

MINUTES OF THE EXECUTIVE DIRECTOR WORKSHOP
of the
LAKE COUNTY WATER AUTHORITY
January 15, 2020

1 A Workshop of the Board of Trustees of the Lake County Water Authority, to interview
2 candidates for the Executive Director position, was held at 3 p.m. on Wednesday, January 15,
3 2020 in the Lake County Water Authority Administration Building, Conference Room at 27351
4 State Road 19, Tavares, Florida.

5 **Members Present-District #**

Staff Present

6 Amy Stone, Chairman (#5)
7 Carolyn Maimone, Vice Chair (#3)
8 Trampis BonJorn (#2)
9 Peggy Cox (#1)
10 Keith Farnar (At-Large)
11 Butch Hendrick (#4)
12 Courtney Stokes (At-Large)

Anna Ely, Recording Secretary
Wendy Sellers, Human Resources
Kevin Stone, Attorney

14 The meeting was called to order at 3:08 p.m. and everyone stood for the Pledge of Allegiance.

15 Attorney, Kevin Stone informed the Board that most of the what he was going to say applies to
16 all the meetings that they have except that this meeting is a little weird and noted that they (the
17 Board members) probably feel weird about it.

18 He explained that some of general rules have to be applied in special ways as the think through
19 what they are doing because they are going to want to say things that really aren't compatible
20 with our statutory duties as a public transparent, open to the public, board.

21 He stated that Chapter 286 of the Sunshine Laws doesn't have any kind of exemptions or
22 confidential procedures or exceptions for the hiring process. He stated that there are a lot of
23 exceptions in the Sunshine Laws, but this isn't one of them.

24 He explained that the entire interview process is open to the public, and the public includes every
25 human being in the world, including the other candidates. He stated that not only can you not
26 exclude the other candidates from the room, to suggest that they leave the room implies that you
27 are going to judge them for exercising their right to be present. He explained that they have a
28 constitutional right in Florida to be present and you can't hold it against someone for being
29 present. He stated that a lot of time people will stand up and leave when their interview is over,
30 but sometimes they don't, and that's just how it is.

31 Attorney Stone also noted that may also sit through your discussion of them. He explained that
32 the new Executive Director will be reporting to this Board and that means that the Board is really
33 the body that hires the Executive Director, and they (the Board) don't have a choice but to
34 exercise their fiduciary duty to this organization by having a robust conversation about the
35 candidates and a robust conversation about the qualifications about the qualifications that you are

Minutes of the Executive Director Workshop
January 15, 2020

36 seeking in candidates. He stated that some of those conversations are probably of a nature that it
37 will hurt the feelings of a candidate, particularly a thin-skinned candidate that expect this process
38 to be like this.

39 He stated that he would encourage Board members to be candid and forthcoming and express
40 their thoughts and express your reservations even if people are in the room, because people's
41 feelings in the short term are less important to this organization than the quality of leadership in
42 the long run. He noted that it's a painful thing, and he has seen it happen, when a board has had
43 to discuss the qualities or lack there-of of a candidate or current employee, because they are
44 going to have to take action on them, so just expect that.

45 Attorney Stone stated that they don't really have motions and votes, because at workshops we
46 don't take final actions. He stated that they will take final action at a subsequent meeting maybe,
47 just to ratify what they discuss today.

48 He explained that their votes and those kinds of things can't be done anonymously. He noted
49 that they have lots of information and score sheets in front of them and they are going to be
50 tempted to take notes and write things down and they should write down their thoughts and
51 organize them that way. He explained that that score sheets and ranking systems can be
52 wonderful tools to get a group moving toward a consensus or final decision, but they also need to
53 keep in mind these are all going to be public records.

54 He stated that they do want to keep their notes professional, as anything they write down could
55 end up in the newspaper or in front of a candidate.

56 Mr. Farner asked if notes were to be turned in and Attorney Stone stated that it is up to them, but
57 he actually likes the practice of turning in agendas and notes at the end of a meeting because staff
58 is more knowledgeable in the Florida Retention Schedule and the length of time they need to be
59 held before they can be disposed of, so would encourage them to either turn them in at the end of
60 the meeting or if they take them home, they need to keep them forever and show them to anyone
61 who asks to see them.

62 Attorney Stone stated that there is no secret voting, and no secret pieces of paper, and if the
63 ranking sheets are used a tool to evaluate where they want to go next, those sheets cannot be
64 anonymous.

65 He also that there can be no discussion between Board members regarding any Board business
66 unless they are in a public meeting that has been noticed ahead of time, and minutes are being
67 taken. It was noted that the current meeting has been noticed ahead of time.

68 Attorney Stone explained that this is a workshop, and when you notice something as a workshop
69 you are putting public on notice that you are not going to be making any final decisions today.
70 He stated that in theory that might discourage someone from coming to a meeting because they
71 know nothing final will happen today. He stated that it doesn't mean that they can't get pretty
72 far down the road of their decision-making process.

Minutes of the Executive Director Workshop
January 15, 2020

73 He explained that depending on how things go, it might be clear that there is a consensus on the
74 candidate, and they might actually give direction to staff to go ahead and prepare a form of an
75 offer. He stated that they are not going to hire anybody today or even at the next meeting, as
76 there is the negotiation process that comes after they pick candidate number one which might not
77 work out.

78 He stated that could have a consensus to direct staff to prepare an offer package that would go to
79 who they are thinking is going to be candidate number one, because that would save them a
80 bunch of time. He stated that they don't want to come back to their next meeting where they can
81 take action and then choose a candidate and come back to a meeting after that to ratify the offer
82 that staff has put together. He stated that they need to see that package, as they don't want to just
83 say to staff, go negotiate something and we will say hi to our new Director at the next meeting.
84 They need to take formal action to hire.

85 Attorney Stone stated that if there is no consensus today, if there is no direction to be given that's
86 fine, they can take their time and get it right, but he does think it would be okay if things are
87 headed that direction to have an idea of what you are going to do at the following meeting. You
88 can have a discussion at the following meeting to verify what you thought you were going to do
89 at this meeting, and they do have to bring it back up with a motion and have public comment
90 available to put into action the ideas they develop today.

91 Mr. Hendrick asked if any part of the Executive Director package has been given to the
92 candidates at all, such as entry level pay scale and it was noted that nothing has been given to the
93 candidates.

94 Ms. Sellers noted that salary expectations is one of the final questions in today's interview
95 process.

96 Ms. Cox asked if staff's salaries are public record and Ms. Sellers stated that they are, but the
97 Executive Director's is not posted publicly. Attorney Stone noted that candidates could ask for a
98 copy of the paystub and we would have to provide it. Ms. Cox stated that it is in the Budget and
99 noted that the Budget is public knowledge.

100 Attorney Stone explained that government salaries a public information and to deny that is a
101 violation of the Sunshine and Public Records act and you can be sued and the person that sues
102 you can get is attorney's fees paid.

103 Chairman Stone explained that Ms. Sellers is going to ask the questions, so that there aren't any
104 differences in the questions and the nuance in which they are asked. She stated that this way,
105 Board members can focus on paying attention to the answers rather than being concerned about
106 who's asking the questions.

107 She stated that they each have the questions in front of them and noted that any questions that
108 were submitted to Ms. Sellers were added to the list to be asked of the candidate. She noted that
109 they are allotting thirty minutes for each interview and depending on time, there could be follow-
110 up questions.

111 Ms. Sellers stated if they want to have additional questions after the process, she can call them
112 after the interviews with those questions. She stated that there is no need to rush, they don't have
113 to make a decision today or even the next Board meeting.

114 Candidates were interviewed in this order

115 **Roberto (Bobby) A Bonilla**

116 **Dr. Jason Danaher**

117 **Ron Hart**

118 **Caryn Gardner-Young**

119 *Note: Ms. Sellers asked the same questions of all prospective candidates, except for the last two*
120 *questions which were asked by Mr. Farnier and Mr. Hendrick.*

- 121 • **Tell us why you want this role.**
- 122 • **This role requires a great deal of time with project management. Explain your**
123 **project management experience with a large project, preferably with water**
124 **resources or other natural resources.**
- 125 • **The role requires a great deal of time dealing with the public and coordinating with**
126 **other government agencies. Explain your experience in this area.**

127 **RECENTLY, AN EMPLOYEE-BASED COMMITTEE CREATED A SET OF VALUES**
128 **FOR LCWA. WE HAVE A FEW QUESTIONS FOR YOU BASED OFF OF THOSE**
129 **VALUES SINCE THIS ROLE REQUIRES A GREAT DEAL OF TIME MANAGING**
130 **PEOPLE**

- 131 • **Commitment: We expect all team members to commit to serving the public, meeting**
132 **deadlines, achieving department and organization goals while continuously**
133 **improving yourself and the organization as a whole. How do you hold people**
134 **accountable to this?**
- 135 • **If you have a staff member who fell down on that, how would you handle that?**
- 136 • **Communication: We expect all team members to be inclusive of others, listening to**
137 **and welcoming different ideas. How do you handle tense situations?**
- 138 • **Teamwork: We expect all team members to be flexible, dependable and self-**
139 **accountable while ensuring time is used effectively and productively. We encourage**
140 **recognition and appreciation of team members across departments. How do you**
141 **recognize/ reward people?**
- 142 • **Trust: We expect all team members to be respectful at all times, keep promises to all**
143 **stakeholders, show integrity and always do the right thing. What have you done in**
144 **the past if an employee violates your trust? What have you done in the past if an**
145 **employee has betrayed your trust?**
- 146 • **Have you ever had to put someone on a performance plan or terminate them?**

- 147 • **Work Ethic: We expect all team members to have a desire to strive for excellence in**
148 **their role, take initiative, assume responsibility and maintain a positive, can-do**
149 **attitude while always putting safety first. How do you ensure safety and project**
150 **completion?**
- 151 • **What are your salary expectations?**
- 152 • **Mr. Farner asked, “What is your impression of Hickory Point?”**
- 153 • **Mr. Hendrick asked, “If you were to get this job, who would be your boss?”**

154 Following the interviews, the Board held a discussion regarding the pros and cons of each
155 candidate.

156 **Bobby Bonilla**

157 Mr. Farner and Mr. Hendrick stated that Mr. Bonilla’s “boots on the ground” attitude combined
158 with his experience and knowledge made him the best candidate for the position. Ms. Cox stated
159 that Mr. Bonilla has done a good job with the Lake County Parks Program.

160 Mr. Farner, Mr. Hendrick and Ms. Cox were impressed by his determination and commitment to
161 his goals.

162 Vice Chair Maimone noted that Mr. Bonilla didn’t answer the interview questions that were
163 presented.

164 **Dr. Jason Danaher**

165 It was noted that Dr. Danaher, while well-educated and an excellent employee needs more
166 experience, and would be a good candidate in the future. It was stated that it is important to
167 increase his role in the Agency, so he knows how to take that position later. It was also noted
168 that he needs to know just how important he is to the Agency.

169 **Mr. Hart**

170 Vice Chair Maimone stated that Mr. Hart interviewed well, and she was impressed with the
171 reports he provided. She stated that Mr. Hart is more experienced than any other candidate for
172 the job and even more experienced than the current director of the Agency.

173 Ms. Cox stated that she has been getting a lot of phone call and emails in favor of Mr. Hart. She
174 noted that if Mr. Hart is appointed Director, she feels they should then move Dr. Danaher up.

175 Mr. Hendrick stated that he thinks Mr. Hart should stay at the position he is in, and he doesn’t
176 think he understands the rank system.

177 Mr. Farner stated he doesn’t think Mr. Hart would make any changes in the agency. He stated
178 that he thinks there is a strong candidate that can develop the agency but doesn’t see that as is
179 Mr. Hart.

180 Ms. Stokes stated that Mr. Hart's knowledge of the water is amazing.

181 Chairman Stone stated that Mr. Hart is not Mr. Perry and they have completely different thought
182 processes and ideas on how to run the Agency. She noted that Water Authority employees have
183 great respect for Mr. Hart, and he has never had any problems with his employees.

184 Vice Chair Maimone stated that she was told by a City Manager that the Water Authority would
185 be crazy not to hire Mr. Hart. She explained that Mr. Hart has taken it upon himself to join City
186 Chambers and the League of Cities just to open up communication with other agencies.

187 Mr. Farner stated that while Mr. Hart is on his short list, he just doesn't see him leading the
188 Agency into the future.

189 Mr. Bonjorn stated that Mr. Hart is very knowledgeable and has a lot of contacts in the
190 community.

191 Ms. Stokes stated that there have been times when she didn't know whether he had the
192 leadership skills needed, but once she read his Hickory Point plan, she sees that he has very clear
193 goals that he has laid out.

194 **Caryn Gardner-Young**

195 Board members were concerned about Ms. Gardner-Young's lack of water resources experience
196 and agreed that while she may be a good office administrator, she is not the right fit for the
197 Water Authority.

198 **Additional Discussion:**

199 Chairman Stone stated that she and Ms. Sellers took the opportunity to talk with other Water
200 Authority employees and management to ask for their input. They noted that staff members
201 expressed their opinions and desires and stated that they would like someone with knowledge in
202 water resource management and that they live in Lake County and have knowledge of the local
203 water systems and its issues. It was also noted that employees also want to be able to do their
204 jobs and not be held back.

205 Ms. Sellers stated that staff members were happy with the re-organization of the Agency, as it
206 meant that someone could be promoted from within. She explained that if someone from outside
207 the Agency is appointed Director, there may be a problem with turnover. She noted that she did
208 inform the employees that ultimately the decision was up to the Board.

209 Vice Chair Maimone asked whose idea it was to create the Employee Values and Ms. Sellers
210 said that while the concept was her idea, it was the employee advisory committee who actually
211 set the values. Ms. Sellers explained that employees are working together to change the
212 atmosphere within agency.

213 Ms. Sellers explained to the Board that they did not need to make a decision on who to hire as
214 Executive Director at this time and noted that no vote could be taken as this was only a
215 workshop.

Minutes of the Executive Director Workshop
January 15, 2020

216 Chairman Stone, Vice Chair Maimone and Mr. BonJorn each stated that Mr. Hart was their
217 choice, while Mr. Farner and Mr. Hendrick were in favor of hiring Mr. Bonilla. Ms. Cox and
218 Ms. Stokes were undecided as to whether Mr. Bonilla or Mr. Hart would be the best fit for the
219 Agency.

220 Chairman Stone stated that if the Board felt they needed to, they could schedule second
221 interviews with any of the candidates and they could take their time and each Board member
222 would have a chance to ask questions.

223 Attorney Stone noted that Board members could also speak to candidates individually, that it
224 doesn't have to be a group setting.

225 Mr. Hendrick and Mr. Farner each stated that if weren't for Mr. Bonilla's application they would
226 be supporting Mr. Hart, but as it stands Mr. Bonilla is their top candidate.

227 The Board decided to continue any discussion at the January 18 regular Board Meeting, at which
228 time they could make a decision should they choose to.

229 Meeting adjourned at 6:19 pm.

230 Respectfully submitted,

231 _____
Anna Ely, Recording Secretary

232 _____
Gary Cooney, Secretary-Treasurer

Amy Stone, Chairman

DRAFT
MINUTES OF THE REGULAR BOARD MEETING
of the
LAKE COUNTY WATER AUTHORITY
January 22, 2020

1 The Regular Hearing of the Board of Trustees of the Lake County Water Authority was held at
2 3:30 p.m. on Wednesday, January 22, 2020 in the Lake County Administration Building, County
3 Commissioners Chambers at 315 West Main Street, Tavares, Florida.

4 **Members Present-District #**

Staff Present

5 Amy Stone, Chairman (#5)	Michael J. Perry, Executive Director
6 Carolyn Maimone, Vice Chair (#3)	Ron Hart, Water Resources Director
7 Trampis BonJorn (#2)	Dr. Jason Danaher, Water Res. Project Manager
8 Peggy Cox (#1)	Biago Gugliotti, Land Resources Director
9 Keith Farner (At-Large)	Ben Garcia, IT Manager
10 Butch Hendrick (#4)	Brian Nagy, Field Services Manager
11 Courtney Stokes (At-Large)	Tracy Hauserman, Land Management Ranger
12	Elizabeth Hyatt, Financial Coordinator
13	Anna Ely, Recording Secretary
14	Kevin Stone, Attorney

15 A list of others present that signed the attendance roster is filed in the permanent files of the
16 Water Authority.

17 **1. CALL TO ORDER / PLEDGE OF ALLEGIANCE**

18 The meeting was called to order at 3:30 p.m. and everyone stood for the Pledge of Allegiance.

19 **2. APPROVAL OF MINUTES**

20 **VICE CHAIR MAIMONE MADE A MOTION TO APPROVE THE MINUTES OF THE**
21 **LAKE COUNTY WATER AUTHORITY WORKSHOP OF DECEMBER 12, 2019.** Mr.

22 BonJorn seconded the motion.

23 **Motion approved 6-0. Ms. Cox was not in attendance at that time.**

24 **MR. BONJORN MADE A MOTION TO APPROVE THE MINUTES OF THE LAKE**
25 **COUNTY WATER AUTHORITY MEETING OF DECEMBER 18, 2019 - REGULAR**
26 **MEETING.** Mr. Hendrick seconded the motion.

27 **Motion approved 6-0. Ms. Cox was not in attendance at that time.**

28 **3. PUBLIC COMMENT**

29 Eileen Tramontana and Stan Napier from Trout Lake Nature Center addressed the Board. Mr.
30 Napier read letter of thanks from a parent regarding the Lake County Water Authority's funding
31 of field trips to Trout Lake for the students of Triangle Elementary.

32 **4. EXECUTIVE DIRECTOR REPORT**

33 Mr. Perry addressed the Board and gave the water level and rainfall report. He showed a graph
34 of Lake Apopka water levels and stated that late last month Lake Apopka was above the
35 Maximum Desirable and the St. Johns River Water Management District (the District) opened
36 the flow not only through NuRF but also through the Spillway.

37 He stated that once the lake level returned to the Maximum Desirable, they then shut off the flow
38 through both NuRF and the Spillway, as the Lake Dora water level had risen substantially. He
39 noted that once Lake Dora levels came down the District again opened the flow through the
40 Spillway and about 100 cfs through the NuRF.

41 He explained that as of this morning, there was 108 cfs coming through the NuRF and the
42 Spillway has been closed so that there is no flow.

43 Mr. Perry stated that from what staff has heard, is that because Lake Apopka is back at
44 Regulatory Schedule, that by the end of the week, the District is going to bring the flows back
45 down to minimum through the NuRF at most. He stated that whatever happens with rainfall will
46 determine future flows, but for now they are stating they will keep it at minimum discharge, with
47 all of it going through the NuRF.

48 Mr. Perry stated that even though the Water Authority staff has asked and pleaded with the
49 District to even out the flows, and not be hard on the gas and hard on the break, they continue to
50 do so. He stated that the Water Authority staff will continue and try and work with the District
51 to have them even the flow out.

52 He stated that Lake Eustis and Lake Harris are at Regulatory Schedule, but when they opened the
53 flow from Lake Apopka, it drove up the water level of Lake Dora. He stated when they shut the
54 flow the lake responded, but when the District resumed flow, the lake level then continued to
55 rise.

56 Mr. Perry noted that early in January the District opened the flow through the Harris Bayou to
57 allow some relief to Lake Dora.

58 He noted that at one point there was in excess of 1,000 cfs flowing through the Burrell Lock and
59 Dam, but the flow is also being closed at this time.

60 He stated that toward the middle of December, Lake Griffin was nearing Maximum Desirable
61 and the District opened Moss Bluff Lock and Dam up to 1200 cfs and now the lake is slightly
62 below regulatory and the flows through Moss Bluff are on their way down.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

63 He stated that for the 2019 calendar year we had a 3.019-inch surplus of rainfall. He noted that
64 this was the third consecutive year of three-plus inches of surplus rainfall and explained that for
65 most of the preceding years we were in deficit conditions with rainfall much lower than the
66 average normal rainfall of 50.49 inches.

67 Mr. Perry stated that the combined flow from Big and Little Creek is about 50 cfs lower this year
68 than at the same time last year. He noted that last year, because of the heavy flows, there was
69 some concern whether surplus water could be moved out to of the system fast enough.

70 He stated that currently the Clermont Chain is at 97.04 msl, which is a little bit less than the
71 target amount of 97.1 msl. He stated that the Cherry Lake structure is closed, with the only flow
72 being through the weep hole at about 4 cfs. He noted that the Clermont Chain is currently about
73 .04 of a foot lower than it was at this time last year.

74 He stated that Mr. Hart and Dr. Danaher have been working hard to keep the lake levels as close
75 to 97.1 as possible.

76 Mr. Perry reported to the Board that last week the Water Authority had received another \$55
77 thousand in FEMA reimbursement related to Hurricane Irma. He stated that this brings the total
78 reimbursement close to \$1.2 million.

79 Mr. Perry stated that Tracy Hauserman, Mary Kock, Dan Kewharding and Travis Snow, along
80 with Ben Garcia, worked with the HR Lady, Wendy Sellers, to create a set of Core Values for
81 the Agency, values that each employee will hold themselves and each other to. He stated that this
82 wasn't anything that was driven by management, and except for Ben Garcia, no management
83 was involved.

84 Mr. Perry, Chairman Stone and Board Members gave recognition to and presented plaques to
85 Brian Nagy for 10 Years of Service with the Water Authority, to Ben Gugliotti for 15 Years of
86 Service, to Ben Garcia for 20 Years of Service. Tracy Hauserman and Ron Hart were also
87 recognized for 20 Years of Service and it was noted that they each have worked for the Water
88 Authority for 23 Years.

89 Chairman Stone thanked them all for their service and stated that it has been a pleasure working
90 with them over the last 3 ½ years that she has been on the Board. She noted that each of the
91 employees are consummate professionals.

92 Mr. Perry stated that the Ribbon Cutting for the new Clermont Boat Ramps was held on January
93 10. He stated that the Water Authority Board was prominently mentioned, and the City of
94 Clermont thanked the Board for their contribution.

95 He noted Chairman Stone spoke on behalf of the Board and stated that the Board was very well
96 presented with Chairman Stone, Vice Chair Maimone, Peggy Cox, Trampis BonJorn and Butch
97 Hendrick in attendance.

98 **5. CONSENT ITEMS**

99 Item was pulled for discussion

100 a. Authorization to Release Bid to Remove Floc Residual from NuRF Containment Area

101 Dr. Danaher explained that the purpose of this bid is to remove existing sediment at the NuRF site
102 and try to get it off-site. He stated that since the sediment was removed last year, the site has
103 accumulated more since that time, and with the current conditions of the ponds we will continue to
104 process and create more, which will limit space.

105 He noted that there is a line item in the current budget for floc removal from the site and he is
106 trying to use this time period when it's a little bit drier to remove it from the site and create a little
107 bit more space.

108 **VICE CHAIR MAIMONE MADE A MOTION TO AUTHORIZE STAFF TO RELEASE**
109 **A BID FOR REMOVAL OF ACCUMULATED FLOC RESIDUAL FROM THE NURF**
110 **CONTAINMENT AREA AND RETURN TO THE BOARD WITH A**
111 **RECOMMENDATION FOR QUALIFIED CONTRACTORS IF FAVORABLE**
112 **RESPONSES ARE RECEIVED.** Mr. BonJorn seconded the motion.

113 Mr. Hendrick stated that he would like to pull this item for a couple of months as he doesn't see a
114 reason to do it right now. He stated that he might have someone who will remove the floc residual
115 for free, and so instead of putting it out to bid and wasting resources, he would rather wait and
116 address it in another month or two.

117 Mr. Farner stated that he is okay either way, but he would rather use the \$120,000 to build another
118 wet containment area a couple-hundred yards away on another portion of the property and return
119 the existing wet containment area to a dry containment area.

120 He stated that there might be a different solution to this problem and that he had mixed emotions
121 about hiring someone to remove the floc at this time. He did note that even if they put it out to bid,
122 they don't have to accept any of the bids.

123 Dr. Danaher stated that he knows what the Agency experienced with Hurricane Irma and having
124 full ponds of settlement and where it put the Agency in terms of limitations in the containment
125 area. He noted the ponds are full capacity now, and they are looking at having to put staff on 24/7
126 shifts through the spring. He explained that he is looking into the future and that fact that the
127 space is going to be required and he would like to get a bid out to see if there are options to move
128 the floc off-site.

129 Dr. Danaher also noted that Phase I of the Pegasus Reports recommends improvements to the
130 containment area with a roadway-based system where things could be moved more smoothly and
131 if we do move forward with Pegasus' plan in 2020, removing the floc off-site would be a benefit,
132 rather than leaving it there for construction workers to work around it.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

133 Mr. Farner stated that he would vote in favor of the motion, but he has some reservations about
134 approving a contract without a lot more studies being done about the possibilities of building a
135 new wet containment area.

136 Mr. BonJorn stated that it wouldn't hurt to go out to bid, but they wouldn't have to make up their
137 minds just yet.

138 Chairman Stone stated that it is her opinion that she wouldn't want to sit in a holding pattern and
139 then we end up with a hurricane at the first of June and we have too much floc still sitting there.
140 She stated that she is not a big fan of stopping normal operations over something that might or
141 might not happen in the future.

142 Mr. Hendrick asked why spend resources to put the bed out if we are going to sit out there a while
143 and he doesn't see any reason that we can't wait another month.

144 Chairman Stone stated that they need to make sure they are doing the best thing for the Water
145 Authority.

146 [VICE CHAIR MAIMONE MADE A MOTION TO AUTHORIZE STAFF TO RELEASE A
147 BID FOR REMOVAL OF ACCUMULATED FLOC RESIDUAL FROM THE NURF
148 CONTAINMENT AREA AND RETURN TO THE BOARD WITH A RECOMMENDATION
149 FOR QUALIFIED CONTRACTORS IF FAVORABLE RESPONSES ARE RECEIVED. Mr.
150 BonJorn seconded the motion.]

151 **Motion approved 5 - 1 with Mr. Hendrick in opposition. Ms. Cox was not in attendance at**
152 **that time.**

153 **6. REGULAR AGENDA**

154 a. FWC Hydrilla Funding Reimbursement

155 Mr. Perry stated that this agenda item is the continuation of a discussion related to Mr. Farner's
156 request to seek reimbursement for the funds given to the Florida Fish and Wildlife for spraying
157 of hydrilla.

158 Mr. Farner stated that although it wasn't our responsibility, the issue the hydrilla was an urgent
159 need and the Water Authority acted while others were still debating funding.

160 He explained that he looks at it like the Water Authority did them a big favor because hydrilla
161 doesn't just grow 8% to 10% a year, it doubles in growth. He stated that he thinks the Water
162 Authority did the right thing and would hope that the Fish and Wildlife Board of Directors does
163 the right thing as well and considers us for reimbursement of all or part of the money the Water
164 Authority expended.

165 Mr. Hendrick stated that he agreed with Mr. Farner to a certain extent, but this is something that
166 should have been done before we gave them the money. He stated that going forward maybe we
167 can learn something from this, and if we want something in return, we should request it before
168 we lend or give out money.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

169 Mr. Farner stated that if the Water Authority had asked them (FWC) at that time, they probably
170 would have said no, and they still may say no, but we (the Water Authority Board) have a duty to
171 the taxpayers and are obligated to at least ask for it, and if they (Florida Fish and Wildlife) tell us
172 no, they tell us no, but at least the taxpayers of Lake County will know that we are looking out
173 for their dollars.

174 He stated that this is not as simple as a letter, they need to get the Legislative Delegation on-
175 board and send letters to the Directors and Board Members of Florida Fish and Wildlife, as well
176 as the Governor's office, and he expects good results. He stated that he thinks they would be
177 supportive.

178 Chairman Stone stated that her concern is we made the motion and passed and agreed to put this
179 money forward without a request for payback and she thinks from a partnership standpoint with
180 FWC, everything that was discussed during those budget hearings, and the discussions with the
181 public regarding the millage, the public was willing for us to do that.

182 She stated that the money was spent in Lake County and we used Lake County taxpayer money
183 to benefit those in Lake County and while it would be great if FWC would be able to pay us
184 back, she felt like it would not be in the best interest of the Water Authority for future
185 partnerships to go and ask them to give something back that we gave them as an assistance.

186 She stated that we (the Water Authority Board) knew there was a budget gap and we made the
187 decision as a Board to go forward and raise our budget so that we could cover that gap. She
188 explained that is a State Legislative determined budget that is then is passed down to FWC from
189 the state level and then down to the different counties in the state. She stated that Lake County is
190 only one of 86 counties in the state and we (Water Authority) determined as a board that there
191 was a need there and we wanted Lake County's waters to be clear of hydrilla as much as
192 possible, knowing that we understand the science behind how hydrilla grows, and the
193 expectation of what would happen if there was no additional treatment.

194 Chairman Stone stated that because of that, we raised the millage and were very vocal about the
195 fact that we were raising the millage to take care of this problem in our county, so their taxpayer
196 money was going back into the county to help them directly.

197 She noted that she would be more inclined to go back to FWC if we were somehow paying for
198 something in another county. She stated that should they face the same type of problem in the
199 future, maybe they should consider going a different direction, but she and Mr. Perry worked
200 hours and hours working with all the legislative groups that service our county, trying to get
201 funding and it was a lost cause, so the decision was made to do what was right for Lake County.

202 Chairman Stone stated that she appreciates the request and understands where its coming from,
203 but she also feels that Chairman Stone stated that requesting a refund of the money would not be
204 good for future cooperative projects with FWC and other entities.

205 Mr. Farner reiterated that it was their responsibility by statute and the Water Authority picked up
206 the slack when they were still questioning what to do, and he is asking for them to refund our
207 money, but if they so no, he can live with that.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

208 Mr. Hendrick noted that the FWC didn't ask for that money from the Water Authority.

209 Vice Chair Maimone stated that she agreed with Chairman Stone, and that while she felt that Mr.
210 Farner's heart was in the right place and looking out for the citizens of Lake County, but we (the
211 Water Authority) offered because we saw a need. She stated that she doesn't like the idea of
212 asking for it back. It was used for what we wanted it to be used for, and our taxpayers got the
213 benefit of having the lakes taken care of much sooner that they would have, had we (Water
214 Authority) not provided the funding. She stated that she doesn't think we should ask for the
215 money back.

216 Mr. Farner asked what was going to stop them from saying they don't have to pay for Lake
217 County anymore since they (Water Authority) paid for it last time.

218 Chairman Stone explained that in every conversation, she and Mr. Perry were very vocal in
219 explaining that the funding was a one-time thing and the Water Authority would not be
220 providing any additional monies and they know we are not going to do this again. She stated
221 that she stood in front of the whole Legislative Delegation and told them that the Water
222 Authority was doing this, and it was a one-time only thing and that the Water Authority could
223 not be taking care of this in perpetuity, that they had to be able to step up to the plate.

224 She stated that they all understood and were thankful that we were able to make the budget gap
225 work. She noted that funding is part of the huge state budget and it got sliced and diced based on
226 the needs of the entire state. She stated that while we have a vested interest in our own county,
227 there are several other counties that also have these same or similar problems that had to be
228 addressed and they didn't have a surplus of funding and couldn't cover all their projects.

229 Chairman Stone stated that because of this, the Water Authority made that decision. She stated
230 that they all know that we are not willing to do this again. She stated that it would be hard to
231 have any partnerships with them in the future if we were to ask for the money back.

232 MR. FARNER MADE A MOTION TO ASK FWC FOR REIMBURSEMENT, EITHER FULL
233 OR PARTIAL, OF THE MONEY THE WATER AUTHORITY EXPENDED ON BEHALF OF
234 THE LAKE COUNTY TAXPAYERS, IN DEALING WITH THE HYDRILLA ISSUE.

235 Attesting Stone suggested that the motion needed to be more specific as to where any letters or
236 requests needed to be directed.

237 Mr. Farner revised his motion to state: THAT THE WATER AUTHORITY GO TO THE
238 STATE LEGISLATURE, WRITE A LETTER TO FWC AND KINDLY ASK THEM FOR
239 REIMBURSEMENT OF ALL OR PART OF OUR EXPENDITURES IN DEALING
240 WITH THEIR MANDATED STATE LEGISLATION DEALING WITH INVASIVE
241 PLANTS/HYDRILLA. THE LETTER IS TO ALSO GO TO THE LEGISLATIVE
242 DELEGATION, FWC BOARD MEMBERS AND DIRECTOR, AND THE
243 GOVERNOR'S OFFICE SO THEY ARE WELL AWARE OF WHAT WE ARE
244 PURSUING AND THE REASONS FOR IT.

245 Motion died for lack of second.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

246 *Ms. Cox joined the meeting*

247 b. Authorization to Open Scrub Point Preserve

248 Ben Gugliotti addressed the Board and stated that although they have been talking about opening
249 Scrub Point for a couple of years, but the Board hasn't taken any official action, so he wanted to
250 come to the Board to get official approval to open the preserve to the public.

251 He explained that historically the biggest issue has been the access road from Hartwood Marsh
252 Road to the gate of the preserve. He stated that in 2016 the Board approved the St. Johns River
253 Water Management District to install some monitoring wells and as part of the project the
254 District had reinforced the road with lime rock up to their wells and created a 100 ft. by 100 ft.
255 pad for the well equipment while they were doing the drilling.

256 He explained that once the wells were completed the pad was reduced to 20 ft. by 20 ft. and the
257 District left the remainder of the material for the Water Authority to do with as we wished, and
258 the idea was to complete the road. He also explained the easement agreement with Mr. Piper and
259 noted that Mr. Piper plans for a housing development on the property adjoining the preserve.

260 **MR. BONJORN MADE A MOTION TO AUTHORIZE STAFF TO OPEN SCRUB**
261 **POINT PRESERVE TO THE PUBLIC WITH ACCESS FROM HARTWOOD MARSH**
262 **ROAD WITH A TARGET OPENING DATE IN JUNE 2020.** Ms. Stokes seconded the
263 motion.

264 Mr. Hendrick asked what kind of expenses would be involved and Mr. Gugliotti stated that there
265 is already public access from the point for boaters and they would add a kiosk at the gate plus a
266 picnic table at the preserve, so additional costs would be less than \$2,000, as there is already
267 \$10,000 in the budget to finish the road and parking area.

268 Ms. Cox stated that she is afraid of opening the property to the public as it is the only
269 undisturbed property in that area. She stated that she was concerned about possible damage to
270 the property and the sensitive plant species. She noted that if they are going to open the property
271 to the public, she would suggest opening the preserve only part of the week such as only on
272 weekends.

273 It was asked if dogs would be allowed and Mr. Gugliotti explained that dogs aren't allowed on
274 any of the Water Authority owned preserves and generally, we don't have a problem with people
275 in the preserves.

276 Chairman Stone stated that she thinks that it will be a while before homes are built in that area.
277 She stated that if some time in the future there is a problem, they would close the preserve. She
278 noted that staff is already maintaining the property.

279 Mr. Farner stated that he has some concerns about some of the rare and indigenous plant species
280 that are located on the preserve and what impact opening the preserve to the public would have
281 on them.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

282 Mr. Perry stated that there is no real rush, it wasn't something that they had to vote on at this
283 time and noted that staff is just looking for some direction on how to proceed.

284 Ms. Cox stated that she personally feels there should be a graduated opening and suggested
285 locking the gate every day at dusk.

286 Concern was expressed that there wouldn't be a site resident and Mr. Gugliotti explained that
287 neither Hidden Waters nor Sabal Bluff have site residents. He stated that the preserves with site
288 residents already had houses on them when the property was acquired. He stated that Ms.
289 Eddy's son had recently built a house next to the gate on a piece of property that he owns, and
290 staff communicates with Mr. Eddy quite often.

291 He noted that it is ultimately the Board's decision as to when and how the preserve is opened to
292 the public.

293 [MR. BONJORN MADE A MOTION TO AUTHORIZE STAFF TO OPEN SCRUB POINT
294 PRESERVE TO THE PUBLIC WITH ACCESS FROM HARTWOOD MARSH ROAD WITH
295 A TARGET OPENING DATE IN JUNE 2020. Ms. Stokes seconded the motion.]

296 **Motion approved 5-2 with Mr. Farner and Mr. Hendrick in opposition.**

297 c. Tree Removal Bids

298 Jason Danaher reported that six responses were received to RFB 2020-02 for Emergency
299 Waterway Tree Removal and he was like the Board to approve executing contracts with the three
300 lowest bidders.

301 **VICE CHAIR MAIMONE MADE A MOTION TO AUTHORIZE EXECUTIVE**
302 **DIRECTOR TO EXECUTE CONTRACTS WITH THE THREE (3) LOWEST BIDDERS**
303 **FOR THE EMERGENCY WATERWAY TREE REMOVAL SERVICE:**

304 **1) ARBOR TREE & LAND, 2) C&M DREDGING AND 3) TIP TOP TREE**

305 Mr. Hendrick seconded the motion.

306 **Motion approved 7-0.**

307 d. Executive Director Interviews

308 **VICE CHAIR MAIMONE MADE A MOTION TO WORK TO GET A CONTRACT**
309 **TOGETHER WITH RON HART TO HIRE HIM AS OUR EXECUTIVE DIRECTOR.**

310 Ms. Cox seconded the motion.

311 Mr. Farner asked if he could make another motion and Chairman Stone stated that there was an
312 existing motion that had to be voted on prior to another motion being made. She stated that if
313 this motion fails there will be the opportunity for a second motion.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

314 Mr. Farner stated that if this motion succeeds, we basically have a new Director and Chairman
315 Stone stated that this was correct.

316 Mr. Farner stated that we don't have to decide on the new Director at this time and Chairman
317 Stone reiterated that there is a motion and a second.

318 Mr. Hendrick stated that he thought everyone's vote needed to be heard so Chairman Stone
319 stated that if there was no other discussion, they could go ahead and take a vote.

320 [VICE CHAIR MAIMONE MADE A MOTION TO WORK TO GET A CONTRACT
321 TOGETHER WITH RON HART TO HIRE HIM AS OUR EXECUTIVE DIRECTOR. Ms.
322 Cox seconded the motion.]

323 **Motion approved 5 – 2 with Mr. Farner and Mr. Hendrick in opposition.**

324 **7. LEGAL COUNSEL REPORT**

325 Attorney Stone reminded the Board that stated restructuring of the Water Authority caused Ms.
326 Burgos' position to be eliminated and so she she was terminated from her employment. He
327 stated that at time she was offered a severance that she did not accept, but instead hired an
328 attorney who then entered into a negotiation with us/our insurance carrier, as her attorney did
329 assert some claims that triggered insurance coverage.

330 He stated that he received a letter from our insurance company that was dated January 9, that the
331 matter has been fully resolved. He stated that the settlement amount is \$32,979. He stated that
332 there are also some fees and costs associated with that, but he thinks that staff and insurance
333 defence thought that was reasonable in light of the circumstances, as Ms. Burgos' salary was
334 close to \$90,000.

335 Attorney Stone stated that the next item he wanted to report back to them on was something that
336 that Mr. Hart has been working on for a long time, which is the Slow Speed Zone for the
337 canal/waterway south of Lake Minneola.

338 He noted that at the last Board Meeting he was instructed to look into the matter, but wasn't
339 given any specific instructions or actions to take, so he is bringing it back to the Board.

340 He stated that he and Trustee Farner had a conversation, as he had done some legwork on his
341 own and had given him some contact information for Florida Fish and Wildlife.

342 Attorney Stone explained that there are two distinct ways to something establishing a boat
343 regulation zone gets in from of the Commission. He stated that one is if their own (FWC) staff
344 initiates it, the Commission, under the Administrative procedures, can create one of these zones.

345 He stated that the other way is if it is done by Ordinance by the local government, city or county.
346 He explained that the Water Authority Board doesn't have the authority to enact an ordinance,
347 we can only ask other people to do it.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

348 He stated that Mr. Hart has spent a lot of time trying to get the FWC staff to initiate it, but
349 despite good intentions and reasonable argument the FWC has refused to do so.

350 Mr. Hart stated that he would like to give an update to the Board, as there has been some
351 movement on the request. He explained that he's had the opportunity to speak with Lamont
352 Nelson with FWC and he has indicated that they are willing to send out an officer, or for him to
353 come down from Tallahassee, and observe the waterway on a weekend. He stated that Mr.
354 Nelson's preference is to wait until we hit the summer months when use would be at its peak.

355 Mr. Hart suggested getting with Mr. BonJorn regarding when there might be a very busy
356 weekend and try to schedule their visit for that weekend to monitor the waterway. He explained
357 that then based on whatever they see for that day, reevaluate whether it would be worthy of
358 placing a permit.

359 He stated that he wanted to make sure that the Board is aware of that before they take any other
360 action.

361 Attorney Stone stated that was a helpful update, and that he also wanted to make sure that the
362 Board is aware that there is another avenue for getting something in front of the commission, is if
363 there is a local government ordinance. He noted that Mr. Hart has worked through this process
364 with local governments. He stated that the canal is bordered by Groveland and Clermont and the
365 lake is bordered by Lake County. He stated that it might be a big awkward to sort that out, but
366 we could ask one of the local governments to get it placed in front of the Commission if they are
367 interested in doing so.

368 He stated that there are different channels to do this and what Trustee Farner and Mr. Hart had
369 been looking at was going through FWC staff, and that is the way to do it, if it is possible. He
370 stated that at this point, it sounds like perhaps there is some light at the end of the tunnel that
371 may just want to wait and see.

372 Mr. Hart stated that even if we can get local ordinance passed, then would have to get a authority
373 from FWC to post the sign, and that may be where we come to an impasse. He stated that he
374 needs to talk with Attorney Stone, to see if there is any other avenue they can pursue.

375 Attorney Stone noted that Mr. Hart is correct in stating that all waterway signs require permitting
376 by FWC. He noted that there are some kinds of regulations that don't even have to go through
377 FWC, but they still regulate the signage, such as when you are close to a bridge or boat ramp,
378 and he doesn't think this location qualifies. He stated that with Mr. Nelson's agree, we might
379 have a crack in the door.

380 Chairman Stone stated that is better than what we had before.

381 Mr. Farner clarified with Mr. Hart that he's been trying for a year and stated that he has been
382 stonewalled by their (FWC) staff all along, so what makes him think he's going to have success
383 now, other than the fact that we now know the legal way to do this process through the forms and
384 our legal staff.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

385 Mr. Hart stated that the probability is very low and Mr. Farner stated that he is okay with giving
386 him some time, but the last time he (Mr. Hart) said he would handle it and you didn't, and you
387 didn't come back and tell the Board that it didn't get done, and they had to find out from the
388 public, who were calling them (Board Members). He stated that he is okay giving him another
389 opportunity to get this done but there has got to be some type of a timeframe in which they see
390 positive results or we need to go through our legal staff and do it a different way. He asked Mr.
391 Hart how long he needed and stated he wanted to know.

392 Chairman Stone thanked Mr. Farner for his opinion.

393 Mr. Hart stated that he cannot commit to how long it will take for them to issue a permit and
394 noted that they may never issue a permit.

395 Mr. Farner stated that that was unacceptable, and if they needed to go through legal staff, where
396 they get a rejection as a whole Board and a city that agrees manage that waterway or least the
397 way the law reads, it has to be enforceable by any agency.

398 Attorney Stone clarified that is has to be enforceable by any government authority with police
399 power.

400 Ms. Cox stated that she has spoken to the residents at Waterside Pointe along the canal, and they
401 are very upset, and asked if they have contacted FWC or the City of Clermont on their own. She
402 noted that the City of Groveland can barely handle what they have now, and this would have to
403 go to the City of Clermont if we are going to get another government agency involved.

404 Mr. Hart stated that all calls from residents have ceawsed and he hasn't heard anything from
405 them for the past year. He stated that the residents haven't been active in pursuing it, although
406 they have had meetings about another canal that borders the community.

407 Ms. Cox noted that that particular canal is along the back of the community and is technically in
408 the County, with Waterside Pointe actually being in the City of Groveland, where the the canal in
409 question is either in the City of Clermont or shared by the City of Groveland and the City of
410 Clermont. She stated that the cities don't usually do much until some of their citizens complain
411 to them.

412 Mr. Farner stated that this is one of those times when we go through the legal process with
413 Florida Fish and Wildlife we have to ask the cities to support this, and nobody has gone through
414 the process this way. He stated that this is the way it had been suggested from the Florida Fish
415 and Wildlife Director's office.

416 Mr. Hart stated that he respectfully disagreed, that he has tried his best to keep the Board
417 informed of what actions he was doing to proceed with the matter, and he has done his best to
418 make sure that the Agency has taken every possible action to try to permit that zone, but we have
419 just not been able to get the results they would like to have.

420 He stated that this is not from a lack of effort or lack of notifying the Board. He stated that he
421 has kept the Board informed that staff was having trouble and have not been able to permit that

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

422 zone, and the Board has repeatedly told him to go back and keep trying. He noted that he has
423 gone back and repetitely tried and it has always ended in an impasse. He explained that it has
424 reached the point, that regardless how many times he knocks on the door, their answer it no,
425 unless they get something from higher up.

426 Mr. Farner stated that if he thinks they are going to get a “no” this time, they have another
427 avenue to take, but he doesn’t want to be waiting another six months. He stated with the new
428 boat ramp open there is going a couple-hundred more bass boats on that chain of lakes every
429 weekend and somebody ends up getting hurt.

430 He stated that he’s okay if Mr. Hart wants to try again, but he wants to hear it in a timely manner
431 whether he is having positive feedback or not, so we can take a different direction if we have to.

432 Mr. Hart stated that it might be wise to go ahead with a letter from Attorney Stone backing it up.
433 He stated that he can work through the front door, and he can work through a side channel.

434 Attorney Stone stated that his recommendation would be to let Mr. Hart continue the normal
435 route, but to also look at who has jurisdiction in that location and have them initiate that process
436 using that alternative channel. He stated that they will work with that and if it comes from a
437 local ordinance, it would get put in front of the Florida Fish and Wildlife Commission. He stated
438 they could still deny it, but it’s the other way of getting it.

439 He stated that the way Mr. Hart has been doing it, is not incorrect, there’s just two ways to get to
440 the Commission and Mr. Hart’s way has been a frustrating one, but he’s got a crack in the door,
441 and there is the other way, which he doesn’t see a reason not to pursue now.

442 Mr. Hart explained that he hasn’t been working on it alone, he stated that has also been working
443 on it with Sean Parks with Lake County Commissioners and he has also been attending the
444 meetings to discuss the issue with them. He noted they have been hitting the same roadblock and
445 FWC is telling each of them that they are not going to approve a speed zone and they are not
446 willing to discuss it anymore.

447 Attorney Stone asked the Board to give him some direction on proceeding with the local
448 governments, while Mr. Hart is also working on it. He stated that he and Mr. Hart would be
449 working together and he would be happy to do it.

450 Chairman Stone stated that she thought a multi-pronged approach would be a very good and
451 instructed Attorney Stone to proceed.

452 **8. BOARD MEMBER COMMENTS**

453 Mr. Hendrick stated that he was curious as to when they will discuss Mr. Hart’s employment
454 package and salary.

455 Attorney Stone stated that Mr. Hart’s engagement will not begin until a contract has been
456 brought back to the Board for approval. He explained that it would be negotiated initially by
457 staff to put together a preliminary package, subject to the Board’s approval at a future meeting.

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

458 Mr. Farner asked to put St. Johns' use of the Spillway, and policies and practices at the NuRF on
459 a future agenda. He stated that they are undoing all our progress in the lakes when they take it
460 from minimum flows to 300 cfs in an instant. He stated that our water quality has gone straight
461 down hill and he holds them directly responsible for that.

462 He stated that the Water Authority has spent millions of dollars to build the NuRF, with the help
463 of DEP to meet targeted goals and the District is not working with us. He stated that he sees
464 legal recourse and damages. He asked to put this topic on an upcoming agenda so they can talk
465 about an MOU with the District with some teeth in it.

466 Mr. Farner stated that not only are they not working with us (Water Authority), he gets the
467 impression they are working against us and are destroying the benefits of months of treating the
468 water going into the lakes.

469 Chairman Stone stated that it could be put on a future agenda and she would commit to meeting
470 with Mr. Hart and Mr. Perry and meeting with the District prior to the Board taking any action.
471 hopefully within the next month to look at different options, before putting it on the agenda.

472 Mr. Farner stated that it may mean that the Water Authority has to go through the court system to
473 get their attention and Chairman Stone stated that she understand what he is saying, but thought
474 they should meet with the District to discuss the matter prior to the Board looking at different
475 options.

476 Ms. Cox asked if there was an agreement with the District when NuRF was built and Mr. Perry
477 explained that there is no written operational agreement with the District on how the NuRF
478 should be operated.

479 Chairman Stone reiterated that she would meet with the District to determine what steps can be
480 taken and try to come to an agreement. She stated that if it appears there is no way to do that,
481 then we will look at what our options are.

482 Mr. Hendrick asked if she thought they would be able to get any further than what we've gotten
483 so far.

484 Mr. Farner noted that a representative from the District had attended one of the Water
485 Authority's recent meetings and had heard our requests and nothing has been done. He stated
486 that the District knows exactly what they are doing and stated that if Chairman Stone can't come
487 back with some kind of agreement, they (the Water Authority) need to take another direction.

488 Vice Chair Maimone stated that they have all been assuming he (the District representative)
489 passed that information down at the agency. It was noted that he had informed them at that
490 meeting that he was retiring.

491 Chairman Stone stated that she completely understands but would like a chance to talk with the
492 District first.

493 Vice Chair Maimone stated that she agreed with Mr. Farner, that even after years and years of
494 discussions, the District still does the opposite of what we need them to do. She stated that she

Minutes of the Regular Lake County Water Authority Board Meeting
January 22, 2020

495 lived in that area when it was dredged, and the District has trashed all that with the way they
496 handled the flows during Hurricane Irma. Mr. BonJorn stated that he agreed with Vice Chair
497 Maimone.

498 Mr. BonJorn stated that it would be very easy for the District to crack it open (flow through
499 NuRF) a bit earlier and Chairman Stone stated that the District would continue to do it like that
500 because there are no repercussions when they do.

501 Mr. Farner suggested getting they also get DEP involved if they have too, since they helped pay
502 for it.

503 **9. BOARD MEMBER ITEMS FOR FUTURE AGENDA**

504 Discussion regarding the District and their operation of NuRF.

505 **10. INFORMATION ITEMS**

- 506 a. Staff Reports
- 507 b. Monthly Financial Reports – October, November and December 2019

508 **11. ANNOUNCEMENT OF UPCOMING MEETINGS AND EVENTS**

- 509 - Board Meeting - Wednesday, February 26, 2020 (3:30 pm)
- 510 BCC Chambers/Admin. Building

511 **13. ADJOURNMENT**

512 The meeting was adjourned at 4:55



TO: Lake County Water Authority Board of Trustees
FROM: Michael J. Perry, Executive Director
DATE: February 12, 2020
SUBJECT: Lake Minneola Algal Bloom

Regular Agenda

Lake Minneola Algal Bloom

Lake Minneola has been experiencing a persistent blue-green algae bloom for the past couple of months. Blue-green algae, or cyanobacteria, is a type of algae found naturally in freshwater environments.

Although blue-green algae are found naturally, increases in nutrients can exacerbate the extent, duration and intensity of blooms. Other factors that contribute to blooms include warm temperatures, reduced water flow, and lack of animals that eat algae.

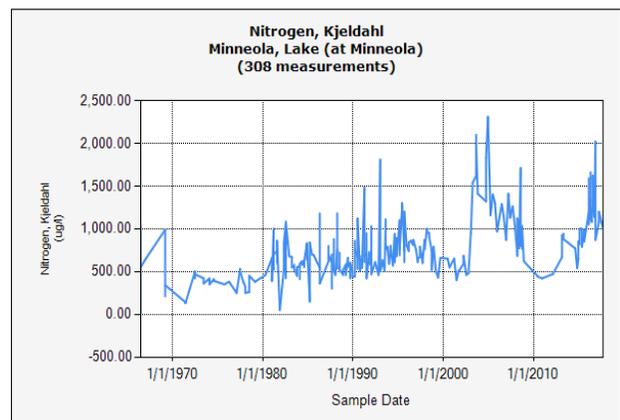
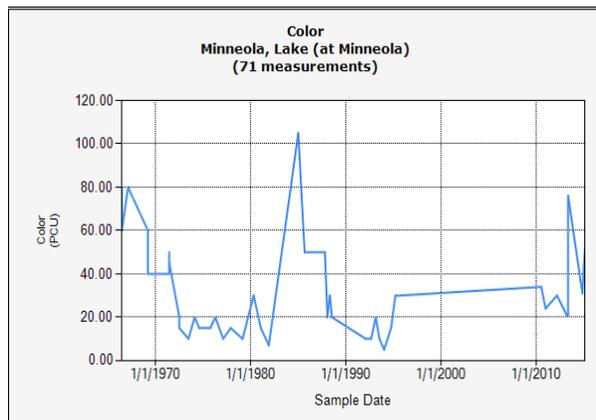
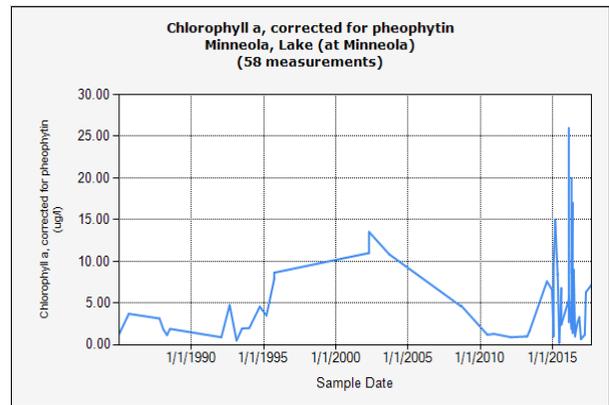
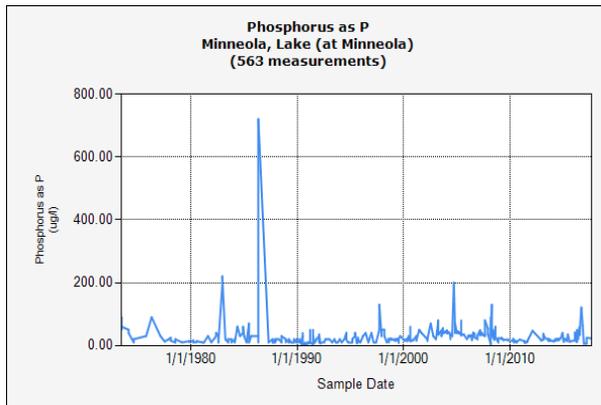
Some – not all – blue-green algae can produce toxins that can contribute to environmental problems and affect public health. Little is known about exactly what environmental conditions trigger toxin production.

On January 16, 2020, the Florida Department of Environmental Protection observed a bloom by the Waterfront Park Boat Ramp and identified the co-dominant taxa were: Microcystis aeruginosa and Anabaena sp., both blue green algae capable of producing a toxin.

BOARD OF TRUSTEES

Table with 7 columns: District One (Peggy Cox), District Two (Trampis BonJorn), District Three (Carolyn Maimone), District Four (Robert Hendrick), District Five (Amy Stone), At-Large (Courtney Stokes), At-Large (Keith A.)

The nature of most freshwater algal bloom events makes it difficult to predict where and when a bloom will occur or how long it will last. However, lessening the negative effects of algal blooms is possible through restoration work to improve water quality by reducing nutrients. Reducing nitrogen and phosphorous levels can help decrease the intensity and duration of algal blooms. The following are graphs of four parameters: Phosphorus, Chlorophyll *a* (a measure of the amount of algae in the water), Color and Nitrogen from a composite of 22 stations that were available on the Water Atlas.



It is not possible to identify the algal type or if it is producing toxins just by looking at the water body. The Florida Department of Environmental Protection (FDEP) coordinates with the water management districts and the Florida Fish and Wildlife Conservation Commission to routinely sample observed and reported algal blooms and test for algal identification and toxicity. The Florida Department of Health (DOH) takes the lead in determining if a harmful algal bloom presents a risk to human health. DOH issues health advisories for recreational waters where there is a risk of the public encountering an existing algal bloom as it deems appropriate.

The World Health Organization considers toxin levels under 10 micrograms/liter to represent a low-level risk for adverse health outcomes from short-term recreational exposure; however, certain sensitive populations (e.g., children, the elderly and immunocompromised populations) may still be at risk even at low concentrations and should avoid any exposure.

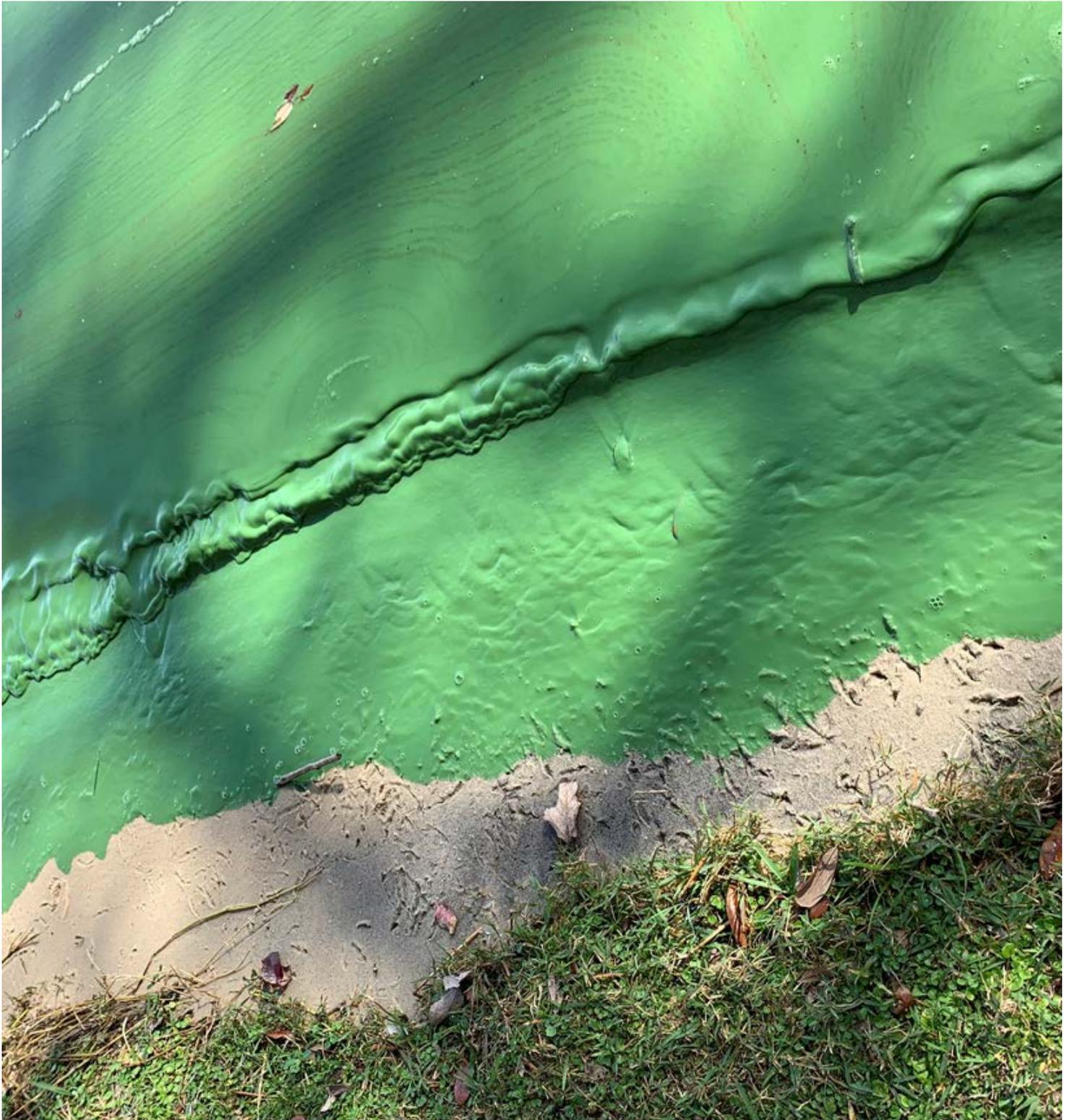
The state's bloom response team encourages everyone to be on the lookout for blooms and report them. Residents statewide can now easily report algal blooms to the department 24 hours a day, 7 days a week. Information can be reported online through at www.reportalgalbloom.com, as well as through a new toll-free number at 1-855-305-3903. To report fish that are either dead or in poor physical condition, residents should contact the Fish Kill Hotline 1-800-636-0511. People experiencing symptoms or illnesses should contact the Florida Poison Control Center at 1-800-222-1222.

When an algal bloom is reported, FDEP collects detailed information such as location, description and size of the bloom. FDEP and Florida's water management districts collect samples when algal blooms are observed during their routine water quality monitoring as well as when blooms are reported. The reports are then evaluated and prioritized for inclusion in near-term sampling plans based on severity of the bloom and potential for human exposure. Algal samples are tested to identify the type of algae present. If the algae are a type that can produce toxins, it is then tested to determine if it is producing toxin and if so, at what level. The toxins typically tested for include microcystin, cylindrospermopsin and anatoxin-a. Recurring and persistent blooms are routinely monitored and retested because whether a bloom is producing toxins and the levels of toxins produced can vary.

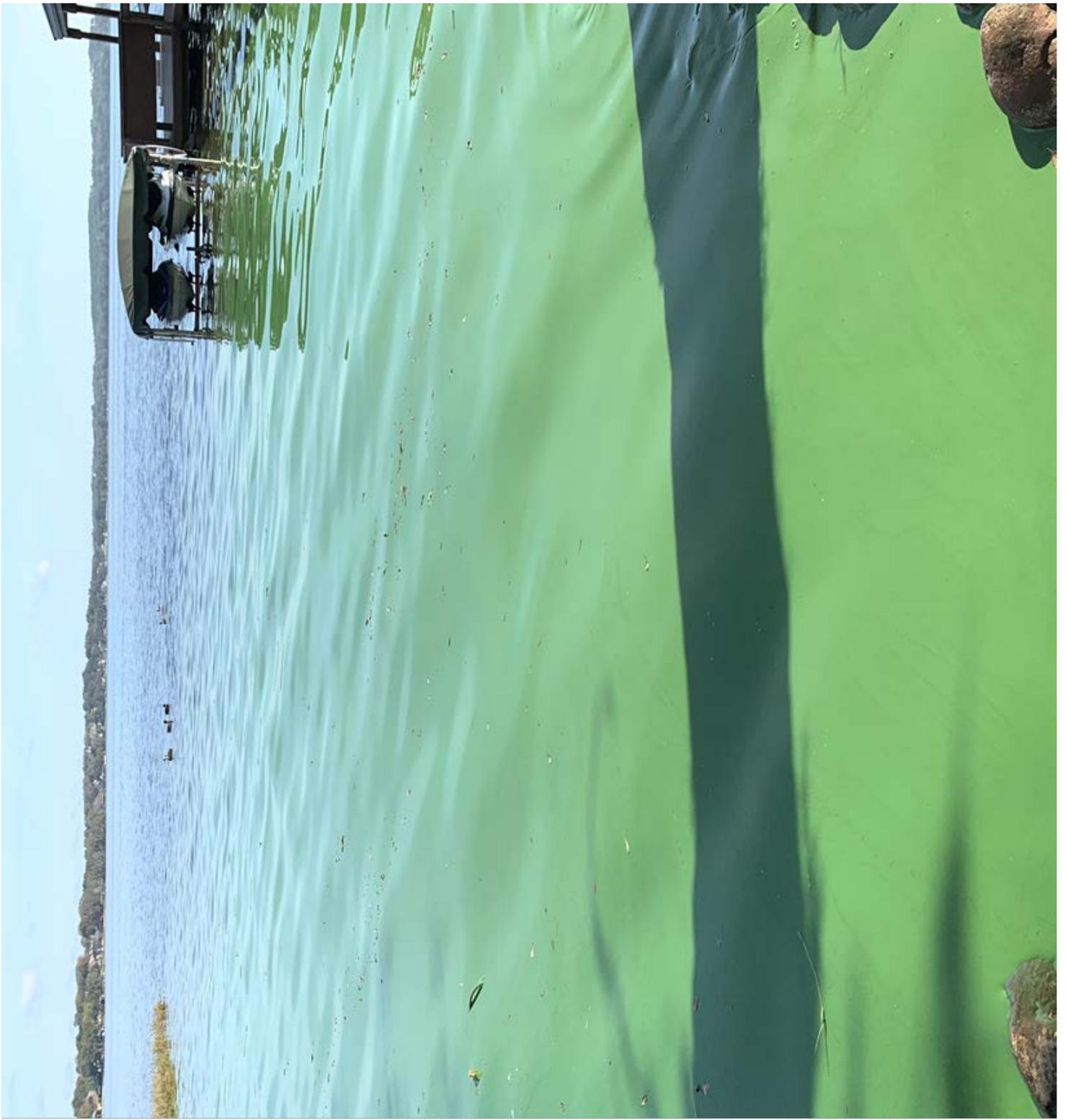
Executive Director Recommendation:

So far, no toxins have been reported. Use common sense and avoid contact with the water until the bloom dissipates. Keep pets out of the water as well as small children and adults with respiratory issues or with sensitive skin.

Authorize staff to begin a more robust water quality monitoring program to establish a nutrient budget for the lake and determine the sources of nutrients that may be contributing to the bloom.







The Future of Harmful Algal Blooms in Florida Inland and Coastal Waters¹

Karl Havens²

Summary

Algal blooms are common in Florida lakes, reservoirs, rivers, and estuaries. Sometimes blooms are beneficial. They are comprised of algae that provide essential food for shellfish and microscopic animals in the water, which in turn are eaten by fish. They also feed oysters, which build reefs that provide essential habitat.

Sometimes, blooms can become harmful and inhibit human recreational uses of the water or impair the ecosystem. Harmful algal blooms are stimulated by excessive levels of nutrients and also by warm water. There is evidence that harmful algal blooms will become more severe and more difficult to control in the future because of warming caused by climate change.

What are algal blooms?

When microscopic algae, or phytoplankton, found in rivers, lakes, reservoirs, estuaries, and the ocean, grow to levels that are considerably higher than the average, this is called a bloom.

Blooms become a concern when they reach excessive levels and are comprised of kinds of algae that are inedible, produce toxic chemicals, or produce nasty odors when they decompose. These harmful algal blooms, also known as HABs, can cause fish kills and impact other animals and plants in a water body, and they can adversely affect

recreational uses of the water. Some of the algae that form HABs can cause skin and respiratory irritation, further impacting swimming, boating, and fishing. HABs also are unsightly and create odors when they die, and therefore have the potential to lower waterfront property values. Imagine a person trying to sell a house with green slime on the waterfront and washed up on the shoreline (Figure 1).



Figure 1. A photo from the air shows dense algae on the water surface along the shoreline of waterfront properties.

Credits: Environmental Protection Agency

In lakes and reservoirs, the most common kind of algae that produce HABs are blue-green algae, also known as cyanobacteria. There are several different kinds of blue-green algae that are notorious HAB-formers, including

1. This document is TP-231, one of a series of the Florida Sea Grant College Program and UF/IFAS Extension. Original publication date February 2018. Visit the EDIS website at <http://edis.ifas.ufl.edu>.

2. Karl Havens, director, Florida Sea Grant College Program; UF/IFAS Extension, Gainesville, FL 32611.

Microcystis, *Anabaena*, and *Cylindrospermopsis*. Many of these algae produce toxins that can kill fish, wildlife, and even domestic animals that come into contact with the water near the lake shore. Harmful algal blooms also have the potential to cause liver cancer or nervous system problems in people who are exposed to the water over a long period. For example, people who obtain drinking water from a lake with frequent HABs have become ill. Those conditions are not common in Florida because most people get their drinking water from the underground aquifer.

In the ocean and nearshore coastal waters, HABs are most often caused by a kind of algae called a dinoflagellate. One of these, *Karenia brevis*, causes red tides (Figure 2) that are common along the Florida coast in the Gulf of Mexico. Red tides produce toxins that cause fish kills and can cause respiratory distress in swimmers and people on the beach when the blooms are near to the shore. Other kinds of dinoflagellates cause HABs in Atlantic coastal waters.



Figure 2. Harmful algal blooms in the ocean, often called red tides, can cause fish kills and respiratory distress to nearby people, even when the bloom is not as intensely colored as this example, shown to illustrate where the blooms get their name.

Credits: Kai Schumann, California Department of Public Health volunteer

In recent years, there have been HABs comprised of various kinds of algae in Biscayne Bay, the Indian River Lagoon, the St. Lucie Estuary, Lake Okeechobee, and the Caloosahatchee Estuary. Figures 3 and 4 show a blue-green HAB that started in Lake Okeechobee, migrated to the St. Lucie River, and ended up on the beaches of Stuart in the summer of 2016.



Figure 3. A large bloom of *Microcystis*, a kind of blue-green algae, covered nearly 60 percent of the surface of Lake Okeechobee in summer 2016.

Credits: NASA Earth Observatory



Figure 4. In summer 2016, the *Microcystis* from Lake Okeechobee was carried downstream in the St. Lucie River to the estuary. Here we can see water flowing under a highway bridge with bright green algae on the surface. The top edge of the bridge is reflecting in the water.

Credits: Ed Philips, UF/IFAS

What causes harmful algal blooms?

The factors causing a HAB occur at three levels. At the first level, a lake, reservoir, or estuary develops underlying conditions that are favorable to blooms. Those include high concentrations of nutrients (nitrogen and phosphorus in particular), adequate light, and, generally, warm water. These conditions set the stage for HABs to occur.

At the second level, additional factors occurring on a shorter time-scale make it even more likely that HABs will happen or that HABs will be more severe. For example, in Lake Apopka and the other shallow lakes near Orlando, it has been documented that HABs are most severe in periods of drought. This is because the nutrients in the water are concentrated when the volume of the lakes is lower and the fish stir up more sediments. There is also a greater amount of light available in the water to fuel algal growth. Large HABs in Lake Okeechobee have consistently happened during the summer one year after there was unusually heavy rainfall and large nutrient transport into that lake from the watershed.

At the third level, when all of the conditions above are just right, there are short-term triggers that can start HABs. The triggers could include a week of calm weather, which allows certain types of HABs to form just below or on the water surface, or some very hot sunny days without cloud cover. Conversely, an intense rain event or a couple of overcast days might end a particular HAB event even when the underlying conditions are still good for algae growth.

Scientists have a good understanding of how the first and second-level conditions described above affect HAB formation. They also understand how the third level, short-term triggers work. However, because those triggers are unpredictable, it remains difficult for scientists or resource managers to know when a particular HAB event will start and how long it will last in a body of water. Given two HABs of the same intensity, one might last one week if a heavy rainstorm happens and mixes up the water; the other could last a month if conditions remain calm and sunny for that long.

In the marine environment, predicting HABs is even more challenging. While it is clear that the algae that cause red tides require nutrients and light in order to grow to a level where they cause an HAB, the triggers for a particular HAB are not well understood. Scientists continue to debate about the degree to which red tides happened historically, before coastal waters were polluted by nutrients derived from human activities.

How might climate change affect HABs?

Scientists predict there will be increases in global temperatures and weather extremes caused by climate change. As discussed earlier, both the temperature of water and the amount of nutrients in that water can affect the occurrence and intensity of blooms. However, the relationship is

complicated. When nutrient levels are low, rising water temperature results in just a small increase in the occurrence of algae that form HABs. On the other hand, when nutrient levels are high—in the range that we commonly see today in lakes such as Okeechobee and Apopka and in estuaries such as the St. Johns and Indian River Lagoon—increases in temperature of just a few degrees result in exponential increases in occurrence of the HAB-forming types of algae.

Scientists are also discovering that the intensity of HABs in lakes is influenced by drought, citing examples from around the world. Here in Florida, cyanobacteria blooms are as much as five times as intense in drought years as in wet years in lakes north of Orlando, including in Lake Apopka. It is expected that in the future, climate change will result in longer-lasting droughts, and this could exacerbate HABs in lakes and reservoirs.

The effects of climate change are a challenge for those who aim to control HABs. It means that actions now to reduce nutrient concentrations are likely to be much more successful than the same amount of nutrient reduction in 20 or 50 years, when the temperature of the water will be higher. Water temperatures in lakes already have increased since the end of the 20th century, so it is not just a future issue but a problem that is of concern now.

What are solutions?

The most direct way communities can solve a problem with HABs is to take action to reduce nutrient inputs to estuaries, the coastal ocean, lakes, and rivers before warming and changes in drought intensity and duration make it nearly impossible to control HABs. Traditional measures to reduce nutrients include:

- switching old neighborhoods from septic to central sewage;
- reducing the use of fertilizer to recommended levels on crops or capturing and cleaning the runoff water from those lands;
- controlling the export of nutrients in manure from animal agriculture; and
- making changes to land use, including in residential neighborhoods, to replace plants that require the addition of nutrients with species of plants that are adapted to grow in Florida soil.

In the case of large lakes in Florida such as Apopka and Okeechobee, traditional measures have not been successful. Despite a concerted effort dating back to the 1970s and

involving a considerable number of programs to control nutrients entering Lake Okeechobee, the input of nutrients to that lake has not changed. In fact, the concentration of nutrients in the lake water has actually increased. Similarly, over the past 20 years, the nutrient level and HAB occurrence in Lake Apopka have not declined, despite large efforts to reduce nutrient inputs from the watershed and from the sediments at the bottom of the lake. Paraphrasing an old saying, tough times call for tough measures, and this might apply to these large, shallow lakes. Removing those nutrients will be tremendously expensive, and the engineering will be highly challenging, yet the benefits over the long term could far outweigh the costs. Despite its cost, sediment removal might need to be considered for HAB remediation. If we do not find a method that effectively limits nutrient concentrations in large, shallow lakes, HABs in these lakes will continue to be controlled by weather, droughts, and rising air and water temperature—all factors that are not under our control.

On the other hand, in smaller bodies of water, especially those that have not been polluted by nutrients for a long period of time, smaller, less expensive actions by individuals, neighborhoods, and towns can have a positive impact. Across Florida, many homeowner associations have been able to control HABs in their small lakes and ponds by reducing the use of fertilizer on grassy areas around the water and on their lawns, and by planting native vegetation to create a buffer strip in the shorelines around the water. The town of Tequesta greatly improved water quality in a portion of the Loxahatchee River when property owners switched from septic tanks to a central sewerage system. There is a wealth of information about how you and your neighbors can reduce nutrient inputs to fresh waters and coastal waters from your local UF/IFAS Extension office, on the UF/IFAS EDIS website, and in the Florida Sea Grant publication *A Practical Guide to Estuary-Friendly Living* (SGEB-64) (<http://nsgl.gso.uri.edu/flsgp/flsgph12001.pdf>).

Further information

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TO: Lake County Water Authority Board of Trustees
FROM: Michael J. Perry, Executive Director
DATE: February 13, 2020
SUBJECT: Innovative Technologies to Treat Cyanobacteria on Lake Yale or Lake Minneola

Regular Agenda

Innovative Technologies to Treat Cyanobacteria on Lake Yale

Cyanobacteria (blue-green algae) are present in Lake County water bodies and under the right conditions may present a public health risk and cause a major socio-economic burden on local communities. Water bodies in both the Clermont Chain and Harris Chain of Lakes have reported blue-green algae blooms more frequently this past decade.

In response to recent occurrences of algal blooms statewide, the Governor directed the Florida Department of Environmental Protection FDEP to form the Blue-Green Algae Task Force. One of the Task Force's main recommendations was investing in innovative technologies to combat Harmful Algae Blooms (HABs) that are cost-efficient, environmentally safe and scalable. In the fall of 2019, the FDEP solicited responses and awarded funding to the SJRWMD and Blue Green Technologies, Inc. Their joint proposal was to treat occurrences of HAB populations in Lake Yale with a new surface-applied, slow-release, hydrogen peroxide based product that when applied to the water body contacts the blue green algae cell; thus, killing it. The product would be applied prior to the bloom becoming an aesthetic issue or health risk through monitoring of the HAB population in the water body. A low dose concentration would be applied when the HAB population spikes and the treatment would shift the algae population back to a beneficial, green algae dominated system.

In the first week of February the SJRWMD notified LCWA staff about this funded project and asked to hold a meeting at the Water Authority office to further explain the scope of work. This project caught the attention of other agencies as well and on February 12th a meeting was held with SJRWMD, LCWA, FWC, DEP and Blue Green Technologies, Inc. representatives. The meeting initially focused on the treatment of HABs in Lake Yale, but quickly was diverted to its potential use on Lake Minneola. Over the past several weeks Lake Minneola has experienced HABs concerning residents around the lake. The LCWA staff thought this water body might be a better test site because it is used more by swimmers for recreational purposes. All present at the meeting agreed Lake Minneola may be a better water body for initial testing due to the current HABs observed, however Fish and Wildlife staff noted that while the product was approved by EPA and has been used on a private lake in Ohio, it has not been approved for use in Florida and would require the appropriate review and approval prior to a permit being issued for the project. Blue Green Technologies, Inc. representatives stated that they were told the approval would be fast-tracked.

BOARD OF TRUSTEES

Table with 7 columns: District One (Peggy Cox), District Two (Trampis BonJorn), District Three (Carolyn Maimone), District Four (Robert Hendrick), District Five (Amy Stone), At-Large (Courtney Stokes), At-Large (Keith A.)

The SJRWMD is going to speak with FDEP representatives from the Task Force and see if they would be flexible in altering the treatment site from Lake Yale to Lake Minneola. At the time of this memo the water body receiving treatment is still unknown, however, the SJRWMD stated that regardless of the water body treated they anticipated treatment would begin in the next 4 months. The overall project duration is scheduled to be approximately 6 months from the initial start date. During the treatment period initial chemical application would occur, followed up by additional treatments if necessary, determined by continued monitoring of the HAB populations on the selected water body.

Executive Director's Recommendation:

For information purposes only; no action required.



St. Johns River

Water Management District

Ann B. Shortelle, Ph.D., Executive Director

4049 Reid Street • P.O. Box 1429 • Palatka, FL 32178-1429 • 386-329-4500
On the internet at www.sjrwmd.com.

December 6, 2019

William Kennedy, Grant Coordinator
Office of Ecosystem Projects
Florida Department of Environmental Protection
Tallahassee, FL

Dear Mr. Kennedy,

The St. Johns River Water Management District is pleased to provide the attached proposals for consideration of funding from the solicitation announced by the Blue Green Algae Task Force on November 6, 2019.

From the District's perspective of which waterbodies are in greatest need of improvement to address harmful algae blooms (HAB) and water quality improvements, we rank the proposals in the following order.

1. AECOM - Intact Cellular Algae Harvesting with Simultaneous Nutrient Export in Lake Jesup to Mitigate Harmful Algae Blooms and Reduce Nutrients
2. BlueGreen US Water Technologies Inc. – Chemical Control and Suppression of Algal Blooms in Lakes Yale and Washington

Based upon conversations with Department staff the District is not including in this solicitation the list of other water quality and HAB management funding requests. It is our understanding those efforts are under separate consideration by the Department, separate from this solicitation.

Thank you for your consideration,

A handwritten signature in blue ink that reads "Erich R. Marzolf".

Erich R. Marzolf, Ph.D., Director
Division of Water and Land Resources

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PROJECT INFORMATION PROPOSAL
FOR GRANT FUNDING CONSIDERATION

*Complete all appropriate sections and sign/date (expand writing areas as needed).
Instructions are included in italics throughout the project information proposal.*

OVERVIEW

The [Blue-Green Algae Task Force](#) was charged with identifying solutions to the harmful algal blooms that are known to impact the state of Florida. After a thorough review of available information and multiple opportunities for input from stakeholders, the Task Force developed [recommendations](#) to address the problem. Among other things, those recommendations encouraged an investment in a diverse portfolio of technologies that are cost-efficient, environmentally safe and scalable. Based upon those recommendations, the Department is seeking proposals from government entities for the implementation of innovative technology projects intended to prevent, detect, clean-up, or otherwise address harmful algal blooms.

Project Information Proposals Accepted from the Following Entities:

Governmental entities in Florida, as described in Subsection 287.012(14), Florida Statutes (F.S.).

Examples of fundable projects or programs include, but are not limited to:

- Projects that invest in new monitoring and detection, with a focus on algae and nutrient speciation, different blue-green algae toxins, etc. to enable a more proactive response.
- Projects that invest in technologies with a prevention focus.
- Projects that invest in technologies that are focused on clean-up and mitigation of blue-green algae blooms.

Proposal Evaluation Periods:

Proposals must be received by the Department within 30 days of the posting of the grant solicitation. Projects not selected in this solicitation can be considered in future solicitations. If a proposal is not funded by the end of this state fiscal year, the proposal will need to be resubmitted for consideration in future solicitations.

Proposal Guidance:

Please provide detailed information in the fields provided in Parts I through IV of the project information proposal. Write n/a for any field(s) that the proposed project is not addressing. More complete information will provide reviewers a better understanding of the proposed project.

All proposal requests must be **submitted electronically** to the Grant Coordinator in the Office of Ecosystem Projects. If you have any questions or need further information, please contact the Grant Coordinator: William “Chad” Kennedy at William.C.Kennedy@FloridaDEP.gov.

Definitions and Terms:

- **Size of Land Area Being Treated** – The size of the contributing land area, in acres (usually a watershed or sub-basin) that drains to the project being constructed.
- **Size of Project Impact** – The size of the site in acres where the project is being constructed (usually the extent of the permitted plans).
- **Waterbody Identification (WBID)** - The term is used interchangeably with waterbody segment. For more information on WBIDs, please visit the DEP Basin 411 website: <https://floridadep.gov/dear/watershed-assessment-section/content/basin-411-0>.
- **Pollutant of Concern** – “Pollutant of concern” means the pollutant or pollutants that have been identified as causing the impairment of a waterbody.
- **Total Maximum Daily Load (TMDL)** – A scientific determination of the maximum amount of a given pollutant that a surface water can absorb and still meet the water quality standards that protect human health and aquatic life. Adopted TMDLs are listed in Chapter 62-304, Florida Administrative Code.
- **Verified Impaired Water** – A waterbody segment included on the Department’s adopted verified list of impaired waters. Such waters do not meet its applicable water quality standards as set forth in Chapters 62-302 and 62-4, F.A.C., as determined by the methodology in Chapter 62-303, F.A.C., due in whole or in part to discharges of pollutants from point or nonpoint sources. The process for verifying that a water is impaired is described in Rule 62-303.400, F.A.C.
- **Basin Management Action Plan (BMAPs)** is a "blueprint" for restoring an impaired waterbody--one that does not meet water quality standards--by implementing actions that will reduce pollutant loadings to meet an adopted Total Maximum Daily Load (TMDL) restoration target.
- **Best Management Practices (BMPs)** Historically the term has referred to auxiliary pollution controls in the fields of industrial wastewater control and municipal sewage control, while in stormwater management (both urban and rural) and wetland management, BMPs may refer to a principal control or treatment technique as well.
- **Reasonable Assurance Plan (RAP)** A restoration plan in accordance with Rule 62-303.600, F.A.C., that is approved by Department order.
- **Innovative Technology** New technologies that have been demonstrated to be technically feasible under certain site conditions, but not widely used under the conditions that exist. This includes innovative applications of common use technology.

PART I – GENERAL INFORMATION

PROPOSAL FOR GRANT FUNDING CONSIDERATION

PROJECT CATEGORY: *Check all that apply*

- X** Prevention
- X** Clean-up
- Water Quality Monitoring Only
- X** Other Water Quality (*describe*) Water Quality Monitoring
- Hydrologic Restoration

PROJECT SUB-CATEGORY: *Check all that apply*

- X** Chemical
- X** Biological
- Mechanical
- X** Combination (*describe the combination*): The treatment chemically activates a selective biological signaling cascade that results in the collapse of the cyanobacterial population in the water and reinforces the growth of competing non-toxic green algae that further hinder cyanobacterial resurgence in the water-body
- X** Early Detection or forecasting

PROJECT FUNDING STATUS: *Check all that apply*

- X** New project that was not previously funded with State or Federal funds through the Department.
- Phase of proposed project (or existing/ongoing project) previously funded through the Department.
 - If any phase of project previously funded with State or Federal funds through the Department, provide project name, funding amount (grant and match, if applicable), and DEP Agreement No.(s): _____*

ENTITY/SPONSOR NAME: St. Johns River Water Management District

CONTACT INFORMATION:

Name: Dr. Dean R. Dobberfuhl, Chief, Bureau of Water Resources
Dr. Erich R. Marzolf, Director, Division of Water and Land Resources
Street Address: 4049 Reid Street (P.O. Box 1429)
City, State, Zip: Palatka, FL 32178-1429
Telephone: Dean (386) 329-4461, Erich (386) 329-4227
Email: ddobberf@sjrwmd.com, emarzolf@sjrwmd.com

PROJECT NAME: Harmful Algal Bloom remediation and prevention in Lake Yale using BlueGreen US Water Technology Inc's Lake Guard™ Technology.

PROJECT BACKGROUND:

Describe how the Entity/Sponsor has determined the need for this project. This may be any decision-making process(s) and/or legislative mandate(s) and/or stormwater master plan(s) and/or operations and maintenance plan(s) that identifies this project as a priority and/or describes how this project will benefit water quality in the project area.

In response to Florida Governor's executive order **19-12**, the Blue-Green Algae Task Force was formed. One of the Task Force's main recommendations was investing in innovative technologies to combat Harmful Algae Blooms (HABs) that are **cost-efficient, environmentally safe and scalable**. In response, Florida DEP issued a solicitation for grant proposals. Under this executive mandate, the St. Johns River Water Management District (SJRWMD) identified Lake Yale, which was plagued with cyanobacterial infection in the past few years, as a candidate for HAB remediation project.

Due to the sheer size of Lake Yale, 4,000 acres, traditional treatments were not applicable to remediate HABs in the lake. SJRWMD identified Lake Guard™ as a new innovative technology that meets Blue-Green Algae Task Force criteria: cost-efficient, environmentally safe and scalable.

HABs have a devastating effect on the health of communities that are adjunct to contaminated lakes as well as on their local economies.

Cyanotoxins are an immediate and present health-risk to humans and animals, and affect the quality of life around the water body. They can cause a range of disease conditions, from nausea and skin irritation to liver and neurocognitive diseases. These airborne toxins are associated with amyotrophic lateral sclerosis (ALS) and Alzheimer's disease for communities that live around infected lakes.

Furthermore, toxic water conditions in the water body, suspend recreational activities throughout the season, affecting tourism in the area and depreciating home and business values around the lake. Homes adjacent to water bodies that are plagued by cyanobacterial infections lose millions of dollars in value overall: a recent study estimates that homes around a 4,000-acre contaminated lake in Ohio have lost over \$100 million in property value over a 5-year period.

The Lake Guard™ technology, the only technology that is scalable to treat large lakes, will control against HABs and restore the aquatic ecosystem; it will keep the water body open for recreational activities throughout the season, which will boost local economies and augment the value of homes and businesses around the lake.

PROJECT LOCATION: *If the project is covering a large area, please describe the extent of the project area, and include the centroid latitude/longitude. If known, additional latitudes/longitudes may also be included. If available, please attach GIS files (maps) for the project(s).*

Geographic Location of Project (e.g. city, county, street address):
Lake Yale, Lake County, Florida

Size of Project Impact (area needed to build project): N/A, the Lake Guard™ technology does not require any heavy equipment. No footprint in the water body and the surrounding area.

Size of Area Being Treated:
Lake Yale is 4,000 acres in size

Latitude (decimal degrees): 28.915436
Longitude (decimal degrees): -81.738925

PROJECT FUNDING REQUEST AMOUNT: \$ 4,220,000

TOTAL COST (Sum of Proposed Project Funding Request and Entity Local Commitment Amounts): \$ 4,220,000

Please describe the project cost under these three categories:

Capital Cost

Capital costs are fixed, one-time expenses incurred on the planning, permitting, site preparation, purchase land or easements, buildings, construction, and equipment used in the project to render the service. In other words, it is the total cost needed to bring a project to an operable status. Keep in mind that the monitoring plan is designed before starting the implementation of your project.

Operational Cost

Operating costs are expenses associated with the maintenance and administration of the proposed project on a day-to-day basis. Please describe anticipated costs of: monitoring, supplies, rental equipment, repair and maintenance, utility usage, salary and wage expenses, and other operational costs. When appropriate, link costs to volume of treatment. For example, the volume of water treated, or area of treatment may correspond with the volume of supplies consumed during water treatment.

Demobilization and After-Action Report Cost

DEP grants will require the grantee to provide an After-Action Report. The Report is a key activity for demonstrating that the project has met DEP grant requirements and will quantify the suitability of the method for future use.

The after-action report will describe how the project site has been returned to the pre-project condition and that the cost to quantify performance (monitoring) and generate the Demonization and After-Action Report should be described. Reports for the Grantee (DEP) will include both a financial summary as well as the results achieved by the project.

Does the total cost shown above equal the total cost of the entire project?

(i.e., project will be fully funded if project is selected for funding with the requested amount and local funds and/or match commitment provided):

Yes **X** No

If no, what is the total cost of the proposed project *(e.g., funding request is for a phase of a larger project or there are other expected funding contributing partners)*: \$

If no, what are the other funding sources for the total cost of this project? *List all expected funding sources and amount required to complete the project:*

COST EFFECTIVENESS:

Describe how this project is cost effective for preventing, combatting or cleaning up harmful algal blooms. For all projects, describe how the cost effectiveness of the project will be measured, including the methods used (e.g. monitoring, cost comparison to current processes, etc.).

Cyanobacteria is a global epidemic which presents an immediate health risk (to those inhaling, drinking or consuming cyanotoxins); it causes a major economic burden on local communities that rely on infected water resources for drinking water, irrigation, recreation and fishing. Toxic blooms destroy businesses and have a clear and direct impact on nearby real estate prices. The total annual damage estimated in the U.S. on account of toxic algal blooms is \$4-6 billion. Different methodologies have been developed internationally over the years, attempting to solve the problem of algal blooms. These include remediation through chemical means, sonication or aeration; as well as attempts to target the level of nutrients in the water by chemical and mechanical means.

All these methods are extremely expensive and operationally challenging. More importantly, they have failed in showing measurable results in lakes that are bigger than a few dozens of acres.

In stark contrast, a single, 30-minute application of the Lake Guard™ technology in Chippewa Lake (OH, 330 acres, Aug 8, 2019) resulted in the immediate collapse of the cyanobacterial population in the water, the restoration of the overall hydrological conditions and the prevention of any resurgence in cyanobacteria activity for the remainder of the season – in a lake that suffered, historically, from heavy blooms through November.

The Lake Guard™ technology is used for the selective elimination and prevention of toxic algal blooms in lakes with thousands of success stories, and hundreds of recurring costumers all around the globe. This technology is in stark contrast to existing methodologies that require massive quantities, are hazardous and labor-intensive, and involve high-cost full-lake shock treatment. Unlike alternative methodologies, the Lake Guard™ technology is the only technology that is scalable to large water bodies and is not limited by size.

When used preventatively, during the early stages of an evolving cyanobacterial outbreak, the Lake Guard™ treatment requires an extremely low dose to achieve a substantial, selective impact. Such early treatment eliminates cyanobacteria before the inevitable build-up of cyanotoxins during bloom episodes.

The combination of the Lake Guard's immediate availability and the fact it requires no special equipment or infrastructure for application; a low-dose regimen, complemented with local, targeted application areas and a simple application protocol – makes it *the only viable and economical* option for the selective remediation and further prevention of cyanobacteria in large lakes.

As a reference, a recent study, [see here](#), estimated that homes and property near two algae-infested lakes in the State of Ohio had cost property owners about \$152 million in property-devaluation. This was over a period of 6 years, from 2009-2015. Further factoring in the costs

associated with healthcare, loss of business, fishing licenses and direct water-treatment operations, the total cost of the Lake Guard™ treatment as proposed here, represents a cash-positive operation within months from introduction.

PROPOSED PROJECT READINESS TO PROCEED:

Design Status: *(check applicable)*

- X** Design is not required for this project.
- Project is 100% designed
- Project is between 60% and 100% designed
- Project is partially designed but less than 60%
- Project is at the conceptual stage, design has not started

Permit Status: *(check applicable)*

- Permits are not required for this project
- Project is fully permitted (100%).
- Between 50% and 100% of the permits have been obtained
- Less than 50% of the permits have been obtained
- X** Permitting process has begun but no permits have been obtained
- Permitting process has not started

Project Start Date: *(check applicable)*

- X** Project construction/eligible grant can start immediately after of notice of funding award.
- Project construction/eligible grant can start within 6 months of notice of funding award.
- Project construction/eligible grant can start within 12 months of notice of funding award.
- Project construction/eligible grant can start after 12 months or more after notice of funding award.

Length of Time Expected to Complete Proposed Project:

How long will the entire project take to complete, if requested amount covers all work for the entire project? If part of a larger project, how much time will be needed to complete all work for the funding requested and local funds and/or match commitment provided?

Include the estimated timeframe in number of months for each applicable task so that the reviewers will know how much time is needed, regardless of when the project evaluation process takes place. Note that tasks may take place concurrently (e.g., monitoring may take place throughout the entire project period). If tasks are performed concurrently, do not add time to the overall project timeframe unless the task(s) need additional time to complete.

Add applicable tasks if they are not listed below. If a task does not apply for the proposal, mark the task N/A so that reviewers will know that this section was not overlooked.

Total time required for BlueGreen's team to survey Lake Yale, establish a treatment protocol and apply the treatment is estimated at 4-6 days. This will be followed by a 7-14 days intervention step (depends on the condition of the water body). Following the intervention step, 14-21 days from treatment, BlueGreen would expect that the toxic cyanobacterial load will drop below harmful levels (<1.0 µg/l). Concurrent with the collapse of cyanobacterial population, BlueGreen expects an increase in the biodiversity of non-toxic green algae in the lake, by 100-500%. Once the lake is rehabilitated to healthy conditions, BlueGreen will monitor the water conditions (Satellite imaging, In-situ digital probe, and microscopy) on a timely manner to maintain success and to intervene when necessary throughout the duration of the project.

General:

The overall tasks required to establish the appropriate dose, timing and location of the application are not time-consuming: once the project is awarded, it will take the BlueGreen intervention team a few days to survey the lake and study its physical, biological and chemical makeup. A treatment plan will be executed immediately within days, designed to selectively reduce cyanobacterial levels below the harmful threshold and to improve the lake's 'Resistance Index' in terms of biodiversity.

Continuous monitoring efforts will take place throughout the term of the Project in order to ensure that cyanobacterial levels do not resurge and to the extent they do – to take a surgical interventional measure that will nip such resurgence in the bud - before any toxin-buildup or substantial impact on beneficial species.

Actions required upon grant of Project:

BlueGreen's intervention team can generate a draft report within 72 hours after site visit, employing the following tools to assess water quality and bloom condition.

- 1) Remote-sensing: Satellite imagery analysis that quantifies the intensity and the total coverage of harmful algal blooms across vast areas in close to real time.
- 2) In-situ digital analysis in multiple locations: YSI PorDSS sonde measurements for dissolved

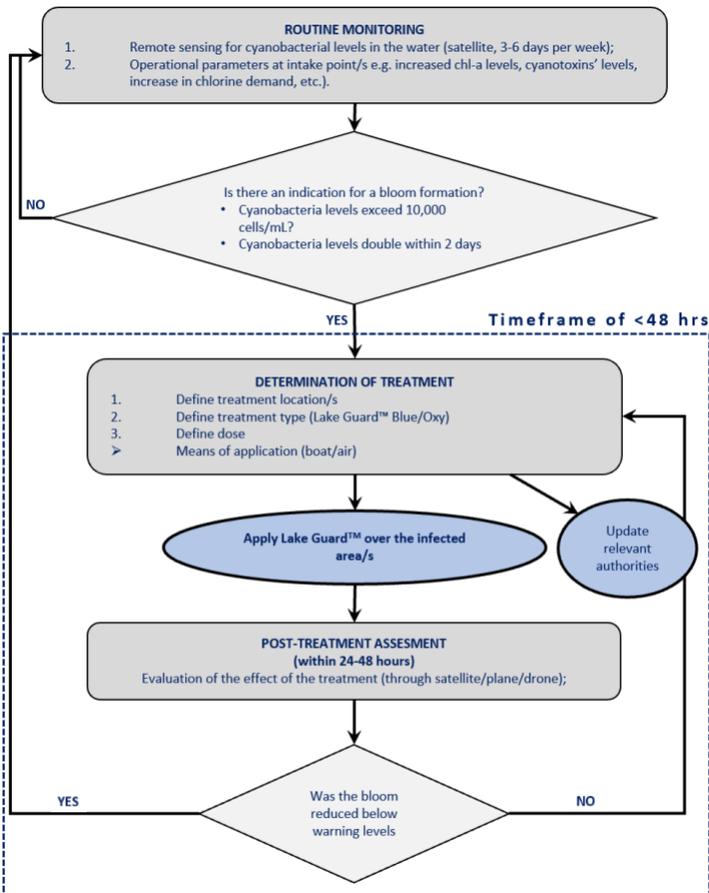
oxygen, pH, alkalinity, chlorophyll b (proxy to total biomass of green algae) and phycocyanin (proxy to total biomass of cyanobacteria).

- 3) Microscopy: Sampling and quantifying the microorganisms present in the aquatic ecosystem in multiple locations.
- 4) Whole Genome Sequencing: Provide accurate species'-level profiling of the aquatic ecosystems. It complements microscopical observations in selected sites, and identifies the abundance of cyanotoxin genes.
- 5) The above parameters are sufficient to devise an accurate treatment regimen with the Lake Guard™. Any further analysis at the disposal of SJRWMD or local authorities will be taken into account.

Timely determination of intervention and maintenance treatment-protocols

After careful analysis of the water condition by BlueGreen scientists, and considerations to wind and current movements, a treatment-protocol with the Lake Guard™ Oxy will be established. The time it takes to complete the treatment application using the Lake Guard™ technology will depend on the size of the cyanobacterial infection in the water body and different parameters in the waters. The treatment application time of large water bodies may take a few hours to complete, depending on the treatment protocol, method and severity of bloom at the time of treatment. For example, a manual application from a boat to treat a moderate bloom in a 350-acre lake took ~30 minutes. A boat application for the size of Lake Yale, 4,000 acres in size, under moderate bloom conditions is estimated at 4-6 hours.

The progressive effectiveness of the treatment will be assessed on a daily basis during the first 3-7 days after treatment. Thereafter, the water body will be monitored on a weekly basis to forecast potentially favorable bloom conditions and devise preventative measures to continuously keep the waters safe from harmful algal blooms.



Based on the flowchart from "Alert levels for the presence of harmful Cyanobacteria in Argentina" (from Ruibal et al. 2009) and the OHIO EPA Public Water System HAB Response Strategy (2015).

Do not include the time for work that has already been completed (which is not eligible for grant funds).

No. of Months for Design and Permitting: About 1 Month

No. of Months for Bidding/Subcontracting: 0.25 months

No. of Months for Construction/Implementation: Initial implementation will take 0.25 months, and then as needed for the duration of the Project term, 12 months

No. of Months for Verification of Success: Ongoing – throughout the Project term, 12 months

No. of Months for Reporting: On a monthly basis

Total No. of Months to Complete: The duration of the proposed Project term is 12 months

ADDITIONAL PROPOSAL INFORMATION: *Please complete as applicable.*

- Is the project expected to be located in or primarily benefit a financially disadvantaged community? (e.g., Rural Economic Development Initiative)? *Information on REDI can be found at the following website:* <http://www.floridajobs.org/docs/default-source/community-planning-development-and-services/rural-community-programs/redi/raomap1.pdf?sfvrsn=2>.
Yes No

If yes, name the community:

- **Does the Proposal Organization have an O&M plan and expected funding identified (including in-kind contributions) that will be needed to operate and maintain this proposed project?**

X Yes No

If yes, describe.

Data regularly collected from the field will be supervised by BlueGreen’s CTO, Dr. Moshe Harel, and its U.S. Director of Operations, Dr. Waleed Nasser. Professor Aaron Kaplan, of the Hebrew University in Jerusalem, will act as a senior advisor to the project. Professor Kaplan has over 26 years of experience in cyanobacterial research and is one of the world’s leading experts in the field.

The company’s executive management will lead a local scientific team if and when an immediate action is needed, able to respond to any unexpected resurgence of cyanobacteria, within 24-48 hours.

The company will implement a whole genome sequencing protocol to provide accurate species-level profiling of the aquatic ecosystems. This technology is considered the gold-standard for achieving the highest resolution of biodiversity, a crucial factor in assessing the health of the water body and following to progression of the water body’s restoration. This technology can identify the abundance of cyanotoxin-producing genes as well as geosmin and 2-methylisoborneol-producing genes that are responsible for unpleasant taste and odor in fish and drinking water. This state-of-the-art sequencing and analytics capability using Oxford Nanopore

sequencing technology, and an in-house bioinformatics pipeline was developed by Dr. Nasser, an expert in the field of genomic sequencing and bioinformatics.

PART II: PROJECT WATERSHED CHARACTERISTICS

WATERBODY ADDRESSED:

1. Provide the name of the waterbody(s) that this project addresses:

Lake Yale

2. Provide the WBID number(s) for the waterbody segment(s) that this project addresses.
Waterbodies are typically divided into segments which are identified by Water Body Identification (WBID) numbers. Water quality impairments are associated with the WBIDs, not the entire waterbody. Here is a link where that information can be found:
<https://floridadep.gov/dear/watershed-assessment-section/content/basin-411-0>

Lake Yale's WBID: 2807A

3. List the parameter(s) for which the waterbody is impaired, if applicable.
Nutrients; TP
4. Does the project treat water that discharges directly into an impaired WBID(s)?
Yes **X** No

If yes, identify the **WBID(s)** that the treated water directly discharges into.
2814A

If no, then describe how the project contributes to reductions of the parameters impairing the WBID(s). (*e.g. does the unimpaired receiving water body discharge into an impaired water body and if so, describe how*)

IMPLEMENTATION OF A WATER QUALITY RESTORATION PLAN(s):

If available, please attach GIS files for the project(s).

5. TMDL Report Name that project is addressing, if applicable: **Total Maximum Daily load for Total Phosphorus For Lake Yale and Yale Canal Lake County, Florida**

If addressing a TMDL, identify the pollution reductions and parameters specified in the TMDL: 10% TP reduction

6. Does this project fall within the geographical boundaries of any of the following: *(check all applicable)*

Developing BMAP
 X Adopted BMAP

Developing RAP
 Adopted RAP

Developing TMDL Alternative Plan/Alternative Restoration Plan
 Approved TMDL Alternative Plan/Alternative Restoration Plan
 Springshed Area
 Outstanding Florida Spring Springshed Area
 Priority Focus Area for an Outstanding Florida Spring

If any of the above are checked, please complete the following:

- a. Enter name of Water Quality Restoration Plan(s):
BASIN MANAGEMENT ACTION PLAN
PHASE 2 for the Implementation of Total Maximum Daily Loads Adopted by the Florida Department of Environmental Protection in the Upper Ocklawaha River Basin
- b. Identify if this project contributes to pollutant reductions specified in the Water Quality Restoration Plan(s).
 X Yes No
- i. If yes, briefly describe the nonpoint source issues or pollutant reductions specified in the Water Quality Restoration Plan(s) that the project is addressing. Include plan page numbers where applicable.
Reduction of nutrient-caused algal blooms
- c. In addition to being located within a Plan area, is this project also listed in the Florida Statewide Annual Report on TMDLs, BMAPs, MFLs, and Recovery or Prevention Strategies (<https://floridadep.gov/star>)?
 X Yes No

- i. If yes, provide the BMAP Project Number: _____ Unknown _____
- ii. and/or, provide the RAP Project Number: _____
- iii. and/or, provide the TMDL Alternative/Alternative Restoration Plan Project Number: _____
- iv. and/or, provide the Recovery or Prevention Strategy/Project Name: _____

d. If the project is located within a Springshed Area, Outstanding Florida Spring Springshed Area, or Priority Focus Area for an Outstanding Florida Spring, does the project address: *(check all applicable)*

- Water Quality *(describe)*: _____
- Water Quantity *(describe how the project will benefit the spring, including quantity of water made available in MGD)*: _____
- Is the Project Listed in a Recovery/Prevention Strategy or Identified in a Regional Water Supply Plan as Benefitting an MFL?
 - If so, name the Strategy and Project Title:

Land Ownership Status: *(check one)*

- Land necessary for the construction of treatment infrastructure has been acquired. Title is held by:
- Land necessary for the construction of treatment infrastructure is under a legal option to buy (please provide documentation of the option-to-buy and funding to execute the purchase).
- Land necessary for the construction of treatment infrastructure is under an easement that allows for construction and access.

X N/A, no treatment infrastructure is required.

PART III: DETAILED PROJECT DESCRIPTION

Include a full description of the proposed project. Project elements that are described on other submitted attachments but are not described in PART III may not be considered as part of the project when evaluating the proposal for funding consideration.

7. Description of the proposed grant funded and (where applicable) local funds commitment activities: *Provide sufficient detail so that the project evaluators will know exactly what is being constructed/implemented and how it will function.*

- a. Provide a detailed description of all project activities for which grant funding is requested.

The Lake Guard™ technology is used for the selective elimination and prevention of toxic algal blooms in lakes irrespective of size and scale. It is a proprietary new formulation of potent algaecides that allows the granular product to float and time-release the active ingredient on the water surface, specifically targeting cyanobacterial aggregates as they drift in the water. The Lake Guard™ technology triggers a biological programmed cell death within the general cyanobacterial populations that results in a population-wide collapse. The collapse of cyanobacteria creates a healthy aquatic environment where non-toxic, beneficial species can thrive and further serve as the lake's 'immune system' against cyanobacterial resurgence.

Currently, BlueGreen Water Technologies (BlueGreen) is successfully commercializing two different products in Israel, the US, China, South Africa and Russia: The Lake Guard™ Blue and the Lake Guard™ Oxy. Lake Guard™ Blue is comprised of 95% (w/w) copper sulfate pentahydrate encapsulated in an inert, biodegradable agent. Lake Guard™ Oxy is comprised of 98% (w/w) sodium percarbonate that releases hydrogen peroxide (H₂O₂) as its active ingredient, and 2% (w/w) of the inert, biodegradable encapsulating agent.

Both, the Lake Guard™ Blue and the Lake Guard™ Oxy, are approved by the U.S. EPA and are certified by the NSF/ANSI/CAN-60 standard for treatment in drinking water.

The ready-to-use Lake Guard™ products can be broadcasted manually from the shore, a boat, or a plane, in any water body no matter its size and shape. This technology is in stark contrast to existing methodologies that require large quantities, are hazardous and labor-intensive, and

involve high-cost full-lake shock treatment. Unlike existing methodologies, the Lake Guard™ technology is scalable to large water bodies, thousands to tens of thousands of acres in size.

BlueGreen recommends that the Lake Guard™ products be used preventatively, during the early stages of an evolving cyanobacterial outbreak, therefore prescribing even lower doses of the active ingredient. Such early treatment eliminates cyanobacteria before the inevitable build-up of cyanotoxins during bloom episodes. Thus, securing a safe cleanup of the toxic species without the risk of increasing toxin-levels in the water or reducing oxygen levels that are associated with the decomposition process of massive amounts of cyanobacterial dead cells (which in turn may cause a fish-kill).

Both Lake Guard™ products are selective against cyanobacterial species, as both products will eventually induce a prolonged oxidative stress. Specifically, the Lake Guard™ Blue, copper, treatment will induce an oxidative stress after the release of the photosynthetic machinery of affected cells, see accompanied report for more details. The prolonged oxidative stress triggers a signaling cascade in cyanobacterial species to initiate programmed cell death. This signaling cascade echoes throughout the water column all the way to the bottom of the lake, causing the collapse of cyanobacterial cell mass (Kaplan *et al.*, 2012; Helman *et al.*, 2003; Matthijs *et al.*, 2012; Harel *et al.*, 2013; Ding *et al.*, 2012; Berman-Frank *et al.*, 2004), see accompanied report for more details. Green algae species are, by far, less sensitive to oxidative stress. The Lake Guard™ technology is, therefore, an environment-friendly and selective treatment against cyanobacteria, the toxic species in the aquatic ecosystem.

Specifically, using the Lake Guard™'s preventative protocol, “pulls the rug” from under the formation of cyanobacterial infections, increases species’ diversity by promoting the growth of non-toxic eukaryotic algae and rebalances the ecological sphere. This healthy balance in the aquatic environment is sustained for extended periods and naturally prevents cyanobacteria from reclaiming dominance over longer intervals.

Aware to the sensitivity of the use of copper in the State of Florida, **BlueGreen** will apply only the **Lake Guard™ Oxy** (essentially a floating, time-releasing PAK27) for treatment purposes. The Lake Guard™ Oxy is considered by all to be safe to the environment, leaving no trace post-treatment (see accompanied literature folder, “Hydrogen peroxide literature”). Although the Lake Guard™ Oxy is more expensive, **BlueGreen is willing, for the purpose of this Project, to subsidize the price-differences as part of its introduction effort of the Lake Guard™ Oxy in the U.S.**

Of note, the Lake Guard™ Oxy has been a success story in hundreds of commercial applications where it showed a similar efficacy profile to that of the Lake Guard™ Blue. In this aspect as well as from an operational point of view (as both products share identical physical properties) examples of the vast success with the Lake Guard™ Blue is relevant, and results are reproducible with the use of the Lake Guard™ Oxy.

The primary beneficial traits of the Lake Guard™ are, therefore, as follows:

- a. **Lower dose** = lower environmental footprint.
- b. **Time-release** = Prolonged oxidative stress that targets, selectively, cyanobacteria which will initiate a programmed cell death signal - the activation of a natural ‘self-destruction’ mechanism within the cyanobacterial population that reverberates down all the way to the benthic zone. As a result, cyanobacterial species rapidly collapse while at the same time, beneficial, non-toxic species of green algae, flourish and reoccupy the ecological niche, serving as a natural buffer preventing cyanobacterial resurgence.
- c. **Floating formulation** = the Lake Guard™ technology affects the physical properties, but not the time-tested chemical properties of the potent algaecides. The Lake Guard™ ‘homes-in’ on cyanobacterial concentrations on the surface of the water, following their movement patterns in real-time while releasing the active ingredient to interact, primarily, with bacterial cell matter, without being wasted elsewhere. This “silver bullet” trait turns the Lake Guard™ into an optimal solution by keeping

the lowest lethal concentration (“LLC”) of the active ingredient while effectively treating algal blooms. This floating property allows for scalable applications in treatment of large water bodies.

- d. **Preventative Application** = The simple, modular application protocol allows for the use of the products at the very early stages of the bloom and requires a record-low dose (0.5-1 lb/infected acre) – far lower than the effective dose in case of a full-scale toxic bloom, which can be avoided altogether, along with its independent environmental adverse implications.
- e. **Environmentally Friendly** = The Lake Guard’s formulation allows targeted delivery of minimal doses of sodium percarbonate to surgically remove cyanobacteria where it is and when it is there. It is minimally (2%) coated with an inert, biodegradable polymer, which in and of itself has no effect on the environment, leaving no trace in the water within 24 hours. The active ingredient, hydrogen peroxide, breaks down into water and oxygen. Furthermore, the Lake Guard™ Oxy can be applied immediately and without delays, upon detecting the formation of a bloom. It undercuts any time-consuming mobilizing efforts required by any other alternative (mobilizing compound, equipment, and personnel) – which translate to days or even weeks passing by with a bacterial bloom in a logarithmic phase multiplying uninterrupted out of control (which in-turn would mandate increasing the effective dose and result in a far greater impact on the environment, e.g. toxins’ release and oxygen depletion).

In addition to contributing to its efficacy, as stated above, the product’s time-release trait means that at any given time the actual concentration of the active ingredient in the water is a fraction of the total potential. Also, the local nature of the application, its spatial distribution and its vertical concentration leaves the lion share of the lake unaffected by the treatment whatsoever, allowing organisms sensitive to the treatment ample space to move away.

- f. **Simple and Safe Application** = Contrary to current applications that require hazardous and prolonged handling of product and its preparation prior to

application (incl. dissolving the raw-material in water, movement of massive quantities onto barges and cumbersome full-lake sub-surface application), the application of Lake Guard™ is simple, quick and safe. It requires no preparation, very little time for application (seconds per acre) and very little, if any, exposure on the part of the applicator.

The Lake Guard™ technology is not limited by the size of the waterbody and is indifferent to its volume. The reason is that treatment should be applied locally, in strategic ‘dropping zones’, from where the compound can distribute itself most effectively along with cyanobacterial aggregates.

As the product floats on the water surface, the dose is determined per surface and not per volume.

The application rate is subject to the product’s approved US-EPA label.

In practical terms – the application rate depends on the various parameters in the water, such as the level of bloom, total organic biomass, pH and alkalinity at the time of application.

Normally, under conditions of a moderate bloom, a dose of 7.5 lb/treated-acre is recommended. Under a preventative measure, a dose of 0.5-1.5 lb/treated-acre will suffice.

It should be highlighted that the term "treated-acres" is defined as the ‘hot spot’, where bloom formation is present. As the treatment is targeted in nature, a surgical, localized application of the Lake Guard™ in the vicinity of such ‘hot spots’ can bring an end to a bloom formation when it is in its very early stages, and toxin levels are still negligible.

This approach is specifically tailored to large lakes that span across unique geological, biological, and ecological zones where blooms’ conditions may vary dramatically.

BlueGreen’s scientific team will consider multiple factors before devising a detailed treatment plan for the water body. These factors include:

- 1) Careful assessment of water currents and wind movement in order to determine the optimal geographical “dropping zone” of the product.
- 2) Remote-sensing: Satellite imagery analysis that quantifies the intensity and the total

coverage of harmful algal blooms across vast areas in close to real time.

- 3) In-situ digital analysis in multiple locations: YSI PorDSS sonde measurements for dissolved oxygen, pH, alkalinity, chlorophyll b (proxy to total biomass of green algae) and phycocyanin (proxy to total biomass of cyanobacteria).
- 4) Microscopy: Sampling and quantifying the microorganisms present in the aquatic ecosystem in multiple locations.
- 5) Whole Genome Sequencing: Provide accurate species'-level profiling of the aquatic ecosystems. It complements microscopical observations in selected sites, and identifies the abundance of cyanotoxin genes.
- 6) The above parameters are sufficient to devise an accurate treatment regimen with the Lake Guard™. Any further analysis at the disposal of SJRWMD or local authorities will be taken into account.

The Lake Guard™ technology target cyanobacteria population associated with producing toxins, as well as geosmin and 2-methylisoborneol molecules that cause unpleasant taste and odor in fish and water.

Treatment

After extensive analyses of the water conditions in the lake, the development of the bloom and its spatial progression, BlueGreen's scientific team will determine the optimal geographical 'dropping zones' in the lake where the appropriate Lake Guard™ product (or a combination thereof) is to be deployed. The deployment methods (manually, by boat or from a plane) are easily interchangeable and usually determined based on convenience, size/volume considerations and availability of said resources. In our experience, the total area that needs to be targeted for treatment is between 3-30% of the total lake size, depending on the severity of the infection and its coverage. Of note, the treatment dose of the floating, time-release Lake Guard™ Oxy is a function of surface area rather than water volume.

Subject to local permits, activities in the lake can resume immediately after treatment. Lake Guard™ Oxy will dissolve completely within 6-12 hours from application.

BlueGreen's ultimate goal is to reduce toxic-cyanobacterial biomass in lakes by promoting natural, interspecies' processes that prevent the resurgence of cyanobacteria in the aquatic ecosystem. Our global experience shows that achieving this goal is not a trivial matter and requires specific expertise.

BlueGreen offers two consecutive service plans. An interventional plan designed to rehabilitate a lake (WhiteSword™) and a follow up maintenance plan (WhiteShield™) designed to ensure that the achievements of the WhiteSword™ program are not overturned. Both programs will involve the use of Lake Guard™ Oxy.

WhiteSword™ is an interventional plan for lakes with an ongoing bloom concern. This package includes a detailed study of the lake, followed by a tailor-made treatment plan (incl. timing, dose, location of application, etc.) that will subsequently bring toxic species in the lake to manageable levels.

Plan Duration: 3 months

Plan targets:

- i. Bring toxic cyanobacterial biomass in the lake below dangerous levels within 72h from initial treatment.
- ii. Rejuvenate microbial biodiversity in the lake (as indicated by the lake's 'Resistance Index') within 2-3 weeks from initial treatment

Immediately following the WhiteSword™ plan, we will start implementing the WhiteShield™, a maintenance service plan in the lake.

WhiteShield™ plan includes an ongoing, detailed oversight of the lake using remote-sensing, in-situ sampling (digital and microscopical), and advanced data analysis complemented with a guaranteed immediate response (<48h) in any event of cyanobacterial resurgence. Our approach is designed to maintain the lake's phytoplankton biodiversity and to prevent blooms from resurging, thus contributing to the health of the lake and to the communal activity that depends on it. The plan's target is to maintain cyanobacterial cell numbers and cyanotoxin levels in check, below warning levels.

Of note, disconnecting the interventional plan from the maintenance plan may result in the lake's slipping back to pre-treatment conditions, in which case the lake must be reassessed and once-again rehabilitated to bring it back to manageable, healthy condition.

WhiteShield™ plan duration is priced monthly.

Application

The Lake Guard™ Oxy will be broadcasted from a moving boat, see [video here](#), in predetermined dropping zones, see **Figure A** (as a preliminary theoretical reference).

The application rate depends on multiple factors as detailed earlier. As an example, the application rate for a preventative measure, during the lag phase of cyanobacterial growth, is 0.5-1.5 lb/acre; in moderate bloom conditions, during the early stages of the exponential growth phase of cyanobacteria, the rate is 5-10 lb/acre; and during full bloom conditions, when cyanobacterial growth reaches the late stages of exponential growth, or the stationary phase, a rate of up to 35 lb/acre might be required for treatment. Treatment should be applied as soon as possible, and shouldn't be postponed until heavy bloom conditions.



Figure A: Example of plausible drop zones from a moving boat. Lake Yale.

Monitoring and Criteria for a Successful Application

The main water parameters that BlueGreen will monitor are: Total cyanobacterial biomass, total green algae biomass, *Resistance Index* (the ratio between green algae and cyanobacteria as an indication to the lake's natural ability to control cyanobacterial blooms), species diversity in the lake (microscopy and sequencing), alkalinity, pH, and dissolved oxygen. Other parameters will also be considered, e.g. the main purpose of the lake, depth, type of soil, the catchment area and contaminating sources, the effectiveness of previous treatments in the lake, temperature of the water, etc.

As a post-treatment success criterion, we expect that the total cyanobacterial biomass to decrease, and that the total green algae biomass to increase, reflecting an improvement of the lake's *Resistance Index* and its overall phytoplankton diversity. Changes in pH and dissolved oxygen levels are expected to be negligible, unless treatment is done during a state of an advanced bloom, in which case pH is expected to decrease to healthier levels (as influenced by cyanobacteria's hyper-photosynthetic activity); and dissolved oxygen may temporarily drop due to an increased activity of heterotrophic bacteria feeding off dead cyanobacterial biomass. BlueGreen does not anticipate any major changes in other water parameters, except for the water-color, that will lose the blue-green tint. In the case of a heavy bloom, the color change will be clearly visible post-treatment. In our experience, the viscosity and the clarity of the water will improve due to treatment.

Reporting

BlueGreen's scientific team will gather spatial and temporal data pre-, during, and at the end of proposed treatment period, and will generate at the end of each stage a comprehensive report that includes direct effect of the treatment on remediating and preventing the resurgence of harmful algal blooms, and the overall health of the aquatic ecosystem.

Infrastructure

No infrastructure is needed for the application of the Lake Guard™ technology. Its application leaves no footprint in the water or around it.

Equipment

No specialized equipment or heavy machinery is needed.

- b. Describe how the project is expected to address the issue of harmful algal blooms and how the results will be used to improve the State's ability to prevent, mitigate or clean up harmful algal blooms.

Harmful Algal Blooms (HABs) have a devastating effect on the health of communities that are adjunct to contaminated lakes as well as on their local economies. Cyanotoxins are an immediate and present health-risk to humans and animals, and affect the quality of life around the water body. They can cause a range of disease conditions, from nausea and skin irritation to liver and neurocognitive diseases. These airborne toxins are associated with amyotrophic lateral sclerosis (ALS) and Alzheimer's disease for communities that live around infected lakes.

Furthermore, toxic water conditions in the water body suspend recreational activities throughout the season, affecting tourism in the area and depreciating home and business values around the lake. Homes adjacent to water bodies that are plagued by cyanobacterial infections lose millions of dollars in value overall: a recent study estimates that homes around a 4,000-acre contaminated lake in Ohio have lost over \$100 million in property value over a 5-year period.

Harmful algal blooms have intensified in the past 30 years in terms of intensity and frequency. Recent studies show that there is no association between bloom intensity and previously hypothesized drivers, e.g. temperature and fertilizer-use (Ho, J.C., Michalak, A.M. & Pahlevan, N. Widespread global increase in intense lake phytoplankton blooms since the 1980s. *Nature* 574, 667–670 (2019). This suggests that the only effective remediation against cyanobacterial blooms is direct intervention to control the cell-numbers, by using chemicals as the only effective treatment.

The Lake Guard™ technology, is the only technology that is scalable to treat large lakes, can control algal blooms and can restore the aquatic ecosystem; it will provide drinking water safe of cyanotoxins, and will keep the lake open for recreational activities throughout the season, which will boost local economies and augment the value of homes and businesses around the lake.

The Lake Guard™ technology requires no infrastructure, and can be deployed quickly, within 48 hours from demand. Although recommended as a preventative measure, the Lake Guard™ availability and modularity is ideal for an emergency situation. Its ease of use can allow for multiple applications simultaneously. The treatment of Lake Okeechobee, considered a moonshot, is within grasp in the near future with the Lake Guard™ technology.

8. **Objective:** Explain how the activities in the grant funded project proposal will achieve the goals of the grant solicitation.

The Lake Guard™ technology checks all the boxes in the for Blue-Green Algae Task Force recommended technology, namely, **cost-efficient, environmentally safe and scalable technology.**

The Lake Guard™ technology addresses two out of the three examples of fundable projects:

- Projects that invest in technologies with a prevention focus.
- Projects that invest in technologies that are focused on clean-up and mitigation of blue-green algae blooms.

9. **Project Effectiveness Evaluation:** Describe how the success of the project will be evaluated, such as water quality monitoring, surveys, etc. Provide enough detail to indicate how activities will be monitored and how the information will be used to improve effectiveness.

The progressive effectiveness of the treatment will be assessed on a daily basis during the first 3-7 days after treatment. Thereafter, the lake will be monitored on a weekly basis to forecast potentially-favorable bloom conditions and devise preventative measures to continuously keep the waters safe from harmful algal blooms.

The main water parameters that BlueGreen’s scientific team will monitor are: total cyanobacterial biomass, total green algae biomass, *Resistance Index* (the ratio between green algae and cyanobacteria as a proxy to the lake’s natural ability to control cyanobacterial blooms), species diversity in the lake (microscopy and sequencing), alkalinity, pH, and dissolved oxygen. Other parameters will also be considered, e.g. the main purpose of the lake, depth, type of soil, the catchment area and contaminating sources, the effectiveness of previous treatments in the lake, temperature of the water, etc.

As a post treatment success criterion, we expect that the total cyanobacterial biomass to decrease below harmful levels, and that the total green algae biomass to increase, reflecting an improvement of the lake’s *Resistance Index* and its overall phytoplankton diversity. Changes in pH and dissolved oxygen levels are expected to be negligible.

10. Project Funding and Timeline: *In the table below, provide the estimated funding amounts and timeline for each grant step in the proposed project. Examples of typical descriptions have been provided but can be edited as needed.*

Description	Grant Funding	Estimated Timeframe to Complete Task
Permitting	-	02/15/2020 to 03/15/2020
Initial product allocation (WhiteSword™)	\$1,250K	03/01/2020 to 03/15/2020
Lake surveillance, initial report	\$60K	03/15/2020 to 03/19/2020
Interventional treatment implementation/s (WhiteSword™)	\$590K	03/20/2020 to 03/21/2020
Close interventional follow up (WhiteSword™)	\$460K	03/22/2020 to 06/21/2020
Additional product allocation Monitoring/Verification/maintenance and implementation (WhiteShield™)	\$1,775K	06/22/2020 to 03/15/2021
Monthly Reports	\$ 85K	on a monthly basis

The exact dates are contingent upon funding notice.

The initial phase, the WhiteSword™ plan, will last 3 months to control against cyanobacteria and bring the water body to a healthy level. The coupled WhiteShield™ plan, a maintenance plan to keep the lake healthy, is proposed for another 9 months.

11. **Additional Information:** Include other relevant information about the project that has not been addressed in the previous questions (e.g., the presence of protected species at the site).

N/A

12. **Does the project use innovative technologies/BMPs?**

For example, stormwater projects that include an extensive treatment train such as a combination of retention ponds, exfiltration trenches, and swales; or enhancements such as denitrification walls, alum and other polymer treatments, electrostatic panels, and parameter specific filters, etc., will be considered more innovative than projects that install a single conventional BMP.

X Yes No

If yes, please explain how the BMPs are innovative. For prevention or clean-up technologies, please provide estimates of the technology performance and safety (if the technology involves potentially toxic substances or byproducts), information to support these estimates, and examples of where the innovative technologies have been successfully used.

The Project detailed herein combines (1) BlueGreen’s patent-protected Lake Guard™ technology; (2) its proprietary Lake Guard™ View technology for satellite monitoring of bloom development, see **Figure B**; as well as (3) the Lake Guard™ GenSeq for high-resolution species’ diversity monitoring as an indicator of the lake’s health and the strength of its “Resistance Index” to cyanobacterial resurgence.



Figure B: Lake Guard™ View, Lake Yale, Florida

BlueGreen's unique ability to timely apply surgical doses of an algaecide that selectively targets cyanobacterial populations and restore in a very short time healthy, biodiverse conditions in the water column are unprecedented.

The Lake Guard™ Blue has a history of thousands of successful applications in Israel, China, Russia, South Africa, and the United States. The Lake Guard™ Oxy (=a floating, time releasing H₂O₂) is BlueGreen's 2nd generation product and has been used extensively in Israel where it has shown superior results to those of the Lake Guard™ Blue, being able to complement it under the harshest conditions where copper sulfate proved ineffective (e.g. very high alkalinity) The examples below serve, interchangeably, both products.

Examples of successful deployments of Lake Guard™ around the globe



USA: Chippewa Lake (OH), 330 acres, has been suffering from algal blooms in the past years, preventing recreation in the lake throughout most of the season. A report prepared for the Medina County in May 2019 listed several treatment alternatives ranging in cost from \$0.5 million to \$1.8 million, none of which were feasible or economical. From an operational point of view, and

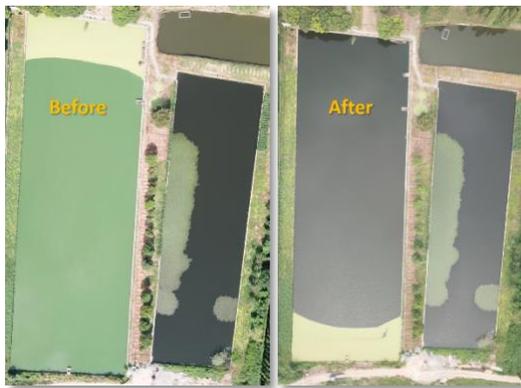
in terms of sheer size, the lake had fallen under the category of an 'untreatable lake'.

With the goal of highlighting the Lake Guard™'s scalability, the BlueGreen team set out to clean the lake. After a few days of surveying the lake, a treatment with ~5 lb Lake Guard™ Blue/acre was applied during the week of Aug. 5, 2019. Application time lasted ~30 min. Drastic changes in favor of beneficial species were registered within 24 hours and the lake was cleared from the bloom that was forming in it. The lake stayed bloom-free until the end of the season in November of 2019, three months post treatment. The beaches and recreational activities

remained open to the public throughout that time, making it the first time of a bloom-free summer in years. This placed Chippewa Lake as one of the very few lakes in Ohio that were safe for recreational activities during that period of time. For a quick overview of the application and results, see [video here](#). A full report is attached hereunder as **Schedule 1b(1)**.



Israel: Since its launch in Israel in mid-2018, the Lake Guard™ was rapidly adopted by the local industry achieving in record speed ~90% market-share over generic alternatives. Amongst our clients is Mekorot, the Israeli National Water Company. For a local example, please refer below to **Schedule 1b(2)**.



China: Since launching in June 2019 – multiple applications in different locations took place in China. A recent example from a pilot designed in preparation for a cleanup project of the waterways of Yixing (Jiangsu Province), on the shores of Lake Tai, one of the most known and worst cases of large-scale toxic blooms (~2,250 km²) is attached

below as **Schedule 1b(3)**.

A short movie of the project can be viewed [here](#).



3.4. Russia: A recreational lake in Kazan (Republic of Tatarstan) has been treated in October of 2018. The lake's superintendent called in September 2019 (a year later) to thank us, reporting that contrary to previous years, the lake has remained bloom-free throughout the 2019

season for the first time in many years. For a short video of the application, see [here](#). A full report of the treatment and its implications is attached hereunder as **Schedule 1b(4)**.

13. For Agricultural BMP Project Proposals: *Check all that apply and attach supporting documentation, if applicable*

- Project is supported by both state and local grower associations.
- Project complements an existing BMP project or U.S. Department of Agriculture (USDA) program.

PART IV – CERTIFICATION, ATTACHMENTS, AND REFERENCES

I, the undersigned Authorized Representative of the Project Proposal, hereby certify that all information contained herein and in the attached is true, correct, and complete to the best of my knowledge and belief. I further certify that I have been duly authorized to file the proposal for consideration of funding and to provide these assurances.

Authorized
Representative Erich R. Marzolf
(Signature)

Erich R. Marzolf, Ph.D., Director
Division of Water and Land Resources
St. Johns River Water Management District
(Name typed)

Signed this 31 Day of January, 2020

List the file names for all attachments that are included with this project proposal (such as maps, design plans, GIS files, letters of support, operations and maintenance plan, etc.), a description of what the attachment contains, and the total number of attachments submitted, including the project proposal.

Filename: Hydrogen peroxide literature

Description: Compressed folder with selected literature about Hydrogen peroxide/ Sodium percarbonate activity against cyanobacteria

Total Number of Files Submitted (include the project proposal in the total number): 2

Cite References (if applicable):

Berman-Frank, I., Bidle, K., Haramaty, L., and Falkowski, P. (2004) The demise of the marine cyanobacterium, *Trichodesmium* spp., via an autocatalyzed cell death pathway. *Limnol. Oceanogr.*, **49**: 2004, 997–1005

DING, Y., GAN, N., LI, J., SEDMAK, B., and SONG, L. (2012) Hydrogen peroxide induces apoptotic-like cell death in *Microcystis aeruginosa* (Chroococcales, Cyanobacteria) in a dose-dependent manner. *Phycologia* **51**: 567–575

Harel, M., Weiss, G., Lieman-Hurwitz, J., Gun, J., Lev, O., Lebendiker, M. et al. (2013) Interactions between *Scenedesmus* and *Microcystis* may be used to clarify the role of secondary metabolites. *Environmental Microbiology Reports* **5**: 97–104.

Helman, Y., Tchernov, D., Reinhold, L., Shibata, M., Ogawa, T., Schwarz, R. et al. (2003) Genes encoding A-type flavoproteins are essential for photoreduction of O₂ in cyanobacteria. *Current Biology* **13**: 230-235.

Ho, J.C., Michalak, A.M. and Pahlevan, N. (2019) Widespread global increase in intense lake phytoplankton blooms since the 1980s. *Nature* **574**, 667–670.

Kaplan, A., Harel, M., Kaplan-Levy, R.N., Hadas, O., Sukenik, A., and Dittmann, E. (2012) The languages spoken in the water body (or the biological role of cyanobacterial toxins). *Frontiers in Microbiology* **3**: 138.

Matthijs, H.C.P., Visser, P.M., Reeze, B., Meeuse, J., Slot, P.C., Wijn, G. et al. (2012) Selective suppression of harmful cyanobacteria in an entire lake with hydrogen peroxide. *Water Research* **46**: 1460-1472.

Schedule 1b(1): Chippewa Lake (OH), USA

Rehabilitating an Aquatic Ecosystem in a Natural Lake

Location: Chippewa Lake, Medina County, Ohio

Set up: A 330-acre recreational water body of historical and ecological significance. Chippewa Lake is Ohio's largest inland natural lake situated in Medina County, Ohio. This natural lake is used for fishing, canoeing, boating, and water-skiing. It includes two beaches and is surrounded by homes, a yacht club, and an upscale restaurant.

Treatment: the week of Aug. 5th, 2019.

Background:

Since many years, Toxic Cyanobacterial Outbreaks (TCOs) have been responsible for the suspension of all activities in Chippewa Lake throughout most of the recreational season (**Fig. 1**). An annual short relief in toxin levels is recorded during the months of June-July. This is attributed to heavy summer rains washing into the lake, flushing the cyanobacterial scum downstream into the Chippewa Creek river, which became the source of contamination to other watersheds downstream. However, flushing out the cyanotoxins along with the floating cyanobacterial mats did not significantly affect the concentrations of planktonic and benthic cyanobacteria in the lake (inoculum), which shortly thereafter would initiate the growth of the next outbreak when flood season is over (**Fig. 1**). The higher the initial inoculum is, the faster and more aggressive will the next TCO be. Since TCOs had never been treated in the lake, the initial cyanobacterial inoculum has been increasing from year to year, causing each bloom episode to be worse than the previous one (**Fig. 1**.)

The intensifying TCOs in Chippewa Lake suspended recreational activities in the lake throughout most of the year. Attempting to solve the problem, Medina County has sponsored a report in late 2018 that suggested different approaches to tackle TCOs in the Lake. Proposed solutions' costs ranged from \$500,000 to \$1,500,000. The report itself had cost the county \$26,000.

Objective:

The objective of the treatment in early August 2019 was to remediate a bloom surge in Chippewa Lake and prevent the expected full-blown TCO in the following months.

Treating an outbreak at its earliest stages is essential for several reasons: first, it requires a minimal algicide dose; second, it avoids a toxin-buildup in the cyanobacterial cells and their release once the bloom collapses; and lastly, it avoids oxygen-depletion associated with the collapse of an advanced bloom and the ensued oxygen-consuming biodegradation process that is mediated by aerobic microbes.

The treatment with Lake Guard™ Blue was applied once a surge in cyanobacterial biomass was detected in the lake, reaching an alarming level of 280,000 cells/ml (14 times the standard), corresponding with an increase in cyanotoxin levels from 0.18 ppm to 0.25 ppm over one-week period. The surge in cyanobacterial levels was visible to the naked eye, with cyanobacterial mats spotted on the eastern shore of the lake, corresponding with NOAA satellite imaging taken on Aug. 3 (Fig. 6) - indicating high levels of cyanobacteria that covers over 50% of the surface of the lake.

Altogether, the lab cell count, toxin levels, satellite imaging, and visual observations corresponded with the historical trend – forecasting a major outbreak in the immediate future.

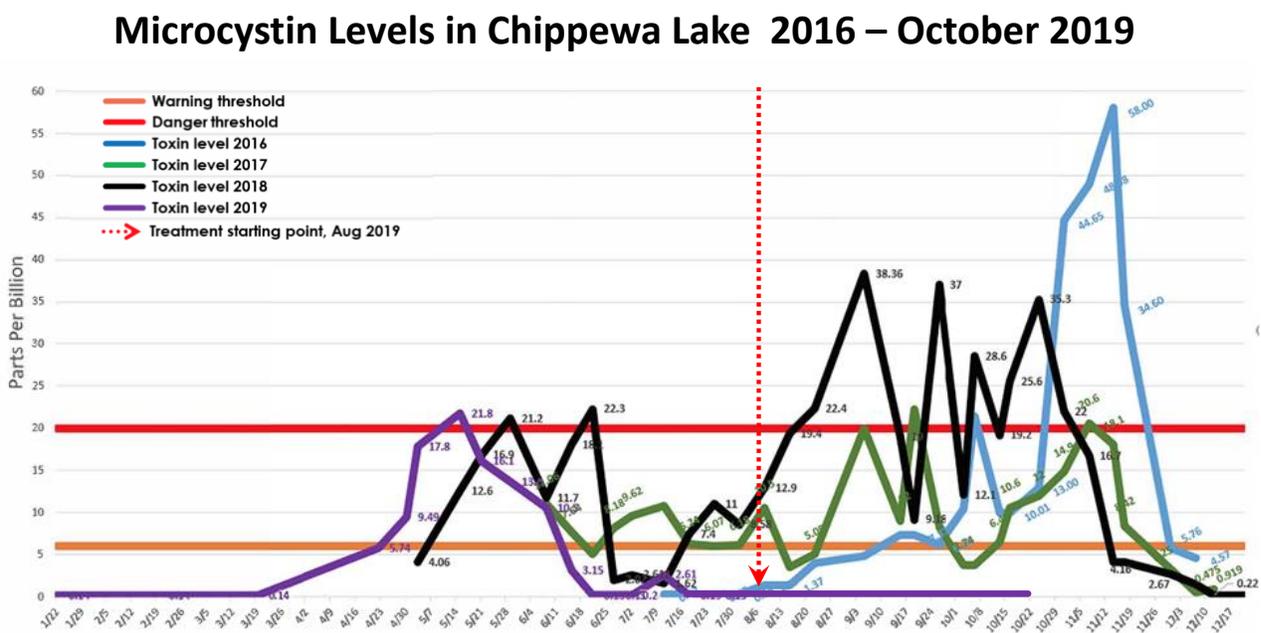


Fig. 1. Microcystin levels measured in Chippewa Lake since the Medina County Park District initiated weekly measurements of cyanotoxins in 2016. The lake freezes between December and March. Historically, microcystin levels would increase during the months of April-June, drop during the heavy rain season in June-July, only to be followed by an intense surge from August through November. A Lake Guard™ Blue treatment was applied on August 8th, 2019 (red dotted arrow). Since the treatment, **microcystin levels remained well below the warning threshold**, purple line. **This year was the first time in many years** where the lake stayed open to the public during the peak season of August and September (*confirmed as of Oct. 22, 2019, at the end of the season, where no more measurements were taken*).

Sampling Methods:

- **YSI ProDSS probe:** dissolved oxygen (DO), pH, chlorophyll-b (Chl-b is a proxy to determine the total biomass of green algae), phycocyanin (PC, is a proxy to determine the total biomass of cyanobacteria).
- **Clogging Potential Meter:** a quantifier of the amount of the total solids in the water, measured in the time it takes the water to clog a filter under constant pressure.
- **Microscopy:** A qualitative sampling of the microorganisms in the aquatic environment. Total phytoplankton was concentrated on a 33 µm filter, using a sample volume of 3-4 gallons.
- **Secchi Disk:** Measures water clarity/turbidity.
- **Satellite imaging** for the presence of TCOs (provided by the National Oceanic and Atmospheric Administration, NOAA)
- **ELISA test for microcystins**, a cyanotoxin. This test measures the microcystin levels in the water. Samples were taken weekly from two fixed points on the eastern side of the lake (provided by the Medina County Park District).
- **YSI 9300 photometer:** measures total copper ion concentration (Cu^{+2}), hydrogen peroxide concentration (H_2O_2), and alkalinity.

Starting on Aug. 5, 2019, all measurements, except for satellite imaging and ELISA tests, were taken daily, for 9 days, at 8 am every morning, from four different sampling points around the lake. Cyanotoxin levels (ELISA laboratory testing), and total coverage of cyanobacterial mats on the water surface (satellite imaging), were assessed independently by the local authorities and supported the findings of a successful treatment.

A first assessment application of ~0.9 lb/acre was applied on day 3, Aug. 7, in order to determine wind and current directions and dispersal patterns on the surface of the water. An operational application followed on Aug. 8th at a rate of 4.5 lb/acre. Results were analyzed and normalized against day 3.

Application Method:

Lake Guard™ Blue was applied directly from a boat during the morning hours at a total dose rate of ~5 lb/acre. The product, packaged in 50-lbs bags, was gravity released from the edge of a [moving boat](#). Once the waterborne product was organized over the western perimeter of the lake (**Fig. 2**), it was

carried by Western winds and currents that scattered the floating particles alongside cyanobacterial aggregates. The total application time of 1,500 lb Lake Guard™ Blue lasted about 30 minutes. Within a few hours, no Lake Guard™ Blue particles were visible to the naked eye. Boating activities were not interrupted throughout the time of application. For precaution reasons, the two beaches were closed between 8 am to 4 pm on the days of application (Aug. 7 and Aug. 8). Measurements taken two-hours post-treatment indicated negligible levels of copper ions (average of 0.3 ppm) in the immediate hours post-treatment, dropping to below detection levels in the following day.

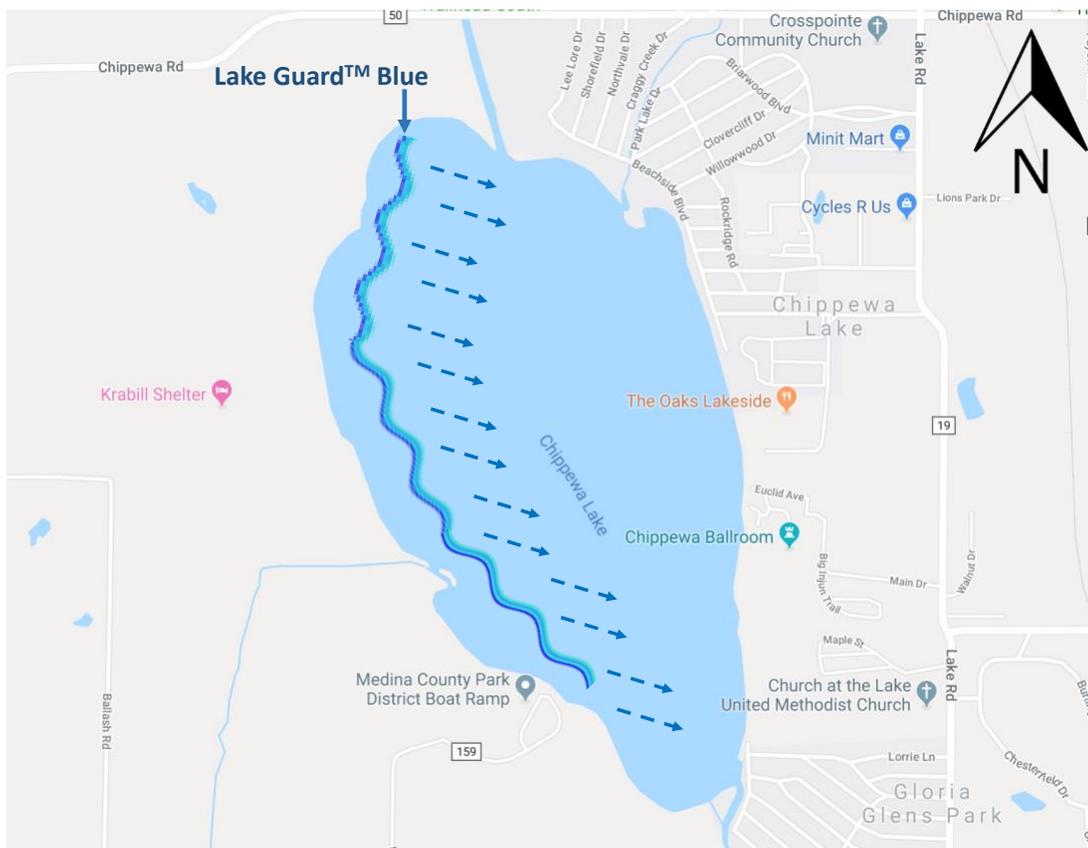


Fig. 2. A schematic approximation of the Lake Guard™ Blue application in Chippewa Lake, 330 acres in size. The ready-to-use product was directly released from a moving boat. The product lined the western perimeter of the lake, while eastbound winds and currents carried the floating particle alongside cyanobacterial aggregates.

Results and Discussion:

Post-treatment phytoplankton assessments indicated a clear and immediate shift from dominating toxic cyanobacterial species (primarily *Anabaena* sp. and *Planktothrix* sp.) towards a healthy variety of eukaryotic green algal species including *Diatoms* and different *Chlamidomonas*-like species (**Fig. 3**). Interestingly, a cyanobacterium *Spirulina* sp. was also observed after the treatment. This strain is used as a “super-food” and is not considered toxic.

Changes in chlorophyll-b (Chl-b) and phycocyanin (PC) levels strongly correlated with the qualitative results obtained by microscopic imaging. The lake’s ‘Resistance Index’ to cyanobacteria, which can be assessed by the ratio between Chl-b and PC (total eukaryotic green algal biomass vs. cyanobacterial biomass) increased significantly by 250% (**Fig. 4**), indicating a clear shift in the balance of power between these two natural competitors – in favor of non-toxic species.

The trend in favor of beneficial species at the account of toxic species is in agreement with post-Lake Guard™ treatments all over the world. This increase in the ‘Resistance Index’ correlated strongly with the longevity of the treatment.

Moreover, the targeted efficiency with which the Lake Guard™ Blue acts in the water results in a natural increase in hydrogen peroxide (H₂O₂) levels in the water column, which increased significantly between days 1-4 post-treatment to a range of 0.5 mM. The presence of hydrogen peroxide in the water is attributed to the copper treatment: Copper blocks the photosynthetic electron path by binding to a component between photosystem II (PSII) and photosystem I (PSI), thus inhibiting the flow of electrons from PSII that causes the formation of singlet oxygen in the core of PSII. The singlet oxygen in PSII is then converted, enzymatically, to hydrogen peroxide. The continuous formation of the hydrogen peroxide will induce a prolonged oxidative stress that activates cell-death in cyanobacteria, but not in green-algae (Kaplan *et al.*, 2012), further enhancing the “accuracy” and the selectivity of the targeted treatment against cyanobacteria (Helman *et al.*, 2003; Matthijs *et al.*, 2012; BlueGreen's reports [HERE](#), and [HERE](#)). This effect of allelochemical secretion from both cyanobacteria and green algae will affect distant, naïve, populations, including benthic populations (Harel *et al.*, 2013; BlueGreen's report [HERE](#)).

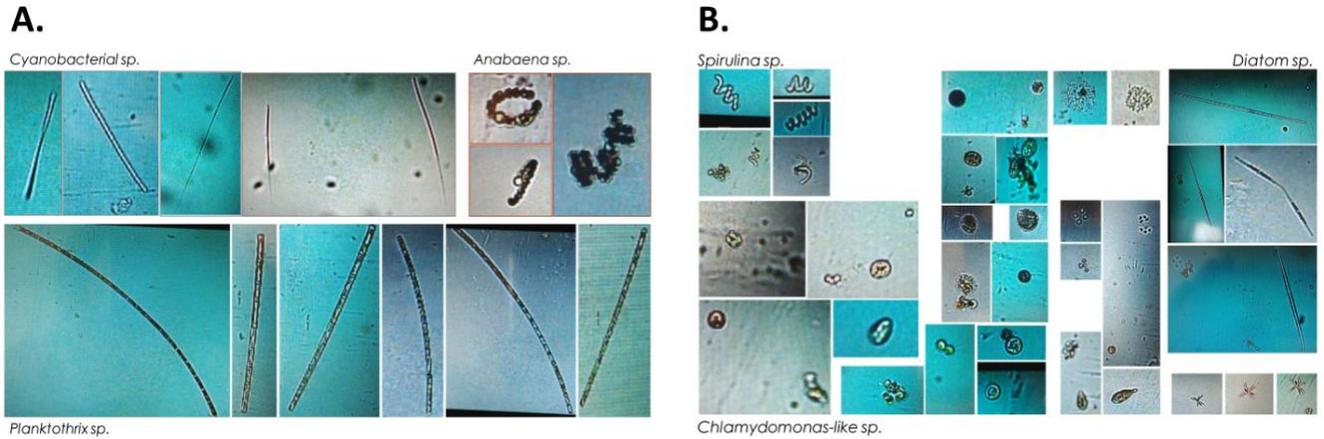


Fig. 3. Qualitative microscopic imaging. **A.** Pre-treatment, most of the phytoplankton captured by the microscope was of cyanobacterial species, mostly *Planktothrix sp.* and *Anabaena sp.* These toxin-producing cyanobacteria were not captured in the images taken post-treatment. **B.** Samples taken three days post-treatment. The phytoplankton captured by microscopic imaging was mostly of beneficial green algae, mainly *Diatom sp.* and different *Chlamydomonas-like sp.* Few *Spirulina sp.*, a nontoxic cyanobacterium, were captured as well by the microscopic imaging.

The amplified cycle ensued by copper treatment, namely the collapse of cyanobacterial populations after Lake Guard™ Blue treatment, followed by the prolonged oxidative stress due to the production of hydrogen peroxide, followed by a signaling cascade that results in the programmed cell death of naïve cyanobacterial populations, was observed in Chippewa Lake days after the treatment. Tens of acres of water surface were covered with a grayish-beige color of protein-based-foam (**Fig. 5**). This phenomenon is attributed to cyanobacterial cell-lysis and a clear indication that cyanobacterial cell-death continued progressing for days after treatment, long after copper levels were undetectable in the water (as detailed hereinafter). Members of ‘Save the Lake Coalition’ reported about the foaming phenomenon as far as two weeks into the treatment - indicating a prolonged, continuous "fight" in which cyanobacteria were ‘losing’ to high levels of eukaryotic green algae and naturally-recurring hydrogen peroxide, that was initially triggered by the treatment.

Microcystin levels remained very low post-treatment (**Fig. 1**), indicating that the timing of the treatment, at the early stages of the bloom-surge, was effective. The sharp decline in cyanobacterial biomass did not result in an increase in cyanotoxin-levels, confirming that the cyanobacterial cells were at their lag-phase stage, when cyanotoxin-accumulation in the cells is minimal (Wood *et al.*, 2010). Had the treatment been applied a week or two later, during the exponential growth phase of toxin-producing cyanobacteria, the levels of the cyanotoxins would have increased.

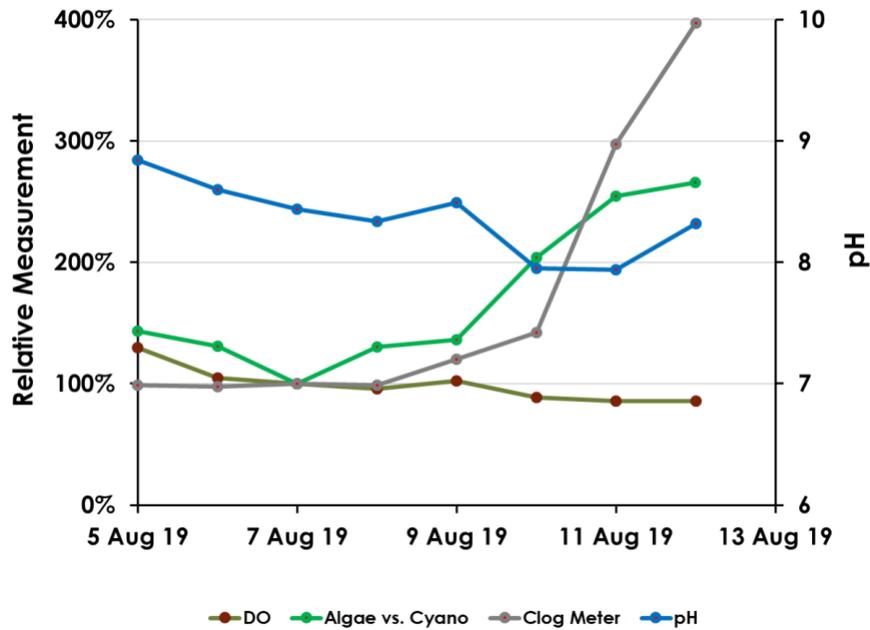


Fig. 4. Relative measurements for Dissolved Oxygen (DO); the ratio of total eukaryotic algal biomass vs. cyanobacterial biomass – the ‘Resistance Index’ (Algae vs. Cyano); Clogging potential meter; and pH. The measurements were taken daily, at 8 am, for 9 consecutive days and from different points in the lake. The initial treatment with the Lake Guard™ Blue was applied on August 7th (day 0), and the relative measurements of DO, Algae vs. Cyano, and Clog Meter were normalized to day 0. All parameters indicate a healthier post-treatment aquatic system.

The pH levels, post-treatment, dropped from pH 8.5 to pH 7.95 (Aug 9-11), a result of the reduction in overall photosynthetic activity (as a proxy to the relative decline in phytoplankton total biomass). Within 4 days (Aug. 12), pH levels rose to pH of 8.35 indicating the reinitiation of photosynthetic activity by new, predominantly non-toxic phytoplankton variety (**Figs. 3 and 4**).

An additional confirmation about the advantages of early treatment, and its impact on the aquatic environment, came from the unchanged dissolved oxygen levels before, during and after treatment (**Fig. 4**) - averting the risk of fish kill due to oxygen depletion (a typical outcome upon the collapse of a massive bloom).

There was no evidence for any adverse impact to either the fauna or the flora of the lake.

The clogging potential meter, which indicates the total solids in the water, improved significantly by 400% immediately after treatment (**Fig. 4**). This measurement serves as an additional indication to the

change in populations in favor of non-toxic species: cyanobacteria are known to release significant quantities of polysaccharides into the water (Harel *et al.*, 2012), which increase water viscosity, and is associated with the 'swimmer's itch' nuisance. Controlling polysaccharide concentrations in the water, due to the collapse of cyanobacterial communities, breaches yet another 'wall' in the cyanobacterial defense mechanism against its natural competition, further enhancing the 'Resistance Index' against cyanobacteria. Breaking said network of polysaccharide production contributed to the water's increased filterability as indicated by the clogging meter results.

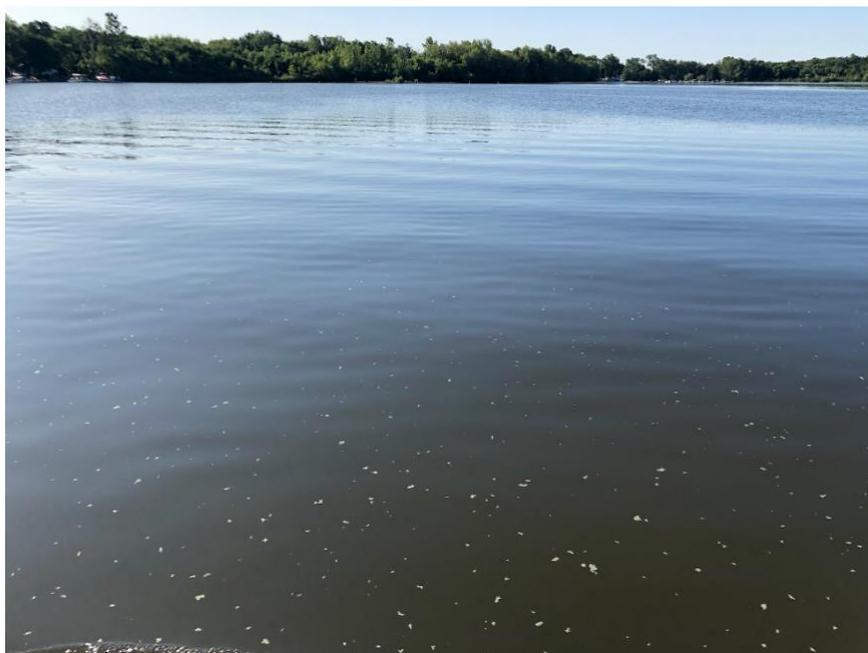


Fig. 5. Protein foam formation throughout the lake, day 3 post-treatment, indicating continuous bacterial cell-death and cell lysis as a result of competition with higher levels of green algae as well as the oxidative stress induced by the Lake Guard™ Blue treatment. Cyanobacteria are far more sensitive to oxidative stress than green algae, further enhancing the 'Resistance Index' in favor of non-toxic species. Members of the *Save the Lake Coalition* continued reporting sightings of this phenomenon as late as two weeks post-treatment.

Secchi-disk measurements, on the other hand, did not change during or after the treatment, remaining at a constant ~45 cm (~18 inches) of water visibility, most likely due to high levels of tannin present in the water.

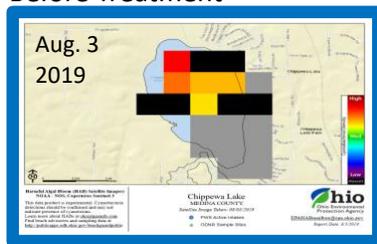
Copper ions (Cu^{+2}) concentration in the water, sampled at 15-30 cm (6-12 inches) below water surface after 1-2 hours of the application, averaged around 0.3 ppm. The copper ion concentration in days 1-3 post-treatment was <0.00 ppm. Water alkalinity levels remained unchanged before and after treatment, at the range of 80 ppm (mg/L).

Combined, the results above indicate that the Lake Guard™ Blue treatment was selective against toxic cyanobacteria and it rehabilitated the ecological ecosystem in the lake in favor of beneficial species. This increase in diversity and biomass of beneficial, nontoxic green algae, acts as a biological buffer that prevents the cyanobacteria from reestablishing dominance in the aquatic system.

The results and analysis above were confirmed by the National Oceanic and Atmospheric Administration (NOAA) satellite imagery, showing a clear difference between pre- and post-treatment conditions. (Fig. 6).

Recent results from cyanotoxin measurements and satellite imaging, indicate to a bloom-free lake for 3 months in a row, and counting, until the end of the season in November.

Before Treatment



NOAA Harmful Algal Bloom Satellite Imagery
From August 3rd, 2019, until the end of the season
Courtesy of Ohio EPA and Medina County Park District

After Treatment

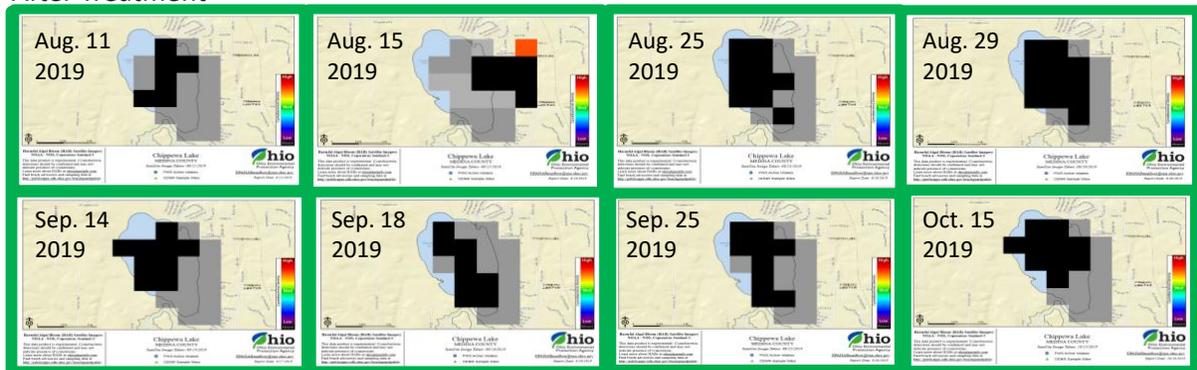


Fig. 6. NOAA satellite imaging shows high levels of cyanobacteria present in Chippewa Lake shortly before treatment (yellow and red pixels on Aug. 3, top panel), that were completely cleared immediately after treatment (Aug. 11 and onward, black pixels, lower panels). Grey pixels represent clouds.

Conclusions:

Lake Guard™ Blue is a selective, highly targeted treatment against toxic cyanobacteria in lakes of all sizes. The simplicity and modularity of its application empower local communities, for the first time, to

reclaim their water resources. They can now react, on-time, to a bloom-formation with record-low doses of algicide, reducing the environmental footprint to a minimum and preventing the subsequent formation of a toxic bloom altogether.

Targeting and eliminating, primarily, the toxic cyanobacteria, will rehabilitate the lake by allowing beneficial green algae to increase in mass and in diversity to reclaim dominance in the ecosystem, and serve as a natural buffer that prevents the next cycle of the cyanobacterial outbreak.

An application that lasted less than 30 min in a 330-acres Chippewa Lake can be easily scaled to treat lakes without any size limitation.

Since that single treatment in the first week of August, 2019, and until the end of the season on November, 2019, the residents of Chippewa Lake continue to enjoy healthy, safe conditions in their natural lake for the first time in years during peak season!

Reference List:

Harel,M., Weiss,G., Daniel,E., Wilenz,A., Hadas,O., Sukenik,S. et al. (2012) Casting a net: fibers produced by *Microcystis* sp. in field and laboratory populations. *Environmental Microbiology Reports* **4**: 342-9.

Harel,M., Weiss,G., Lieman-Hurwitz,J., Gun,J., Lev,O., Lebendiker,M. et al. (2013) Interactions between *Scenedesmus* and *Microcystis* may be used to clarify the role of secondary metabolites. *Environmental Microbiology Reports* **5**: 97–104.

Helman,Y., Tchernov,D., Reinhold,L., Shibata,M., Ogawa,T., Schwarz,R. et al. (2003) Genes encoding A-type flavoproteins are essential for photoreduction of O₂ in cyanobacteria. *Current Biology* **13**: 230-235.

Kaplan,A., Harel,M., Kaplan-Levy,R.N., Hadas,O., Sukenik,A., and Dittmann,E. (2012) The languages spoken in the water body (or the biological role of cyanobacterial toxins). *Frontiers in Microbiology* **3**: 138.

Matthijs,H.C.P., Visser,P.M., Reeze,B., Meeuse,J., Slot,P.C., Wijn,G. et al. (2012) Selective suppression of harmful cyanobacteria in an entire lake with hydrogen peroxide. *Water Research* **46**: 1460-1472.

Wood,S.A., Rueckert,A., Hamilton,D.P., Cary,S.C., and Dietrich,D.R. (2010) Switching toxin production on and off: intermittent microcystin synthesis in a *Microcystis* bloom. *Environmental Microbiology Reports* **3**: 118-24.

Schedule 1b(2): Israel

A Seasonal Treatment, Nitzanim Reservoir

Purpose:

Nitzanim Reservoir retains water for irrigation purposes. Prevention of blooms in the reservoir is key to its continuous operation. It is required to supply its clients with water that meets both bacterial standards as well as filterability standards at all times.

Place:

The 15-acre Nitzanim reservoir is located near the city of Ashkelon, Israel.

Background:

Israeli water associations operate some 600 reservoirs (10-190 acres in size) all over the country, designed to retain and manage recycled wastewater for irrigation.

Cyanobacterial outbreaks occur regularly in these reservoirs likely due to multiple reasons including a high level of nutrients (e.g., phosphates and nitrates), high temperatures and sunlight intensity.

Noticeably, water alkalinity is very high ranging between 500-800 mg/l CaCO₃.

Over the years, Israeli irrigation ponds have been continuously treated with raw copper at a dose rate of 10-20 kg/acre (20-40 lb/acre). Applied either from crop-dusters or manually, from a boat. The effectiveness of the treatment was rather poor, thus demanding frequent treatment. In many cases, the superintendents are forced to open and clean up pumps and filters, sometimes on daily basis to maintain the water flow. Eventually, as water levels decrease towards the end of the irrigation season, most reservoirs are forced to arrest the water flow due to condensed algal blooms that clog and damage the pumps.

Materials and methods:

The reservoir has a surface area of 15 acres and is about 50 ft deep (~2.6 million cubic ft). It was monitored 2-3 times every week between January and June of 2018.

Measurements:

- Chlorophyll-a (as an indicator for total phytoplankton) was measured by a handheld device (FluoroSense™, by [Turner Designs](#), USA).
- pH
- Temperature
- Total particulate matter was assessed using a Clogging Potential Meter (Israel Water Works Association, Israel) with a 33 µm sieve filter. This device measures the time it takes for the sieve

to clog under constant water pressure. In principle, *the longer it takes for the filter to clog – the better is the water quality.*

Water was sampled from the intake flow in a fixed location in the middle of the reservoir, 6 feet above the bottom of the reservoir, and 45 feet below the surface when the reservoir is full.

Sampling was conducted in triplicates. All results were averaged for each sampling point. Algal population analysis was conducted by a microscope observation using hemocytometer cell count chamber.

Treatment Protocol

The treatments were conducted in accordance with the status of the algal biomass as well as the water's filterability status. One representative example is shown below. The parameters presented were measured in the field and the company's laboratory.

Results and Conclusions:

A mix of toxic cyanobacterial species (*Anabaena* sp. and *Microcystis* sp.) constituted over 95% of the entire phytoplankton populations in the reservoir prior to treatment.

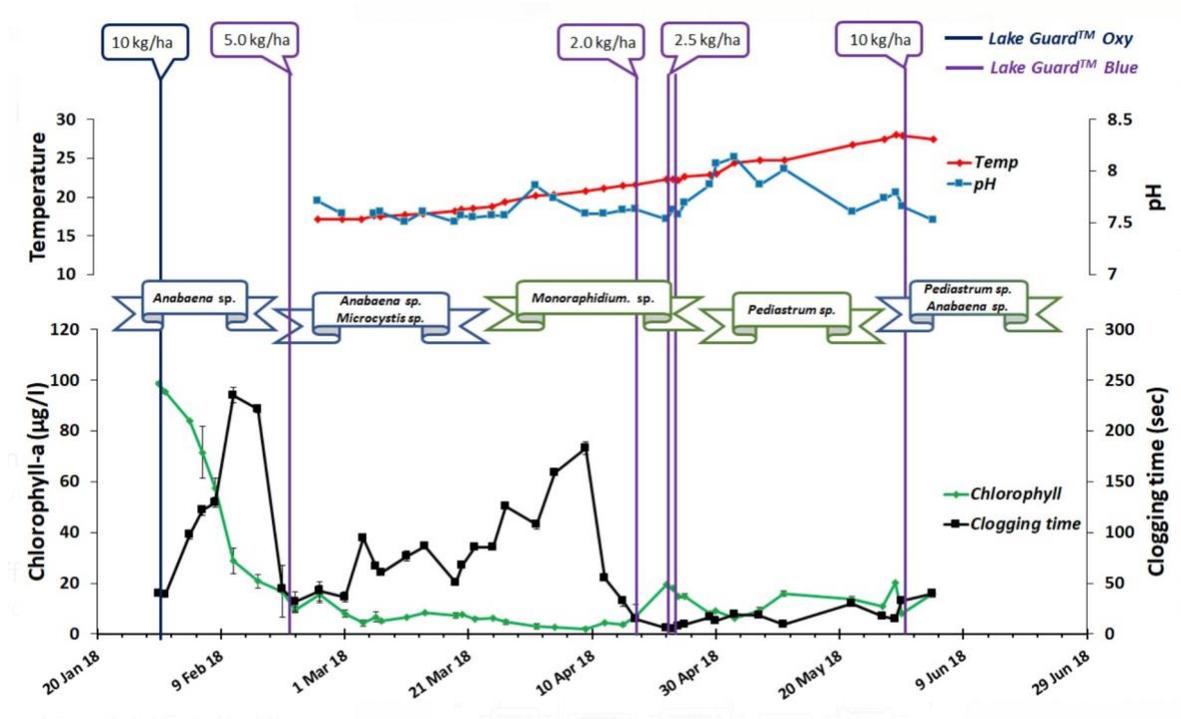


Fig. 1. Seasonal treatment with Lake Guard™ Oxy and Lake Guard™ Blue in an irrigation reservoir, Kibbutz Nitzanim, indicating the dramatic impact of the treatment on algal levels, its prolonged effect, as well as its ability to influence species-variety in favor of non-toxic ones (1kg/ha. ≈ 1lb/acre).

An initial treatment with Lake Guard™ Oxy followed by treatments with Lake Guard™ Blue (as specified in Fig.1) caused the total collapse of the toxic bloom, keeping it for months to-come below dangerous levels. Analysis of the phytoplankton population clearly indicated that the treatment outcome underscored "Killing the Winner" paradigm, whereby the dominant species were severely affected by the treatment, allowing non-harmful eukaryotic algal species, mostly *Monorapridium* sp. and *Pediastrum* sp. (far less sensitive to the treatment), to occupy the “vacant” ecological niche (Fig. 1).

While in principle, non-toxic species should be welcomed as a natural buffer to toxic species, this is not the case in wastewater reservoir where they may clog filter pumps as well. For this reason – treatment was conducted under intensifying conditions of non-harmful green-algae. Needless to say, that in freshwater bodies, unlike irrigation ponds, the thriving of green algae in the aquatic system is a positive ‘Resistance Index’ against toxic species.

The impact of a seasonal treatment with Lake Guard™ on the Lowest Lethal Concentration of Copper needed:

The overall amount of copper applied in 2018, using Lake Guard™, was 1/3 of that used in the year before (Fig. 2) despite the intensification of toxic blooms in a nearby water body. Considering the ~200% yearly rise in cyanobacteria populations in various water bodies in Israel between 2014-2017, the actual reduction in copper applied in 2018, using Lake Guard™, is closer to ~85%.

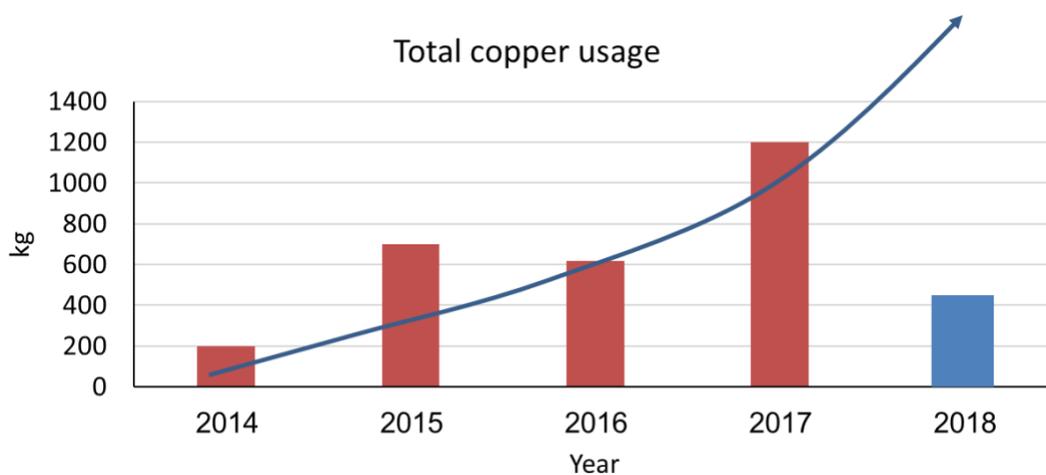


Fig. 2. Copper used as an algaecide in Kibbutz Nitzanim irrigation reservoir during 2014-2018.

Schedule 1b(3): Yixing/Lake Tai

A heavy-bloom lake cleanup with Lake Guard™ Blue

Place: People's Republic of China, Jiangsu province, Yixing

Date: Aug. 6 – Aug. 21, 2019

Purpose:

The purpose of the pilot was to demonstrate the advantages of the use of Lake Guard™ Blue as an economical, safe, and environmentally friendly mean to control massive harmful algal blooms, even under the harshest conditions.

The pilot was conducted in an old fishpond (7,100 m², ~2 acres), in the **vicinity** of Lake Tai (Fig. 1), across a similarly contaminated ‘corridor’ linking a waterway between the city of Yixing and Lake Tai. Ongoing efforts to deal with loads of cyanobacteria streaming through this ‘corridor’, both from the lake as well as from the city at an average annual cost of \$25 million, have been fruitless.

The fishpond, which was contaminated with a very high cyanobacterial biomass was treated with a large dose to achieve an immediate decline of biomass levels.



Fig. 1. The treatment setup on the shores of Lake Tai, China.

Description of Application:

The fishpond was dosed on Aug. 7th and on Aug. 8th, 2019.

The particles of the Lake Guard™ Blue traveled with the currents **and** the wind across the pond, interacting with the phytoplankton inhabiting the pond. Each application lasted less than 5 min. By the afternoon of Aug. 8, ~6h after the second application, all water parameters have indicated a complete collapse of the bloom.

Two weeks later, the phytoplankton population, composed of eukaryotic green algae, showed a **tremendous** recovery with beneficial-species replacing and likely outcompeting toxic cyanobacteria, and maintaining a healthy aquatic ecosystem.

Sampling methodology:

Throughout the pilot period, quantitative measurements were made by YSI ProDSS probe that measured dissolved oxygen, pH, chlorophyll-b (Chl-b), and phycocyanin (PC). Chlorophyll-b measurements serve as a proxy for total algal biomass in the water. PC levels serve as a direct proxy to total cyanobacterial biomass.

In parallel, qualitative assessments were made visually.

Results:

A. Changes in cyanobacterial and total algal levels (**Fig. 2**):

Prior to treatment (at time 0), the PC and Chl-b values were 21.84 µg/l and 22.32 µg/l, respectively. After 48 hours, the PC dropped to 1.72 µg/l (**-93% from time 0**) and Chl-b concentration was 9.39 µg/l (**-58% from time 0**).

Two weeks later, on Aug. 20th, the PC values continue to be stagnant at 2.04 µg/l whereas Chl-b concentration increased to 45.34 µg/l (i.e. a **482% increase** from its post-treatment lowest point). Since PC levels were not significantly altered in the span of two weeks, the significant rise in Chl-b levels reflects the rise in beneficial green algae populations over cyanobacterial species.

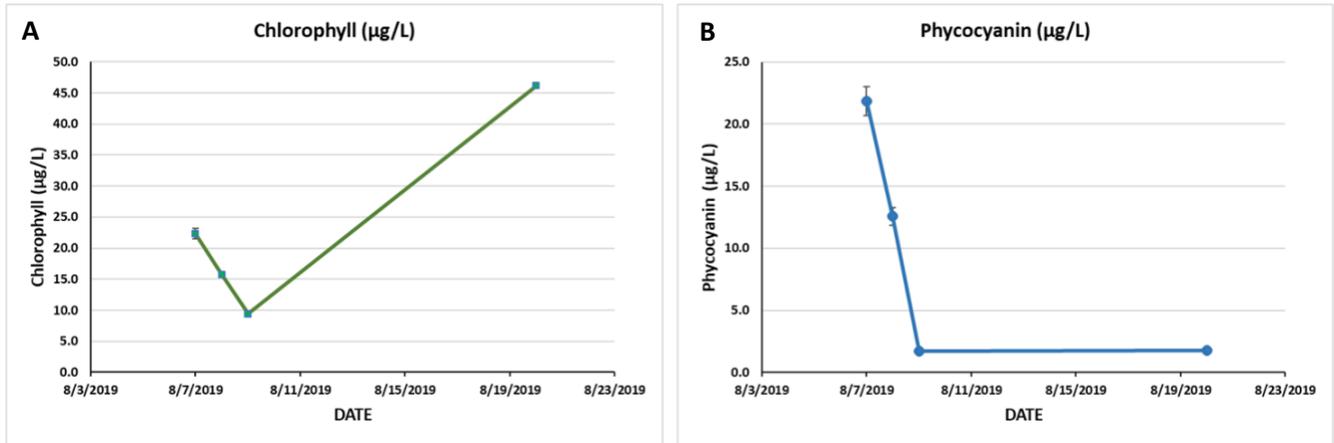


Fig. 2. Changes in photosynthetic pigments over the course of the pilot, chlorophyll-b (A); and phycocyanin (B)

B. Changes in pH and dissolved oxygen (DO) values (**Fig. 3**):

The dramatic reduction in photosynthetic and respiratory activities (consuming and releasing CO₂, respectively) had an immediate and direct influence on the pH, which dropped from **9.05** to **8.29** within 48h. By Aug. 20, two weeks later, pH levels dropped to **7.43**.

The DO levels decreased immediately post-treatment due to bacteria-mediated biodegradation process of dead cyanobacterial biomass that depletes dissolved oxygen, and due to the collapse of oxygen-producing cyanobacteria. The DO levels, however, increased gradually, from its lowest point on day 2, as the oxygen-producing green algae started to thrive in the rebalanced aquatic ecosystem- as indicated in the increase in Chl-b, but not PC levels (**Fig. 2**).

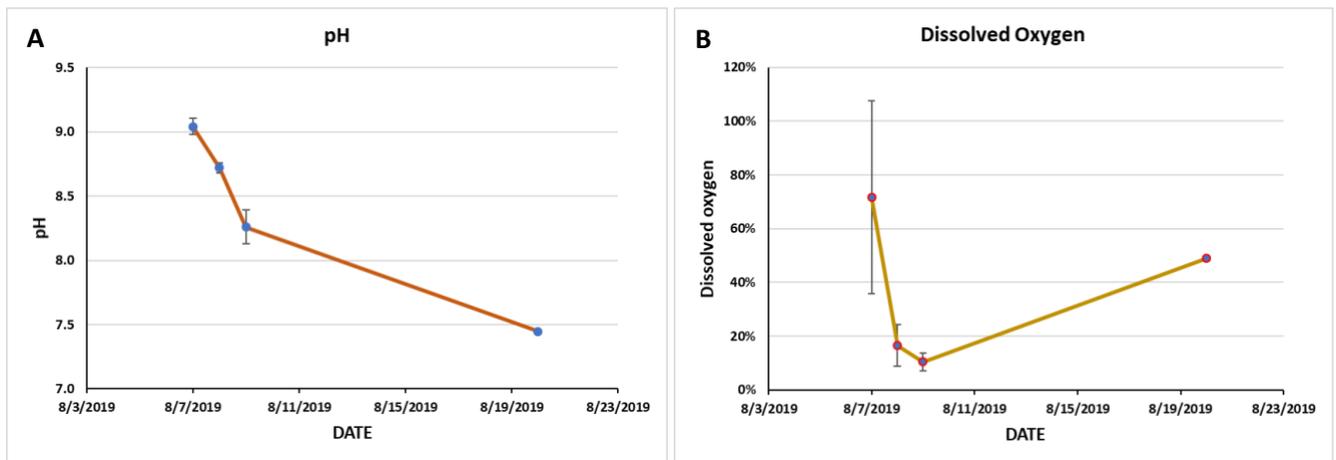


Fig. 3. Changes in pH (A): the pH levels drop, due to decrease in photosynthetic activity, to healthy levels once the bloom is eradicated; and corresponding changes in DO levels (B)

Conclusions:

A severe bloom of predominantly toxic cyanobacterial **species** was treated with Lake Guard™ Blue in an old fishpond. The treatment affected, primarily, the dominant toxic species while enabling other nontoxic phytoplankton species to thrive in the ecological niche. The ability to almost-selectively treat the toxic species is attributed to the higher sensitivity of cyanobacterial species to the oxidative stress that is triggered by the treatment.

The Chl-b/PC ratio (**Fig. 4**) serves as an excellent proxy of the fraction of toxic cyanobacteria compared with other algae in the water body, the 'Resistance Index'. The lower the 'Resistance Index' is - the greater is the abundance of toxic cyanobacteria. Under "healthy" conditions, this ratio should be high - indicating that non-toxic algae dominate the water body and can inhibit the growth of toxic cyanobacteria. Over the 2-week pilot experiment, the 'Resistance Index' in the pond improved by **2,570%**.

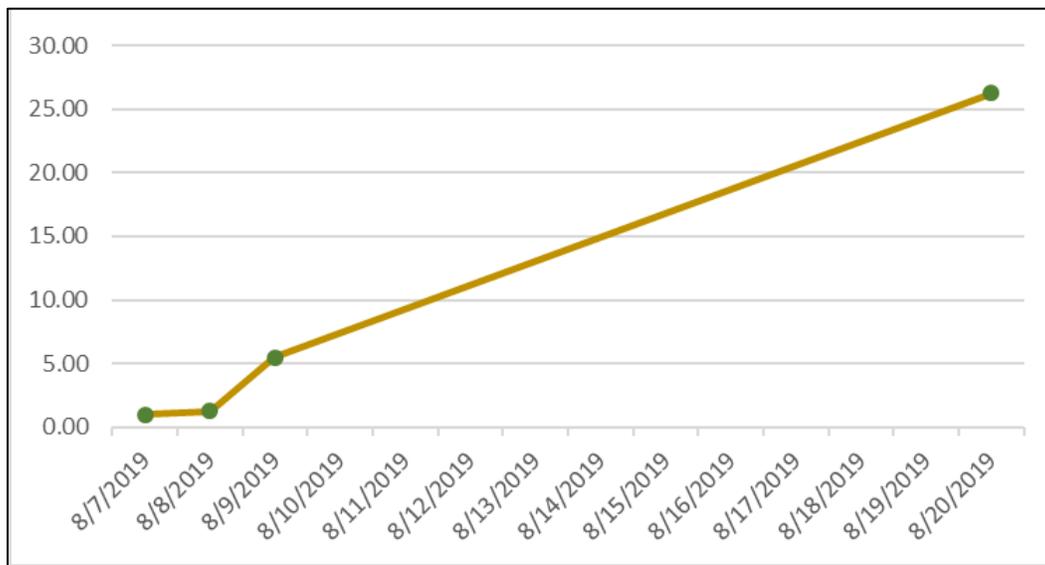


Fig. 4. Chlorophyll-b to phycocyanin ratio. This value expresses the population variation, or the pond's 'Resistance Index' to toxic blooms, whereas a higher value represents more non-toxic green algae to cyanobacteria.

The significance of the 'Resistance Index' to water management and its **impact** on the waterbody's health clearly correspond with the situation on the ground, as it was apparent to the naked eye throughout the pilot (**Fig. 5**).



Fig. 5. Visible changes in the water quality of the pond before and after treatment. The upper panel shows the pond, pre-treatment. The lower panel shows the pond, post-treatment.

Schedule 1b(4): Kazan, Russia

Long Lasting Impact of a Lake Guard™ Blue Treatment

Place: Park Pobedi, Kazan, The Republic of Tatarstan, The Russian Federation.

Date: The treatment and follow up were conducted between October 2 and October 10, 2018.

Setup: A local recreational lake with 40,000 m² surface area (10 acres).

Application: Treatment with Lake Guard™ Blue, 8lbs/acre, was performed manually on the morning of October 2nd, 2018, from the banks of the lake by an untrained local. The application took less than 10 minutes. Once waterborne, the floating, time-releasing particles were pushed by the wind and currents and organized themselves along with cyanobacterial aggregations.

Sampling Methodology:

Water (250 ml) was collected immediately before applying the treatment (time 0), at 72 hours, and 120 hours after treatment by the Kazan State University. Samples were stored in the dark and analyzed under a microscope. The microscopic analysis was composed of total-count of phytoplankton cell-density as well as total phytoplankton biomass. The latter is an additional and important value in order to determine the effect of a given treatment over a variety of phytoplankton populations.

The lake was inspected, on a regular basis, for the past year by the local superintendent.

Results:

Prior to treatment (time 0), the phytoplankton cell density reached 130,000 cells/L, translating into total biomass of 29 mg/L. After treatment, there was a significant reduction in total phytoplankton cell-density as well as biomass on day 3 and 5 (a reduction of 65% and 78% respectively, **Fig. 1A-B**).

In terms of phytoplankton variety, prior to treatment, a single cyanobacterial specie, *Aphanizomenon flos-aquae* (L.) Ralfs, dominated the lake with a cell density of ~89,000 cells/L. Concurrently, other phytoplankton species in the ecosystem contributed <5% each of the total cell-density (**Fig. 2A**). In terms of biomass, however, three species dominated the overall population,

including *Aphanizomenon* sp., and two green algae species (*Chlamydomonas* sp. and *Carteria* sp.) (Fig. 2B).

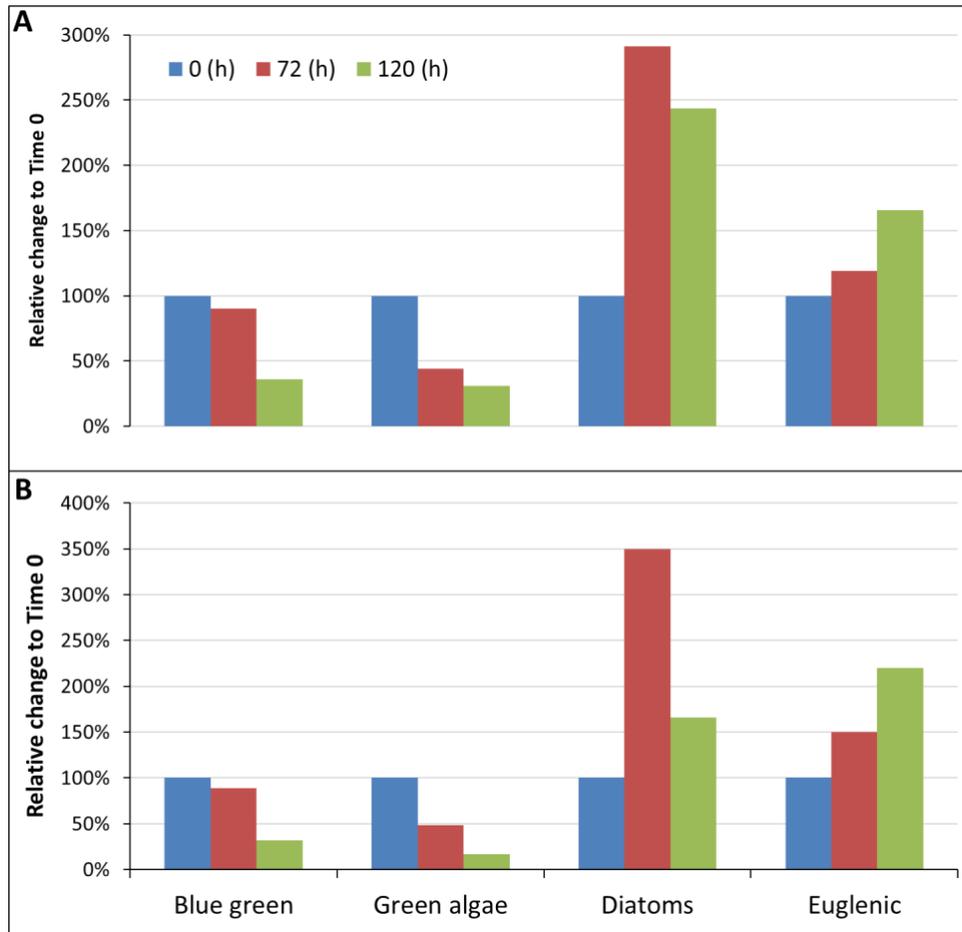


Fig. 1. Relative changes in comparison to time 0. (A) cell-density of phytoplankton and (B) biomass of phytoplankton.

The different phytoplankton populations showed different trends in terms of changes in cell density and biomass, 120 hours post-treatment. While toxic cyanobacterial species exhibited a 70% decrease in both cell-density and biomass values, other green algal species, like Diatoms and Euglena, increased in cell density by 144% and 66%, and in biomass by 66% and 120%, respectively (Fig. 1). This indicates that the treatment shifted the phytoplankton populations from toxic cyanobacterial species eukaryotic green algae.

No adverse impact was observed to the fauna or the flora in or around the pond. And based on reports from the lake's superintendent, the latest report was in September 2019, no bloom episodes have been

detected in the lake since the only treatment with the Lake Guard™ Blue in October of 2018, one year ago. This is in sharp contrast to previous years, where harmful algal blooms plagued the lake.

One treatment with the Lake Guard™ Blue rebalanced the aquatic ecosystem towards healthier conditions. These conditions were maintained for 1 year, and counting. And for the first time in years, the lake stayed open for recreational activities throughout the season.

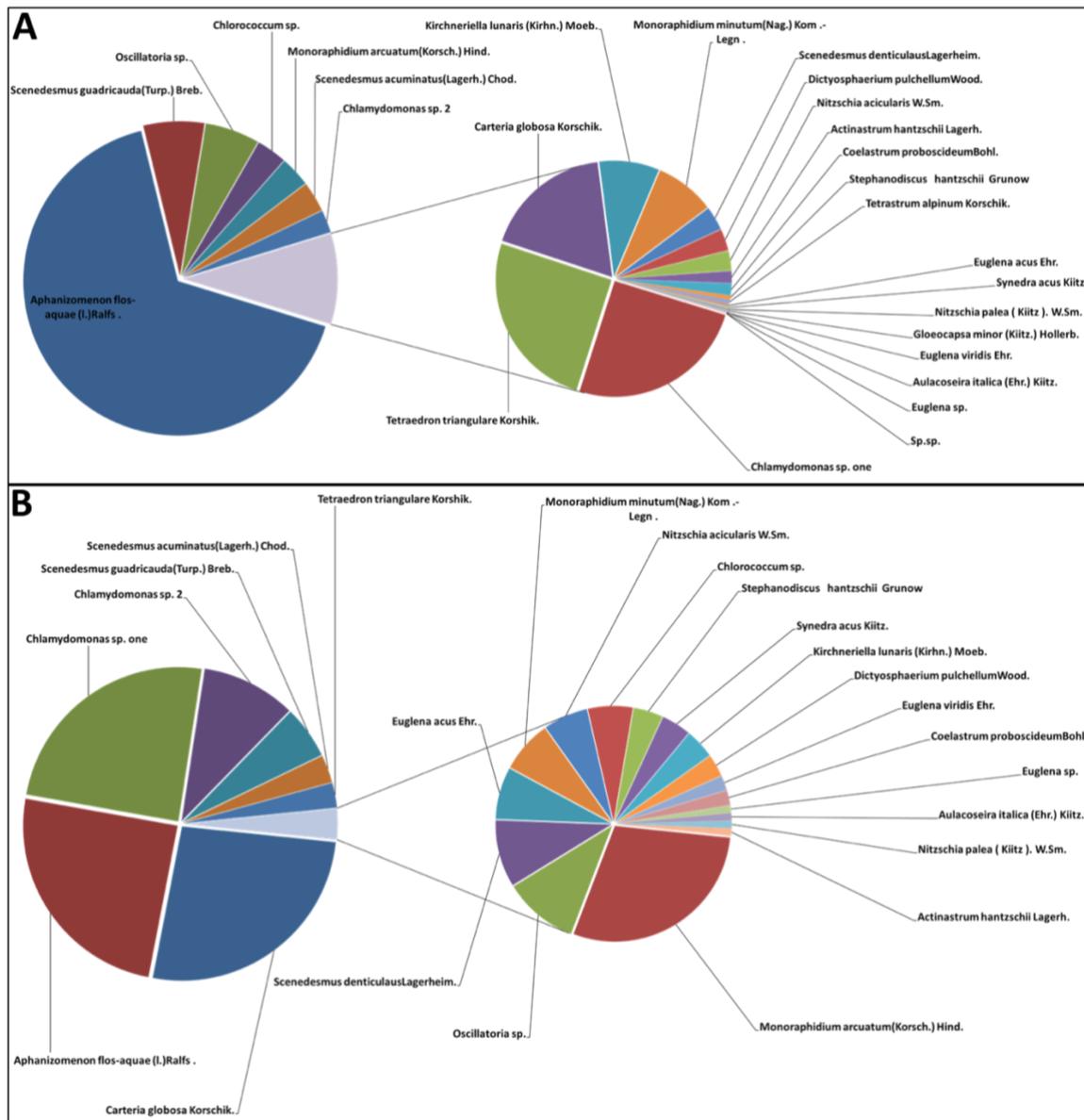


Fig. 1. Relative phytoplankton composition (%) at day 0 in values of (A) cell density, and (B) biomass. Notably, while in terms of cell density *Aphanizomenon* sp. dominated the pond, on the account of biomass (cell size), however, there were three species that dominated the phytoplankton population in terms of biomass, including *Aphanizomenon* sp., and two green algae (*Chlamydomonas* sp. and *Carteria* sp.).

Conclusions:

A simple, cost-effective treatment with one small dose of Lake Guard™ Blue surgically removed one dominant toxic species and enabled non-harmful, beneficial phytoplankton species to occupy the ecological niche and to further outcompete the toxic cyanobacteria **throughout the entire season**. The dramatic shift between the toxic species (cyanobacteria) to non-toxic ones (green-algae) is a repeating motive in Lake Guard™ treatments throughout the world. Reshaping the balance of species in the water, in fact, 'restarts' the disrupted ecological sphere, allowing it to keep a healthy balance between these coexisting species in the water naturally and uninterruptedly.

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TO: Lake County Water Authority Board of Trustees
FROM: Ron Hart, Water Resources Director
DATE: February 7, 2020
SUBJECT: Burrell Structure Site Residence

Regular Agenda

Burrell Structure Site Residence

The Water Authority transformed Haynes Creek into its current condition and constructed the Burrell Lock & Dam on the waterway. The Water Authority also constructed a lock tenders' residence for the lead caretaker of the structures (Figure 1). When the LCWA entered lease agreements with the Water Management Districts, it required the Districts to maintain and have liability for all structures.



Figure 1. Site Residence at the Burrell Lock & Dam on Haynes Creek.

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With the advent and installation of automated gates, an on-site operator is no longer necessary for the dam. The district is also contracting all operations of the lock structures and does not feel it is necessary to have an onsite caretaker any longer.



East and West Views of the Burrell Caretaker's Residence.

Last month, the SJRWMD notified staff of several issues with the on-site residence. They have followed up with a letter explaining the issues along with their recommendation (see attached letter and photos). The home has severe moisture issues and sewer fly infestations. They have made repeated repairs only to have the problems continue. They have determined that the structure has deteriorated to a point where they would prefer to demolish rather than continuing to repair the structure. The demolition would be contracted for and paid for by the SJRWMD.

Executive Director's Recommendation:

Authorize the SJRWMD to demolish and remove the caretaker's residence at the Burrell Lock & Dam.



St. Johns River Water Management District

Ann B. Shortelle, Ph.D., Executive Director

4049 Reid Street • P.O. Box 1429 • Palatka, FL 32178-1429 • 386-329-4500
On the internet at www.sjrwmd.com.

January 7, 2020

Mr. Michael Perry, Director
Lake County Water Authority
27351 State Rd. 19
Tavares, FL. 32778

Re: Burrell Dam Residence

Dear Mr. Perry:

You are aware our District maintains residences at the three locks & dams of the Ocklawaha Basin for use by staff of the successful contractor providing our lock tending services. However, despite repeated repair attempts at the Burrell Lock residence, the domicile has deteriorated to a point where it is no longer economical for the District to maintain.

Much of the issues with this residence is the proliferation of moisture in and around the structure. The building is not on a concrete slab, but on a concrete block wall perimeter. The flooring is supported by wooden joists, but beneath that is an untreated, earthen, crawl space. Most of the moisture issues initially arose from rainfall drainage flowing down the driveway and toward and under the building. Although we have redirected these flows around the house and sprayed a foam insulation application under the floors; the preponderance of water and moisture continues to saturate the building requiring continuous air-conditioning to combat interior condensation problems. When the air conditioner is not run properly, it only further contributes to the moisture issue. In addition, an increasingly persistent *Phorid Fly* is proliferating within the residence, despite professional pest control applications.

In summary, as of November 25th the District has terminated the Residence Agreement with our Contractor, providing a 90-Day period for vacating the Burrell residence. As of January 1, 2020, the residence has been vacated and is now unoccupied. We understand official ownership of the building is by the Lake County Water Authority (the District leases the property), which led to our meeting with you and Mr. Hart on December 10th to discuss the fate of the property. We had proposed the structure be razed upon its vacancy, but if you have other desires, we are very willing to discuss them with you. With that in mind, you indicated that the Authority may want to surplus the property including the structure(s) associated with the property.

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Your proposal for Lake County to assume control of the residence was discussed in general terms and the District would be in favor as long as access to the lock and dam are still provided and water and sewer is maintained to the small restroom facility east of the residence. We believe the residence and this structure share both water and sewer services (see attached site plan). There may be other considerations, and should you wish to pursue this option, we would turn over the discussions to our Real Estate Bureau.

Because the living quarters were not open to inspection during our site visit with you, we are providing a few pictures of the residence to illustrate the conditions described above (not all pictures are the current situation but document the overall problem). Should you need to access the property to properly evaluate the value of the structure, we have re-keyed all entry's and can make access available to you upon request.

It is our understanding that you would like to discuss the fate of this building and property with your Board. Once this meeting has taken place, please let us know what steps you would like for the District to take. Thank you for working with us on this.

Sincerely,

A handwritten signature in black ink that reads "John Richmond". The signature is fluid and cursive, with a large loop at the end of the last name.

John Richmond, P.E.
Bureau of Operations and Maintenance

Enclosure

cc: Ann B. Shortelle, PhD, SJRWMD
Karl E. Hankin, P.E., SJRWMD
Woody Boynton, P.E, SJRWMD
Ramesh Buch, SJRWMD



Walls to ceiling interface – moisture present



Condensation on interiors of windows



Sub-floor foam sealant / insulation



Persistent Phorid, "Sewer Fly" infestation



Sub-floor joist and support



Wall foundation, foam sealant, moisture access area



St. Johns River Water Management District

Ann B. Shortelle, Ph.D., Executive Director

4049 Reid Street • P.O. Box 1429 • Palatka, FL 32178-1429 • 386-329-4500
On the internet at www.sjrwmd.com.

November 25, 2019

Rene Bartlett
ISS Facility Services, Inc.
General Manager
728 Blanche Street Suite 114
Jacksonville, Florida 32204

Re: Burrell Lock Residence

Dear Ms. Bartlett:

Thank you for taking the time to speak with us last week concerning the Burrell Lock residence. As we discussed, the recent repairs to remedy insect and moisture issues at the residence were not entirely successful. To remedy these issues will require more significant repairs than what has been attempted in the past. Based on this assessment and your indication that eliminating this residence from the Lock & Dam Services for the St. Johns River Water Management District's Navigational Locks and Dams Agreement would have no effect on the cost, the District has decided to eliminate this residence from the Agreement.

In accordance with the terms of the Agreement, specifically Section 14 (b): Modification of Specifications; Change Orders; Emergency Changes in Work - Change Orders, the District is eliminating the residence at Burrell Lock. Specific changes will be made to Attachment A – Statement of Work that references the residence at Burrell Lock or implies a designated residence at this location. Yards and Grounds Maintenance shall still be the obligation of ISS. In addition, the Lock Tender Residence Agreement in Attachment G for the Burrell Residence shall no longer be required and is being terminated. Per the Terms and Conditions, Item #18, the resident has 90-days from the date of this letter to vacate the premises.

Thank you for working with us on this aspect of the Contract. Should you have any questions, please do not hesitate to contact me at 386-937-0541 or jrichmond@sjrwmd.com. A change order to reflect the above changes will be forthcoming.

Sincerely,

A handwritten signature in blue ink that reads "John Richmond".

John Richmond, PE, Sr. Professional Engineer
Bureau of Operations and Maintenance



TO: Lake County Water Authority Board of Trustees
FROM: Ron Hart, Water Resources Director
DATE: February 10, 2020
SUBJECT: Denham Property Annexation into Leesburg

Regular Agenda

Denham Property Annexation into Leesburg

The Lake County Water Authority's Flat Island Preserve is within the City of Leesburg's city limits. Staff recommends that the additional adjoining Denham Muck Farm and the northwest Flat Island property also be annexed into the City of Leesburg (Figure 1). This action would

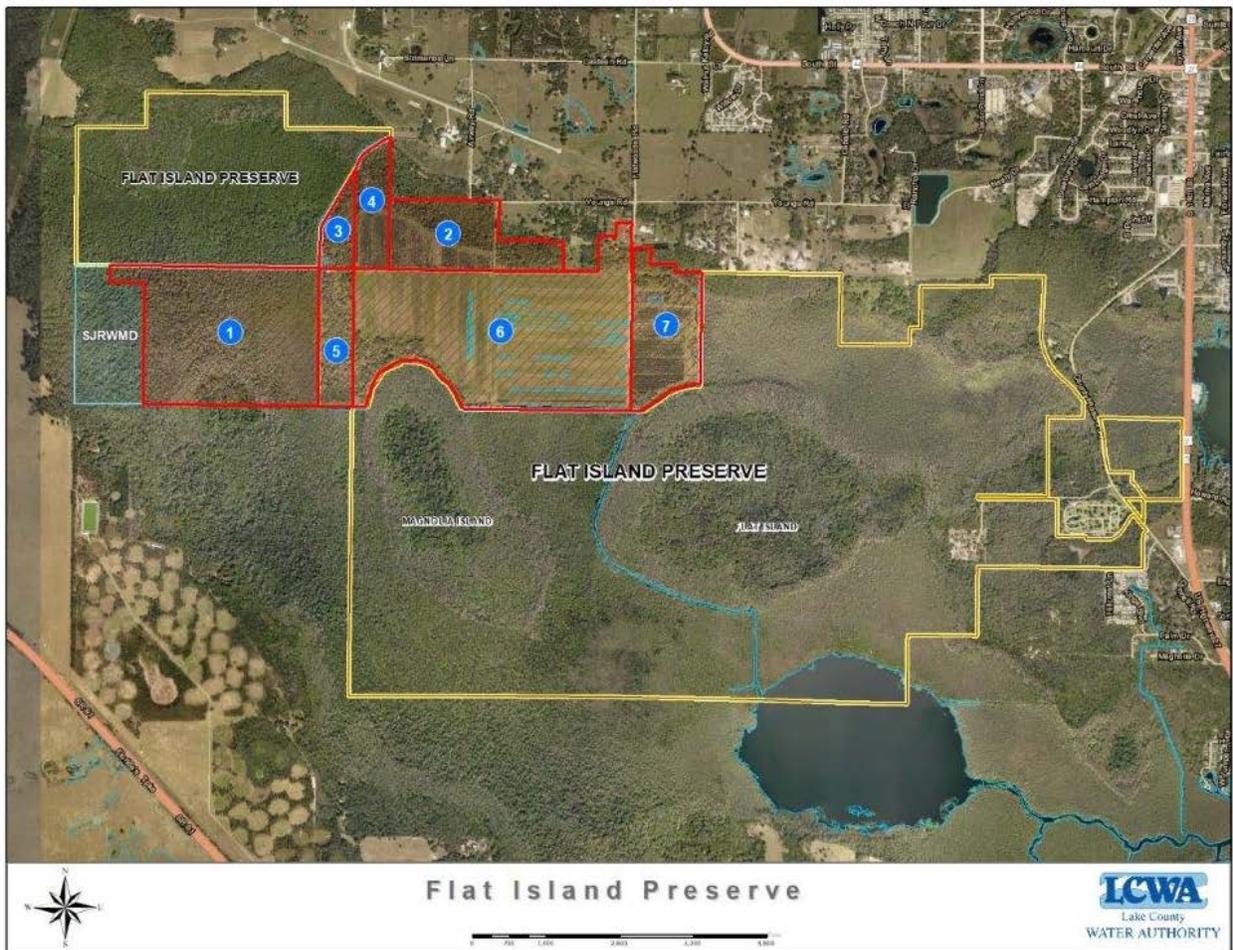


Figure 1. Flat Island Preserve outlined in yellow. The new Denham Muck Farm outlined in red and the northwest section of the Flat Island Preserve outlined in yellow.

BOARD OF TRUSTEES

Table with 7 columns: District One (Peggy Cox), District Two (Trampis BonJorn), District Three (Carolyn Maimone), District Four (Robert Hendrick), District Five (Amy Stone), At-Large (Courtney Stokes), At-Large (Keith A.).

ensure that one agency has jurisdiction over the entire property and will reduce confusion over which should respond for fire or police services. In addition, the City has funded a portion of the purchase cost (\$500,000) with the understanding that we would annex into the City upon request. The City is not currently requesting annexation. However, staff feels it is important to complete this process so that we have a designated entity to review site planning and development.

Executive Director Recommendation:

Authorize staff to work with the City of Leesburg to annex the Lake Denham Parcels and the Flat Island Northwest parcel into the City



TO: Lake County Water Authority Board of Trustees
FROM: Jason Danaher, Water Resources Project Manager
DATE: February 6, 2020
SUBJECT: Release RFB/RFP to Remove Permanent Alum Flocculant from NuRF Ponds

Regular Agenda

Release RFB/RFP for Third-party Dredging of Alum Flocculant from NuRF Ponds

Alum flocculant in treated water continues to accumulate in the NuRF ponds. Staff continues to dredge the ponds to remove settled material and will be moving towards 24/7 operation of the facility in order to expedite the removal process. However, the dredging operation is limited in its ability to fully clean the ponds. Each pond is approximately 20 feet in depth. The dredge can only reach a maximum depth of 12 feet, but in doing so this exerts physical stress on the equipment. In a best case scenario, the ponds are cleaned, but remain with a permanent flocculant storage of at least 6 to 8 feet. This permanent flocculant storage limits the facilities ability to accept prolonged flows because a large portion of the pond is permanently filled in.

Pegasus Engineering's site evaluation emphasized the current constraints of the dredging technology and offered potential alternatives that would allow dredging equipment to fully reach the pond bottom. This would allow staff to clean the ponds and return them back to the original design depth, thus allowing for the potential to accept high flows for longer periods of time. Even so, with the upgraded dredging technology the facility will still be limited in its ability to process and dewater the sediment because the single centrifuge can only handle a specific volume of dredged material.

With expected and above average rainfall, the past several years, the NuRF has not experienced a time period to clean the ponds without having to concurrently accept discharge from Lake Apopka. If the LCWA Board approves Phase 1 recommendations of the Pegasus Engineering site evaluation and new dredging technology is commissioned, LCWA staff believes the facility will still be limited in its ability to accept high flows because it will take months, if not years, to remove the volume of permanent flocculant that exists while simultaneously accepting Lake Apopka discharge. It currently takes 3 months operating 24/7 to clean a single pond to a depth of the permanent flocculant storage. The material staff is currently able to remove is much less compacted than the permanent flocculant which has accumulated over the past 10 years and continues to compact while treating water.

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Therefore, staff requests permission from the Board to release an RFB/RFP to seek qualified contractors who can dredge the permanent floc present in the east and west pond. This would return the ponds back to their original designed depth, allow the ponds to accept flows for a prolonged period of time and potentially give upgraded equipment a jump-start to keep the ponds clean in the future.

Staff foresees two options with removal of alum floc from the ponds:

- 1) Speak with the SJRWMD about transferring the dredged material to lands on the Northshore; permitting may delay this activity; or
- 2) Dredge the material to an on-site upland location at the NuRF using geotextile technology and have the dewatered material stored on-site or hauled off-site; permitting for this activity may be a more viable option.

Executive Director's Recommendation:

Authorize staff to release a RFB/RFQ for removal of alum floc from the NuRF ponds and return to the board with a recommendation for qualified contractors if favorable responses are received.



TO: Lake County Water Authority Board of Trustees
FROM: Michael J. Perry, Executive Director
DATE: February 12, 2020
SUBJECT: Approval of New Executive Director Contract

Regular Agenda

Approval of New Executive Director Contract

At the January 2020 meeting, the Board selected Ron Hart to be the next Executive Director for the agency. Ron met with Chairman Stone and Wendy Sellers, the HR Lady, to negotiate the terms of Mr. Hart’s contract with the Water Authority. Attorney Stone was to review the contract format from a legal perspective.

Chairman Stone directed staff to have Mr. Hart’s contract as an item on the February agenda for the Board to review, amend if necessary and to approve. As of the date of this agenda memo, a draft contract has not been provided to staff for inclusion with this memo. Staff will provide a draft contract to the Board as soon as it becomes available.

Executive Director Recommendation:

Approve and/or amend the draft contract with Ron Hart as Executive Director for the Water Authority.

BOARD OF TRUSTEES

District One	District Two	District Three	District Four	District Five	At-Large	At-Large
Peggy Cox	Trampis BonJorn	Carolyn Maimone	Robert Hendrick	Amy Stone	Courtney Stokes	Keith A.



TO: Lake County Water Authority Board of Trustees
FROM: Michael J. Perry, Executive Director
DATE: February 12, 2020
SUBJECT: Executive Director Transition

Regular Agenda

Executive Director Transition

With the selection of the next Executive Director for the agency completed and the approval of his contract on the February Board agenda, Chairman Stone would like the Board to discuss the transition and the departure of the existing Executive Director.

Mr. Perry's contract runs through the end of December 2020. The Board has several options to address this topic including, but not limited to, keeping him on in an advisory role through the end of the contract period, buying out the balance of the contract period, exercising the severance clause in accordance with the contract, or a combination of options.

It takes 90 days for the Florida Retirement System (FRS) and Social Security benefits to begin and Mr. Perry must provide a separation date to the FRS if it is different than December 31, 2020 (the end of the DROP period) before the FRS would begin the process.

Executive Director Recommendation:

Determine an approach for the Executive Director transition.

BOARD OF TRUSTEES

Table with 7 columns: District One (Peggy Cox), District Two (Trampis BonJorn), District Three (Carolyn Maimone), District Four (Robert Hendrick), District Five (Amy Stone), At-Large (Courtney Stokes), At-Large (Keith A.)

**EMPLOYMENT AGREEMENT
BETWEEN THE
LAKE COUNTY WATER AUTHORITY
AND
MICHAEL J. PERRY**

THIS AGREEMENT, made and entered into this ____ day of _____, 2016, by and between the Lake County Water Authority, of the State of Florida hereinafter called “employer” or “Authority” as party of the first part, and Michael J. Perry, hereinafter called “employee”, as party of the second part, both of whom understand as follows:

WHITNESSETH

WHEREAS, Authority desires to employ the services of said Michael J. Perry as Executive Director of the Lake County Water Authority as provided by Chapter 2005-314, Laws of Florida; and

WHEREAS, Authority desires to provide certain benefits, establish certain conditions of employment, and to set working conditions of said Employee; and

WHEREAS, Employee desires to continue employment as Executive Director of said Lake County Water Authority; and

Section 1: Duties

Employer hereby agrees to employ Michael J. Perry as Executive Director to be responsible for the day-to-day administration and management of the Authority and its employees. He shall carry out this responsibility as directed by the Lake County Water Authority Board of Trustees pursuant to the rules, policies, procedures, directives and resolutions of the Board of Trustees, as well as all applicable laws of the State of Florida. The Executive Director shall represent the Authority before the legislature, federal, state and local governmental agencies, public and private entities, individuals, and the general public as often as is appropriate and necessary. The Executive Director shall perform such other duties as the Board of Trustees of the Lake County Water Authority shall from time to time direct him. Employee shall be free to engage in other non-compensated activities provided that they do not detract from his duties on behalf of the Authority or create the perception of impropriety or conflict of interest. Employee shall not engage in outside activities of a compensated nature (e.g., teaching, consulting, etc.) unless such activities are specifically discussed with and approved by the Authority.

Section 2: Term

A. Employee agrees to remain in the exclusive employ of Employer until December 31, 2020, and neither to accept other employment nor to become employed by any other employer until after December 31, 2020, or until this agreement is terminated as provided herein, whichever occurs first. After December 31, 2020, the Agreement shall continue in force until terminated by one of the parties as provided herein.

B. To the extent that new terms and conditions are negotiated, such items should be addressed six months prior to the end of the contract period. Nothing in this agreement shall obligate the Employer to extend this Agreement beyond the contract period. Employee serves at the will of the employer.

C. Nothing in this agreement shall prevent, limit, or otherwise interfere with the right of Employer to terminate the services of Employee at any time, subject only to the provisions set forth in Section 4 of this Agreement. The parties agree that the Employee serves at the will of Employer.

D. Nothing in this Agreement shall prevent, limit or otherwise interfere with the right of the Employee to resign at any time from his position with Employer, subject only to the provision set forth in Section 4 of this Agreement.

Section 3: Suspension

Employer may suspend the Employee with full pay and benefits at any time during the term of this Agreement, but only if a majority of the Lake County Water Authority Board of Trustees agree.

Section 4: Termination and Severance Pay

A. Termination For Cause. Notwithstanding any provision to the contrary, the Employee may be terminated at any time for cause by a majority of the Lake County Water Authority Board of Trustees. For the purposes of this agreement, "cause" shall include, but not be limited to, gross incompetence, malfeasance or misfeasance, habitual drunkenness or drug dependency, the commission of any felony or other crime involving dishonesty, false statements, or moral turpitude, or mental incompetency. In the event the Employee is terminated for cause, the Employer shall have no obligation to pay severance pay to the Employee, and the Employee shall be entitled only to his accrued benefits under the Employer's personnel policy.

B. Termination For Convenience. In the event Employee is terminated by the majority of the Lake County Water Authority Board of Trustees before expiration of the aforesaid term of employment (as defined in Section 2, Paragraph A above) for convenience and during such time that Employee is willing and able to perform his duties under this Agreement, the Employer agrees to make a lump sum cash payment (severance pay) of one month of severance pay for each year of employment, since 2000, up to a maximum severance pay of four (4) months. Health insurance coverage for Employee and Employee's spouse and children shall be paid by Employer for the number of months for which a severance payment is due, or until Employee is employed elsewhere and is entitled to full health benefits, whichever comes first.

C. In the event Employer at any time during the term of this agreement reduces the salary or other financial benefits of Employee in a greater percentage that an applicable across-the-board reduction for all employees of Employer, or in the event Employer refuses, following written notice, to comply with any other provision benefiting Employee herein, or the Employee resigns following a formal resolution or other formal request by the Authority that he resign, then, in that event, Employee may, at his option, be deemed "terminated," and be subject to the severance provisions of this section 4-B.

D. In the event the Employee voluntarily resigns his position with the Authority, then Employee shall give Employer sixty (60) days' notice in advance unless the parties otherwise agree. No severance pay shall be payable to Employee upon voluntary resignation. Employee shall receive payment for all accrued and unused sick and annual leave without limitations or restrictions, subject to normal Federal withholding.

Section 5: Disability

If the Employee is permanently disabled or is otherwise unable to perform his duties because of sickness, accident, injury, mental incapacity or health for a period of four (4) successive weeks beyond any accrued sick and annual leave, the Employer shall have the option to terminate this Agreement, subject to the requirements of Section 4. In such event, Employee shall be compensated for any accrued benefits in accordance with Authority policy.

Section 6: Salary

A. Employer agrees to pay employee the rate established by the Authority at the time the Agreement is executed payable in installments at the same time as other employees of the Employer are paid. Employer may increase said salary and/or benefits of Employee in such amounts and to such extent as they may determine that it is desirable to do so.

B. The Authority shall review and evaluate the performance of the Employee at least once annually. The review and evaluation shall be in accordance with specific criteria developed jointly by Employer and Employee. The criteria may be added or deleted from as the Authority and the Employee determine.

C. At least annually, the Authority and Employee shall define such goals and performance objectives which they determine necessary for the proper operation of the Lake County Water Authority and in the attainment of the Authority's policy objectives and shall further establish a relative priority among those various goals and objectives. Said goals and objectives shall be reduced to writing. They shall be attainable within the time limitations as specified and in the annual operating budgets and appropriations provided.

D. In effecting the provisions of this Section, the Authority and Employee mutually agree to abide by the provisions of applicable law.

E. The Employee, as an employee of the Authority shall be a member of the Florida State Retirement System (FRS), and the Employer shall make all pension contributions required thereby with Employee being classified as "Senior Manager."

Section 7: Hours of Work

The Employee shall work full-time and shall work sufficient hours necessary to fully perform his duties and responsibilities. The Employee shall be required to be readily available to the Authority for all job requirements as set forth herein.

Section 8: Automobile

Employer agrees to provide Employee with an automobile for his exclusive use for Authority business and *de minimus* personal use.

Section 9: Vacation and Sick Leave

Employee shall accrue annual vacation time and sick leave at the same rate as provided to other Authority employees.

Section 10: Health and Life Insurance

Employer agrees to provide its group medical insurance, dental insurance and life insurance to the Employee on the same terms as other employees of the Authority.

Section 11: Indemnification

Employee shall be entitled to the benefits afforded of the sovereign immunity under Section 768.28, F.S. as it may be amended from time to time.

Section 12: Bonding

Employer shall bear the full cost of any fidelity or other bonds required of the Employee under any law or ordinance.

Section 13: Other Terms and Conditions of Employment

The Authority, in consultation with the Executive Director, shall fix any such other terms and conditions of employment, as it may determine from time to time, relating to the performance of Employee, provided such terms and conditions are not inconsistent with or in conflict with the provisions of this agreement or any other law.

Section 14: Notices

Notices pursuant to this agreement shall be given by deposit in the custody of the United States Postal Service, postage pre-paid, addressed as follows:

Employer - Lake County Water Authority, 27351 State Road 19, Tavares, Florida 32778

Employee - Michael J. Perry, 24919 Turkey Lake Road, Howey in the Hills, FL 34737

Alternatively, notices required pursuant to this agreement may be personally served in the same manner as is applicable to civil judicial or as of the date of deposit of such written notice in the course of transmission in the United States Postal Service.

Section 15: General Provisions

- A. The text herein shall constitute the entire agreement between the parties.
- B. This agreement shall be binding upon and inure to the benefit of the heirs at law and the executors of the Employee.
- C. If any provision or any portion thereof, contained in this agreement is held unconstitutional, invalid or unenforceable, the remainder of this agreement, or portion thereof, shall be deemed severable and shall remain in full force and effect.

IN WITNESS WHEREOF, the Lake County Water Authority has caused this agreement to be signed and executed in its behalf by its Chairman and duly attested by its attorney, and the Employee has signed and executed this agreement, both in duplicate the day and year first written above.

EMPLOYEE

Michael J. Perry

ATTEST

LAKE COUNTY WATER AUTHORITY

Carole J. Barice, Esquire

Peggy Cox
Chairman



TO: Lake County Water Authority Board of Trustees
FROM: Michael J. Perry, Executive Director
DATE: February 12, 2020
SUBJECT: Executive Directors Report - January - February 2020

Executive Directors Report

Significant Activities

The following are details of the Executive Director's significant activities:

- Attended the Board of County Commissioners meeting on January 14th.
Attended the Harris Chain Restoration Council meeting on February 7th.
Attended the Board of County Commissioners meeting on February 11th.
Met with FDEP and SJRWMD regarding a Lake Yale project on February 12th.

Apopka Beauclair Canal Nutrient Reduction Facility - The SJRWMD reduced flow through NuRF to 0 cfs on September 10, 2018 due to an inoperable gate on the outfall of the East Pond. Due to the significant rainfall in December 2018, flow has been as high as 350 cfs moving across the spillway. Peak flow over the AB canal spillway during the month of May 2019 reached 150 cfs for a short time frame and then leveled out to 125 cfs to the middle of the month. The last half of May 2019 maintained sustained flows of approximately 10 cfs. Flow commenced through the NuRF again on June 1st and peak flow over the AB canal spillway reached 50 cfs on for a few days the third week of July and the remainder of the flow went through the NuRF at a maximum of 50 cfs. Centrifuge repairs were completed the last week in July and the NuRF accepted flow through the facility up to 250 cfs the first two weeks of August, 10 cfs for the third week, and 150 cfs for the remainder of the month. Flow was split the second week of the month with 250 cfs going through the AB canal spillway and 150 cfs treated through the NuRF as the SJRWMD tried to drain stored water off the north shore of Lake Apopka. After September 14, 2019 flow down the AB canal was reduced to 10 cfs and remained there for the remainder of the month and during this time period all flow was directed through the NuRF. Water level in Lake Apopka was below regulation for most of October despite above average rainfall. Flow through the NuRF was minimal at 10 cfs until the last week of October when flow increased to 100 cfs for the remainder of the month until Lake Apopka reached regulation at which time flow was reduced to 10 cfs on November 1. Flow through the NuRF was minimal at 10 cfs until the last week of November when flow increased to 50 cfs for the remainder of the month. The district has begun to pump some

BOARD OF TRUSTEES

Table with 6 columns: District One (Peggy Cox), District Two (Trampis BonJorn), District Three (Carolyn Maimone), District Four (Robert Hendrick), District Five (Amy Stone), At-Large (Courtney Stokes), At-Large (Keith A.).

stored water off the Northshore of Lake Apopka causing the water body to increase above regulation. Water level in Lake Apopka was above regulation for December. Flow through the NuRF was maintained at 50 cfs for the first half of December and then sustained at 100 to 150 cfs for the remainder of the month. Due to the potential loss of sediments from NuRF ponds the flow through the facility was capped at 150 cfs and the SJRWMD placed the balance over the AB spillway the last week of December. Flow over the AB spillway was 125 to 200 cfs during the first three weeks of January, until Lake Apopka reached regulation at the end of the month.

Based on weekly total phosphorus data and average flow rate reported by SJRWMD, staff has calculated the daily load into the facility and the daily load out of the facility. The NuRF has removed 14,210 kg (31,263 pounds) of total phosphorus between March 2, 2009 and January 10, 2020. The NuRF has removed 9,687 kg (20,683 pounds) of total phosphorus since Hurricane Irma passed through on September 10-11, 2017.

The NuRF has removed 58% of the incoming total phosphorus mass to date. The removal percentage does not take into account the fact that the total phosphorus exiting the facility is not bioavailable. Average (non flow-weighted) total phosphorus concentration in the NuRF discharge to date is 39.2 ppb which is above the Lake Beauclair 32.0 ppb TMDL. Average (non flow-weighted) inflow total phosphorus concentration to date is 93.4 ppb.

The facility began operation on March 2, 2009 and as of January 10, 2020 has treated 62.37 billion gallons of water from Lake Apopka. The facility has removed 14,210 kg (31,263 pounds) of total phosphorus using 13.89 million gallons of alum at a cost of \$7,855,299.

Harris Chain Minimum Flows and Levels - The SJRWMD Governing Board took action on its MFL priority list at its November 2008 meeting. The Upper Ocklawaha River Basin lakes (Harris Chain) is on the priority list and an MFL for the UORB lakes was to be completed in 2013. District staff is currently working to develop an appropriate groundwater/surface water interaction model necessary to support the development of the MFLs. Staff attended a meeting of the peer review committee of the model that the SJRWMD is preparing from which the MFL's and subsequently any changes to the regulatory schedules will be based upon. Water Authority staff will continue to stay closely involved with the revision of the proposed priority list and will update the Board as necessary.

Other Consumptive Use Permitting Issues - Board members have expressed a concern about finding out about the decisions on Water Use Permits (WUPs) leaving little time for the Board to react.

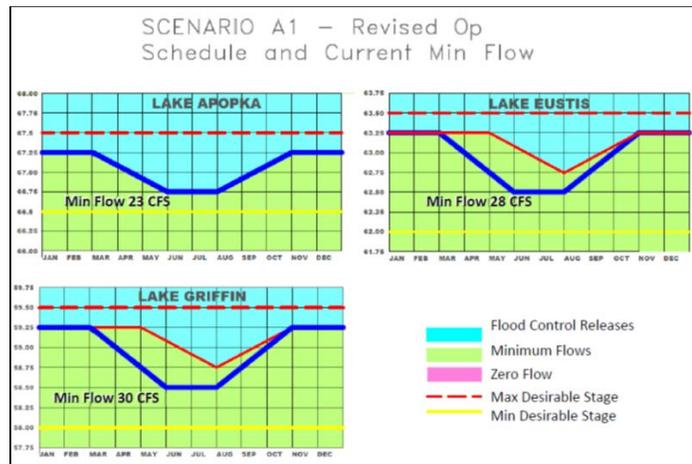
Staff has researched the Districts web-based permitting information and has determined that as of February 12, 2020 there are 8 active Water Use Permit applications in-house at the SJRWMD for Lake County and that there are 57 active Environmental Resource Permits (stormwater and site development related permits) in-house at the SJRWMD for Lake County.

Unless directed by the Board, staff will only alert the Board to Water Use Permits involving surface water withdrawals and the number of active Water Use Permits and Environmental Resource Permits.

Lake Levels and Palatka River Structures - For 2015, the cumulative rainfall amount was 3.14 in. **below** the year-to-date average ranging from a surplus of +4.85 inches to a deficit of -10.26 inches depending on the gauge location in the county. For 2016, the cumulative rainfall amount was 4.78 in. **below** the year-to-date average. For 2017, the cumulative rainfall amount is 4.08 in. above the year-to-date average ranging from a deficit of -4.13 inches to a surplus of +11.71 inches depending on the gauge location in the county. For 2018, the cumulative rainfall amount is 4.72 in. **above** the year-to-date average. The cumulative rainfall ranging from a deficit of -0.82 inches to a surplus of +10.75 inches depending on the gauge location in the county. For 2019, the cumulative rainfall amount is 3.09 in. **above** the year-to-date average. The cumulative rainfall ranging from a surplus of +10.29 inches to a deficit of -2.60 inches depending on the gauge location in the county.

For 2020, the cumulative rainfall amount is 1.60 in. **below** the year-to-date average. The cumulative rainfall over the past 12 months ranges from a surplus of +8.14 inches to a deficit of -6.06 inches depending on the gauge location in the county.

The SJRWMD approved the following planned deviation of operating schedules for Burrell and Moss Bluff structures during 2012 and 2013. The solid red line represents the new schedule. No changes are proposed to the Apopka-Beauclair Structure.



As of February 12, 2020, Lake Minnehaha was at 97.12 ft. which is 0.38 ft. **below** the top of the regulatory range (96.0 ft. - 97.50 ft.). Due to heavy rains in December 2018 and continued rain associated with passing

fronts, the Cherry Lake Dam was opened to allow flow of 75 cfs on December 21, 2018 and flow was adjusted several times. Due to declining flows from Big and Little Creeks and declining rainfall, the dam was closed as of March 25, 2019. On August 23, 2019 the Cherry Lake Dam was opened due to above average rainfall for the previous three months resulting in the lake rising above 97.00 ft. The flow was adjusted several times and most recently due to the potential affects from approaching Hurricane Dorian. With the lack of rainfall in September 2019, the Cherry Lake Dam flow was adjusted down several times and closed on October 1, 2019. Rainfall returned in October 2019 and the Cherry Lake Dam was opened to 30 cfs on October 7, 2019 as the lake level rose above the target elevation of 97.10 ft. The dams have been adjusted several times since then to keep the lake level near the target elevation of 97.10 ft.

During January 2020, rainfall averaged 0.86 inches, 1.60 inches **below** the historic average (2.46 inches) for Clermont. For the year to date, the total rainfall of 0.86 inches is 1.60 inches **below** the historical average of 2.46 inches. This is approximately 35% of the expected year-to-date rainfall.



TO: Michael Perry, Executive Director LCWA
FROM: Jason Danaher, Water Resources Manager
DATE: February 3, 2020
SUBJECT: Staff Report for January 2020

Water Management: Palatlakaha River Basin

A. Rainfall – The stations averaged 0.86 inches during January which is 1.60 inches below the historic average (2.46 inches) for Clermont. For the year to date, our total rainfall of 0.86 inches is 1.60 inches below the historical cumulative average of 2.46 inches. This is approximately 35% of the expected year-to-date rainfall.

Table with 4 columns: Location, January (inches), 12 Month Running Total, 12 Month Surplus/Deficit. Rows include 474, Brown Shinn Road, Villa City, M-1, Emeraldalda, and Tavares.

Rainfall average for past 12 months = 50.73 inches for the 6 stations reported.

B. Water Control Structure Report – Cherry Lake and Villa City structures were open and adjusted up to January 21st and then closed for the remainder of the month. Discharge from Cherry Lake ranged from 80 to 189 cfs based on predicted and actual rainfall events. Water level at all sites were within regulatory range except for M-6A which was 0.08 feet below minimum regulation. Water levels as of February 3, 2020 are:

Table with 5 columns: Location, Regulatory Range, Upper (ft), Lower (ft), Change (upper). Rows include Minnehaha, Cherry Lake, Villa City, M-6A, M-5A, M-4A, and M-1.

BOARD OF TRUSTEES

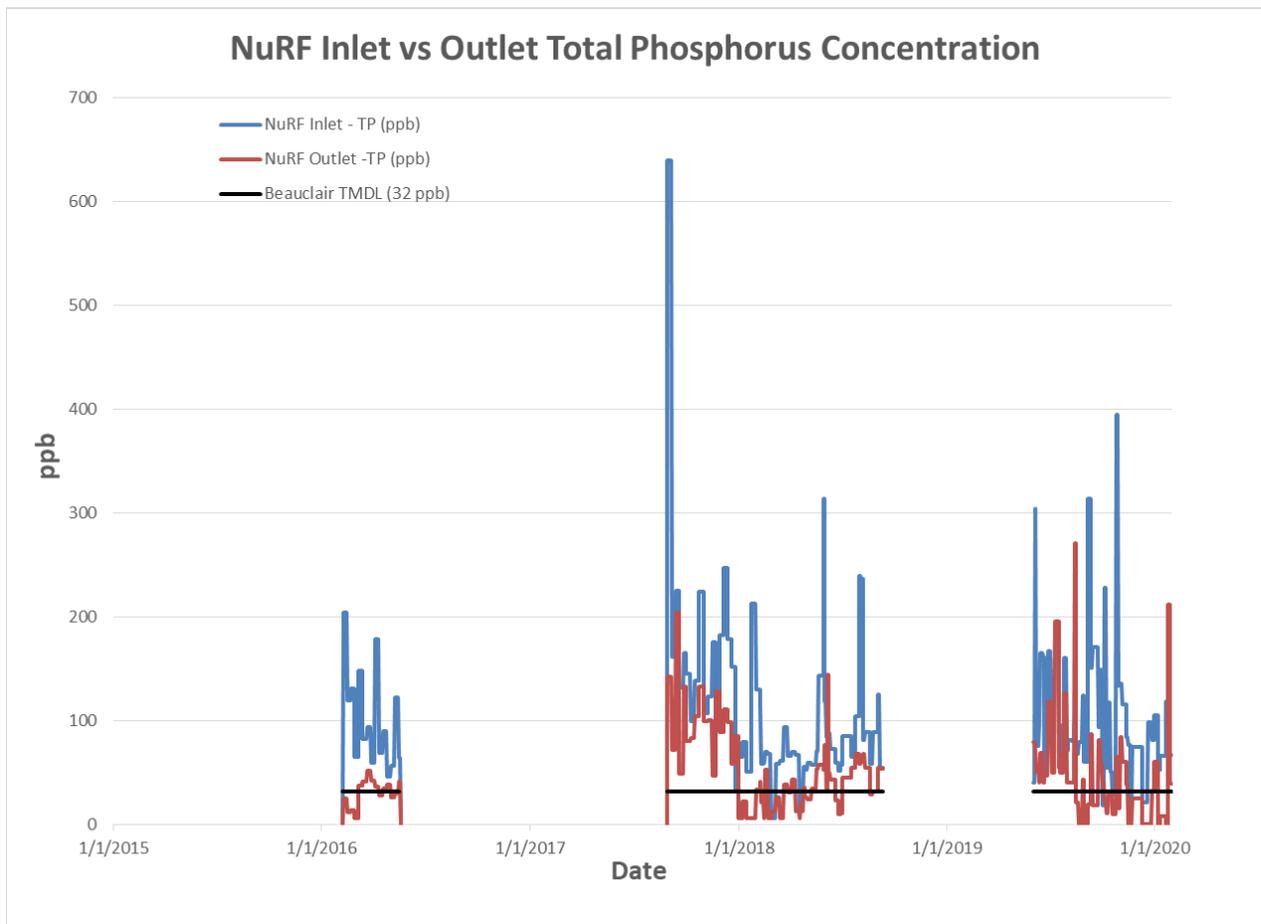
Table with 7 columns: District One (Peggy Cox), District Two (Trampis BonJorn), District Three (Carolyn Maimone), District Four (Robert Hendrick), District Five (Amy Stone), At-Large (Courtney Stokes), At-Large (Keith A.).

C. Water Quality Sampling – Nutrient Reduction Facility

The Nutrient Reduction Facility began operating March 2, 2009 and coincided with closing of the existing dam. Almost one hundred percent of Lake Apopka discharge has been routed through the NuRF. Per our joint NuRF Operation and Management Plan, St. Johns has assumed control of discharge through the facility.

The graphs below indicate the weekly data for total phosphorus concentration (Figure 1) and the facility's daily load reduction based on the concentration and flow (Figure 2). Water level in Lake Apopka was above regulation for January. Flow through the NuRF was maintained at 50 cfs to 150 cfs for the first three weeks of January and then ceased for the remainder of the month. Due to the potential loss of sediments from NuRF ponds the flow through the facility was capped at 150 cfs and the SJRWMD placed the balance over the AB spillway. Flow over the AB spillway was 125 to 200 cfs during the first three weeks of January, until Lake Apopka reached regulation at the end of the month.

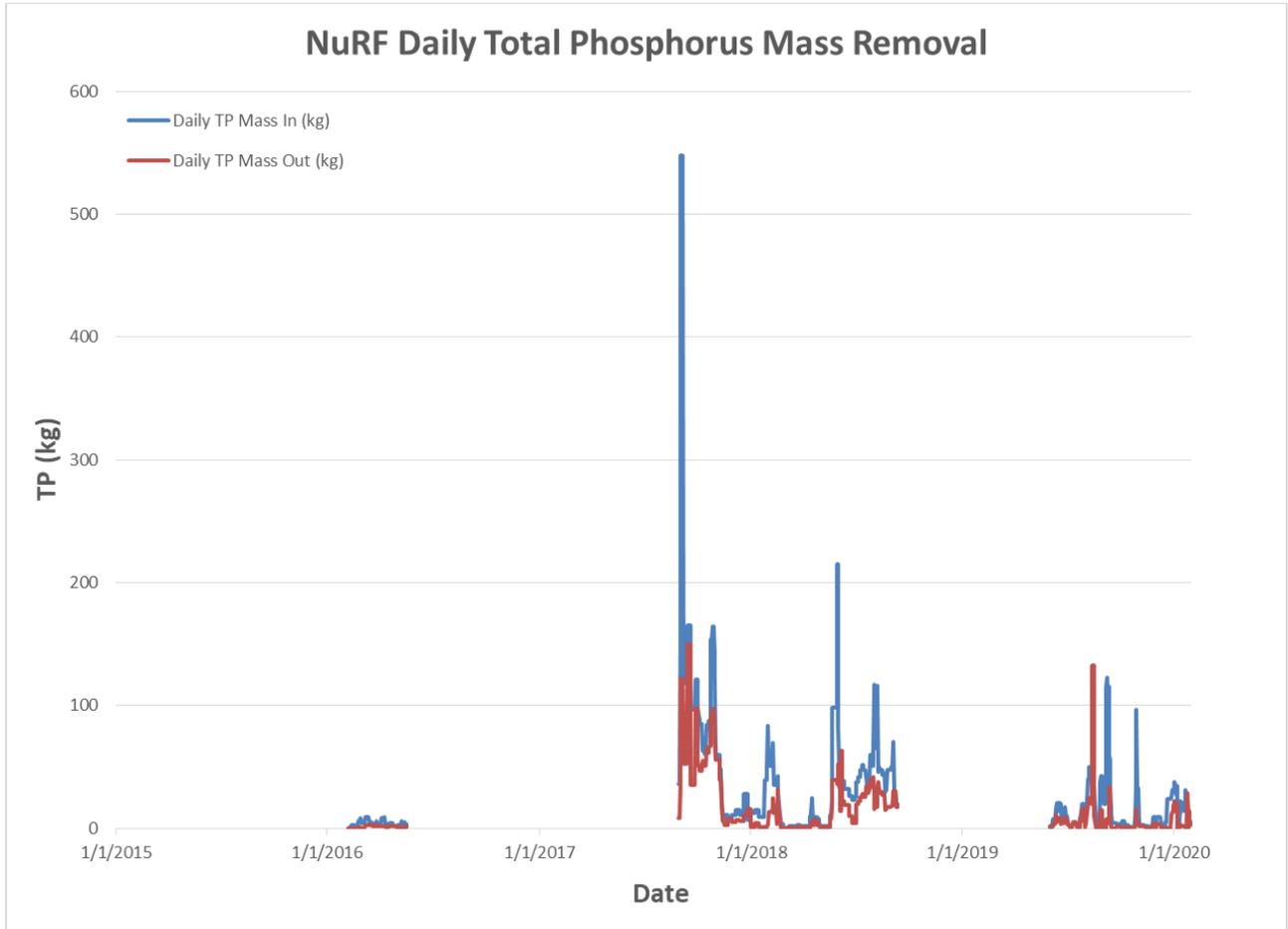
Figure 1.



Based on weekly total phosphorus data and average flow rate reported by SJRWMD, staff has calculated the daily load into the facility and the daily load out of the facility (Figure 2). The

NuRF has removed 14,210 kg (31,263 pounds) of total phosphorus between March 2, 2009 and January 10, 2020.

Figure 2.



The NuRF has removed 58% of the incoming total phosphorus mass to date. The removal percentage does not take into account the fact that the total phosphorus exiting the facility is not bioavailable. Average (non flow-weighted) total phosphorus concentration in the NuRF discharge to date is 39.2 ppb which is above the Lake Beauclair 32.0 ppb TMDL. Average (non flow-weighted) inflow total phosphorus concentration to date is 93.4 ppb.

Vital NuRF Statistics 03/02/09 through 01/31/19

Total Alum Used	13.89 million gallons
Alum Purchased To-Date	\$7,855,299
Total Water Treated	62.37 billion gallons
Total P Removed	31,263 pounds
Average TP Conc. In	93.4 ppb
Average TP Conc. Out	39.2 ppb

D. Contract/Project Status

- Pegasus Engineering – The NuRF site evaluation final draft is being completed after additional material was asked to be input into the report.

E. NuRF

- Operated the centrifuge.
- Moved cake to containment area.
- Collected water samples.
- Mowed and string trimmed around the facility.
- Bush hogged the property.
- Recorded alum readings daily.
- Ordered alum according to flows.
- Ordered polymer when needed.
- Recalibrated the pH meters.
- Repaired the dozer hydraulic lines.
- Repaired the AC on the old bobcat.
- Filled in potholes in the road.
- Modified couplings for the dredge lines.
- Replaced some of the flex dredge lines.
- Greased the bobcats when needed.
- Welded broken I-beams on both sides of the east pond.
- Replaced the broken solenoid for the flush water on the centrifuge.
- Replaced the bearings for the polymer pump.
- Filled in the road in front of the pole barn with crushed cinder blocks.
- Cleaned the shop and office.
- Cleaned the centrifuge building including the spider webs on the ceiling.
- Pressure washed the bobcat.
- Started training Aerotek temporary workers.

F. Maintenance Staff Projects

- January 15th, staff fixed the fence at Villa City.
- January 28th, staff found bearings to get polymer pump back online at NuRF.
- January 29th, staff worked at NuRF.
- January 30th, staff worked at NuRF.



TO: Michael J. Perry, Executive Director
FROM: Biagio Gugliotti, Land Resources Director
DATE: February 12, 2020
SUBJECT: January Staff Report

Communication & Education Activities Updates

- A. Staff tries to update the LCWA Facebook page on a regular basis. The page currently has 784 Followers. Staff posts photos of Water Authority-led activities, shares news from other water-related posts and advertises agency activities or programs.
B. With the cooler months coming upon us staff has resumed the paddling and hiking trips.
C. January 11th, LCWA Naturalist held a Dog Hike at Lake Norris Conservation Area and had 10 hikers and 2 dogs.



- D. The Mary Ellen Robertson Chapter of the Daughters of the American Revolution are hosting a Mary Ellen Robertson Founders Day at Bourlay Historic Nature Park on February 1st.
E. The Water Authority has been approached by the Amazing Race for Charity about using Hidden Waters Preserve as part of their route for the 7th annual event on April 4, 2020.
F. March 6th is set for Bat Hike with Smores' at Flat Island Preserve.

Restoration Activities

- A. Staff has been removing exotics by hand and/or by herbicide when the weather permits.
B. Staff is conducting prescribed burns as weather and staffing permits.
C. Staff has been maintaining the restoration plots at Sabal Bluff Preserve.

BOARD OF TRUSTEES

Table with 6 columns: District One (Peggy Cox), District Two (Trampis BonJorn), District Three (Carolyn Maimone), District Four (Robert Hendrick), District Five (Amy Stone), At-Large (Courtney Stokes), At-Large (Keith A.).

Property Activities

A. **Bourlay Historic Nature Park** – January 2nd, staff checked the trails, restrooms, and Cracker House. January 8th, staff checked on the land management contractor cutting invasive exotics along the shoreline. January 9th, staff met with representatives of the Daughters of the American Revolution (DAR) to discuss the upcoming Mary Ellen Robertson Day scheduled for February 1st. January 13th, staff de-thatched the Chickee Hut and cut new thatch. January 14th, staff re-thatched the chickee. Staff also pressured washed signs and benches by the chickee.



January 16th, staff checked the restrooms, chickee hut and trails. January 22nd, staff went and cut a tree off the trail and checked the rest of the preserve. January 23rd, staff weeded the garden area, patched holes in roadway into the preserve and painted signposts.

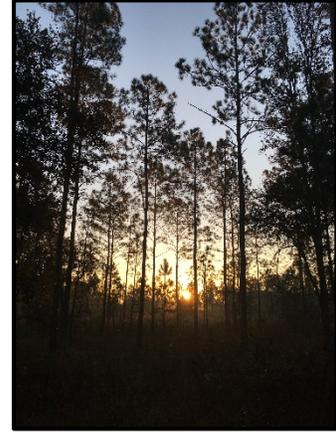


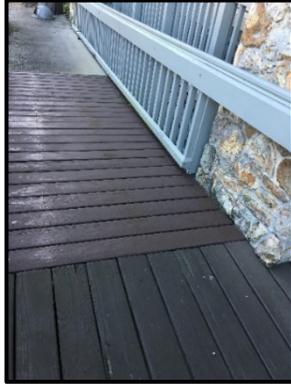
January 24th, staff pressure washed the restrooms and sidewalks. Staff trimmed the trails. Staff checked on the land management contractors working on the shorelines. January 28th, staff cleared trails and bush hogged some areas. January 29th, staff mowed the preserve and weeded and trimmed around the garden, posts, benches, picnic tables, and restrooms. Staff met with the DAR in final preparation for the Mary Ellen Robertson Day. Staff also helped in the site residence yard and sanded down the restroom doors in preparation for painting. Staff also pulled all the vines off the site residence fence near the newly installed sign and one area along trail where hikes are going to walk by. January 30th, staff met with contractor working on the shoreline restoration. Staff string trimmed around the parking lot area and painted bathroom and janitor doors. Staff installed new Bourlay House sign and picked up trash.



- B. **Crooked River Preserve** – January 2nd, staff checked the trails and restrooms. January 6th, staff changed combo's for the canoes and kayaks. January 16th, staff took the well sample and took it to the water lab. Staff also checked the restrooms and trails. January 30th, staff changed the combos on the canoes. Staff checked the restrooms.
- C. **Flat Island Preserve** – January 2nd, staff checked the trails, restrooms, campsites, and blew off the boardwalk. January 14th, staff checked on the erosion cleanup on the southern boundary from the adjacent Lake Denham Cove development. January 16th, staff changed the canoe/locker combos, primed the pitcher pump, cleaned the group campsite, and checked the restrooms. January 17th, staff mowed the preserve and checked the property. January 21st, staff cleaned the group campsite and tried to fix toilet in women's restroom.

- D. **Sawgrass Island Preserve** – January 7th, staff mowed trails, roadways, and campsites. January 25th, staff along with WILA worked on widening and trimming up the Hammock Trail where it gets narrow. January 30th, staff met with representatives from the Fish and Wildlife Commission to tour the Sawgrass Island Marsh.
- E. **Sabal Bluff Preserve** – January 2nd, staff checked the trails. January 16th, staff checked the trails.
- F. **Hidden Waters Preserve** – January 15th, staff trimmed trails and string trimmed both parking lots. Staff also pulled trash at both parking lots and picked up trash along trails. January 22nd, staff went and cut a tree off trail and checked the rest of the preserve.
- G. **Lake Norris Conservation Area** – January 6th, staff changed combo's on gate and canoes. January 11th, staff along with a Naturalist led a "Dog Hike" at the preserve. January 28th, staff changed combo's on gate and canoes.
- H. **Fern Prairie** – January 2nd, staff checked on trees that were cut by SECO Power and left on the preserve.
- I. **Scrub Point Preserve** - January 5th, staff participated in the Clermont Christmas Bird Count which included Scrub Point Preserve. January 8th, staff met with Chuck Piper and the Executive Director to discuss the status of the Land Exchange with the National Park Service. January 16th, staff removed a large fallen branch from the point. Staff also removed wooden steps that had been screwed onto an oak tree near the water. Staff also mowed the point and the five-acre parcel.
- J. **Bear Track Preserve** – January 15th, staff met with representatives from the Florida Forest Service, to oversee the establishment of a fire line along the western boundary of the newly acquired parcels. January 22nd, staff cut trees off the trail and checked out the rest of the preserve.
- K. **Other properties inspected for trash, ATV activity, and vandalism:**
- L. **Other Staff Activities**
- Every Monday staff meets with Field Services to schedule projects for the week.
 - January 2nd, staff performed the end of the month preserve run: collected sign in sheets and filled brochure boxes.
 - January 3rd, staff painted the front entrance fence at Hickory Point.
 - January 6th, staff attended the monthly staff meeting. Staff worked on the staff report and Board Memos. Staff worked on the reports, playground inspection, beach samples, and emails for free kid's fish clinic.
 - January 7th, staff helped repair the pavilion railings at Hickory Point Park.



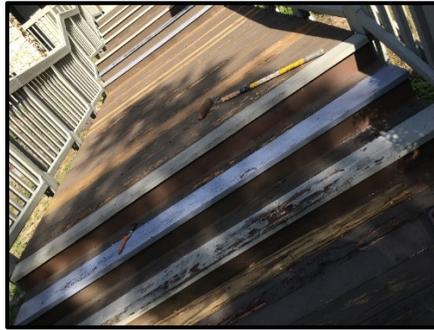
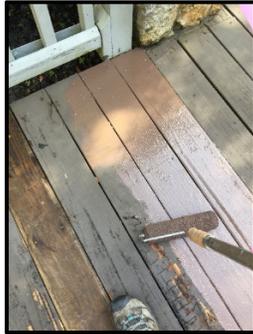


- January 8th, staff responded to a report of damaged Water Authority fence near CR 44, but did not find any damage. Staff dropped off the Land Management Mule for service at the dealership. Staff helped paint the ramps and side steps on the pavilion at Hickory Point Park. Staff worked on paperwork for bass tournaments and ran to Rural King for Field Services.
- January 9th, staff helped replace decking behind the pavilion at Hickory Point Park. Staff pulled weeds and trimmed hedges in front of the LCWA office. Staff picked up tree branches with tractor and put them in the brush pile at Hickory Point Park. Staff painted around the pavilion at Hickory Point Park and picked up more paint.
- January 10th, staff worked on the office landscaping and sprayed weeds. Staff had a meeting about upcoming events and the volunteer program.
- January 13th, staff mowed Hickory Point Park. Staff worked on paperwork for free kid's fishing clinic and bass tournaments. Staff also emailed local papers information on the Mary Ellen Robertson Event and the Free Kids's Fishing Clinic.
- January 14th, staff painted the restroom, janitor, and electrical doors on the first floor of the pavilion at Hickory Point Park.





- January 15th, staff painted the upstairs at Hickroy Point Park in the pavilion: bathroom doors and janitor closet doors. Staff also painted the back steps of the pavilion at Hickory Point Park.



Staff took the old Bourlay House Sign to CTI Signs and sent over photos for them to replace old signage. Staff got a quote to order new swing seats for the playground at Hickory Point Park and finalized payment and delivery.

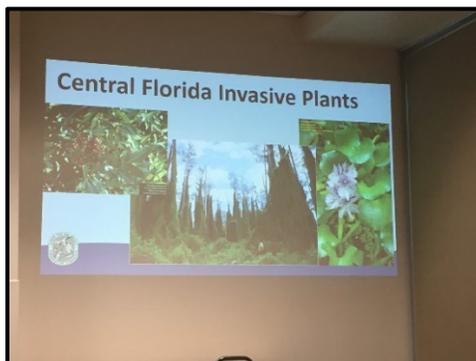
- January 16th, staff performed the mid-month preserve check: filled brochure boxes and collected sign in sheets. Staff picked up soap dispensers at Lake Country Paper and some supplies for Hickory Point Park.
- January 17th, staff painted the back steps of the pavilion at Hickory Point Park and touched up the front steps. Staff also waxed the floors of the pavilion.

- January 21st, staff dropped of the Dodge Ram to the Dodge Dealership. Staff stopped by Belew's Welding and picked up part for the floating dock at Hickory Point Park. Staff took a sign to County Sign Shop to get more made for the preserves that allow camping. Staff also dropped a tractor off at Fields Equipment for brake work. Staff worked on emails for signs and free kid's fishing clinic.
- January 22nd, staff attended a Fire Cooperators Annual Meeting at the Florida Forest Service's Withlacoochee District Headquarters. Staff attended the LCWA Board Meeting.
- January 23rd, staff did a pile burn at Hickory Point. This was Travis' certification check-out burn.



Staff picked up the Mule from the dealership.

- January 27th, staff did a presentation for a Conservation Science, Master Naturalist Program at Trout Lake Nature Center. Staff helped with the landscaping at Hickory Point: pulled weeds, trimmed hedges, raked out leaves, and spread mulch. Staff also sprayed the flower beds at Hickory Point Park.
- January 28th, staff attended a CEU Day in Osceola County by the CISMA group to obtain CEU's for spray license renewal.



- January 29th, staff attended the County Safety Meeting.
- January 31st, staff pulled trash can liners and picked up trash at Hickory Point Park.

Preserve Visitation (Numbers based upon visitors who signed in, actual visitation may be higher.) *Numbers also include visitors who reserve camping and canoe/kayaks

Preserve	January 2020	January 2019
Bourlay Historic Nature Park	91	45
Crooked River Preserve *	315	230
Flat Island Preserve *	656	618
Hidden Waters Preserve	459	471
Lake Norris Cons. Area (SJRWMD- owned) *	96	180
Sabal Bluff Preserve	68	70
Sawgrass Island Preserve	110	136
Hickory Point Park (kayak rentals) *	0	0
TOTALS:	1,795	1592



TO: Lake County Water Authority Board of Trustees

FROM: Ben Garcia, IT/Office Manager

DATE: February 14, 2020

SUBJECT: GIS Activities Report for January 2020

IT Management

- Updated the virus protection server and added all users to system
- Updated virus protection software in the network with new definitions
- Updated the firewall on the network for virus and spam emails protection
- Updated the maintenance license on the virus and spam email protection software
- Administered the user accounts on network servers
- Upgraded and changed settings the spam email software to filter emails
- Updated firewall system with new updates and definitions
- Troubleshooted again our phone system and re-installed the managing software
- Worked on the IT/Office 2020 budget

Office Management

- Reviewed, interviewed and processed all paperwork and background checks for new filed services ranger hires.
- Update personnel files with new Change of Status forms for a few employees
- Updated the FRS and FDOR departments with active and former employee list
- Met, revised and presented the LCWA Values to staff on monthly meeting
- Reviewed and discussed financial reports and procedures with front office staff
- Search state contract for services and equipment for new budget year
- Register new employees to new county benefits registration website
- Reviewed and met with new deferred comp company for staff investment opportunities

GIS Management

- Hickory Point aerial map for sidewalk repairs
- Scrub point access road map
- Drone map for Wolf Branch sink area

BOARD OF TRUSTEES

District One	District Two	District Three	District Four	District Five	At-Large	At-Large
Peggy Cox	Trampis BonJorn	Carolyn Maimone	Robert Hendrick	Amy Stone	Courtney Stokes	Keith A. Farner



TO: Michael J. Perry, Executive Director
FROM: Brian Nagy, Field Services Supervisor
DATE: February 12, 2020
SUBJECT: January Staff Report – Hickory Point Park

Hickory Point Park

A. Special Events

- None

B. Staff Work

- Park Attendant worked the pavilion rentals throughout the month; monitored rentals, cleaned pavilion and outside restrooms.
• Park Ranger mowed, string trimmed, and edged around the park.
• Park Attendant checked the trash and cleaned the restrooms daily as needed.
• January 2nd, staff worked on installing the new big air fans upstairs in the pavilion.
• January 3rd, staff painted the front entrance fence. Staff also finished the installation of the new big air fans upstairs in the pavilion.
• January 6th, staff attended the staff meeting. Staff took the beach sample to the water lab and performed the playground inspection. Staff started trimming up the trees along the entrance road and hauled them off to the burn pile.
• January 7th, staff repaired railings and spindles around the pavilion. Staff worked on repairing the parking lot lights throughout the park.
• January 8th, staff painted the pavilion ramps and steps in the front and painted the new railings and spindles. Staff also continued to work on the parking lot lights.
• January 9th, staff helped replace decking behind the pavilion. Staff pulled weeds and trimmed hedges in front of the LCWA office. Staff picked up tree branches with tractor and put them in the brush pile. Staff painted around the pavilion at and picked up more paint. Staff finished work on the parking lot and entrance lights to the park. Staff also repaired the upstairs restroom ceilings with stucco and paint.
• January 10th, staff finished trimming up the trees in the park and moved the debris to the burn pile.
• January 13th, staff mowed the park and the LCWA office. Staff pressure washed the pavilion trash cans and some decking.
• January 14th, staff painted the restroom, janitor, and electrical doors on the first floor of the pavilion. Staff repaired faucet in upstairs sink and fixed leak at drain. Staff painted the ceilings of the restrooms too.
• January 15th, staff painted the upstairs in the pavilion: bathroom doors and janitor closet doors. Staff also painted the back steps of the pavilion. Staff got a quote to order new swing seats for the playground at and finalized payment and delivery. Staff weed trimmed the entrance roadways and vacuumed up the leaves. Staff also

BOARD OF TRUSTEES

Table with 7 columns: District One (Peggy Cox), District Two (Trampis BonJorn), District Three (Carolyn Maimone), District Four (Robert Hendrick), District Five (Amy Stone), At-Large (Courtney Stokes), At-Large (Keith A.)

**Maryann Krisovitch
Education Contractor
352-434-5025
mkrisovitch@aol.com**

**Lake County Water Authority
January 2020**

Date	Activity	Hours	# Contacts
1/7/20	Treadway STEM night prep	.5	
1/9/20	DAR event site meeting at Bourlay HNP	2.5	3
1/9/20	Treadway STEM Night	4	150
1/10/20	Monthly planning meeting and activity revisions	4.5	
1/11/20	DAR BNHP event prep	1	
1/12/20	Sunday Funday Water Life Booth at Trout Lake Nature Center	5	109
1/14/20	FWC Harris Chain event & prep	3	40
1/16/20	Highland Lakes Jeopardy presentation & prep	3	58
1/17/20	Arbor Day exhibit prep	1	
1/18/20	Tavares Arbor Day booth	5.5	200
1/21/20	Hawthorne TV – water quality	2	700
1/27/20	South Lake High School water quality testing – 4 classes	5	80
1/28/20	Tavares High School water quality testing – 6 classes	8	150
1/29/20	Envirothon planning meeting	1.5	1
1/29/20	Treadway Career Day & DAR BNHP event prep	.5	
1/26/20	DAR BNHP event site meeting	2.5	4
1/31/20	Treadway Career Day	4.5	200
1/1-1/31	Misc. phone calls, emails, reports	2	
Total for January		56	1,695

Total contacts to date	2,751
Annual budget amount	\$15,000
Budget amount remaining FY '20	\$11,864
Total hours budgeted	469
Total hours remaining FY '20	371

Date	Upcoming Activities	Time
2/1/20	DAR Mary Ellen Robertson Day @ Bourlay HNP	10am – 2pm
2/5/20	Triangle Elementary Career Day	9am – 11am
2/8/20	Kid's Fishing Clinic	8am – noon
2/13/20	Water quality monitor training – Lake Idamere Park	3:30pm – 5pm
2/19/20	Holiday RV Park presentation	3:30pm-4:30pm
3/9/20	Hawthorne TV	9am – 9:30am
3/26/20	Envirothon – Hickory Point	9am – 1pm
3/28/20	Lake Louisa Festival booth	9am – 2pm
4/4/20	Amazing Race for Charity at Hidden Waters	7:30am
4/18/20	Shoreline Paddle clean up - location TBD	9am

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Naturalist's Monthly Events for January 2020

Date	Activity	Hours	Participants
1/9/20	Treadway El. STEM Night	3.5	150+-
1/10/20	LCWA office cleaning, assembling materials. Planning Meeting	4.0	
1/11/20	Lake Norris Dog Hike	3.0	10 people 2 dogs
1/16/20	Loch Leven water testing	2.25	
1/18/20	Tavares Arbor Day	6.25	200+-
1/21/20	Return and restock materials LCWA	1.5	
1/20	Phone calls/Emails	1.	
1/21/20	Produce January bill and report	.5	
Totals	January 2020	22.	360+-

Date	Upcoming Events	Purpose
2/21/20	Crooked River Night Paddle	
2/24/20	Loch Leven Water Testing	

LAKE COUNTY MARINE PATROL TICKET SUMMARY
January-2020

	Jan-20	FY2019-2020 Year-to-Date	FY2018-2019 Year-to-Date
Total Number of Tickets Written	25	67	47
Lake County Residents	10	44 (66%)	37 (79%)
Other Florida Residents	13	21 (31%)	7 (15%)
OutofState Residents	2	2 (3%)	3 (6%)
Location of Citation			
Clermont Chain	0	29 (43%)	27 (57%)
St. Johns River	1	5 (7%)	0 (0%)
Harris Chain	22	31 (46%)	20 (43%)
Other	2	2 (3%)	0 (0%)
Type of Offense			
Violation of Wake Zone	11	30 (45%)	19 (40%)
Safety Equipment	12	33 (49%)	25 (53%)
Careless Operation	0	0 (0%)	1 (2%)
Expired Registration	0	1 (1%)	1 (2%)
Other	2	3 (4%)	1 (2%)
Type of Vessel			
Jet Ski	7	22 (33%)	14 (30%)
Boat	17	44 (66%)	33 (70%)
Unknown	1	1 (1%)	0 (0%)
Age Groups			
Over 45	1	29 (43%)	28 (60%)
21 - 45	4	18 (27%)	16 (34%)
Under 21	0	0 (0%)	3 (6%)
Unknown	0	0 (0%)	0 (0%)
Total Hours on Water	82.5	367	284
Preserve Patrols - # of Visits	6	73	49
Preserve Patrols - # of Hours	3.5	79	56
Contacts	162	772	673
Citations	11	18	8
Written Warnings	14	49	39
Verbal Warnings	36	112	86
Other Contacts	11	72	60
Safety Inspections	90	521	480