

**STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS**

SIERRA CLUB,

Petitioner,

v.

DOAH CASE NO. 19-0644

DEPARTMENT OF ENVIRONMENTAL
PROTECTION,

Respondent.

THOMAS GREENHALGH,

Petitioner,

v.

DOAH CASE NO. 19-0645

DEPARTMENT OF ENVIRONMENTAL
PROTECTION,

Respondent.

SAVE THE MANATEE CLUB, INC.,

Petitioner,

v.

DOAH CASE NO. 19-0646

DEPARTMENT OF ENVIRONMENTAL
PROTECTION,

Respondent.

SILVER SPRINGS ALLIANCE, INC.; and
RAINBOW RIVER CONSERVATION, INC.,

Petitioners,

v.

DOAH CASE NO. 19-0647

DEPARTMENT OF ENVIRONMENTAL
PROTECTION,

Respondent.

OUR SANTA FE RIVER INC.;
ICHETUCKNEE ALLIANCE, INC.;
GINNIE SPRINGS OUTDOORS, LLC; and
JIM TATUM,

Petitioners,

v. DOAH CASE NO. 19-0648

DEPARTMENT OF ENVIRONMENTAL
PROTECTION,

Respondent.

PAUL STILL,

Petitioner,

v. DOAH CASE NO. 19-0649

DEPARTMENT OF ENVIRONMENTAL
PROTECTION,

Respondent.

FRIENDS OF WEKIVA RIVER, INC.,

Petitioner,

v. DOAH CASE NO. 19-0650

DEPARTMENT OF ENVIRONMENTAL
PROTECTION,

Respondent.

PROPOSED RECOMMENDED ORDER FROM PETITIONERS SIERRA CLUB, TOM GREENHALGH, SAVE THE MANATEE CLUB INC., SILVER SPRINGS ALLIANCE, RAINBOW RIVER CONSERVATION INC., OUR SANTA FE RIVER INC., ICHETUCKNEE ALLIANCE INC., JIM TATUM, AND FRIENDS OF THE WEKIVA RIVER INC.

Pursuant to notice, a final hearing was held in this case on November 12-15 and 18-20, 2019, in Tallahassee, Florida, before Francine M. Ffolkes, an Administrative Law Judge with the Division of Administrative Hearings (DOAH).

APPEARANCES

For Petitioner Paul Still, PhD.:

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For all other Petitioners:

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STATEMENT OF THE ISSUE

The issue in this case was whether five (5) separate orders issued by the Secretary of the Florida Department of Environmental Protection (DEP) on June 29, 2018, approving five (5) separate Basin Management Action Plans (BMAPs), including numerous springs in north and central Florida, do not comply with the provisions of section 403.067, Florida Statutes, and the Florida Springs and Aquifer Protection Act, sections 373.801-813, Florida Statutes, and the rules adopted under these statutes.

PRELIMINARY STATEMENT

On June 29, 2018 the DEP Secretary approved the Suwannee River BMAP, Santa Fe River BMAP, Silver Springs and Upper Silver River and Rainbow Spring Group BMAP, Wekiwa Spring and Rock Springs BMAP, and Volusia Blue Springs BMAP.

Petitioners timely filed petitions and, subsequently, amended petitions, with DEP. On February 5, 2019, DEP referred the amended petitions to DOAH to conduct an evidentiary hearing and submit a recommended order. The amended petitions were consolidated and the consolidated case was ultimately scheduled for hearing on November 12-15 and 18-22, 2019. Ginnie Springs Outdoors, LLC, filed a notice of withdrawal and was dismissed. Various dispositive or partially dispositive motions and for other relief were filed by the parties and, after responses, the motions were denied.

Petitioners filed motions for official recognition and for admission of various laws, rules, records and documents on July 24, 2019, August 16, 2019, and September 27, 2019. Pursuant to the July 24, 2019 motion, Petitioners' Exhibits P-1 through P-12 (statutory laws and administrative rules) were officially recognized; Petitioners' Exhibits P-13 through P-17 (final

TMDL reports) were admitted; and Petitioners' Exhibits P-23 through P-25 were admitted¹.

Pursuant to the August 16, 2019 motion, Petitioners' Exhibits P-26 through P-35 were admitted.

And pursuant to Petitioners September 27, 2019 motion, Petitioners' Exhibit 121 was admitted.

A joint prehearing stipulation was filed on September 6, 2019. Deposition transcripts of DEP corporate representatives Tom Frick, Gregory DeAngelo, and Moira R. Homann, as well as deposition transcripts of experts Michael D. Dukes, PhD., Katie Tripp, PhD., and Robert L. Knight, PhD, were admitted subject to transcript designations to be submitted pursuant to a post-hearing order. The hearing concluded on November 20, 2019 and a 12-volume transcript of the proceedings was filed on December 13, 2019.

At hearing, Joint Exhibits 1 through 5 (BMAPs) were admitted as JE-1 through JE-5. Petitioners presented fact witnesses: Merrillee Jipson, Michael Roth, Burt Eno, Dennis Jones, Faith Jones, John Jopling, Chris Spontak, Mike Cliburn, Chris Mericle, Patrick Rose, Jim Tatum, Thomas Greenhalgh, and John Moran; and expert witnesses: Anthony R. Gaudio, E. Allen Stewart, P.E., Robert L. Knight, PhD., and Thomas Greenhalgh, P.G. The following exhibits were admitted for Petitioners: P-36 through P-46, P-48 through P-50, P-58, P-61 through P-63, P-65, P-68, P-75, P-80, P-82 through P-84 (pp. 55-58), P-92, P-95, P-99, P-100C through P-100G, P-103 (Greenhalgh memo and attached aerials), P-104 through P-106, P-108, 109 (pp. 25-26 and cover page), P-110, P111, P-114 through P-116, P-120, P-121, P-132 through P-139, P-140 through P-142 (corporate representative deposition transcripts), P-143 (Tripp deposition transcript), P-144 (Dukes deposition transcript), and P-149 through P-152.

Dr. Still presented Exhibits S-1 through S-3, S-8 (pp. 5-19 and 23), S-9, and S-10 (pp. 7-8).

¹ Throughout this document, petitioners' exhibits are referenced as [P-number], DEP exhibits as [DEP-number], and joint exhibits as [JE-number]. Transcript references are shown as [T-page number].

DEP presented fact and expert witnesses: Tom Frick, Gregory DeAngelo, Kevin R. Coyne, Moira R. Homann, Celeste Lyon, Terry Hansen, P.G., and Mary Paulic; and expert witness Richard Hicks, P.G.; and exhibits DEP-12, DEP-17 through DEP-22, DEP-26 through DEP-39, DEP-47, DEP-53, and DEP-56 through DEP-63.

Based on the parties' stipulations and the evidence adduced at the final hearing, the following findings of fact are made:

FINDINGS OF FACT

Parties

1. The Department is the administrative agency of the State of Florida statutorily charged with, among other things, protecting and restoring Florida's water resources. DEP's duties include administration and implementation of section 403.067, Florida Statutes, and section 373.807, Florida Statutes, and the rules promulgated thereunder in the Florida Administrative Code. Pursuant to that authority, the Department is responsible for the development and implementation of Total Maximum Daily Loads and BMAPS for waters not meeting applicable water quality standards, including those for impaired Outstanding Florida Springs (OFS).

Individual Petitioners

2. Petitioner Thomas Greenhalgh, P.G., is DEP's District Geologist for the Northeast District and the Suwannee River Water Management District (SRWMD). Mr. Greenhalgh and his wife's family own property in the Suwannee River BMAP area, including one-half mile of Suwannee River shoreline, a spring, and a farming operation. For his entire life, Mr. Greenhalgh has swum, dived, snorkeled, canoed, and fished in the Suwannee River basin and its springs, and he continues to do so. He has observed in his lifetime that the Suwannee River and springs --- once incredibly clear, with vigorous flows, unbelievable numbers of fish, and a bottom covered

in eelgrass – now have much lower flows, few fish, and an almost complete coating of algae. Mr. Greenhalgh is concerned that if the water quality of the springs systems and Suwannee River are not adequately addressed, they will remain polluted and he will never be able to enjoy them with his daughter as he did in the past. Mr. Greenhalgh contends that the Suwannee River BMAP does not adequately address nitrate loading, will allow further degradation of water quality, and consequently adversely affects his use and enjoyment of the springs and Suwannee River. [T-1036-1044]

3. Petitioner Paul Still, Ph.D., lives on Lake Sampson in Bradford County, Florida. Lake Sampson is in the Upper Santa Fe River Basin. He has used the Lower and Upper Santa Fe River and its springs for recreation since he moved to the area in 1979. He enjoys canoeing, swimming, photography, and walking and observing the environment of the river and springs. Excessive algal growth due to increased nutrients has significantly impacted Dr. Still's use and enjoyment of the river and springs, including swimming and canoeing. [T-1292-1295]

4. Petitioner James Tatum has lived on the Santa Fe River with his wife since 2003. Their property includes 400 feet of river shoreline and a small spring. There are several other springs near his residence. Mr. Tatum has been scuba diving and collecting fossils in the river and its springs since 1977 and continues to do so. He and his family snorkel, swim, kayak, and canoe and enjoy wildlife-viewing on the river and springs. He has concerns that rising nitrate levels in the springs and river are elevating the nitrate level in his wells and that proliferation of algae in the river diminishes his uses of the springs and river. When Mr. Tatum started diving in the river and springs, he could see to the bottom of the river, and springs, green plants, wildlife, and fish were abundant. Now the only plant life in the river near his residence is filamentous algae and a green scum. Mr. Tatum is aware that the Santa Fe River BMAP is supposed to

reduce nitrates in the river over a 20-year time span, but he is concerned the goals will not be met, and that over the next 20 years conditions will continue to deteriorate. [T-1187-1190]

Organizational Petitioners

5. **The Ichetucknee Alliance, Inc.**, (Alliance) is a 501(c)(3) not-for-profit organization with a mission of restoring, preserving, and protecting the Ichetucknee River and its associated springs. Formed in 2013 by advocacy groups looking out for the Ichetucknee, the Alliance presently has 173 dues paying members. All but five live in Florida, and 143 live near the Ichetucknee River in Columbia, Suwannee, Gilchrist, or Alachua County. Seven members live on the Ichetucknee River. The Alliance members use and enjoy the Ichetucknee and its springs for swimming, tubing, fishing, kayaking, photography, and for its beauty. [T-1391-1394]

6. John Jopling and John Moran are members of the Alliance. Both have enjoyed the Ichetucknee River and springs for decades, and continue to do so for swimming, tubing, kayaking, canoeing, photography, and aesthetic appreciation. Both have seen degradation of the Ichetucknee and are concerned that the BMAP will not result in improvement in water quality to restore the Ichetucknee. Both support the Alliance's challenge to the BMAP as addressing their concerns. Mr. Moran has been photographing Ichetucknee Springs for the past 34 years, including images from 1995 and 2012 showing the degradation of the springs over time. [T-1405-1408, 1411-1412, 1591-1596]

7. The Alliance is involved in many projects and activities to restore, protect and preserve the Ichetucknee and its springs. For example, the Alliance sponsors educational videos, and members participate in a river watch program, performing water clarity and other testing, and a fish count to quantify the impact of nitrates and loss of flow on fish life in the Ichetucknee.

Members also participate in regular river clean-up trips. Approximately a third of the Alliance members, about 60 members, are actively involved in these projects. [T-1394-1397]

8. The Alliance actively advocates for its members for the restoration, protection and preservation of the Ichetucknee, including advocacy with the Columbia County Commission, DEP, and the SRWMD. The Alliance previously initiated an administrative hearing to challenge the minimum flows and levels for the Ichetucknee and was granted party status for the proceeding. The Alliance participated in the development of the BMAP for the Ichetucknee by participating in public meetings on the subject and determined that the BMAP would not restore the water quality of the Ichetucknee river or springs. [T-1395, 1398, 1405-1409]

9. Thirteen members of the Alliance submitted affidavits attesting to how they use and enjoy Ichetucknee Springs. Each member expressed concern that the Santa Fe River BMAP (which includes Ichetucknee Springs) would not restore water quality of the springs and spring run, and stated how their substantial interests would be adversely affected by the BMAP's failure to restore water quality. [P-135] The interests described in the affidavits are similar to those presented by Mr. Moran and support Mr. Jopling's extensive testimony that a substantial number of Alliance members are substantially affected by these proceedings [T-1393-1405]

10. **Our Santa Fe River, Inc.**, (OSFR) is a section 501(c)(3) not-for-profit all-volunteer organization. It has approximately 100 dues-paying members, at least 90 per cent from the local area. OSFR's mission is to protect the waters and lands supporting the aquifer, springs, and rivers within the watershed of the Santa Fe River by promoting public awareness of the ecology, quality, and quantity of the waters and lands immediately adjacent to and supporting the Santa Fe River, including its springs and underlying aquifer. [T-1143-1144; P-150]

11. OSFR provides education, stewardship, and advocacy for the river and springs. It educates by providing information booths at various fairs and festivals about issues impacting the river and springs. OSFR provides stewardship for the river and springs through clean-ups about 4 times a year. Twenty to twenty-five members usually take part in these events. OSFR advocates for the river and springs by attending every SRWMD meeting and by attending county commission meetings and various city meetings. [T-1142, 1146-1148]

12. Most members of OSFR use and enjoy the river and springs by canoeing, kayaking, and swimming. Some members enjoy fishing and diving. Witnesses Michael Roth, Merrilee Malwitz-Jipson, and John Moran are members of OSFR who use and enjoy the Santa Fe River and its springs by kayaking, canoeing, swimming, photography, and aesthetic enjoyment. They have seen the river and springs degrade, and support OSFR's challenge of the BMAP to address their concerns. [T-1148-1149, 1153-1154, 1175-1176, 1592-1594]

13. On behalf of its members, OSFR participated in the development of the Santa Fe River BMAP, attending a public hearing and commenting. OSFR had concerns about the Plan's funding, enforceability, and failure to address the entire pollutant load. After participating in the BMAP development, OSFR concluded the Santa Fe BMAP was inadequate and decided to file this challenge. OSFR members support this challenge. [T-1151-1153]

14. Eighteen members of OSFR submitted affidavits describing their use and enjoyment of the Santa Fe River and springs. Each member stated their concern that the Santa Fe BMAP would not restore water quality in the river and springs, and stated how their substantial interests would be adversely affected by water quality not being restored under the BMAP. [P-136] These sworn affidavits support the testimony of Mr. Roth that OSFR's members will be substantially adversely affected by the Santa Fe River BMAP in its current form.

15. **Friends of the Wekiva River, Inc.**, (FOWR) has been a non-profit 501(c)(3) corporation since 1982. FOWR's purposes are to promote and protect the unique environmental and recreational values of the Wekiva River and its tributaries, ... "to protect the integrity of the Wekiva River Basin, to work toward restoration and continuation of the Wekiva River, its tributaries, in their natural state, to engage lawfully in the exchange and dissemination of information concerning the purposes and objectives of the corporation, and to carry on educational activities to the same end." FOWR has a dues-paying membership of 145, with 80 lifetime members. Almost all reside within the Wekiva basin. [T-1123-1126, 1136-1137; P-149]

16. FOWR provides activities for its members to use and enjoy the Wekiva River and its springs, including bird walks, field trips, and nature talks regarding the natural resources in the Wekiva Basin. FOWR also sponsors clean-up actions for the Wekiva River. [T-1128]

17. Many members of FOWR use and enjoy the Wekiva River and its springs for canoeing, swimming, snorkeling, wildlife photography, and to just enjoy the peace and serenity of the river. For example, witness Michael Cliburn and Faith Jones use and enjoy the Wekiva River and its springs for canoeing, swimming, birdwatching, and aesthetic enjoyment. They have seen degradation of the river and springs, are familiar with the BMAP, and do not believe it will restore the river and springs, affecting their use and enjoyment of the resource in the future. [T-1128-1129, 1133-1134, 1137-1140]

18. FOWR, on behalf of its members, actively participates with governmental agencies concerning protection of the Wekiva River and its springs, heading up the process leading to the Wekiva River's designation as an Outstanding Florida Water and a National Wild and Scenic River, aiding in the development of the Wekiva Protection Act, and advocating for the installation of sewers in the Wekiva Basin. [T-1131-1132]

19. FOWR, on behalf of its members, provided comments and attended meetings concerning DEP's adoption of the BMAP for the Wekiva River and springs, and DEP designated FOWR as a "stakeholder" in this BMAP development process. FOWR representatives concluded that the proposed BMAP would not adequately protect and restore the spring and river and decided to challenge the proposed BMAP. Members strongly favor pursuing the challenge. [T-1132-1134, 1140]

20. Failure of the BMAP to adequately address nitrate water quality issues in the Wekiva Basin will adversely affect substantial interests of FOWR and its members. The proliferation of algae, damage to fish and wildlife, and loss of water clarity will interfere with and damage their use and enjoyment of the river and springs. [T-1134]

21. Twenty-eight members of FOWR submitted affidavits stating how they use and enjoy the Wekiva River and its springs. Like Cliburn and Jones, each expressed concern that the Wekiva BMAP would not restore water quality of the springs and river and stated how their substantial interests would be adversely affected by the BMAP's failure to restore water quality. [P-139]

22. **The Sierra Club, Inc.** is a national organization comprised of state chapters and local groups. The Suwannee-St. Johns Sierra Club Group (Group) was authorized by the Sierra Club to file the petition challenging the Suwannee River BMAP. The mission of the Group is to explore, enjoy, and protect, by any means possible, our natural and wild spaces. There are approximately 2,300 members of the Group. [T-1156, 1160-1162, 1166-1167]

23. The Group provides information and programs for its members to use and enjoy the Suwannee River Basin and its springs, such as outdoor nature-based exploration activities. Members have expressed concern that filamentous algae are visually impacting their use and

enjoyment of the Suwannee Basin waters and springs, that fishing is diminished, that the habitat does not look like it once did because the submerged and other vegetation are changing, and that people are getting rashes from contact with these waters. [T-1168, 1173-1174, P-134]

24. Witness Christopher Mericle lives within the Suwannee BMAP basin on the North Withlacoochee River and is a member of the group. He swims almost daily in the river, and fishes, boats, and enjoys the serenity of the river. He also leads canoe and kayak trips on the river. He is concerned that if the goal of the BMAP is not achieved and water quality continues to be diminished or not restored, he will be adversely affected in his guide business, in his property values, and by loss of his intrinsic enjoyment of the river and springs. [T-1587-1589]

25. The Group, on behalf of its members, provided comments to DEP regarding the proposed Suwannee River BMAP. DEP accepted the Sierra Club as a “stakeholder” in the BMAP development process. [T-1174]

26. Seventeen members of the Sierra Club submitted affidavits stating how they use and enjoy the Suwannee River Basin waters and springs. Each expressed concern that the Suwannee BMAP would not restore water quality of the springs and river and stated how their substantial interests would be adversely affected by the BMAP’s failure to restore water quality. [P-134] All of these affidavits, like Mr. Mericle’s testimony, confirm that Club members’ substantial interests would be substantially affected if the Suwannee BMAP is not strengthened, as explained by Group Vice-Chair Merrilee Malwitz-Jikpson. [T-1156-1174]

27. **Rainbow River Conservation, Inc.**, (RRC) is a 501(c)(3) corporation incorporated in 1991. The mission of RRC is to: “Protect and preserve the water quality, the natural beauty, the riverbed, and the floodplains of the Rainbow River. Pursue this mission through education, conservation, stewardship and advocacy.” RRC consists of about 250 member families. RRC

members are mainly local, with 94 percent living in Florida. About a third of the members live on the Rainbow River. [T-1527-1529, 1531; P-151]

28. RCC provides many programs and activities to protect and preserve the Rainbow River and its springs, including providing a website and brochures to members and the public regarding the river and springs. RCC has organized an annual river clean-up for the past 30 years; typically about 150 people participate. RCC members collect data for river studies to help evaluate conditions of the river. [T-1531-1532]

29. Members of RCC use and enjoy the river and springs in a variety of ways, including kayaking, canoeing, swimming, snorkeling, and diving. Some members enjoy photographing the river and springs and sharing their photography. [T-1533]

30. Witnesses Burt Eno, Senator Dennis Jones, and Gordon Hart are members of RCC who use and enjoy the Rainbow River and its springs, including for boating, kayaking, swimming, and photography. Each has observed and become increasingly concerned with the degradation of the river and springs and stated that increases in nitrate, Hydrilla, and algae are adversely impacting their use and enjoyment of the river and springs. Each supports the RCC's challenge of the BMAP to address their concerns. [T-1542-1548, 1550-1553]

31. On behalf of its members, RCC addresses governmental agencies about issues concerning the Rainbow River and springs, including at meetings with DEP, the SWFWMD, and the Florida Department of Transportation. RCC was active in the City of Dunnellon's decisions regarding converting septic² tanks to centralized sewers. RCC participated in development of the BMAP for the Rainbow River and springs and was listed as a "stakeholder" in the proposed BMAP. After participating in the BMAP process, RCC decided to challenge the BMAP on

² Throughout, we use the term "septics" to refer to conventional septic systems and the term Onsite Sewage Treatment and Disposal System (OSTDS) to refer to advanced systems designed to reduce nutrient leaching.

behalf of its members because the BMAP would not reduce nitrates enough to restore water quality in the river and springs. RRC members support this BMAP challenge. [T-1536-1538]

32. Failure to address water quality problems related to nitrate will affect the RRC and its members because it will result in a continuing proliferation and spreading of algae, impacting the natural habitat and beauty and recreational opportunities the RRC members enjoy, such as swimming, boating, kayaking, fishing, nature observation and photography. [T-1539-1541]

33. Thirty members of RRC submitted affidavits stating how they use and enjoy the Rainbow River and its springs. Each member expressed concern that the BMAP for Rainbow River and its springs would not restore water quality of the springs and river and stated how their substantial interests would be adversely affected by this failure. [P-138] These statements corroborated the testimony of the witnesses present that RRC members' substantial interests would be substantially affected by the outcome of this litigation. [T-1527-1556]

34. **Silver Springs Alliance, Inc.**, (SSA) was incorporated in 2011. Its mission is to “protect, restore, and preserve the Silver Springs ecosystem.” It has approximately 55 dues-paying members, mostly from Marion County. [T-1178-1179]

35. SSA, on behalf of its members, communicates with governmental officials regarding matters affecting the water quality and water quantity of the springs. Witness Chris Spontak, President of the SSA, has met with county commissioners, state representatives, and state senators about springs issues. SSA previously initiated an administrative hearing challenging minimum flows and levels set by the St. Johns River Water Management District. SSA was granted party status to challenge the District in that case. [T-1181]

36. Members of the SSA use and enjoy Silver Springs and Silver River for kayaking and swimming. Witness Spontak kayaks and swims in the river and springs frequently, and has been

doing so since the 1950's. He observed that the springs and river once had glistening white sand and bright green eel grass, but over time the condition of the springs and river has deteriorated. The silver sand is now covered with a brownish-gray accumulation of dead algae. The main spring, which had been like a fishbowl in the past, is now more of an algal bowl. [T-1181-1182]

37. On behalf of its members SSA filed the petition challenging the BMAP for Silver Springs because information from scientists involved with this issue indicated that the BMAP would not accomplish the goal of reducing nitrates enough to restore the springs and river. The members were notified about this decision. [T-1184-1185]

38. Six members of SSA submitted affidavits on how they use and enjoy Silver Springs and the river. Each member expressed concern that the Silver Springs BMAP would not restore water quality in the river and springs and stated how their substantial interests would be adversely affected by the BMAP's failure to restore water quality. [P-137] Mr. Spontak knows several of these members; their sworn statements support his testimony that SSA's members' interests will be adversely impacted by the current BMAP. [T-1184-1185]

39. **Save the Manatee Club, Inc.**, (SMC) is a 501(c)(3) corporation formed in 1992. It has over 100,000 members and supporters world-wide, with 15,000 in Florida, and around 850 in Volusia County where (Volusia) Blue Spring is located. The mission of SMC is "to protect imperiled manatees and their aquatic habitat for the future." On behalf of its members, SMC is involved in government actions on local, state and federal levels that may impact manatees and their aquatic habitat. [T-1565, 1567-1569, 1578-1579; P-152]

40. SMC's efforts have been instrumental in furthering manatee conservation and scientific knowledge. SMC has established a manatee observer program, where staff and trained volunteers document manatee use of Blue Spring and provide data on life histories to further

species management efforts. Together, over 50 volunteers have documented nearly 1800 hours of observations. [P-143] SMC is also instrumental in educating the public and raises funds by allowing members to “adopt” specific manatees that populate Blue Springs. SMC maintains both underwater and above-water cameras at the springs to continuously monitor manatees on a web cam. This monitoring allows for research and for members who have adopted a manatee to monitor its activities in the springs. This “manaTV” program is very popular, with thousands of viewing hours from more than 100,000 individuals. [T-1572-1575]

41. Witness Patrick Rose, SMC’s Executive Director, has observed the degradation of Blue Springs since the 1990’s. More algae is now growing on the bottom and on plants and sunken tree branches. In the past the spring looked blue. Now it looks green. He has observed a steady increase in nitrogen levels and algal growth in the springs. [T-1564, 1566]

42. The increase in algae impacts the manatees in Blue Springs. Algae attract armored catfish, which aggravate the manatees by constantly moving over them to scrape off epiphytic materials, including skin cells. This irritation causes manatees to constantly roll and move instead of resting and conserving energy; the nuisance may drive them out of the spring into the river, where they may be exposed to cold stress and increased risk of collision with watercraft. Further increases in algae in the spring could attract other exotic species affecting manatees, such as snails that are vectors for parasitic flukes known to impact manatees elsewhere. The increase in algae also reduces visibility, which makes SMC’s manatee observation program more difficult. [T-1582-1583, P-143]

43. SMC participated in development of BMAP Blue Spring BMAP, attending meetings with DEP. DEP designated SMC as a “stakeholder” in this BMAP development. SMC determined that the proposed BMAP did not address SMC’s concerns and decided to file a

petition challenging the BMAP. Members supported and expressed appreciation for filing the challenge. [T-1579-1581, P-143]

44. Seven members of SMC submitted affidavits stating how they use and enjoy Blue Springs, that they are active volunteers with SMC, and that their use and enjoyment of Blue Spring, including their ability to engage with, observe, and appreciate manatees, is substantially adversely affected by existing water quality problems which seem to worsen, and by the anticipated failure of the BMAP to restore water quality. [P-133, P-133] Both Dr. Tripp and Mr. Rose testified that these affidavits are representative of concerns that they hear from SMC members and supporters. [T-1577-1578; P-143]

Petitioners' Experts

45. Robert L. Knight, Ph.D., was accepted without objection as an expert in springs and wetland ecology, quality assessment of surface water and groundwater, nutrient impacts in springs, and water pollution control. [T-904] There were no objections to Dr. Knight's testimony and no objections to the exhibits introduced through Dr. Knight's testimony.

46. Thomas Greenhalgh, P.G., was a fact witness, and was also accepted as an expert in geology, hydrogeology, and springs. Mr. Greenhalgh was also proffered as an expert with respect to BMAPs and BMPs, but the proffer was not accepted. Mr. Greenhalgh testified primarily from his experience as DEP's Geological Survey Division expert geologist for the SRWMD area. Though Mr. Greenhalgh's testimony touched upon the effectiveness of BMPs and some BMAP projects in improving groundwater quality, this testimony was within his accepted expertise and did not include subjects exclusively requiring BMP or BMAP expertise. There were no objections to Mr. Greenhalgh's expertise during his testimony, except with respect to

questions involving the application of law because Mr. Greenhalgh was not qualified as an expert in law. [T-1034-1035]

47. Anthony Gaudio was accepted as an expert in on-site wastewater management, and on-site wastewater management industry practices, without objection. [T-1196] There were no objections to Mr. Gaudio's testimony or exhibits based upon lack of expertise.

48. Allen E. Stewart, P.E. was accepted as an expert in water quality management and environmental engineering, without objection. [T-1253] There were no objections to Mr. Stewart's testimony based on lack of expertise.

DEP's Witnesses

49. DEP's witnesses, with the exception of Richard Hicks, P.G., were staff members of DEP's Division of Environmental Assessment and Restoration who participated in the development of the BMAPs. These witnesses testified as fact and expert witnesses. Richard Hicks, P.G. is a retired administrator of the groundwater section in the Division of Environmental Assessment Restoration. Mr. Hicks was accepted as an expert in the fields of geology and the fate and transport of groundwater pollutants. [T-300-302]

The Basin Management Action Plans in Question

50. These proceedings were brought by the foregoing nine Petitioners under joint representation, plus Dr. Paul Still, *pro se* separately. The Amended Petitions filed by the nine Petitioners challenge five BMAPs: the Santa Fe River BMAP; the Silver and Rainbow Rivers BMAP; the Suwannee River BMAP; the Volusia Blue Spring BMAP; and the Wekiwa Spring and Rock Springs BMAP.

51. BMAPs were previously adopted for the Santa Fe River basin in 2012 and for Silver Springs, Rainbow Springs, and Wekiwa River/Rock Springs in 2015. The 2018 BMAPs for these

water bodies are revisions or replacements of those earlier BMAPs. The 2018 BMAPs for Suwannee River and Volusia Blue Spring are the first for those waters.

52. DEP was required, under section 373.807, Florida Statutes, to develop and implement BMAPs for all OFSs for which an impairment determination had been made under the numeric nutrient standards in effect for spring vents. For these BMAPs, the relevant standard is 0.35 milligrams of nitrate per liter (0.35 mg-N/l), with the exception of Wekiwa Spring and Rock Springs, where the standard is 0.286 mg-N/l. Of 30 OFSs designated in section 373.802(4), Florida Statutes, DEP classified 24 as impaired for nitrate, and 15 of the 24 are contained within the areas of the five BMAPs challenged in these proceedings. In other words, this proceeding is concerned with one-half of all impaired OFSs.

53. Both Dr. Knight and Mr. Greenhalgh testified that nitrate levels have increased significantly in OFSs in recent decades and are continuing to increase. Impacts of elevated nitrate levels in springs are severe. Native aquatic vegetation has been largely replaced or smothered by noxious, filamentous algae and other algae, biological productivity has been reduced significantly, and invertebrate and fish populations have plummeted. Mr. Moran provided pictorial evidence that OFSs are no longer “pools of stunning blue wonder” but are “in ecological collapse.” These are some of the signs of impairment that these nitrate BMAPs are intended to eliminate within the next 20 years. [T-938, 940, 941, 943, 1455, 1593, 1596]

54. Point sources of nitrogen are regulated by NPDES permits and ERPs; non-point source pollution is the main concern in these proceedings. Most nonpoint source nitrogen that leaches into groundwater comes either from land application of urban and agricultural fertilizer, or from human and animal waste. In the Suwannee and Santa Fe BMAP areas, agricultural fertilizer and livestock waste are by far the largest sources of nitrogen; in the Silver and Rainbow

BMAP areas, septic leach about as much as agricultural sources; in the Wekiwa/Rock and Volusia Blue Spring BMAPs, leaching from septic and urban turfgrass fertilizer predominates. [See pie charts in section 2 of each BMAP showing loading to groundwater by source.]

55. Section 403.067, Florida Statutes, requires BMAPs to achieve the total maximum daily load (TMDL), the calculation of which must establish “the amount of a pollutant that a water body or water body segment may receive from all sources without exceeding water quality standards.” Similarly, section 373.807(1)(b)(8), Florida Statutes, requires that a BMAP for an OFS must “include at a minimum, ... an implementation plan designed with a target to achieve the nutrient total maximum daily load no more than 20 years after the adoption of a basin management action plan.”

The Global Issue

56. The Petitioners contend that these BMAPs are invalid because they are not designed to achieve the TMDLs, as required by sections 373.807 and 403.067, Florida Statutes, and fail to implement provisions of these laws. Referring to the Santa Fe BMAP, witness John Jopling perhaps expressed Petitioners’ views best: “... the statute doesn't say you gotta come up with this plan unless it's hard. They don't say you gotta come up with a plan unless the plan would include stepping on somebody's toes. They say come up with a plan to reduce these. You must. You shall. And this plan manifestly on its face, if we take the DEP at a hundred percent face value, simply doesn't do that.” [T-1407-1408]

Nitrogen-Reduction Credits Identified in BMAPs Are Insufficient

Credits Are a Fraction of the Required Load Reduction

57. For a BMAP to be successful, it must include nitrogen-loading reductions sufficient to lower nitrate concentrations at the spring vent to 0.35 mg/l or less within 20 years. DEP

expresses these reductions as reductions in nitrogen-loading to groundwater, but Dr. Knight pointed out that they can be calculated either as reductions in loading to the land surface or to groundwater. [T-954]

58. Mr. DeAngelo testified that the number of pounds-N/year that must be reduced at the spring vent is calculated by multiplying nitrate concentrations at the vent by average flows at the vent during a relevant period-of-record, and comparing that result with the TMDL requirement. Petitioners agree that each subject BMAP contains a reasonable estimate of the required nitrate reductions. For example, in the Rainbow River, the “Load reduction to meet the TMDL at the spring vents is 1,783,607 lb-N/yr.” [T-358; JE-2, Table 8b, p.53)

59. For a BMAP to succeed, reductions in nitrate load to groundwater should equal or exceed required reductions at the spring vent. Whenever DEP proposes a lesser reduction, the BMAP must explain the seemingly impossible – namely, how the load reduction required at the vent could be achieved through a lesser reduction “upstream” of the vent. [T-1007]

60. However, in 12 of the 15 OFSs relevant to this challenge, DEP proposed nitrogen-reduction credits based on policies and projects that fall far short of the required reductions at the vent. Data contained in the BMAPs themselves, and summarized in column 8 of P-48, indicate that for the Santa Fe BMAP, nitrate-reducing credits in lbs.-N/year are only 26 percent of the nitrate reduction needed to meet the TMDL. Dr. Knight noted the same lack of reduction credits characterizes the Silver/ Rainbow, and Suwannee BMAPs, where the corresponding percentages are 52 to 68 percent, 18 to 23 percent, and 48 percent, respectively. [T-987-988; P-48]

61. Testimony from DEP witnesses was inconsistent on the question of whether the credits contained in the BMAPs are sufficient to meet the TMDLs. Mr. Frick opined that this shortfall between policy and project credits on the one hand, versus reductions required by the

TMDL on the other, is irrelevant – “comparing apples to oranges.” He contended that “the activities that we’re asking the sources to do will meet the [TMDL at] the spring vents.” Mr. DeAngelo concurred, although he did acknowledge that comparisons are useful in determining the appropriate “policy envelope”. [T-88, 167, 877, 1617]

62. Other DEP witnesses, however, disagreed with Mr. Frick and Mr. DeAngelo. Mr. Hansen noted that “at this point we do not have enough documented reductions to achieve that [Suwannee] TMDL.” Ms. Paulic opined similarly that: “We have targets that we want -- we have targets over the next 20 years to reach those [for the Silver/Rainbow TMDL]. Right now, [we] do not have adequate projects to meet those goals.” Mr. Hansen and Ms. Paulic did not testify that the pounds of credits are less than the reduction in pounds needed at the vent. Rather, they testified that the credits are inadequate to achieve the TMDL. Neither qualified their concern with references to uncertainty about fate and transport of nitrogen. [T-696, 745]

63. DEP provided no good explanation for the notion that a smaller reduction in nitrogen loading can produce a larger nitrate reduction at the spring vent. For the Rainbow River BMAP, for example, DEP did not explain how a reduction to groundwater of 321,680 lbs-N/year could possibly lead to a nitrate reduction at the spring vent of 1,783,607 lbs-N/year. Mr. Frick offered two unsatisfactory explanations. He speculated that assuming 50 percent of what’s emerging from a spring vent comes from a one square-mile area, then reducing loading from that small area could have an amplified impact on pollution at the vent. Mr. Frick cited the upgrade to the Tallahassee wastewater treatment plant and the subsequent declining nitrate levels at Wakulla Springs as an example. [T-171; P- 140, p.52]

64. Mr. Frick’s testimony regarding the Tallahassee plant was purely anecdotal. Wakulla Spring is not in issue in this proceeding, and Mr. Frick provided no analysis to back up his claim.

Thomas Greenhalgh, P.G., explained that, based on his knowledge and experience, the declining nitrate levels at Wakulla Springs are largely due to dilution from increased flows of clean water from the Apalachicola National Forest, as opposed to the upgrade of the wastewater treatment plant. [T-1488]

65. Neither example applies to the BMAPs at issue. The mathematical assumptions in Mr. Frick's argument are not reasonable; reducing a load in a small area cannot result in a larger load reduction at the vent. [T-1007]

66. Further, as indicated in Appendix B of all of these BMAPs ("Projects to Reduce Nitrogen Sources"), there are no concentrated sources of pollution, such as a highly polluting one square-mile area or a relatively compact wastewater spray field, identified in any of these BMAPs. Sources of pollution identified in these BMAPs are numerous and widely dispersed. DEP is clearly aware of this, since none of DEP's policies or projects in these BMAPs target small geographically confined areas. (See project lists in Appendix B of JE-1, 2, 3, 4, and 5]

Fate and Transport of Nitrate in the Aquifer

67. Mr. Frick conceded that nitrogen-reduction credits fall short of the requirements in TMDL rules, but claimed in several discovery requests that "Because fate and transport of nitrogen is unknown, it is not possible to say that for each pound of nutrient loading to groundwater, a certain amount of loading at the spring vent will occur. Therefore, a comparison of those two numbers is not useful." [T- 88] [E.g. P-100c, Discovery Request No. 10]

68. However, despite Mr. Frick's invocation of the fate-and-transport explanation, the testimony of other DEP witnesses acknowledged, implicitly or explicitly, that nitrate-reduction credits should equal or exceed the nitrate-reduction needed at the vent to meet the TMDL.

69. Mr. DeAngelo clearly acknowledged this linkage on four occasions during his testimony: (1) “When you look at the amount of load reduction to groundwater that we’re achieving through our policies in the Wekiwa and the Volusia BMAP compared to the targeted reductions we need at the spring vent, we’re well over -- that number is much larger than the number at the spring vent;” (2) “We’re two or three times what that load reduction at the vent in numerical value is in our load to groundwater;” (3)) “If that line item in Volusia and Wekiwa for septic was half of what it currently is, we would still have more reductions in load to groundwater than -- than the load reduction target at the vent;” and (4) “Even if you were to take in half that line item in those tables that are attributable to septic, you still, in our opinion, would have enough reductions. You know, that’s those two numbers. The load to groundwater reductions would still be larger than -- than what our target would be for reductions at the spring vent.” [T- 389, 472-473, 1613]

70. In addition to these implicit acknowledgements, DEP’s explicit acceptance of the link between nitrate-reduction credits and needed nitrate-reductions at the vent is shown by the “gap analysis” contained in draft BMAPs. For example, section 2.11 of the draft Suwannee BMAP clearly indicates that reduction credits need to be as large as the TMDL target reduction. [P-84]

71. DEP acknowledged: “The current gap in necessary projects to achieve the TMDLs is 1,999,761 lbs-N/yr.” Table 11 at the bottom of this page shows that 1,999,761 lbs-N/yr is exactly the difference in lbs-N/yr between credits and the required reduction to comply with the TMDL at the vents. Although DEP contended that “a comparison of these two numbers is not useful,” the “gap analyses” in these draft BMAPs show that, in the final months preceding the June, 2018 release of the BMAPs, DEP considered this comparison quite useful and considered equivalent reduction credits quite necessary. [P-84, P-100c, p.57]

72. Petitioners agreed with DEP that there is uncertainty concerning the exact fate and transport of nitrates in groundwater, but Mr. Greenhalgh noted that the fate of non-attenuated nitrogen is obvious; it reaches the aquifer and is discharged from a spring vent. The problem with DEP's reliance on the fate/transport argument is that it allows the Department to suggest that any load reduction quantity they select is consistent with the law. [P-140, p.51]

73. Rather than invoking uncertainty and proposing legally insufficient credits, DEP had two viable alternatives for proposing credits sufficient to achieve the TMDLs.

74. First, DEP could have determined the amount and allocation of required credits by using percentage reductions for non-point sources recommended in TMDL rules. For example, the Silver River TMDL rule specifies that "The Load Allocations for nonpoint sources are to address anthropogenic sources in the basin such that in-stream nitrate concentrations meet the TMDL target, which, based on the mean concentrations from the 2000-2011 period, will require a 79 percent reduction of nitrate." DEP's Nutrient TMDL Report for Silver Springs is equally explicit: "To achieve the monthly average nitrate target of 0.35 mg/L in Silver Springs, the Silver Springs Group, or the Upper Silver River, the nitrate loads that result from inputs of nitrogen from nonpoint sources need to be reduced by 79%." [P-14, p.66; P-9, 20c]

75. To be consistent with the TMDL rule, DEP could have simply required in the Silver BMAP that loading to groundwater from each source-category shown in its NSILT "pie charts" would have to be reduced by 79 percent. Section 403.067(6)(b), Florida Statutes, identifying ten considerations that may be applied in allocating the TMDL, provides DEP with flexibility to make some equitable adjustments to these reductions. [JE-2, Fig.3a. p.47]

76. Dr. Knight highlighted an alternative means of assigning and allocating nitrogen-reduction credits. His testimony regarding the Blue Water Audit tool showed that estimates of

nitrogen applied to the land surface may be credibly linked to amounts of nitrogen exiting the vent. Dr. Knight testified that the percentage reduction needed at the vent should be similar to the percentage reduction in nitrogen applied to the land surface. Mr. Frick dismissed this idea as “not scientifically defensible,” despite the fact that data in the Blue Water Audit are more detailed and specific than data used for NSILT analyses. [T-174, 951-955, 959, 991] During his testimony regarding P-46, Dr. Knight explained how a tool like the Blue Water Audit could enable DEP to allocate nitrogen reductions to categories of nonpoint sources in the Silver BMAP area.

77. However, rather than utilizing either of these options for complying with the clear language of the TMDL rules, DEP chose in these BMAPs to cite lack of scientific exactitude as justification for proposing insufficient credits to comply with the TMDL rules. [T-961]

*DEP’s Selection of a Total Number of Credits
to Target TMDL Compliance Is Completely Arbitrary*

78. Each BMAP includes a table showing amounts in lbs-N/yr for “Total Credits from BMAP Policies and Submitted Projects” and amounts in lbs-N/yr for “Load reduction to meet the TMDL at the spring vents” (for example, Tables 8a and 8b in JE-2, pp. 52-53).

79. As explained above, it is not scientifically reasonable or legally defensible for DEP to propose a number of credits smaller than the required reductions. [T-953, 959, 1008, 1487]

80. As Mr. Hansen acknowledged, there is no number in the Santa Fe BMAP for “required load reduction to groundwater.” In fact, there is no such number in any of the BMAPs. Consequently, there is no explanation in any of the BMAPs to show why a particular amount of credits is sufficient to target the required load reduction. [T-712]

81. After claiming in his deposition that credits of 487,000 to 632,000 pounds could result in reductions at the spring vent of 930,000 pounds, Mr. Frick stated that even a 200,000 pound reduction to groundwater could lead to a 930,000-pound reduction at the vent (P-140,

p.51). Taking Mr. Frick's rationale to its logical conclusion, a reduction of 100,000 pounds or 100 pounds or even 1 pound would be sufficient to meet the TMDL and comply with the law.

82. By citing uncertainty associated with fate and transport of nitrates in groundwater, and by contending that small reductions in load to groundwater can somehow be magnified into larger reductions at the spring vent, DEP freed itself to choose **any number at all** for the required reduction in load to groundwater, and assert that number is sufficient to reach a TMDL. [P-140, p. 51] DEP could apparently fill in any number for the "credits" and assert that the BMAP will meet the TMDL on the basis that what happens within the aquifer is a complete mystery. This is the most significant and consequential scientific error in these BMAPs.

83. The pie-charts, or NSILTs, provide no linkage between credits and the reductions required. Ms. Lyon testified that the NSILTs, although valuable for estimating nitrate-loading to groundwater, were not used to calculate the amount of credits necessary to comply with the TMDL rules. [T-636]

84. Each BMAP contains a figure in pounds-N/yr for "Total Credits from BMAP Policies and Submitted Projects." The total value for "credits" is simply the sum of BMP-based reductions plus the credits from projects provided to DEP by various entities. The final lists shown in Appendix B of these BMAPs are not the result of transparent calculations determining the amount of credits needed to comply with the TMDL. They are simply an unsubstantiated tally of what DEP hopes would come from identified projects and policies.

85. In summary, these BMAPs do not show how DEP calculated either the amount of reductions to groundwater provided by projects and policies, or the amount of credits needed to comply with the TMDL. DEP simply collected a list of projects and policies and, whatever their

total, declared them to be sufficient to comply with the law, even in cases where the sum of the credits from these projects is far less than the required reduction at the spring vent.

86. Mr. Frick claimed that “We did the major allocation to the entire geography, the entire watershed” But in fact, DEP did not do **any** allocations in these BMAPs, as Mr. Frick’s labored explanation [T-179-180] makes clear; there is in fact no number in the BMAPs for required reductions to groundwater; nor is there one for the entire springshed. The BMAPs include target load reductions at the spring vents (a simple mathematical calculation) and long lists of policies and projects, but no credible plans designed to achieve the targets.

87. Mr. DeAngelo touted occasions in BMAPs when credits appeared to exceed the required reduction. When the credits fell short, he fell back on uncertainty over fate and transport. [T-472, 882]

Volusia and Wekiwa BMAPs

88. Projections shown in column 8 of P-48 demonstrate that, for the Santa Fe, Silver/Rainbow, and Suwannee BMAPs, nitrate-reducing credits from policies and projects fall far short of the nitrate reduction required to meet the TMDL. However, the Volusia and Wekiwa BMAPs list credits from policies and projects which exceed the nitrate reduction required to meet the TMDL. [P-48]

89. As found below, however, credits in the Volusia and Wekiwa BMAPs are over-estimated significantly – enough in fact to render these BMAPs non-compliant as well. The reasons for this over-estimation are found in the findings that follow below.

Calculation of Needed Load Reductions

90. During the hearing, both Ms. Homann and Mr. Frick were asked to discuss seven letters which four organizations addressed to Ms. Homann between September 2017 and June

2018 – i.e. in the year leading up to DEP’s approval of the BMAPs. These seven letters, dealing with the Volusia and Wekiwa BMAPs, argued that DEP’s methods for accurately determining required nitrogen reductions were deeply flawed. Both Mr. Frick and Ms. Homann claimed they did not recall the contents of the letters. Three of these letters were signed by witnesses in this proceeding: two by Mr. Mike Cliburn, a standing witness for Friends of the Wekiwa River and one by Dr. Katie Tripp, expert witness for Save the Manatee Club. [T-164, 851]

91. In the Volusia BMAP, the annual N-load to groundwater is shown as 514,094 pounds. But the BMAP indicates that only 32 percent of this load, or 162,500 pounds, is discharged at the spring vent. So for any BMAP load reduction of 100 lbs. to groundwater, nitrogen discharging from the spring would only be reduced by 32 lbs. Had DEP followed the recommendations contained in these seven letters, it would have had to identify three times as many credits as are contained in the Volusia BMAP. [T-853] [JE-4, Table 3, p. 21; JE-4, Table 4, p. 25]

“Policy Envelopes”

92. Mr. DeAngelo noted on several occasions that errors in certain BMAP calculations documented by Petitioners were not critical because corrected calculations would not change the “policy envelope”. [E.g. T-390, 414, 473] Mr. DeAngelo’s use of the term “policy envelope” refers to a range of four options created by DEP for applying septic upgrades. [T-366]

93. Two issues arise regarding DEP’s use of the term “policy envelope.” First, the term appears nowhere in law or in any of these five BMAPs. Nor does DEP make the argument in any BMAP that errors are excusable because the “policy envelope” would be unchanged.

94. Second, and more importantly, whether an error in calculation or in concept changes a DEP “policy envelope” is irrelevant to whether a BMAP complies with the law. What is relevant is the fact that errors and faulty assumptions accumulate and affect whether a BMAP is

consistent with the law. The implication that errors don't matter if they don't change the "policy envelope" is a red herring. The statutes require that a BMAP must show a path to TMDL compliance, not that a "policy envelope" is unchanged even though mistakes litter that path.

Agricultural Best Management Practices (BMPs)

BMPs Relevant to These BMAPs Are Unverified

95. Mr. Hansen testified that DEP has only performed confirmatory verifications of the nitrate reduction efficiencies of BMPs for leatherleaf fern and ridge citrus, but for none of the agricultural activities predominating in these BMAP areas – namely, vegetable/agronomic crops, cow/calf operations, equine operations, and dairies. DEP has no schedule for undertaking these verifications. [T-729, 730, 758, P-142, p. 233]

96. Mr. Greenhalgh opined that confirmatory verification of agricultural BMPs would require substantial monitoring of nitrogen-leaching to groundwater under different agricultural regimes. DEP has not attempted to perform these verifications, even though Mr. Frick confirmed that DEP has a rule in place that could be used to verify existing BMPs. Mr. Greenhalgh testified that unverified BMPs should not be assigned nitrogen-reduction credits, for the simple reasons that they are unverified. [T-233, 1099-1100, 1467]

Ineffectiveness of BMPs in Reducing Leaching of Nitrogen to Groundwater

97. Notwithstanding DEP's initial verifications of agricultural BMPs, their efficacy in reducing nitrogen-leaching in karst environments is questionable. Mr. Greenhalgh noted that "there is not a BMP that has been adopted by agriculture that has been verified by DEP to be effective at a representative site with a groundwater study involved." [T-1099]

98. In calculating nitrogen-reduction credits in all five BMAPs, DEP assumes that owner-implemented BMPs will reduce 15 percent of the loading to groundwater from dairies, 10

percent of the loading from livestock waste, and 15 percent of the loading from farm fertilizer. (e.g. JE-3, pp.15-16]

99. Dr. Dukes, DEP's expert witness on agriculture, stated that he did not know how these reductions were determined. Mr. Coyne and Mr. Hansen testified that the basis for these presumed reductions is spelled out in DEP-26 and DEP-27. However, these two exhibits explain very little. Each is only one page in length. DEP produced no comprehensive report summarizing the findings of the studies referenced in these exhibits, nor is there any indication that either exhibit or the studies listed were peer-reviewed. Further, DEP Ex. 27 was only completed **after** the BMAPs were adopted by the Department and subsequently challenged by Petitioners. [T-554, 601, 717; P-144, p.35)

100. The insubstantial nature of these exhibits is surprising since, in three BMAPs, agricultural BMPs are critical to DEP's estimates of "credits to load to groundwater." Credits claimed from BMPs for dairies, livestock waste, and farm fertilizer comprise:

- 61.4 percent of the "Total Credits from BMAP Policies and Submitted Projects" in the Santa Fe BMAP [JE-1, Table 11, pp. 34-35];
- 57.5 percent of the "Total Credits from BMAP Policies and Submitted Projects" in the Suwannee BMAP [JE-3, Table 10, p.38]; and
- 37.9 percent of the "Total Credits from BMAP Policies and Submitted Projects" in the Rainbow Basin [JE-2, Table 8b, p.53].

101. Neither DEP-26 nor DEP-27 references any level of reduction in nitrogen leaching to groundwater from dairy BMPs. Yet, collectively in the Santa Fe and Suwannee BMAPs, DEP credits dairy BMPs with 58,066 lbs/yr in nitrogen reductions. [T-1005, 1102; JE-1, 3]

102. Livestock wastes are highly significant to these BMAPs, constituting 42 percent of the groundwater pollution in the Rainbow BMAP area [JE-2, p.44], 29 percent in the Silver BMAP area [JE-2, p.44], and 21.5 percent in the Suwannee BMAP area [JE-3, p.31]. DEP-26 lists two studies (neither of which was conducted in a karst environment) supposedly supporting the 10 percent reduction claimed for livestock BMPs. However, the exhibit notes that “effectiveness of implementing livestock waste BMPs is difficult to quantify.” DEP’s rationale – that the claimed reduction “may be achieved mainly through efforts to keep animals from congregating in small areas” – seems very dubious indeed since even widely dispersed livestock will still produce waste. Dr. Knight testified that effective BMPs would require either “giant buffer areas around these farms, or you reduce... the number of animals”. [T-981]

103. DEP Ex. 27 lists four studies to justify the claim of a 15 percent load reduction from farm fertilizer. None of the first three studies are relevant to these BMAPs because they do not include field verification of BMP effectiveness in reducing nitrogen loads to groundwater. The first is a modeling study, not a field study; the second analyzes recent decreases in fertilizer use by watermelon growers (i.e. it has no relevance to future nitrogen reductions from BMPs); the third is a 20-year old study of surface runoff from a non-karstic area of Florida.

104. The fourth study listed in DEP-27 is P-99 (referred to in the hearing as the “Wendy Graham study”), published by UF-IFAS and SRWMD in 2008. It is the only comprehensive study in Florida of the effectiveness (or lack thereof) of BMPs in reducing nitrate pollution of groundwater. The study includes this summary statement: “It may be difficult to achieve acceptable nitrate conditions without the implementation of additional BMPs”. This conclusion was supported by the testimony of Mr. Frick: “And so we think that that (AAPPs) are also needed for us to be able to achieve our goal. [P-99, p.3; T-151]

105. Dr. Knight testified that the Graham study showed very limited if any benefits from row crop BMPs and no benefit at all from poultry and dairy BMPs. [T-979] Mr. Greenhalgh noted that “at the row crop site, you leach 40 to 70 percent of the applied nitrogen . . . , and they all exceeded the drinking water standard multiple times” and believed the study showed that BMPs “don’t work.” [T-1102; P-99]

106. DEP Ex. 27 cites this finding from page 3 of this 2008 report as justification for their 15 percent credit from farm fertilizer BMPs: “The study concluded annually nitrate reductions in groundwater ranged from 5.4% to 21.1% with and (sic) average of 13%.”

107. However, the following statement on page 3 of the report shows that even the 13% figure is unreliable: “BMPs consisted of reduction of fertilizer amounts and improved timing of fertilizer applications.” These are not practices included in adopted BMPs. Unless and until IFAS changes its recommended rates of fertilizer application for agronomic crops, reducing fertilizer loading as part of a research project is neither an example of a BMP’s efficiency, nor proof of BMP effectiveness. It merely confirms the obvious conclusion that reducing the amount of fertilizer applied to a field will reduce the amount of nitrate leaching to groundwater.

108. Faced with the paucity of studies regarding nitrate leaching to groundwater in karstic areas, DEP looked to studies of nitrate run-off to surface waters. In response to Discovery request No. 4 from all petitioners [e.g. P-100c], DEP cited a “Study showing that applying attenuation and recharge factors to surface water percent reductions from agricultural BMPs to ‘convert them’ to groundwater percent reductions results in percent reductions around 10 percent.” However, when questioned about this “study”, Mr. DeAngelo indicated that there is in fact no such study, and that the 10 percent figure came from a “back of the envelope

calculation”. [P-142, p. 259-260]. Reliance on unsubstantiated back-of-the-envelope calculations is not an example of utilizing sound science or the best available information.

109. DEP made other unwarranted assumptions in calculating credits from agricultural BMPs. First, Mr. Frick confirmed that DEP assumes throughout that there will be 100% compliance with BMPs. This assumption is problematical, especially since producers self-report compliance and some no doubt believe that compliance will hurt their bottom line. Shown data on spotty BMP compliance and asked whether he was concerned that the enrollment goal of 100% may be overstated, Mr. Coyne admitted that “my optimism is dropping.” [T-222, 598]

110. Secondly, Ms. Lyon stated that fertilizer rates used in NSILT analyses are at or close to the IFAS-recommended rates. However, Mr. Greenhalgh pointed out that producers frequently exceed the IFAS rates, often by a significant amount. Dr. Dukes, DEP’s agricultural expert, agreed that some producers fertilize at rates 50 percent higher than the IFAS recommendations. [T-639, 1381, 474; P-144, p. 41]

111. Even assuming that DEP’s credits of 15, 15, and 10 percent for various agricultural BMPs are reasonable, and if one further assumes that compliance with these BMPs will be universal and perfect, these limited reductions will not enable BMAPs to come close to meeting the TMDL targets, at least in the Santa Fe, Silver/Rainbow, and Suwannee BMAPs. Mr. Coyne agreed with this conclusion. A memo provided to the petitioners from Mr. Coyne’s file states that, for the Silver/Rainbow BMAP, “Expand BMP tools as needed for all sources. Current BMPs do not adequately address needed loading reductions.” [T-578, 588; P-92]

112. In other words, at least three of these BMAPs are certain to fail unless much more aggressive agricultural BMPs or projects are put in place. But there is no indication in the BMAP documents or testimony that this is a priority, or even a possibility. DEP has sufficient authority

to recommend commencement of rule-making for advanced BMPs, but Mr. Coyne stated that DEP has not made this recommendation and the BMAPs are silent in this regard. [T-568]

BMPs in Place for Years Have Not Been Proven Effective

113. Implementation of agricultural BMPs has been required in the Santa Fe River Basin since the area's first BMAP was adopted in March 2012. Citing DEP data from the Santa Fe Priority Focus Area (PFA), Dr. Knight testified that, despite implementation of BMPs, median nitrate-N concentrations in groundwater from sampled wells showed a statistically significant increase during the five-year period from 2013-2017, and "there's no way they could meet the TMDL requirements.". Most of the large tracts of commercial agricultural acreage were enrolled in the BMP program. DEP reached a similar conclusion from these data: "No significant decreases in nitrate-N concentration were observed over the four-year period in the sampled springs or Santa Fe River sites." [T-911, 980, 1004; 1102, P-23, pp. 6, 38; DEP-39, p. 7]

114. Mr. Greenhalgh testified that the Suwannee River Partnership was established in the 1990s to provide agricultural producers who signed up for BMPs with a presumption of compliance with water-quality standards. He noted that 94 percent of all producers signed up, but these measures were ineffective. In the intervening 20-plus years, nitrate levels in groundwater and in OFSs in the Suwannee Basin have increased markedly. [T-1453, 1456, 1457]

115. Mr. Greenhalgh's testimony raised another important issue relating to DEP's claims regarding benefits of BMPs. If 94 percent of all producers in the Suwannee BMAP area signed up for BMPs many years ago, it is unreasonable for DEP to assume that BMPs will produce an additional 15 percent reduction in nitrate pollution in the Suwannee Basin in the future. The assumed benefits of these long-implemented BMPs should already be included in the baseline water quality data. [T-1453, 1466]

Additional Agricultural Policies and Practices

116. Each of the five subject BMAPs include a table showing potential credits to meet the TMDL. Each table includes a line for “Advanced Agricultural Practices and Procedures” (AAPPs), with this stipulation: “Includes 10% to 50% reduction from 100% of fertilized acres.” [e.g. JE-1, Table 11, pp. 34-35]. The credits claimed from AAPPs are substantial. For example, in the Santa Fe BMAP, DEP claims credits up to 774,244 lbs-N/year from AAPPs, a total which dwarfs credits of 473,889 lbs-N/year from all other “BMAP Policies and Submitted Projects.”

117. DEP provided contradictory testimony on whether it counted AAPPs as N-reduction credits. Mr. Frick stated that “There needs to be a program for advanced agricultural practices and procedures. And so we think that that is also needed for us to be able to achieve our goal.” On the other hand, in discovery, DEP denied that it had included these AAPPs “as part of this BMAP’s estimated load reduction to achieve the TMDL within 20 years.” When asked directly about these conflicting positions, Mr. Frick responded “I’m gonna go with the – how we answered.” In other words, he denied in direct testimony that DEP intended that presumed credits from AAPPs should be counted toward achieving the TMDLs. Mr. DeAngelo concurred with this assessment. [T-140, 151, 159; P-100f, Discovery Request No. 10] According to DEP, AAPPs are listed “for context, to show the range of nutrient reductions potentially achievable through a 10 to 50 percent reduction of loading on 100 percent of the fertilized acres in the springshed.” When asked “what the data was or the basis for getting this 10 to 50 percent reduction of nitrates from those additional practices,” Mr. Frick had no answer, nor did DEP provide any evidence that the practices would be adopted, as assumed by DEP, on all available acres. Unlike agricultural BMPs, Mr. Frick confirmed that none of these AAPPs have been adopted by rule, nor is rule-making underway to adopt them. There are no data in any BMAP

showing whether or not they will work, nor is there any information on whether producers would actually implement any of these AAPPs. [T-153, 156; P-100f, Discovery Request No. 11]

118. Table 14 of the Suwannee BMAP [JE-3, p.47] is an example of how DEP arrived at highly speculative load-reduction credits from these AAPPs. A 10% reduction in N-leaching on every available fertilized acre in the BMAP area would yield a credit of 579,498 lbs-N/year, while a 50% reduction would yield a credit of 2,897,490 lbs-N/year. As Mr. Greenhalgh pointed out, since AAPPs lack verification, funding, and monitoring, these numbers are “placeholders” – mathematical calculations that have no actual basis in reality on the ground. [T-1096]

119. Inclusion of nitrate load reductions from AAPPs in these BMAPs, with no evidence that rulemaking to adopt them is initiated or imminent, nor evidence of their acceptance in the agricultural community, is entirely speculative and without foundation. Inclusion of these AAPPs in the “credits” tables only serves to sow confusion regarding the strategies underlying the BMAPs. It is unreasonable to assume that AAPPs will make any impact during the lifetime of the BMAPs, and any credits attributed to them should be ignored. [T-151]

Future Growth in Agriculture

120. In addressing the load reduction to groundwater that must be achieved within 20 years, DEP assumes in these BMAPs that the sources of the loading to groundwater in year 20 will be identical to the sources of the current loading – i.e. there will be no new sources of loading in 2039 that aren’t present in 2019. This is apparent because in each BMAP, the total load reduction in pounds targeted for year 20 is the same reduction that the BMAP requires for the 2018 estimated load. [e.g, see JE-5, pp.13, 27 and similar citations in the other BMAPs] The loads to groundwater from those current sources are calculated with NSILT.

121. Mr. Frick confirmed that DEP did not adjust the future groundwater load by adding additional loading that will occur over the next 20 years due to growth in agriculture. Mr. Frick acknowledged that growth may well occur, but stated that BMAPs do not have to analyze the impacts of that growth; rather they only have to “identify mechanisms” to deal with that growth. However, merely “identifying” the same mechanisms that have not been proven effective in the past – i.e. agricultural BMPs – is surely not the intent of the statute. [T-205, 226, 232]

122. The five BMAPs in question contain neither quantitative estimates of growth in agriculture over the next 20 years nor assessments of the impact of that expected growth on nitrogen loading.

123. The Florida Department of Agriculture and Consumer Services (FDACS) produces an annual report entitled “Florida Statewide Agricultural Irrigation Demand.” In the most recent FSAID report, dated June 28, 2019, FDACS estimates that growth in agricultural irrigation demand will be very large in the SRWMD area. For counties within the Santa Fe BMAP area, irrigated acreage is projected to increase by 26 percent and estimated irrigation demand is projected to increase by 34 percent during the period of BMAP implementation – namely, 2020 to 2040. [T-995, P-35, P-50]

124. For counties within the Suwannee BMAP area, irrigated acreage is projected to increase by 37 percent and estimated irrigation demand is projected to increase by 50 percent during the same period. [T-995; P-50]

125. Mr. Greenhalgh, the official State Suwannee Basin Hydrogeologist, testified that agricultural irrigation does not occur without application of fertilizers, so that any percentage increase in irrigation will be reflected in a comparable percentage increase in fertilizer use.

Thus, over the next 20 years, one can reasonably expect increases in farm fertilizer on the order of 35 to 50 percent in the Santa Fe and Suwannee BMAP areas, respectively. [T-1436]

126. DEP provided several unconvincing rationales for why it ignored FDACS's projections of agricultural growth. First, DEP claimed that it lacked this information; in several identical discovery responses, DEP stated that "No specific analyses were submitted to the Department with respect to forecasts of population growth or increases in agricultural activity for the Silver-Rainbow BMAP area." [E.g. P-100g, Request No. 10] Yet, key DEP personnel were clearly aware of the FSAID projections. For example, in a power-point presentation dated November 3, 2017 – eight months before the BMAPs were approved – Ms. Lyon included a slide with the notation "Moving Forward with FSAID – Statewide Agricultural Irrigation Demand Geodatabase." [DEP-17, slide 11]

127. Another rationale offered by DEP was that, even if it had seen the FSAID reports, they wouldn't be very useful because FSAID projections do not show exactly where agricultural growth will occur in the BMAP areas. Yet, given their familiarity with FSAID reports, DEP surely knew that Appendix B of each report contains detailed maps showing specific areas where future irrigation growth is expected to occur. [T-360, 483; P-35, Appendix B]

128. DEP's claims that it wasn't provided with appropriate data and analyses also ring false considering that projected increases in agricultural growth were clearly an issue of concern to DEP during its development of the BMAPs. For example, the 2017 draft Suwannee BMAP contained this statement: "Irrigated acreage is projected to increase 11% (36,680 acres) in the next 25 years. The associated increased load to groundwater **will need to be addressed** in addition to the current load reductions." (emphasis supplied) [P-84, p.56]

129. Each of the five BMAPs contains a section entitled “Future Growth Management Strategies” (e.g. JE-1, section 2.10 on pp. 46-47). The only strategy identified in this section to deal with agricultural growth is this: “Likewise, all new agricultural operations must implement FDACS-adopted BMPs and potentially other additional measures (section 2.6), or must conduct water quality monitoring that demonstrates compliance with water quality standards.” While this “growth management strategy” may limit future growth in nitrogen pollution from agriculture, it will certainly not eliminate or offset that growth. For example, if new agricultural operations were to add 100 pounds of nitrogen pollution between 2020 and 2040, utilizing BMPs in those operations might reduce that additional load from 100 pounds to 85 or 90 pounds. But these BMPs will assuredly do nothing to eliminate the 85 or 90 pounds of new nitrogen pollution.

130. There is no technical reason why projections of future agricultural growth could not have been folded into DEP’s NSILT analyses. Ms. Lyon stated that “the way it (NSILT) is designed now and the available data sources, it cannot do that.” But that is not the same as saying that NSILT could not have been modified slightly to do so, as Dr. Still pointed out. [T-664]

131. Much of the data fed into the NSILTs are necessarily approximations. For instance, in applying nitrogen-attenuation factors across a springshed, DEP used only three discrete “weighting factors” to account for variations in groundwater recharge: 10 percent, 50 percent, or 90 percent. [E.g. JE-3, p.91] Obviously, there are parcels where re-charge is not exactly 10, or 50, or 90 percent, but utilizing only three recharge values is a reasonable analytical short-cut. NSILT also employs a rough approximation for estimates of farm fertilizer. As Mr. Hansen pointed out, FDACs does not provide DEP with actual fertilizer application rates. [T-725]

132. So while it is true that estimates of future agricultural growth are just that – estimates – they are estimates with as much or more exactitude than the rough estimates for recharge and fertilizer applications utilized by DEP in every NSILT analysis.

133. It is telling that in these BMAPs, DEP incorporated a number of questionable assumptions (e.g. 100% BMP compliance, 100% septic replacement [T-225], 100% of OSTDS will function perfectly) that either reduced the calculated load to groundwater or increased the calculated nitrogen-reduction credits; at the same time, DEP did not incorporate other, more reasonable assumptions (e.g. the legislatively mandated projections of future agricultural growth) that would have increased the calculated load to groundwater. In short, faced with an inadequate number of nitrogen-reduction credits, DEP was not scientifically objective in choosing which assumptions and projections to utilize or not utilize in key BMAP calculations.

Future Growth in Population

134. Many of the issues discussed above under “Future Growth in Agriculture” are also relevant to analysis of future population growth in the BMAP areas.

135. In addressing the load reduction to groundwater that must be achieved within 20 years, DEP assumes in these BMAPs that the sources of the loading to groundwater in year 20 will be identical to the sources of the current loading – i.e. there will be no new sources of loading in 2039 that aren’t present in 2019.

136. Mr. DeAngelo testified that DEP did not adjust the future load to groundwater by adding in additional loading that will inevitably occur over the next 20 years due to growth in population. Ms. Paulic confirmed that no State population projections were utilized in the Silver/Rainbow BMAP, a fast-growing area. [T-360, 751]

137. Mr. DeAngelo indicated that DEP will utilize “adaptive management” to deal with future increases in population but only after this growth becomes apparent, perhaps at the time of the five-year milestone. However, there is no reason to wait five years to plan for population growth. Mr. DeAngelo himself testified that he expected Florida’s population to grow over the next five years. [T-386, 488; P-142, p. 185]

138. Reliable estimates of population growth are readily available. UF’s Bureau of Economic and Business Research (BEBR) produces annual reports which look ahead 25 years to estimate population growth in each Florida county in five-year intervals. [P-24] Dr. Knight used data from the 2019 BEBR report to show that population growth over the next 20 years in the five BMAP areas will range from roughly 10 percent in counties comprising the Suwannee BMAP to roughly 30 percent in counties comprising the Wekiwa BMAP. [P-49, T-992-995] Yet the five BMAPs contain neither quantitative estimates of population growth over the next 20 years nor assessments of the impact of that growth on nitrogen loading in the BMAP areas.

139. DEP apparently ignored BEBR’s population projections for the same reason it ignored the FDACS’s agricultural projections – because “No specific analyses were submitted to the Department with respect to forecasts of population growth or increases in agricultural activity for the Silver-Rainbow BMAP area.” [P-100g, Request No. 10] BEBR may not have submitted its 2018 and 2019 reports directly to DEP, but in fact BEBR’s reports are well established and widely utilized, and it would have been a simple matter for DEP to access them.

140. Each of the five BMAPs contains a section entitled “Future Growth Management Strategies”. [JE-1, section 2.10, pp. 46-47] Population growth is addressed in a reference to “new urban development” and in a brief discussion of standards for new wastewater treatment facilities (WWTFs) and for advanced OSTDS.

141. Dr. Knight explained that population growth will inevitably lead to growth in wastewater. This increased load from human waste will have to be treated in WWTFs or septics or advanced OSTDS systems. Greater population will also lead to more lawns, and therefore to increased applications of urban turf fertilizer. [T-994]

142. DEP's "growth strategy" may limit future increases in nitrogen pollution attributable to population growth, but it will certainly not eliminate those increases. For example, if population growth occurring under current policies would be expected to add 100 pounds of nitrogen pollution between 2020 and 2040, requiring those new residents to utilize AWT or advanced OSTDS might reduce that additional load from 100 pounds to 50 pounds. But these advanced systems will assuredly do nothing to eliminate those 50 pounds of new nitrogen pollution. Mr. DeAngelo acknowledged this when he replied in the affirmative to this question: "And would you expect that, if you had an increase in population, **that would be to some extent offset** by the installation of sewers or public treatment systems?" (emphasis supplied) [T-391]

143. Mr. Stewart testified that, while some existing septics within BMAP areas will be upgraded to more advanced systems, thereby reducing nitrogen-loading, there will be additional loading over the next 20 years from at least three new sources: advanced OSTDS in new construction on lots under one acre in PFAs; new septics on lots over one acre in the PFAs; and new septics on all lots outside the PFAs within the BMAP area. As population grows, these new systems will inevitably be installed, but projected loadings from these new systems are ignored in DEP's NSILT analyses. [T-1272]

144. DEP's own documents refer to the need to evaluate increases due to population growth. For example, on page 65 of the Nutrient TMDL Report for Rainbow Springs [DEP-1], we find this statement: "Among other components, BMAPs typically include the following: An

evaluation of future increases in pollutant loading due to population growth;” Similar statements are found in the Nutrient TMDL Reports for Silver Springs [DEP-2, p.75] and for Volusia [DEP-4, pp. 58-59]. These three TMDL Reports were approved between 2012 and 2014, but DEP chose to ignore its own sound advice when it prepared the five BMAPs a few years later.

145. DEP chose to deal with future growth in nitrogen loading by offering a vague list of “mechanisms,” most of which have proven to be ineffective in the past. The result of not analyzing and dealing with future population growth and future agricultural growth is that TMDL targets will be missed by an even greater margin.

Nitrogen Loading from Septics Is Underestimated

146. DEP made two significant errors in estimating the amount of nitrogen that reaches groundwater from conventional septic systems. These errors relate to **population factors** and **environmental attenuation factors** (EAF).

147. First, in determining the relationship between population and septic pollution, DEP used US EPA’s national average nitrogen generation rate of 9.012 lbs-N/person/year. However, DEP then applied an “effective population factor” that adjusted the number of people per household to account for daytime residential absenteeism. [T-402] Mr. DeAngelo admitted that DEP’s calculations erroneously adjusted for absenteeism, which was already taken into account in EPA’s figures. [T-403]

148. Hearing testimony did not clarify the size of this error. Ms. Lyon estimated it at four percent (T-626) but she did not specify whether the value itself was under-estimated by four percent, or whether the septic portion of the pie chart was under-estimated by four percent. There is a significant difference between these two values. As Ms. Lyon acknowledged, corrections may only change the proportion of the load attributable to septic by a few percent in

the pie-charts, while the number of pounds of nitrogen reaching groundwater could increase substantially. [T-635] This ambiguity could be why Mr. DeAngelo acknowledged that the error could be either 10 percent or 18 percent. [T-405, 407] DEP cannot know if its plans, once corrected, will achieve the TMDLs.

149. Mr. DeAngelo asserted that the consequences of this error are unimportant, because the selected “policy envelope” would not change. [T-414] His assertion is problematical for two reasons: (1) it was made on the fly at the hearing based on an unquantified change in the underlying data; and (2) BMAPs have to attain a TMDL, not a policy envelope.

150. The second error in DEP’s estimation of nitrogen leaching from septics relates to EAF, which is a measure of how much of the nitrogen entering septics is lost, or attenuated, before reaching groundwater. In its NSILT analyses, DEP assigned the following EAF values for conventional septics in various basins:

- 40 percent for Rainbow [DEP-19, pp. 40, 43];
- 40 percent for Silver [DEP-20, pp. 39, 41 and DEP-21, pp. 41, 43, 45]; and
- Either 50 percent [DEP-22, p. 37] or 60 percent for Volusia [DEP-22, p.34].

151. The higher the EAF percentage DEP chose to assign to EAF, the lower the amount of nitrogen will enter the groundwater, according to NSILT analysis. For example, Table 3 of the Volusia BMAP [JE-4, p. 21] shows that 278,365 lbs-N/yr will enter groundwater from conventional septics, assuming an EAF value of 50 percent. Had DEP used an EAF value of 30 percent, 389,711 lbs-N/yr would enter groundwater from these septics, an increase of 111,346 lbs-N/yr, or 40 percent, above DEP’s estimate.

152. Mr. Gaudio and Mr. Stewart testified that using an EAF value of 30 percent is the standard industry practice and a more reasonable choice than DEP’s estimate in Volusia of 50

percent. [P-61; T-1205-1206, 1255] By using its own EAF value rather than the industry standard, Mr. Stewart opined that DEP underestimated the nitrate load to groundwater in the Wekiva BMAP by 35 percent. [T-1259]

153. DEP provides no rationale for its higher-than-standard EAFs, which if anything should be set lower than the industry's 30 percent standard when applied in karstic environments like the Silver/Rainbow BMAP area.³ Incorporating a standard EAF would have been a more prudent way to approach challenges that must be addressed in these BMAPs. [T-1258, 1276]

154. Moreover, DEP is either very inconsistent or willfully disingenuous in its assumptions regarding attenuation of nitrogen loads from conventional septics. In their response to Save The Manatee Club's interrogatories [P-100e, Request 42] and in DEP-56, the Department assumes zero percent attenuation from conventional septics.

155. This means that DEP assumed widely different EAF values (40-60 percent in its NSILT analyses and zero percent in calculating credits) for the **same attenuation process**. This blatant manipulation of attenuation estimates allowed DEP to claim that credits exceed the required reduction in some of the Volusia and Wekiva BMAPs. Using different values for the same process is scientifically indefensible, but by doing so, DEP presented its "analysis" in a way most likely to show that the BMAPs include sufficient reductions to meet the TMDL.

156. In summary, DEP's NSILT values for the load to groundwater from conventional septics are substantially under-estimated, which means that the needed reduction of septic loading to groundwater is much greater than what is stated in the BMAPs. [T-1259]

OSTDS Remediation Credits Are Over-Estimated

³ This is because, in karst formations, rapid passage of wastewater through the shallow soil layer and limestone does not provide sufficient contact time for significant nitrogen attenuation. [T-917, 918, 932]

157. DEP's credits for required septic upgrades are unrealistic. For example, in the Volusia BMAP, DEP claims that converting conventional septic to a combination of sewer and advanced septic will yield a nitrogen-reduction credit of 120,138 – 175,586 lbs-N/yr. [JE-4, Table 6, p. 27] These reductions are based on DEP's assumption that advanced OSTDS will achieve 65% more nitrogen removal than conventional systems. [DEP-56]

158. This assumption is clearly in error, and it severely compromises DEP's ability to achieve the reductions required to reach the TMDL concentrations. FDOH documents [DEP-29] indicate that certain advanced OSTDS may reduce nitrogen **entering the groundwater** by up to 65 percent. However, DEP assumes that advanced OSTDS will remove 65 percent **in addition to** the reductions conventional septic already achieve. [T-439, 440]

159. If as stated above, DEP assumes that the EAF for conventional septic is 50 percent, then DEP is in effect assigning these advanced OSTDS the ability to prevent 82.5 percent of the nitrogen entering the system from entering the groundwater:

$$\textit{Reduction} = 50\% + [65\% \times 50\%] = [50\% + 32.5\%] = 82.5\%$$

160. DEP's assumptions are even more overly optimistic in the Wekiva BMAP, which shows an attenuation factor of 57 percent from conventional septic. (JE-5, Table 7, p. 31 shows that 19 pounds of nitrogen are reduced to 8.1 pounds through attenuation in conventional septic) In this case, assuming an additional 65 percent reduction from upgrades to advanced OSTDS systems would result in total nitrogen removal by advanced OSTDS of 85 percent, which Mr. Stewart testified was "unreasonable." DEP's assumption that advanced OSTDS will reduce nitrogen by 65 percent more than conventional septic is far beyond FDOH's target of 65 percent nitrogen removal for advanced systems: [T-1268-1269, P-61; DEP-29]

$$\textit{Reduction} = 57\% + 65\% \times [100\% - 57\%] = [57\% + 28\%] = 85\%$$

161. FDOH permits three types of advanced OSTDS: performance-based treatment systems (PBTS); aerobic treatment units (ATUs); and in-ground nitrogen removing bio-filters (INRBs). Mr. Gaudio testified that most ATUs are proprietary systems, that PBTSs must be designed and certified by an engineer, and that both systems require a service contract for biannual inspections, as well as annual inspections from FDOH to ensure they are achieving nitrogen-reduction compliance. [T-1212-1213; DEP-29]

162. INRBs, by contrast, are passive systems with prescriptive construction standards that have a presumption of compliance and with no requirement for operating permits or service contracts. [T-1214-1215] Mr. Gaudio also noted that the quality assurance plan for INRBs, from which FDOH derived the presumption of compliance, included elements not required by FDOH rules to be installed in INRBs, including certain types of lignocellulosic substrate, differently sized wood chips, and most critically, liners and pressure-dosing dispersal pumps. [T-1216-22] As a result, it is highly unlikely that INRBs, as installed, will achieve even 65 percent nitrogen reductions, much less 65 percent more than conventional septic tanks. [T-1215, 1222, 1227]

163. However, because they are not proprietary, have lower operating and maintenance costs, and can cut corners in installation by not including several of the components tested by FDOH in the certification process, INRBs are the least expensive advanced OSTDS and the most likely to be installed in BMAP PFAs [T-1232]. Mr. Gaudio testified that in his experience, lower costs dictate that INRBs are virtually the only advanced system installed. In calculating credits, DEP is counting on advanced OSTDS to achieve 65 percent **more** nitrogen removal than conventional septic tanks, when in fact the preponderance of the installed systems are unlikely to achieve anything close to that.

164. Finally, without mandatory inspections, which are not currently required for INRBs, there is no way to assure that they are compliant and properly functioning. Mr. Stewart testified that approximately one-third of all advanced OSTDS are not operating properly. [P-75, T-1262, 1263, 1268] Much like BMPs, where DEP unreasonably assumes 100 percent compliance, DEP assumes that every advanced OSTDS will operate as designed. Instead, DEP should consider the average failure rate of these systems when assigning credits for upgrades.

165. By limiting upgrade requirements to small lots in the PFAs, the Volusia and Wekiva BMAPs will incentivize development utilizing conventional septic systems on lots of all sizes outside the PFAs and on lots larger than one acre inside the PFAs. [T-1271-1272] As mentioned above under “Future Growth in Population,” the BMAPs do not account for additional septic systems and advanced OSTDS loading over the next 20 years from at least three new areas. This additional loading may cumulatively exceed any reductions from upgrades to advanced OSTDS. [T-1272] Without considering these factors, DEP cannot credibly contend that its plans will achieve the target TMDL concentrations.

166. In summary, in developing its septic policies, DEP used several inconsistent or inappropriate assumptions, resulting in both the underestimation of loads to groundwater from conventional septic systems and the overestimation of benefits from OSTDS upgrades. Had DEP flipped the numbers around and assumed zero percent attenuation from septic systems in estimating current nitrogen loads to groundwater and 40 to 57 percent attenuation from existing septic systems in assigning credits for advanced OSTDS, it is highly unlikely that the reduction credits for the Volusia and Wekiva BMAPs would exceed the required nitrogen reductions at those spring vents. In other words, without invoking questionable assumptions, these BMAPs would probably not achieve their TMDLs within the statutorily specified timeframe.

167. In rebuttal testimony, Mr. DeAngelo stated that the cartoon in DEP-56 was erroneous and no longer represents the position of the Department. [T-1608, 1609] But analyses in the BMAPs continue to rely on the flawed assumptions shown in the cartoon – assumptions which result in very large errors in the calculation of both loads and credits. DEP has performed no re-analysis based on their realization during the hearing that their cartoon, and the analysis on which it was based, were in error.

Credits Assigned to Projects

168. Nitrogen-reduction credits attributed to specific projects are critical to a compliant BMAP but as Dr. Knight pointed out, the BMAPs provide no useful information on how purported load reductions from individual projects were calculated or tabulated. [T-971]

169. Both Dr. Knight and Dr. Still raised serious questions about DEP’s calculations of the benefits of some projects. Dr. Knight, who literally wrote the book on treatment wetlands, explained that the credits claimed in the Santa Fe BMAP from a Lake City treatment-wetland project [JE-1, p. 63, project LC-02] were double what his experience would suggest. He also questioned the calculations and assumptions underlying purported reductions from changes in fertilizer practices by the Department of Transportation. This credit, which can be substantial, is claimed in every one of the five BMAPs (E.g. JE-2, p. 118, Project S047). [T-976]

170. Dr. Still questioned the claim that “Peanut-Hay Mix Pasture Systems” could be implemented on nearly 125,000 acres in the Santa Fe BMAP area. [T-1325; JE-1, p. 41]

171. Mr. Hansen testified that DEP claimed no credits for projects lacking the planning-level details required by section 373.807(1)(b), Florida Statutes. This claim is inaccurate; there are many examples of credits claimed from projects lacking data on start date, completion date,

funding sources, and/or funding amount. These include HS-05 [JE-1, p. 63]; R065 [JE-2, p. 168]; R099 – R101 [JE-2, pp. 176-178]; OC-01 [JE-4, p. 50]; and O-11 [JE-5, p. 75] [T-716].

172. Mr. DeAngelo testified that the nitrogen-loading reduction for a project is credited as soon as it is approved rather than after it is completed. This premature crediting is inappropriate because many years may separate project approval and project completion. Further, crediting nitrogen reductions as soon as a project is approved contradicts DEP's assertions that travel times to spring vent may be very lengthy. [P-142, p. 266]

173. DEP inappropriately claimed credits for many projects completed well before the relevant TMDL was approved. Egregious examples include Project A04, completed in 1992 [JE-5, p. 66] and Project AS-01, completed in 2000. [JE-5, p. 70]. Mr. DeAngelo could not explain why these projects were included in the BMAPs. [T-500]

174. Ms. Homann acknowledged that the Wekiwa BMAP contains an uncorrected error of about 45,000 lbs-N/year in the credit claimed for the Conserv II project. [T-844]

175. DEP had an opportunity to correct these errors, and others, prior to and within these proceedings, but appears to have no schedule for doing so. Ms. Homann testified that she did not know when the Conserv II error would be corrected in the BMAP. Mr. DeAngelo stated that the septic error would only be corrected when the BMAP is revised, perhaps in 5 years or more. In fact, there is no reason why these errors could not have been corrected in the 16 months between the completion of the BMAPs and these proceedings. [T-403, 845]

176. Petitioners contend that many more questionable assumptions are apparent in DEP's calculation of credits from individual projects. The larger point here is that in all instances cited and in many others, DEP's use of questionable assumptions was tilted to help DEP in its

calculations of nitrogen loading to the aquifer or of nitrogen-reduction credits. The BMAPs' lack of credibility in these regards must be considered.

Lack of Information Is Not a Valid Excuse for Unscientific Assumptions

177. Petitioners acknowledge that some scientific issues associated with nitrate pollution in OFSs are inadequately understood and are matters for ongoing research. However, limitations in scientific understanding should not provide DEP with an excuse to produce unscientific and non-compliant BMAPs. But in fact DEP did cite uncertainties, scientific and otherwise, to excuse failings in these BMAPs.

178. The Department's frequent assertion of uncertainties regarding the fate and transport of nitrogen leads to the absurd conclusion that the required reduction in nitrogen loading to groundwater may be any quantity it chooses. Using this excuse, the required reduction was, in several cases, a number completely unrelated to the nitrogen reductions required to achieve the TMDL concentration. (T- 65; P-140, page 51)

179. DEP inappropriately used uncertainty as a defense in other ways as well. Mr. Frick said the Department could only approximate the efficacy of agricultural BMPs because it has never verified their effectiveness, as it is required to do by law. According to Mr. Coyne, DEP has no plans to do so. And DEP suggests it is not DEP's fault that these verifications, and other studies, have not been undertaken because FDACS hasn't been cooperative in making appropriate farm sites or farm data available. [T-78, 109, 568, 707, 724]

180. DEP asserted that it was unaware of predictable growth in agriculture and population because no one provided the Department's planners with data on these trends. [P-100g, Request No. 10; P-100e, Request No. 34] Transmission of these data by a third party was hardly necessary – they are contained in annual reports publicly available to everyone in the

State. Similarly, when asked whether increases in farm irrigation would inevitably lead to increases in fertilizer applications, Mr. Frick declined to confirm the obvious. [T-218]

181. Two DEP witnesses claimed ignorance of the contents of seven letters addressed and sent to Ms. Homann in the year preceding completion of the BMAPs. These letters were the subject of meetings between DEP and some of the petitioners. DEP's claims of ignorance are not credible because the letters laid out serious arguments for why DEP's calculations of the required reductions to groundwater are systematically in error. [T-164, 851, 1133]

182. Agencies such as DEP are frequently required to plan and even to regulate with an incomplete set of data and facts. DEP has repeatedly and conveniently claimed uncertainty and ignorance in these BMAPs and in these proceedings as a tactic to avoid confronting many issues, albeit sensitive ones, which are critical to the credibility and success of the BMAPs. As Mr. Jopling noted, the law doesn't say DEP can avoid producing a lawful BMAP just because it would involve stepping on somebody's toes.

CONCLUSIONS OF LAW

Jurisdiction

183. DOAH has jurisdiction over the parties to and subject matter of this proceeding, pursuant to sections 120.569 and 120.57(1), Florida Statutes.

Standards of Review, Proof, and Evidence

184. This is a *de novo* proceeding, designed to formulate final agency action, and not to review action taken preliminarily. See §120.57(1)(k), Fla. Stat.; *Capeletti Bros. v. Dep't of Gen. Servs.*, 432 So.2d 1359, 1363-1364 (Fla. 1st DCA 1983).

Standing

185. Section 120.52(13), Florida Statutes, defines a "party," as a person "whose substantial interests will be affected by proposed agency action, and who makes an appearance as a party." Section 120.569(1) provides, in pertinent part, that "[t]he provisions of this section apply in all proceedings in which the substantial interests of a party are determined by an agency."

186. It is well-established that to demonstrate a person or entity has a substantial interest in a proceeding, two things must be shown. First, there must be an injury-in-fact of sufficient immediacy to entitle one to a hearing. Second, it must be shown that the substantial injury is of a type or nature which the proceeding is designed to protect. The first has to do with the degree of the injury and the second with the nature of the injury. *See Agrico Chem. Co. v. Dep't of Env'tl. Reg.*, 406 So.2d 478, 482 (Fla. 2d DCA 1981), *rev. den.*, 415 So.2d 1359 (Fla. 1982).

187. *Agrico* was not intended as a barrier to participation in proceedings under chapter 120 against persons who are affected by the potential and foreseeable results of agency action. *See Peace River/Manasota Reg'l Water Supply Auth. v. IMC Phosphates Co.*, 18 So.3d 1079, 1082-1083 (Fla. 2d DCA 2009)("[S]tanding is a legal concept that requires a would-be litigant to demonstrate that he or she reasonably expects to be affected by the outcome of the proceedings, either directly or indirectly." (quoting *Hayes v. Guardianship of Thompson*, 952 So.2d 498, 505 (Fla. 2006)). Rather, the intent of *Agrico* was to preclude parties from intervening in a proceeding where those parties' substantial interests are remote and speculative. *See Vill. Park v. Dep't of Bus. Reg.*, 506 So.2d 426, 433 (Fla. 1st DCA 1987).

188. In *Reily Enterprises, LLC v. Fla. Dept. of Env'tl. Prot.*, 990 So.2d 1248 (Fla. 4th DCA 2008), the court found that a challenger to a permit, who alleged their use and enjoyment of waters would be adversely affected, met the *Agrico* test for standing; *see also, St. Johns*

Riverkeeper, Inc. v. St. Johns River Water Mgmt. Dist., 54 So.3d 1051 (Fla. 5th DCA 2011)

(allegation proposed use of river water would impact use and enjoyment of river by a substantial number of organization's members is sufficient).

189. All petitioners allege their reasonable expectations that the challenged BMAPs will not expeditiously or ever result in water quality improvement and that the natural environment will continue to deteriorate. All petitioners asserted their substantial interests in the use and enjoyment of the BMAP waters for recreational and aesthetic and scientific purposes would be injured if the BMAPs fail to achieve the necessary water quality improvement.

Proceedings Must Be Designed to Protect the Asserted Interests

190. Section 373.801, Florida Statutes, establishes findings and the intent of Chapter 373, Part VII, Florida Statutes, including section 373.807. See §373.801, Fla. Stat. ("springs are a unique part of this state's scenic beauty ... provide critical habitat for plants and animals, including many endangered or threatened species . . . provide immeasurable natural, recreational, economic, and inherent value . . . Water quality of springs is an indicator of local conditions of the Floridan Aquifer, which is a source of drinking water for many residents . . . springs provide recreational opportunities for swimming, canoeing, wildlife watching, fishing, cave diving, and many other activities in this state. . . Without effective remedial action, further declines in water quality and water quantity may occur. . . action is urgently needed").

191. The injuries that could affect the petitioners' substantial interests are of a type and nature which these proceedings are designed to protect. *Agrico Chem, Co. v. Dept. of Env't'l Reg.*, 406 So.2d 478, 482 (Fla. 2d DCA 1981).

192. Based on the findings of fact and analyses above, it is concluded that Petitioners Greenhalgh, Tatum, and Still have standing to participate in these proceedings.

Organizational Petitioners' Standing

193. In addition to the foregoing, the Association Petitioners must prove their standing by satisfying the three-prong test for environmental associations established in *Friends of the Everglades, Inc., v. Bd. of Trustees of the Int. Improvement Trust Fund*, 595 So.2d 186 (Fla. 1st DCA 1992). In *Friends of the Everglades*, the court held that an environmental organization must meet both the two-pronged test for standing of *Agrico* and the test for standing of associations under *Fla. Home Builders Ass'n v. Dept. of Labor and Emp't Servs.* (extended to administrative proceedings under section 120.57(1), Florida Statutes, by *Farmworker Rights Org. v. Dept. of Health and Rehab. Servs.*, 417 So.2d 753 (Fla. 1st DCA 1982)).

194. The Association Petitioners must prove their environmental associational standing by demonstrating: (1) that a substantial number of their members could substantially be affected by the challenged agency action; (2) that the agency action they sought to challenge was within their association's general scope of interest and activity; and (3) that the relief they requested was of the type appropriate for them to receive on behalf of their members. *See St. Johns Riverkeeper, Inc. v. St. Johns River Water Mgmt. Dist.*, 54 So.3d 1051, 1054 (Fla. 5th DCA 2011). The Associations' burden was not whether they have or will prevail on the merits, but rather whether they have presented sufficient proof of injury to their asserted interests within the two-prong standing test. *See Bd. of Comm'rs of Jupiter Inlet Dist. v. Thibadeau*, 956 So.2d 529 (Fla. 4th DCA 2007).

Showing Members' Substantial Interests Would Be Affected

195. In *NAACP, Inc. v. Fla. Bd. of Regents*, 863 So.2d 294 (Fla. 2003), the Florida Supreme Court did not interpret the term “substantially affected” in section 120.56(1)(a) as requiring more than being a person within the category of persons to whom the rule would apply. *NAACP*, at 299-300. Pursuant to *NAACP*, an organization may establish standing by showing that its members “stand to be affected” by the challenged agency action. *See also, Rosenzweig v. Department of Transp.*, 979 So.2d 1050 (Fla. 1st DCA 2008) (bicycle club had standing to challenge DOT's statutory interpretation that it had almost absolute discretion to dispense with bicycle lanes on state road projects).

Substantial Number Determination Is Not Based on a Percentage

196. Associations have standing to represent their members, who would themselves meet the relevant statutory standing requirement, when such members are substantial in number and meet the relevant standing test. *Fla. Home Builders Ass'n v. Dept. of Labor and Emp't Servs.*, 412 So.2d 351 (Fla. 1982). Florida agency final orders, including at least one from the Department, have rejected use of a “percentage” test to deny standing. *See Manasota-88, Inc. and Concerned Citizens of Citrus Cnty., Inc., v. Dept. of Health and Rehab. Servs.*, DOAH Case No. 85-2813RP (Dec. 20, 1985, Final Order); and *Hollywood Lakes section Civic Assn. v. Avatar Corp. and Fla. Dep't. of Env'tl. Prot.*, OGC Case No. 92-0704, DOAH Case No. 92-3748 (Feb. 12, 1993, Recommended Order).⁴

197. Florida appellate courts have ruled there is no bright-line test for the substantial number requirement. *Hillsborough Cnty. v. Fla. Rest. Assoc.*, 603 So.2d 587 (Fla. 2d DCA 1992)(“[w]e do not find that a specific number or percentage is required in order to meet the standing requirement of *Florida Home Builders*”).

⁴ Upheld by Final Order in *Hollywood Lakes section Civic Assoc. v. Avatar*, 1993 Fla. ENV LEXIS 13; 93 ER FALR 19 (Feb. 12, 1993, Final Order).

198. Courts have found associational standing where as few as three (3) members of the organizational petitioner demonstrated that they would be affected by the proposed agency action. *Federation of Mobile Home Owners of Fla., Inc. v. Dept. of Bus.Reg.*, 479 So.2d 252 (Fla. 2d DCA 1985); See also, *Nat. Wildlife Fed. and Fla. Wildlife Fed. v. Glisson*, 531 So.2d 996 (Fla. 1st DCA 1988); and *Cannery, Citrus, Drivers, et al. v. Winter Haven Hospital*, 279 So.2d 23 (Fla. 1973).

199. The BMAPs themselves support Petitioners' standing, in that several of the organizational petitioners are identified as "stakeholders" in the challenged BMAPs. The BMAPs explain "Stakeholder involvement is critical to develop, gain support for, and secure commitments in a BMAP DEP invites stakeholders to participate in the BMAP development process and encourages public participation and consensus to the greatest practicable extent."

200. The Department adduced no evidence controverting any petitioner's proof of standing.

201. The Organizational Petitioners adequately alleged that their substantial interests would be substantially affected. The Organizational Petitioners' members' substantial interests are comparable to those of the petitioner in *St. Johns Riverkeeper, supra*, whose members' substantial interests were in the use and enjoyment of the St. Johns River. The Organizational Petitioners' members' have substantial interests in the use and enjoyment of the OFS and related waters in the BMAPs they challenge, for recreation, photography, aesthetic enjoyment and for healthy activities.

202. It was reasonable for the Organizational Petitioners to expect that the substantial interests of their members in the use and enjoyment of the affected waters would be substantially

affected by BMAPs that fail to prevent and adequately reduce the affected waters' degradation from the effects of excessive nitrate.

203. Proof of standing is not different in plan challenges except that the effects are likely to be indirect effects. Compare *Hayes, supra*. Two plan challenge cases sometimes cited are inapposite. In *Wash. Cnty. v. N.W. Fla. Water Mgmt. Dist.*, 85 So.3d 1127 (Fla. 1st DCA 2012), the petitioner challenged a Northwest Florida regional water supply plan that designated an inland wellfield as an "alternative water supply." The petitioner explained that by establishing such a wellfield as an alternative water supply, the law allowed the Northwest Florida Water Management District to presume the CUP was consistent with the public interest, one of three permitting criteria. See, §373.223(5), Fla. Stat. The petitioner explained that it was simultaneously challenging the CUP application for such an inland wellfield at DOAH and would be affected by the presumption in that proceeding. The Court held that passage of section 120.569(2)(p), Florida Statutes, deeming an application for, and the agency's intent to issue a CUP to provide a *prima facie* showing that all permit criteria are met, negated the petitioner's asserted basis for standing.

204. The other plan challenge case, *Putnam Cnty. Env'tl. Council v. St. Johns River Water Mgmt. Dist.*, 136 So.3d 766 (Fla. 1st DCA 2014), involved a petition to the Land and Water Adjudicatory Commission. The petitioner in *Putnam County* did not meet the first jurisdictional criterion regarding effect on natural resources, because the plan had no direct effect on natural resources. §373.114(1)(a), Fla. Stat.; *Putnam Cnty. Env'tl. Council*, 136 So.3d at 768. This jurisdictional criterion has no relevance except in petitions filed under section 373.114(1), Florida Statutes.

205. Based on the findings of fact and legal analysis above, the Organizational Petitioners adequately showed that their substantial interests in the use and enjoyment of the waters addressed in the challenged BMAPs would be substantially affected by the BMAPs' failure to prevent and adequately reduce nitrate loading. The Organizational Petitioners also met their burden to establish it was reasonable to expect the injuries they alleged could occur.

206. In this proceeding, each Organizational Petitioner provided direct testimony of an officer that a substantial number of that organization's members have a substantial interest in the use and enjoyment of the subject waters for recreational and aesthetic purposes.

207. Each Organizational Petitioner also submitted affidavits from organization members attesting to the members' use and enjoyment of the subject water resources for recreational and aesthetic purposes. Such affidavits are hearsay, but these affidavits do support and explain the direct testimony adduced by each organization regarding members' use and enjoyment of the subject waters. See §120. 57(1)(c), Fla. Stat.

208. The Organizational Petitioners have each met their burden to show that a substantial number of their members would be substantially affected by the BMAPs' failure to prevent and adequately reduce nitrate loading.

Associations' General Scope of Interest and Activity

209. Each Organizational Petitioner demonstrated that their organization was created to support the members' interest in the preservation, protection and restoration of the waters and related natural resources around which they were organized for recreational and aesthetic enjoyment. [P149-152]

Relief Requested

210. Petitioners' Amended Petitions requested that the BMAPs be determined to be inconsistent with Florida Law, which is relief of a type appropriate for the organization to receive on behalf of its members.

211. In sum, the Organizational Petitioners adequately alleged and proved that the substantial interests of a substantial number of their members would be substantially adversely affected by the BMAPs' failure to prevent and adequately reduce nitrate loading. Based on the foregoing findings and analysis, the Organizational Petitioners have standing to participate in these proceedings regarding the waters that are identified in their Amended Petitions.

Expert Witnesses Were Qualified to Present the Accepted Testimony and Evidence

212. To offer expert testimony a witness must be:

Accepted as an expert under the standard of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993), which was adopted when section 90.702, Florida Statutes, was amended in 2013. Ch. 2013–107, § 1, Laws of Fla. Although the Florida Supreme Court declined to adopt this amendment to the extent it was procedural in *In re Amendments to Florida Evidence Code*, 210 So.3d 1231 (Fla. 2017), the amendment would still apply in administrative proceedings under Chapter 120, Florida Statutes, which are not governed by rules of procedure promulgated by the Florida Supreme Court. *See* § 120.54(5)(a)1., Fla. Stat. (2016) (providing that the uniform rules adopted by the Administration Commission shall be the rules of procedure for each agency subject to Chapter 120).

SDI Quarry v. Gateway Estates Park Condo. Ass'n, 249 So.3d 1287, 1293 (Fla. 1st DCA 2018).

213. The testimony of Petitioners' experts was consistent with the standards announced in section 90.702, Florida Statutes. Furthermore, any contention that such testimony did not meet these standards was waived because DEP did not object, move *in limine* regarding the expertise of any expert witness, or request a hearing pursuant to *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993). *SDI Quarry, supra*, citing *Rojas v. Rodriguez*, 185 So.3d 710 (Fla. 3d DCA 2016); and *Booker v. Sumter Cty. Sheriff's Office/N. Am. Risk Servs.*, 166 So.3d 189, 192–93 (Fla. 1st DCA 2015).

BMAP Requirements

214. The Department is required to “coordinate with local governments, water management districts, the Department of Agriculture and Consumer Services, . . . environmental groups, regulated interests,” and others “in developing and executing the total maximum daily load program.” §403.067(1), Fla. Stat.

215. The Department must first develop a list of waters that are verified to not meet the applicable water quality standards, prioritize these “impaired” waterbodies, conduct a TMDL assessment, and establish total maximum daily loads for them. §403.067(2)-(5), Fla. Stat.

216. “Total maximum daily load” is defined in relevant part as “the sum of the individual wasteload allocations for point sources and the load allocations for nonpoint sources and natural background.” §403.031(21), Fla. Stat.

217. The TMDL calculation must “establish the amount of a pollutant that a water body or water body segment may receive from all sources without exceeding water quality standards, and shall account for seasonal variations and include a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.” §403.067(6)(a)(2), Fla. Stat.

218. “The objective of a TMDL is to provide a basis for allocating acceptable loads among all of the known pollutant sources in a watershed so that appropriate control measures can be implemented and water quality standards achieved.” [P-14, pp.65-66]

219. The TMDL program must be “scientifically based” and “fairly and equitably allocate pollution loads to both nonpoint and point sources.” §403.067(1), Fla. Stat.

“Implementation of the allocation shall include consideration of a cost-effective approach coordinated between contributing point and nonpoint sources of pollution for impaired water

bodies or water body segments and may include the opportunity to implement the allocation through non-regulatory and incentive-based programs.” *Id.*

Detailed Allocations of the TMDL Are Required in These BMAPs

220. The Department has adopted TMDLs by rule for most of the OFS in the subject BMAPs; others were established in the Suwannee River BMAP on a default basis at the 0.35 mg/l concentration. See, 62-302.531(2)(b)(2) (default spring vent TMDL), 62-304.405 (Suwannee TMDL) 62-304.410 (Santa Fe TMDL) 62-304.500(20) (Silver TMDL) 62-304.505(15) (Volusia Blue TMDL) 62-304.506 (Wekiva TMDL) 62-304.640 (Rainbow TMDL). DEP must establish allocations of the TMDLs in these BMAPs. 403.067(6)(b).

221. The relevant TMDL Rules (other than the default) include allocations among wasteload allocations (WLAs) to NPDES point sources (though no direct NPDES discharges directly affect the subject impaired waters, so no allocation is made to that category), WLAs to municipal separate storm sewer system (MS4) permits, and “load allocations” for nonpoint sources. See, e.g. Fla.Admin.Code 62-304.500(20). These allocations require specified percent reductions for MS4 permits and nonpoint sources that apply basin-wide (79% in the example above for both MS4 permits and for nonpoint sources).

222. Though the TMDL Rules do not specifically use the word “initial,” it is concluded these TMDL Rule allocations are “initial allocations.” Section 403.067(6)(b) provides in relevant part:

An initial allocation of allowable pollutant loads among point and nonpoint sources may be developed as part of the total maximum daily load. However, in such cases, the detailed allocation to specific point sources and specific categories of nonpoint sources shall be established in the basin management action plan pursuant to subsection (7).

§403.067(6)(b), Fla. Stat.

223. The reference in subsection (6)(b), above, to subsection (7) may be interpreted as simply recognizing that allocations established pursuant to subsection (6) are to be included in

BMAPs which are adopted pursuant to subsection (7). Subsection (7) restates the options that may be employed by the Department to “equitably allocate, pursuant to paragraph (6)(b), pollutant reductions. . . , as appropriate.” §403.067(7)(a)(2), Fla. Stat. It was not appropriate for the Department to opt for a “basin as a whole” approach in these BMAPs because a detailed allocation is required by subsection 403.067(6)(b) when an initial allocation has been established with the TMDL rule.

224. Section 373.807(1)(b)(7), Florida Statutes, includes a requirement similar to section 403.067(6)(b), using the following slightly different language: “An estimated allocation of the pollutant load must be provided for each point source or category of nonpoint sources.” Subsection 373.807(1)(b)(7) also lists the categories of nonpoint sources as “including, but not limited to, urban turf fertilizer, sports turf fertilizer, agricultural fertilizer, onsite sewage treatment and disposal systems, wastewater treatment facilities, animal wastes, and stormwater facilities.” *Id.*

225. The NSILT-generated pie charts included in each BMAP do not meet the requirement of section 373.807(1)(b)(7) because the pie charts only provide an estimate of the existing nitrate loading from categories of nitrate sources. That is, the pie-charts identify the sources of the load but not the required reductions of that load. All other provisions regarding “allocations” are consistent with common dictionary definitions of an “allocation” as an allotment or apportionment.

§403.031(21), Fla. Stat. (allocations plus background must not exceed TMDL); §403.067(1), Fla. Stat. (TMDL program must “fairly and equitably allocate pollution loads to both nonpoint and point sources”); (emphasis supplied) §403.067(6)(b) (“allocations must be based on consideration of” 10 factors relating to what can be equitably, efficiently, and economically achieved).

226. The Department’s interpretation, that the term “estimated allocation of the pollutant load” in section 373.807(1)(b)(7) refers to an estimate of existing loads by source categories, certainly would be correct if the clause read “An estimated ~~allocation~~ of the pollutant load must be

provided for each point source or category of nonpoint sources.” Though the Department witnesses explained that these loading estimates may be used to evaluate whether the septic plan requirement of section 373.807(3) is triggered, and to determine the appropriate “policy envelope” to apply, estimates of existing loading by source category are what the NSILT provides, and what is reflected in the BMAP pie charts, but they are not true estimated load allocations.

227. The BMAPs’ NSILT discussion actually recognizes the need to allocate load reductions to categories. For example, in the NSILT section of the Suwannee BMAP, the Department states:

The general NSILT approach involves estimating the nitrogen load to the surface for various source categories based on land use. The NSILT subjects the surface loading to recharge and attenuation to derive the estimated load to groundwater at the top of the aquifer. The estimated load to groundwater determines the scope of reduction strategies needed in the BMAP for each source category.

JE-3, p.85 (underline added).

228. The Department’s interpretation that detailed load allocations are not required may relate to the Department’s assertion that it lacked information needed to perform a true detailed allocation. [See, P-100C, p.57] However, the difficulty of the statutorily required task is not an accepted basis for a strained and contradictory statutory interpretation.

229. The Department’s interpretations of sections 403.067(6)(b) and 373.807(1)(b)(7) defy the apparent intent of the legislature and the common, and in context, meaning of the terms used in these statutes. Without allocation of a maximum load, or minimum reduction of the existing load, for each category of nonpoint source, the allocations plus background cannot be summed to equate to the TMDL, the BMAPs do not provide 20-year targets for the categories of nonpoint sources to achieve, no loading source may be targeted for additional load reductions, and no basis for credit trading is established. See, §403.067(7)(a)(7), §403.067(b)(2)(g), and §403.067(8), Fla. Stat.

230. It is concluded the subject BMAPs fail to include allocations of maximum loads, or minimum load reductions, to categories of nonpoint source to reduce loading and achieve the TMDL, as required by sections 403.067(6)(b), and 373.807(1)(b)(7), Fla. Stat.

Allocations Must Be Consistent With the TMDL Rule

231. A “basin management action plan does not supplant or otherwise alter any assessment made under subsection (3) or subsection (4) or any calculation or initial allocation.” §403.067(7)(a)(3), Fla. Stat. Although the subject BMAPs do mention TMDL rules, they do not mention the required load reductions for nonpoint sources, which should have provided targets to be achieved in the BMAPs. Tables in each BMAP titled “Total reduction required to meet the TMDL” [e.g. JE-5, Table 4, page 26] provide what appears to be a reasonable value for the required reduction at the spring vent. However, it is not clear whether or how these load reductions relate to the Rule percentage reduction requirements. The credits listed in tables titled “Summary of potential credits for the [BMAP] to meet the TMDL” [e.g. JE-5, Table 6, pp. 28-29] are not an allocation of the allowable nitrogen load to each source category in the springshed. They are simply a tabulation of potential “credits” that might accrue if the policies and projects are fully implemented and achieve the nitrogen reductions assumed by DEP.

232. DEP claims that the BMAPs comply with the law because the required load reduction “is being allocated to the entire basin.” [e.g. JE-5, page 26] However, this is clearly not the case. Even if each “Load reduction to meet the TMDL at the spring vent” is assumed to be correct, the BMAPs only include policies and projects that might reduce loading by 26 percent, 52 to 68 percent, 18 to 23 percent, and 48 percent of the required nitrate reduction identified for the Santa Fe, Silver, Rainbow, and Suwannee BMAP areas, respectively. Despite the “gap” acknowledged by its own witnesses, DEP claims that these insufficient reductions nonetheless

meet the requirements of the statutes because uncertainty regarding fate and transport of nitrates relieves the agency of the need to propose credits matching the “load reduction to meet the TMDL at the spring vent”. DEP’s stance allows it to claim that proposing projects and policies adding up to virtually any number of credits could prove to be sufficient to achieve the TMDL concentrations. This cannot be the intent of the statutes; arbitrary or inadequate reductions are not consistent with the applicable TMDL rule-required reductions.

BMAPs Must Be Designed With a Target To Achieve The TMDL

233. Section 403.067(6)(b) provides:

The total maximum daily loads shall include establishment of reasonable and equitable allocations of the total maximum daily load between or among point and nonpoint sources that will alone, or in conjunction with other management and restoration activities, provide for the attainment of the pollutant reductions established pursuant to paragraph (a) to achieve water quality standards for the pollutant causing impairment. ... The initial and detailed allocations shall be designed to attain the pollutant reductions established pursuant to paragraph (a) ...

§403.067(6)(b), Fla. Stat. (underline added)

234. Section 403.067(7)(a)(4)(a), Florida Statutes, provides:

(7) DEVELOPMENT OF BASIN MANAGEMENT PLANS AND IMPLEMENTATION OF TOTAL MAXIMUM DAILY LOADS.

(a) Basin management action plans.—

4. Each new or revised basin management action plan shall include:

a. The appropriate management strategies available through existing water quality protection programs to achieve total maximum daily loads, which may provide for phased implementation to promote timely, cost-effective actions as provided for in s. 403.151;

§403.067(7)(a)(4)(a), Fla. Stat. (underline added)

235. Section 373.807(1)(b)8, Florida Statutes, provides in relevant part that OFS BMAPs must include an “implementation plan designed with a target to achieve the nutrient total maximum daily load no more than 20 years after the adoption of a basin management action

plan.” And OFS BMAPs must also include “a schedule establishing 5-year, 10-year, and 15-year targets for achieving the nutrient total maximum daily load.” (emphases supplied)

§373.807(1)(b)(8), Fla. Stat.

236. The “target to achieve” language in section 373.807(1)(b)8 does not grant the Department free rein to generally begin on a trajectory toward the TMDL; this phrase is not less demanding than sections 403.067(6)(b), 403.067(7)(a)(4), and the last clause of section 373.807(1)(b)(8), Florida Statutes. The legislative findings and intent established in section 373.801, Florida Statutes, suggest the contrary, that OFS BMAPs should be more demanding, if anything. It is concluded the “target to achieve” language in section 373.807(1)(b)8 does not authorize a deviation from the requirement that an OFS BMAP, upon its adoption, must establish a scientifically-based path to achievement of the TMDL within 20 years. It is not sufficient for a BMAP to merely include statements that the target is 0.35 mg/l without also including a credible plan for achieving that target within 20 years.

Estimated Effectiveness of Agricultural BMPs

237. Subsection 403.067(7)(c), titled “Best Management Practices,” requires FDACS to develop and adopt agricultural BMPs by rule, and these BMPs are to be implemented by any responsible agricultural pollutant source subject to a BMAP. §403.067(7)(c)(2), Fla. Stat. Such agricultural operations may only be required to implement BMPs that have been adopted by rule. §403.067(7)(c)(2), Fla. Stat.

238. Before FDACS adopts each BMP rule, DEP must use best professional judgment to provide initial verification of the effectiveness of the BMP. §403.067(7)(c)(3), Fla. Stat. Subsequently, DEP must verify effectiveness of BMPs at representative sites, to demonstrate their effectiveness in achieving the estimated levels of pollution reduction. §403.067(7)(c)(3),

Fla. Stat. Where water quality problems are demonstrated, despite the appropriate implementation, operation, and maintenance of agricultural BMPs, FDACS, water management district, or DEP must institute a reevaluation of the BMPs. §403.067(7)(c)(4), Fla. Stat.

239. As found, the Department provided only initial verification for the agricultural BMPs relied upon in the subject BMAPs. Though the applicable BMPs were adopted between 2008 and 2016, and though these BMPs were included in earlier iterations of these BMAPs, no confirmatory verifications have been completed for them. Environmental assessments of these BMPs – for example in the Santa Fe and Suwannee Basins – have not found them to be effective.

240. It is concluded that DEP had the burden of proving their estimates of the efficacy of agricultural BMPs. The most probative evidence indicates they are only marginally effective. A 13% reduction of nitrate loads was indicated in the single definitive study, but even that result should be questioned because of the experimental design. The BMAPs overestimate the extent to which BMPs are fully and correctly implemented, resulting in an even greater gap between BMAP policies and projects and the necessary load reductions needed to achieve the TMDLs.

241. Section 403.067(7)(a)(1), Florida Statutes, states that BMAPs “must integrate the appropriate management strategies available to the state through existing water quality protection programs.” There is no evidence that rulemaking has been initiated or planned for adoption of Advanced Agricultural Practices and Procedures as BMPs. They are therefore not part of “existing water quality protection programs” and any credits that might be attributed to them in these BMAPs should be ignored.

Potential Future Loading

242. Each BMAP must “identify the mechanisms that will address potential future increases in pollutant loading.” §403.067(7)(a)(2), Fla. Stat. Presumably reflecting its earlier

interpretation of Subsection 403.067(7)(a)(2), DEP's Nutrient TMDL Reports identify an "evaluation of future increases in pollutant loading due to population growth" as a "Next Step" after TMDL adoption. [e.g., P-1, page 65]

243. Besides identifying mechanisms to address potential future loading, BMAPs must also include "milestones for implementation and water quality improvement." §403.067(7)(a)(6), Fla. Stat. OFS BMAPs must also include "a schedule establishing 5-year, 10-year, and 15-year targets for achieving" the TMDL, which "shall be used to provide guidance for planning and funding purposes." §373.807(1)(b)(8), Fla. Stat. The subject BMAPs identify 5-year, 10-year, and 15-year targets that are based on reduction of the existing loading as of 2018 and ignore all recent and potential future loading. Because the subject BMAPs fail to include an estimation of the magnitude of future loading from both population and agricultural growth, meaningful 20-year planning, identification of potential funding, and the establishment of "5-year, 10-year, and 15-year targets for achieving" the TMDL are neither realistic nor scientific in nature.

244. It is concluded that the TMDL statutes require OFS BMAPs to reflect an assessment or estimate of the potential future loading in order to determine the mechanisms needed and to establish realistic science-based milestones and 5-year incremental targets.

Mechanisms to Address Potential Future Loading

245. All of the BMAPs provide only non-specific allusions to mechanisms to address future loading from population and agricultural growth, including implementation by new agricultural operations of unverified BMPs and potentially other additional measures, as well as "other laws such as local land development regulations, comprehensive plans, ordinances, incentives, environmental resource permit requirements, and consumptive use permit requirements, all provide additional mechanisms for protecting water resources."

246. But agricultural BMPs are presumed, but not verified, to only reduce the additional loading by between 10 and 15%; local governments cannot regulate agricultural operations that implement verified BMPs, §163.3162(3)(a) and (b), Fla. Stat.; most agricultural practices are exempt from ERP and CUP regulation, See §373.406, Fla. Stat.; and those that are not exempt are entitled to a presumption of compliance if they implement nitrogen BMPs. §403.067(7)(c)3, Fla. Stat. Further, projected population growth in the BMAP area over the next 20 years will lead to more wastewater, more septic systems and OSTDS, and more lawn fertilizer. Therefore, these future load-reduction mechanisms may reduce but will certainly not offset or eliminate the projected additional load associated with population growth and added agricultural acreage. In other words, even with these mechanisms in place, increases in nitrate pollution will inevitably occur.

247. These BMAPs fail to acknowledge the lack of strategies and projects capable of offsetting the potential future loading, and fail to specify any legislative, research, or funding strategies that should be pursued to address this loading.

Iterative Process and Adaptive Management

248. The Department must conduct “An assessment of progress toward” the milestones established in these BMAPs “every 5 years, and revisions to the plan shall be made as appropriate.” §403.067(7)(a)(6), Fla. Stat. Neither section 403.067 nor section 373.807 requires, or even anticipates, BMAP revision every five years. Section 403.067(7)(a)(6) anticipates that the BMAP will provide for achievement of the TMDL, but requires review every five years, and allows that, upon review, it may be determined that BMAP strategies and projects may not achieve the expected load reductions, in which case revisions may be “appropriate.” *Id.* Department policy may be otherwise, but the law does not require BMAP revision every 5 years.

249. While adaptive management is an appropriate planning strategy where the environmental systems, strategies and system responses include many unknowns, adaptive management is not a substitute for a 20-year plan effectively designed to achieve a TMDL. [T-1276, 1277] As described above in the “Findings of Fact”, Department witnesses have acknowledged the shortfalls in these BMAPs, including the failure to deal with future growth and the lack of adequate nitrogen-reduction credits. DEP’s reliance on adaptive management is the Department’s cure-all for these shortfalls. DEP is essentially arguing that even if the plans aren’t currently showing compliance, maybe they will when they’re reviewed five years in. Adaptive management may be a useful tool for some tasks, but it should not be used as an excuse for failing to meet clear statutory requirements. [T-1277]

Effectiveness of Conventional Septic Systems and Enhanced OSTDS

250. As found, DEP made multiple significant errors in evaluating conventional septic systems. These errors include double-counting residential absenteeism and overestimating attenuation of the nitrate load from conventional septic before the load reaches the groundwater. Both errors result in the nitrate loading attributable to conventional septic being underestimated in the NSILT pie charts. As a consequence, the needed nitrate load reductions are significantly underestimated.

251. With respect to the benefits of conversion to enhanced OSTDS, DEP also made multiple errors. The most significant of these errors is DEP’s assumption of a 65% greater reduction of the nitrate load with OSTDS compared to conventional septic. In other words, DEP assumed conventional septic reduced loading by a certain percentage and then assumed the remaining load would be reduced an additional 65 percent by enhanced OSTDS. The resulting

estimated load reduction, 82 to 85 percent, overestimates the achievable load reductions from enhanced OSTDS.

252. The other significant error regarding enhanced OSTDSs is DEP's assumption that all enhanced OSTDS may achieve a 65 percent load reduction. Uncontroverted evidence and common sense both indicate that consumers will select the less expensive, passive, nonproprietary INRB system option. INRBs are highly unlikely to reduce nitrate loading by 65 percent. They do not require monitoring, and they are unlikely to be maintained, with the result that reductions from them are likely to be significantly less than 65 percent.

253. The foregoing errors demonstrate a systematic bias creating a false impression that these BMAPs could achieve the target TMDL concentrations. Collectively these errors reduced the calculated existing load to groundwater, and increased the calculated nitrogen-reduction credits. Without these questionable assumptions and errors, these BMAPs are even less likely to achieve the target TMDL concentrations within the statutorily specified timeframe.

BMAP Projects

254. Section 373.807(1)(b), Florida Statutes, requires, in relevant part, that these BMAPs include:

1. A list of all specific projects and programs identified to implement a nutrient total maximum daily load;
2. A list of all specific projects identified in any incorporated onsite sewage treatment and disposal system remediation plan, if applicable;
3. A priority rank for each listed project;
4. For each listed project, a planning level cost estimate and the estimated date of completion;
5. The source and amount of financial assistance to be made available by the department, a water management district, or other entity for each listed project;
6. An estimate of each listed project's nutrient load reduction. . . .

255. As found, these BMAPs include neither sufficient projects to implement nutrient TMDLs nor specific information required for a vast number of the projects listed in BMAP

Appendices. These projects cannot provide the basis for any conclusion as to whether the BMAPs will result in TMDL compliance.

256. In acknowledgement of the foregoing, DEP witnesses asserted that all projects included in the BMAP calculations of potential load reductions included the required information. However, the evidence demonstrated this was not true. A number of projects were improperly credited with load reductions despite lacking the required information.

257. DEP admits that it assigned the Conserv-II project excessive load-reduction credits, but deferred adjustment of such credits to some uncertain time in the future. DEP also assigned credits for projects completed well in advance of TMDL rule adoptions. DEP provided no explanation for these errors and offered no timetable for their correction.

258. Without including these deficient and untimely projects, it would have been much more evident that these BMAPs are very unlikely to achieve the target TMDL concentrations within the statutorily specified timeframe.

CONCLUSIONS AND RECOMMENDATIONS

The five BMAPs in question are not consistent with the letter and intent of sections 403.067, and 373.807, Florida Statutes, as described in this Recommended Order.

In its attempt to show that nitrogen reductions to groundwater would be sufficient in each BMAP to ensure TMDL compliance at the spring vents, DEP gathered projects and prospective projects from cooperating governmental entities, developed very aggressive credit assumptions, and asserted high expectations of both implementation and load-reduction results. These efforts, ultimately, were not successful. In three of the five BMAPs, the calculated load reductions are clearly less than the load reductions needed at the spring vents; in the other two, cumulative errors indicate that such achievement will be very unlikely. DEP asserted, unconvincingly, that

uncertainties regarding the fate of nitrates in groundwater made the sufficiency of these claimed reductions unchallengeable. In all five BMAPs, DEP consistently stretched its conclusions and assumptions beyond sound scientific reality. Project benefits and BMP benefits were exaggerated, obvious growth trends were ignored, and contradictory septics/OSTDS assumptions were embraced. These efforts were aimed at the laudable goal of achieving the TMDLs, but in the end they do not add up to sound science.

DEP abuses its discretion if DEP does not:

- a. Correct the identified deficiencies and errors.
- b. Revise these five BMAPs consistently with these recommendations within one year, including the following:
- c. Include a realistic plan for meeting the TMDLs within 20 years without reliance on future potential BMAP iterations, adaptive management, or hopes for advanced BMPs that have not been adopted by rule.
- d. Recognize limitations in DEP's authority, but nonetheless produce clear and accurate assessments of the extent of the reductions required for compliance with TMDLs, including detailed allocations of each TMDL to categories of nonpoint sources, as required by law.
- e. Include a set of policies and projects consistent with the nitrate reductions required to comply with TMDLs. At least three of these BMAPs as expressed fail this test and these failures obscure the extent of the worsening problem that must be overcome to comply with these statutes.
- f. If DEP's existing authority is inadequate, the BMAPs need to explain why and to delineate necessary legislative changes.
- g. Include a strategy and schedule for verifying any agricultural BMPs whose nitrate-reduction credits are relied upon in any BMAP, as required by law. Provide a more credible estimate of credits assumed for adopted agricultural BMPs. Compose a substantive document, which should be peer-reviewed, describing the research underlying these credits.
- h. Acknowledge that current agricultural BMPs are not sufficient to enable the Suwannee and Santa Fe BMAPs to achieve the TMDL concentrations within 20 years.

- i. Re-evaluate agricultural nutrient best management practices utilized in these BMAP areas and, as required by 403.067(7)(c)(4), initiate rule-making to require implementation of practices more effective at reducing leaching of nutrients.
- j. Include a recommendation that FDACS aggressively pursue funding to encourage producers to apply less fertilizer.
- k. Describe additional measures that could be adopted to bridge the gap in these BMAPs between nitrogen-reduction credits and the required reduction at the spring vents.
- l. Develop recommendations for a robust program of strategic fee simple and easement acquisition.
- m. Develop recommendations for fertilizer tracking and annual reporting from purchase to land application by parcel or section.
- n. Develop credible quantitative links between the lists of nitrogen-reduction credits and required reductions at the vents. The current BMAPs are scientifically incomplete in that they fail to explain how any particular set of credits relates to the required nitrate reductions at the vents.
- o. Develop a plan of study to evaluate fate and transport issues, including dye-trace studies and new model development. In asserting a limited understanding of the exact modes of fate and transport of nitrogen in the aquifer, DEP occupies an unacceptable position that literally any amount of credits it proposes will be sufficient to meet the TMDL.
- p. As required by law, the revised BMAPs must incorporate reasonable growth projections for agriculture and population. These projections are readily available in documents produced annually for State agencies. NSILT should be utilized to update the “pie-charts” with these 20-year projections, and credible funding and mechanisms to control the additional loading must be included.
- q. Errors in calculating credits from projects and policies should be corrected in the revised BMAPs and all the elements required by section 373.807(1)(b), Florida Statutes, should be provided on any project or policy for which nitrogen-reduction credits are claimed.
- r. Consistent assumptions and figures should be utilized to describe both nitrogen attenuation from septics and nitrogen-reducing characteristics of OSTDS. The current BMAPs make inconsistent assumptions which appear to minimize the nitrogen load to groundwater from conventional septics and maximize the benefits of advanced OSTDS replacement systems.

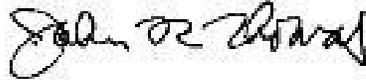
In the end, BMAPs are plans. Even if DEP lacks the authority to impose a particular policy, such as a fertilizer tax, it certainly does not lack the authority to explain any gaps in credits and

to recommend policies, funding, and legislative changes that would ensure successful BMAPs. The statutes make clear the legislature's intent that these plans must lay out a road-map for TMDL compliance. Excuses are not acceptable.

In summary, these five BMAPs need to be revised to make them compliant with the letter and intent of statutes aimed at restoring Outstanding Florida Springs.

Certificate of Service

I HEREBY CERTIFY that a true and correct copy of the foregoing was furnished by electronic mail to Paul Still, Jeffrey Brown, Esq., Carson S. Zimmer, Esq., and Kenneth Hayman, Esq. on this 27th day of January, 2020.



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