THE "FOUR LAKES STORY"—MID-MICHIGAN'S DAM FAILURES: WHAT HAPPENED AND WHAT WE LEARNED. A CASE STUDY OF THE FOUR LAKES TASK FORCE AND THE RESTORATION OF THE FOUR LAKES SYSTEM

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Secord, Smallwood, Wixom, and Sanford Lakes (the "Four Lakes") are in Midland and Gladwin Counties (State of Michigan) and were created by the impoundment of the Tittabawassee and Tobacco rivers by four privately-owned hydroelectric dams.[1] For nearly 100 years, the Four Lakes were the epitome of the State's wonderful and beautiful natural resources, providing recreational opportunity for the average Michigander, and economic opportunity and a stable tax base for Midland and Gladwin Counties. On May 19, 2020, the Edenville (Wixom Lake) dam and Sanford (Lake) dam failed, resulting in catastrophic flooding leaving many in Midland and Gladwin counties with damaged property, flooding debris and shoreline devastation.[2] Over ten thousand people were

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1. *See About*, FOUR LAKES TASKFORCE, https://www.four-lakes-taskforce-mi.com/about.html [https://perma.cc/633R-KBZ2]; *see also About*, WIXOM LAKE ASSOCIATION, https://www.wixomlakeassociation.org/about#:~:text=Wixom%20Lake%20is%20a%20reservoir,Tobacco%20Spillway)%20and%20a%20powerhouse [https://perma.cc/3BUW-HC97]; *see also The Lake*, SANFORD LAKE ASSOCIATION, https://sanfordlakeassociation.org/the-lake/ [https://perma.cc/H7NR-2RY9].

2. Cheyna Roth, *Timeline: The Edenville Dam Saga, Before, During and After the Break*, MLIVE (Sep. 1, 2020, 4:06 PM), https://www.mlive.com/news/2020/09/timeline-the-edenville-dam-saga-before-during-and-after-the-break.html#:~:text=12%3A22%20a.m.%20May%2019,homes%20and%20go%20to%20shelters [https://perma.cc/W8VY-3QWQ].

evacuated, and properties in the City of Midland and surrounding townships were affected by the flooding and resultant damage.[3] The dam failures caused millions of dollars in damage to homes, businesses and public infrastructure. The region was declared a national disaster on July 9, 2020 by President Donald Trump.[4]

The Four Lakes story, however, did not begin with the May 2020 dam failures. In early 2018, a group of lakefront property owners learned that Boyce Hydro Power, LLC was not in compliance with the terms of its Federal Energy and Regulatory Commission (FERC) license in connection with the Edenville Dam, and FERC was threatening to revoke the license.[5] The dam operator, Boyce Hydro Power, LLC (and other Boyce entities, collectively "Boyce Hydro") had complete control over dam operations and ownership of the dams, bottomlands and flowage rights.[6] Michigan common law does not require a private dam owner to maintain the existence of a dam or the artificial level of a lake.[7] Concerned with the potential loss of Wixom Lake, and future loss of the other three lakes, the lake associations and property owners sought a public solution, and began the process of transitioning the four hydroelectric dams from private ownership to public ownership.[8] The counties of Midland and Gladwin formed a citizen task force to explore the process of acquiring, financing and managing the dams and lake levels in accordance with Part 307 "Inland Lake Levels" of the Michigan Natural Resources and Environmental Protection Act ("Part 307").[9]

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3. *See id.*

4. Robert Acosta, *President Trump Oks Major Disaster Declaration for Mid-Michigan After Severe Flooding*, MLIVE (July 9, 2020, 8:56 PM), https://www.mlive.com/news/saginaw-bay-city/2020/07/president-trump-oks-major-disaster-declaration-for-mid-michigan-after-severe-flooding.html [https://perma.cc/W6CZ-C8M9].

5. *See*, Roth *supra* note 3.

6. *See* Jay Landers, *Static Liquefaction Likely Caused Edenville Dam Failure Report Says*, AM. SOC. OF CIVIL ENG'RS (Sept. 15, 2021) https://www.asce.org/publications-and-news/civil-engineering-source/civil-engineering-magazine/article/2021/09/static-liquefaction-likely-caused-edenville-dam-failure-report-says#:~:text=Owned%20by%20Boyce%20Hydro%20Power,were%20constructed%20in%20the%201920s [https://perma.cc/HRX9-6W6U].

7. Goodrich v. McMillan, 187 N.W. 368 (1922) (finding that ownership of a dam does not impose a duty on the dam owner to maintain the water at an artificial level created by operation of a dam); *see also* Drainage Board v. Village of Homer, 87 N.W.2d. 72 (1957) (stating that riparian landowners were continuously charged with notice that the pond is artificial and that its level may be lowered or returned to natural state at any time by the dam owner).

8. *See*, FOUR LAKES TASKFORCE *supra* note 1.

9. MICH. COMP. LAWS § 324.30702 (1994).

The purpose of Part 307 is to provide for the control and maintenance of inland lake levels for the benefit and welfare of the public.[10] The Act essentially authorizes counties to make policy decisions as to the levels of their inland lakes, and to build and finance dams as necessary to maintain the desired lake levels.[11] It authorizes the establishment of a special assessment district to defray the costs in connection with administration, operation, maintenance and improvement of lake level structures.[12] Moreover, the Act authorizes the special assessment district to issue municipal bonds, notes and lake level orders in anticipation of special assessments.[13] Part 307 provides the legal, operational and financial model for the public's sustainability of lake level structures.

The Four Lakes Task Force (FLTF) is a Michigan non-profit corporation and was established to lessen the "burdens of government" by serving as the Midland and Gladwin Counties' delegated authority under Part 307.[14] The FLTF board of directors is comprised of representatives from each of the counties, and property owner associations located on Secord, Smallwood, Wixom, and Sanford Lakes.[15] The FLTF board is a sophisticated and experienced group of volunteers with professional backgrounds in science, engineering, finance, and other disciplines that have come together to recover and restore the Four Lakes.[16] This has been augmented with an operations and project team of engineers, hydrology and hydraulics consultants and environmental scientists.[17] The recovery and restoration effort, which is estimated to cost almost $300 Million, involves coordination of design and construction to meet state dam safety requirements, environmental permitting, and financing.[18]

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10. In re Martiny Lakes Project, 160 N.W.2d 909, 912 (1968).

11. In re Matter of Van Etten Lake, N.W.2d 572, 576 (1986) (quoting *In re Martiny Lakes Project* 160 N.W.2d at 912).

12. MICH. COMP. LAWS § 324.30711(1) (1995).

The county board may determine by resolution that the whole or a part of the cost of a project to establish and maintain a normal level for an inland lake shall be defrayed by special assessments against the following that are benefited by the project: privately owned parcels of land, political subdivisions of the state, and state owned lands under the jurisdiction and control of the department. If the county board determines that a special assessment district is to be established, the delegated authority shall compute the cost of the project and prepare a special assessment roll. *Id.*

13. MICH. COMP. LAWS § 324.30705 (2020).

14. *The Four Lakes of Gladwin and Midland County Fact Sheet*, THE FOUR LAKES TASKFORCE (Oct. 2021) https://www.four-lakes-taskforce-mi.com/uploads/1/2/3/1/123199575/fourlakesfactsheet_layout18.pdf [https://perma.cc/25CQ-98NB].

15. *Who We Are*, THE FOUR LAKES TASKFORCE, https://www.four-lakes-taskforce-mi.com/who-we-are.html [https://perma.cc/RV7B-Y5N3].

16. *See id.*

17. *See id.*

18. THE FOUR LAKES TASKFORCE, *supra* note 16, at 3.

The restoration of the Four Lakes system is critical for the central and southeast regions of Michigan. It will require a private-public partnership to restore this great asset of Michigan. Restoration will also require the federal and state government to utilize its regulatory authority to: (1) restore a community devastated by this disaster, (2) restore an ecosystem that has been in place nearly 100 years, and (3) restore the public trust in a system that allowed a private dam owner to avoid its responsibilities resulting in a hardship, including extreme financial burden, placed on thousands of families, many who are retirees on fixed incomes.

This article is a case study in connection with the events prior to and following the May 2020 dam failures, and will address the legal, technical, financial, and political challenges and issues associated with Four Lakes system. This article will discuss the Four Lakes project from its beginning to where it is today, the restoration plan, and the lessons learned along the way, including regulatory oversight failures, and policy changes for addressing those failures.

I. THE FOUR LAKES SYSTEM

The Four Lakes system was created with the impoundment of Tittabawassee and Tobacco Rivers following the construction of four hydroelectric dams in the 1920s.[19] The four dams and corresponding lakes (i.e. Sanford Lake, Wixom Lake, Smallwood Lake and Secord Lake) are located in Midland County and Gladwin County, spanning seven townships and one village, and affecting over 6,500 properties.[20] The Four Lakes system occupies about 39 river miles, with each dam being the headwater of the next downstream dam and are hydraulically and hydrologically interrelated.[21] The most upstream dam is the Secord Dam, followed by the Smallwood Dam, Edenville Dam and Sanford Dam. From the Sanford Dam, the "river flows 35 miles to its confluence with the Shiawassee [River], where they form the Saginaw River."[22] Prior to the May 2020 disaster, each hydroelectric dam included a dam, reservoir (i.e.

19. THE FOUR LAKES TASKFORCE, *supra* note 1.

20. Order Setting Normal Level for Sanford Lake, Wixom Lake, Smallwood Lake and Secord Lake and Confirming the Four Lakes Special Assessment District Boundaries, In the Matter of: Wixom Lake, Sanford Lake, Smallwood Lake, and Secord Lake, No. 19-5980-PZ (Cir. Ct. for Midland Cnty. May 28, 2019) (Exhibit A).

21. Order Issuing Original License, 85 Federal Energy Guidelines: FERC Reports ¶ 61,063 (Oct. 16, 1998), https://elibrary.ferc.gov/eLibrary/search [https://perma.cc/4BQL-W4JV]. (click on "General Search", search on "Accession", enter "19981020-0311", and then click "Generate PDF" to download a PDF of the letter).

22. *Id.* at 1–2.

lakes), and powerhouse, and were operated in a coordinated fashion to optimize peak demand for electricity.[23]

The Secord Dam is the most upstream of the four dams.[24] The Secord Dam, "which is three sections totaling about 2,085 feet in length and has a maximum height of 55 feet," creates Secord Lake, a 1,100-acre reservoir with a 69-mile shoreline at full pool.[25] There is a 47-foot-long intake leading to the powerhouse, which is located at the dam and has an install capacity of 1.2 megawatts (MW).[26]

The Smallwood Dam has three sections totaling about 1,095 feet in length and a maximum height of 38 feet, creating Smallwood Lake, "a 500-acre reservoir with a gross storage of approximately 6,000 acre-feet and 25-mile shoreline a normal pool elevation.[27] There is a 25-foot-long intake leading to the powerhouse, which is located at the dam and has installed capacity of 1.2 MW."[28]

The Edenville Dam "consists of three sections totaling about 6,600 feet in length and having a maximum height of 54.5 feet, spans both the Tittabawassee and Tobacco Rivers", creating Wixom Lake, a 2,600-acre reservoir "with a 49-mile shoreline at full pool.[29] There is a 50-foot-long intake leading to the powerhouse, which is located at the dam and an installed capacity of 4.8MW."[30]

The Sanford Dam consists of a 26-foot-high, 1,600-foot-long dam with an integrated 71-foot-long powerhouse section, a 149-foot-long spillway section controlled by six Taintor gates, and a 1,380-foot-long earth embankment, creating Sanford Lake, a 1,526-acre reservoir.[31] The Sanford Dam had an installed capacity to produce 3.3MW.[32]

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23. *Id*. at 2.

24. *Order Issuing Minor License*, 85 Federal Energy Guidelines: FERC Reports ¶ 61,064, 2 (Oct. 16, 1998), https://elibrary.ferc.gov/eLibrary/search [https://perma.cc/4BQL-W4JV] (click on "General Search", search on "Accession", enter "19981020-0310", and then click "Generate PDF" to download a PDF of the letter).

25. *Id.*

26. *See id.*

27. *Order Issuing Minor License*, 85 Federal Energy Guidelines: FERC Reports ¶ 61,065 (Oct. 16, 1998), https://elibrary.ferc.gov/eLibrary/search [https://perma.cc/4BQL-W4JV] (click on "General Search", search on "Accession", enter "19981020-0309", and then click "Generate PDF" to download a PDF of the letter).

28. *See id.*

29. FERC, *supra* note 23, at 3.

30. *Id.*

31. Order on Rehearing and Amending License Order, 62 Federal Energy Guidelines: FERC Reports ¶ 61,066 (Oct. 16, 1998) https://elibrary.ferc.gov/eLibrary/search [https://perma.cc/4BQL-W4JV] (click on "General Search", search on "Accession", enter "19981016-3066", and then click "Generate PDF" to download a PDF of the letter).

32. *See id.* at 2.

All four dams are classified by the Federal Emergency Management Agency (FEMA) as "High-Hazard Potential Dams" in which failure is expected to result in loss of life and may also cause significant economic losses, including to downstream property or critical infrastructure, environmental damage, or disruption to lifeline losses.[33]

Most of the original properties required for hydroelectric generation were acquired in 1923 when the Wolverine Power Company, a Delaware corporation ["Wolverine"], purchased land from the Riverdale Farms Company, a Michigan corporation. A warranty deed dated May 30, 1923 (and recorded on July 23, 1923) in Gladwin County conveyed "forever, all the certain pieces or parcels of land situated and being in the Townships of Tobacco, Billings, Hay, Secord and Clement in the County of Gladwin…" and further provided "and '[W]henever in the following descriptions or any parcel part or parts thereof, referenced is made to 'elevation above said level' or 'elevation above the mean tide of the Atlantic Ocean' such elevation is and shall be determined from the bench mark heretofore established at Sanford, in the Township of Jerome, County of Midland… which bench mark will be transferred by 'the Riverdale Farms Company '[to] a permanent location on its property at the Sanford dam site…''.[34]

The warranty deed granted to Wolverine real property and flowage rights[35] with the primary right and the authority to raise and lower the water of the Tittabawassee and Tobacco Rivers in the "construction, maintenance, and operation of any such dam or dams" while preserving an inferior right to the Riverdale Farms Company for purposes of boating,

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33. FED. EMERGENCY MGMT. AGENCY, FEDERAL GUIDELINES FOR DAM SAFETY: HAZARD POTENTIAL CLASSIFICATION SYSTEM FOR DAMS, (October 1998, *reprinted* January 2004), https://www.ferc.gov/sites/default/files/2020-04/fema-333.pdf [https://perma.cc/643Q-W4P6].

34. Memorandum from Joseph W. Colaianne of Clark Hill (Mar. 15, 2021) http://www.four-lakes-taskforce-mi.com/uploads/1/2/3/1/123199575/clark_hill_to_kepler_re._part_307___sad_2.1.2021.pdf [https://perma.cc/X5FX-K36R].

35. In connection with flowage rights, the warranty deed from Riverdale Farms stated the following: "[i]n addition to the right title and interest here and conveyed by this indenture by said party of the first part [Riverdale Farms Company] to said party of the second part (Wolverine Power Company] in and to the above described land, property and rights and not in limitation thereof, said party of the first part of itself, it's successors or assigns, hereby grants, bargains, sells, conveys and sets over unto said party of the second part, it's successors and assigns forever, the exclusive and perpetual right to overflow any and all of the above described property and any and all of the property which said party of the first part now owns or is possessed in said Townships of Tobacco, Billings, Hay, Secord and Clement, County of Gladwin, State of Michigan, by the construction and operation of a dam across the Tittabawassee and Tobacco Rivers[.]" *Id.* at 3.

hunting and fishing.[36] Historically, the properties were to be developed for the primary purpose of constructing and operating hydroelectric dams to generate electricity. However, a second inferior right was reserved for utilization of the reservoirs created (i.e., the Four Lakes) for the purpose of development, "boating, hunting and fishing."[37]

Over the last hundred years, summer cottages, residential subdivisions, marinas, parks, and other commercial enterprises developed along the Four Lakes and its tributaries, supporting local economy, creating a thriving environmental and lake ecosystem.[38] Retirees and their families invested in the region with the expectation that the Four Lakes System would remain in perpetuity.

II. WOLVERINE POWER COMPANY, BOYCE HYDRO POWER, AND FEDERAL OVERSIGHT

Since the 1920s until about 2004, the hydroelectric dams were privately owned and operated by Wolverine.[39] In 1976, FERC[40]

36. "Said party of the first part [Riverdale Farms Company] hereby expressly reserves to itself, its successors and assigns forever, the perpetual nonexclusive right but at its on their own risk, to use the waters of the Tittabawassee River and its tributaries impounded by the dams and the water power developments contemplated by the party of the second part [Wolverine Power Company], for domestic and farm purposes, the same to be taken under conditions satisfactory to said party of the second part and for purposes of boating, hunting and fishing, and the right to ingress and egress for such purposes from adjacent land owned or possessed by said party of the first part to said waters over and across the lands hereby conveyed to said party of the second part which are not submerged by said waters, but such rights also reserved shall at no time nor under any circumstances be used to interfere with or obstruct the full use and enjoyment of the property and rights are conveyed by said party of the first part for any use or uses to which said party of the second part may use or desire to use said property and the waters of the Tittabawassee and Tobacco Rivers and their tributaries so impounded for the operation of or in connection with said water power plants or developments in any and rights reserved by said party of the first part, its successors and assigns shall be subject to and inferior to the rights of second part, its successors and assigns, and said party of the second part, its successors and assigns, shall not be liable of any injury, damage, cost and expense which said party of the first part, its successors and assigns[.]" *Id*. at 4.

37. *Id.* at 3.

38. *See, e.g.*, FOUR LAKES TASKFORCE, *supra* note 1.

39. Compliance Order, 159 Federal Energy Guidelines: FERC Reports ¶ 62,292, 2 (June 15, 2017), https://elibrary.ferc.gov/eLibrary/search [https://perma.cc/4BQL-W4JV] (click on "General Search", search on "Accession", enter "20170615-3024", and then click "Generate PDF" to download a PDF of the letter).

40. FERC is regulated and derives its authority from the Federal Power Act, Chapter 12 of Title 16 of the United States Code, entitled "Federal Regulation and Development of Power", and is an independent regulatory commission within the Department of Energy. One of the powers of the FERC is to issue licenses for the construction, operation, and

determined that the Tittabawassee River was a navigable waterway of the United States and that Wolverine's dams were required to be licensed by the Federal Power Act in order to produce and sell electricity.[41] In 1983, Wolverine filed its license application for the Sanford Dam, and in 1987, FERC issued the license.[42]

In 1989, Wolverine filed license applications for the Secord Dam, Smallwood Dam and Edenville Dam.[43] Notice of the license applications was issued, and interested parties, consisting of the Michigan Department of Natural Resources, the United States Department of Interior, the Wixom Lake Association, and residents of the Four Lakes intervened in the FERC proceedings.[44] The Wixom Lake Association and local residents intervened over concerns that "large fluctuations of reservoir levels adversely affect boaters and lake-front residences" and requested FERC provide "that any license issued limit such fluctuations."[45] Following a hearing and considering the concerns raised by interested parties, FERC issued to Wolverine licenses for each of the dams for a period of 30 years (through 2028).[46] The FERC licenses included several terms and conditions concerning dam safety, property rights, water quality, public recreation and safety, and other project purposes.[47] Operations and maintenance, and any work incidental to additions or alterations required by FERC, were subject to the inspection and supervision of FERC and is authorized representatives.[48]

Following evaluation and inspection of the four dams, on January 4, 1999, FERC's regional engineer issued a letter to Wolverine describing the projects needed to increase spillway capacity of the dams.[49] The "spillway capacity" is the maximum outflow flood which a dam can safely pass.[50] In particular, FERC's inspection showed that the Edenville Dam, lacked sufficient spillway capacity to pass the Probable Maximum Flood

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maintenance of dams, water conduits, reservoirs, power houses, and transmission lines, or other project works that relate to navigation or the development of power on any of the streams over which Congress has jurisdiction or upon any part of the public lands of the United States, or for the utilization of the surplus water or waterpower from any government dam. 16 U.S.C. § 797(e) (1986).

41. FERC, *supra* note 23, at 2.
42. *See id*.
43. *See id*.
44. *See id.*
45. *Id.* at 2–3.
46. *See id.* at 16.
47. See FERC, supra notes 23, 26, 29.
48. FERC, *supra* note 43, at 3.
49. Letter from Ronald A. Lesniack, PE of FERC, Accession #19990129-0235 (Jan. 4, 1999).
50. FERC, *supra* note 43, at 4.

(PMF) in accordance with FERC's Dam Safety Guidelines.[51] Wolverine failed to immediately address this concern requesting instead that it be given additional time to study the spillway capacity issue.[52]

On June 13, 2002, the FERC Regional Engineer issued another letter "requiring Wolverine to file by July 31, 2002 a detailed plan and schedule for the completion of the spillway upgrades and to complete the modifications to address in adequate spillway capacity by December 31, 2006."[53] In the interim, on June 23, 2004, Wolverine transferred the FERC licenses and dam properties to Synex Michigan, LLC ("Synex"). Synex subsequently changed its name to Boyce Hydro Power, LLC ("Boyce Hydro").[54] As the new licensee, Boyce Hydro was required to comply the prior FERC orders requiring dam upgrades and improvements. On July 15, 2004, Boyce Hydro sent a letter to the FERC's Regional Engineer indicating its intention to complete the "construction of an auxiliary spillway on the Tittabawassee River in 2004 and was studying whether it also needed to construct a second auxiliary on the Tobacco River."[55] The auxiliary spillways were never constructed.[56]

From the onset, Boyce's compliance record was uneven, at best. Issues ranged from failing to comply with environmental and recreational conditions of the licenses to serious dam safety issues.[57] On June 15, 2017, the FERC Director of the Division of Hydropower Administration and Compliance sent 46-page order to Boyce detailing 11 years of Boyce's non-compliance with its FERC license and regulations:

1) failing to increase spillway capacity of the project; 2) performing unauthorized dam repairs; 3) performing unauthorized earth-moving activities; 4) failing to file an adequate Public Safety Plan; 5) failing to construct approved recreation facilities […] and for restricting public access; 6) failing to acquire all necessary project property rights; and 7) failing to comply with the Commission's 1999 Order approving its Water Quality Monitoring Plan.[58]

On November 20, 2017, FERC issued a Cease Generation Order to Boyce for the Edenville Dam, resulting in Boyce not being permitted to

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51. *See id.* at 4–5.

52. *See id.* at 6.

53. FERC, Order Revoking License, 164 FERC ¶ 61, 178 (Sep. 10, 2018), https://www.ferc.gov/sites/default/files/2020-06/10808-058.pdf [https://perma.cc/2ZNM-N5Y9].

54. FERC, *supra* note 43, at 2.

55. Letter from FERC to Synex (Sept. 23, 2004), https://elibrary.ferc.gov/eLibrary/search [https://perma.cc/4BQL-W4JV] (click on "General Search", search on "Accession", enter "20041005-0132", and then click "Generate PDF" to download a PDF of the letter).

56. *See* Roth, *supra* note 3.

57. FERC, *supra* note 43, at 1.

58. *Id.*

run water through the power general turbines.[59] This order was temporarily lifted on January 5, 2018 through March 1, 2018, which allowed Boyce to run water through the turbines and generate electricity and manage the lake levels at Wixom Lake during the winter months.[60] In the interim, FERC issued an order proposing the revocation of Edenville Dam license.[61]

III. FOUR LAKES TASK FORCE

Concerned with the potential and permanent loss of Wixom Lake, as well uncertainty in connection with the long-term sustainability of Secord, Smallwood and Sanford Lakes, in March 2018 the Wixom Lake Association and Sanford Lake Preservation Association filed motions to intervene in the FERC revocation proceedings (in connection with the Edenville Dam license).[62] The lake associations, sought to delay the revocation, while it pursued a public solution in order to preserve the Four Lakes and transition the four hydroelectric dams from private ownership to public ownership.[63] To this end, in July 2018, lake association representatives approached the counties of Midland and Gladwin (the "Counties") to form a citizen task force to explore the process of acquiring, financing and managing the dams and lake levels in accordance with Part 307 "Inland Lake Levels" of the Michigan Natural Resources and Environmental Protection Act, MCL 324.30701, et seq. ("Part 307").[64] They established the FLTF to coordinate efforts and was appointed to

59. FERC, Order Revoking License, 164 FERC ¶ 61,178 (issued Sep. 10, 2018) https://www.ferc.gov/sites/default/files/2020-06/10808-058.pdf [https://perma.cc/QA5L-A3Z7].

60. **AUTHOR PLEASE ADD AUTHORITY**

61. FERC, *supra* note 62, at 15.

62. *Id.* at 15–16.

63. *Id.*

64. Commissioner Minutes of July 10, 2018, Gladwin Board of Commissioners (Jul. 10, 2018), https://gladwincounty-mi.gov/wp-content/uploads/2018/08/Meeting-Minutes-July-10-2018.pdf [https://perma.cc/7SJB-G65V]; Resolution Recommending the Formation of a Citizen Task Force to Plan to Implement the Normal Lake Level for Wixom Lake, Sandford Lake, Smallwood Lake, and Secord Lake Pursuant to Part 307 of the Michigan Natural Resources, and Environmental Protection Act, Gladwin Board of Commissioners, Res. 2018-017 (Jul. 10, 2018), https://gladwincounty-mi.gov/wp-content/uploads/2018/08/Meeting-Minutes-July-10-2018.pdf [https://perma.cc/5YS2-Y63P]; Resolution Recommending the Formation of a Citizen Task Force to Plan to Implement the Normal Lake Level for Wixom Lake, Sandford Lake, Smallwood Lake, and Secord Lake Pursuant to Part 307 of the Michigan Natural Resources, and Environmental Protection Act, Midland County Board of Commissioners, Res. 72-7-18AO, (Jul. 17, 2018)

serve as the Counties' Delegated Authority and pursue legal action to establish the normal levels for the Four Lakes System.[65]

After years of obfuscation, needless extensions and outright delays perpetrated by Boyce, on September 10, 2018 FERC issued an order revoking the Edenville Dam.[66] Specifically, FERC called out Boyce's longstanding failure to increase the dam spillway capacity to safely pass flood flows, as well as its failure to comply with its license, FERC's regulations, and the June 15, 2017 Compliance Order.[67] The water levels at Wixom Lake were ordered to be lowered, and jurisdiction over the project and dam safety was transferred to Michigan's Department of Environment, Great Lakes and Energy (EGLE).[68]

On October 4, 2018, FLTF and EGLE representatives met to discuss protocols in connection with the transition from FERC oversight to EGLE Dam Safety oversight.[69] At this meeting, FLTF discovered that there was very little material or information connected with the transfer of jurisdiction.[70]

IV. ESTABLISHING NORMAL LEVELS OF THE FOUR LAKES; AND FOUR LAKES SPECIAL ASSESSMENT DISTRICT

Michigan common law does not require a private dam owner to maintain the existence of a dam or the artificial level of a lake. The case of *Goodrich v. McMillan*,[71] established the rule that ownership of a dam *does not impose a duty* on the dam owner to maintain the water at an artificial level created by operation of a dam.[72] The harshness of the common law created considerable uncertainty among lakefront property owners. Part 307 (and prior Michigan law dating back to the early 1900's) provides a public solution for preserving lakes that were created by the artificial impoundment of water.

Section 30701 of Part 307 defines "normal level" of an inland lake as:

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65. FERC, Order Revoking License, 164 FERC ¶ 61,178, (issued Sept. 10, 2018) https://www.ferc.gov/sites/default/files/2020-06/10808-058.pdf [https://perma.cc/QA5L-A3Z7].

66. *See id.* at 13.

67. *See id.* at 11.

68. Jason Hayes, *One Year After the Edenville Dam Failure*, MACKINAC CENTER FOR PUBLIC POLICY (May 21, 2021), https://www.mackinac.org/one-year-after-the-edenville-dam-failure [https://perma.cc/23HZ-52VH].

69. **AUTHOR PLEASE ADD AUTHORITY**

70. **AUTHOR PLEASE ADD AUTHORITY**

71. 187 N.W. 368 (1922).

72. *See id.*

> [t]he level or levels of the water of an inland lake that provide the most benefit to the public; that best protect the public health, safety, and welfare; that best preserve the natural resources of the state; and that best preserve and protect the value of property around the lake.[73]

The purpose of Part 307 is to provide for the control and maintenance of inland lake levels for the benefit and welfare of the public.[74] Part 307 essentially authorizes counties to make policy decisions as to the levels of their inland lakes, and to build and finance dams as necessary to maintain the desired lake levels.[75] Ultimately, however, the county circuit court has the authority to weigh competing factors in its determination of the normal levels of an inland lake.[76] Before a circuit court determined the "normal level", it must consider, in some instances, many competing factors such as past lake level records, hydrology of the watershed, and downstream impacts.[77] Moreover, once established, the circuit court has "continuing jurisdiction" over the lake levels, which means, anything affecting the lake levels, including departures from the normal levels, should be presented to the circuit court for its consideration.[78]

Part 307 also provides the financial model for sustainability of lake level structures. The statute authorizes the establishment of a special assessment district to defray the costs in connection with administration, operation, maintenance and improvement of lake level structures.[79]

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73. MICH. COMP. LAWS § 324.30701(h) (1995).

74. In Re Martiny Lakes Project,160 N.W.2d 909, 912 (1968); Lenawee Bd. of Commr's v. Abraham, 287 N.W.2d 371, 373 (1979).

75. In re Matter of Van Etten Lake, 386 N.W.2d 572, 576 (1986).

76. MICH. COMP. LAWS § 324.30701(c) (1995).

77. *See* MICH. COMP. LAWS § 324.30707(4) (1995). This statute, in pertinent part, provides: "In a determination of the normal level of an inland lake, the court shall consider all the following: (a) Past lake level records, including the ordinary high-water mark and seasonal fluctuations. (b) The location of septic tanks, drain fields, sea walls, docks, and other pertinent physical features. (c) Government surveys and reports. (d) The hydrology of the watershed. (e) Downstream flow requirements and impacts on downstream riparians. (f) Fisheries and wildlife habitat protection and enhancement. (g) Upstream drainage. (h) Rights of riparians. (i) Testimony and evidence offered by all interested persons. (j) Other pertinent facts and circumstances." *Id.*

78. MICH. COMP. LAWS § 324.30707(5) (1995).

79. MICH. COMP. LAWS § 324.30711(1) (1995) "The county board may determine by resolution that the whole or a part of the cost of a project to establish and maintain a normal level for an inland lake shall be defrayed by special assessments against the following that are benefited by the project: privately owned parcels of land, political subdivisions of the state, and state owned lands under the jurisdiction and control of the department. If the county board determines that a special assessment district is to be established, the delegated authority shall compute the cost of the project and prepare a special assessment roll." *Id*.

Moreover, the special assessment district is authorized to issue municipal bonds, notes and lake level orders in anticipation of special assessments.[80] Municipal securities (i.e., bonds and notes) can be issued for up to a period of 40 years.[81] The entity responsible for operating and maintaining the normal levels established by the circuit court, is the entity or "Delegated Authority" appointed by the county board of commissioners.

In October 2018, the Counties adopted resolutions finding that in "order to protect the public's health, safety and welfare, to best preserve the natural resources of the state, and to preserve and protect the value of property around the lakes" that it was necessary to establish the normal levels for all Four Lakes.[82] In addition, the resolutions provided that all costs in connection with the maintenance of the normal levels of the Four Lakes shall be "defrayed by special assessments for the benefits derived against privately owned parcels of land, political subdivisions of the state, and state owned lands."[83] The Sanford Lake Preservation Association, which later changed its name to the Four Lakes Task Force (FLTF), was appointed the Counties' Delegated Authority.[84] The FLTF was to serves as the counties' agent to "oversee the lake level project, to prepare a Special Assessment District[s] and Special Assessment Roll[s] . . . and to "take all other actions as necessary and required by the delegated authority as provided in Part 307."[85] The Counties further directed their respective legal counsel to file a petition in the circuit courts of the Counties for the determination of the legal lake levels and boundaries of the special assessment district.[86]

In January 2019, petitions were filed in the Midland and Gladwin Circuit Courts to establish the normal levels for each of the Four Lakes, and to confirm the boundaries and establishment of the Four Lakes Special Assessment District. [87] Notices were published and mailed to all property owners in the proposed special assessment district.[88] In addition, notices

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80. *See* MICH. COMP. LAWS § 324.30705 (2020).

81. *See* MICH. COMP. LAWS § 324.30705(2) (2020).

82. *See* GLADWIN CNTY. BD. OF COMM'RS, Res 2018–034, 2 (Oct. 09, 2018); *see also* MIDLAND CNTY. BD. OF COMM'RS, Res. (Oct. 16, 2018).

83. *See id*.

84. *See id.*

85. *See id*.

86. *See id.* at 3.

87. *See* Order Setting Normal Lake Levels, In the Matter of: Wixom Lake, Sanford Lake, Smallwood Lake and Secord Lake, No. 19–5980–PZ (Midland Cnty. Cir. Ct. May 28, 2019). Pursuant to an order dated March 12, 2019, the Gladwin County Circuit Court assigned the Gladwin matter, No. 19–009892–PZ, to be heard by the Midland County Circuit Court as well. *See id.* at 1 n.1.

88. *See* Memorandum from Joseph W. Colaianne, *supra* note 36.

were provided to each of affected township or village, and state agencies.[89] The petitions proposed lake levels consistent with the historical operations set forth in the FERC licenses.[90] On May 3, 2019, testimony and information in connection with the lake levels and special assessment district were presented to the Midland circuit court.[91] On May 28, 2019, the circuit court entered an order confirming the normal lake levels for each of the Four Lakes and special assessment district.[92]

In August 2019, the FLTF and the Counties entered into an interlocal agreement establishing terms and conditions in connection with the acquisition of the four hydroelectric dams, and the administration, financing, operation, maintenance, repair and improvements of the lake level facilities.[93] To this end, and after several months of negotiations and due diligence in connection with acquisition of the dams, FLTF and Boyce Hydro (and various Boyce entities) entered into a purchase agreement on December 31, 2019.[94] The purchase price for all four dams and related properties, including power generation facilities, was $16,000,000.[95] The purchase agreement contemplated a series of installment payments beginning in June 2020, and a final closing and transfer of the dams, bottomlands, flowage rights and power generation facilities by January 2022.[96] FLTF, on behalf of the Four Lakes Special Assessment District, proceeded to undertake steps to obtain public financing and due diligence connection with the acquisition and repair of the dams.[97]

On May 17, 2020, storms brought heavy rainfall across the Midland and Gladwin region.[98] On the evening of May 19, an embankment failed on the Edenville Dam after the Tittabawassee River surpassed a height of 26.5 feet.[99] Several hours later excess water from the Edenville Dam failure caused the Sanford Dam to breach.[100] In addition, the upstream dams at Secord and Smallwood lakes were also damaged. Thousands of homes, properties, businesses and public infrastructure were

89. *See id.*
90. *See id.*
91. *See id.*
92. *See id.*
93. *See id.*
94. *See* Boyce Hydro, *Four Lakes Task Force Sign Purchase Agreement*, FOUR LAKES TASK FORCE (Jan. 2, 2020), https://www.four-lakes-taskforce-mi.com/updates/boyce-hydro-four-lakes-task-force-sign-purchase-agreement [https://perma.cc/M249-AMGM].
95. **AUTHOR PLEASE ADD AUTHORITY**
96. **AUTHOR PLEASE ADD AUTHORITY**
97. **AUTHOR PLEASE ADD AUTHORITY**
98. Roth, *supra* note 3.
99. *See id.*
100. *See id.*

damaged or destroyed during this catastrophic flood event.[101] President Trump declared it a national disaster.[102]

The dam failures occurred prior to the FLTF making its first installment and option payment to Boyce Hydro in June 2020 (in accordance with the terms of the purchase agreement that was signed in December 2019; and an amendment to that agreement in April 2020).[103] Consequently, the transaction was terminated, and neither the Counties or FLTF assumed any control or ownership of the dams.[104] This presented a significant problem in the immediate aftermath of the May 19 dam failures since neither the Counties or FLTF had any control or rights to enter properties owned by Boyce Hydro.[105] Almost immediately, it was clear that the Boyce Hydro was no position to address the impacts created by the dam failures and flooding, and further, refused to comply with FERC or State directives. Indeed, not long after the flooding (and not surprising), Boyce Hydro filed for bankruptcy protection.[106]

In the days following the disaster, a strategy was needed to address the immediate recovery efforts and coordinate with federal, state and local agencies. In addition, until the counties obtained control and ownership of the dams and related properties, no long-term planning could pursue. Accordingly, in June 2020, the Counties appointed FLTF as the lead local agency in coordinating the funding, administration, design, improvement, repairs and replacement of the dams, including funding and contract with Federal, State and local agencies.[107] In addition, the Counties proceeded to condemn and secure Boyce Hydro properties and flowage rights in order to undertake the recovery and restoration of the Four Lakes System.[108]

In connection with the recovery efforts, FLTF secured $50 Million through USDA-Natural Resources Conservation Services, to initially stabilize the dams, remove flooding debris, and restore shoreline.[109] Then, FLTF proceeded, in coordination with its engineering and other consultants, to undertake a feasibility study to address design, funding and

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101. Roth, *supra* note 3.

102. Acosta, *supra* note 5.

103. *See* FOUR LAKES TASK FORCE, PLAN FOR THE RESTORATION OF THE FOUR LAKES OF GLADWIN COUNTY AND MIDLAND COUNTY, 17 (2021), https://www.four-lakes-taskforce-mi.com/uploads/1/2/3/1/123199575/restoration_path_forward_final_5.17.21.pdf [https://perma.cc/PME2-SKBD].

104. *See id.*

105. *See id.*

106. *See id.*

107. *See* CNTY. OF MIDLAND, CNTY. OF GLADWIN, & FOUR LAKES TASK FORCE, AMENDMENT NO. 1 TO AGREEMENT BETWEEN MIDLAND AND GLADWIN COUNTIES AND FOUR LAKES TASK FORCE 2 (2020).

108. *See id.*

109. *See* FOUR LAKES TASK FORCE, *supra* note 108, at 13.

regulatory framework for repairs and reconstruction of the dams, and restoration of the Four Lakes System.[110] To this end, in May 2021, after several months of study, FLTF released the "Plan for the Restoration of the Four Lakes of Gladwin County and Midland County."[111] The study details: (1) survey results of property owners in connection with funding and dam restoration; (2) legal framework under Part 307 to transition private ownership to public ownership of the dams, and restore the lake levels; (3) public policy considerations, in connection with dam safety and environmental restoration; (4) funding and financing the lake level project and operations; and (5) special assessments and affordability analysis.[112] After extensive analysis the FLTF made the following conclusions:

- Property Owner Survey and Community Engagement indicated that the best alternative for Midland and Gladwin Counties is to return the Four Lakes System in accordance with Part 307.[113]
- That it is technically feasible to restore and repair dams for lake level management.[114]
- That it is financially feasible to restore and repair the Four Lakes system but will be a challenge to property owners in the Four Lakes Special Assessment District without significant financial assistance from State and Federal government.[115] The estimated cost for the restoration is nearly $240 Million.[116]
- Restoration of the dams to produce hydroelectricity is not financially feasible.[117]
- The primary focus on the management of the Four Lakes System is for public safety, preserving the environment and ecosystem, and proactively working with counties on strategic flood mitigation and improved flood management during historical storms.[118]

V. ENVIRONMENTAL RESTORATION AND ACCOUNTABILITY

The Counties, the Four Lakes Special Assessment District, and the FLTF, have taken the lead to acquire, restore, repair, improve and maintain

110. *See id.* at 8.
111. *See* FOUR LAKES TASK FORCE, PLAN FOR THE RESTORATION OF THE FOUR LAKES OF GLADWIN COUNTY AND MIDLAND COUNTY (2021), https://www.four-lakes-taskforce-mi.com/uploads/1/2/3/1/123199575/restoration_path_forward_final_5.17.21.pdf. [https://perma.cc/PME2-SKBD].
112. *See id*. at 5.
113. *See id.* at 8.
114. *See id.*
115. *See id.*
116. *See id.*
117. *See id.* at 9.
118. *See id.* at 8–11.

the legal lake levels of the Four Lakes. First and foremost, the focus will be on designing and construction of the dams to bring them into compliance with Part 315 "Dam Safety" of the MNREPA.[119] During the construction and repair phase to restore the Four Lakes, FLTF has proposed the following:

- **Monitoring.** Monitoring river flow, rainfall, lake levels, temperature. This process will be as automated and open as possible.[120] FLTF will work with the regulators to assure there is agreement on strategy during the transition from FERC.[121]
- **Mitigating Invasive Species.** FLTF will work closely with local lake improvement boards and municipal agencies and will report publicly in connection with mitigation of aquatic and plant invasive species.[122]
- **Vegetation Management.** Examples from other lakes that have failed, show significant tree growth can occur on lake bottomlands during construction.[123] Vegetation will need to be mange through the transition period. FLTF will develop a plan to manage bottomland vegetation.[124]
- **Recreational Opportunities.** Boyce never completed its FERC recreational license requirements.[125] FLTF will undertake an assessment of the current recreational facilities, assess damage, and seek input from the Counties and local municipalities on future interest.[126] Based on that report a recreational plan will be developed.[127]
- **Fisheries.** Prior to the dam breach, the Four Lakes were excellent fisheries, and over the years were established, stocked and augmented by the MDNR.[128] The Four Lakes community and the State has desire to ensure they return. To this end, FLTF proposes:

i. With MDNR sponsorship, determine the key issues for establishing a long-term plan to restore fish populations, and the protection of these lakes from invasive species.[129]

ii. To identify and assure there are options for fish migration that can be implemented on Sanford and Edenville.[130]

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119. *See* MICH. COMP. LAWS §§ 31501–505 (1995).
120. *See generally* FOUR LAKES TASK FORCE, *supra* note 108.
121. *See id.*
122. *See id.* at 66–68.
123. *See id.* at 67–68.
124. *See id.*
125. *See id.* at 15.
126. *See id.* at 68–69.
127. *See id.*
128. *See id.* at 20.
129. *See id.* at 20, 65–66.
130. *See id.*

 Flood Management. FLTF is undertaking a flood control study to establish dam safety design standards and understand impacts of restoration in flood plain and shorelines.[131] FLTF is also sponsoring a "Probable Maximum Precipitation" study for the Tobacco and Tittabawassee Rivers basin.[132] FLTF is sharing the studies and will work with downstream partners, the State of Michigan, as well as USACE, FEMA.[133]

 Stream Mitigation. FLTF understands that drain of the lakes and the refilling of the lakes will have impacts. FLTF believes that the State would be the best resource to manage stream mitigation, and FLTF would like to further develop strategies of restoring streams and lakes to best preserves the natural recourse of the state.[134] Restoring the lakes back will mitigate much of the shoreline and will address more than a 120 miles of storm drainage entering the lakes.[135]

 Wetland Mitigation. Significant acreage of wetlands has been destroyed with the dam failures.[136] These should return as the water levels of the lakes return.[137] The bottomlands of the Four Lakes will likely become emerging or new wetlands as a result of the dam breach.[138] FLTF's desired approach is to identify a base line that was destroyed.[139] EGLE should monitor the new wetlands created, and if there is an EPA or EGLE regulatory requirement to offset what is lost in the filling of the lakes, those costs should be State obligation, or mitigated via State and Federal Grants to other communities.[140]

Once the dams are constructed, FLTF (on behalf of the Counties) would direct its energies to the following:

 Protection and monitoring of wetlands created following the reconstruction of the dams.[141]

 Monitoring and management to protect of threatened and endangered species and to mitigate the population of invasive species.[142]

 Monitoring of the environment during the operations of the dams.[143]

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131. *See id.* at 29–30.
132. *See id.* at 30.
133. *See id.*
134. *See id.* at 59–63.
135. *See id.*
136. *See id.* at 64.
137. *See id.*
138. *See id.*
139. *See id.*
140. *See id.*
141. *See id.*
142. *See id.* at 65–66.
143. *See id.* at 59–72.

This will take a private-public partnership, to manage through prior to the lake levels, to restore the lake levels.[144] Restoration will also require the federal and state government, to look beyond regulations, and fund mandates that would have been placed on Boyce Hydro Power.[145]

VI. MANAGING DAM INFRASTRUCTURE OF A SERVICE LIFE BASIS

Volumes have been written about the Life Cycle Analyses (LCA) of dams and their associated impoundments which were constructed for various commercial purposes ranging from water supply, irrigation, hydropower, flood storage, diversion, etc. Typically, these analyses consider three distinct phases, construction, operation, and decommissioning when the commercial function of the project no longer exists. In connection with the Four Lakes, the analysis requires a paradigm shift to address the situation where the commercial purpose (hydropower) has been supplanted with that of sustaining a rich, diverse ecosystem and the associated public benefits for current and future generations.[146] In short, FLTF has begun an analysis for maintaining the lake system in the operational phase into perpetuity, applying a risk-based approach to establish an inflow design flood (IDF) for each of the four dams.[147] This analysis requires addressing measures to protect and enhance the ecosystem, adapting to demographic changes and maintaining the lake infrastructure indefinitely. As we transitioned from FERC oversight to State "Dam Safety" oversight, FLTF has proposed a risk-based analysis that will consider all the following:

- **Develop a site-specific Probable Maximum Precipitation (PMP).** This entails using accurate update-to-date meteorological data and applying site-specific temporal/spatial patterns to perform site-specific analyses.[148] Compared to the 1993 regional based PMP,[149] this will result in less uncertainty and provide an up to date, more accurate representation of the PMP. The study will also derive the annual exceedance probability of rainfall and an uncertainty analysis of PMP depths, which will inform subsequent risk-based decision-making processes.[150]
- **Update the Probable Maximum Flood (PMF).** The current HEC-HMS models will be updated using the site-specific PMP do develop

144. *See id.* at 7.
145. *See id.* at 7–8.
146. *See* PLAN FOR THE RESTORATION OF THE FOUR LAKES, *supra* note 108, at 19.
147. *See id*. at 35.
148. *See id*. at 33.
149. *See id*. at 9, 32.
150. *See id.* at 33.

updated inflow hydrographs for a range of floods up to the PMF for each dam.[151]

- **Hydrologic Potential Failure Mode Assessment.** Identify potential failure modes (overtopping, erosion, overstressing structural components, etc.) over the range of flood flows up to the PMF and assess their likelihood of occurrence.[152]
- **Refine the Inundation Mapping.** Use the hydrologic events identified with potential failure to develop inundation maps over the range of potential failure mode flows.[153]
- **Incremental Consequence of Failure Analysis.** Incorporate up to date demographic data with the refined inundation mapping) to determine the consequences of failure for each failure mode flow.[154]
- **Select the IDF.** Apply established risk-based decision-making criteria to select the IDF based on consequences of failure.[155]

FLTF would then recommend a peer review of the above analysis to increase the confidence level in the findings.[156] Using the risk-based approach to select the IDF will allow FLTF to establish spillway capacity requirements for each dam that reflect the latest meteorological information, demographic data, and state-of-art engineering principles. These steps will provide a solid foundation for sustaining the Four Lakes, their ecosystems and associated public benefits for future generations.

VII. CONCLUSION

The Counties and Four Lakes community had an affordable plan prior to the dam failures. The lake associations had engaged and pressed governmental regulators to address compliance issues with Boyce, but the regulators were slow to act. For over 14 years, Boyce was permitted to obfuscate, delay, and avoid investment in dam safety, while profiting from the sale of power. The damaged system is now at the feet of the community to clean-up with no formal or secure financial structure in place for financing the restoration, or regulatory system suited for this situation. The Four Lakes system is not only an example of what can happen to a private dam, it is an example of what will happen to every other dam in Michigan that was originally built for a purpose, such as hydropower, that no longer can sustain the infrastructure to support the lakes, regulatory and market

151. *See id.*
152. *See id.* at 31.
153. *See id.* at 31–33.
154. *See id.*
155. *See id.*
156. *See id.*

conditions have already pre-determined this for many dams. Part 307 provides the legal, operational, and financial model for the public's sustainability of lake level public infrastructure, and the expansion of the dams regulated under Part 307 should be a targeted goal of the State.