

May 2, 2023

Via email:
Rulemaking.Comments@nrc.gov

COMMENTS BY NUCLEAR INFORMATION AND RESOURCE SERVICE, ALLIANCE FOR A GREEN ECONOMY, CITIZENS RESISTANCE AT FERMI 2, CONNECTICUT COALITION AGAINST MILLSTONE, EFMR MONITORING GROUP AT THREE MILE ISLAND, PHYSICIANS FOR SOCIAL RESPONSIBILITY WISCONSIN, AND SEACOAST ANTI-POLLUTION LEAGUE ON PROPOSED RULE AND DRAFT GENERIC ENVIRONMENTAL IMPACT STATEMENT FOR RENEWING NUCLEAR POWER PLANT LICENSES.

Dear U.S. Nuclear Regulatory Commission:

Nuclear Information and Resource Service and the below-signed organizations write today to timely respond to the Nuclear Regulatory Commission (NRC)'s Notice Renewing Nuclear Power Plant Licenses—Environmental Review, 88 Fed. Reg. 13,329 (Mar. 3, 2023), including the Proposed Rule and draft Revision 2 to NUREG-1437, “Generic Environmental Impact Statement for License Renewal of Nuclear Plants” (Draft GEIS).

We respectfully submit that the Proposed Rule and Draft GEIS violate the National Environmental Policy Act because the NRC's designation of “SMALL” to the environmental impacts of universally re-licensing all nuclear reactors in the U.S. is technically indefensible. Therefore, we call upon the NRC to withdraw the Proposed Rule and Draft GEIS and prepare site-specific Environmental Impact Statements that take a hard look at *all* environmental impacts, at the time that licensees file applications for license renewal.

We hereby adopt and incorporate as our own, the comments on the above-referenced matters submitted by, respectively, Beyond Nuclear and the Sierra Club; Natural Resources Defense Council; and San Luis Obispo Mothers for Peace. In addition, we supplement those comments with the enclosed document, “Survey of Site-Specific Impacts of Subsequent License Renewal for Representative Nuclear Reactors.”

Thank you for your consideration.

Sincerely,



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Executive Director

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Survey of Site-Specific Impacts of Subsequent License Renewal for Representative Nuclear Reactors

In April of 2023, Nuclear Information and Resource Service collected survey responses on site-specific environmental impacts of several nuclear reactor sites. Data was compiled by questionnaires completed by members of local, regional, and national environmental organizations with specific historical knowledge of the reactor sites on which they provided information. The sites include both boiling water reactors and pressurized water reactors, located near different types of water sources (lakes, oceans, and rivers). Summaries of the data collected on the following reactors are included below, with documentation to the extent available. Because many of the reactors' operations began in the 1970s, documentation of many incidents must only be accessed from NRC's Public Document Room via microfiche records. Our ability to access documents was limited by the short duration of the public comment period.

Enrico Fermi, unit 2

Fermi, unit 2 is the only operating reactor at the site it occupies with the retired unit 1 reactor, which has been defueled and awaits decommissioning since 1972. The site was licensed in 2015 for construction and operation of a third reactor, Fermi, unit 3, but the plant's owner, DTE Energy, announced at the time that it has no plans to begin construction. Fermi, unit 2 is located on the northwest shore of Lake Erie, in Monroe County, Michigan. Unit 2 is a General Electric Mark I BWR, which began operation in 1988, with a rated generation capacity of 1122 MWe. At the time it was licensed, unit 2 was the largest Mark I reactor in the world.

Surface Water Impacts

Cooling System Type:	Evaporative Draft Cooling Tower
Cooling Water Source:	Lake Erie
Ultimate Heat Sink:	Lake Erie
Surface Water Impacts:	Harmful Algal Blooms Thermal Pollution Impingement and Entrainment of fish and aquatic life

Radioactive Releases

- Liquid effluents are discharged into Lake Erie and Swan River
- Over 1 million gallons of contaminated water from a 1993 accident were released into Lake Erie

Nuclear Disasters/Accidents

In 1993, a turbine blade broke off and caused extensive damage to the plant and a fire.¹ Over 1 million gallons of water used to put out the fire became radioactively contaminated, and was eventually discharged into Lake Erie.

¹ Henry, Tom. "Fukushima plans stir memories for Fermi 2 water release." *The Toledo Blade*. April 18.2021. <https://www.toledoblade.com/frontpage/2021/04/18/On-a-much-smaller-scale-Fermi-2-had-a-radioactive-water-release-in-1993-too/stories/20210417021>

James A. FitzPatrick Nine Mile Point, units 1 and 2

The James A. FitzPatrick and Nine Mile Point nuclear power plants are physically adjacent to one another on the shore of Lake Ontario, in the town of Lycoming, Oswego County, New York. Historically, they were licensed and operated as two separate power plants, and had different owners. The plants came under common control and operation by a single corporation in 2017, when Exelon Corp. purchased FitzPatrick from Entergy Corp. As of 2023, they are now 100% owned and operated by Constellation Energy, under a series of corporate restructurings executed by Exelon from 2021-2023.

All three reactors are General Electric BWRs. Nine Mile Point, unit 1, and FitzPatrick are Mark I models, which began commercial operation in 1969 and 1975, respectively. Nine Mile Point, unit 2, is a Mark II, and began commercial operation in 1988. Nine Mile Point 1 is the oldest currently operating reactor in the U.S., and the fourth oldest globally. Lake Ontario is an international body of water, shared with Canada and overseen by the International Joint Commission on the Great Lakes (IJC). Under the Boundary Waters Treaty of 1909, the IJC has the authority to “approve projects that affect water levels and flows across the boundary and investigating transboundary issues and recommending solutions,” including a number of matters that could be impacted by Nine Mile Point and FitzPatrick: drinking water, commercial shipping, hydroelectric power generation, agriculture, ecosystem health, industry, fishing, recreational boating and shoreline property. Among other concerns, a nuclear disaster at Nine Mile Point and/or FitzPatrick could have severe impacts on all of the above.

Furthermore, the Nine Mile Point and FitzPatrick sites are on unceded treaty lands of the Onondaga Nation. The Onondaga Nation has thoroughly documented concerns over the impacts of Nine Mile Point and FitzPatrick to its territory in a 2020 red paper.² In addition, the waters of Lake Ontario and its outlet, the St. Lawrence River, are part of the sovereign territories of several other Indigenous nations, including the Abinaki, Cayuga, Missisauga, Mohawk, and Seneca nations. The international dimensions of the impacts to Lake Ontario are inherently site-specific.

Surface Water Impacts

Cooling System Type:	Nine Mile Point, unit 1 – Once-Through Cooling Nine Mile Point, unit 2 – Evaporative Draft Cooling Tower James A. FitzPatrick – Once-Through Cooling
Cooling Water Source:	Lake Ontario
Ultimate Heat Sink:	Lake Ontario
Surface Water Impacts:	Thermal discharges (Nine Mile Point, unit 1, and FitzPatrick) Entrainment and Impingement of Aquatic Species Entrainment and Impingement of Avian Species (2000 event) Endangered Species
Drinking Water Impacts:	Lake Ontario is the drinking water source for 9 million people Liquid effluent discharges

² Onondaga Nation, Haudenosaunee Environmental Tax Force, and American Indian Law Alliance. “Nuclear Reactors are Not Green.” January 30, 2020.

<https://storage.googleapis.com/wzukusers/user-28491011/documents/3d6172a81ffc4c5ab8c805800face0e3/NukeRedPaper1-30-20-haudenosaunee.pdf>

1991 release at FitzPatrick
Tritium leaks at Nine Mile Point and FitzPatrick

There four species of fish in Lake Ontario listed as threatened or endangered.³

In January 2000, Nine Mile Point, unit 1, killed over 100 ducks when operators reversed the directional flow of the water intake system.⁴

Nine Mile Point 2: Legionnaire's disease from cooling tower infestation in 1989

Radioactive Releases

- All three reactors release liquid and gaseous radioactive effluents through their routine operations. In several instances, larger than normal and accidental releases have occurred.
- NRC effluent release reports documented over 3 million curies of noble gas releases from Nine Mile Point and FitzPatrick.
- Nine Mile Point, unit 1, spilled 40,000 gallons of radioactive water in the wastewater treatment facility in 1981, which was covered up and went unremediated for eight years.
- In March 1991, FitzPatrick released an unmonitored amount of radioactive materials from a vent in one of the radioactive waste concentrators, contaminating areas of the reactor site and discharging into Lake Ontario.⁵
- Through the 1990s, both Nine Mile Point and FitzPatrick illegally sent dozens of shipments of radioactive sewage to Oswego County's wastewater treatment plant.
- Nine Mile Point and FitzPatrick have both had documented leaks of tritium.⁶

Other Pollution and Environmental Health Impacts

The county has been suffered many environmental harms, including one of the largest coal plants in the state (now retired), and four superfund sites. The latter includes a hazardous waste incinerator, Pollution Abatement Services, which operated intermittently from 1970-1977. Nine Mile Point and FitzPatrick remain among the largest polluters in the area, their environmental impacts compound those of other polluting facilities and legacy environmental pollution from these and other sources.

Socioeconomic Impacts

Oswego County, where Nine Mile Point is located, has high rates of poverty unemployment. The local economy has long suffered from losses of well-paying jobs due to factory closures and

³ <https://animals.mom.com/endangered-species-lake-ontario-8734.html>

⁴ Gunter, Linda, Paul Gunter, Scott Cullen, Nancy Burton, Esq. "Licensed to Kill: How the nuclear power industry destroys endangered marine wildlife and ocean habitat to save money." Safe Energy Communication Council, Humane Society of the United States, Nuclear Information and Resource Service, and STAR Foundation. 2001. <http://www.nirs.org/wp-content/uploads/reactorwatch/licensedtokill/LiscencedtoKill.pdf>

⁵ U.S. Nuclear Regulatory Commission. "Notice of Violation and Proposed Imposition of Civil Penalty." July 17, 1991. <https://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber=ML20085A455>

⁶ Groom, Debra J. "Low levels of tritium found at FitzPatrick nuclear plant." *The Post-Standard*. Syracuse, NY. December 29, 2009. https://www.syracuse.com/news/2009/12/low_levels_of_tritium_found_ou.html

U.S. Nuclear Regulatory Commission. "List of Leaks and Spills at Operating U.S. Commercial Nuclear Power Plants October, 2020." <https://www.nrc.gov/docs/ML2014/ML20141L500.pdf>

deindustrialization, as well as declines in the agricultural sector. The nuclear power plants (Nine Mile Point and FitzPatrick, both owned by Constellation Energy) have been the largest private sector employer in the county for many years.

Nine Mile Point's continued operation has been based on out-of-market subsidies paid by New York consumers -- subsidies much larger than the Nuclear Production Credits available under the Inflation Reduction Act. A second license extension for Nine Mile Point -- especially unit 1 -- is likely contingent on such subsidies continuing. The increased cost of electricity due to New York's nuclear subsidies is passed on to all consumers (residential, government, and businesses). This means residential consumers have less income to pay for non-utility expenses, reducing their spending in local businesses. Local governments have less funds available for schools and other government services. Both large and small businesses have higher costs, and tend to raise prices and/or cut costs. The latter can include cutting labor costs by reducing the size of their workforce. Because renewable energy sources are both lower cost for energy and create more jobs/MWh of generation, the continued operation of Nine Mile Point will have a negative effect on jobs in New York State.

An analysis conducted in 2015 found that local jobs and economic development could be achieved by phasing out the FitzPatrick reactor, through a just transition for workers and the local community, at lower cost to New York electricity consumers, and lower greenhouse gas emissions.⁷

Nuclear Disasters/Accidents

Nine Mile Point unit 1 is the oldest operating reactor in the US, beginning operation in 1969.

- Cracked welds in the core shroud have been known since at least 1994, the worst cracking of reactor internals in the industry at the time, after 25 years of operation. The reactor is over 53 years old. The core shroud was not repaired, but outfitted with spring-tensioned tie-rods to apply additional friction and pressure on the cracked welds. Tie-rods failed before the 1997 outage and inspection, and tie-rod repairs were made. NRC exempted the reactor's core shroud from further crack inspections in 1998, based on a disputed evaluation of inspection results.⁸

⁷ Azulay, Jessica, and Tim Judson. "Replacing FitzPatrick: How the Closure of a Nuclear Reactor can Reduce Greenhouse Gasses and Radioactive Waste, while Creating Jobs and Supporting the Local Community." Alliance for a Green Economy and Nuclear Information and Resource Service. 2015. <https://www.nirs.org/wp-content/uploads/neconomics/replacingthefitzpatricknuclearreactor.pdf>

⁸ Division of Engineering, U.S. Nuclear Regulatory Commission. "Status report: Intergranular stress corrosion cracking of BWR core shrouds and other internal components." March 1, 1996. <https://www.osti.gov/servlets/purl/236061>

U.S. Nuclear Regulatory Commission. "Information Notice No. 97-17: Cracking of Vertical Welds in the Core Shroud and Degraded Repair." April 4, 1997. <https://www.nrc.gov/reading-rm/doc-collections/gen-comm/info-notices/1997/in97017.html>

Associated Press. "Inspection Is Urged at a Nuclear Plant." *The New York Times*. September 26, 1998. <https://www.nytimes.com/1998/09/26/nyregion/inspection-is-urged-at-a-nuclear-plant.html>

U.S. Nuclear Regulatory Commission. "Niagara Mohawk Power Corporation, Nine Mile Point Nuclear Station, Unit No. 1; Issuance of Final Director's Decision Under 10 CFR 2.206." Federal Register. December 3, 1999. <https://www.govinfo.gov/content/pkg/FR-1999-12-03/pdf/99-31377.pdf>

- Cracks in the Nine Mile Point unit 2 core shroud were documented in 2000, after only 12 years of operation.⁹

Nine Mile Point, unit 2, underwent a 15% extended power uprate in 2012, increasing power output to 20% greater than the original license after a 4.3% stretch power uprate in 1996. The 2012 uprate was achieved by increasing fuel enrichment from 4.2% to 4.36%, and increasing the number of fuel assemblies in the core from 764 to 840. Average fuel burnup rate would be 48,000 MWD/tU. The reactor vessel has 15% more fissile material in the core, greater decay heat at higher burnup. There is also less volume of coolant water within the core shroud, due to the 10% increase in the number of fuel assemblies. The license amendment states that the power uprate will result in increased amounts of iodine fission products in the core.¹⁰

Nine Mile Point 1 and FitzPatrick are both General Electric Mark I BWRs. Nine Mile Point unit 2 is a Mark II BWR. Both designs are known to have containment systems vulnerable to failure in a loss-of-coolant accident, as demonstrated by the meltdowns and hydrogen explosions at the three Mark I BWRs that were operating when the Tohoku earthquake and tsunami struck the Fukushima Dai-Ichi nuclear power plant.

- FitzPatrick is the only Mark I BWR in the country which operated for over 40 years without installing a hardened containment vent, and was the last to comply with NRC's post-Fukushima orders to retrofit the containment venting systems (in 2018).
- All three reactors have elevated fuel pools which are racked to maximum density, conditions that a National Academy of Sciences panel concluded makes the risk of fuel pool fires caused by acts of malice a national security risk that should be addressed by removing fuel to dry storage and low-density racking, per the original plant license.
 - This risk would be mitigated if the reactors retired when their operating licenses expire. To date, licensees have only eliminated high-density fuel pool storage of irradiated fuel during decommissioning.

Nine Mile Point 2 experienced a station blackout event in 1991, declaring a site area emergency.¹¹

Nine Mile Point and FitzPatrick are subject to extreme weather events that could be initiating events for a radiological disaster:

- Ice storms downed power lines and caused widespread power outages in 2003, which also knocked out most of the offsite emergency sirens and made road travel extremely hazardous, due to ice, downed trees, and downed power lines. A 2022 ice storm downed

⁹ Niagara Mohawk Power Corporation. "Core Shroud Reinspection Results (TA C No. MA 7284)." April 28, 2000.

<https://www.nrc.gov/docs/ML0037/ML003712802.pdf>

¹⁰ U.S. Nuclear Regulatory Commission. "Nine Mile Point Nuclear Station, Unit No. 2 – Issuance of Amendment re: Extended Power (TAC NO. ME1476)." December 22, 2011. <https://www.nrc.gov/docs/ML1133/ML113300041.pdf> (PDF pp. 167, 175)

U.S. Nuclear Regulatory Commission. "Docket No. 50-410 – Nine Mile Point Nuclear Station, Unit 2: Renewed Facility Operating License <https://www.nrc.gov/docs/ML0527/ML052720302.pdf> (p. 377)

¹¹ *Time Magazine*. "Nuclear Power: Down for the Count." August 26, 1991.

<https://archive.ph/20130204092426/http://www.time.com/time/archive/preview/0,10987,973670,00.html>

power lines and caused outages in several parts of Oswego County within the emergency planning zone.¹²

- Severe lake-effect snowfalls can make roads impassable and potentially interfere with deployment of FLEX equipment. In 2005, Oswego experienced a 10-foot snowfall over 8 days, and nearby Fulton experienced two 8-foot snowfalls within two weeks of each other.¹³
- The sites are subject to flooding risks from high lake water levels and/or storm surge.¹⁴
- Lake Ontario develops frazil ice during winter, which can cause clogging of cooling water intakes.¹⁵

¹² U.S. NRC. "Daily Event Reports, Event Numbers 39729, 39730, 39731, and 39737." April 7, 2003.

<https://www.nrc.gov/reading-rm/doc-collections/event-status/event/2003/20030407en.html>

Moyers Corners Fire Department. "Major Ice Storm Hits Central New York." April 7, 2003.

<http://www.mcfcd.org/news/5435559c626163190e8c0000>

Welytok, Kayla. "Check out the latest power outages." WSYR-TV. November 17, 2022.

<https://www.localsyr.com/news/local-news/oswego-county-slammed-with-power-outages-during-heavy-snow/>

Hayes, Anne. "Ice buildup knocked out power for thousands in Oswego County, most restored." Syracuse.com.

November 16, 2022. <https://www.syracuse.com/crime/2022/11/ice-buildup-knocked-out-power-for-thousands-in-oswego-county-most-restored.html>

¹³ Fernandez, Manny. "8 Days, 10 Feet and the Snow Isn't Done Yet." *The New York Times*. February 12, 2007.

<https://www.nytimes.com/2007/02/12/nyregion/12snow.html>

¹⁴ Horning, Payne. "High Lake Ontario levels nearly pushed Nine Mile nuclear plant into emergency action." WRVO.

July 14, 2017. <https://www.wrvo.org/environment/2017-07-14/high-lake-ontario-levels-nearly-pushed-nine-mile-nuclear-plant-into-emergency-action>

¹⁵ U.S. NRC. "Power Reactor Status Report for February 13, 2000." February 13, 2000. <https://www.nrc.gov/reading-rm/doc-collections/event-status/reactor-status/2000/20000213ps.html>

Lochbaum, David. "Fission Stories #199: Frazzled at FitzPatrick." December 27, 2016.

<https://blog.ucsusa.org/dlochbaum/frazzled-at-fitzpatrick/>

Millstone, units 2 and 3

Millstone units 2 and 3 are located on the coast of Long Island Sound, in Waterford, Connecticut. Both are pressurized water reactors of different designs. Unit 2 was designed by Combustion Engineering, has a licensed thermal capacity of 2700 MWt, and began commercial operation in 1975. Unit 3 was designed by Westinghouse, has a licensed thermal capacity of 3709 MWt, and began commercial operation in 1986. They share the site with Millstone, unit 1, a General Electric Mark I BWR, which retired in 1998 and awaits decommissioning. Under the commission's previous oversight process, Millstone was placed on NRC's Watch List and found guilty of falsifying environmental records and other serious violations.¹⁶ Public beaches and recreational areas are near the plant, and can be affected by liquid and gaseous releases from the reactors.

Surface Water Impacts

Cooling System Type: Once-Through Cooling (both units)
Cooling Water Source: Long Island Sound
Ultimate Heat Sink: Long Island Sound
Surface Water Impacts: Impingement and Entrainment of Aquatic Species
Significant impact on Niantic River winter flounder¹⁷

Radioactive Releases

Millstone reactors' operations have released radioactive materials to the environment in several ways:

- Radioactive Water Discharges
- Radioactive Gas Discharges
- Known Leaks, Spills, Groundwater Contamination Requiring Clean-up
- Offsite Dumping/Disposal/Release of Radioactive Waste

The reactor site's proximity to public beaches and recreation areas make it possible for larger populations to be exposed than local residency demographic data would indicate.

Other Pollution and Environmental Health Impacts

Millstone was found to have feloniously discharged toxic waste in 1996.¹⁸

The surrounding community suffers from a statistically high level of cancers and other diseases.¹⁹

¹⁶ Allen, Mike. "A Record Fine at a Connecticut Nuclear Power Plant." *The New York Times*. September 28, 1999. <https://www.nytimes.com/1999/09/28/nyregion/a-record-us-fine-at-a-connecticut-nuclear-plant.html>

¹⁷ *Hartford Courant*. "Flounder Kill: Which One is the Main Culprit?" February 11, 1999. <https://www.courant.com/1999/02/11/flounder-kill-which-one-is-main-culprit/>

¹⁸ New York Times, 1999.

¹⁹ Goranson, Susan. "94-R-0023." Office of Legislative Research, Connecticut General Assembly. February 1, 1994. <https://cga.ct.gov/PS94/rpt%5Colr%5Chtm/94-R-0023.htm>

Peach Bottom, units 2 and 3

Philadelphia Electric's ("PECO") applied for a license to operate the Peach Bottom Atomic Power Station in late-July, 1960. The application was approved by the Atomic Energy Commission. Peach Bottom, unit 1, was a 40-megawatt, High Temperature Graphite Moderated reactor that operated from 1966-1974. Peach Bottom 2 & 3, are 1,065 megawatt Boiling Water Reactor designed by General Electric and engineered by Bechtel. Both reactors began operation in July 1974.

The Nuclear Regulatory Commission ("NRC") and the Institute for Nuclear Power Operations ("INPO") have clearly demonstrated that Philadelphia Electric's ("PECO"), renamed Exelon in 2000, performance has historically been lackadaisical and sub-par. Exelon "spun off" Peach Bottom and all of its other nuclear power plants into Constellation in 2022. In order to put Peach Bottom's operating history into perspective, it is necessary to review PECO's plant legacy.

According to Eric Epstein, Chairman, TMI-Alert: "Managerial problems further aggravate and compound the inherent flaws with Peach Bottom's reactor and containment structure." The reactors at Peach Bottom are General Electric ("GE") Boiling Water Reactors ("BWR"). Epstein noted, "The GE-BWR is an obsolete design no longer built or constructed. Many in the industry feel it is inferior to Pressurized Water Reactors. Obviously, the age of the reactors, and the subsequent embrittlement that ensues, further erode the margin of safety."

Peach Bottom's Mark I containment structure has been demonstrated by Sandia Laboratories to be vulnerable during a core melt accident. Epstein explained: "The containment is likely to fail during a core melt accident [like Three Mile Island] allowing radiation to escape directly into the environment." Nuclear industry officials say the problem with the Mark 1 is that it is too small and wasn't designed to withstand the high pressure it is supposed to resist.

February 18, 1987 - An NRC study said Peach Bottom's reactors were more likely to release radiation in the event of a core-melt accident.

March 31, 1987 - Peach Bottom was indefinitely shutdown. Operators were found sleeping on the job, playing video games, engaging in rubber band and paper ball fights, and reading unauthorized material.

January 11, 1988 - INPO President Zack Pate strongly criticized Philadelphia Electric's management and their revised reorganization plan.

Pate noted that, "The fundamental approach to nuclear operational management at Philadelphia Electric Company has not changed and is unlikely to change noticeably in the foreseeable future." He added, "success ultimately depends on the individual managers in key line positions. Since for the most part, the same managers who have been ineffective in this area for years are in the key line positions in the new organization, substantial improvement is unlikely." Pate concluded, "Major changes in the corporate culture at PECO are required. The recently announced reorganization plan will not achieve this."²⁰

²⁰ Nuclear Information and Resource Service. *The Nuclear Monitor*. February 22, 1988. pp.1-2

Surface Water Impacts

Cooling System Type:	Once-Through Cooling
Cooling Water Source:	Susquehanna River
Ultimate Heat Sink:	Susquehanna River
Surface Water Impacts:	Harmful Algal Blooms Thermal Pollution Impingement and Entrainment of fish and aquatic life

During the 2002 drought nuclear power plants were exempted from water conservation efforts and participate in a “voluntary” program. In Pennsylvania, twenty-four counties were designated as “drought emergencies”, and another thirty-one were on “drought watch.” The Governor, the Secretary of the Department of Environmental Protection, and the Chairman of the Public Utility Commission, implored Pennsylvanians to conserve water. As the Patriot News astutely observed: “Warnings about the growing pressure on supplies are increasing, but much of the population continues to take the the availability of water for granted” (Editorial, September 24, 2002). Yet, no elected official approached the five “security conscious” nuclear power plants to coordinate operation of their assets in a manner that would conserve scarce water resources.

Peach Bottom did not “conserve” water until the plant was forced to close to address a massive fish kill. On August 30, 2002, high differential pressures on the circulating water intake screens forced the manual shut down of Peach Bottom. “The problem was caused by a sudden surge in the amount of fish (Gizzard Shad) that entered the intake canal and clogged the screens. Unit 3 power was returned to 100 percent following cleaning of the circulating water screens and restating of the 3’A’ circulating water pump” (Source: Nuclear Regulatory Commission, IR-50-277/02-05; 50-278/02-05).

“Whether the kills are legal or not, a former southern LancasterCounty worker at the Peach Bottom nuclear plant said he was ‘sickened’ by the large numbers of sport fish he saw sucked out of the Susquehanna. “When the water comes in, fish would swim in through tunnels and swim into wire baskets,” said the man who lives in southern Lancaster County and asked that his name not be used. “There were hundreds and hundreds of fish killed each day. Stripers and bass and walleye and gizzard shad and all kinds of fish. It took a forklift to carry them out. “Every species in the river comes in there when they turn those big intakes on.” (“Intelligencer Journal,” January 15, 2005)

“Two electric utilities, PPL Corp. and Exelon Corp., have paid large sums of money to settle disputes with the Susquehanna River Basin Commission over the amount of water they use to operate their nuclear power plants. PPL last week agreed to pay \$500,000 to the commission to settle a claim that it did not get permission six years ago to increase the water it takes from the river. Last December, Exelon Nuclear paid \$640,000 to settle a similar claim related to its Peach Bottom plant in York County.”²¹

In 2007, Peach Bottom, units 2 and 3, were documented returning water to the River at temperatures in excess of 110 degrees.

²¹ *Patriot News*. September 19, 2007.

Radioactive Releases

September 15, 1989 - The Pennsylvania Superior Court reversed a lower court's decision dismissing charges by George Field against the Philadelphia Electric Company. Field, a health-physics technician, alleged that PECO directly released radiation on him to avoid shutting the plant down. The three judge panel concluded: We can visualize no conduct more outrageous in character, so extreme in degree, that went beyond all possible bounds of decency and to be regarded as atrocious and utterly intolerable in a civilized community, than to vent highly radioactive steam upon an employee. Furthermore, this was an intentional act. They elected to do this to him and then attempted to conceal the resulting situation The three judge panel remanded the case back to York County Common Pleas Court. Field is seeking \$5.2 million in damages.²²

Nuclear Disasters/Accidents

There have been several safety and security vulnerabilities at Peach Bottom over the course of its operational history.

March 3, 2008: NRC Annual Assessment called for “additional regulatory oversight” of Peach Bottom’s performance, as a result of security officer inattentiveness revealed in the last quarter of 2007. The inspection covered all of 2007 and the plant was found to have performed satisfactorily in areas related to reactor and radiation safety. Enhanced oversight will include additional inspections in the areas of security force performance monitoring, corrective actions, safety conscious work environment (SCWE) and completion of commitments. The Nuclear Regulatory Commission’s report on the annual inspection told Exelon that “behaviors and interactions within the security organization did not encourage the free flow of information related to raising safety issues.” This presumably was a reference to media reports that the Wackenhut Corp. security officer who videotaped his fellow officers sleeping on the job, claimed he had tried to report the problem within the work environment and was met with no action, before he gave the recording to local media. Peach Bottom received a White rating for the violations, through the Reactor Oversight Process.

Officials of the Nuclear Regulatory Commission met with Exelon Generation Co. representatives to discuss the results of an NRC inspection that focused on “safety conscious work environment” (SCWE). The inspection and the meeting were in response to incidents related to Wackenhut Corp. security officers, who were found sleeping on the job and the related issue of why incidents were not reported before a worker took a videotape to the media.

The NRC requires that license holders, like Exelon, “maintain an environment in which safety issues are promptly identified and effectively resolved and employees feel free to raise safety concerns,” according to an NRC announcement of the April 15 meeting.

November, 1987: The Federal Bureau of Investigations discovered a drug distribution ring at Peach Bottom.²³

²² *The Philadelphia Inquirer*. September 15, 1989. Page 3-B.

²³ Associated Press. “Six Arrested on Charges Of Drug Dealing at Nuclear Power Plant.” November 18, 1987. <https://apnews.com/article/9f14835943af0c9f86446af8c79a3abe>

February 18, 1987: An NRC study said Peach Bottom's reactors were more likely to release radiation in the event of a core-melt accident.

Point Beach, units 1 and 2

Point Beach, units 1 and 2, are located in Two Rivers, Wisconsin, on the shore of Lake Michigan, the source of drinking water for 10 million people. Both reactors are PWRs designed by Westinghouse, with a licensed thermal capacity of 1,800 MWt. Unit 1 began commercial operation in 1971, making it one of the oldest currently operating reactors in the U.S. Unit 2 began commercial operation in 1973; it is known to have one of the most severely embrittled reactor vessels in the U.S. Point Beach is known to have a historically poor operational safety record.²⁴ Originally owned and operated by Wisconsin Electric Power, NextEra Energy Resources purchased it in 2007 under utility restructuring. While it has since operated as a merchant power plant, NextEra sells 90% of its electricity output to We Energies at fixed prices, which escalate annually.

Surface Water Impacts

Cooling System Type:	Once-Through Cooling
Cooling Water Source:	Lake Michigan
Ultimate Heat Sink:	Lake Michigan
Surface Water Impacts:	Impingement and Entrainment of Aquatic Life Thermal Effluents

Built just before the National Environmental Policy Act (NEPA) mandated cooling towers for many new power plants, Point Beach, units 1 and 2, require 85-95% more water than would be necessary for nuclear plants with cooling towers. The reactors intake and then discharge an average of 915 million gallons of Lake Michigan water each day.

This once through cooling system has high volume flow rates for intake and discharge systems that damage or destroy fish larvae and phytoplankton and delivers excess thermal heat to the natural aquatic ecosystem of Lake Michigan.

The water is returned to the lake up to 24.3 degrees Fahrenheit hotter than the seasonal lake temperature.

Radioactive Releases

If NextEra's request to operate Point Beach for an additional 20 years (to 2050/53) is granted, the reactors will generate an additional 504 metric tons of high-level nuclear wastes in that timespan. The operation of the reactors from 1970-2017 created an estimated 965 metric tons of waste and by the end of the current licenses in 2030/2033 there will be a total of 1,342 metric tons of waste that will remain in dry cask storage on the shore of Lake Michigan—an environmental risk to local communities for generations to come.

Socioeconomic Impacts

Based on a report from Mark Cooper, the Purchased Power Agreement (PPA) between NextEra (owners of PBNP) and We Energies from 2007, means ratepayers are paying 1.8 times the market price of electricity today and will see rates more than double over the next decade. For We Energies customers this will total about \$5 billion by the end of this current licensing in

²⁴ Nukewatch. "Point Beach Nuclear Reactors." February 16, 2021.
https://www.closepointbeachnuclear.org/files/ugd/242ced_25488a610ff8439d8483f3a894a111ae.pdf

2030-2033. We understand that energy burden is a real environmental justice issue facing financially struggling Wisconsin families.

Erosion and Climate Change

Changing lake levels have caused significant erosion around the shores of Point Beach. The site itself is imperiled due to the many impacts of climate change. For example, there is great volatility in lake levels with the lowest level recorded in history for Lake Michigan in 2013 and the historically highest level recorded in 2020.

The increasing number of extreme weather events in the Midwest add significant vulnerability to the safe operation of nuclear reactors. For instance, the derecho which struck the Duane Arnold reactor in Iowa in August 2020 destroyed its cooling towers and backup generators. Several derechos have impacted Wisconsin, including the August 2020 derecho. This century, those include the June 2001 Central Wisconsin Derecho, the July 2011 Upper Midwest-Great Lakes Derecho, and the December 2021 Midwest Derecho and tornado outbreak.

Nuclear Disasters/Accidents

Point Beach Nuclear Plant Unit 2 was cited by the NRC in 2013 as one of the most embrittled reactor pressure vessels (RPV) in the United States. Embrittlement is the loss of strength, ductility and resistance to cracking, and markedly increases the risk that the reactor pressure vessel could crack open if the reactor would need to be suddenly flooded with cold water during an emergency shutdown. This would lead rapidly to a loss-of-coolant accident and reactor meltdown, and release radioactivity into the air, water and soil surrounding Point Beach, contaminating the drinking water source for 10 million people.

Seabrook

Seabrook is a PWR designed by Westinghouse, located in Seabrook, New Hampshire, near Hampton Harbor and the saltwater marsh estuary to the Atlantic Ocean, 40 miles north of Boston, Massachusetts. It has a rated generation capacity of 1244 Mwe, and began commercial operation in 1990, after 14 years of construction. Long construction time and financial mismanagement led to many whistleblower reports of construction deficiencies.

Seabrook is the only nuclear plant in U.S. known to be experiencing alkali-salt reaction (ASR) micro-cracking in concrete foundations and other structures. Tritium leakage (and subsurface flooding) began before the reactor was ten years old, necessitating pumping of contaminated groundwater into cooling water outfall pipes offshore. In early operation, cooling water inflow killed dozens of seals, until excluder devices were installed on the intakes (in response to complaints from environmental organizations). Originally built and operated by Public Service of New Hampshire, it has been owned and operated by NextEra energy

Surface Water Impacts

Cooling System Type:	Once-Through Cooling
Cooling Water Source:	Atlantic Ocean
Ultimate Heat Sink:	Atlantic Ocean
Surface Water Impacts:	Impingement and Entrainment of Aquatic Life Groundwater Contamination (tritium)

The license renewal EIS in 2015 documented impingement/entrainment (death) to hundreds of thousands of fish species and many millions of mollusk/fish larvae and fish eggs over the life of plant. Two fish species of commercial value in particular were identified as having “large” impacts from continued operations. NMFS reportedly expressed concern over this situation, though re-licensing moved forward. Groundwater degradation from tritium leakage (described above) was also documented in the 2015 license renewal EIS.

Radioactive Releases

Tritium releases as described above.

Other Pollution and Environmental Health Impacts

A cancer cluster for two rare childhood cancers was identified in downwind NH Seacoast communities by New Hampshire Public Health Services in 2017, though no conclusions were ever made as to a possible source. A previous analysis of CDC data by the Radiation and Public Health Project found that there was an increase in childhood cancer incidence in the region in the decade after Seabrook began operations, versus the decade prior to reactor startup.

Nuclear Disasters/Accidents

Climate/extreme weather impacts could lead to increased risk of a nuclear disaster. The “Lessons Learned” report in 2018 found that likely extreme precipitation and storm surge (using old sea level rise estimates) would cause “beyond design basis” impacts, risking flooding of reactor building and other facilities. NextEra’s principal mitigation measure is to stockpile sandbags, as a voluntary measure.

Progression of ASR degradation of concrete structures could lead to increased seismic risk, as well as the potential for containment failure.

Seabrook's proximity to Boston and busy summer recreation areas puts a great number of people at risk. Large numbers of people visiting beaches and parks in the summer months lead to severe traffic congestion within the emergency planning zone, which could make both prompt evacuation and sheltering-in-place impossible.