazen and Sawyer has been executed and data is being compiled from RWSA, ACSA and the City. A kick-off meeting was held on December 12, 2018. Additional meetings with various departments at the City, County and ACSA were held in mid-January to gather information on population trends. Bathymetric studies of the South Rivanna and Ragged Mtn Reservoirs will be completed by March 2019.

History:

The City of Charlottesville, Albemarle County Service Authority, and RWSA entered into the Ragged Mountain Dam Project Agreement in 2012. This Agreement included provisions to monitor the bathymetric capacity of the Urban water reservoirs as well as a requirement to conduct reoccurring demand analysis, demand forecasting and safe yield evaluations. This study will evaluate and calculate current and future demands and present safe yield. Per the project Agreement, these analyses shall be completed by calendar year 2020.

28. Urban Finished Water Infrastructure Master Plan

Design Engineer:	Michael Baker International (Baker)
Project Start:	November 2018
Project Status:	15% complete
Completion:	January 2020
Total Capital Project Budget:	\$253,000

Current Status:

Work on this project has begun following the project kick-off meeting in January 2019.

History:

As identified in the 2017 Strategic Plan, the Authority has a goal to plan, deliver and maintain dependable infrastructure in a financially responsible manner. Staff has identified asset master planning as a priority strategy to improve overall system development. Many previously identified projects in the urban finished water treatment and distribution system are in preliminary engineering, design or construction. As such, staff have identified a need to develop a current and ongoing finished water master plan.

29. South Rivanna River Crossing and North Rivanna Transmission Main

Design Engineer:	Michael Baker International (Baker)
Project Start:	July 2020
Project Status:	Planning

Construction Start:	2021
Completion:	2023
Total Capital Project Budget:	\$5,340,000

Current Status:

An update to the Airport Zone Study Report was completed in summer of 2018, confirming the need for and timing of the river crossing and transmission main. Design of the project will begin in summer 2020.

History:

RWSA has previously identified through master planning that a 24-inch water main will be needed from the South Rivanna Water Treatment Plant (SRWTP) to Hollymead Town Center to meet future water demands. Two segments of this water main were constructed as part of the VDOT Rt. 20 Solutions projects, including approximately 10,000 LF of 24-inch water main along Rt. 29 and 600 LF of 24-inch water main along the new Berkmar Drive Extension, behind the Kohl’s department store. To complete the connection between the SRWTP and the Airport Road Pump Station Site, RWSA plans to construct a new river crossing at the South Fork Rivanna River and two “gap” sections of 24-inch water main between the already completed sections. Much of the new water main route is within VDOT right-of-way; however, acquisition of right-of-way will be required at the river crossing and on the Kohl’s Property at Hollymead Town Center.

30. Route 29 Pump Station

Design Engineer:	Michael Baker International (Baker)
Project Start:	July 2019
Project Status:	Planning
Construction Start:	2021
Completion:	2022
Total Capital Project Budget:	\$2,300,000

Current Status:

Design of the pump station is anticipated to begin in the summer of 2019.

History:

The Rt. 29 Pipeline and Pump Station master plan was developed in 2007 and originally envisioned a multi-faceted project that reliably connected the North and South Rivanna pressure bands; reduced excessive operating pressures, and developed a new Airport pressure zone to serve the highest elevations near the Airport and Hollymead Town Center. The master plan update was completed in June of 2018 to reflect the changes in the system and demands since 2007. This project, along with the South Rivanna River Crossing and North Rivanna Transmission Main project, will provide a reliable and redundant finished water supply to the North Rivanna area. The proposed pump station will be able to serve system demands at both the current high pressure and future low pressure conditions. These facilities will also lead to future phase implementation which will include a storage tank and the creation of the Airport water pressure zone.

31. South Rivanna Hydropower Plant Decommissioning

Consultant:	Gomez and Sullivan
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Project Start:	October 2016
Project Status:	Exemption Surrender Process – Phase 2 Underway
Construction Start:	2019
Completion:	2020
Approved Capital Budget:	\$400,000
Current Project Estimate:	\$750,000

Current Status:

A consultation document was provided to local regulatory agencies and a meeting was held on May 21, 2018 with the agencies to discuss the decommissioning process. Minor comments were provided by those agencies and development of the surrender application for submission to FERC is underway. As part of the application, a draft decommissioning plan has been developed and is being reviewed by RWSA. Due to a recent significant wet weather event, returning the 72-inch diameter penstock to a reservoir drain has been evaluated by Gomez and Sullivan. Modifications to the decommissioning plan are being developed to incorporate that into the project.

History:

RWSA constructed a hydropower plant at the South Fork Rivanna Dam in 1987. Power generation at the plant was limited for a number of years due to various mechanical issues. In December 2011, RWSA retained HDR to perform a mechanical and electrical equipment assessment and to provide recommendations for capital expenditures and continued operation. This assessment identified the need to perform a number of mechanical and electrical modifications to improve operation of the hydropower plant. On June 16, 2013, while the plant was down for testing associated with repairs to the speed reducer and generator, the powerhouse flooded during a heavy rainfall event. A post-flood inspection indicated that the rising water damaged the electrical equipment. In addition to electrical system issues, the turbine blades were “stuck” and inoperable prior to the flood event. Prior to beginning any rehabilitation work on the hydropower plant, it was determined that a feasibility study should be performed that reviewed previous recommendations and took into account interaction with the Federal Energy Regulatory Commission (FERC) to determine if it was cost effective for RWSA to rehabilitate the facility. The feasibility study was conducted by Gomez and Sullivan and concluded that rehabilitation of the facility would most likely not provide a return on investment based on current market conditions. Staff recommended that RWSA proceed with surrendering the exemption to licensure with FERC and decommission the facility. During the meeting on October 25, 2016, the Board of Directors agreed with the recommendation and staff began to proceed with the surrender process.

Work associated with the first phase of the exemption surrender process with Gomez and Sullivan and Van Ness Feldman was completed confirming with FERC what the next steps in the surrender process would include. A work authorization with Gomez and Sullivan for Phase 2 of the exemption surrender process was finalized in August 2017 and includes tasks to manage the local regulatory agencies consultation process and development of the surrender application and decommissioning plan.

32. Security Enhancements

Design Engineer:	TBD
Project Start:	July 2018

Project Status:	Planning
Construction Start:	2019
Completion:	2021
Total Capital Project Budget:	\$2,400,000

Current Status:

RWSA Engineering staff has begun addressing priority items discussed during the meeting it held with RWSA Operations staff in October 2018 and determining which portions of the project will require additional input from various RWSA departments. RWSA staff has met with ACSA and City staff to discuss how access control and intrusion detection systems have been implemented into the day-to-day operations of the respective utilities. Meetings with additional utilities and organizations will be conducted as needed to gain additional perspective on access control and other security measures. It is expected that a Request for Proposal (RFP) will be issued by RWSA staff in order to facilitate the selection of an access control system. The selected access control system will be implemented into the CZWTP, OBSWTP, and SRWTP expansion/improvement projects as an initial measure, with additional facilities to follow. As the project’s scope of work is refined, a consultant will be selected to provide project assistance where needed.

History:

As required by the Federal Bioterrorism Act of 2002, water utilities must conduct Vulnerability Assessments and have Emergency Response Plans. RWSA recently completed an updated Risk Assessment of its water system in collaboration with the Albemarle County Service Authority (ACSA), City of Charlottesville (City), and University of Virginia (UVA). A number of security improvements that could be applied to both the water and wastewater systems were identified. The purpose of this project will be to install security improvements at RWSA facilities including additional security gate and fencing components, vehicle bollards, facility signage, camera system enhancements, additional security lighting, intrusion detection systems, door and window hardening, installation of industrial strength locks, communication technology and cable hardening, and an enhanced access control program.

33. Upper Schenks Branch Interceptor, Phase II

Design Engineer:	Frazier Engineering, P.A.
Project Start:	TBD
Project Status:	Planning
Construction Start:	TBD
Completion:	TBD
Approved Capital Budget:	\$4,485,000
Current Project Estimate:	\$3,985,000

Current Status:

Discussions are underway to determine an alignment for the replacement sewer line, generally located between the McIntire Recycling Center and Preston Avenue along McIntire Road. As part of this process, some additional subsurface exploration work will be conducted starting next month to gather rock information along the alignment in McIntire Road as well as across the ballfield.

History:

The Schenks Branch Sanitary Sewer interceptor is a pipeline operated by RWSA that serves the City

of Charlottesville. The 21-inch sewer line was originally constructed by the City in the 1950s. Evaluations from the flow metering and modeling from the Comprehensive Sanitary Sewer Interceptor Study, and negotiations with the ACSA and City, resulted in an inflow and infiltration reduction plan from which it was concluded that increased capacity of the Schenks Branch Interceptor was needed for wet weather peak flow. Due to several road construction projects and the construction of the Meadow Creek Interceptor project along the sewer alignment, Schenks Branch was to be constructed in multiple phases. The completed sections, collectively known as the Lower Schenks Branch Interceptor, include the Tie-in to Meadow Creek, the section along McIntire Road Ext, and the section through the Route 250 Interchange.

The remaining sections, which are considered the Upper Schenks Branch Interceptor, were split into 2 phases. The first phase has been completed and is located within City-owned Schenks Greenway adjacent to McIntire Road and the second phase is to be located on County property (baseball field and County Office Building) adjacent to McIntire Road or within McIntire Road. Both phases are included in a DEQ Consent Order. As a result of discussions between RWSA and DEQ, DEQ approved a milestone schedule for completing the Phase 1 section by March 31, 2017 and set in “abeyance” a schedule for completing work on Phase 2 as a result of complications associated with the execution of the necessary easements. Phase 2, preliminary construction drawings and specifications have been developed. No new agreements concerning right-of-way have been reported to RWSA regarding Phase 2. No bidding or construction can take place until one of the following two options occur: (1) County grants RWSA a suitable easement on County property; or (2) City grants RWSA permission and a street cut permit to install the sewer directly under McIntire Road.

34. Engineering and Administration Building

Design Engineer:	Dewberry
Project Start:	April 2018
Project Status:	Space Needs Analysis
Construction Start:	2021
Completion:	2023
Total Capital Project Budget:	\$3,000,000

Current Status:

An assessment of space needs for the departments housed within the existing Administration Building and Engineering Building has been completed and layouts for an expanded Administration Building have been developed along with a draft final report. The report and layouts are being reviewed by a committee at RWSA to provide any additional comments before the documents are finalized. The proposed FY 2020 – 2024 CIP delays this project beyond FY 2024.

History:

RWSA currently has its administrative headquarters in two buildings on the grounds of the MCAWRRF. The two-story Administration Building was constructed in the early 1980’s and houses offices, IT server space, meeting space, and a full-service laboratory. The second building is a series of four trailers installed in between 2003-2010 that house the engineering department. The Administration Building is located at the head of the wastewater treatment plant and is surrounded by underground piping and process functions that may conflict with existing parking and/or the building in a future expansion. There is currently a need to house additional staff; increase office

and meeting space; plan for the replacement of the trailers; bring IT server workrooms to modern standards; and provide classroom space for education outreach. Staff has procured a consultant to perform a space needs analysis and provide recommendations on how to address future building needs.

35. Asset Management Plan

Design Consultant:	GHD, Inc.
Project Start:	July 2018
Project Status:	65% Complete (Phase 1)
Completion:	2020
Total Capital Project Budget:	\$500,000

Current Status:

As part of the first phase, Asset Management awareness training and workshops related to Asset Management Program Development, the Gap Assessment process, and development of an Asset Management Policy have been conducted.

History:

Asset management is the practice of managing our infrastructure to minimize the total cost of owning and operating these assets while providing desired service levels. In doing so, it is used to make sure planned maintenance activities take place and that capital assets are replaced, repaired or upgraded at the right time, while ensuring that the money necessary to perform those activities is available. RWSA has some components of an asset management program in place (i.e. GIS, work order system), but has identified the need to further develop the program as part of our Strategic Planning process. In order to continue to build the program, a consultant has been procured to assist with a three-phase process that will include facilitation and development of an asset management strategic plan, development and management of a pilot study where the results of the strategic plan will be applied to a specific class of assets, and assistance through a full implementation process. As part of this three-phase process, the consultant will also assist RWSA with the procurement of a software package to facilitate the overall program.

O&M Related Projects

Staff is currently working on several O&M related projects within the water and wastewater systems as listed below:

#	Project Description	Total Approx. Value
35	NRWTP Raw Water Metering Improvements	\$135,000
36	NRWTP Sludge Lagoon Study and WTP Needs Assessment	\$60,100
37	NRWTP High Service Pump Replacement	\$200,000
38	MCAWRRF Cogeneration System Analysis	\$48,300
39	SRWTP Future Site Development Analysis	\$15,000

- **NRWTP Raw Water Metering Improvements**

The NRWTP is permitted to provide up to 2.0 MGD of potable drinking water to customers located in the Urban service area. After water is pumped from the raw water pump station on the North Fork

Rivanna River, the raw water flow is metered by an orifice plate, or insert style meter, prior to entering the rapid mix chamber. The meter is located behind the existing powdered activated carbon feed system and is difficult to access. In addition, RWSA recognizes that the accuracy of this style of meter is reduced by laying length conditions in comparison to modern magnetic flow meters which have been installed at other locations. RWSA is working with SEH to develop contract documents to have a magnetic flow meter installed on the raw water line in an exterior below grade vault. The schedule for bidding of this work will be dependent on the availability of funds.

- NRWTP Sludge Lagoon Study and WTP Needs Assessment

The two lagoons or settling ponds at the plant are earthen basins designed to capture and hold residuals generated through the treatment process as well as periodic draining and washdown of the sedimentation and flocculation basins. The basins were designed to allow all the residuals and solids to settle out and then the clarified water to be decanted and conveyed to the river. The operational use of these lagoons is not as originally intended, and the Virginia Department of Environmental Quality has concerns regarding their condition. A study is being performed to determine how they can be improved, and other locations on site that may be less prone to flood waters. Under this project, a needs assessment at the plant will be also be performed and updated.

- NRWTP High Service Pump Replacement

The two existing high service pumps at the NRWTP were installed when the plant was originally constructed in 1974 and as a result have reached the end of their serviceable lives. Due to excessive maintenance needs and concerns regarding their reliability, RWSA worked with SEH to develop quote packages for the procurement of the pumps and then installation. Quotes have been received for the procurement of the pumps and installation and the work anticipated to begin in mid-February 2019.

- MCAWRRF Cogeneration System Analysis

The MCAWRRF currently utilizes a cogeneration facility which accepts digester gas and uses it to create electricity and heat. The facility was put into operation in 2011. The generator supplies power back to the plant electrical distribution system providing energy usage savings through offsetting usage through the electric utility. Unfortunately, there have been a number of issues associated with operation of the generator including, expensive and proprietary maintenance services and temperature issues. With a significant and expensive scheduled maintenance event forthcoming, RWSA wanted to conduct a study to determine if these issues could be resolved or if there was a more efficient way to utilize the digester gas. This study will evaluate options for improvements to the existing system or new systems that could be implemented along with estimated costs and returns on investment. The study is expected to be completed by March 2019.

- SRWTP Future Site Development Analysis

As future water demands increase, facility expansions and additions at the SRWTP site are proposed to continue. At some point in the future, RWSA plans to increase the capacity at the SRWTP to 16 MGD along with preliminary plans for a 41 MGD raw water pump station and a 25 MGD pretreatment facility associated with the future transfer of raw water from the South Rivanna Reservoir to the Ragged Mountain Reservoir. With property development activity increasing near

the plant, the intent of this analysis is to confirm what approximate space would be needed to meet the plant's future needs in order to better determine future property requirements. The analysis is expected to be completed by March 2019.

MEMORANDUM

**TO: RIVANNA WATER & SEWER AUTHORITY
BOARD OF DIRECTORS**

FROM: DAVE TUNGATE, DIRECTOR OF OPERATIONS

REVIEWED BY: BILL MAWYER, EXECUTIVE DIRECTOR

SUBJECT: OPERATIONS REPORT FOR JANUARY 2019

DATE: FEBRUARY 26, 2019

WATER OPERATIONS:

The average daily/monthly total water distributed for January 2019 was as follows:

<i>Water Treatment Plant</i>	<i>Average Daily Production (MGD)</i>	<i>Total Monthly Production (MG)</i>	<i>Maximum Daily Production in the Month (MGD)</i>
Observatory	1.82	56.49	2.16 (1/03/19)
South Rivanna	5.37	166.41	6.73 (1/29/19)
North Rivanna	<u>0.32</u>	<u>10.04</u>	0.39 (1/28/19)
<i>Urban Total</i>	7.51	232.94	8.68 (1/29/19)
Crozet	0.540	16.72	0.90 (1/31/19)
Scottsville	<u>0.047</u>	<u>1.44</u>	0.066 (1/22/19)
<i>RWSA Total</i>	8.10	251.10	---

- All RWSA water treatment facilities were in regulatory compliance during the month of January.

Status of Reservoirs (as of February 21 , 2019):

- Urban Reservoirs: 100 % of Total Useable Capacity
- Ragged Mountain Reservoir is full (100%)
- Sugar Hollow Reservoir is full (100%)
- South Rivanna Reservoir is full (100%)
- Beaver Creek Reservoir is full (100%)
- Totier Creek Reservoir is full (100%)

WASTEWATER OPERATIONS:

All RWSA Water Resource Recovery Facilities (WRRFs) were in regulatory compliance with their effluent limitations during the month of January 2019. Performance of the WRRFs in January was as follows compared to the respective VDEQ permit limits:

WRRF	Average Daily Effluent Flow (mgd)	Average CBOD₅ (ppm)		Average Total Suspended Solids (ppm)		Average Ammonia (ppm)	
		RESULT	LIMIT	RESULT	LIMIT	RESULT	LIMIT
Moores Creek	11.7	<QL	10	0.1	22	0.12	2.0
Glenmore	0.155	2.8	15	4.2	30	0.77	NL
Scottsville	0.089	2.4	25	7.9	30	0.11	NL
Stone Robinson	0.002	NR	30	NR	30	NR	NL

NR = Not Required

NL = No Limit

<QL: Less than analytical method quantitative level (2 ppm for CBOD, and 1 ppm for TSS).

Nutrient discharges at the Moores Creek AWRRF were as follows for January 2019:

State Annual Allocation (lb./yr.)		Average Monthly Allocation (lb./mo.)*	Moores Creek Discharge (lb./mo.)	Performance as % of Average Allocation*
Nitrogen	282,994	23,583	11,473	49%
Phosphorous	18,525	1,544	210	14%

*State allocations are expressed as annual amounts. One-twelfth of that allocation is an internal monthly benchmark for comparative purposes only.

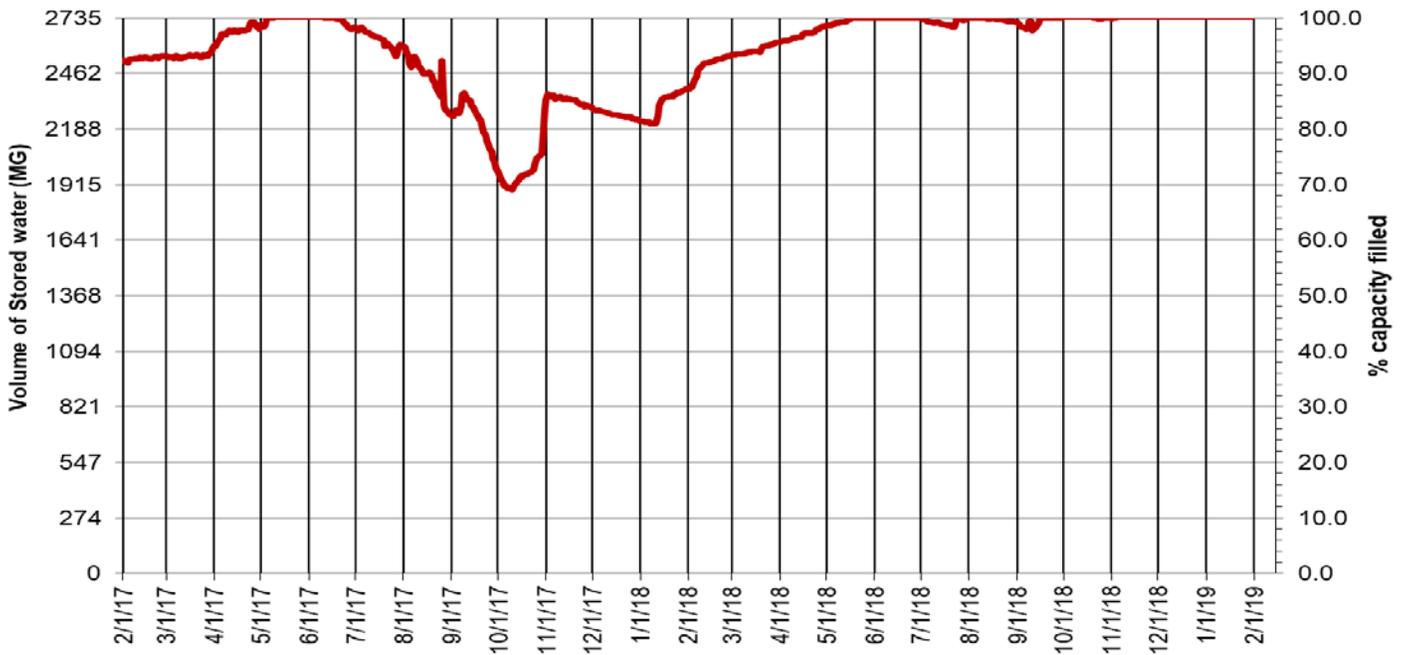
WATER AND WASTEWATER DATA:

The following graphs are provided for review:

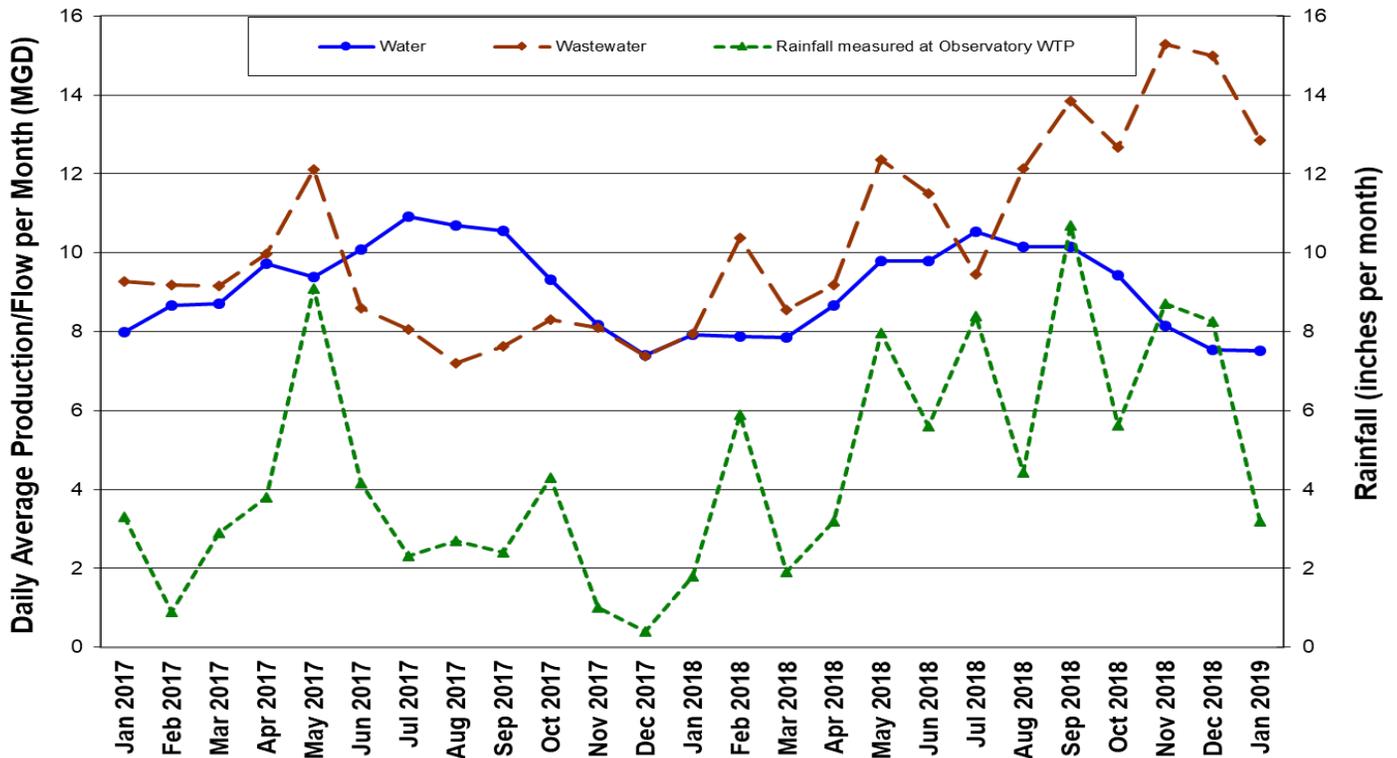
- Usable Urban Reservoir Water Storage
- Urban Water and Wastewater Flows versus Rainfall

Usable Urban Reservoir Water Storage

Maximum 2,735 MG after 10/1/16



Urban Water and Wastewater Flows versus Rainfall





STRATEGIC PLAN QUARTERLY UPDATE

1st Quarter – 2019

Report to the Board of Directors
February 26, 2019

RIVANNA
WATER AND SEWER AUTHORITY
& SOLID WASTE AUTHORITY

Goal Team Composition

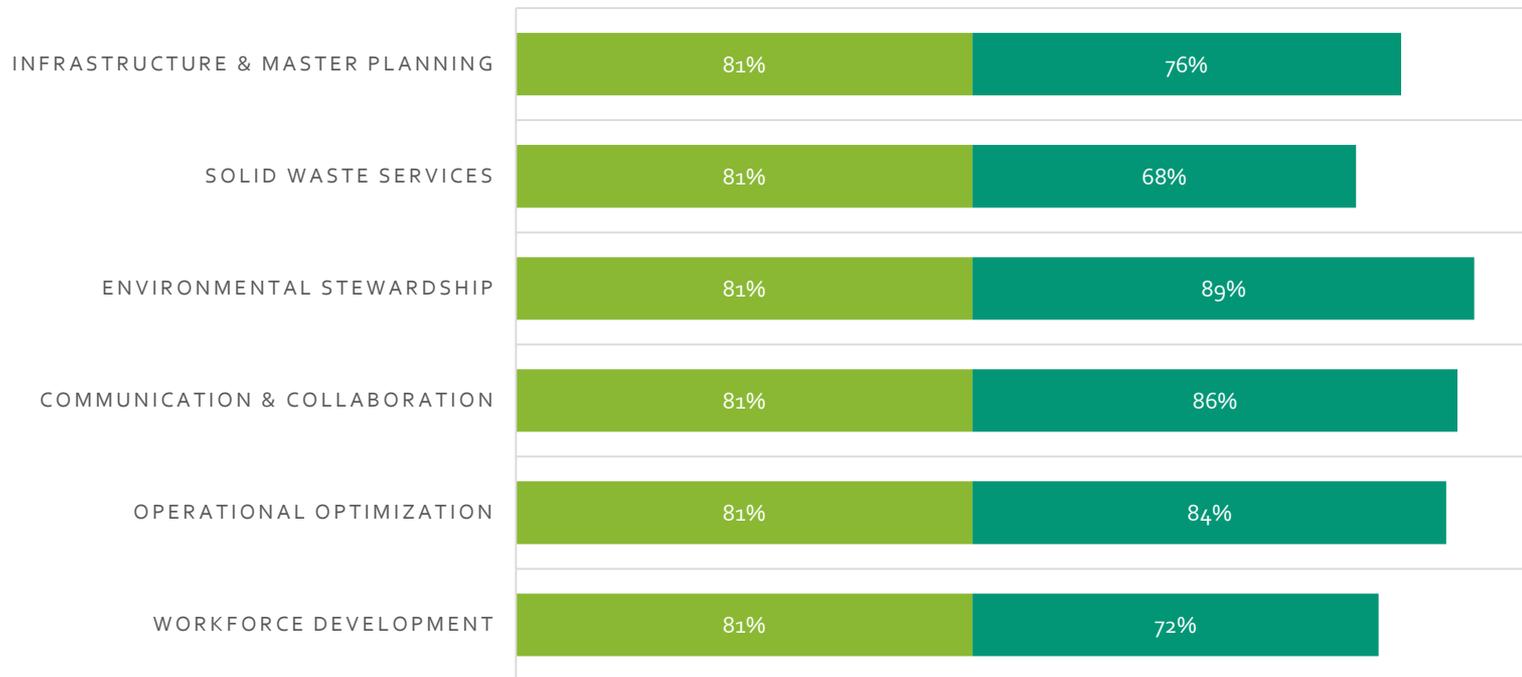
Goal	Champion
Communications	Katie McIlwee
Environmental Stewardship	Andrea Terry
Solid Waste Services	Phil McKalips
Workforce Development	Betsy Nemeth / Lonnie Wood
Infrastructure	Scott Schiller
Operational Optimization	David Tungate



By the Numbers

Overall plan completion: **79%**

Expected Completed



Workforce Development Tactics

Strategies:

- A. Develop a comprehensive staffing, classification, & compensation plan
 - B. Conduct a training needs assessment & enhance the training program
-

Recent Activity:

- A. Reviewed annual staffing needs; recommendations to be included in annual budget
- B. Continued work with PVCC for training – Safety & Operator Leadership Training
- C. First draft of Individual Development Plan document complete

Next Steps:

- A. Review of pay scale for adjustments
- B. Review IDP document with Leadership team
- C. Roll out individual employee development plans

PROGRESS STATUS



TACTIC COMPLETION



Operational Optimization Tactics

Strategies:

- A. Continually evaluate, prioritize, & improve key business & operational processes
- B. Protect our workforce & the public through continually growing a culture of safety

Recent Activity:

- A. Hired safety consultant to develop Safety Master Plan
- B. Installation of security systems in South Rivanna and Crozet WTPs; new web based cameras purchased for safety and security
- C. Completed corrosion inhibitor study

Next Steps:

- A. Complete Safety Master Plan
- B. Complete sealing of digester #3
- C. Implement corrosion inhibitor study recommendations

PROGRESS STATUS



TACTIC COMPLETION



Communication & Collaboration Tactics

Strategies:

- A. Create & maintain internal communication platforms
- B. Create & implement a comprehensive public outreach plan

Recent Activity:

- A. Analyzed web statistics to enhance usability of the Rivanna website
- B. Completed Employee Portal

Next Steps:

- A. Continue to coordinate with City, County, ACSA, and RCA on RiverFest
- B. Begin coordination with IT to research and test internal communications platforms
- C. Resume standardizing records management protocols once IT Master Plan is complete

PROGRESS STATUS



TACTIC COMPLETION



Environmental Stewardship Tactics

Strategies:

- A. Increase internal environmental engagement
- B. Designate resources to support environmental outreach & green initiatives

Recent Activity:

- A. Added Environmental Tips section to the employee newsletter
- B. Identified topics for inclusion on the Employee Portal
- C. Identified & requested funding in budget for green initiatives

Next Steps:

- A. Submit drafts of items for Employee Portal
- B. Coordinate staff to participate in a stream clean-up through RCA
- C. Continue to coordinate with City, County, ACSA, and RCA on RiverFest

PROGRESS STATUS



TACTIC COMPLETION



Solid Waste Services Tactics

Strategies:

- A. Determine community needs & preferred service levels
- B. Enhance partnerships with local governments & the University of Virginia

Recent Activity:

- A. Completed Ivy Master Plan
- B. Reduced MSW and CDD tipping fees at Ivy; communicated with large haulers
- C. Researched possibility of opening Ivy MUC on Mondays

Next Steps:

- A. Present Ivy Master Plan to Board; begin to implement suggestions
- B. Present opening Ivy MUC on Mondays to the Board

PROGRESS STATUS



TACTIC COMPLETION



Infrastructure & Master Planning Tactics

Strategies:

- A. Implement an Authority-wide asset management program
 - B. Develop & maintain long-term master plans for all critical asset classes
-

Recent Activity:

- A. Completed Asset Management Plan Awareness Training and Program Development Workshops
- B. Worked with GIS Coordinator to organize current asset information
- C. Reviewed current master plan needs and the role of the Champions

Next Steps:

- A. Continue to organize asset information & complete the effort as part of the Asset Management Plan development process
- B. Develop matrix to track and manage master plan needs
- C. Work to determine who the asset class champions should be & role responsibilities

PROGRESS STATUS



TACTIC COMPLETION



QUESTIONS?

Strategies

1. Workforce Development

- A. Develop a comprehensive staffing, classification, & compensation plan
- B. Conduct a training needs assessment & enhance the training program

2. Operational Optimization

- A. Continually evaluate, prioritize, & improve key business & operational processes
- B. Protect our workforce & the public through continually growing a culture of safety

3. Communication & Collaboration

- A. Create & maintain internal communication platforms
- B. Create & implement a comprehensive public outreach plan

4. Environmental Stewardship

- A. Increase internal environmental engagement
- B. Designate resources to support environmental outreach & green initiatives

5. Solid Waste Services

- A. Determine community needs & preferred service levels
- B. Enhance partnerships with local governments & the University of Virginia

6. Infrastructure & Master Planning

- A. Implement an Authority-wide asset management program
- B. Develop & maintain long-term master plans for all critical asset classes

Workforce Development Tactics

Develop a comprehensive staffing, classification, & compensation plan

- Implement approved pay grade schedule - July 1
- Develop Master Staffing Plan
- Review staffing plans with BOD, gain approval (CONCEPTUALLY) of plan, formal approval will occur in budget approval for next fiscal year's new positions
- Continued annual review of staffing needs at an executive level

Conduct a training needs assessment & enhance the training program

- 12 month training calendar
- PVCC Leadership Training
- Employee Development Plans
- New Employee Training - scheduling, comm., trainers, ON-BOARDING specific to positions
- Training communication and scheduling

Operational Optimization Tactics

Continually evaluate, prioritize, & improve key business & operational processes

- Inventory and prioritize critical business and operational processes
- Identify key performance indicators for each department
- Research appropriate benchmarks/best practices
- Select one key business or operational process to improve as a pilot
- Create training to support efficiency and effectiveness improvements

Protect our workforce & the public through continually growing a culture of safety

- Identify and prioritize 10 safety concerns in each department regarding design engineering, operations, and preventative maintenance
- Research successful public-sector safety programs, including health and safety audits for project design
- Develop and communicate guidance for safety incident reporting, near misses, and suggestions
- Monitor and evaluate the outcomes from the vulnerability assessment
- Develop recommendations to improve cyber security

Communication & Collaboration Tactics

Create & maintain internal communication platforms

- Inventory current internal communications efforts and ensure all employees have equal access to internal communications
- Collaborate with Employee Council
- Create internal communication “trees” for specific types of information (e.g. safety, emergency information, on-boarding/off-boarding, etc.)
- Research and develop a digital communications protocol"
- Review SOPs for job duties
- Standardize records management protocols

Create & implement a comprehensive public outreach plan

- Inventory current public outreach activities
- Research communication planning best practices
- Develop communication service level agreements with ACSA and the City of Charlottesville
- Create communication contact lists (names, roles, responsibilities) for City of Charlottesville, Albemarle County, ACSA, and UVA
- Evaluate social media outreach options, including Facebook
- Partner with local schools and civic groups for facility tours and environmental education

Environmental Stewardship Tactics

Increase internal environmental engagement

- Inventory green initiatives
- Partner with Community/env'l groups
- Research other Organizations on green initiatives
- Identify Environmental Engagement goals
- Develop communication tools
- Create Green Road shows

Designate resources to support environmental outreach & green initiatives

- Create a standing Employee Environmental Committee (structure)
- Create a staffing plan (existing and potential new position) Coordinate with Workforce Development
- Develop an annual budget for green initiatives and activities

Solid Waste Services Tactics

Determine community needs & preferred service levels

- Research Existing Solid Waste and Recycling Practices/Data
- Communicate Data and Existing Services to Public
- Design Outreach
- Conduct Outreach
- Analyze Outreach Data
- Report on Outreach Results to Exec. Dir. & Board

Enhance partnerships with local governments & the University of Virginia

- List Potential Partnership Organizations (POs)
- Identify Points of Contact for each PO
- Craft Message (what we are, resources we have, what we do)
- Contact Pos; discuss our resources, operations, needs; define their resources, needs, operations
- Evaluation Process (turn #4 into possible Programs and evaluate)
- Present possible Programs to Exec. Dir. and Board for action (and, if needed, funding)
- Implement

Infrastructure & Master Planning Tactics

Implement an Authority-wide asset management program

- Develop an RFP for an Asset Management Plan
- Create an Asset Management Committee and Prepare for AM
- Identify and Meet Short Term Software Needs
- Procure Consultant Assistance (Phase 1 - Strategic Plan)
- Organize Current Asset Information
- Develop an Asset Management Strategic Plan

Develop & maintain long-term master plans for all critical asset classes

- Inventory all existing master plans
- Identify existing master plan obligations
- Conduct gap analysis to get to comprehensive master plans
- Classify all critical asset classes, functions, and departments that require master planning (in conjunction with Strategy 1, Tactic 5)
- Assign champions to asset class master plans
- Create a process to ensure that master plan-prioritized recommendations are linked to capital improvement program

MEMORANDUM

**TO: RIVANNA WATER & SEWER AUTHORITY
BOARD OF DIRECTORS**

FROM: BILL MAWYER, EXECUTIVE DIRECTOR

SUBJECT: INTRODUCTION OF FY 2020 - 2024 CAPITAL IMPROVEMENT PLAN

DATE: FEBRUARY 26, 2019

The proposed Five-Year Capital Improvement Plan (CIP) totaling \$99.5 million for Fiscal Years 2020-2024 is being submitted for your review. This CIP was developed to strategically and proactively provide water and wastewater infrastructure in a financially responsible manner for our customers and the community.

The proposed CIP includes \$60 million for urban water projects and \$17.1 million for urban wastewater projects, along with \$22.4 million for non-urban water and wastewater projects. The proposed CIP represents a 35% decrease from the prior year's FY 2019-2023 CIP, which totaled \$153.9 million. A number of projects from last year's CIP have been extended or delayed beyond the proposed CIP, primarily to level rate increases to our customers. Major objectives and projects in the proposed CIP include:

- Maintaining existing facilities
 - Renovate and upgrade our three largest water treatment plants at South Rivanna, Observatory and Crozet. Increase drinking water treatment capacity at the Observatory and Crozet water treatment plants
 - Replace the Sugar Hollow Dam Rubber Gate
 - Repair South Rivanna Dam Gates
 - Replace Upper Schenks Branch Wastewater Piping
- Improving water supply, redundancy and reliability
 - Complete the raw water line across the Birdwood property
 - Acquire easements for a pipeline to connect the South Rivanna and Ragged Mountain Reservoirs
 - Provide a second finished water line from the South Rivanna Water Treatment Plant beneath the South Rivanna River
 - Construct a finished water pumping station near Airport Road

- Compliance with regulatory requirements
 - Construct the Crozet Wastewater Flow Equalization Tank
 - Modify the Beaver Creek Dam Spillway
 - Relocate the North Rivanna WTP Lagoons
 - Enhance Security Systems

- Master Planning
 - Urban Finished Water Master Plan
 - Water Demand and Safe Yield Studies
 - MC AWRRF Master Plan

This proposed CIP will continue the efforts of the Authority to provide reliable drinking water and wastewater infrastructure for our customers and the community.

Board Action Requested:

The FY 2020-2024 Capital Improvement Program totaling \$99.5 million is provided for review by the Board of Directors.

Capital Improvement Plan

Fiscal Years
2020 - 2024

DRAFT
February 2019



South Rivanna Water Treatment Plant



Birdwood Golf Course Waterline



Crozet Water Treatment Plant



Observatory Water Treatment Plant



Beaver Creek Dam



Rivanna Water & Sewer Authority
695 Moores Creek Lane, Charlottesville, Virginia 22902

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Introduction

The Capital Improvement Plan (CIP) for Fiscal Years 2020-2024 has been prepared as a strategic and financially responsible plan for the Rivanna Water and Sewer Authority (RWSA) to complete major infrastructure construction projects. The projects included in the CIP are necessary to achieve the RWSA's core mission of providing safe, high-quality drinking water and environmentally responsible wastewater treatment services for the City of Charlottesville and the Albemarle County Service Authority (ACSA). The CIP is a 5-year planning document which provides an estimated budget and schedule for projects as they advance through the design and construction process.

The infrastructure requirements of the Capital Improvement Plan are developed through our Asset Management and Master Planning programs to address water and wastewater capacity demands, regulatory mandates and rehabilitation needs. Each year, these projects are reviewed and prioritized by the RWSA management team and brought forth for review by the Board of Directors.

During the past year, several capital projects were very near completion or are no longer needed, and as such are being removed from the 2020-2024 CIP. These projects account for approximately \$51.1 million or 33.2% of FY 19-23 CIP. These projects include:

- Interconnect Lower Sugar Hollow and Ragged Mountain Raw Water Mains
- Flow Meter and Auto Valve on Sugar Hollow to Ragged Mountain Transfer
- Route 29 Pump Station Site Acquisition
- Urban Water GAC and Water Treatment Plant Improvement
- Wholesale Water Master Metering – Urban
- Crozet Water GAC and Water Treatment Improvement
- Crozet Water Treatment Plant – WTP Expansion Finished Water Pump Station
- Crozet Water System – Master Plan
- Scottsville Water GAC
- Crozet Interceptor Pump Stations – Bypass Fittings and Isolation Valves
- Bridge Repairs
- Moores Creek AWRRF Odor Control – Phase 2
- Moores Creek AWRRF Roof Replacements
- Moores Creek AWRRF Second Centrifuge

The total 5-year 2020-2024 CIP is approximately \$99.5 million, with the previous expenditures on active projects totaling approximately \$2.8 million, leaving a net proposed 5-year projected expenditure of \$96.7 million.

There are several new projects added to the CIP this year, with a total estimated expenditures of \$5.65 million from 2020-2024, including:

- South Rivanna Dam – Gate Repair (\$0.9 million)
- North Rivanna Water Treatment Plant – Upgrades (\$2.325 million)

- Scottsville Water Treatment Plant LT2 Improvements (\$0.1 million)
- Albemarle Berkley PS – Capacity Analysis and Upgrade (\$0.73 million)
- Albemarle Berkley Basin Demolition (\$0.2 million)
- Moores Creek AWRRF Gas Sphere Rehabilitation (\$0.74 million)
- IT Master Plan – Software (\$0.45 million)

There are a few projects where the proposed budgets have been modified based on the anticipated project requirements and necessitate funding adjustments. The projects with changes include:

- Ragged Mountain Reservoir to Observatory WTP Raw Waterline (\$4.12 million existing / \$0 million proposed)
- Ragged Mountain Reservoir to Observatory WTP Pump Station (\$2.41 million existing / \$0 million proposed)
- Observatory WTP Improvements (\$18.6 million existing / \$19.7 million proposed)
- Sugar Hollow Dam Rubber Crest Gate Replacement (\$0.94 million existing / \$1.14 million proposed)
- Avon to Pantops Water Main (\$13.2 million existing / \$4.9 million proposed)
- South Rivanna Hydropower Decommissioning (\$0.4 million existing / \$0.725 million proposed)
- Beaver Creek Dam Alteration (\$8.83 million existing / \$4.90 million proposed)
- New Raw Water Pump Station and Intake (\$6.1 million existing / \$4.14 million proposed)
- Upper Schenks Branch Interceptor (\$4.49 million existing / \$3.99 million proposed)
- Crozet Flow Equalization Tank (\$3.3 million existing / \$4.86 million proposed)
- Maury Hill Branch Sewer Replacement (\$0.29 million existing / \$0 million proposed)
- Engineering and Administration Building (\$3.0 million existing / \$0 million proposed)
- Moores Creek AWRRF Master Plan (\$0.1 million existing / \$0.25 million proposed)
- Moores Creek AWRRF Mechanical Thickener (\$1.2 million existing / \$0 million proposed)
- Grinder and Air Control Improvements (\$0.10 million existing / \$0.21 million proposed)
- Radio Upgrades (\$0.52 million existing / \$0.65 million proposed)

FINANCIAL SUMMARY
MAJOR SYSTEM CATEGORIES

FINANCIAL SUMMARY

Major System Categories – Water

System Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress
	Current CIP	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
Urban Water (UW)										
Community Water Supply Plan	\$8,831,000	(\$2,526,000)	\$3,240,249	\$2,470,000	\$594,751				\$6,305,000	\$123,782
Observatory WTP & Ragged Mountain/Sugar Hollow Reservoir System	\$19,570,000	\$1,270,000	\$2,703,198	\$415,000	\$6,371,802	\$7,850,000	\$3,500,000		\$20,840,000	\$1,154,558
Finished Water Storage/Distribution	\$22,090,000	(\$8,143,000)	\$2,782,000	\$201,000	\$2,667,000	\$4,205,000	\$1,292,000	\$2,800,000	\$13,947,000	\$178,046
South & North Fork Rivanna Water System	\$7,900,000	\$11,050,000	\$581,891	\$9,474,524	\$7,893,585	\$1,000,000			\$18,950,000	\$145,516
All Systems Security & Technology	\$1,710,500	\$287,500	\$495,500	\$635,000	\$787,500	\$75,000			\$1,998,000	\$14,169
Subtotal (UW)	\$60,101,500	\$1,938,500	\$9,802,838	\$13,195,524	\$18,314,638	\$13,130,000	\$4,792,000	\$2,800,000	\$62,040,000	\$1,616,071
Non-Urban Water (NUW)										
Crozet Water System	\$23,030,000	(\$5,307,000)	\$4,221,690	\$5,016,310	\$1,317,000	\$943,000	\$835,000	\$5,390,000	\$17,723,000	\$702,248
Scottsville Water System	\$0	\$245,000	\$145,000	\$100,000	\$0	\$0	\$0	\$0	\$245,000	\$0
Subtotal (NUW)	\$23,030,000	(\$5,062,000)	\$4,366,690	\$5,116,310	\$1,317,000	\$943,000	\$835,000	\$5,390,000	\$17,968,000	\$702,248
WATER TOTAL	\$83,131,500	(\$3,123,500)	\$14,169,528	\$18,311,834	\$19,631,638	\$14,073,000	\$5,627,000	\$8,190,000	\$80,008,000	\$2,318,319

FINANCIAL SUMMARY

Major System Categories – Wastewater

System Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress
	Current CIP	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
Urban Wastewater (UWW)										
Wastewater Interceptors and Pumping Stations	\$11,161,000	\$1,725,000	\$3,077,945	\$3,720,000	\$4,817,385	\$1,020,670	\$250,000		\$12,886,000	\$449,438
Moore's Creek AWRRF	\$7,251,632	(\$3,062,000)	\$2,951,632	\$130,000	\$1,108,000	\$0			\$4,189,632	\$65,743
All Systems Security & Technology	\$1,710,500	\$287,500	\$495,500	\$635,000	\$787,500	\$75,000			\$1,998,000	\$14,169
Subtotal (UWW)	\$20,123,132	(\$1,049,500)	\$6,525,077	\$4,485,000	\$6,712,885	\$1,095,670	\$250,000		\$19,073,632	\$529,350
Non-Urban Wastewater (NUWW)										
Scottsville WRRF	\$100,000	\$110,000		\$65,000	\$145,000				\$210,000	
Glenmore WRRF	\$111,000	\$64,000	\$25,000	\$85,000	\$65,000				\$175,000	
Subtotal (NUWW)	\$211,000	\$174,000	\$25,000	\$150,000	\$210,000				\$385,000	
WASTEWATER TOTAL	\$20,334,132	(\$875,500)	\$6,550,077	\$4,635,000	\$6,922,885	\$1,095,670	\$250,000		\$19,458,632	\$529,350
TOTAL	\$103,465,632	(\$3,999,000)	\$20,719,605	\$22,946,834	\$26,554,523	\$15,168,670	\$5,877,000	\$8,190,000	\$99,466,632	\$2,847,668

PROJECT DETAILS

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Completed Projects

During fiscal year 2019, several capital improvement projects were completed, were advanced to the final phases of close-out, or were determined to be no longer necessary. As such they will be removed from consideration in future planning documents. Presented in the table below are the fourteen (14) completed projects, pertinent information on the adopted budgets, as well as the projected final costs and any anticipated savings. There was a total completed projects cost savings of \$2.1 million.

6. Interconnect Lower Sugar Hollow and Ragged Mountain Raw Water Mains: The two 18-inch water mains that supply water from Ragged Mountain Reservoir to Observatory Water Treatment Plant are 72 and 110 years old, respectively. The mains are interconnected at the top of the Ragged Mountain Dam, with one serving the 1920's Royal Pump Station and the other serving the more modern Stadium Road Pump Station. Both pump stations provide water to the Observatory Water Treatment Plant. This project was to interconnect the two raw water lines near the Rt. 29/Fontaine Avenue interchange. As design work proceeded, the cost of the project exceeded the potential benefit. With a new replacement water main anticipated by FY 2026, the interconnect project is being eliminated from the CIP.
7. Sugar Hollow to Ragged Mountain Reservoir Transfer Flow Meter: The Sugar Hollow Raw Waterline is an 18-inch diameter cast iron pipeline which conveys water from Sugar Hollow Reservoir to Ragged Mountain Reservoir. The waterline discharges directly into the Ragged Mountain Reservoir and is used to supplement inflow. Prior to this project, the control valve used to modulate flow between the two reservoirs was a manually-operated gate valve at the Sugar Hollow Gatekeeper's House near the Sugar Hollow Dam. This required RWSA staff to travel to the Sugar Hollow Gatekeeper's House to operate the valve, which given the limited cellular communication in that area, posed a potential safety hazard. In addition, prior to the project, there were limited means to monitor and record flow between the two reservoirs. In this project, one of RWSA's On-Call Maintenance Construction Contractors installed a new 18-inch flow meter, a modulating control valve, and new power and SCADA control wiring, to provide the means to effectively regulate the flow between the two reservoirs remotely from the Observatory Water Treatment Plant. Also, an existing, original 18-inch diameter gate valve upstream of the new 18-inch flow meter was replaced to provide redundancy in the system.

In addition to the improvements on the raw waterline, this project included the complete demolition of several previously abandoned structures including the Sugar Hollow Gatekeeper's House and four smaller utility buildings and sheds. As a result of the demolition process, the majority of RWSA-owned utilities and structures on the site are at or below grade, which enables the property to have more beneficial use in the future.

9. Rt. 29 Pump Station Site Acquisition: This project provided site acquisition for a new Rt. 29 Pump Station and Storage Tank to be built at a later time in the general area south of Airport Road and north of Hollymead Towncenter on TMP No. 32-41 as identified in the Albemarle County Comprehensive Plan. The future pump station and tank, along with a new transmission pipeline between the proposed pump station and the South Rivanna Water Treatment Plant, will provide an interconnection between the areas presently served by the South Rivanna Water Treatment Plant and the North Rivanna Water Treatment Plant. The interconnection is needed

for redundancy of service in the event of an emergency, during drought conditions, and to adequately serve the growing needs of the 29 area generally north of the Forest Lakes subdivision. Multiple meetings and negotiations took place with the property's land owner in an effort to acquire the needed property. The negotiations were not successful, and the property was acquired through condemnation proceedings authorized at the May 2017 RWSA Board Meeting. Final legal proceedings have been completed.

11. Urban Water Granular Activated Carbon and Water Treatment Improvements: In July 2012, the Board decided to pursue the installation of Granular Activated Carbon (GAC) contactors to achieve Stage 2 D/DBPR compliance with the EPA in the Urban System. The GAC adsorbs organic matter from the water, thereby reducing the precursors to THMs and HAAs. As decided by the Board in December 2013, the GAC systems have been sized at a lower capacity than the current rated plant capacities (the "Hybrid GAC" approach). The GAC contactors were not expected to be on-line in time for the EPA-mandated compliance date. In the interim, a Risk Reduction Plan was developed, outlining the use of Powder Activated Carbon (PAC) to reduce trace natural organic matter from the source water thereby reducing DBPs. The PAC feed systems were included in this project and were adequate treatment for the new regulations in the interim time period before GAC completion. The PAC systems were completed in 2015.

In addition to installation of PAC feed systems and GAC contactors, this project also included various improvements at the South Rivanna WTP including construction of additional clearwell storage, replacement of the lime feed system, upgrades to the filter underdrains and backwash system, replacement of the filter media, sound attenuation and ventilation improvements for the high service pump station, installation of a variable frequency drive for the raw water pump station, installation of a new raw water flow meter and several improvements to the residuals management facilities; at the North Rivanna WTP including new filter control valves, new pump control valves, new filter sludge removal equipment, new electrical system upgrades throughout the plant, and the installation of a surge relief mechanism; and at the Observatory WTP including various improvements such as a new chlorine contact tank, improved potable water service piping to the filter building and upgraded finished water discharge piping. Construction of the projects were completed in May 2018.

12. Wholesale Water Master Metering: The January 2012 Water Cost Allocation Agreement designated how the City of Charlottesville (City) and ACSA share in the financing of the New Ragged Mountain Dam project. Within the agreement is a general provision developed by the ACSA and the City to enhance measurement of the water usage by each of the distribution agencies. In an effort to meet this obligation, the RWSA Board of Directors authorized staff in August of 2012 to complete an engineering study on metering plan alternatives. The study identified several alternatives for a metering plan based on combinations of metering and estimating methodologies. A Jurisdictional Approach was recommended which included installation of water meters at locations at the City/county corporate boundary plus one meter at each of the three urban water treatment plants. At its September 2013 meeting the Board directed that staff proceed with the Jurisdictional Coverage Approach. The final design includes 25 remote meter locations plus the three finished water flow meters at the water treatment plants. Construction of the 25 remote meter locations began in early 2016 and was completed

in early 2019. The three finished water flow meters were installed in 2015 as part of the Urban Water Granular Activated Carbon Project.

23. Crozet Water Granular Activated Carbon and Water Treatment Improvements: For the Crozet water system, installation of granular activated carbon (GAC) contactor units was selected to achieve Stage 2 D/DBPR compliance with EPA due to the start/stop operation of the water treatment plant and the relatively higher water age in the distribution system. The GAC adsorbs organic matter from the water, thereby reducing the precursors to THMs and HAAs. Included in the Crozet WTP GAC project were various other improvements including upgrade of the chlorine feed system to a modern hypochlorite feed system, as well as replacing the existing fluoride and corrosion inhibitor chemical feed systems. The new chemical feed systems are housed in additional rooms in the GAC contactor building. This new location also allows for shorter chemical feed lines. Construction of the project was completed in September 2017.
25. Crozet Water Treatment Plant Finished Water Pump Station: The Crozet water treatment facilities required an expansion to secure future needs of the Crozet community. The Finished Water Pump Station is the final step in the treatment and conveyance process and was original to the plant. As a result it had numerous design and operational impediments or challenges that severely limited its operational reliability. A new pump station at the site was required for both current and future service needs. The project included evaluation, permitting, design, construction and construction management of a new Finished Water Pump Station and construction was completed in Spring 2019.
26. Drinking Water Infrastructure Plan: The Crozet drinking water service area continues to see expanded growth, and recent discussions with Albemarle County and Albemarle County Service Authority (ACSA) personnel have confirmed that recent growth trends indicate that water use demands in Crozet are on the rise. While some projects are currently underway to address the immediate needs in Crozet, RWSA staff concluded that it was pertinent to develop a comprehensive mid and long-range plan for the entire water system, including analysis of water supply, treatment, distribution, storage and raw water conveyance. The project evaluated and analyzed all of these parameters, and developed a Drinking Water Infrastructure Plan for the Crozet Service Area's water supply and distribution needs and recommended improvements for the next 50-year design period (Year 2070). The final plan will be complete in early 2019.
27. Scottsville Water Granular Activated Carbon: For the Scottsville water system, installation of granular activated carbon (GAC) contactor units was selected to achieve Stage 2 D/DBPR compliance with EPA due to the start/stop operation of the water treatment plant and the higher water age in the distribution system. The GAC adsorbs organic matter from the water, thereby reducing the precursors to THMs and HAAs. Construction of the project was completed in November 2017.
32. Crozet Interceptor Pump Station Bypass Isolation Valves: There are four pump stations located in the Crozet Interceptor system that help convey the flow from the Crozet area into the Morey Creek Interceptor and the rest of the urban collection system. These pump stations were constructed in the 1980s and provided no means of isolating each pump station from its downstream force main. This condition complicated maintenance-related activities as each

time a pump station component needed to be serviced or replaced, the volume of wastewater within the force main had to be addressed at the pump station as it drained back to the wet well. In addition, the Crozet Interceptor Pump Stations also have limited storage within their wet wells, and any reduction of down time as a result of dealing with the impacts of no isolation valves, decreased the amount of time available to work on the equipment. In order to alleviate this condition, temporary valves called “line stops” were temporarily installed on the force mains downstream of the pump stations to allow enough time for a new isolation valve to be installed. This isolation valve location provides the maximum amount of down time available based on current system conditions for future pump station maintenance activities. While line stops were in place, bypass connections were also provided at each pump station. These will allow staff the option of bringing in bypass pumps for more significant pump station shutdowns required for maintenance activities or repairs that the isolation valves alone cannot account for. Construction of this project was completed in the Winter of 2018/2019.

35. Bridge Repairs: The bridge crossing Moores Creek located at the Advanced Water Resource Recovery Facility was constructed in the early 1980s. In late 2011, staff commissioned a detailed inspection of the bridge. The inspection results indicated that the bridge was in good condition but required maintenance repairs to assure continued safe operation. This work includes sealing the expansion joints, scupper installation to drain the bridge deck, repairs to the steel plate girders and their bearings, catwalk and steel corrosion repair and repainting, and minor concrete repair. This work will be completed by the spring of 2018 in conjunction with the Moores Creek Odor Control Improvements project.
36. Odor Control Phase 2: As part of the implementation of the next phase of the 2007 Odor Control Master Plan at the MCAWRRF, operations audits were performed, liquid and vapor phase sampling were conducted, and a computerized dispersion model was developed from 2013 to 2014. Recommendations for odor control improvements that would significantly control odors from traveling beyond the MCAWRRF fence line were presented to the RWSA Board of Directors in December 2014 and the CIP project was approved at the January 2015 Meeting, with subsequent increases due to project challenges. The final design for odor control improvements includes covering the head works and screening channels, installing grit facilities, constructing a bypass line through one equalization basin, covering the primary clarifiers, building additional odor scrubbing facilities to treat the foul air from the covered sources, removing the post-digestion clarifiers from service, modifying the handling, and hauling and storage of bio solids, all of which has been recently completed in Odor Control Improvements Project. The constructed facilities are shown as costs associated with these complete and will be capitalized in this CIP. The remaining odor control work included in the current CIP budget includes cleaning the equalization basins and holding ponds which is anticipated to be bid out this spring and coating the interior of the digesters which is ongoing.
37. Roof Replacements: The majority of the buildings at the Moores Creek Advanced Water Resource Recovery Facility were constructed in 1981 and 1982 during a major expansion of the existing treatment plant. All buildings constructed at that time were built with a metal roof system. In 2014, deficiencies were identified in the roof at the Administration Building and the roof was replaced. The materials of the original roof at the Administration Building are the same as the roof material on the other buildings. Likewise, many of the buildings have started

to experience leaks and structural deficiencies. As a result, the purpose of this project is to replace the roof systems at the following buildings at the Moores Creek AWRRF: Blower Building, Moores Creek Pump Station, Sludge Pump Station No. 2, Maintenance Building 1, and Maintenance Building 2, Sludge Pumping Building, Primary Pump Building, and the Effluent Pump Building. Design of these improvements began in March 2017 with completion of construction in late 2018.

38. Second Centrifuge: The Moores Creek AWRRF currently operates a high-speed centrifuge to process and dewater digested bio solids from the treatment process. The centrifuge was constructed during the 2009-2012 Nutrient Upgrade project and served to replace an older plate and frame filter press operation (which was removed during installation of the centrifuge), with a second plate and frame press serving as backup. An evaluation of the remaining filter press concluded that extensive repairs would be required to maintain this as a backup dewatering system and the repairs would not be cost-effective as purchasing a second centrifuge. Without the utility of the second press the facility does not have a redundant process, and thus during planned or emergency outages a portable back-up unit must be rented or leased. A second centrifuge will allow for continued bio solids dewatering during planned or emergency repairs to one of the two centrifuges, for higher-rate processing by operating both units simultaneously during other periods (thus saving on staff time), and for better maintenance of proper solids flow through the plant.

Completed Projects

No.	Project Description	Five-Year Capital Program			
		Adopted Budget 6/2018	Previous Expenditures (6/30/2018)	Final Projected Costs/Close Out	Savings
6	Interconnect Lower SH and RM Raw Water Mains	\$331,000	\$8,076	\$8,076	\$322,924
7	Flow Meter and Auto Valve on SH to RM Transfer	\$383,241	\$15,311	\$383,241	
9	Route 29 Pump Station Site Acquisition	\$1,720,000	\$1,042,168	\$1,720,000	
11	Urban Water GAC and Water Treatment Plant Improvement	\$24,925,494	\$24,089,122	\$24,307,304	\$618,190
12	Wholesale Water Master Metering - Urban	\$3,200,000	\$2,679,816	\$3,221,659	(\$21,659)
23	Crozet Water GAC and Water Treatment Improvement	\$3,418,390	\$3,250,630	\$3,267,341	\$151,049
25	Crozet WTP - WTP Expansion Finished Water Pump Station	\$2,600,000	\$2,067,760	\$2,233,510	\$366,490
26	Crozet Water System - Master Plan	\$300,000	\$245,223	\$297,577	\$2,423
27	Scottsville Water Granular Activated Carbon	\$1,615,000	\$1,569,384	\$1,577,733	\$37,267
32	Crozet Interceptor Pump Stations - Bypass Fittings and Isolation Valves	\$720,000	\$18,334	\$462,000	\$258,000
35	Bridge Repairs	\$330,000	\$261,198	\$279,468	\$50,532
36	MCAWRRF Odor Control Phase 2	\$8,907,519	\$8,841,776	\$8,907,519	
37	MCAWRRF Roof Replacements	\$1,264,000	\$809,424	\$965,253	\$298,747
38	MCAWRRF Second Centrifuge	\$1,337,000	\$1,154,719	\$1,291,133	\$45,867
TOTAL		\$51,051,644	\$46,052,941	\$48,921,814	\$2,129,830

CIP 19-23 Total	CIP 20-24 Completed	CIP 20-24 Remaining	CIP 20-24 New Funding	CIP 20-24 New Total
\$153,902,035	\$51,051,644	\$103,465,632	(\$3,383,759)	\$99,466,632

Community Water Supply Plan

The Community Water Supply Plan represents the program developed with substantial community input to fulfill RWSA's contractual obligation to the City of Charlottesville (City) and the Albemarle County Service Authority (ACSA) to provide adequate drinking water for their future needs. An initiative started in 2003 to find a long-term solution that could achieve both local support and meet federal and state requirements. After multiple community meetings, updates with local officials, and frequent consultations with federal and state agencies, local support was obtained to apply for federal and state permits to expand the Ragged Mountain Reservoir and build a future pipeline between the South Rivanna and Ragged Mountain Reservoirs, with stream and wetlands mitigation to be provided through property in the Buck Mountain Creek area and property adjacent to a lower reach of Moores Creek near its confluence with the Rivanna River. Federal and state permits were granted in 2008, and amended in 2011.

The first phase of this long-term program centered around the expansion of the Ragged Mountain Reservoir, a project that would simultaneously address a legal obligation to correct safety deficiencies on the existing site. Through a combination of technical investigations, engineering evaluations, and continued public discussion, a decision was reached in February 2011 through the City Council and Board of Supervisors to build the new dam as an earthen dam, with the initial phase raising the reservoir pool height by 30 feet. The decision also outlined an objective of the further pursuit of water conservation through the City and ACSA, and the pursuit of opportunities for dredging of the South Rivanna Reservoir, with the second phase of reservoir expansion in the future as necessary.

Project Descriptions:

1. South Rivanna Reservoir to Ragged Mountain Reservoir Water Line Right-of-Way: The approved 50-year Community Water Supply Plan includes the future construction of a new raw water pipeline from the South Rivanna River to the Ragged Mountain Reservoir. This new pipeline will replace the Upper Sugar Hollow Pipeline along an alternative alignment to increase raw water transfer capacity in the Urban Water System. The project includes a detailed routing study to account for recent and proposed development and road projects in Albemarle County and the University of Virginia. Preliminary design, preparation of easement documents, and acquisition of water line easements along the approved route will also be completed as part of this project. Prior expenditures also covered a previous review of the 2009 conceptual design that was requested by the Board.
2. South Rivanna Reservoir Dredging: The South Rivanna Reservoir stores raw water for treatment at the South Rivanna Water Treatment Plant and in the future, is proposed to provide water for transfer to the enlarged Ragged Mountain Reservoir. River flow into the reservoir is from a drainage area, almost entirely within Albemarle County, of approximately 259 square miles. Soil erosion from natural events, from land use in the agricultural area, from land disturbances in the developed areas, and from re-suspension of flood plain deposits created during the 19th century (stream bank erosion), are likely the causes of sediment becoming trapped within the reservoir. The initial design of the reservoir anticipated the accumulation of these sediments, and a significant portion of the total storage volume was designated for this

purpose. Currently the sediment stored does not exceed the available sediment storage capacity.

The January 2012 Ragged Mountain Dam Project Agreement outlines that “the City and ACSA agree to direct, and RWSA agrees, to perform such dredging projects at the South Fork Rivanna Reservoir as may be specified jointly by the City and ACSA pursuant to the Water Cost Allocation Agreement.” The Cost Allocation Agreement stipulates that target maintenance dredging shall be performed, and that the dredging be market driven, cost effective, and opportunistic and shall not exceed \$3.5M. In 2012 and 2013, RWSA, via the Public-Private Education Facilities and Infrastructure Act (PPEA) process, solicited proposals to provide maintenance dredging. In July 2013, the one qualified PPEA proposer withdrew its proposal, citing difficulties in obtaining necessary land agreements.

Future Board decisions on the project contracting approach will dictate the next steps. This project remains in the CIP as the fulfillment of a contractual obligation from the January 2012 Ragged Mountain Dam Cost Allocation Agreement, and RWSA counsel has offered an opinion that consent to amend the Agreement from the City and ACSA is required before the RWSA Board can amend or cancel the project.

3. Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line: Raw water is transferred from the Ragged Mountain Reservoir (RMR) to the Observatory Water Treatment Plant by way of two 18-inch cast iron pipelines, which have been in service for more than 110 and 70 years respectively. The increased frequency of emergency repairs and expanded maintenance requirements are one impetus for replacing these pipelines. The proposed water line will be able to reliably transfer water to the expanded Observatory plant, which will have the capacity to treat 10-12 million gallons per day (mgd). The new pipeline is expected to be constructed of 36-inch ductile iron and will be on the order of 14,000 feet in length. Due to funding limitations, this project is being postponed beyond the limits of this 5-year CIP.
4. Ragged Mountain Reservoir to Observatory Raw Water Pump Station: The Ragged Mountain Reservoir (RMR) to Observatory WTP raw water pump station is planned to replace the existing Stadium Road and Royal pump stations, which in part have exceeded their design lives or will require significant upgrades with the Observatory WTP expansion. The pump station will pump up to 10 mgd to the Observatory WTP. Integration of the new pump station with the planned South Rivanna Reservoir (SRR) to RMR pipeline is being considered in the interest of improved operational and cost efficiencies. An integrated pump station would also include the capacity to transfer up to 16 million gallons per day (mgd) of raw water from RMR back to the SRR WTP. The location of this pump station will be recommended as part of the SRR to RMR raw water main preliminary engineering study, which is currently under way. Due to funding limitations, this project is being postponed beyond the limits of this 5-year CIP.
5. Birdwood Golf Course Waterline: RWSA and the UVA Foundation chose to expedite construction of the portion of the future South Rivanna to Ragged Mountain 36-inch raw water main through the Birdwood property. This enables pipeline work to proceed just ahead of the planned golf course reconstruction project to prevent subsequent disruption to the property and

adjacent neighbors, as well as mitigate future increased water line construction costs. The golf course reconstruction project began in November 2018. This work includes installation of approximately 6,100 linear feet of 36-inch raw water main along the eastern property boundary of the golf course.

Community Water Supply Plan

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year						
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
1	South Rivanna Reservoir to Ragged Mountain Reservoir Water Line Right-of-Way	\$2,295,000		\$840,249	\$870,000	\$584,751				\$2,295,000	\$123,782
2	South Rivanna Reservoir Dredging	\$10,000				\$10,000				\$10,000	
3	Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line	\$4,116,000	(\$4,116,000)								
4	Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Pump Station	\$2,410,000	(\$2,410,000)								
5	Birdwood Golf Course Waterline		\$4,000,000	\$2,400,000	\$1,600,000					\$4,000,000	
	TOTAL	\$8,831,000	(\$2,526,000)	\$3,240,249	\$2,470,000	\$594,751	\$0	\$0	\$0	\$6,305,000	\$123,782

Observatory WTP and Ragged Mountain/Sugar Hollow Reservoir System

The Observatory Water Treatment Plant (WTP) and Ragged Mountain/Sugar Hollow Reservoir System is comprised of the water treatment facility on Observatory Mountain and the associated raw water infrastructure that stores and conveys source water to the plant. The raw water storage system includes the new Ragged Mountain Dam (constructed in 2014, with a useable raw water storage capacity of 1.5 billion gallons) and the Sugar Hollow Dam (originally constructed in 1947, upgraded in 1999 and downstream discharge improvements completed in September 2014, with a useable raw water storage capacity of 339 million gallons as updated by a 2015 bathymetric survey). The system also includes 17.6 miles of 18-inch raw water cast-iron mains, originally installed in 1908, 1922, and 1946. The Sugar Hollow Raw Water Main historically conveyed water from the Sugar Hollow Dam to the Observatory Water Treatment Plant, however, as a result of the New Ragged Mountain Dam project, the main now discharges directly into Ragged Mountain Reservoir. The remaining downstream section of the Sugar Hollow main now conveys raw water from the Ragged Mountain Reservoir to the treatment plant. The line crosses the Mechums River (where an abandoned pumping station is sited) on its way to Ragged Mountain Reservoir, and eventually passes through the Royal Pumping Station and terminates at the Observatory WTP. The Ragged Mountain Raw Water Main conveys water from the Ragged Mountain Reservoir through the Stadium Road Pumping Station and terminates at the Observatory Water Treatment Plant.

Project Descriptions:

6. Observatory Water Treatment Plant Improvements: The Observatory Water Treatment Plant is the oldest of the three urban plants. Early planning for the Community Water Supply envisioned that the plant would undergo a wholesale upgrade. This upgrade will concentrate on specific improvements to critical elements, identified by a Needs Assessment Study as improvements to the flocculators, filters, sedimentation basins, and chemical feed facilities to enhance future reliability. In addition, the existing reinforced concrete flume, which conveys treated water from the sedimentation basins to the filters, is in need of replacement, old piping control valves will be replaced and modernized, and electrical and SCADA control systems will be upgraded.

The Observatory Water Treatment Plant was originally constructed in the mid-1950s. Since that time very little has been replaced or upgraded at the facility. The sixty-year-old facility has much of the original equipment that is inefficient, prone to unexpected failure, and does not have readily accessible replacement parts. A portion of the project was completed in the 2016-2017 fiscal year. The flocculator systems were completely upgraded with new mechanical and electrical equipment, including variable speed motor drives for optimum efficiency. The upgraded flocculators have been in service since May 2017.

In addition to providing needed equipment upgrades, the improvements will also increase the plant's capacity from 7.7 million gallons per day to 10 million gallons per day based on a feasibility analysis performed during the Preliminary Engineering phase of the project. It was determined that the capacity upgrades could be performed economically and would provide needed reliability and redundancy in the Urban System.

It should be noted that the Observatory Water Treatment Plant is sited on land leased to RWSA by the University of Virginia. The terms of the existing lease expire on April 17, 2021. Prior to construction of the remaining improvements, the terms of a new lease may be needed with RWSA and the University as participants. The new lease is currently under negotiation.

7. Sugar Hollow Dam – Rubber Crest Gate Replacement & Intake Tower Repairs: In 1998 the Sugar Hollow Dam underwent a significant upgrade to improve structural stability and spillway capacity. The original metal spillway gates were replaced with a manufactured five-foot-high inflatable rubber dam that is bolted to the existing concrete structure. This rubber dam allows for the normal storage of water in the reservoir with the ability to be lowered during extreme storm events. The rubber dam has an approximate service life of twenty years and is therefore now due for replacement. The aging intake tower structure will be evaluated as part of the project for necessary repairs and improvements. Recommended repairs may include issues relating to the intake gate valves and tower walls, including repair or replacement of intake trash racks, and sealing/grouting of minor concrete wall cracks.

Observatory Water Treatment Plant and Ragged Mountain/Sugar Hollow Reservoir System

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year						Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024			
6	Observatory Water Treatment Plant Improvements	\$18,630,000	\$1,070,000	\$2,648,198		\$5,701,802	\$7,850,000	\$3,500,000		\$19,700,000	\$1,154,558	
7	Sugar Hollow Dam - Rubber Crest Gate Replacement & Intake	\$940,000	\$200,000	\$55,000	\$415,000	\$670,000				\$1,140,000		
	TOTAL	\$19,570,000	\$1,270,000	\$2,703,198	\$415,000	\$6,371,802	\$7,850,000	\$3,500,000	\$0	\$20,840,000	\$1,154,558	

Finished Water Storage/Transmission – Urban System

The urban finished water storage and transmission system serves to provide transmission of treated water from the three RWSA water plants (Observatory, South Rivanna, and North Rivanna Rivanna) to the distribution networks of the Albemarle County Service Authority, the City of Charlottesville, and the University of Virginia. The system includes approximately 40 miles of pipeline, six water storage tanks: Avon Street (2 MG), Pantops (5 MG), Piney Mountain. (0.7 MG), Stillhouse (0.7 MG), Observatory (3 MG), and Lewis Mountain (0.5 MG), and the Alderman Road and Stillhouse pumping stations.

Project Descriptions:

8. Valve Repair - Replacement (Phase 2): Isolation valves are critical for normal operation of the water distribution system and timely emergency response to water main breaks. Staff continuously reviews results from an ongoing valve exercising and condition assessment program performed by the RWSA Maintenance Department. This project will repair any valves identified during the condition assessment as having a repairable deficiency and replace the highest priority valves that are inoperable and unrepairable. This phase of the Valve Repair-Replacement Project will include a repair of an existing valve on the Southern Loop Waterline and replacement of valves on the North Rivanna, South Rivanna, Pantops, and Crozet Waterlines.
9. Piney Mountain Tank Rehabilitation: The 700,000-gallon Piney Mountain Tank serves the North Rivanna pressure band. A routine inspection of the Piney Mountain Tank revealed several deformed roof rafters, indicating the potential for structural deficiency. An in-depth structural inspection was performed and a list of recommended roof repairs provided. This project includes consultant services for design and bidding of necessary roof repairs and other ancillary items, as well as construction, construction administration, and inspection services. Long term plans for the Rt. 29 service area include the modification or elimination of this facility. The current recommended improvements are needed to maintain the existing tank in service for at least the next 10 years.
10. Avon to Pantops Water Main: The southern half of the Urban Area water system is currently served by the Avon Street and Pantops storage tanks. The Avon Street tank is hydraulically well connected to the Observatory Water Treatment Plant while the Pantops tank is well connected to the South Rivanna Water Treatment Plant. The hydraulic connectivity between the two tanks, however, is less than desired, creating operational challenges and reducing system flexibility. In 1987, the City and ASCA developed the Southern Loop Agreement, outlining project phasing and cost allocations, as envisioned at the time. The first two phases of the project were constructed shortly thereafter. The third phase, known as the “Eastern Branch” is the subject of the current project. The initial funding for this project was used for route alignment determination, hydraulic modeling, and preliminary design. Due to the complicated nature of our finished water systems, it was decided at the August 2018 Board meeting that a more comprehensive approach is warranted and we should complete the Finished Water Master Plan prior to moving forward with final design and construction of the Avon to Pantops Water Main. Additionally, due to alternate funding priorities the construction of this main has been delayed 3-years.

11. Water Demand Projection and Safe Yield Study: In January 2012, the City of Charlottesville, Albemarle County Service Authority, and RWSA entered into the Ragged Mountain Dam Project Agreement. Within the agreement are provisions to monitor the bathymetric capacity of the Urban water reservoirs as well as a requirement to conduct reoccurring demand analysis, demand forecasting and safe yield evaluations. The bathymetric survey of the South Rivanna Reservoir and the Ragged Mountain Reservoir were funded in the FY2019 O&M Budget. Subsequent to collecting the reservoir survey data, this study will evaluate and calculate current and future demands and present safe yield. Per the project agreement, these analyses shall be completed by calendar year 2020.
12. South Rivanna River Crossing and North Rivanna Transmission Main: RWSA has previously identified through master planning that a 24-inch water main will be needed from the South Rivanna Water Treatment Plant (SRWTP) to Hollymead Town Center to meet future water demands. Two segments of this water main were constructed as part of the VDOT Rt. 29 Solutions projects, including approximately 10,000 LF of 24-inch water main along Rt. 29 and 600 LF of 24-inch water main along the new Berkmar Drive Extension, behind the Kohl's department store. To complete the connection between the SRWTP and the Airport Road Pump Station Site, there is a need to construct a new river crossing at the South Fork Rivanna River and two "gap" sections of 24-inch water main between the already completed sections. Much of the new water main route is within VDOT right-of-way; however, acquisition of right-of-way will be required at the river crossing and on the Kohl's Property at Hollymead Town Center. This project includes funding for construction as well as engineering design, easement acquisition, bid-phase services, and construction administration and inspection services.
13. Rt. 29 Pump Station: The Rt. 29 Pipeline and Pump Station master plan was developed in 2007 and originally envisioned a multi-faceted project that reliably connected the North and South Rivanna pressure bands, reduced excessive operating pressures, and developed a new Airport pressure zone to serve the highest elevations near the Airport and Hollymead Town Center. The master plan was updated in 2018 to reflect the changes in the system and demands since 2007. This project, along with project number 12 above will provide a reliable and redundant finished water supply to the North Rivanna area. The proposed pump station will be able to serve system demands at both the current high pressure and a future low pressure condition. These facilities will also lead to future phase implementation which will include a storage tank and the creation of the Airport pressure zone.
14. Finished Water System Master Plan: As identified in the 2107 Strategic Plan, the Authority has a goal to plan, deliver and maintain dependable infrastructure in a financially responsible manner. Staff has identified asset master planning as a priority strategy to improve overall system development. There are asset classes where comprehensive and ongoing plans exist or are in development (e.g. wastewater collection, raw water supply, Crozet water, etc.). In the case of the urban finished water system, many of the previously identified capital projects are in design or construction. As such, staff have identified a need to develop a current and ongoing finished water master plan. This work will utilize the demand forecasting from the Water Demand Project and Safe Yield Study.

Finished Water Storage/Transmission – Urban System

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year						
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
8	Valve Repair - Replacement (Phase 2)	\$500,000		\$500,000						\$500,000	
9	Piney Mountain Tank Rehabilitation	\$500,000		\$500,000						\$500,000	\$51,185
10	Avon to Pantops Water Main	\$13,200,000	(\$8,300,000)	\$1,375,000				\$725,000	\$2,800,000	\$4,900,000	\$126,861
11	Water Demand Projection and Safe Yield Study	\$100,000	\$54,000	\$154,000						\$154,000	
12	South Fork Rivanna River Crossing and North Rivanna Transmission	\$5,340,000				\$843,000	\$3,930,000	\$567,000		\$5,340,000	
13	Rt. 29 Pump Station	\$2,300,000			\$201,000	\$1,824,000	\$275,000			\$2,300,000	
14	Finished Water System Master Plan	\$150,000	\$103,000	\$253,000						\$253,000	
	TOTAL	\$22,090,000	(\$8,143,000)	\$2,782,000	\$201,000	\$2,667,000	\$4,205,000	\$1,292,000	\$2,800,000	\$13,947,000	\$178,046

South and North Rivanna Water Systems

The South Rivanna Water System is comprised of the source water, storage, conveyance and treatment infrastructure currently serving the urban area from the South Fork Rivanna River. The system includes the South Fork Rivanna Reservoir and Dam (built in 1966). The Dam is co-located with the raw water intake and pump station, as well as a small hydroelectric generation facility. The source water from the South Rivanna Reservoir is treated at the South Rivanna treatment plant (12-mgd rated capacity).

The North Rivanna Water System is comprised of a river intake and raw water pumping station on the North Fork of the Rivanna River, as well as the North Fork Water Treatment Plant (2-mgd rated capacity). The North Rivanna System provides water to the ACSA service area located along US Route 29, between Forest Lakes subdivision and Piney Mountain Road.

Project Descriptions:

15. South Rivanna Hydropower Plant Decommissioning: The South Fork Hydropower Plant is a small hydroelectric generating facility constructed in 1987. The plant has historically operated intermittently, as river flows allow. The generated power is used at the South Rivanna Water Treatment Plant, thereby reducing power purchased off the electric grid. During an effort to troubleshoot and repair the turbine, a large rain and lightning event caused unexpected flooding into the facility. Insurance paid damages to more recent improvements, but not the pre-existing needs to repair the turbine. Engineering investigations in 2013 associated with the failed mechanical equipment and flood event confirmed the need for further disassembly and inspection of the turbine shaft and blade linkages from a remote factory location.

Due to the complexity of possible rehabilitation, the associated Federal Energy Regulatory Commission (FERC) dam permitting, and the numerous variables in the economic analysis, proposals were solicited from national hydropower experts to initiate a feasibility study to determine the cost effectiveness of rehabilitating the hydropower plant while making sure to account for FERC-related costs and issues. The feasibility study was completed in May 2016 and determined that rehabilitation of the facility had a small likelihood for a positive return on investment. This conclusion was brought to the Board of Directors along with a recommendation to initiate the surrender of the exemption to licensure and decommission the facility. The Board approved this recommendation and staff has begun the exemption surrender process. The budget includes regulatory support as well as physical improvements such as removing defunct electrical components, abandoning components of the turbine and evaluating the re-establishment of the penstock as a reservoir drain.

16. South Rivanna Water Treatment Plant Improvements: The South Rivanna Water Treatment Plant recently completed significant upgrades as part of the Urban Granular Activated Carbon project. Over the course of that project, several other significant needs were identified and assembled into a single project within this Capital Plan. The project components include, but are not limited to, the following: a new coagulant storage facility; installation of two additional filters to meet firm capacity needs and new filter control panels; an enclosure around the lime storage facilities; the addition of a second variable frequency drive at the Raw Water Pump Station as well as other general pump station improvements; the relocation for the electrical

gear from a sub terrain location at the Sludge Pumping Station to a new aboveground enclosure; a new administration building on site for additional office, meeting, and storage space; an additional high service pump and the addition of variable frequency drives to three of the pumps; sedimentation basin improvements; replacement of filter inlet valves and actuators; remodeling of the existing filter building for better lab and control space and painting throughout; new clarifier drives; a new closed transition transfer switch for the facility; and a realignment of the plant entrance near the front gate. Currently this facility operates at 80-90% of capacity and the identified upgrades will improve reliability and resiliency, particularly at higher flow rates.

17. South Rivanna Dam – Gate Repair: The South Rivanna Dam, originally constructed in 1965, is equipped with two 36” diameter slide gates and conduits, one each on the north and south abutments of the dam, which can be utilized to dewater the facility or to meet minimum instream flow (MIF) requirements when the dam is not spilling. These gates are original to the dam and while they are operable and are exercised regularly, they can no longer provide a complete seal, therefore allowing some leakage through the dam. RWSA has protocols in place to temporarily stop leakage through the gates when necessary to conserve water; however, there is a desire to repair or replace the gates and components as needed to restore full functionality. The project includes other repairs to the facility, including improvements to the concrete wall adjacent to the Raw Water Pump Station as well as improvements to the north dam tower to provide safer access by staff while still discouraging access by the general public.
18. North Rivanna Water Treatment Plant – Upgrade: The North Rivanna Water Treatment Plant was recently retro-fitted with GAC treatment. While the electrical system was upgraded as part of the GAC project, the remaining equipment and process control are original to the plant. Additionally, recent flooding has identified an issue with the siting and viability of the current backwash lagoons. This project includes an evaluation as well as replacement of the backwash and sludge handling for the plant.

South and North Rivanna Water Systems

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
15	South Rivanna Hydropower Plant Decommissioning	\$400,000	\$325,000	\$400,000	\$325,000					\$725,000	\$98,625
16	South Rivanna Water Treatment Plant Improvements	\$7,500,000	\$7,500,000	\$181,891	\$7,864,524	\$6,953,585				\$15,000,000	\$46,891
17	South Rivanna Dam - Gate Repair		\$900,000		\$900,000					\$900,000	
18	North Rivanna Water Treatment Plant - Upgrade		\$2,325,000		\$385,000	\$940,000	\$1,000,000			\$2,325,000	
	TOTAL	\$7,900,000	\$11,050,000	\$581,891	\$9,474,524	\$7,893,585	\$1,000,000	\$0	\$0	\$18,950,000	\$145,516

Crozet Water System

The Crozet Water System includes the source water, raw water conveyance, finished water treatment, transmission and storage infrastructure for the Crozet community in western Albemarle County. The source water for this system is the Beaver Creek Reservoir and Garnett Dam which was built in 1964 with a current useable storage capacity of 521 million gallons. Raw water is treated at the Crozet Water Treatment Plant (1.0 mgd rated capacity) and provides finished water to the Albemarle County Service Authority. The system includes the Crozet Elevated (Waterball) Tank (0.05 MG) for water treatment plant backwash; the Crozet Ground Storage Tank (0.5 MG) and pump station, and the Buck's Elbow Storage Tank (2.0 MG).

Project Descriptions:

19. Beaver Creek Dam Alteration: From 2008-2014 the Virginia Department of Conservation and Recreation (DCR) adopted revised *Impounding Structures Regulation* which imposed new, more rigorous, evaluations of dams within the Commonwealth. As a result, the Beaver Creek Dam has been reclassified as a high hazard dam, thereby requiring the spillway to pass a larger design storm. The spillway capacity was not designed to pass the larger design storm, and thus will require modifications to adhere to current regulations. This project includes investigation, preliminary design, public outreach, permitting, easement and property acquisition, final design, and construction of the anticipated modifications. Also included in this project are a new relocated raw water pump station, intake and oxygenation system.

RWSA operates the Beaver Creek Dam and reservoir as the sole raw water supply for the Crozet Area. In 2011, an analysis of the Dam Breach inundation areas and changes to Virginia Department of Conservation and Recreation (DCR) *Impounding Structures Regulations* prompted a change in hazard classification of the dam from Significant to High Hazard. This change in hazard classification requires that the capacity of the spillway be increased. Following the completion of an updated alternatives analysis by Schnabel Engineering in 2018, staff decided to proceed with design of a labyrinth spillway and chute through the existing dam with a bridge to allow Browns Gap Turnpike to cross over the new spillway. This CIP project includes investigation, preliminary design, public outreach, permitting, easement acquisition, final design, and construction of the anticipated modifications. Work for this project will be coordinated with the new relocated raw water pump station and intake. Additionally, due to alternate funding priorities the construction of this project has been delayed 3-years.

20. Beaver Creek Raw Water Pump Station and Intake: The Drinking Water Infrastructure Plan for the Crozet water service area recommends installation of a new Raw Water Pump Station and Intake at the Beaver Creek Dam in order to meet new minimum instream flow requirements and provide adequate raw water pumping capacity to serve the growing Crozet community for the next 50 years. The pump station will be moved out of its existing location at the toe of the dam to a new location, to be determined during design. The new intake structure will include enhanced controls to allow for access to the best quality water at any given time.

Following a Reservoir Water Quality and Management Study by DiNatale Water Consultants, several recommendations were made to improve water quality in the Beaver Creek Reservoir,

including installation of a new outlet structure and installation of a hypolimnetic oxygenation system. The oxygenation system would reduce reliance on algaecide treatments by increasing dissolved oxygen in the reservoir. Due to alternate funding priorities, the entire pump station and intake project have been delayed 3-years. Additionally, hypolimnetic oxygenation system has been eliminated from the project. The site, however, will be designed to accommodate it's possible future inclusion.

21. Buck's Elbow & Crozet Waterball Tank Painting: The 2,000,000-gallon Buck's Elbow Ground Storage Tank provides finished water storage for the Crozet Area while the 50,000- gallon Crozet Waterball Tank serves as filter backwash storage at the Crozet Water Treatment Plant (CZWTP). Routine inspections of these tanks in 2012 indicated that the tanks would require recoating by 2020. The project includes recoating the interior and top-coating the exterior of both tanks to prevent corrosion. Also included is the installation of an active mixing system and construction of a chlorine feed station at the Buck's Elbow Tank to decrease stratification, maintain consistent chlorine residuals, and improve overall water quality in the Crozet area. Minor repairs and improvements to both tanks will also be included in this work, such as foundation repairs and safety enhancements. This project includes consultant services for design of project specifications, as well as construction, construction administration, and inspection services. Installation of the active mixing system and construction of the chlorine feed station at Buck's Elbow Tank is expected to begin in Spring 2019, while the painting of both tanks has been postponed until 2025.
22. Crozet Water Treatment Plant Expansion: The Crozet water treatment system is currently permitted and rated to supply up to 1.0 million gallons per day (mgd) of water to the ACSA distribution system. Over the past several years, average day usage of water has increased steadily, with maximum day demand approaching plant capacity. In addition, much of the existing plant systems are the same as when the plant was constructed in the 1960's.

Expanding the plant capacity at Crozet WTP would require a new Virginia Department of Environmental Quality Water Withdrawal Permit and could include possible stream release requirements. In order to fully analyze all aspects of the design required for this project a Preliminary Engineering Report (PER), plant field testing, preliminary permitting work and coordination with pertinent regulators were completed. The results of the PER stated that the current treatment plant can be upgraded, and the capacity increased, through installation of newer, and more technologically advanced equipment into the existing footprint of the filter plant. Work associated with this project includes general building rehabilitation, filter improvements, sedimentation expansion and improvements, chemical feed improvements, flocculator expansion, alum storage/containment improvements and waste sludge handling and removal improvements.

Crozet Water System

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
19	Beaver Creek Dam Alteration	\$8,830,000	(\$3,932,000)	\$192,871	\$516,129	\$561,000	\$668,000	\$660,000	\$2,300,000	\$4,898,000	\$191,871
20	New Raw Water PS & Intake	\$6,100,000	(\$1,962,000)	\$160,000	\$138,000	\$300,000	\$275,000	\$175,000	\$3,090,000	\$4,138,000	
21	Buck's Elbow & Crozet Waterball Tank Painting	\$1,200,000	(\$1,013,000)	\$60,000	\$127,000					\$187,000	
22	Crozet Water Treatment Plant Expansion	\$6,900,000	\$1,600,000	\$3,808,819	\$4,235,181	\$456,000				\$8,500,000	\$510,377
	TOTAL	\$23,030,000	(\$5,307,000)	\$4,221,690	\$5,016,310	\$1,317,000	\$943,000	\$835,000	\$5,390,000	\$17,723,000	\$702,248

Scottsville Water System

The Scottsville Water System is comprised of the raw water conveyance, finished water treatment, transmission and storage infrastructure for the Town of Scottsville in southern Albemarle County. The source water for this system is the Totier Creek Intake, and the backup supply is the Totier Creek Reservoir, which was built in 1971 with a current useable capacity of 182 million gallons. Raw water is treated at the Scottsville Water Treatment Plant (0.25 mgd rated capacity) and provides finished water to the Albemarle County Service Authority. The system includes the Scottsville Storage Tank (0.25 MG).

Project Description:

23. Scottsville WTP Finished Water Flow Meter: The Scottsville Water Treatment Plant provides potable drinking water to Albemarle County Service Authority customers in the Scottsville service area. After water has been treated at the plant, it is collected in an existing clearwell which was constructed with the original facility. From the clearwell, the water is pumped into the distribution system by one of two high service pumps. The flow from these pumps is not metered. In order to keep a record of the total flow entering the Scottsville distribution system, plant operators must periodically conduct draw-down tests to verify the pumping rate of each of the two pumps. The total flow is then calculated based on the run time of each pump. Based on these procedures, this method of measuring flow may not be representative of the flow entering the system as the pumping rate will vary based on the clearwell level and the hydraulic grade line of the distribution system. In addition, the Virginia Department of Health has indicated that the flow should be metered during recent conversations related to the disinfection profile calculation throughout the plant. To resolve this issue, this project will modify the high service pump discharge piping to allow for the installation of a finished water meter.
24. Scottsville Water LT2 Improvements: RWSA conducts routine regulatory sampling of the raw water from Totier Creek and Totier Creek Reservoir for compliance with the EPA Long Term 2 Enhanced Surface Water Treatment Rule (LT2). The rule provides risk based guidance on the needed level of treatment for the deactivation of microbial pathogens. This project anticipates the addition of ultraviolet disinfection to the treatment process in Scottsville.

Scottsville Water System

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
23	Scottsville Water Finished Water Flow Meter		\$145,000	\$145,000						\$145,000	
24	Scottsville Water LT2 Improvements		\$100,000		\$100,000					\$100,000	
	TOTAL	\$0	\$245,000	\$145,000	\$100,000	\$0	\$0	\$0	\$0	\$245,000	\$0

Wastewater Interceptors/Pumping Stations

The RWSA wastewater interceptors and pumping stations serve to convey wastewater from the collection systems of the City of Charlottesville and Albemarle County Service Authority to the Moores Creek Advanced Water Resource Recovery Facility (MCAWRRF). This grouping includes: the Crozet Interceptor and four associated pumping stations; the Moores Creek Interceptor and Relief Sewer; the Morey Creek, Maury Hills, Powell Creek, Meadow Creek, Schenks Branch, Woodbrook and Rivanna Interceptors; as well as the Albemarle-Berkley Interceptor and associated Albemarle Pumping Station. Also included in this system are the two primary pump stations into the MCAWRRF, the Rivanna and Moores Creek Pump Stations.

Project Descriptions:

25. Upper Schenks Branch Interceptor: The Schenks Branch Interceptor is located in the eastern part of the City of Charlottesville and ties into the Meadowcreek Interceptor. The interceptor was constructed in the mid-1950s of 21-inch clay and concrete pipe. The existing interceptor is undersized to serve present and future wet weather flows as determined by the City, and is to be upgraded to 30-inch pipe. The Upper Schenks Branch Interceptor consists of two sections along McIntire Road. Both of these sections have been designed with the first phase of this project located in the City's Schenks Branch Greenway, completed in early 2016. The second phase of the Upper Schenks Interceptor will be replaced by RWSA in coordination with the City of Charlottesville's sewer upgrades once easement negotiations with Albemarle County are complete (or the City authorizes the second phase project be constructed under McIntire Road). Project costs include design, permitting, easement acquisition, construction, construction observation/administration by the engineering consultant; and project contingencies
26. Interceptor Sewer and Manhole Repair: This project is used to conduct assessment of various interceptors as well as rehabilitation of interceptors that do not have a separate CIP project. Planned projects include condition assessments and assumed rehabilitation of the Morey Creek Interceptor, Powell Creek Interceptor and Upper Rivanna Interceptor as well as rehabilitation efforts identified for the Moores Creek Interceptor and the Moores Creek Relief Interceptor that have been identified from previous condition assessment efforts. A sewer rehabilitation contract has been developed under this project as well which procured a dedicated contractor for all rehabilitation work. This project will also provide an allowance in budgeted funds to carry out future repairs. The intent of this project is to complete a condition assessment of all RWSA interceptors (except those replaced during the period with new pipe) and perform as-needed rehabilitation work by the end of 2020. Such periodic assessments of all sewer pipe reflects industry best practices and the maintenance expectations of federal and state regulators as a part of avoiding sanitary sewer overflows
27. Crozet Interceptor: The Crozet Interceptor is located in western Albemarle County and serves the Crozet area. Flow metering indicated that the interceptor experienced substantial inflow and infiltration and requires rehabilitation. In order to minimize future infrastructure improvements, ACSA and RWSA have agreed to rehabilitate this interceptor and the sewers that flow to the interceptor. The initial phase of rehabilitation to repair defects in manholes and pipelines contributing to the inflow and infiltration in the interceptor upstream of Crozet

Pump Station No. 4 has been completed. The current budget accounts for condition assessment work and assumed rehabilitation needs for the lower portions of the interceptor. While wet weather flows have moderately improved based on the initial phase of work, the ACSA and RWSA continue to investigate and remediate deficiencies along the entire interceptor.

28. Crozet Flow Equalization Tank: Rehabilitation work in the RWSA and ACSA sewer systems is on-going to meet the I&I reduction goals in the Crozet Interceptor. This is based on the flow metering and modeling results of the Comprehensive Sanitary Sewer Model & Study conducted in 2006 and as part of the Crozet Interceptor CIP project. The results of the 2006 study were updated in 2016 to evaluate I/I reduction goals and future capital project needs. The need to proceed with construction of a flow equalization tank in the Crozet area was confirmed as a result of this study update, which took into account recent flow monitoring data that had been collected following previous I/I reduction efforts. Based on those results, a preliminary engineering evaluation and siting analysis of a flow equalization tank upstream of Crozet Pump Station No. 4 was completed to ensure that the facility could be designed, permitted, constructed and ready for operation by 2020 in order to meet the two-year storm flow targets. The budget for this project includes estimates for the preliminary engineering, final design, property acquisition, legal assistance, construction costs and construction management services.
29. Crozet Pump Station 1, 2, 3 Rehabilitation: The Crozet Interceptor Pump Stations were constructed in the 1980's and many of the components are still original. This project includes the replacement of pumps and valves at Pump Station 2 in order to improve pumping capabilities at this location and provide spare parts for the pumps at Pump Station 1. It also includes roof replacements at all four pump stations, siding replacement for the wet well enclosure at Pump Station 3, and installation of new water wells at Pump Stations 3 and 4.
30. Maury Hill Branch Sewer Upgrade: Based on the sewer study performed in 2016, the Maury Hill Branch Sewer was targeted for capacity upgrades around 2020. This project would include an upgrade from 8-inch diameter to 12-inch diameter sewer along with all new manholes. The work was anticipated to be coincident with rehabilitation needs and capacity increases to accommodate the growth at the UVA Fontaine Research Park. Due to alternate funding priorities, this project has been delayed 2-years outside of the current 5-year CIP.
31. Albemarle Berkley PS – Capacity Analysis and Upgrade: The Albemarle Berkley Pump Station serves as the collection point for several wastewater lift stations located across the Albemarle County school properties off Lambs Road. Expansion of population and increased flows have resulted in increased pump station run times. Additionally, the pit pump station does not meet current safety or operational standards. This project will evaluate the needs for the station and alternative solutions.
32. Albemarle Berkley PS – Basin Demolition: Historically the Albemarle Berkley Pump Station was co-located within an open air basing that occasionally collected sewage during power outages. With the addition of a back-up power generator, the basin no longer serves a technical purpose. Given the proximity of the deteriorating structure to school property, this project serves to demolish and fill the area of the existing basin.

Urban Wastewater Interceptors/Pumping Stations

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
25	Upper Schenks Branch Interceptor	\$4,485,000	(\$500,000)	\$20,000	\$100,000	\$3,315,000	\$550,000			\$3,985,000	\$11,187
26	Interceptor Sewer and Manhole Repair	\$1,941,000		\$1,088,330		\$695,000	\$157,670			\$1,941,000	\$176,434
27	Crozet Interceptor	\$625,000		\$394,615		\$230,385				\$625,000	\$181,725
28	Crozet Flow Equalization Tank	\$3,300,000	\$1,560,000	\$1,300,000	\$3,560,000					\$4,860,000	\$80,092
29	Crozet Pump Station 1, 2, 3 Rehabilitation	\$525,000	\$20,000	\$275,000	\$20,000			\$250,000		\$545,000	
30	Maury Hill Branch Sewer Replacement	\$285,000	(\$285,000)							\$0	
31	Alb. Berkley PS - Capacity Analysis and Upgrade		\$730,000		\$40,000	\$412,000	\$278,000			\$730,000	
32	Alb. Berkley PS - Basin Demolition		\$200,000			\$165,000	\$35,000			\$200,000	
	TOTAL	\$11,161,000	\$1,725,000	\$3,077,945	\$3,720,000	\$4,817,385	\$1,020,670	\$250,000	\$0	\$12,886,000	\$449,438

Moores Creek Advanced Water Resource Recovery Facility

The Moores Creek Advanced Water Resource Recovery Facility (MCAWRRF) is the largest wastewater treatment facility within the RWSA system. The plant was originally constructed in 1958 and upgraded and expanded in 1981 and 1982, and currently has a rated capacity of 15 mgd. From 2009 thru 2012 the facility was upgraded to provide enhanced nutrient removal, and increased wet weather pumping and treatment capacity. This site includes the infrastructure for the wastewater treatment process as well as the RWSA administration facilities.

Project Descriptions:

33. Odor Control Phase 2: As part of the implementation of the next phase of the 2007 Odor Control Master Plan at the MCAWRRF, operations audits were performed, liquid and vapor phase sampling was conducted, and a computerized dispersion model was developed from 2013 to 2014. Recommendations for odor control improvements that would significantly control odors from traveling beyond the MCAWRRF fence line were presented to the RWSA Board of Directors in December 2014 and the CIP project was approved at the January 2015 Meeting, with subsequent increases due to project challenges. The final design for odor control improvements includes covering the head works and screening channels, installing grit facilities, constructing a bypass line through one equalization basin, covering the primary clarifiers, building additional odor scrubbing facilities to treat the foul air from the covered sources, removing the post-digestion clarifiers from service, modifying the handling, and hauling and storage of bio solids, all of which has been recently completed in Odor Control Improvements Project. The remaining odor control work included in the current CIP budget includes cleaning the equalization basins and holding ponds which is anticipated to be bid out this spring and coating the interior of the digesters which is ongoing.
34. Engineering and Administration Building: RWSA currently has its administrative headquarters in two buildings on the grounds of the Moores Creek Advanced Water Resource Recovery Facility. The two-story Administration Building was constructed in the early 1980's and houses offices, IT server space, meeting space and a full service laboratory. The second building is a series of four trailers installed in between 2003-2010 that house the engineering department. The Administration building is located at the head of the wastewater treatment plant and is surrounded by underground piping and process functions that may conflict with existing parking and/or the building in a future plant expansion. There is currently a need to house additional staff; increase office and meeting space; plan for the replacement of the trailers; bring the IT server workrooms to modern standards; provide classroom space for education outreach. Due to the alternate funding priorities and the desire to complete the MCAWRRF master plan, this project has been delayed 4-years beyond the current 5-year CIP.
35. Digester Sludge Storage Improvements: The sole sludge storage tank at the MCAWRRF was constructed in 1959 of reinforced concrete and is in need of repairs. The scope of work would include piping modifications, hydraulic improvements, tank safety improvements such as handrail and lights, and structural improvements to the existing sludge storage tank roof.

36. Aluminum Slide Gate Replacement: Several large aluminum slide gates are located at the influent side of the Moores Creek Pump Station. These gates allow staff to stop or divert flow to perform maintenance activities. After repeated attempts to access and repair the gates, it is now necessary to replace and modify the gate arrangement. The replacement includes new gates for greater flexibility and resiliency as well as significant flow bypass pumping. Likewise there are several gates at the Ultraviolet disinfection facility that leak water, causing a reduced capacity of the facility. Replacement of these gates will restore the process to full capacity. In addition, motor operated valves at the headworks will improve wet weather operations related to the new grit facility.
37. Moores Creek AWWRF Master Plan: The majority of the Moores Creek Water Resource Recovery Facility was constructed in the early 1980's. At the time, the plant layout was developed with space held open for future process expansion. With the Enhanced Nutrient Removal (ENR) project in 2009, the operation and layout of the plant was fundamentally altered, as needed to meet the new regulation. The project did anticipate the need for future expansion and some of the processes have readily available space. However, a full expansion plan was not developed at the time. As identified in the 2107 Strategic Plan, the Authority has a goal to plan, deliver and maintain dependable infrastructure in a financially responsible manner. Staff has identified asset master planning as a priority strategy to improve overall system development. As such, this project will serve to evaluate and plan for future space and process needs to accommodate capacity expansion and/or anticipated regulatory changes.
38. Mechanical Thickener: During the design of the Moores Creek AWWRF Phase 2 Odor Control project, the consultants conducted a detailed evaluation of all facility odor sources. One of the key sources identified, was the post-digestion clarifiers. These clarifiers are two round open-topped tanks of digested wastewater sludge, located on the north side of the plant. During the ENR upgrade, the characteristics of the post-aeration sludge changed. This change has led to less predictable sludge handling through the existing gravity thickeners. This change in the post-aeration sludge characteristics has made obtaining a clear thickener overflow more difficult without chemical addition. Removing the post-digestion clarifiers from service combined with solids carryover from the existing gravity thickeners create a number of downstream consequences in primary clarification, sludge digestion and solids dewatering. Removing these facilities from service reduces the sludge thickness and therefore the plant's ability to adequately process it. This project includes the design and installation of a mechanical thickener prior to digestion that will increase plant solids processing reliability and capacity. Due to the alternate funding priorities and the desire to complete the MCAWWRF Master Plan, this project has been delayed 4-years beyond the current 5-year CIP.
39. Compost Shed Roof Rehabilitation: In the early 1980's a large metal-framed shed roof was constructed to house the biosolids composting operations. Subsequent to stopping composting at Moores Creek AWWRF, the shed roof serves as an equipment maintenance yard, solids handling facility and material storage lock-up. The shed roof is exhibiting signs of rafter deterioration and ongoing drainage issues. This project will serve to evaluate and perform remediation needs at this facility.

40. Gas Sphere Rehabilitation: The Gas Sphere at the Moores Creek Advanced Water Resource Recovery Facility (MCAWRRF) provides storage for methane produced as a byproduct of wastewater treatment. The sphere was constructed in 1980 and was last evaluated in 2005. Vessels of this type require periodic inspection and maintenance in order to operate efficiently and safely for their expected service life. This project includes an out-of-service evaluation of the tank and subsequent completion of identified repair items, which may include but are not limited to recoating of the exterior of the tank, repairs to the concrete support ring, installation of safety devices, and other minor repairs. Included in the budget are funds for evaluation, design and bidding services, permitting, construction, and construction administration services.

Moores Creek Advanced Water Resource Recovery Facility

Proj. No.	Project Description	Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
33	Odor Control Phase 2	\$2,216,632		\$2,216,632						\$2,216,632	\$65,743
34	Engineering and Administration Building	\$3,000,000	(\$3,000,000)							\$0	
35	Digester Sludge Storage Improvements	\$265,000	\$48,000	\$265,000		\$48,000				\$313,000	
36	Aluminum Slide Gate Replacements	\$470,000		\$470,000						\$470,000	
37	Moores Creek AWRRF Master Plan	\$100,000	\$150,000		\$50,000	\$200,000				\$250,000	
38	Mechanical Thickener	\$1,200,000	(\$1,200,000)							\$0	
39	Compost Shed Roof Rehabilitation		\$200,000			\$200,000				\$200,000	
40	Gas Sphere Rehabilitation		\$740,000		\$80,000	\$660,000				\$740,000	
	TOTAL	\$7,251,632	(\$3,062,000)	\$2,951,632	\$130,000	\$1,108,000	\$0	\$0	\$0	\$4,189,632	\$65,743

Scottsville Wastewater System

The Scottsville Wastewater System includes the influent pumping station, the water resource recovery facility constructed in 1983, and the historical treatment lagoon (now incorporated into the plant operation). The water resource recovery facility has a rated capacity of 0.2 mgd.

Project Descriptions:

41. Grinder and Air Control Improvements: Currently the influent raw water pump station does not have a means to prevent large material from impacting the pumps, resulting in frequent clogging and maintenance. The space within the pump station is very limited and therefore does not allow for screening. This project will design and install an inline grinder within the influent pump channel. In addition, this project will evaluate methods to automate air control for the biological treatment process. The current method of air control produces inconsistent results, adversely impacting treatment and operations.

Scottsville Water Resource Recovery Facility

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
41	Grinder and Air Control Improvements	\$100,000	\$110,000		\$65,000	\$145,000				\$210,000	
	TOTAL	\$100,000	\$110,000	\$0	\$65,000	\$145,000	\$0	\$0	\$0	\$210,000	\$0

Glenmore Wastewater System

The 0.381-mgd water resource recovery facility, located within the Glenmore subdivision, is operated by RWSA. The facility includes an influent pumping station located immediately adjacent to the treatment facility.

Project Descriptions:

42. Influent Pump & VFD Addition: The Glenmore WRRF is predicted to see additional dry and wet weather flows as construction within the service area continues. Future wet weather flows will require higher influent pumping capacity and an additional pump and electrical variable frequency drive will be required to maintain firm capacity.
43. Secondary Clarifier Coating: The secondary clarifiers at the Glenmore facility were painted over 10-years ago. The clarifier environment is a particularly harsh environment subject to corrosive gasses, grit abrasion and mechanical wear. Based on observations by operations staff, the coating system is in need of replacement to prevent deterioration and failure of the underlying metal superstructure. This project includes the cleaning and full coating of the metal portions of the clarifier.

Glenmore Water Resource Recovery Facility

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
42	Influent Pump & VFD Addition	\$61,000	\$4,000			\$65,000				\$65,000	
43	Secondary Clarifier Coating	\$50,000	\$60,000	\$25,000	\$85,000					\$110,000	
	TOTAL	\$111,000	\$64,000	\$25,000	\$85,000	\$65,000	\$0	\$0	\$0	\$175,000	\$0

All Systems

Project Descriptions:

44. Radio Upgrades: The regional 800 MHz Public Safety Communication System, in which the Rivanna Water and Sewer Authority participates to provide internal and emergency radio communication, is expected to reach the end of its service life in 2018. Because of technology changes (software and hardware) the Charlottesville-UVA-Albemarle County Emergency Communications Center (ECC) will need to upgrade or replace the system to keep it useable. This project plans for the upgrade or replacement of major technology components and equipment of the existing system include: electronic components at all tower sites and the prime site at the ECC facility; new console equipment at the regional ECC; equipment such as tower site generators and UPS systems; an additional tower site (to improve service in southern Albemarle County); microwave backbone; and replacement of the system recording facilities. The project will take 24 months to complete and will be completed in Fiscal Year 2018. RWSA is being apportioned a part of the \$18.8M project cost proportionately based on the number of radios (2.4% of the total project cost). In addition to this assessment from the ECC, the Authority will also be required to undertake upgrades to its fleet of stationary, mobile, and portable radios.
45. Asset Management: Asset management is the practice of managing our infrastructure to minimize the total cost of owning and operating these assets while providing desired service levels. In doing so, it is used to make sure planned maintenance activities take place and that capital assets are replaced, repaired or upgraded at the right time, while ensuring that the money necessary to perform those activities is available. The Rivanna Water and Sewer Authority (RWSA) has some components of an asset management program in place (i.e. GIS, work order system), but has identified the need to further develop the program as part of our Strategic Planning process. In order to continue to build the program, a consultant was procured to assist with a three-phase process that will include facilitation and development of an asset management strategic plan, development and management of a pilot study where the results of the strategic plan will be applied to a specific class of assets, and assistance through a full implementation process. As part of this three-phase process, the consultant will also assist RWSA with the procurement of a software package to facilitate the overall program.
46. Security Enhancements: As required by the federal Bioterrorism Act of 2002, water utilities must conduct vulnerability assessments (VA) and have emergency response plans. RWSA recently completed a VA of its water system in collaboration with other regional partners and identified a number of security improvements that could be applied to both its water and wastewater systems. The purpose of this project will be to install security improvements at RWSA facilities including an enhanced access control program, industrial strength door and window components, security gate and fencing modifications, an improved lock and key program, facility signage, closed circuit television (CCTV) enhancements, intrusion detection systems (IDS), additional security lighting, and ladder guards.
47. IT Master Plan – Software: Staff is currently conducting an IT Master Plan to assess and benchmark current software and business practices. As the planning effort nears completion

there will be a need for several wholesale software upgrades. This project will address those Authority wide needs.

All Systems

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
44	Radio Upgrades	\$521,000	\$125,000	\$521,000		\$125,000				\$646,000	\$28,337
45	Asset Management	\$500,000		\$300,000		\$200,000				\$500,000	
46	Security Enhancements	\$2,400,000		\$170,000	\$1,120,000	\$1,100,000				\$2,400,000	
47	IT Master Plan - Software		\$450,000		\$150,000	\$150,000	\$150,000			\$450,000	
	TOTAL	\$3,421,000	\$575,000	\$991,000	\$1,270,000	\$1,575,000	\$150,000	\$0	\$0	\$3,996,000	\$28,337

APPENDICES

CIP Financial Summary

Water System Summary

Wastewater System Summary

CIP Financial Summary

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
1	South Rivanna Reservoir to Ragged Mountain Reservoir Water Line Right-of-Way	\$2,295,000		\$840,249	\$870,000	\$584,751				\$2,295,000	\$123,782
2	South Rivanna Reservoir Dredging	\$10,000				\$10,000				\$10,000	
3	Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line	\$4,116,000	(\$4,116,000)							\$0	
4	Ragged Mountain Reservoir to Observatory Water Treatment Plant	\$2,410,000	(\$2,410,000)							\$0	
5	Birdwood Golf Course Waterline		\$4,000,000	\$2,400,000	\$1,600,000					\$4,000,000	
6	Observatory Water Treatment Plant Improvements	\$18,630,000	\$1,070,000	\$2,648,198		\$5,701,802	\$7,850,000	\$3,500,000		\$19,700,000	\$1,154,558
7	Sugar Hollow Dam - Rubber Crest Gate Replacement & Intake	\$940,000	\$200,000	\$55,000	\$415,000	\$670,000				\$1,140,000	
8	Valve Repair - Replacement (Phase 2)	\$500,000		\$500,000						\$500,000	
9	Piney Mountain Tank Rehabilitation	\$500,000		\$500,000						\$500,000	\$51,185
10	Avon to Pantops Water Main	\$13,200,000	(\$8,300,000)	\$1,375,000				\$725,000	\$2,800,000	\$4,900,000	\$126,861
11	Water Demand Projection and Safe Yield Study	\$100,000	\$54,000	\$154,000						\$154,000	
12	South Fork Rivanna River Crossing and North Rivanna Transmission Main	\$5,340,000				\$843,000	\$3,930,000	\$567,000		\$5,340,000	
13	Rt. 29 Pump Station	\$2,300,000			\$201,000	\$1,824,000	\$275,000			\$2,300,000	

CIP Financial Summary (Continued)

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
14	Finished Water System Master Plan	\$150,000	\$103,000	\$253,000						\$253,000	
15	South Rivanna Hydropower Plant Decommissioning	\$400,000	\$325,000	\$400,000	\$325,000					\$725,000	\$98,625
16	South Rivanna Water Treatment Plant Improvements	\$7,500,000	\$7,500,000	\$181,891	\$7,864,524	\$6,953,585				\$15,000,000	\$46,891
17	South Rivanna Dam - Gate Repair		\$900,000		\$900,000					\$900,000	
18	North Rivanna Water Treatment Plant - Upgrade		\$2,325,000		\$385,000	\$940,000	\$1,000,000			\$2,325,000	
19	Beaver Creek Dam Alteration	\$8,830,000	(\$3,932,000)	\$192,871	\$516,129	\$561,000	\$668,000	\$660,000	\$2,300,000	\$4,898,000	\$191,871
20	New Raw Water PS & Intake, Oxygenation (BCR)	\$6,100,000	(\$1,962,000)	\$160,000	\$138,000	\$300,000	\$275,000	\$175,000	\$3,090,000	\$4,138,000	
21	Buck's Elbow & Crozet Waterball Tank Painting	\$1,200,000	(\$1,013,000)	\$60,000	\$127,000					\$187,000	
22	Crozet Water Treatment Plant Expansion	\$6,900,000	\$1,600,000	\$3,808,819	\$4,235,181	\$456,000				\$8,500,000	\$510,377
23	Scottsville Water Finished Water Flow Meter		\$145,000	\$145,000						\$145,000	
24	Scottsville Water LT2 Improvements		\$100,000		\$100,000					\$100,000	
25	Upper Schenks Branch Interceptor	\$4,485,000	(\$500,000)	\$20,000	\$100,000	\$3,315,000	\$550,000	\$0	\$0	\$3,985,000	\$11,187
26	Interceptor Sewer and Manhole Repair	\$1,941,000	\$0	\$1,088,330	\$0	\$695,000	\$157,670	\$0	\$0	\$1,941,000	\$176,434

CIP Financial Summary (Continued)

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
27	Crozet Interceptor	\$625,000		\$394,615		\$230,385				\$625,000	\$181,725
28	Crozet Flow Equalization Tank	\$3,300,000	\$1,560,000	\$1,300,000	\$3,560,000					\$4,860,000	\$80,092
29	Crozet Pump Station 1, 2, 3 Rehabilitation	\$525,000	\$20,000	\$275,000	\$20,000			\$250,000		\$545,000	
30	Maury Hill Branch Sewer Replacement	\$285,000	(\$285,000)								
31	Alb. Berley PS - Capacity Analysis and Upgrade		\$730,000		\$40,000	\$412,000	\$278,000			\$730,000	
32	Alb. Berley PS - Basin Demolition		\$200,000			\$165,000	\$35,000			\$200,000	
33	Odor Control Phase 2	\$2,216,632		\$2,216,632						\$2,216,632	\$65,743
34	Engineering and Administration Building	\$3,000,000	(\$3,000,000)							\$0	
35	Digester Sludge Storage Improvements	\$265,000	\$48,000	\$265,000		\$48,000				\$313,000	
36	Aluminum Slide Gate Replacements	\$470,000		\$470,000						\$470,000	
37	Moore's Creek AWWRF Master Plan	\$100,000	\$150,000		\$50,000	\$200,000				\$250,000	
38	Mechanical Thickener	\$1,200,000	(\$1,200,000)							\$0	
39	Compost Shed Roof Rehabilitation		\$200,000			\$200,000				\$200,000	

CIP Financial Summary (Continued)

Proj. No.	Project Description	Five-Year Capital Program			Projected Future Expenses by Year					Recommended CIP	Work-in-Progress (Prev. Expenses 6/30/2018)
		Current CIP Adopted 6/2018	Proposed Changes	Current Capital Budget	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024		
40	Gas Sphere Rehabilitation		\$740,000		\$80,000	\$660,000				\$740,000	
41	Grinder and Air Control Improvements	\$100,000	\$110,000		\$65,000	\$145,000				\$210,000	
42	Influent Pump & VFD Addition	\$61,000	\$4,000			\$65,000				\$65,000	
43	Secondary Clarifier Coating	\$50,000	\$60,000	\$25,000	\$85,000					\$110,000	
44	Radio Upgrades	\$521,000	\$125,000	\$521,000		\$125,000				\$646,000	\$28,337
45	Asset Management	\$500,000		\$300,000		\$200,000				\$500,000	
46	Security Enhancements	\$2,400,000		\$170,000	\$1,120,000	\$1,110,000				\$2,400,000	
47	IT Master Plan - Software		\$450,000		\$150,000	\$150,000	\$150,000			\$450,000	
Total		\$103,465,632	(\$3,999,000)	\$20,719,605	\$22,946,834	\$26,564,523	\$15,168,670	\$5,877,000	\$8,190,000	\$99,466,632	\$2,847,668

Water System Summary

Urban Water System	Summary		Current Capital Budget	Projected Future Expenses by Year					Recommended CIP	Work-in-Progress
	Current CIP	Proposed Changes		FY20	FY21	FY22	FY23	FY24		
PROJECT COSTS										
Community Water Supply Plan	\$ 8,831,000	\$ (2,526,000)	\$ 3,240,249	\$ 2,470,000	\$ 594,751	\$ -	\$ -	\$ -	\$ 6,305,000	\$ 123,782
Observatory WTP/Ragged Mtn/Sugar Hollow Systems	19,570,000	1,270,000	2,703,198	415,000	6,371,802	7,850,000	3,500,000	-	20,840,000	1,154,558
Finished Water Storage/Distribution - Urban System	22,090,000	(8,143,000)	2,782,001	201,000	2,667,000	4,205,000	1,292,000	2,800,000	13,947,001	178,047
South & North Fork Rivanna WTP and Reservoir System	7,900,000	11,050,000	581,891	9,474,524	7,893,565	1,000,000	-	-	18,950,000	145,516
Total Projects Urban Water Systems	\$ 58,391,000	\$ 1,651,000	\$ 9,307,337	\$ 12,560,524	\$ 17,527,138	\$ 13,055,000	\$ 4,792,000	\$ 2,800,000	\$ 60,041,999	\$ 1,601,901
FUNDING SOURCES URBAN SYSTEM - TO DATE										
Work-in-Progress			\$ 1,601,900	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,601,900	
Debt Proceeds Available 2015B			5,294,967	8,000,000	5,225,033	-	-	-	18,520,000	
Capital Funds Available			2,410,470	-	-	-	-	-	2,410,470	
SUBTOTAL			9,307,337	8,000,000	5,225,033	-	-	-	22,532,370	
FUNDING SOURCES URBAN SYSTEM - NEEDS										
Future Cash reserve transfer to Capital Fund				\$ 1,000,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 500,000	\$ 6,000,000	
New Debt Needed			-	3,560,524	10,802,105	11,555,000	3,292,000	2,300,000	31,509,629	
SUBTOTAL			-	4,560,524	12,302,105	13,055,000	4,792,000	2,800,000	37,509,629	
TOTAL URBAN WATER FUNDING			\$ 9,307,337	\$ 12,560,524	\$ 17,527,138	\$ 13,055,000	\$ 4,792,000	\$ 2,800,000	\$ 60,041,999	
Estimated Bond Issues					\$14,362,600		\$17,147,000		\$60,041,999	

Non-Urban Water System	Summary		Current Capital Budget	Projected Future Expenses by Year					Recommended CIP	Work-in-Progress
	Current CIP	Proposed Changes		FY20	FY21	FY22	FY23	FY24		
PROJECT COSTS										
Crozet Water System	\$ 23,030,000	\$ (5,307,000)	\$ 4,221,690	\$ 5,016,310	\$ 1,317,000	\$ 943,000	\$ 835,000	\$ 5,390,000	\$ 17,723,000	\$ 702,248
Scottsville Water System	-	245,000	145,000	100,000	-	-	-	-	245,000	-
Total Rural Water Systems	\$ 23,030,000	\$ (5,062,000)	\$ 4,366,690	\$ 5,116,310	\$ 1,317,000	\$ 943,000	\$ 835,000	\$ 5,390,000	\$ 17,968,000	\$ 702,248
Non-URBAN FUNDING SOURCES										
Work in Progress			\$ 702,248	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 702,248	
Capital Funds Available			\$ 145,000	\$ 100,000					245,000	
Debt Proceeds 2018 Bond			3,519,442	5,016,310	1,317,000	943,000	734,248	-	11,530,000	
Future Cash reserve transfer to Capital Fund										
New Debt Needed			-	-	-	-	100,752	5,390,000	5,490,752	
TOTAL NON-URBAN WATER FUNDING			\$ 4,366,690	\$ 5,116,310	\$ 1,317,000	\$ 943,000	\$ 835,000	\$ 5,390,000	\$ 17,968,000	
Estimated Bond Issues				\$ -			5,490,800			

Wastewater System Summary

Urban Wastewater System	Summary		Current Capital Budget	Projected Future Expenses by Year					Recommended CIP	Work-in-Progress
	Current CIP	Proposed Changes		FY20	FY21	FY22	FY23	FY24		
PROJECT COSTS										
Wastewater Interceptor/Pumping Stations	\$ 11,161,000	\$ 1,725,000	\$ 3,077,945	\$ 3,720,000	\$ 4,817,385	\$ 1,020,670	\$ 250,000	\$ -	\$ 12,886,000	\$ 449,438
Moore's Creek WWTP	7,251,632	(3,062,000)	2,951,632	130,000	1,108,000	-	-	-	4,189,632	65,743
Security & Asset Management										
Total Urban Wastewater Systems	\$ 18,412,632	\$ (1,337,000)	\$6,029,577	\$3,850,000	\$5,925,385	\$1,020,670	\$250,000	\$0	\$17,075,632	\$515,181
FUNDING SOURCES URBAN SYSTEM - IN PLACE										
Work-in-Progress			\$ 515,181	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 515,181	
Debt Proceeds - 2018			1,472,396	3,100,000	731,604	-	-	-	5,304,000	
Capital Funds Available			4,042,000	-	-	-	-	-	4,042,000	
SUBTOTAL			6,029,577	3,100,000	731,604	-	-	-	9,861,181	
FUNDING SOURCES URBAN SYSTEM - NEEDS										
Future Cash Reserves			\$ -	\$ 750,000	\$ 500,000	\$ -	\$ -	\$ -	\$ 1,250,000	
New Debt Needed			(0)	\$0	4,693,781	1,020,670	250,000	-	5,964,451	
SUBTOTAL			(0)	\$750,000	5,193,781	1,020,670	250,000	-	7,214,451	
TOTAL URBAN WASTEWATER FUNDING			\$ 6,029,577	\$ 3,850,000	\$ 5,925,385	\$ 1,020,670	\$ 250,000	\$ -	\$ 17,075,632	
Estimated Bond Issues					\$ 4,693,800		\$ 1,270,700		\$ 5,964,500	

Non-Urban Wastewater System	Summary		Current Capital Budget	Projected Future Expenses by Year					Recommended CIP	Work-in-Progress
	Current CIP	Proposed Changes		FY20	FY21	FY22	FY23	FY24		
PROJECT COSTS										
Glenmore WWTP	\$ 111,000	\$ 64,000	\$ 25,000	\$ 85,000	\$ 65,000	\$ -	\$ -	\$ -	\$ 175,000	\$ -
Scottsville WWTP	100,000	110,000	-	65,000	145,000	-	-	-	210,000	-
Total Rural Wastewater Systems	\$211,000	\$174,000	\$ 25,000	\$ 150,000	\$ 210,000	\$ -	\$ -	\$ -	\$ 385,000	\$ -
FUNDING SOURCES RURAL SYSTEM - NEEDS										
Capital Funds Available			\$ 25,000	\$ 45,000					70,000	
Future Cash Reserve			-	80,000	-	-	-	-	80,000	
New Debt Needed				25,000	210,000	-	-	-	235,000	
TOTAL RURAL WASTEWATER FUNDING			\$ 25,000	\$ 150,000	\$ 210,000	\$ -	\$ -	\$ -	\$ 385,000	
Estimated Bond Issues			\$ 235,000		\$ 235,000					

	2020 - 2024 Proposed CIP	2019-2023 Adopted CIP	Change \$
<u>Project Cost</u>			
Urban Water Projects	\$ 60,042,000	\$ 89,832,485	\$ (29,790,485)
Urban Wastewater Projects	17,075,632	32,895,150	(15,819,518)
Non-Urban Projects	22,349,000	31,174,400	(8,825,400)
Total Project Cost Estimates	<u>\$ 99,466,632</u>	<u>\$ 153,902,035</u>	<u>\$ (54,435,403)</u>
<u>Funding in place</u>			
Work-in-Progress (paid for)	\$ 2,943,110	\$ 33,967,484	(31,024,374)
Debt Proceeds Used	35,354,000	11,230,305	24,123,695
Cash-Capital Available	6,767,470	7,702,584	(935,114)
	<u>\$ 45,064,580</u>	<u>\$ 52,900,373</u>	<u>\$ (7,835,793)</u>
<u>Financing Needs</u>			
Possible Future Reserves	\$ 7,530,000	4,111,000	3,419,000
New Debt	46,872,052	96,890,662	(50,018,610)
	<u>\$ 54,402,052</u>	<u>\$ 101,001,662</u>	<u>\$ (46,599,610)</u>
Total Funding	<u>\$ 99,466,632</u>	<u>\$ 153,902,035</u>	<u>\$ (54,435,403)</u>
Percentage of funding in place	45.3%	34.4%	
Ratio of debt to expense	85.6%	92.3%	
Ratio of cash to expense	14.4%	7.7%	

Rivanna Water and Sewer Authority
 CIP 2020-2024
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Detail by Major Systems	Total Proposed CIP	Urban Water Projects	Urban Wastewater Projects	Shared Projects	Water Non-Urban Projects	Wastewater Non-Urban Projects
<u>Project Cost</u>						
Urban Water Projects	\$ 60,042,000	\$ 60,042,000	\$ -		\$ -	\$ -
Urban Wastewater Projects	17,075,632	-	17,075,632		-	-
Non-Urban Projects & Shared	22,349,000	-	-	3,996,000	17,968,000	385,000
Total Project Cost Estimates	\$ 99,466,632	\$ 60,042,000	\$ 17,075,632	\$ 3,996,000	\$ 17,968,000	\$ 385,000
<u>Funding in place</u>						
Work-in-Progress (paid for)	\$ 2,943,110	\$ 1,601,900	\$ 515,180	\$ 123,780	\$ 702,250	\$ -
Debt Proceeds available	35,354,000	18,520,000	5,304,000	-	11,530,000	-
Cash-Capital Available	6,767,470	2,410,470	4,042,000	-	245,000	70,000
Subtotal	\$ 45,064,580	\$ 22,532,370	\$ 9,861,180	\$ 123,780	\$ 12,477,250	\$ 70,000
<u>Financing Needs</u>						
Possible Future Reserves	\$ 7,530,000	6,000,000	1,250,000	200,000	-	80,000
New Debt	46,872,052	31,509,630	5,964,452	3,672,220	5,490,750	235,000
Subtotal	\$ 54,402,052	\$ 37,509,630	\$ 7,214,452	\$ 3,872,220	\$ 5,490,750	\$ 315,000
Total Funding	\$ 99,466,632	\$ 60,042,000	\$ 17,075,632	\$ 3,996,000	\$ 17,968,000	\$ 385,000
Percentage of funding in place	45.3%	37.5%	57.8%	3.1%	69.4%	18.2%
Ratio of debt to expense	85.6%	83.3%	66.0%	91.9%	94.7%	61.0%
Ratio of cash to expense	14.4%	14.0%	31.0%	5.0%	1.4%	39.0%

	<u>Urban Water</u>	<u>Urban Wastewater</u>	<u>Non-Urban</u>	<u>Total</u>
Current Adopted CIP 2019 - 2023	\$ 89,832,485	\$ 32,895,150	\$ 31,174,400	\$ 153,902,035
<u>Changes:</u>				
Completed or Closed Projects	(30,559,735)	(12,558,519)	(7,933,390)	(51,051,644)
Adjustments on existing Projects	(5,005,759)	(3,035,000)	(4,988,000)	(13,028,759)
New Projects	<u>7,423,000</u>	<u>2,086,000</u>	<u>136,000</u>	<u>9,645,000</u>
Total Changes	(28,142,494)	(13,507,519)	(12,785,390)	(54,435,403)
Total Proposed CIP 2020 - 2024	\$ 61,689,991	\$ 19,387,631	\$ 18,389,010	\$ 99,466,632

Rivanna Water and Sewer Authority
 CIP 2020-2024
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		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
City of Charlottesville								
Urban Water								
Operating Rate	Per 1000 gal.	1.969	2.070	2.104	2.293	2.477	2.625	2.783
	% Change		5.1%	1.6%	9.0%	8.0%	6.0%	6.0%
Debt Service Charge	Per month	\$ 160,039	\$ 181,008	192,897	218,176	242,493	266,925	291,313
			13.1%	6.6%	13.1%	11.1%	10.1%	9.1%
Revenue Requirements:								
Operating Rate Revenue	Annual	\$ 3,514,200	\$ 3,587,700	\$ 3,645,800	\$ 3,973,922	\$ 4,291,836	\$ 4,549,346	\$ 4,822,307
Debt Service Revenues	Annual	1,920,500	2,172,100	2,314,800	2,618,112	2,909,914	3,203,097	3,495,762
Total		\$ 5,434,700	\$ 5,759,800	\$ 5,960,600	\$ 6,592,034	\$ 7,201,749	\$ 7,752,442	\$ 8,318,068
	\$ Change		\$ 325,100	\$ 200,800	\$ 631,434	\$ 609,716	\$ 550,693	\$ 565,626
	% Change		6.0%	3.5%	10.6%	9.2%	7.6%	7.3%
Urban Wastewater								
Operating Rate	Per 1000 gal.	1.951	2.146	2.340	2.480	2.629	2.787	2.954
	% Change		10.0%	9.0%	6.0%	6.0%	6.0%	6.0%
Debt Service Charge	Per month	\$ 392,841	\$ 408,260	408,755	418,870	426,250	431,910	437,600
			3.9%	0.1%	2.5%	1.8%	1.3%	1.3%
Revenue Requirements:								
Operating Rate Revenue	Annual	\$ 3,540,600	\$ 3,711,300	\$ 3,966,800	\$ 4,204,808	\$ 4,457,096	\$ 4,724,522	\$ 5,007,994
Debt Service Revenues	Annual	4,714,100	4,899,100	4,905,100	5,026,440	5,115,000	5,182,920	5,251,200
Total		\$ 8,254,700	\$ 8,610,400	\$ 8,871,900	\$ 9,231,248	\$ 9,572,096	\$ 9,907,442	\$ 10,259,194
	\$ Change		\$ 355,700	\$ 261,500	\$ 359,348	\$ 340,848	\$ 335,346	\$ 351,751
	% Change		4.3%	3.0%	4.1%	3.7%	3.5%	3.6%
Total all Rate Centers								
Operating Rate Revenue		\$ 7,054,800	\$ 7,299,000	\$ 7,612,600	\$ 8,178,730	\$ 8,748,932	\$ 9,273,868	\$ 9,830,300
Debt Service Revenues		6,634,600	7,071,200	7,219,900	7,644,552	8,024,914	8,386,017	8,746,962
Total City All Revenues		\$ 13,689,400	\$ 14,370,200	\$ 14,832,500	\$ 15,823,282	\$ 16,773,846	\$ 17,659,885	\$ 18,577,262
	\$ Change		\$ 680,800	\$ 462,300	\$ 990,782	\$ 950,564	\$ 886,039	\$ 917,377
	% Change		5.0%	3.2%	6.7%	6.0%	5.3%	5.2%
Additional for 10-Year CIP								
					52,100	176,000	383,300	633,000
		\$ 13,689,400	\$ 14,370,200	\$ 14,832,500	\$ 15,875,382	\$ 16,949,846	\$ 18,043,185	\$ 19,210,262
			5.0%	3.2%	7.0%	6.8%	6.5%	6.5%

Rivanna Water and Sewer Authority
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		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
ACSA Charges From RWSA								
Urban Water								
Operating Rate	Per 1000 gal.	1.969	2.07	2.104	2.293	2.477	2.625	2.783
	% Change		5.1%	1.6%	9.0%	8.0%	6.0%	6.0%
Debt Service Charge	Per month	\$ 285,439	\$ 307,598	320,737	357,389	391,909	426,657	461,241
			7.8%	4.3%	11.4%	9.7%	8.9%	8.1%
Revenue Requirements:								
Operating Rate Revenue	Annual	\$ 3,243,900	\$ 3,447,000	\$ 3,502,800	\$ 3,818,052	\$ 4,123,496	\$ 4,370,906	\$ 4,633,160
Debt Service Revenues	Annual	3,425,300	3,691,200	3,848,800	4,288,673	4,702,911	5,119,880	5,534,895
Total		\$ 6,669,200	\$ 7,138,200	\$ 7,351,600	\$ 8,106,725	\$ 8,826,408	\$ 9,490,786	\$ 10,168,056
	\$ Change		\$ 469,000	\$ 213,400	\$ 755,125	\$ 719,682	\$ 664,379	\$ 677,269
	% Change		7.0%	3.0%	10.3%	8.9%	7.5%	7.1%
Urban Wastewater								
Operating Rate	Per 1000 gal.	1.951	2.146	2.340	2.480	2.629	2.787	2.954
	% Change		10.0%	9.0%	6.0%	6.0%	6.0%	6.0%
Debt Service Charge	Per month	\$ 222,550	\$ 246,308	279,499	297,485	312,095	328,905	345,735
			10.7%	13.5%	6.4%	4.9%	5.4%	5.1%
Revenue Requirements:								
Operating Rate Revenue	Annual	\$ 3,139,800	\$ 3,565,800	\$ 3,966,800	\$ 4,204,808	\$ 4,457,096	\$ 4,724,522	\$ 5,007,994
Debt Service Revenues	Annual	2,670,600	2,955,700	3,354,000	3,569,823	3,745,143	3,946,863	4,148,823
Total		\$ 5,810,400	\$ 6,521,500	\$ 7,320,800	\$ 7,774,631	\$ 8,202,239	\$ 8,671,385	\$ 9,156,817
	\$ Change		\$ 711,100	\$ 799,300	\$ 453,831	\$ 427,608	\$ 469,146	\$ 485,431
	% Change		12.2%	12.3%	6.2%	5.5%	5.7%	5.6%
Non-Urban Rate Centers								
Operating Rate Revenue	Annual	\$ 1,964,600	\$ 2,075,300	2,237,100	2,371,326	2,513,606	2,664,422	2,824,287
Debt Service Revenues	Annual	830,700	1,134,400	1,454,100	1,546,600	1,639,100	1,731,600	1,824,100
Total		\$ 2,795,300	\$ 3,209,700	\$ 3,691,200	\$ 3,917,926	\$ 4,152,706	\$ 4,396,022	\$ 4,648,387
				\$ 481,500	\$ 226,726	\$ 234,780	\$ 243,316	\$ 252,365
				15.0%	6.1%	6.0%	5.9%	5.7%
Total all Rate Centers								
Operating Rate Revenue		\$ 8,348,300	\$ 9,088,100	\$ 9,706,700	\$ 10,394,186	\$ 11,094,198	\$ 11,759,850	\$ 12,465,441
Debt Service Revenues		6,926,600	7,781,300	8,656,900	9,405,096	10,087,154	10,798,343	11,507,818
Total ACSA All Revenues		\$ 15,274,900	\$ 16,869,400	\$ 18,363,600	\$ 19,799,282	\$ 21,181,353	\$ 22,558,194	\$ 23,973,260
	\$ Change		\$ 1,594,500	\$ 1,494,200	\$ 1,435,682	\$ 1,382,070	\$ 1,376,841	\$ 1,415,066
	% Change		10.4%	8.9%	7.8%	7.0%	6.5%	6.3%
Additional for 10-Year CIP								
		\$ 15,274,900	\$ 16,869,400	\$ 18,363,600	\$ 19,983,182	\$ 21,715,853	\$ 23,576,865	\$ 25,569,460
			10.4%	8.9%	8.8%	8.7%	8.6%	8.5%

Rivanna Water and Sewer Authority
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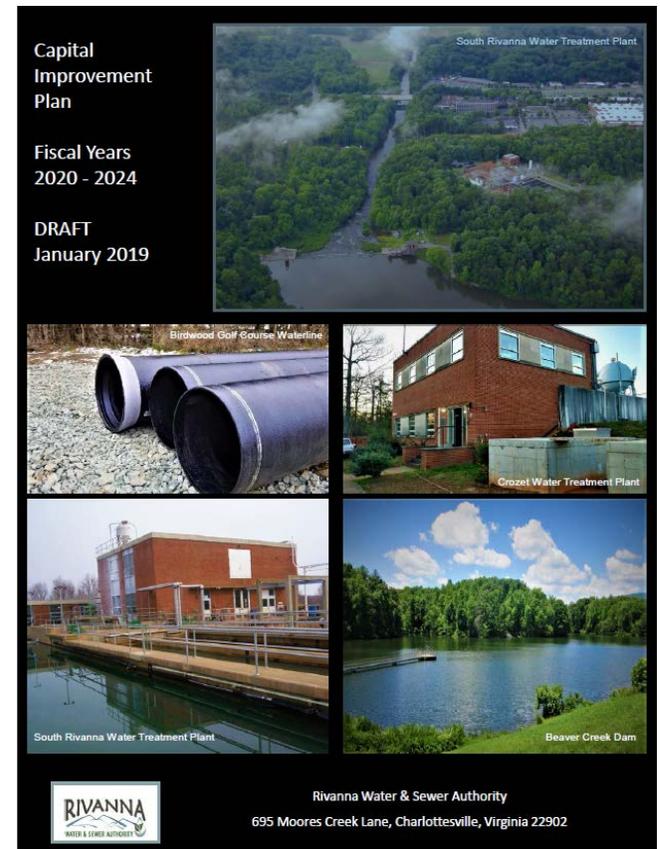
2/7/2019

	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
RWSA							
Operations Revenues							
Urban Water	\$ 6,758,100	\$ 7,034,700	\$ 7,148,600	\$ 7,791,974	\$ 8,415,332	\$ 8,920,252	\$ 9,455,467
Urban Wastewater	6,680,400	7,277,100	7,933,600	8,409,616	8,914,193	9,449,045	10,015,987
Other Rate Centers	1,964,600	2,075,300	2,237,100	2,371,326	2,513,606	2,664,422	2,824,287
Total	<u>\$ 15,403,100</u>	<u>\$ 16,387,100</u>	<u>\$ 17,319,300</u>	<u>\$ 18,572,916</u>	<u>\$ 19,843,130</u>	<u>\$ 21,033,718</u>	<u>\$ 22,295,741</u>
Change \$		984,000	932,200	1,253,616	1,270,214	1,190,588	1,262,023
Change %		6.4%	5.7%	7.2%	6.8%	6.0%	6.0%
Debt Service Charge Revenues							
Urban Water	5,345,800	5,863,300	6,163,600	6,906,785	7,612,825	8,322,977	9,030,657
Urban Wastewater	7,384,700	7,854,800	8,259,100	8,596,263	8,860,143	9,129,783	9,400,023
Other Rate Centers	830,700	1,134,400	1,454,100	1,546,600	1,639,100	1,731,600	1,824,100
Total	<u>\$ 13,561,200</u>	<u>\$ 14,852,500</u>	<u>\$ 15,876,800</u>	<u>\$ 17,049,648</u>	<u>\$ 18,112,068</u>	<u>\$ 19,184,360</u>	<u>\$ 20,254,780</u>
Change \$		1,291,300	1,024,300	1,172,848	1,062,420	1,072,292	1,070,420
Change %		9.5%	6.9%	7.4%	6.2%	5.9%	5.6%
Total RWSA Customer Revenues	<u>\$ 28,964,300</u>	<u>\$ 31,239,600</u>	<u>\$ 33,196,100</u>	<u>\$ 35,622,564</u>	<u>\$ 37,955,198</u>	<u>\$ 40,218,078</u>	<u>\$ 42,550,521</u>
Change \$		\$ 2,275,300	\$ 1,956,500	\$ 2,426,464	\$ 2,332,634	\$ 2,262,880	\$ 2,332,443
Change %		7.9%	6.3%	7.3%	6.5%	6.0%	5.8%
Additional for 10-Year CIP							
	<u>\$ 28,964,300</u>	<u>\$ 31,239,600</u>	<u>\$ 33,196,100</u>	<u>\$ 35,858,564</u>	<u>\$ 38,901,698</u>	<u>\$ 42,566,549</u>	<u>\$ 47,128,192</u>
		0.0%	6.3%	8.0%	8.5%	9.4%	10.7%

Proposed Capital Improvement Plan FY 2020 - 2024

BILL MAWYER, EXECUTIVE DIRECTOR

FEBRUARY 26, 2019





Proposed FY 20 – 24 CIP

- \$99.5 M
- 39 Projects to be completed
- 3 Projects to be extended into FY 26
 1. Avon to Pantops Water Main
 2. Beaver Creek Dam Modifications
 3. Beaver Creek Raw Water Pump Station
 - a. Deleted Beaver Creek Oxygenation System
- \$54.4 M Less than FY 19-23 CIP of \$153.9 M



CIP Objectives

Renovate and Upgrade Largest Water Treatment Plants

- South Rivanna
- Observatory
- Crozet

Maintain Existing Facilities

- Sugar Hollow Dam Rubber Gate Replacement
- South Rivanna Dam Gate Repairs
- Upper Schenks Branch Interceptor
- Bucks Elbow Tank Chlorination System
- Interceptor and MH Repair
- Albemarle Berkley Basin Demolition
- Digester Sludge Storage Improvements
- MC Aluminum Slide Gate Replacement
- Scottsville WW Grinder and Air Control
- Glenmore Clarifier Coating

Redundancy / Resiliency

- Birdwood GC Water Main
- SRR to RMR Pipeline Easements
- SFR River Crossing and NR Transmission Main
- Rt 29/ Airport Road Pump Station

Regulatory Compliance

- Crozet Flow Equalization Tank
- North Rivanna WTP Lagoon
- Scottsville WTP Flow Meter
- Scottsville LT2 Improvements
- Security Enhancements

Master Planning

- Finished Water System
- Water Demand and Safe Yield
- Moores Creek AWRRF
- Albemarle Berkley PS Capacity Analysis
- Asset Management
- IT Master Plan – Software



Major Projects

1. Crozet, South Rivanna, and Observatory Water Treatment Plant Renovations and Upgrades (\$43.2 M)
2. Sugar Hollow Dam Rubber Gate Replacement (\$1.1 M)
3. South Rivanna Dam Gate Repairs (\$0.9 M)
4. South Fork Rivanna River Crossing and North Rivanna Transmission Main (\$5.3 M)
5. Route 29 Pump Station (\$2.3 M)
6. North Rivanna Water Treatment Plant Lagoon Relocation (\$2.3 M)
7. Crozet Wastewater Flow Equalization Tank (\$4.9 M)
8. Security Enhancements (\$2.4 M)

Water Treatment Plant Renovations & Upgrades

- Cost: \$43.2 M
- Completion: 2019-2023



South Rivanna WTP



Observatory WTP



Crozet WTP

Sugar Hollow Dam Rubber Gate Replacement

- Cost: \$1.1 M
- Completion: 2019 - 2021



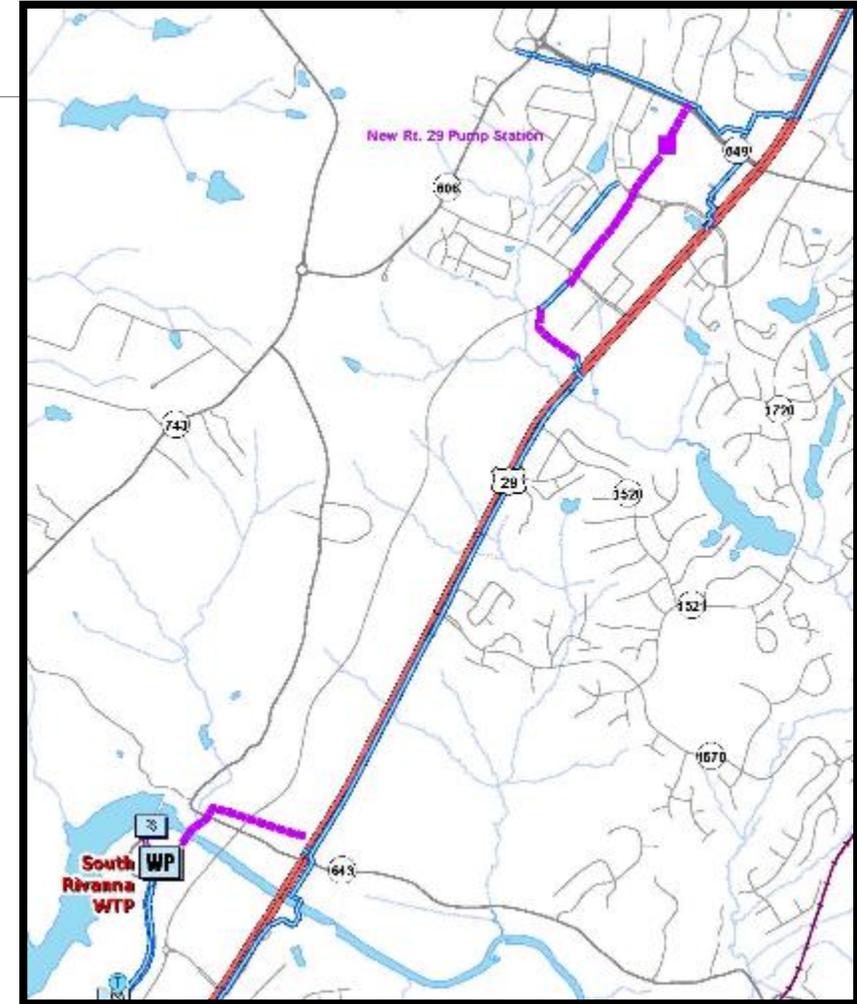
South Rivanna Dam Gate Repairs

- Cost: \$0.9 M
- Completion: 2019 - 2020



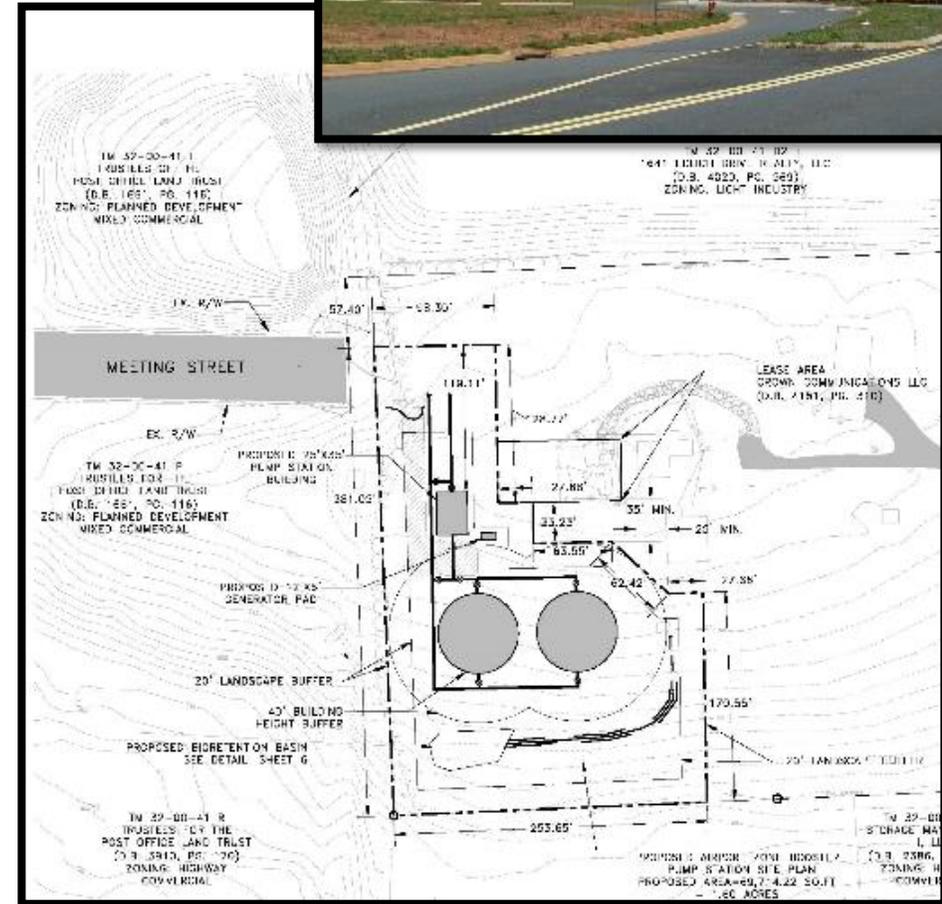
South Rivanna River Crossing & North Rivanna Transmission Main

- Second Crossing under the South Rivanna River
- Connection to the Proposed Rt. 29 Pump Station
- Interconnects Pressure Zones
- Allows for Future Creation of the Airport Pressure Zone and Lower Operating Pressures
- Implementation of Rt. 29 North Master Plan
- 7,500 feet of 24-inch main
- Cost: \$5.34 M
- Completion: 2021 - 2023



Rt. 29 Pump Station

- Provide Redundant Feed to North Rivanna Pressure Zone
- Eliminate the Need for Temporary Pumping
- Dramatically Enhance Emergency Response Times
- Provide for Future Growth in the Places 29 Master Plan Area
- Lead to Future Creation of Airport Pressure Zone and Reduction of High Operating Pressures
- Cost: \$2.3 M
- Completion: 2019 - 2022



North Rivanna WTP – Backwash Lagoon Relocation

- Cost: \$2.3 M
- Completion: 2019 – 2022
- Historical Configuration that no Longer Meets the Regulatory or Functional Need of the Facility



Backwash Lagoons – Normal operation



Backwash Lagoons – Inundated after the North Rivanna River receded in 2018

Crozet Flow Equalization Tank & PS



Henrico Co. DPU – Broadwater Creek Flow Equalization Tank

- Controls Peak Wastewater Flows within the Entire Crozet System to Avoid Overflows
- Includes New Tank, Odor Control, a Flushing System, and Modifications to the Adjacent Crozet PS No. 4
- Cost: \$4.9 M
- Completion: 2019 – 2021

Security Enhancements

- 2017 Vulnerability Assessment
- Uniform Access Control System for all Facilities
- Improve or Replace select Locks, Doors, Windows, Gates
- Improve Fencing and Signage
- Enhance Cameras, Lighting and Surveillance
- Cost: \$2.4 M
- Completion: 2019 - 2021



Major Projects – Extended* or Delayed

1. Beaver Creek Dam Modifications & Pump Station (\$10 M/ \$13 M)*
2. Avon to Pantops Water Main (\$5 M/ \$8 M)*
3. Ragged Mountain Reservoir to Observatory Water Treatment Plant Raw Water Line (\$11.8 M)
4. Ragged Mountain Reservoir to Observatory Water Treatment Pump Station (\$4 M)
5. Engineering and Administration Building Addition (\$3 M)
6. Moores Creek AWRRF Mechanical Thickeners (\$1.9 M)

Long Range Plan

- 15 Year, FY 20 – 34 CIP
 - FY 20-24 \$99.5 M
 - FY 25-29 \$82.7 M
 - FY 30-34 \$73.2 M
-
- \$254.4 M

Financial Information

Table 1

	2020 - 2024 Proposed <u>CIP</u>	2019-2023 Adopted <u>CIP</u>	<u>Change \$</u>
<u>Project Cost</u>			
Urban Water Projects	\$ 60,042,000	\$ 89,832,485	\$ (29,790,485)
Urban Wastewater Projects	17,075,632	32,895,150	(15,819,518)
Non-Urban Projects	22,349,000	31,174,400	(8,825,400)
Total Project Cost Estimates	\$ 99,466,632	\$ 153,902,035	\$ (54,435,403)
<u>Funding in place</u>			
Work-in-Progress (paid for)	\$ 2,943,110	\$ 33,967,484	(31,024,374)
Debt Proceeds Used	35,354,000	11,230,305	24,123,695
Cash-Capital Available	6,767,470	7,702,584	(935,114)
	\$ 45,064,580	\$ 52,900,373	\$ (7,835,793)
<u>Financing Needs</u>			
Possible Future Reserves	\$ 7,530,000	4,111,000	3,419,000
New Debt	46,872,052	96,890,662	(50,018,610)
	\$ 54,402,052	\$ 101,001,662	\$ (46,599,610)
Total Funding	\$ 99,466,632	\$ 153,902,035	\$ (54,435,403)
Percentage of funding in place	45.3%	34.4%	
Ratio of debt to expense	85.6%	92.3%	
Ratio of cash to expense	14.4%	7.7%	

Rivanna Water and Sewer Authority
 CIP 2020-2024
 Summary Information - DRAFT

2/7/2019

Financial Information

Table 4

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
City of Charlottesville								
Urban Water								
Operating Rate	Per 1000 gal.	1.969	2.070	2.104	2.293	2.477	2.625	2.783
	% Change		5.1%	1.6%	9.0%	8.0%	6.0%	6.0%
Debt Service Charge	Per month	\$ 160,039	\$ 181,008	192,897	218,176	242,493	266,925	291,313
			13.1%	6.6%	13.1%	11.1%	10.1%	9.1%
Revenue Requirements:								
Operating Rate Revenue	Annual	\$ 3,514,200	\$ 3,587,700	\$ 3,645,800	\$ 3,973,922	\$ 4,291,836	\$ 4,549,346	\$ 4,822,307
Debt Service Revenues	Annual	1,920,500	2,172,100	2,314,800	2,618,112	2,909,914	3,203,097	3,495,762
Total		\$ 5,434,700	\$ 5,759,800	\$ 5,960,600	\$ 6,592,034	\$ 7,201,749	\$ 7,752,442	\$ 8,318,068
	\$ Change		\$ 325,100	\$ 200,800	\$ 631,434	\$ 609,716	\$ 550,693	\$ 565,626
	% Change		6.0%	3.5%	10.6%	9.2%	7.6%	7.3%
Urban Wastewater								
Operating Rate	Per 1000 gal.	1.951	2.146	2.340	2.480	2.629	2.787	2.954
	% Change		10.0%	9.0%	6.0%	6.0%	6.0%	6.0%
Debt Service Charge	Per month	\$ 392,841	\$ 408,260	408,755	418,870	426,250	431,910	437,600
			3.9%	0.1%	2.5%	1.8%	1.3%	1.3%
Revenue Requirements:								
Operating Rate Revenue	Annual	\$ 3,540,600	\$ 3,711,300	\$ 3,966,800	\$ 4,204,808	\$ 4,457,096	\$ 4,724,522	\$ 5,007,994
Debt Service Revenues	Annual	4,714,100	4,899,100	4,905,100	5,026,440	5,115,000	5,182,920	5,251,200
Total		\$ 8,254,700	\$ 8,610,400	\$ 8,871,900	\$ 9,231,248	\$ 9,572,096	\$ 9,907,442	\$ 10,259,194
	\$ Change		\$ 355,700	\$ 261,500	\$ 359,348	\$ 340,848	\$ 335,346	\$ 351,751
	% Change		4.3%	3.0%	4.1%	3.7%	3.5%	3.6%
Total all Rate Centers								
Operating Rate Revenue		\$ 7,054,800	\$ 7,299,000	\$ 7,612,600	\$ 8,178,730	\$ 8,748,932	\$ 9,273,868	\$ 9,830,300
Debt Service Revenues		6,634,600	7,071,200	7,219,900	7,644,552	8,024,914	8,386,017	8,746,962
Total City All Revenues		\$ 13,689,400	\$ 14,370,200	\$ 14,832,500	\$ 15,823,282	\$ 16,773,846	\$ 17,659,885	\$ 18,577,262
	\$ Change		\$ 680,800	\$ 462,300	\$ 990,782	\$ 950,564	\$ 886,039	\$ 917,377
	% Change		5.0%	3.2%	6.7%	6.0%	5.3%	5.2%
Additional for 10-Year CIP								
		\$ 13,689,400	\$ 14,370,200	\$ 14,832,500	\$ 15,875,382	\$ 16,949,846	\$ 18,043,185	\$ 19,210,262
			5.0%	3.2%	7.0%	6.8%	6.5%	6.5%

Rivanna Water and Sewer Authority
 CIP 2020-2024
 Summary Information - DRAFT

2/7/2019

Financial Information

Table 5

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
ACSA Charges From RWSA								
Urban Water								
Operating Rate	Per 1000 gal.	1.969	2.07	2.104	2.293	2.477	2.625	2.783
	% Change		5.1%	1.6%	9.0%	8.0%	6.0%	6.0%
Debt Service Charge	Per month	\$ 285,439	\$ 307,598	320,737	357,389	391,909	426,657	461,241
			7.8%	4.3%	11.4%	9.7%	8.9%	8.1%
Revenue Requirements:								
Operating Rate Revenue	Annual	\$ 3,243,900	\$ 3,447,000	\$ 3,502,800	\$ 3,818,052	\$ 4,123,496	\$ 4,370,906	\$ 4,633,160
Debt Service Revenues	Annual	3,425,300	3,691,200	3,848,800	4,288,673	4,702,911	5,119,880	5,534,895
Total		\$ 6,669,200	\$ 7,138,200	\$ 7,351,600	\$ 8,106,725	\$ 8,826,408	\$ 9,490,786	\$ 10,168,056
	\$ Change		\$ 469,000	\$ 213,400	\$ 755,125	\$ 719,682	\$ 664,379	\$ 677,269
	% Change		7.0%	3.0%	10.3%	8.9%	7.5%	7.1%
Urban Wastewater								
Operating Rate	Per 1000 gal.	1.951	2.146	2.340	2.480	2.629	2.787	2.954
	% Change		10.0%	9.0%	6.0%	6.0%	6.0%	6.0%
Debt Service Charge	Per month	\$ 222,550	\$ 246,308	279,499	297,485	312,095	328,905	345,735
			10.7%	13.5%	6.4%	4.9%	5.4%	5.1%
Revenue Requirements:								
Operating Rate Revenue	Annual	\$ 3,139,800	\$ 3,565,800	\$ 3,966,800	\$ 4,204,808	\$ 4,457,096	\$ 4,724,522	\$ 5,007,994
Debt Service Revenues	Annual	2,670,600	2,955,700	3,354,000	3,569,823	3,745,143	3,946,863	4,148,823
Total		\$ 5,810,400	\$ 6,521,500	\$ 7,320,800	\$ 7,774,631	\$ 8,202,239	\$ 8,671,385	\$ 9,156,817
	\$ Change		\$ 711,100	\$ 799,300	\$ 453,831	\$ 427,608	\$ 469,146	\$ 485,431
	% Change		12.2%	12.3%	6.2%	5.5%	5.7%	5.6%
Non-Urban Rate Centers								
Operating Rate Revenue	Annual	\$ 1,964,600	\$ 2,075,300	2,237,100	2,371,326	2,513,606	2,664,422	2,824,287
Debt Service Revenues	Annual	830,700	1,134,400	1,454,100	1,546,600	1,639,100	1,731,600	1,824,100
Total		\$ 2,795,300	\$ 3,209,700	\$ 3,691,200	\$ 3,917,926	\$ 4,152,706	\$ 4,396,022	\$ 4,648,387
				\$ 481,500	\$ 226,726	\$ 234,780	\$ 243,316	\$ 252,365
				15.0%	6.1%	6.0%	5.9%	5.7%
Total all Rate Centers								
Operating Rate Revenue		\$ 8,348,300	\$ 9,088,100	\$ 9,706,700	\$ 10,394,186	\$ 11,094,198	\$ 11,759,850	\$ 12,465,441
Debt Service Revenues		6,926,600	7,781,300	8,656,900	9,405,096	10,087,154	10,798,343	11,507,818
Total ACSA All Revenues		\$15,274,900	\$ 16,869,400	\$ 18,363,600	\$ 19,799,282	\$ 21,181,353	\$ 22,558,194	\$ 23,973,260
	\$ Change		\$ 1,594,500	\$ 1,494,200	\$ 1,435,682	\$ 1,382,070	\$ 1,376,841	\$ 1,415,066
	% Change		10.4%	8.9%	7.8%	7.0%	6.5%	6.3%
Additional for 10-Year CIP								
		\$15,274,900	\$ 16,869,400	\$ 18,363,600	\$ 19,983,182	\$ 21,715,853	\$ 23,576,865	\$ 25,569,460
			10.4%	8.9%	8.8%	8.7%	8.6%	8.5%



Proposed FY 20 – 24 CIP

- \$99.5 M
- 39 Projects to be completed
- 3 Projects to be extended into FY 26
 1. Avon to Pantops Water Main
 2. Beaver Creek Dam Modifications
 3. Beaver Creek Raw Water Pump Station
 - a. Deleted Beaver Creek Oxygenation System

Questions?

