EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges

Position Statement of the Guardians of Martin County

Adopted by the Guardians Executive Committee and a quorum of the Board of Directors on February 14, 2018. This updates position statements approved on December 12, 2016, and January 23, 2018, both of which supported construction of a water storage reservoir south of Lake Okeechobee. It will expire on February 14, 2021, unless, after subsequent review, it is further extended by the Board.

Position

The Guardians of Martin County find the South Florida Water Management District (SFWMD) preferred alternative for the Everglades Agricultural Area (EAA) Reservoir project to be sub-optimal.and insufficient to ensure survival of the Indian River Lagoon. The project needs to be redesigned so that the Comprehensive Everglades Restoration Plan (CERP) goal of reducing by 80% the discharges of excess Lake Okeechobee water to the St. Lucie and Caloosahatchee estuaries can be attained. The SFWMD estimates that its preferred alternative (C240A) will reduce discharge volumes by 55% when all approved projects have been constructed.

The Guardians continue to strongly support the construction of a water storage reservoir in the EAA, but it must have adequate areas for water quality treatment before water can be sent south of the EAA. Every gallon of water sent south is a gallon that is not discharged into the northern estuaries. More than 35,000 acres of additional land is needed to meet the CERP discharge goal. There is an adequate amount of land owned by the state in the vicinity of the reservoir project area to do that. But because these lands are designated as wildlife management areas, Florida's executive agencies have thus far been reluctant to consider repurposing these lands.

The Guardians support the following actions:

- Construct a reservoir with a storage capacity of 240,000 acre-feet on the 17,000 acre A-2 parcel, as per the SFWMD's Option C240A.
- Use all 17,000 acres of the A-2 parcel for a reservoir with 14-foot walls to reach the water storage goal (this is what the Everglades Foundation has proposed).
- Begin construction of the A-2 Reservoir as soon as possible.
- Repurpose the Holey Land Wildlife Management Area (35,000 acres) as a stormwater treatment area (STA), which by itself would reduce discharge volumes by 50%; adding the Rotenberger WMA (29,000 acres) would reduce discharges by 69%; adding the reductions from other authorized projects, as the SFWMD does, would add another 26% to reduce discharge volumes, for total reductions of 76% if only the Holey Land WMA is repurposed, or 95% if Holey Land and Rotenberger WMAs are repurposed.

- Identify in the very near future lands within the South Florida Water Management District that could be acquired with Land Acquisition Trust Fund ("Amendment One" of 2014) monies and added to the state's WMA inventory.
- If repurposing the Holey Land and Rotenberger wildlife management areas is infeasible, then amend the Water Storage Reservoirs Law of 2017 (a.k.a. SB10, now Florida Statutes 373.4598) so that private lands in the vicinity of the reservoir site could be acquired by eminent domain.
- Recognize that it will take time, money, and political will to identify adequate water quality treatment areas; meanwhile, start building the A-2 Reservoir portion of the project.

Issue

There are two problems with SFWMD Option C240A: first, the Water Storage Reservoirs Law of 2017 (Florida Statutes 373.4598, widely known as SB10) calls for an "optimal configuration" for the project, which Option C240A does not provide because it does not use enough land to get the job done; and second, Option C240A falls for short of the CERP goal of reducing discharges to the northern estuaries by 80%. These two shortcomings are analyzed below.

Problem 1. SFWMD's Option C240A fails to meet the intent of SB10 (Florida Statutes 373.4598) to use state-owned lands in an "optimal configuration" (see ***Optimal Configuration*** analysis and discussion below) to meet the two quantitative CERP goals of the project to reduce discharges by 80% as well as send 300,000 acre-feet of additional water south of the EAA.

- The SFWMD has constrained its alternatives analysis to the 17,000 acre A-2 parcel that is currently leased to farmers, plus the 15,000 acre A-1 parcel on which a water quality treatment facility (Flow Equalization Basin, or FEB) has already been constructed and is being used to help remove phosphorous from agricultural runoff south of Lake Okeechobee. Thankfully, the SFWMD's preferred Option C240A leaves the A-1 FEB alone, as the Everglades Foundation, the Guardians of Martin County, Bullsugar Alliance, and other conservation-oriented groups have suggested.
- The SFWMD has not been able to locate "willing sellers" who might consider exchanging their lands near the A-2 project site for other lands the District owns in the EAA. Even if the SFWMD canceled all its leases on EAA farm lands and exchanged them, it would not be enough land to meet the CERP goal of 80% discharge reduction.
- The SFWMD has not considered the 15,000 acres in the C-139 Annex parcel adjacent to the southwest corner of the EAA as potentially contributing to the project (another 3,000 acres of these lands have been committed to a new FEB).
- The SFWMD has ignored the request of the Everglades Coalition (approximately 60 citizen conservation groups) expressed in a January 16, 2018, letter to Governor Rick Scott requesting that the District analyze additional alternatives that would expand the project footprint by including additional lands.

- The Everglades Coalition letter specifically mentions a proposal by the Everglades Foundation (EF) that calls for an additional 13,000 acres.
- The Guardians of Martin County has a January 23, 2018, Position Statement supporting the use of wildlife management areas abutting the project area: Option H1 calls for 35,000 acres (Holey Land Wildlife Management Area) and Option H2 for 64,000 acres Holey Land and Rotenberger Wildlife Management Areas) to be repurposed for water quality treatment. On January 30, 2018, the Guardians sent a letter to Governor Scott and other state officials asking that the SFWMD analyze these alternatives.

- Because the SFWMD constrained its set of alternatives so narrowly, there is a potential legal challenge that the project does not meet the requirements of the National Environmental Policy Act (NEPA) of 1969. This could be of concern to the US Army Corps of Engineers (USACE), which is the State of Florida's federal partner in the Comprehensive Everglades Restoration Plan (CERP) efforts. The USACE is expected to pay half the costs of the EAA Reservoir project. (See ***NEPA*** discussion below.)

Problem 2. The SFWMD's Option C240A fails to meet the stated Comprehensive Everglades Restoration Alternative (CERP) goal of reducing by 80% the discharges of excess water from Lake Okeechobee to the "northern estuaries" (St. Lucie to the east of the lake and Caloosahatchee to the west). Independent analysis by Jay O'Laughlin, Ph.D., supports the following conclusions:

- SFWMD's Option C240A, had it been in place in 1980, would have reduced by 29% the total volume of historic discharges since then to the St. Lucie.
  - According to the SFWMD estimate presented February 8, 2018, all authorized projects, including the EAA Reservoir, would reduce the total volume of historic discharges by 55%.
  - By subtraction, the other authorized projects would have reduced the volume of discharges by 26% (55% – 29% = 26%).
- Everglades Foundation (EF) Option would have reduced by 32% the total volume of historic discharges to the St. Lucie; adding the 26% from other authorized projects, as the SFWMD does, the volume of discharges would have been reduced by 58%.
- Guardians' Hybrid Option H1 would have reduced by 50% the total volume of historic discharges to the St. Lucie; adding the 26% from other authorized projects, as the SFWMD does, the volume of discharges would have been reduced by 76%.
- Guardians' Hybrid Option H2 would have reduced by 69% the total volume of historic discharges to the St. Lucie; adding the 26% from other authorized projects, as the SFWMD does, the volume of discharges would have been reduced by 95%.

Optimal Configuration. It should be clear from the above summary analysis that the SFWMD and EF options are suboptimal in comparison with the two Guardians' Hybrid Options. The reason is that neither the SFWMD nor EF options have enough water quality treatment areas to meet the CERP goal of an 80% reduction in discharges.

One way of considering what an optimal configuration might be is to analyze as a benchmark an actual project the SFWMD has designed to store and treat polluted runoff. To date the only such project is the C-44 Reservoir/STA project currently under construction in Martin County. The ratio of acres of STAs to water storage capacity can be used as a benchmark criterion.

C-44 Reservoir/STA Project: The 3,400 acre reservoir currently under construction is accompanied by 6,300 acres of STAs. The reservoir is designed to be 15 feet deep, thus providing a nominal storage capacity of 51,000 acre-feet, or roughly 16 billion gallons. The ratio of STA acres to storage capacity is 0.123 acres of STAs per thousand acre-feet of storage capacity. By comparison, SFWMD Option C240A has 240,000 acre-feet of capacity and 6,500 acres of STAs, which is 0.027 acres of STAs per thousand feet of storage capacity. If the C-44 Reservoir/STA project is a good design, then the EAA C240A project design is only about one-fifth (22%) as good, which makes it sub-optimal. If one considers the C-44 Project as a model for the EAA Reservoir, then almost 30,000 acres of STAs would be needed. However, 30,000 acres is inadequate to meet the CERP goal of reducing by 80% discharges to the northern estuaries.

Table 1 was developed for comparison purposes, using the benchmark criterion identified above in Column [6], the ratio of STAs per thousand acre-feet of reservoir storage capacity. This criterion can also be considered as the STA profile of a project option. Column [7] compares the STA profile of each option with the C-44 STA profile.

The EF Option (44%) is twice as good as the SFWMD C240A Option (22%); both are sub-

Table 1. Summary of EAA Reservoir Option Configurations, Compared with the C-44 Reservoir/STA Project Currently Under Construction in Martin County

Reservoir Features				STA Analysis		
[1]	[2]	[3]	[4]	[5]	[6]	[7]
Option Identifier	Nominal Storage Capacity (ac-ft.)	Reser-voir Acres	Depth (ft.)	STA Acres	STA Profile STA Acres per 1000 ac-ft of Nominal Storage Capacity (ratio)*	EAA Reservoir Option STA Profile [6] compared to C-44 Project (% of total)
SFWMD C240A	240,000	10,100	23	6,500	0.027	22%
Everglades Foundation	240,000	17,000	14	13,000	0.054	44%
C-44 Reservoir/STA Project	51,000	3,400	15	6,300	0.123	100%
Guardians' Hybrid H1	240,000	17,000	14	35,000	0.146	119%
Guardians' Hybrid H2	240,000	17,000	14	64,000	0.267	217%

STA = Stormwater Treatment Area; ac-ft = acre-feet of water; SFWMD = South Florida Water Management District
* Calculated as Column [5] ÷ Column [2]

optimal by comparison with the C-44 Project. Both of the Guardians' Hybrid Options exceed the C-44 Project STA. Hybrid Option H1 has a 19% higher STA profile than the C-44 Project, and the Hybrid Option H2 more than doubles the C-44 Project STA profile. In summary, the H1 Option is more than 5 times better than the SFWMD Option, and 2.7 times better than the EF Option. The H2 Option is almost 10 times better than the SFWMD and nearly 5 times better than the EF Option.

NEPA. The National Environmental Policy Act (NEPA) of 1969 is the cornerstone environmental law in the United States. Although many other states have passed similar legislation, Florida has not. Nevertheless if a resource management project in Florida is connected in some way with a federal agency, such as using federal funds, the requirements of NEPA must be followed to the letter of the law.

NEPA requires that federal agencies must do an environmental assessment for any "major" federal action. The expenditure of $800 million to build a CERP reservoir certainly must abide by NEPA. A sticking point is that if the environmental analysis indicates that there are significant effects from the project, then the federal agency, in this case the US Army Corps of Engineers (USACE), must do a detailed environmental impact statement. The agency shall "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources" (NEPA sec. 102(E)).

Because the SFWMD has severely constrained the footprint for the EAA Reservoir project, there may be some doubt that "appropriate alternatives" have been studied, developed, and described as NEPA requires. This is especially so because citizen conservation groups have suggested alternatives for the SFWMD to analyze, and these requests have been ignored. Because the USACE was not involved in the design of the two alternatives put forward by the SFWMD, the agency may be unwilling to begin the process of approving the federal government's share of the project budget, as called for by all approved CERP projects.

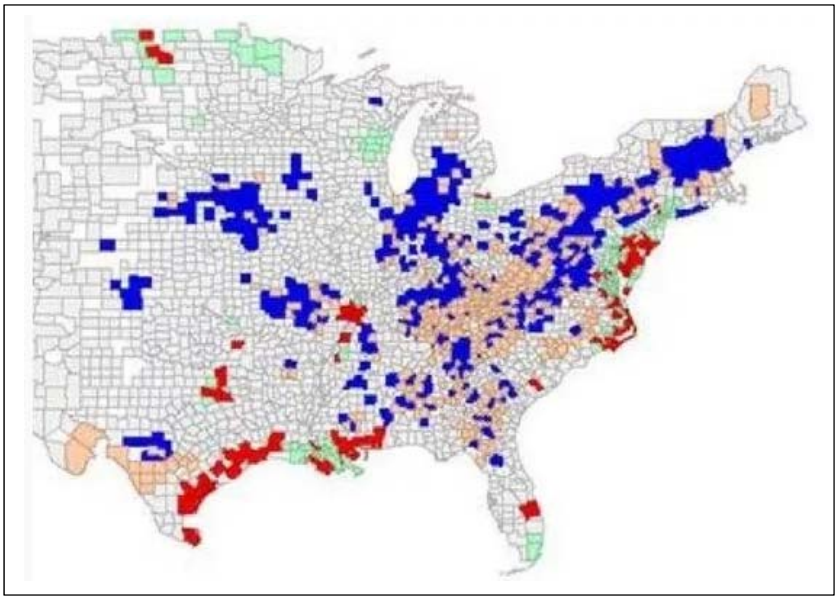
Background

First, we acknowledge the diligent efforts of Sen. Joe Negron to make the EAA Reservoir a reality. Second, in discussions of whether the EAA Reservoir should be constructed and what its configuration should be, the public health aspects of reducing discharges seems to get lost. We scratch the surface of these issues herein, in hopes that this will become a primary consideration as Everglades restoration progress. Third, the legislative findings that support the EAA Reservoir and particularly its effects on reducing discharges to the St. Lucie are summarized. Fourth, the Guardians of Martin County have been active in supporting the construction of an effective EAA Reservoir; recent efforts focused on this are described in a chronological list.

Thanks, Senator Negron. The Guardians of Martin County are thankful for the efforts of Sen. Joe Negron of Stuart, who has championed efforts to reduce harmful discharges of Lake

Okeechobee waters into the St. Lucie River, Estuary, and the Indian Rover Lagoon. In 2014 he led efforts to legislatively fund a University of Florida Water Institute study identifying the options for reducing discharges and sending more water south. During his first year as President of the Florida Senate in 2017, he led efforts to pass Senate Bill 10 (SB10) which Governor Rick Scott signed into law on May 9, 2017, while visiting Martin County, one of four counties that he had declared disaster areas in 2016 because of the adverse effects of high-volume discharges.

Public Health Impacts. In high-discharge years, algal blooms in the St. Lucie and Caloosahatchee rivers and estuaries have become public health hazards and in some cases advisories have warned against contact with the water. On May 5, 2017, The Stuart News reported that "Ohio State University study links toxic algae blooms, fatal liver disease" https://www.tcpalm.com/story/news/local/indian-river-lagoon/health/2017/05/22/ohio-state-university-study-links-toxic-algae-blooms-fatal-liver-disease/100971180/



The map to the left is from that study. Red clusters mean high rates of both algae blooms and deaths from nonalcoholic liver disease. The red clusters in south central Florida are in four counties: Martin, St. Lucie, Indian River, and Okeechobee. The other colors mean: high blooms, low deaths (peach); low blooms, high deaths (green); and low rates for both (blue).

In the four Florida counties, the death rate from liver disease not related to alcohol was nearly twice as high as the national rate during the 12 years of the OSU study. The span of the study, which was published in 2015, did not include blooms that coincided with lake discharges in 2013 and 2016.

One of the study coauthors cautioned that although a correlation between algal blooms and death rate was found, that does not mean that the blooms caused liver disease. Edith "Edie" Widder, Ph.D., is founder and lead scientist at the Ocean Research & Conservation Association in Fort Pierce. She said correlation is an important first step and a warning sign to be heeded. She is concerned that many crops irrigated from canal water that carries blue-green algae in Martin County could be accumulating the toxin microcystin from the algae, which can cause nausea and vomiting if ingested; rash or hay fever symptoms if touched or inhaled; and liver disease if drank. The Guardians have provided some financial support for a study of these effects.

Blue-green algae contains other chemicals that in the future may become recognized as a health hazard. Although some scientists believe there is a possible linkage between blue-green algae and neurodegenerative diseases such as Alzheimer's, the appropriate reaction should be similar to that of the possible linkage between blue-green algae and liver disease: Although a correlation may exist, that does not mean algal blooms cause such diseases. (See "Frequently Asked Questions: Cyanobacteria/Blue-Green Algae" Fact Sheet from the Florida Department of Health http://www.floridahealth.gov/environmental-health/aquatic-toxins/_documents/cyano-faqs-pio.pdf)

Legislative Findings. The Florida Everglades Forever Act, first passed in 1993, stated that Everglades improvement and management programs should "***To the greatest extent possible, wasteful discharges of fresh water to tide shall be reduced***, …"(Florida Statutes 373.4592).

The Legacy Florida Act, passed in 2016, requires the Florida Department of Environmental Protection and the SFWMD to "***give preference to those Everglades restoration projects that reduce harmful discharges*** of water from Lake Okeechobee to the St. Lucie or Caloosahatchee estuaries in a timely manner."

The findings in the Water Storage Reservoirs Law of 2017 (SB10; Florida Statutes 373.4598) succinctly describe the problem this position statement addresses:

> 373.4598 Water storage reservoirs.—
> (1) LEGISLATIVE FINDINGS AND INTENT.—
> (a) The Legislature declares that an ***emergency exists*** regarding the St. Lucie and Caloosahatchee estuaries ***due to the high-volume freshwater discharges*** to the east and west of the lake. Such discharges have manifested in widespread algae blooms, ***public health impacts***, and extensive environmental harm to wildlife and the aquatic ecosystem. These conditions, as outlined in the state of emergency declared by the Governor under Executive Orders 16-59, 16-155, and 16-156, threaten the ecological integrity of the estuaries and the economic viability of the state and affected communities. (Emphasis added.)
> (b) The Legislature finds that increasing water storage is necessary to reduce the high-volume freshwater discharges from the lake to the estuaries and restore the hydrological connection to the Everglades. ***CERP projects necessary to reduce the discharges*** and improve the flows to the Everglades ***should receive priority funding***, ***such as*** the Lake Okeechobee Watershed project to the north of the lake; ***the Everglades Agricultural Area reservoir project to the south of the lake***; the C-43 West Basin Reservoir Storage project to the west of the lake; and the Indian River Lagoon-South project to the east of the lake. (Emphasis added.)
> (c) The Legislature finds that ***the rate of funding for CERP must be increased*** if restoration will be achieved within the timeframe originally envisioned and that the delay in substantial progress toward completing critical elements of restoration, such as southern storage, will cause irreparable harm to natural systems and, ultimately, increase the cost of restoration. A substantial commitment to the advancement of projects identified as part of CERP ***will reduce***

ongoing ecological damage to the St. Lucie and Caloosahatchee estuaries. (Emphasis added.)

(d) The Legislature recognizes that ***the EAA reservoir project was conditionally authorized in the Water Resources Development Act of 2000 as a project component of CERP***. Unless other funding is available, the Legislature directs the district, in the implementation of the reservoir project, to abide by applicable state and federal law in order to do that which is required to obtain federal credit under CERP. (Emphasis added.)

Guardians of Martin County Activities Focused on the EAA Reservoir. The Guardians have been concerned about the quality of Martin County's waters for some time, and were spurred to consider taking action following the March 2015 release of the University of Florida Water Institute report on options for reducing discharges. The Guardians' most recent actions are sequentially catalogued below:

December 16, 2016: The Guardians approved a position statement "Florida's Future Water Supply Depends on Improved Surface Water Management" that included a strong statement of support for the construction of a water storage reservoir in the EAA south of Lake Okeechobee. It was authored by Guardians Board member and principal water policy analyst Jay O'Laughlin, Ph.D., and reviewed by Guardians Advisory Board member Maggy Hurchalla and Gary Goforth, P.E., Ph.D., an environmental engineering consultant with 35 years of experience in water resource management. http://theguardiansofmartincounty.com/wp-content/uploads/2016/12/GMC_Water_Position.pdf

April 23, 2017: The Guardians posted to its website a paper "Arguments Against An EAA Reservoir and Rebuttals" written by Guardians Board member and principal water policy analyst Jay O'Laughlin, Ph.D., and reviewed by Maggy Hurchalla and Gary Goforth, P.E., Ph.D. http://theguardiansofmartincounty.com/wp-content/uploads/2017/04/arguments-rebuttals_EAA-reservoir_JayOL_04-16-2017.pdf

November 20, 2017: The Guardians conducted an email campaign encouraging people to provide comments on the inadequacy of the EAA Reservoir project design alternatives. At a public meeting on the project in December, 2017, the SFWMD said it had received more than 800 email comments from people, and thanked the public for being involved. The Guardians campaign resulted in more than 200 such comments.

November 22, 2017: Guardians Board member and principal water policy analyst Jay O'Laughlin, Ph.D., provided written comments to the SFWMD regarding the inadequacy of the set of proposed EAA Reservoir alternatives and requested that the District include an alternative project configuration similar to the C-44 Reservoir/STA Project currently under construction in Martin County. To date the SFWMD has not done so.

January 4, 2018: TCPalm, publisher of The Stuart News, sponsored a "town hall" meeting on the EAA Reservoir project, featuring a presentation by Sen. Joe Negron of Stuart, comments and

questions from local area panelists, and an open question and answer forum with Sen. Negron. During that forum Guardians Board member and principal water policy analyst Jay O'Laughlin, Ph.D., told the Senator that more than 90% of the discharges from Lake Okeechobee could be reduced by repurposing the wildlife management area at the southern edge of the EAA as water quality treatment areas. He presented the Senator with a 20-page paper "Outside the Box Options for the EAA Reservoir/STA Project" with analysis supporting that conclusion, by Jay O'Laughlin, Ph.D., and Joseph L. Gilio, a retired professional wetlands scientist. The Senator, who had earlier used the term "Outside the Box" when he urged the SFWMD to consider a wider array of alternative project configurations, said he was eager to read it. (The paper was revised with improved graphics on January 22, 2018; see URL below.)

January 22, 2018: Guardians Board member and principal water policy analyst Jay O'Laughlin, Ph.D., provided Brandon Tucker with a revised version of the "Outside the Box" paper with improved graphics. Mr. Tucker said he would ask SFWMD staff to review it and provide him with feedback. https://www.dropbox.com/s/eavmb1qa29cvikx/EAA-res-analysis_doc_1-22-18.pdf?dl=0

January 23, 2018: The Guardians approved and posted to its website a position statement "Designing the EAA Reservoir to Eliminate Harmful Lake Okeechobee Discharges." http://theguardiansofmartincounty.com/wp-content/uploads/2018/01/GMC-position-statement_EAA-reservoir_-1-23-18.pdf

January 30, 2018, The Stuart News published "Time to Talk About the Third Rail in Everglades Restoration: Guest Column" by Guardians Board member and principal water policy analyst Jay O'Laughlin, Ph.D. The "third rail" is repurposing wildlife management areas adjacent to the planned EAA Reservoir site to function as water quality treatment areas. https://www.tcpalm.com/story/opinion/contributors/2018/01/30/time-talk-third-rail-everglades-restoration-guest-column/1074603001/

January 30, 2018: Guardians Board member and principal water policy analyst Jay O'Laughlin, Ph.D., sent a letter to Governor Scott and other officials requesting that the SFWMD analyze two more alternatives that would use state-owned lands to expand the project footprint, either of which does a much better job meeting project goals than what the District has proposed. https://www.dropbox.com/s/nzybx3han6zvlvs/Gov-Rick-Scott_letter_1-30-18.pdf?dl=0

> Accompanying the letter was a Guest Column by Jay O'Laughlin published in The Stuart News on January 30 (see URL above), the Guardians Position Statement of January 23, 2018, requesting that the SFWMD analyze two additional alternatives, and a 23-page document dated January 22, 2018 (see URL above) providing support for the claims in the Guest Column and Position Statement.
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> Copies of the letter to Governor Scott were sent to the SFWMD Executive Director, Governing Board Chair, and Martin County Governing Board representative. Copies

were also sent to Martin County legislators and key legislative committee chairs, as well as the Governor's cabinet, which as trustees of the Internal Improvement Trust Fund is responsible for the management of 64,000 acres of land in the vicinity of the reservoir project area.

February 2, 2018: The Stuart News editorial board published "Don't do half-baked job on Everglades Reservoir." https://www.tcpalm.com/story/opinion/editorials/2018/02/02/dont-do-half-baked-job-everglades-reservoir-our-view/1082534001/

February 12, 2018. The Stuart News published "Saving the Everglades shouldn't mean disrupting our wildlife areas: Guest Column" by Martha Musgrove, Board member of The Florida Wildlife Federation. It was critical of the Guardians position, as described in the January 30, 2018, Guest Column by Jay O'Laughlin, Ph.D., supporting the repurposing of wildlife management areas adjacent to the planned EAA Reservoir site. The column objected to the loss of recreation areas and supported taking land out of agricultural production for the EAA Reservoir water quality treatment. https://www.tcpalm.com/story/opinion/contributors/2018/02/12/saving-everglades-shouldnt-mean-disrupting-our-wildlife-areas-guest-column/328965002/

February 13, 2018: The Guardians Executive Committee approved a revision of the January 23, 2018, position statement retitled "EAA Reservoir Needs Redesign to Minimize Harmful Lake Okeechobee Discharges" and asked Guardians Board member and principal water policy analyst Jay O'Laughlin, Ph.D., to make necessary revisions and present the position statement at the Guardians Board of Directors meeting on February 20, 2018. (This document is the position statement to be approved. It was authored by Jay O'Laughlin, Ph.D., a Guardians Board member and principal water policy analyst.)