U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NUREG-1437
Supplement 23
Second Renewal

Generic Environmental Impact Statement for License Renewal of Nuclear Plants

Supplement 23 Second Renewal

Regarding Subsequent License Renewal for Point Beach Nuclear Plant Units 1 and 2

Second Draft Report for Comment

Office of Nuclear Material Safety and Safeguards

AVAILABILITY OF REFERENCE MATERIALS IN NRC PUBLICATIONS

NRC Reference Material

As of November 1999, you may electronically access NUREG-series publications and other NRC records at the NRC's Library at www.nrc.gov/reading-rm.html. Publicly released records include, to name a few, NUREG-series publications; *Federal Register* notices; applicant, licensee, and vendor documents and correspondence; NRC correspondence and internal memoranda; bulletins and information notices; inspection and investigative reports; licensee event reports; and Commission papers and their attachments.

NRC publications in the NUREG series, NRC regulations, and Title 10, "Energy," in the *Code of Federal Regulations* may also be purchased from one of these two sources:

1. **The Superintendent of Documents**
   U.S. Government Publishing Office
   Washington, DC 20402-0001
   Internet: https://bookstore.gpo.gov/
   Telephone: (202) 512-1800
   Fax: (202) 512-2104

2. **The National Technical Information Service**
   5301 Shawnee Road
   Alexandria, VA 22312-0002
   Internet: https://www.ntis.gov/
   1-800-553-6847 or, locally, (703) 605-6000

A single copy of each NRC draft report for comment is available free, to the extent of supply, upon written request as follows:

Address: **U.S. Nuclear Regulatory Commission**
Office of Administration
Program Management and Design
Service Branch
Washington, DC 20555-0001
E-mail: Reproduction.Resource@nrc.gov
Facsimile: (301) 415-2289

Some publications in the NUREG series that are posted at the NRC's Web site address www.nrc.gov/reading-rm/doc-collections/nuregs are updated periodically and may differ from the last printed version. Although references to material found on a Web site bear the date the material was accessed, the material available on the date cited may subsequently be removed from the site.

Non-NRC Reference Material

Documents available from public and special technical libraries include all open literature items, such as books, journal articles, transactions, *Federal Register* notices, Federal and State legislation, and congressional reports. Such documents as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings may be purchased from their sponsoring organization.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at—

The NRC Technical Library
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852-2738

These standards are available in the library for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from—

American National Standards Institute
11 West 42nd Street
New York, NY 10036-8002
Internet: www.ansi.org
(212) 642-4900

Legally binding regulatory requirements are stated only in laws; NRC regulations; licenses, including technical specifications; or orders, not in NUREG-series publications. The views expressed in contractor prepared publications in this series are not necessarily those of the NRC.

The NUREG series comprises (1) technical and administrative reports and books prepared by the staff (NUREG–XXXX) or agency contractors (NUREG/CR–XXXX), (2) proceedings of conferences (NUREG/CP–XXXX), (3) reports resulting from international agreements (NUREG/IA–XXXX),(4) brochures (NUREG/BR–XXXX), and (5) compilations of legal decisions and orders of the Commission and the Atomic and Safety Licensing Boards and of Directors' decisions under Section 2.206 of the NRC's regulations (NUREG-0750), (6) Knowledge Management prepared by NRC staff or agency contractors (NUREG/KM-XXXX).

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

NUREG-1437
Supplement 23
Second Renewal

Generic Environmental Impact Statement for License Renewal of Nuclear Plants

Supplement 23 Second Renewal

Regarding Subsequent License Renewal for Point Beach Nuclear Plant Units 1 and 2

Second Draft Report for Comment

Manuscript Completed: April 2025
Date Published: April 2025

Office of Nuclear Material Safety and Safeguards

COMMENTS ON DRAFT REPORT

Proposed Action Issuance of subsequent renewed facility operating licenses DPR-24 and DPR-27 for Point Beach Nuclear Plant, Units 1 and 2, in Two Rivers, Wisconsin

Type of Statement Supplemental Environmental Impact Statement, Second Draft Report for Comment

Agency Contact Kevin Folk
U.S. Nuclear Regulatory Commission (NRC)
Office of Nuclear Material Safety and Safeguards
Mailstop T-4B72
Washington, DC 20555-0001
Email: Kevin.Folk@nrc.gov

Comments:

Any interested party may submit comments on this supplemental environmental impact statement, second draft report for comment. Please specify "NUREG-1437, Supplement 23, Second Draft Report for Comment," in the subject or title line for your comments. Comments should be filed no later than 45 days after the date on which the U.S. Environmental Protection Agency notice, stating that this supplemental environmental impact statement, second draft report for comment has been filed with the U.S. Environmental Protection Agency, is published in the *Federal Register*. Comments received after the expiration of the comment period will be considered if it is practical to do so, but assurance of consideration of late comments cannot be given. You may submit comments electronically by searching for Docket ID NRC-2020-0277 at the website: Regulations.gov.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions into the NRC's Agencywide Documents Access and Management System. The NRC does not routinely edit comment submissions to remove identifying or contact information.

COVER SHEET

Responsible Agency: U.S. Nuclear Regulatory Commission, Office of Nuclear Material Safety and Safeguards.

Title: Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23, Second Renewal, Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2, Second Draft Report for Comment (NUREG-1437).

For additional information or copies of this document contact:

U.S. Nuclear Regulatory Commission
ATTN: Kevin Folk
Office of Nuclear Material Safety and Safeguards
Mail Stop T-4B72
11555 Rockville Pike
Rockville, MD 20852
Email: Kevin.Folk@nrc.gov

ABSTRACT

In November 2021, the U.S. Nuclear Regulatory Commission (NRC) staff issued the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23, Second Renewal, Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2 (Point Beach), Draft Report for Comment. The staff prepared that document as part of its environmental review of the NextEra Energy Point Beach, LLC application to renew the operating licenses for Point Beach for an additional 20 years. That document included the staff's evaluation of the environmental impacts of license renewal and alternatives to license renewal and the staff's preliminary recommendation that the adverse environmental impacts of license renewal for Point Beach are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable.

This document is the second draft report on the NRC staff's environmental review of the Point Beach subsequent license renewal application. This second draft report includes the staff's evaluation of new information obtained since the issuance of the November 2021 first draft report. This information includes the new and revised environmental issues and impact determinations contained in the NRC's 2024 final rule revising its environmental protection regulation, Title 10 of the *Code of Federal Regulations* Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," and Revision 2 of NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants." The staff also considered any new and significant information with respect to generic (i.e., Category 1) environmental issues and determinations. For the convenience of the reader, where this second draft report retains the language of the November 2021 first draft report, it identifies substantive changes to that language including text corrections or updates using red **bold** text for additions and red ~~strikeout~~ text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report, the second draft report simply states that there are no substantive changes to that language.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY[1]

Background

By letter dated November 16, 2020, NextEra Energy Point Beach, LLC (NextEra, the applicant, the licensee) submitted to the U.S. Nuclear Regulatory Commission (NRC, the Commission) an application requesting subsequent renewal of the Point Beach Nuclear Plant, Units 1 and 2 (Point Beach), renewed facility operating licenses (Agencywide Documents Access and Management System Package Accession No. ML20329A292; NextEra 2020-TN11241). The Point Beach Unit 1 current renewed facility operating license (DPR-24) expires at midnight on October 5, 2030, and the Point Beach Unit 2 current renewed facility operating license (DPR-27) expires at midnight on March 8, 2033. In its application, NextEra requests a license renewal period of 20 years beyond the dates when the current renewed facility operating licenses expire (i.e., to 2050 for Point Beach Unit 1, and to 2053 for Point Beach Unit 2).

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 51.20(b)(2) (TN10253), the renewal of a power reactor operating license requires preparation of an environmental impact statement (EIS) or a supplement to an existing EIS. In addition, 10 CFR 51.95(c), "Operating license renewal stage," states that, in connection with the renewal of an operating license, the NRC staff shall prepare an EIS, which is a supplement to the Commission's NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" **(LR GEIS)** (NRC 2024-TN10161).

Once the NRC officially accepted NextEra's application, the NRC staff began the environmental review process as described in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." The environmental review begins by the NRC publishing in the *Federal Register* a notice of intent to prepare a supplemental environmental impact statement (SEIS) and to conduct scoping for the nuclear power plant. To prepare the Point Beach SEIS, the NRC staff performed the following:

- conducted a public scoping meeting on February 17, 2021
- conducted an environmental and severe accident mitigation alternatives audit during the week of April 5, 2021
- reviewed NextEra's environmental report (ER) and compared it to **the LR GEIS**
- consulted with Federal, State, Tribal, and local governmental agencies
- conducted a review of the issues following the guidance set forth in NUREG-1555, Supplement 1, **Revision 2**, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Supplement 1: Operating License Renewal, Final Report" **(LR ESRP)** (NRC 2024-TN10251)
- considered public comments received during the scoping period

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red **bold** text for additions and red ~~strikeout~~ text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

In November 2021, the NRC issued the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23, Second Renewal, Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2, Draft Report for Comment (the 2021 DSEIS) (NRC 2021-TN7293). **Subsequently, the NRC staff prepared this second draft report for comment in accordance with 10 CFR 51.72(a)(2) and (b), which address the preparation of a supplement to a draft environmental impact statement for proposed actions that have not been taken, under the following conditions:**

- **There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.**
- **When, in the opinion of the NRC staff, preparation of a supplement will further the purposes of the National Environmental Policy Act of 1969, as amended (42 *United States Code* (U.S.C.) 4321 et seq.-**TN661**) (NEPA).**

This second draft report for comment includes the NRC staff's evaluation of new information obtained since the issuance of the 2021 DSEIS. This information includes the NRC's publication of a final rule on August 6, 2024 (89 FR 64166-TN10321**), which revised the NRC's environmental protection regulation, 10 CFR Part 51. The final rule updated the potential environmental impacts associated with the renewal of an operating license for a nuclear power plant for up to an additional 20 years, which could either be an initial license renewal or a subsequent license renewal (SLR). The technical basis for the final rule is provided by Revision 2 of the LR GEIS (**NRC 2024-TN10161**), which was revised as part of the rulemaking as an update to the 2013 LR GEIS, Revision 1 (**NRC 2013-TN2654**). The final rule also included the issuance of Revision 2 of the LR ESRP (**NRC 2024-TN10251**) and Revision 2 of Regulatory Guide 4.2, Supplement 1, "Preparation of Environmental Reports for Nuclear Power Plant License Renewal Applications" (**NRC 2024-TN10280**). Additionally, the staff considered any new and significant information with respect to generic (i.e., Category 1) environmental issues and determinations.**

The final SEIS documenting the NRC staff's environmental review of the Point Beach SLR application will incorporate both the first and second draft reports for comment and any changes made in response to public comments on the first and second draft reports for comment.

Proposed Federal Action

There are no substantive changes to this section of the Executive Summary of the 2021 DSEIS.

Purpose and Need for the Proposed Federal Action

There are no substantive changes to this section of the Executive Summary of the 2021 DSEIS.

Environmental Impacts of License Renewal

This SEIS evaluates the potential environmental impacts of the proposed action and reasonable alternatives to that action. The NRC designates the environmental impacts from the proposed action and reasonable alternatives as SMALL, MODERATE, or LARGE. **Resource-specific effects or impact definitions from applicable environmental laws and executive orders, other than SMALL, MODERATE, and LARGE, are used where appropriate.** The **LR** GEIS (NRC 2024-TN10161) evaluates **80** environmental issues related to plant operation and classifies each issue as either a Category 1 issue (generic to all or a distinct subset of nuclear

power plants) or a Category 2 issue (specific to individual power plants). Category 1 issues are those that meet all of the following criteria:

- The environmental impacts associated with the issue **have been determined to** apply either to all plants or, for some issues, to plants having a specific type of cooling system or other specified plant or site characteristics.
- A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts **(except for offsite radiological impacts of spent nuclear fuel and high-level waste disposal and offsite radiological impacts – collective impacts from other than the disposal of spent fuel and high-level waste)** ~~;except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal~~.
- Mitigation of adverse impacts associated with the issue **has been** considered in the analysis, and it has been determined that additional plant-specific mitigation measures **are not likely to be sufficiently** beneficial to warrant implementation.

For Category 1 issues, no additional **nuclear power plant-specific (i.e.,** site-specific**)** analysis is required in this SEIS unless new and significant information is identified. Chapter 4 of this SEIS presents the process for identifying new and significant information.

Category 2 issues are site-specific issues that do not meet one or more of the criteria for Category 1 issues; therefore, a SEIS must include additional site-specific review for these non-generic issues.

On February 24, 2022, the Commission issued three memoranda and orders (CLI-22-02 (NRC 2022-TN8182**), CLI-22-03 (**NRC 2022-TN8272**), and CLI-22-04 (**NRC 2022-TN9553**)) that addressed the NRC staff's environmental reviews in SLR proceedings for five nuclear power plants, including Point Beach. CLI-22-03 specifically addressed Point Beach. In the orders, the Commission concluded that the 2013 LR GEIS, on which the NRC staff had relied, in part, to meet its obligations under 10 CFR Part 51 (**TN10253**) and NEPA for its environmental reviews of nuclear power plant SLR applications, did not consider SLR. Therefore, the Commission determined that the NRC staff's SLR environmental reviews, including the environmental review for the Point Beach SLR application, were inadequate. The Commission directed the NRC staff to conduct rulemaking and update the LR GEIS to cover the environmental impacts of renewing the operating license of a nuclear power plant for the SLR term. The Commission also directed that thereafter the NRC staff should take appropriate action with respect to pending SLR applications to ensure that the environmental impacts for the SLR term are considered.**

As referenced above, on August 6, 2024, the NRC published a final rule (89 FR 64166-TN10321**) revising its environmental protection regulation, 10 CFR Part 51 (**TN10253**). The final rule was updated with a correction to Appendix B to Subpart A of 10 CFR Part 51 on August 21, 2024 (**89 FR 67522-TN10823**). The final rule updated the potential environmental impacts associated with the renewal of an operating license for a nuclear power plant for up to an additional 20 years, which could either be an initial license renewal or one term of SLR. The revised 2024 LR GEIS, which was revised as an update to the 2013 LR GEIS (**NRC 2013-TN2654**), provides the technical basis for the final rule. The 2024 LR GEIS (**NRC 2024-TN10161**) further supports the updated list of environmental issues and associated environmental impact findings contained in**

Table B-1 in Appendix B to Subpart A of 10 CFR Part 51 for both initial license renewal and one term of SLR.

The final rule became effective on September 5, 2024, and, therefore, the NRC staff considers in this SEIS the new and modified issues, as applicable, as well as any new and significant information for Category 1 issues.

To support the preparation of this second draft report for comment, the NRC staff conducted a supplemental environmental audit to evaluate new information available since the development and issuance of the 2021 DSEIS, including new and revised environmental issues and determinations contained in the final rule and the 2024 LR GEIS (NRC 2024-TN10161**), and focusing on new and significant information with respect to generic (i.e., Category 1) environmental issues.** NextEra and the NRC staff identified no information that is both new and significant related to Category 1 issues that has the potential to affect the conclusions in the **LR** GEIS. This conclusion is supported by the NRC staff's review of NextEra's ER (NextEra 2020-TN11241) and other documentation relevant to the applicant's activities, the public scoping process, and the findings from the NRC staff's site audits. Therefore, the NRC staff relied upon the conclusions of the **LR** GEIS for all Category 1 issues applicable to Point Beach.

In this SEIS, the NRC staff evaluated Category 2 issues applicable to Point Beach, as well as cumulative **effects or** impacts, and considered new information regarding severe accident mitigation alternatives. Table ES-1 summarizes the Category 2 issues relevant to Point Beach and the NRC staff's findings related to those issues. If the NRC staff determined that there were no Category 2 issues applicable for a particular resource area, then the findings of the **LR** GEIS, as documented in Appendix B to Subpart A, "Environmental Effect of Renewing the Operating License of a Nuclear Power Plant," of 10 CFR Part 51 (TN10253), are incorporated for that resource area.

Table ES-1 Summary of NRC Conclusions Relating to Plant-Specific Impacts of License Renewal at Point Beach

Resource Area	Relevant Category 2 Issues	Impacts
Groundwater Resources	Radionuclides released to groundwater	SMALL
Terrestrial Resources	~~Effects on terrestrial resources~~ **Non-cooling system impacts on terrestrial resources**	SMALL
Aquatic Resources	Impingement **mortality** and entrainment of aquatic organisms (plants with once-through cooling systems or cooling ponds)	SMALL
	Effects of thermal ~~impacts~~ **effluents** on aquatic organisms (plants with once-through cooling systems or cooling ponds)	SMALL

Table ES-1 Summary of NRC Conclusions Relating to Plant-Specific Impacts of License Renewal at Point Beach (Continued)

Resource Area	Relevant Category 2 Issues	Impacts
~~Special Status Species and Habitats~~ **Federally Protected Ecological Resources**	~~Threatened, endangered, and protected species and essential fish habitat~~ **Endangered Species Act: federally listed species and critical habitats under U.S. Fish and Wildlife Service jurisdiction** **Endangered Species Act: federally listed species and critical habitats under National Marine Fisheries Service jurisdiction** **Magnuson-Stevens Act: essential fish habitat** **National Marine Sanctuaries Act: sanctuary resources**	May affect, but is not likely to adversely affect, the northern long-eared bat**, tricolored bat,** piping plover**, and monarch butterfly**. No effect on essential fish habitat. **Not likely to destroy, cause the loss of, or injure any sanctuary resources**
Historic and Cultural Resources	Historic and cultural resources	Would not adversely affect known historic properties
Human Health	Microbiological hazards to the public ~~(plants with cooling ponds or canals or cooling towers that discharge to a river)~~ Electric shock hazards ~~Chronic effects of~~ Electromagnetic fields **(EMFs)**	SMALL SMALL Uncertain impact
~~Environmental Justice~~	~~Impacts on minority populations, low-income populations, and Indian Tribes~~	~~No disproportionately high and adverse human health and environmental effects~~
Greenhouse Gas Emissions and Climate Change	**Climate change impacts on environmental resources**	**See SEIS Section 3.15.3.8**
Cumulative **Effects**	Cumulative **effects**	See SEIS Section 3.16
~~Postulated Accidents~~	~~Severe accidents (SAMAs)~~	~~See SEIS Appendix F~~

There are no further substantive changes to the Executive Summary of the 2021 DSEIS.

ABBREVIATIONS AND ACRONYMS

$	$ dollar(s) (U.S.)
§	section
°C	degrees Celsius
°F	degrees Fahrenheit
ac	acre(s)
ADAMS	Agencywide Documents Access and Management System
AEA	Atomic Energy Act of 1954
BMP	best management practice
BTA	best technology available
Btu	British thermal unit
Btu/ft^3	British thermal unit(s) per cubic foot
CFR	*Code of Federal Regulations*
CO	carbon monoxide
CO_2	carbon dioxide
CO_2eq	carbon dioxide equivalent
CWA	Clean Water Act (Federal Water Pollution Control Act)
CZMA	Coastal Zone Management Act
DOE	U.S. Department of Energy
DSEIS	draft supplemental environmental impact statement
ECHO	EPA's Enforcement and Compliance History Online
ECT	Environmental Consulting & Technology, Inc.
EFH	essential fish habitat
EIS	environmental impact statement
EMF	electromagnetic field
EPA	U.S. Environmental Protection Agency
ER	environmental report
ESA	Endangered Species Act
FR	*Federal Register*
ft	feet/foot

FWS	U.S. Fish and Wildlife Service
g/KWh	grams per kilowatt-hour
gal	gallons
LR GEIS	NUREG-1437, “Generic Environmental Impact Statement for License Renewal of Nuclear Plants”
GHG	greenhouse gas
gpd	gallons per day
gpm	gallons per minute
GT	gigaton(s)
GWP	global warming potential
ha	hectare(s)
HTD	hard-to-detect
in.	inch(es)
ISFSI	independent spent fuel storage installation
km	kilometer(s)
kW	kilowatt(s)
$kWh/m^2/day$	kilowatt-hour per square meter per day
L	liters
lb	pound(s)
lb/ga	pounds per gallon
lb/MBtu	pounds per million British thermal units
Lpm	liters per minute
m	meters
MBtu	million British thermal units
MDC	minimum detectable concertation
mg	million gallons
mgd	million gallons per day
mgy	million gallons per year
mi	mile(s)

mLd	million liters per day
mm	millimeters
mrad	milliradiation absorbed dose, millirad
mrem	millirem
mSv	millisievert
MTWS	modified traveling water screens
MW	megawatt(s)
MWe	megawatt(s) electric
NA	not available / not applicable
NAAQS	National Ambient Air Quality Standards
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NextEra	NextEra Energy Point Beach, LLC
NIEHS	National Institute of Environmental Health Sciences
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NRC, Commission	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
pCi/L	picocuries per liter
PM	particulate matter
PM_{10}	PM less than or equal to 10 microns
$PM_{2.5}$	PM less than or equal to 2.5 microns
Point Beach	Point Beach Nuclear Plant, Units 1 and 2
ppm	parts per million
RCP	representative concentration pathway
rem	roentgen equivalent man
REMP	radiological environmental monitoring program
SAMA	severe accident mitigation alternative

SEIS	supplemental environmental impact statement
SLR	subsequent license renewal
SO_2	sulfur dioxide
SSD	subsurface drainage system
Sv	sievert(s)
U.S.	United States
U.S.C.	*United States Code*
USGCRP	U.S. Global Change Research Program
WCMP	Wisconsin Coastal Management Program
WDNR	Wisconsin Department of Natural Resources
WI	Wisconsin
WPDES	Wisconsin Pollutant Discharge Elimination System
yr	year

1 INTRODUCTION AND GENERAL DISCUSSION[2]

The U.S. Nuclear Regulatory Commission (NRC, the Commission) environmental protection regulations in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51 (TN10253), "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," implement the National Environmental Policy Act of 1969, as amended (42 *United States Code* (U.S.C.) 4321 et seq.-TN661) (NEPA). The regulations at 10 CFR Part 51 require the NRC to prepare an environmental impact statement (EIS) before deciding whether to issue an operating license or a renewed operating license for a nuclear power plant.

The Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.-TN663) (AEA), specifies that licenses for commercial power reactors can be granted for up to 40 years. The initial 40-year licensing period was based on economic and antitrust considerations rather than on technical limitations of the nuclear facility. NRC regulations permit these licenses to be renewed beyond the initial 40-year term for an additional period, limited to 20-year increments per renewal. The renewed license issuance is based on the results of the NRC staff's aging management reviews that the facility can continue to operate safely during the proposed period of extended operation (10 CFR 54.29, "Standards for issuance of a renewed license"-TN4878). There are no limitations in the AEA or the NRC's regulations restricting the number of times a license may be renewed. The decision to seek a renewed license rests entirely with nuclear power facility owners and typically is based on the facility's economic viability and the investment necessary to continue to meet NRC safety and environmental requirements.

In support of its environmental review of the NextEra Energy Point Beach, LLC (NextEra, the applicant, the licensee) application to subsequently renew the renewed facility operating licenses for Point Beach Nuclear Plant, Units 1 and 2 (Point Beach), for an additional 20 years, in November 2021, the NRC issued the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23, Second Renewal, Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2, Draft Report for Comment (the 2021 DSEIS) (NRC 2021-TN7293**). That document included the NRC staff's evaluation of the environmental impacts of license renewal and alternatives to license renewal. Alternatives considered included: (1) a new nuclear alternative (a small modular reactor facility located at the Point Beach site); (2) a natural gas alternative (a natural gas combined-cycle facility located at the Point Beach site); (3) a combination alternative consisting of small modular reactor, solar photovoltaic, and onshore wind facilities; and (4) the no-action alternative. The NRC staff's preliminary recommendation was that the adverse environmental impacts of license renewal for Point Beach are not so great that preserving the option of license renewal for energy-planning decisionmakers would be unreasonable.**

[2] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

On February 24, 2022, the Commission issued three memoranda and orders (CLI-22-02 (NRC 2022-TN8182), CLI-22-03 (NRC 2022-TN8272), and CLI-22-04 (NRC 2022-TN9553)) that addressed the NRC staff's environmental reviews in subsequent license renewal (SLR) proceedings for five nuclear power plants, including Point Beach. CLI-22-03 specifically addressed Point Beach. In the orders, the Commission concluded that the 2013 LR GEIS, on which the NRC staff had relied, in part, to meet its obligations under 10 CFR Part 51 (TN10253) and NEPA for its environmental reviews of nuclear power plant SLR applications, did not consider SLR. Therefore, the Commission determined that the NRC staff's SLR environmental reviews, including the environmental review for the Point Beach SLR application, were inadequate. The Commission directed the NRC staff to conduct rulemaking and update the LR GEIS to cover the environmental impacts of renewing the operating license of a nuclear power plant for the SLR term. The Commission also directed that thereafter the NRC staff should take appropriate action with respect to pending SLR applications to ensure that the environmental impacts for the SLR term are considered.

On August 6, 2024, the NRC published a final rule revising its environmental protection regulation, 10 CFR Part 51 (TN10253). The final rule was updated with a correction to Appendix B to Subpart A of 10 CFR Part 51 on August 21, 2024 (89 FR 67522-TN10823). The final rule updated the potential environmental impacts associated with the renewal of an operating license for a nuclear power plant for up to an additional 20 years, which could either be an initial license renewal or one term of SLR. The revised 2024 LR GEIS, which was revised as an update to the 2013 LR GEIS (NRC 2013-TN2654), provides the technical basis for the final rule. The 2024 LR GEIS (NRC 2024-TN10161) further supports the updated list of environmental issues and associated environmental impact findings contained in Table B-1 in Appendix B to Subpart A of 10 CFR Part 51 for both initial license renewal and one term of SLR. The final rule also included the issuance of Revision 2 of the NUREG-1555, Supplement 1, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants: Supplement 1: Operating License Renewal, Final Report" (LR ESRP) (NRC 2024-TN10251), and Revision 2 of Regulatory Guide 4.2, Supplement 1, "Preparation of Environmental Reports for Nuclear Power Plant License Renewal Applications" (NRC 2024-TN10280). The final rule became effective on September 5, 2024.

Thereafter, the NRC staff prepared this second draft report for comment for the Point Beach SLR application in accordance with 10 CFR 51.72(a)(2) and (b), which address the preparation of a supplement to a draft EIS for proposed actions that have not been taken, under the following conditions:

- There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.
- When, in the opinion of the NRC staff, preparation of a supplement will further the purposes of NEPA.

This second draft report for comment includes the NRC staff's evaluation of new information obtained since the issuance of the 2021 DSEIS. Additionally, the NRC staff considered any new and significant information with respect to generic (i.e., Category 1) environmental issues and determinations.

The final SEIS documenting the NRC staff's environmental review of the Point Beach SLR application will incorporate both the first and second draft reports for comment and any changes made in response to public comments on the first and second draft reports for comment.

1.1 Proposed Federal Action

NextEra Energy Point Beach, LLC (NextEra, the applicant, the licensee) initiated the proposed Federal action by submitting an application for **SLR** for Point Beach Nuclear Plant, Units 1 and 2 (Point Beach) (NextEra 2020-TN11241). The current Point Beach renewed facility operating licenses expire at midnight on October 5, 2030, for Unit 1 (DPR-24), and at midnight on March 8, 2033, for Unit 2 (DPR-27). The NRC's Federal action is to decide whether to renew the licenses for an additional 20 years.

1.2 Purpose and Need for the Proposed Federal Action

The purpose and need for the proposed Federal action (issuance of subsequent renewed facility operating licenses for Point Beach) is to provide an option that allows for power generation capability beyond the term of the current renewed facility operating licenses to meet future system generating needs. Such needs may be determined by energy-planning decisionmakers such as the licensee, State regulators, utility owners, and Federal agencies other than the NRC. This definition of purpose and need reflects the NRC's recognition that, unless there are findings in the NRC's safety review (required by the AEA) or findings in the NRC's environmental analysis (required by NEPA) that would lead the NRC to reject **an SLR** application, the NRC does not have a role in energy-planning decisions as to whether a particular nuclear power plant should continue to operate.

1.3 Major Environmental Review Milestones

There are no substantive changes to this section of the 2021 DSEIS.

1.4 License Renewal Generic Environmental Impact Statement

To improve the efficiency of its license renewal review process, the NRC staff performed a generic assessment of the environmental impacts associated with license renewal. The **LR** GEIS (NRC 1996-TN288, NRC 1999-TN289, NRC 2013-TN2654, NRC 2024-TN10161) documents the results of the NRC's systematic approach to evaluating the environmental consequences of renewing the licenses of individual nuclear power plants and operating them for an additional 20 years. In the **LR** GEIS, the staff analyzed in detail and resolved those environmental issues that could be resolved generically. The NRC issued the **LR** GEIS in 1996 (NRC 1996-TN288), Addendum 1 to the LR GEIS in 1999 (NRC 1999-TN289), ~~and~~ Revision 1 to the **LR** GEIS in 2013 (NRC 2013-TN2654)**, and Revision 2 to the LR GEIS in 2024 (**NRC 2024-TN10161**). As discussed above, Revision 2 to the LR GEIS specifically accounts for both initial license renewal and one term of SLR. The 2024 LR GEIS (**NRC 2024-TN10161**) reflects lessons learned, knowledge gained, and experience from license renewal environmental reviews performed since the development of the 2013 LR GEIS (**NRC 2013-TN2654**); considers changes to applicable laws and regulations; and factors in new scientific data and methodology with respect to the assessment of the potential environmental impacts of nuclear power plant license renewal.** Unless otherwise noted, all references to the **LR** GEIS include the original 1996 **LR** GEIS, Addendum 1, and the 2013 **and 2024** revision**s**. The conclusions in the **LR** GEIS are codified in Appendix B to

Subpart A of 10 CFR Part 51 (TN10253), “Environmental Effect of Renewing the Operating License of a Nuclear Power Plant.”

The **LR** GEIS establishes separate environmental impact issues for the NRC staff to independently evaluate. ~~Appendix B to Subpart A of 10 CFR Part 51 provides a summary of the staff's findings in the GEIS.~~ For each environmental issue addressed in the LR GEIS, the NRC staff does the following:

- describes the activity that affects the environment
- identifies the population or resource that is affected
- assesses the nature and magnitude of the impact on the affected population or resource
- characterizes the significance of both beneficial and adverse effects
- determines whether the results of the analysis apply to all plants
- considers whether additional mitigation measures would be warranted for impacts that would have the same significance level for all plants

The NRC established ~~its standard of significance for impacts using the Council on Environmental Quality terminology for “significant.” Significance indicates the importance of likely environmental impacts and is determined by considering two variables: context and intensity. Context is the geographic, biophysical, and social context in which the effects will occur. Intensity refers to the severity of the impact in whatever context it occurs. Accordingly, the NRC established~~ three levels of significance for potential impacts—SMALL, MODERATE, and LARGE—as defined below.

SMALL: Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. **For the purposes of assessing radiological impacts, the Commission has concluded that those impacts that do not exceed permissible levels in the Commission's regulations are considered SMALL**.

MODERATE: Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE: Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

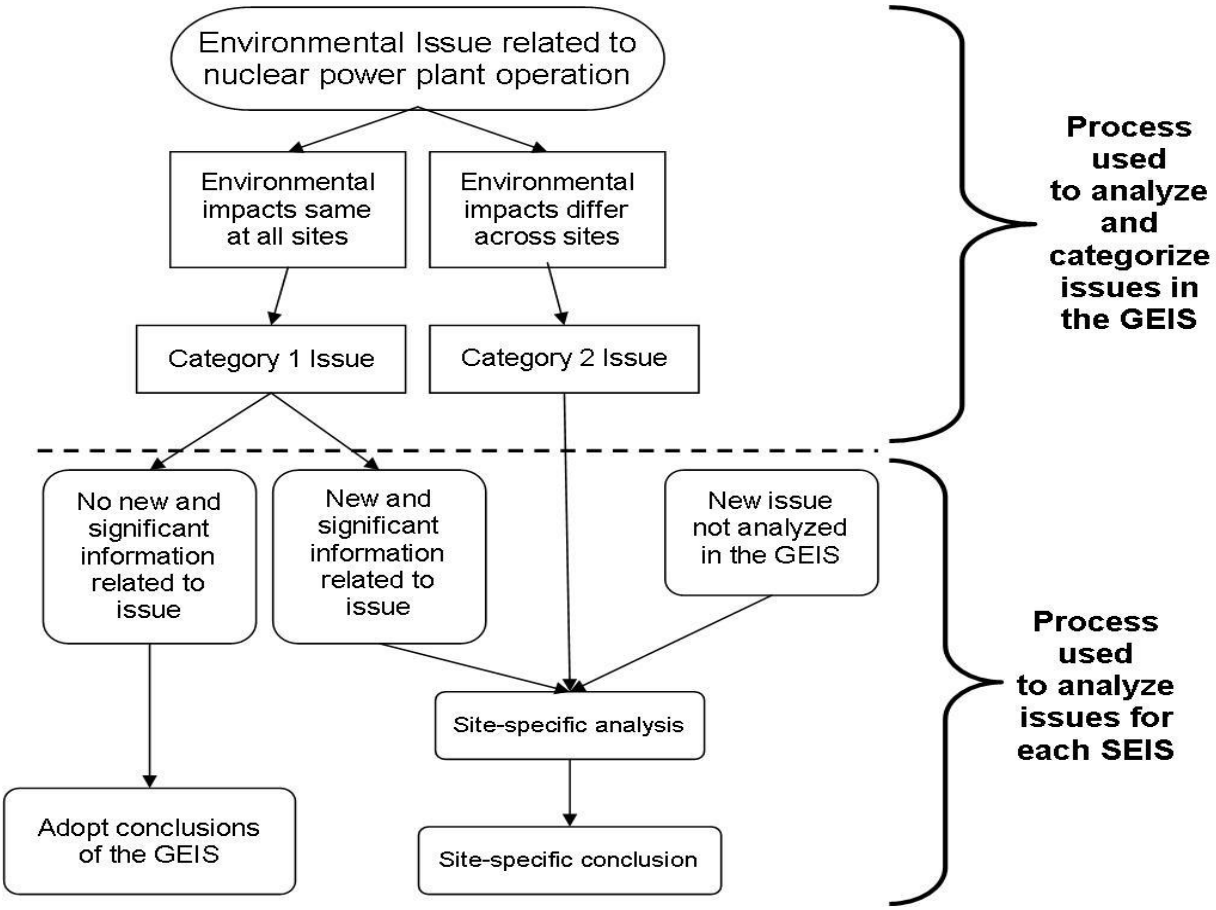
These levels are used for describing the environmental impacts of the proposed action as well as for the impacts of a range of reasonable alternatives to the proposed action. Resource-specific effects or impact definitions from applicable environmental laws and executive orders, other than SMALL, MODERATE, and LARGE, are used where appropriate.

The **LR** GEIS determines whether the analysis of the environmental issue could be applied to all plants and whether additional mitigation measures would be warranted. Issues are assigned a Category 1 (generic to all or a distinct subset of plants) or Category 2 (site-specific to certain plants only) designation. As established in the **LR** GEIS, Category 1 issues are those that meet the following three criteria:

- The environmental impacts associated with the issue have been determined to apply either to all plants or, for some issues, to plants that have a specific type of cooling system or other specified plant or site characteristics.
- A single significance level (i.e., SMALL, MODERATE, or LARGE) has been assigned to the impacts **(except for offsite radiological impacts of spent nuclear fuel and high-level waste disposal and offsite radiological impacts – collective impacts from other than the disposal of spent fuel and high-level waste)** ~~(except for collective offsite radiological impacts from the fuel cycle and from high-level waste and spent fuel disposal)~~.
- Mitigation of adverse impacts associated with the issue has been considered in the analysis, and it has been determined that additional plant-specific mitigation measures are **not** likely ~~not~~ to be sufficiently beneficial to warrant implementation.

For generic issues (Category 1), the SEIS requires no additional site-specific evaluation unless new and significant information has been identified. Chapter 3 describes the process for identifying new and significant information for site-specific analysis. Site-specific issues (Category 2) are those that do not meet one or more of the three criteria of Category 1 issues; therefore, the SEIS requires additional site-specific review for these issues.

~~The GEIS, Revision 1, evaluates 78 environmental issues, provides generically applicable findings for numerous issues (subject to the consideration of any new and significant information on a site-specific basis), and concludes that a site-specific analysis is required for 17 of the 78 issues~~ **The LR GEIS evaluates 80 environmental issues (i.e., 59 Category 1, 20 Category 2, and 1 issue that remain uncategorized) that may be associated with nuclear power plant operation and refurbishment during the license renewal term.** Figure 1-1 illustrates the license renewal environmental review process. The results of that site-specific review are documented in the SEIS.



*In the **LR** GEIS, the NRC evaluated **80** issues.*
*A site-specific analysis is required for **20** of those **80** issues.*

Figure 1-1 Environmental Issues Evaluated for License Renewal

1.5 Supplemental Environmental Impact Statement

There are no substantive changes to this section of the 2021 DSEIS.

1.6 Decisions to be Supported by the SEIS

This SEIS supports the NRC's decision on whether to renew the operating licenses for Point Beach for an additional 20 years. The regulation at 10 CFR 51.103(a)(5) (TN10253) specifies the NRC's decision standard as follows:

> In making a final decision on a license renewal action pursuant to [10 CFR] Part 54…, the Commission shall determine whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable.

There are many factors that the NRC takes into consideration when deciding whether to renew the operating license of a nuclear power plant. The analyses of environmental impacts in this SEIS will provide the NRC's decisionmakers (the Commission) with important environmental information for consideration in deciding whether to issue subsequent renewed licenses for Point Beach.

1.7 Cooperating Agencies

During the scoping process, the NRC staff did not identify any Federal, State, or local governmental agencies as cooperating agencies for this SEIS.

1.8 Consultations

The Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.-TN1010) (ESA); the Magnuson–Stevens Fishery Conservation and Management Act of 1996, as amended (16 U.S.C. 1801 et seq.-TN7841) (MSA); and the National Historic Preservation Act of 1966, as amended (54 U.S.C. 300101 et seq.-TN4157) (NHPA), require Federal agencies to consult with applicable State and Federal agencies and organizations before taking an action that may affect endangered species, fisheries, or historic and archaeological resources, respectively. See Appendix C for a list of the agencies and groups with which the NRC staff consulted.

1.9 Correspondence

During the review, the NRC staff contacted the Federal, State, regional, local, and Tribal agencies listed in Appendix C. Appendix C chronologically lists all the correspondence that the NRC staff sent and received associated with the ESA, the MSA, and the NHPA. Appendix D chronologically lists all other correspondence.

1.10 Status of Compliance

NextEra is responsible for complying with all NRC regulations and other applicable Federal, State, and local requirements. Appendix F, “Laws, Regulations, and Other Requirements,” of the **LR** GEIS, Revision 1 (NRC 2013-TN2654), describes some of the major applicable Federal statutes. Numerous permits and licenses are issued by Federal, State, and local authorities for activities at Point Beach. Appendix B of this SEIS contains further information from the Point Beach application about NextEra’s status of compliance.

1.11 Related State and Federal Activities

The NRC staff reviewed the possibility that activities of other Federal agencies might impact the renewal of the operating licenses for Point Beach. Any such activities could result in cumulative environmental impacts and the possible need for the Federal agency to become a cooperating agency for preparing this SEIS. The NRC staff determined that there are no Federal projects that would make it necessary for another Federal agency to become a cooperating agency in the preparation of this SEIS (10 CFR 51.10(b)(2); TN10253). Table E-1 in Appendix E includes the Federal facilities in the vicinity of Point Beach.

Section 102(2)(C) of NEPA (TN661) requires the NRC to consult with and obtain comments from any Federal agency or designated authority that has jurisdiction by law or special expertise with respect to any environmental impact involved in the subject matter of the SEIS. For example, during the preparation of the SEIS, the NRC consulted with the State Historic Preservation Officer, among others. Appendix C provides a complete list of consultation correspondence.

2 ALTERNATIVES INCLUDING THE PROPOSED ACTION[1]

There are no substantive changes to this section of the 2021 DSEIS (NRC 2021-TN7293).

2.1 Description of Nuclear Power Plant Facility and Operation

There are no substantive changes to this section of the 2021 DSEIS.

2.1.1 External Appearance and Setting

There are no substantive changes to this section of the 2021 DSEIS.

2.1.2 Nuclear Reactor Systems

There are no substantive changes to this section of the 2021 DSEIS.

2.1.3 Cooling and Auxiliary Water Systems

There are no substantive changes to this section of the 2021 DSEIS.

2.1.3.1 Cooling Water Intake and Discharge

There are no substantive changes to this section of the 2021 DSEIS.

2.1.3.2 Well Water Supply System

There are no substantive changes to this section of the 2021 DSEIS.

2.1.4 Radioactive Waste Management Systems

There are no substantive changes to this section of the 2021 DSEIS.

2.1.4.1 Radioactive Liquid Waste Management

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

The NRC staff reviewed 5 years of radioactive effluent release data from 201**9** through 202**3** (~~NextEra 2017, 2018, 2019~~, NextEra 2020-TN11249, NextEra 2021-TN11250, NextEra 2022-TN11252, NextEra 2023-TN11254, NextEra 2024-TN11257). A 5-year period provides a dataset that covers a broad range of activities that occur at a nuclear power plant, such as refueling outages, routine operation, and maintenance, which can affect the generation of radioactive effluents into the environment. The NRC staff compared the data against

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

NRC dose limits and looked for indications of adverse trends (i.e., increasing dose levels or increasing radioactivity levels).

One inadvertent radioactive liquid release since 2020 was documented in the Point Beach 2021 Annual Monitoring Report (NextEra 2022-TN11252**). This release was below regulatory limits and no Offsite Dose Calculation Manual limits were challenged. NextEra confirmed that there have not been any other reportable unplanned releases of radioactive liquid materials that would trigger a notification requirement from 2019 through September 17, 2024 (**NextEra 2024-TN11258**).**

The following summarizes the calculated doses from radioactive liquid effluents released from Point Beach during 202**3** (NextEra 2024-TN11257).

Point Beach Unit 1 in **2023**

- The total-body dose to an offsite member of the public from Point Beach Unit 1 radioactive effluents was **3.26** × 10^{-3} millirem (mrem) (**3.26** × 10^{-5} millisievert (mSv)), which is well below the 3 mrem (0.03 mSv) dose criterion in Appendix I to 10 CFR Part 50 (TN249).
- The maximum organ dose (gastrointestinal tract) to an offsite member of the public from Point Beach Unit 1 radioactive effluents was **3.82** × 10^{-3} mrem (**3.82** × 10^{-5} mSv), which is well below the 10 mrem (0.1 mSv) dose criterion in Appendix I to 10 CFR Part 50.

Point Beach Unit 2 in **2023**

- The total-body dose to an offsite member of the public from Point Beach Unit 2 radioactive effluents was **3.26** × 10^{-3} mrem (**3.26** × 10^{-5} mSv), which is well below the 3 mrem (0.03 mSv) dose criterion in Appendix I to 10 CFR Part 50.
- The maximum organ dose (gastrointestinal tract) to an offsite member of the public from Point Beach Unit 2 radioactive effluents was **3.82** × 10^{-3} mrem (**3.82** × 10^{-5} mSv), which is well below the 10 mrem (0.1 mSv) dose criterion in Appendix I to 10 CFR Part 50.

There are no further substantive changes to this section of the 2021 DSEIS.

2.1.4.2 Radioactive Gaseous Waste Management

NextEra calculates dose estimates for members of the public based on radioactive gaseous effluent release data and atmospheric transport models. NextEra's annual radioactive effluent release reports present in detail the radiological gaseous effluents released from Point Beach and the resultant calculated doses. As described above in Section 2.1.4.1, the NRC staff reviewed 5 years of radioactive effluent release data from the 201**9** through 202**3** reports (~~NextEra 2017, 2018, 2019b~~, NextEra 2020-TN11249, NextEra 2021-TN11250, NextEra 2022-TN11252, NextEra 2023-TN11254, NextEra 2024-TN1125). The NRC staff compared the data against NRC dose limits and looked for indications of adverse trends (i.e., increasing dose levels) over the period.

One inadvertent radioactive gaseous release since 2020 was documented in the Point Beach 2023 Annual Monitoring Report (NextEra 2024a) involving a leak from the waste gas system. This release was below regulatory limits and no Offsite Dose Calculation Manual limits were challenged. NextEra confirmed that there have not been any other reportable unplanned gaseous releases of radioactive materials that would trigger a notification requirement from 2019 through September 17, 2024 (NextEra 2024-TN11258**).**

The following summarizes the calculated doses from radioactive gaseous effluents released from Point Beach during 202**3** (NextEra 2024-TN11257):

Point Beach Unit 1 in 20**23**

- The air dose due to noble gases with resulting gamma radiation in gaseous effluents was **1.92** × 10^{-4} millirad (mrad) (**1.92** × 10^{-6} milligray), which is well below the 10 mrad (0.1 milligray) dose criterion in Appendix I to 10 CFR Part 50 (TN249).
- The air dose from beta radiation in gaseous effluents was **2.91** × 10^{-4} mrad (**2.91** × 10^{-6} milligray), which is well below the 20 mrad (0.2 milligray) dose criterion in Appendix I to 10 CFR Part 50.
- The critical organ dose to an offsite member of the public from radiation in gaseous effluents as a result of iodine-131, iodine-133, tritium, and particulates with greater than 8-day half-lives was **9.75** × 10^{-3} mrem (**9.75** × 10^{-5} mSv), which is below the 15 mrem (0.15 mSv) dose criterion in Appendix I to 10 CFR Part 50.

Point Beach Unit 2 in 20**23**

- The air dose due to noble gases with resulting gamma radiation in gaseous effluents was **1.92** × 10^{-4} mrad (**1.92** × 10^{-6} milligray), which is well below the 10 mrad (0.1 milligray) dose criterion in Appendix I to 10 CFR Part 50.
- The air dose from beta radiation in gaseous effluents was **2.91** × 10^{-4} mrad (**2.91** × 10^{-6} milligray), which is well below the 20 mrad (0.2 milligray) dose criterion in Appendix I to 10 CFR Part 50.
- The critical organ dose to an offsite member of the public from radiation in gaseous effluents as a result of iodine-131, iodine-133, tritium, and particulates with greater than 8-day half-lives was **9.75** × 10^{-3} mrem (**9.75** × 10^{-5} mSv), which is below the 15 mrem (0.15 mSv) dose criterion in Appendix I to 10 CFR Part 50.

There are no further substantive changes to this section of the 2021 DSEIS.

2.1.4.3 Radioactive Solid Waste Management

There are no substantive changes to this section of the 2021 DSEIS.

2.1.4.4 Radioactive Waste Storage

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

Point Beach Units 1 and 2 each store spent fuel in a spent fuel pool and in an onsite independent spent fuel storage installation (ISFSI). The ISFSI safely stores spent fuel onsite in licensed and approved dry cask storage containers. Spent fuel is stored in the ISFSI **subject to the general license (see Table B-2)**. ~~under a separate license.~~ The possible need to expand the size of the ISFSI would depend on the U.S. Department of Energy's (DOE) future performance of its obligation to accept spent nuclear fuel or the availability of other interim storage options. Per the Point Beach **environmental report** (ER), if ISFSI expansion were needed, it would most likely be constructed west of the existing facility within the ISFSI-defined area and the licensee stated that it would cause no significant environmental impact (NextEra 2020-TN11241, Section 3.1.4). **Based on information discussed with NextEra staff during the audit, Point Beach has available space within the ISFSI-defined area should an**

expansion be needed during the SLR term. There is previously disturbed land available to accommodate such expansion, and no significant environmental impact would be anticipated (NextEra 2024-TN11258**)**. ~~Currently, NextEra has not proposed the installation of additional spent fuel storage pads to the current ISFSI area to support subsequent license renewal. If future changed circumstances require the installation of additional spent fuel storage pads, then this would be subject to a separate NEPA review. Therefore, the staff does not consider expansion of the ISFSI in this SEIS.~~ The NRC staff notes ~~, however,~~ that the impacts of onsite storage of spent nuclear fuel during the period of extended operation have been determined to be SMALL, as stated in 10 CFR Part 51 (TN10253), Appendix B, Table B-1; see also NUREG-2157, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (NRC 2014-TN4117).

2.1.4.5 Radiological Environmental Monitoring Program

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

In addition to the radiological environmental monitoring program (REMP), NextEra established a Point Beach onsite groundwater protection initiative program in accordance with **Nuclear Energy Institute (NEI)** 07-07, "Industry Ground Water Protection Initiative" (NEI 2007-TN1913). This program monitors the onsite plant environment to detect leaks from plant systems and pipes containing radioactive liquid. Section 3.5.2.3, "Groundwater Quality," of this SEIS contains information on Point Beach's groundwater protection initiative program. In 20**23**, the groundwater protection program included 1**8** ~~wells~~ **groundwater monitoring locations (**NextEra 2024-TN11257**)**. ~~The REMP program collected samples from one additional well (15 in total).~~ As part of the REMP, analyses are conducted for gross beta, tritium, Sr-89, SR-90, I-131, and gamma isotopic analyses on a quarterly basis for groundwater. Lake water is also sampled **and analyzed** ~~for a subset of these parameters~~.

Section 3.5.2.3 of this SEIS describes the results from the 20**23** annual groundwater sampling. During this sampling period, tritium was detected in shallow groundwater at concentrations well below the **U.S. Environmental Protection Agency** (EPA)-established safe drinking water maximum contaminant level of 20,000 picocuries per liter (pCi/L). ~~In addition, the short-lived radionuclide cobalt-58 was also detected at a very low concentration but did not appear in later samples and was concluded to not be indicative of a potential leak.~~ No detectable radionuclides **have been** identified in ~~2019~~ water samples from deep wells **(potable) as of 2023** (NextEra 2024-TN11257). **The 2023 Annual Monitoring Report describes the results from 2023 annual groundwater sampling. Groundwater monitoring indicates that low levels of tritium continue to occur in the upper soil layer but not in the deep drinking water aquifer. These results also indicate that the low levels of tritium are restricted to a small, well-defined area close to the plant. Analyses to date indicate that the drinking water contains no tritium. None of the tritium in the upper soil layer is migrating off-site toward the surrounding population (**NextEra 2024-TN11257**). Section 3.5.2 of this SEIS contains additional information regarding tritium and groundwater monitoring.**

There are no further substantive changes to this section of the 2021 DSEIS.

2.1.5 Nonradioactive Waste Management Systems

There are no substantive changes to this section of the 2021 DSEIS.

2.1.6 Utility and Transportation Infrastructure

There are no substantive changes to this section of the 2021 DSEIS.

2.1.6.1 Electricity

There are no substantive changes to this section of the 2021 DSEIS.

2.1.6.2 Fuel

There are no substantive changes to this section of the 2021 DSEIS.

2.1.6.3 Water

There are no substantive changes to this section of the 2021 DSEIS.

2.1.6.4 Transportation Systems

There are no substantive changes to this section of the 2021 DSEIS.

2.1.6.5 Power Transmission Systems

There are no substantive changes to this section of the 2021 DSEIS.

2.1.7 Nuclear Power Plant Operations and Maintenance

There are no substantive changes to this section of the 2021 DSEIS.

2.2 Proposed Action

As stated in Section 1.1 of this SEIS, the NRC's proposed Federal action is to decide whether to issue subsequent renewed Point Beach operating licenses for an additional 20 years of operation. Section 2.2.1 below provides a description of normal power plant operations during the SLR term.

2.2.1 Plant Operations during the Subsequent License Renewal Term

There are no substantive changes to this section of the 2021 DSEIS.

2.2.2 Refurbishment and Other Activities Associated with Subsequent License Renewal

There are no substantive changes to this section of the 2021 DSEIS.

2.2.3 Termination of Nuclear Power Plant Operations and Decommissioning After the Subsequent License Renewal Term

NUREG-0586, Supplement 1, Volumes 1 and 2, *Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Regarding the Decommissioning of Nuclear Power Reactors* (NRC 2002-TN665) (the decommissioning GEIS), describes the impacts of decommissioning. The majority of plant operations activities would cease with reactor shutdown. However, some activities (e.g., security and oversight of spent nuclear fuel) would remain

unchanged, whereas others (e.g., waste management, administrative work, laboratory analysis, surveillance, monitoring, and maintenance) would continue at reduced or altered levels. Systems dedicated to reactor operations would cease operation. However, if these systems are not removed from the site after reactor shutdown, their physical presence may continue to impact the environment. Impacts associated with dedicated systems that remain in place, or with shared systems that continue to operate at normal capacities, could remain unchanged.

Decommissioning will occur whether Point Beach is shut down at the end of its current operating licenses or at the end of the subsequent period of extended operation 20 years later. There is no site-specific issue related to decommissioning. The **LR** GEIS concludes that license renewal would have a negligible (SMALL) effect on the impacts of terminating operations and decommissioning on all resources (NRC 2013-TN2654, NRC 2024-TN10161).

2.3 Alternatives

As stated above, NEPA (TN661) requires the NRC to consider reasonable alternatives to the proposed action of issuing subsequent renewed facility operating licenses for Point Beach. For a replacement power alternative to be reasonable, it must be either (1) commercially viable on a utility scale and operational before the reactor's operating license expires or (2) expected to become commercially viable on a utility scale and operational before the reactor's operating license expires (NRC 2013-TN2654, NRC 2024-TN10161). The NRC published the most recent **LR** GEIS revision in 20**24**, and it incorporated the latest information on replacement power alternatives available at that time; however, rapidly evolving technologies are likely to outpace the information in the **LR** GEIS. Thus, for each supplement to the **LR** GEIS, the NRC staff must perform a site-specific analysis of replacement power alternatives that accounts for changes in technology and science since the most recent **LR** GEIS revision.

The first alternative to the proposed action of the NRC issuing subsequent renewed facility operating licenses for Point Beach is for the NRC to not issue the licenses. This is called the no-action alternative and is described below in Section 2.3.1. In addition to the no-action alternative, this section discusses three reasonable replacement power alternatives. As described in Section 2.3.2 below, these alternatives seek to replace Point Beach's generating capacity by meeting the region's energy needs through other means or sources that are, or expected to be, commercially viable on a utility scale and operational before Point Beach's current renewed facility operating licenses expire.

2.3.1 No-Action Alternative

At some point, all operating nuclear power plants will permanently cease operations and undergo decommissioning. Under the no-action alternative, the NRC does not issue the subsequent renewed facility operating licenses for Point Beach and the units shut down at or before the expiration of the current renewed facility operating licenses on October 5, 2030 (Unit 1), and March 8, 2033 (Unit 2). The **LR** GEIS describes the environmental impacts that arise directly from permanent plant shutdown. The NRC expects shutdown impacts to be relatively similar, whether they occur at the end of the current license term (i.e., after 60 years of operation) or at the end of a subsequent renewed license term (i.e., after 80 years of operation).

After permanent shutdown, plant operators will initiate decommissioning in accordance with 10 CFR 50.82 (TN249), "Termination of license." The decommissioning GEIS (NUREG-0586) (NRC 2002-TN665) describes the environmental impacts from decommissioning a nuclear power plant and related activities. The analysis in the decommissioning GEIS identifies resource

area issues that are generic (and therefore bounded by the analysis in the decommissioning GEIS) and separately identifies six site-specific issues. A licensee in decommissioning must assess in its post-shutdown decommissioning activities report submitted to the NRC whether there are planned decommissioning activities with reasonably foreseeable environmental impacts that are not bounded in previous EISs, including the decommissioning GEIS. For bounded activities, licensees need not provide additional analysis; for not-bounded activities, such as site-specific issues not bounded in previous site-specific EISs or generic issues where the impacts fall outside of the bounds stated in the decommissioning GEIS, licensees must provide additional analysis. Chapter 4, **Section 4.14.2** of the **LR** GEIS (NUREG-1437) (~~NRC 2013a,~~ NRC 2024-TN10161) and Section 3.15.2, "Terminating Plant Operations and Decommissioning," of this SEIS describe the incremental environmental impacts of **SLR** on decommissioning activities.

Termination of operations at Point Beach would result in the total cessation of electrical power production by Point Beach Units 1 and 2. Unlike the replacement power alternatives described below in Section 2.3.2, the no-action alternative does not expressly meet the purpose and need of the proposed action, as described in Section 1.2, because the no-action alternative does not provide a means of delivering baseload power to meet future electric system needs. Assuming that a need currently exists for the power generated by Point Beach, the no-action alternative would likely create a need for a replacement power alternative. The following section describes a wide range of replacement power alternatives and Chapter 3 of this SEIS assesses their potential environmental impacts. Although the NRC's authority only extends to deciding whether to issue subsequent renewed facility operating licenses for Point Beach, the replacement power alternatives described in the following sections represent possible options for energy-planning decisionmakers if the NRC decides not to issue subsequent renewed facility operating licenses for these units.

2.3.2 Replacement Power Alternatives

There are no substantive changes to this section of the 2021 DSEIS.

2.3.2.1 New Nuclear (Small Modular Reactor) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

2.3.2.2 Natural Gas Combined-Cycle Alternative

There are no substantive changes to this section of the 2021 DSEIS.

2.3.2.3 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

2.4 Alternatives Considered but Eliminated

The NRC staff originally considered 16 replacement power alternatives to Point Beach's **SLR** but ultimately eliminated 13 of these from detailed study. The NRC staff eliminated these 13 alternatives because of technical reasons, resource availability limitations, or commercial or regulatory limitations. Because many of these limitations will likely still exist when the current Point Beach licenses expire in 2030 (Unit 1), and 2033 (Unit 2), the NRC staff does not expect that these 13 alternatives will be reasonably available when needed to replace Point Beach's

generating capacity. This section describes the 13 eliminated alternatives as well as the reasons why the NRC staff eliminated each alternative.

2.4.1 Solar Power

There are no substantive changes to this section of the 2021 DSEIS.

2.4.2 Biomass Power

There are no substantive changes to this section of the 2021 DSEIS.

2.4.3 Wind Power

There are no substantive changes to this section of the 2021 DSEIS.

2.4.4 Demand-Side Management

There are no substantive changes to this section of the 2021 DSEIS.

2.4.5 Hydroelectric Power

There are no substantive changes to this section of the 2021 DSEIS.

2.4.6 Geothermal Power

There are no substantive changes to this section of the 2021 DSEIS.

2.4.7 Wave and Ocean Energy

There are no substantive changes to this section of the 2021 DSEIS.

2.4.8 Municipal Solid Waste-Fired Power

There are no substantive changes to this section of the 2021 DSEIS.

2.4.9 Petroleum-Fired Power

There are no substantive changes to this section of the 2021 DSEIS.

2.4.10 Coal-Fired Power

There are no substantive changes to this section of the 2021 DSEIS.

2.4.11 Fuel Cells

There are no substantive changes to this section of the 2021 DSEIS.

2.4.12 Purchased Power

There are no substantive changes to this section of the 2021 DSEIS.

2.4.13 Delayed Retirement of Other Generating Facilities

There are no substantive changes to this section of the 2021 DSEIS.

2.5 Comparison of Alternatives

In this chapter, the NRC staff considered in depth one alternative to Point Beach **SLR** that does not replace the plant's energy generation (i.e., the no-action alternative) and three alternatives to Point Beach **SLR** that may reasonably replace the plant's energy generation. These replacement power alternatives are (1) new nuclear generation (a small modular reactor facility with three reactor modules), (2) a new natural gas combined-cycle facility, and (3) a combination of a small modular reactor facility, solar photovoltaic generation with battery storage, and onshore wind generation with battery storage. Chapter 3 in this SEIS describes and assesses the environmental impacts of the proposed action and the alternatives. Table 2-1 below summarizes the environmental impacts of Point Beach **SLR**, the no-action alternative, and the three reasonable replacement power alternatives to Point Beach **SLR**. The environmental impacts of the proposed action (issuing Point Beach subsequent renewed facility operating licenses) would be SMALL for all impact categories.

In comparison, each of the three reasonable replacement power alternatives has environmental impacts in at least four resource areas that are greater than the environmental impacts of the proposed action. In addition, the replacement power alternatives would also have the environmental impacts inherent to new construction projects. If the NRC takes the no-action alternative and does not issue Point Beach subsequent renewed facility operating licenses, energy-planning decisionmakers would likely implement one of the three replacement power alternatives discussed in depth in this chapter. Based on the NRC staff's review of these three reasonable replacement power alternatives, the no-action alternative, and the proposed action, the NRC staff concludes that the proposed action of Point Beach **SLR** is the environmentally preferred alternative. Therefore, the NRC staff's preliminary recommendation is that the NRC issue the Point Beach subsequent renewed facility operating licenses.

Table 2-1 Summary of Environmental Impacts of the Proposed Action and Alternatives [Table 2-2 in the 2021 DSEIS]

Impact Area (Resource)	Point Beach License Renewal (Proposed Action)	No-Action Alternative	New Nuclear Alternative (Small Modular Reactor)	Natural Gas Combined-Cycle Alternative	Combination Alternative (Small Modular Reactor, Solar, Onshore Wind)
Land Use	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE	MODERATE to LARGE
Visual Resources	SMALL	SMALL	SMALL TO MODERATE	SMALL to MODERATE	MODERATE to LARGE
Air Quality	SMALL	SMALL	SMALL	SMALL to MODERATE	SMALL
Noise	SMALL	SMALL	SMALL	SMALL to MODERATE	SMALL to MODERATE
Geologic Environment	SMALL	SMALL	SMALL	SMALL	SMALL to MODERATE
Surface Water Resources	SMALL	SMALL	SMALL	SMALL	SMALL to MODERATE

Table 2-1 Summary of Environmental Impacts of the Proposed Action and Alternatives [Table 2-2 in the 2021 DSEIS] (Continued)

Impact Area (Resource)	Point Beach License Renewal (Proposed Action)	No-Action Alternative	New Nuclear Alternative (Small Modular Reactor)	Natural Gas Combined-Cycle Alternative	Combination Alternative (Small Modular Reactor, Solar, Onshore Wind)
Groundwater Resources	SMALL	SMALL	SMALL	SMALL	SMALL
Terrestrial Resources	SMALL	SMALL	SMALL	SMALL to MODERATE	MODERATE to LARGE
Aquatic Resources	SMALL	SMALL	SMALL	SMALL	SMALL to MODERATE
Federally Protected Ecological Resources ~~Special Status Species & Habitats~~	SEE NOTE[a]	SEE NOTE[b]	SEE NOTE[c]	SEE NOTE[c]	SEE NOTE[c]
Historic and Cultural Resources	SEE NOTE[d]	SEE NOTE[e]	SEE NOTE[f]	SEE NOTE[f]	SEE NOTE[f]
Socioeconomics	SMALL	SMALL to MODERATE	MODERATE to LARGE	SMALL to MODERATE	MODERATE to LARGE
Transportation	SMALL	SMALL	MODERATE to LARGE	SMALL to MODERATE	MODERATE to LARGE
Human Health	SMALL[g]	SMALL[g]	SMALL[g]	SMALL[g]	SMALL[g]
~~Environmental Justice~~ [h]	~~SEE NOTE[h]~~	~~SEE NOTE[i]~~	~~SEE NOTE[i]~~	~~SEE NOTE[i]~~	~~SEE NOTE[i]~~
Waste Management and Pollution Prevention	SMALL[j]	SMALL[j]	SMALL[j]	SMALL	SMALL[j]
Greenhouse Gas Emissions	**SMALL**	**SMALL**	**SMALL**	**MODERATE**	**SMALL**

(a) May affect, but is not likely to adversely affect, northern long-eared bat**, tricolored bat,** piping plover**, and monarch butterfly**. No effect on essential fish habitat (EFH). **For national marine sanctuaries, not likely to destroy, cause the loss of, or injure any sanctuary resources.**

(b) Overall, the effects on federally listed species, critical habitats, and EFH would likely be smaller under the no-action alternative than the effects under continued operation but would depend on the specific shutdown activities as well as the listed species, critical habitats, and designated EFH present when the no-action alternative is implemented.

(c) The effects on federally listed species, critical habitats, and EFH would depend on the proposed alternative site and plant design and operation, as well as listed species and habitats present when the alternative is implemented. Therefore, the NRC staff cannot forecast a level of impact for this alternative.

(d) Given that no new ground disturbance or modifications and no periodic maintenance dredging or shoreline stabilization is anticipated during the subsequent license renewal term, and that NextEra has procedures in place to manage and protect cultural resources, the NRC staff concludes that Point Beach subsequent license renewal would not adversely affect any known historic properties or historic and cultural resources.

Table 2-1 Summary of Environmental Impacts of the Proposed Action and Alternatives [Table 2-2 in the 2021 DSEIS] (Continued)

Impact Area (Resource)	Point Beach License Renewal (Proposed Action)	No-Action Alternative	New Nuclear Alternative (Small Modular Reactor)	Natural Gas Combined-Cycle Alternative	Combination Alternative (Small Modular Reactor, Solar, Onshore Wind)

(e) Land-disturbing activities or dismantlement as a result of facility shutdown are not anticipated as these would be conducted during decommissioning. However, effects on historic properties or historic and cultural resources would depend on the specific shutdown activities when the no-action alternative is implemented.

(f) The impact determination of this alternative would depend on the specific location of the new facility.

(g) The chronic effects of electromagnetic fields on human health associated with operating nuclear power and other electricity generating plants are uncertain.

(h) Analysis of this issue has been removed from this SEIS. See Section 3.12 of this SEIS for more information.

~~(i) Not renewing the operating licenses and terminating reactor operations could have a noticeable impact on socioeconomic conditions in communities near Point Beach, and a reduction in tax revenue resulting from nuclear plant shutdown could decrease the availability of public services. Minority and low-income populations dependent on these services could be disproportionately affected. It is unlikely that a replacement power generating facility would be constructed and allowed to operate in a manner that would result in disproportionately high and adverse human health and environmental effects on minority and low-income populations. However, this determination would depend on the location, plant design, and operational characteristics of the alternative. Therefore, it cannot be determined whether this alternative would result in disproportionately high and adverse human health and environmental effects to nearby minority and low-income populations.~~

(j) NUREG-2157, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (NRC 2014-TN4117), discusses the environmental impacts of spent fuel storage for the time frame beyond the licensed life for reactor operations.

3 AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, AND MITIGATING ACTIONS[1]

3.1 Introduction

In conducting its environmental review of the Point Beach Nuclear Plant, Units 1 and 2 (Point Beach), subsequent license renewal **(SLR)** application by NextEra Energy Point Beach, LLC (NextEra), the staff of the U.S. Nuclear Regulatory Commission (NRC) defines and describes the environment that could be affected by the proposed action (issuing subsequent renewed licenses authorizing an additional 20 years of operation). The staff then evaluates the environmental consequences of the proposed action as well as reasonable alternatives to the proposed action.

Chapter 2 of this supplemental environmental impact statement (SEIS) describes the Point Beach facility and its operations, as well as the scope of the agency's proposed action and the no-action alternative. Chapter 2, Section 2.3, further describes the NRC staff's process for developing a range of reasonable alternatives to the proposed action, including the replacement power alternatives that the staff selected for detailed analysis in this chapter and the supporting assumptions and data relied upon. As noted in Chapter 2, Table 2-1, the site location for the replacement power alternatives would be within the Point Beach site or within NextEra's service area. Chapter 2, Table 2-2, summarizes the environmental impacts of the proposed action and alternatives to the proposed action.

In this chapter, the NRC staff first defines the affected environment as the environment that currently exists at and around the Point Beach site. Because existing conditions are at least partially the result of past construction and nuclear power plant operations, this chapter considers the nature and impacts of past and ongoing actions and evaluates how, together, these actions have shaped the current environment. This chapter also describes reasonably foreseeable environmental trends. The effects of ongoing reactor operations at the site have become well established as environmental conditions have adjusted to the presence of the facility.[2] Sections 3.2 through 3.13 describe the affected environment for each resource area, followed by the staff's evaluation of the environmental consequences of the proposed action and alternatives to the proposed action. The NRC staff compares the environmental impacts of **SLR** with those of the no-action alternative and replacement power alternatives to determine whether the adverse environmental impacts of **SLR** are so great that it would be unreasonable to preserve the option of **SLR** for energy-planning decisionmakers.

---

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

[2] Where appropriate, the NRC staff has summarized referenced information or incorporated information by reference into this SEIS. This allows the staff to focus on new and potentially significant information identified since initial license renewal of Point Beach, Units 1 and 2.

The NRC staff's evaluation of environmental consequences includes the following:

- impacts associated with continued operations similar to those that have occurred during the current license renewal term
- impacts of various alternatives to the proposed action, including a no-action alternative (not issuing the renewed subsequent licenses) and replacement power alternatives (new nuclear (small modular reactor (SMR)), natural gas combined-cycle, and a combination alternative (new nuclear, solar photovoltaic (PV), onshore wind)
- impacts from the termination of nuclear power plant operations and decommissioning after the **SLR** term
- impacts associated with the uranium fuel cycle
- impacts of postulated accidents (design-basis accidents and severe accidents)
- cumulative impacts of the proposed action
- resource commitments associated with the proposed action, including unavoidable adverse impacts, the relationship between short-term use and long-term productivity, and irreversible and irretrievable commitment of resources
- new and potentially significant information on environmental issues related to the impacts of operation during the **SLR** term

As stated in Sections 1.4 and 1.5, this SEIS documents the NRC staff's environmental review of the Point Beach **SLR** application and supplements the information provided in NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (**LR** GEIS) (NRC 2013-TN2654, NRC 2024-TN10161). The **LR** GEIS identifies **80** issues (divided into Category 1 and Category 2 issues) to be evaluated for the proposed action in the license renewal environmental review process. Section 1.4 of this SEIS explains the criteria for Category 1 issues (generic to all, or a distinct subset of, nuclear power plants) and Category 2 issues (specific to individual nuclear power plants), as well as the definitions of SMALL, MODERATE, and LARGE impact significance.

For Category 1 issues, the NRC staff relies on the analysis in the **LR** GEIS unless otherwise noted. Table 3-1 lists the Category 1 (generic) issues that apply to Point Beach during the proposed **SLR** period. For these issues, the NRC staff did not identify any new and significant information that would change the conclusions of the **LR** GEIS. To identify any new and significant information, the staff reviewed the applicant's environmental report (ER) (NextEra 2020-TN11241), conducted a public environmental scoping process, conducted environmental site audit**s**, and reviewed the sources referenced in the SEIS. **Following the NRC's issuance on August 6, 2024 of the final rule (**89 FR 64166-TN10321**) revising Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions" (**TN10253**), and of the 2024 LR GEIS (**NRC 2024-TN10161**; see Chapter 1 of this SEIS), the staff conducted a supplemental environmental audit. The staff also considered additional information provided by NextEra (**NextEra 2024-TN11258**).** ~~Therefore,~~ **As a result of this review, the staff determined that** there are no impacts related to the issues beyond those discussed in the **LR** GEIS (Table 3-1 and Table 3-2 below), as cited in Sections 3.2 through 3.13 below. Section 3.14 describes the staff's process for evaluating new and significant information.

1 **Table 3-1 Applicable Category 1 (Generic) Issues for Point Beach**

Environmental Category – Issue	LR GEIS Section	Impact
Land Use – Onsite land use	4.2.1.1	SMALL
Land Use – Offsite land use	4.2.1.1	SMALL
Visual Resources – Aesthetic impacts	4.2.1.2	SMALL
Air Quality – Air quality impacts ~~(all plants)~~	4.3.1.1	SMALL
Air Quality – Air quality effects of transmission lines	4.3.1.1	SMALL
Noise – Noise impacts	4.3.1.2	SMALL
Geologic Environment – Geology and soils	4.4.1	SMALL
Surface Water Resources – Surface water use and quality (non-cooling system impacts)	4.5.1.1	SMALL
Surface Water Resources – Altered current patterns at intake and discharge structures	4.5.1.1	SMALL
Surface Water Resources – Altered thermal stratification of lakes	4.5.1.1	SMALL
Surface Water Resources – Scouring caused by discharged cooling water	4.5.1.1	SMALL
Surface Water Resources – Discharge of metals in cooling system effluent	4.5.1.1	SMALL
Surface Water Resources – Discharge of biocides, sanitary wastes, and minor chemical spills	4.5.1.1	SMALL
Surface Water Resources – Surface water use conflicts (plants with once-through cooling systems)	4.5.1.1	SMALL
Surface Water Resources – Effects of dredging on surface water quality	4.5.1.1	SMALL
Surface Water Resources – Temperature effects on sediment transport capacity	4.5.1.1	SMALL
Groundwater Resources –Groundwater contamination and use (non-cooling system impacts)	**4.5.1.2.1** ~~3.5.2.1~~	SMALL
Groundwater Resources –Groundwater use conflicts (plants that withdraw less than 100 gallons per minute [gpm])	**4.5.1.2.2** ~~3.5.2.1~~	SMALL
Groundwater Resources –Groundwater quality degradation resulting from water withdrawals	**4.5.1.2.5** ~~3.5.2.1~~	SMALL
Terrestrial Resources – Exposure of terrestrial organisms to radionuclides	4.6.1.1	SMALL
Terrestrial Resources – Cooling system impacts on terrestrial resources (plants with once-through cooling systems or cooling ponds)	4.6.1.1	SMALL
Terrestrial Resources – Bird collisions with plant structures and transmission lines	4.6.1.1	SMALL
Terrestrial Resources – Transmission line right-of-way (ROW) management impacts on terrestrial resources	4.6.1.1	SMALL
Terrestrial Resources – Electromagnetic field **effects on terrestrial plants and animals** ~~on flora and fauna (plants, agricultural crops, honeybees, wildlife, livestock)~~	4.6.1.1	SMALL
Aquatic Resources – Entrainment of phytoplankton and zooplankton ~~(all plants)~~	4.6.1.2	SMALL
Aquatic Resources – Infrequently reported **effects of** thermal **effluents** ~~impacts (all plants)~~	4.6.1.2	SMALL
~~**Aquatic Resources –** Effects of cooling water discharge on dissolved oxygen, gas supersaturation, and eutrophication~~	~~4.6.1.2~~	~~SMALL~~

Table 3-1 Applicable Category 1 (Generic) Issues for Point Beach (Continued)

Environmental Issue	LR GEIS Section	Impact
Aquatic Resources – Effects of nonradiological contaminants on aquatic organisms	4.6.1.2	SMALL
Aquatic Resources – Exposure of aquatic organisms to radionuclides	4.6.1.2	SMALL
Aquatic Resources – Effects of dredging on aquatic resources	4.6.1.2	SMALL
Aquatic Resources – Non-cooling system impacts ~~Effects~~ on aquatic resources ~~(non-cooling system impacts)~~	4.6.1.2	SMALL
Aquatic Resources – Impacts of transmission line ROW management on aquatic resources	4.6.1.2	SMALL
~~**Aquatic Resources –** Losses from predation, parasitism, and disease among organisms exposed to sublethal stresses~~	~~4.6.1.2~~	~~SMALL~~
Socioeconomics – Employment and income, recreation and tourism	4.8.1.1	SMALL
Socioeconomics – Tax revenue~~s~~	4.8.1.2	SMALL
Socioeconomics – Community services and education	4.8.1.3	SMALL
Socioeconomics – Population and housing	4.8.1.4	SMALL
Socioeconomics – Transportation	4.8.1.5	SMALL
Human Health – Radiation exposures to the public	4.9.1.1.1	SMALL
Human Health – Radiation exposures to plant workers	4.9.1.1.1	SMALL
Human Health – Chemical hazards ~~Human health impact from chemicals~~	4.9.1.1.2	SMALL
Human Health – Microbiological hazards to plant workers	4.9.1.1.3	SMALL
Human Health – Physical occupational hazards	4.9.**1.**1.5	SMALL
Postulated Accidents – Design-basis accidents	4.9.1.2	SMALL
Postulated Accidents – Severe accidents	**4.9.1.2**	**SMALL**
Waste Management – Low-level waste storage and disposal	4.11.1.1	SMALL
Waste Management – Onsite storage of spent nuclear fuel	4.11.1.2	SMALL
Waste Management – Offsite radiological impacts of spent nuclear fuel and high-level waste disposal	4.11.1.3	(a)
Waste Management – Mixed-waste storage and disposal	4.11.1.4	SMALL
Waste Management – Nonradioactive waste storage and disposal	4.11.1**.5**	SMALL
Greenhouse Gas Emissions and Climate Change – Greenhouse gas impacts on climate change	**4.12.1**	**SMALL**
Uranium Fuel Cycle – Offsite radiological impacts—individual impacts from other than the disposal of spent fuel and high-level waste	**4.14.1.5**	SMALL
Uranium Fuel Cycle – Offsite radiological impacts—collective impacts from other than the disposal of spent fuel and high-level waste	**4.14.1.5**	(b)
Uranium Fuel Cycle – Nonradiological impacts of the uranium fuel cycle	**4.14.1.5**	SMALL
Uranium Fuel Cycle – Transportation	**4.14.1.5**	SMALL
Termination of Nuclear Power Plant Operations and Decommissioning – Termination of plant operations and decommissioning	4.1**4**.2.1	SMALL

(a) The environmental impact of this issue for the time frame beyond the licensed life for reactor operations is contained in NUREG-2157 (NRC 2014-TN4117).

(b) There are no regulatory limits applicable to collective doses to the general public from fuel-cycle facilities. The practice of estimating health effects on the basis of collective doses may not be meaningful. All fuel-cycle facilities are designed and operated to meet the applicable regulatory limits and standards. The Commission concludes that the collective impacts are acceptable.

Table 3-1 Applicable Category 1 (Generic) Issues for Point Beach (Continued)

Category	Environmental Issue	LR GEIS Section	Impact
	The Commission concludes that the impacts would not be sufficiently large to require the National Environmental Policy Act of 1969 (NEPA) conclusion, for any plant, that the option of extended operation under 10 CFR Part 54 (TN4878) should be eliminated. Accordingly, while the Commission has not assigned a single level of significance for the collective impacts of the uranium fuel cycle, this issue is considered Category 1.		

Source: Table B-1 in Appendix B, Subpart A, to 10 CFR Part 51 (TN10253); ~~2013a,~~NRC 2024-TN10161.

Further, the NRC staff analyzed the Category 2 (plant-specific) issues applicable to Point Beach during the proposed **SLR** period and assigned impacts on these issues as shown in Table 3-2.

Table 3-2 Applicable Category 2 (Plant-Specific) Issues for Point Beach

Environmental Issue	LR GEIS Section	Impact[a]
Groundwater Resources – Radionuclides released to groundwater	4.5.1.2.7	SMALL
Terrestrial Resources – Non-cooling system impacts on terrestrial resources ~~Effects on terrestrial resources (non-cooling system impacts)~~	4.6.1.1.1	SMALL
Aquatic Resources – Impingement **mortality** and entrainment of aquatic organisms (plants with once-through cooling systems or cooling ponds)	4.6.1.2.1	SMALL
Aquatic Resources – Effects of thermal effluents on aquatic organisms ~~Thermal impacts on aquatic resources~~ (plants with once-through cooling systems or cooling ponds)	4.6.1.2.4	SMALL
Federally Protected Ecological Resources – Endangered Species Act: federally listed species and critical habitats under U.S. Fish and Wildlife Service jurisdiction ~~Threatened, endangered, and protected species and essential fish habitat~~	4.6.1.3.1	May affect, but is not likely to adversely affect, northern long-eared bat**, tricolored bat,** piping plover**, and monarch butterfly**
Federally Protected Ecological Resources – Endangered Species Act: federally listed species and critical habitats under National Marine Fisheries Service jurisdiction	**4.6.1.3.2**	**No effect**
Federally Protected Ecological Resources – Magnuson–Stevens Act: Essential Fish Habitat	**4.6.1.3.3**	**No effect**
Federally Protected Ecological Resources – National Marine Sanctuaries Act: sanctuary resources	**4.6.1.3.4**	**Not likely to destroy, cause the loss of, or injure any sanctuary resources**
Historic and Cultural Resources – Historic and cultural resources	4.7.1	Would not adversely affect historic properties
Human Health – Microbiological hazards to the public ~~(plants with cooling ponds or canals or cooling towers that discharge to a river)~~	4.9.1.1.3	SMALL
~~**Human Health –** Chronic effects of~~ Electromagnetic fields **(EMFs)**[b]	4.9.1.1.4	Uncertain impact
Human Health – Electric shock hazards	4.9.1.1.5	SMALL

Table 3-2 Applicable Category 2 (Plant-Specific) Issues for Point Beach (Continued)

Environmental Issue	LR GEIS Section	Impact[a]
~~**Postulated Accidents –** Design-basis accidents~~	~~4.9.1.2~~	~~SMALL~~
~~**Postulated Accidents –** Severe accidents~~	~~4.9.1.2~~	~~See Appendix F of this SEIS~~
~~Environmental Justice – Impacts on Minority Populations, and low-income populations, and Indian Tribes[c]~~	~~4.10.1.1~~	~~No disproportionately high and adverse human health and environmental effects on minority populations, low-income populations, and Indian Tribes~~ ~~No disproportionately high and adverse human health impacts would be expected in special pathway receptor populations in the region because of subsistence consumption of water, local food, fish, and wildlife~~
Greenhouse Gas Emissions and Climate Change – Climate change impacts on environmental resources	**4.12.2**	**See Section 3.15.3.8**
Cumulative Effects – Cumulative **effects**	4.13	**See Section 3.16**

(a) Impact determinations for Category 2 issues are based on findings described in Sections 3.2 through 3.13 below, as applicable, for the proposed action.
(b) This issue was not designated as Category 1 or 2 and is discussed in Section 3.11.6.2 below.
(c) Analysis of this issue has been removed from this SEIS. See Section 3.12 of this SEIS for more information.
Source: Table B-1 in Appendix B, Subpart A, to 10 CFR Part 51 (TN10253); ~~2013a,~~NRC 2024-TN10161.

3.2 Land Use and Visual Resources

This section describes the land uses and visual resources in the vicinity of the Point Beach site. Following this description, the NRC staff analyzes the potential impacts on land use and visual resources from the proposed action and alternatives to the proposed action. Section 3.2 of NextEra's ER (NextEra 2020-TN11241) describes NextEra's current onsite and offsite land use conditions as well as visual resources.

3.2.1 Land Use

As described in Section 2.1.1 of this SEIS, the Point Beach site lies on the shores of Lake Michigan in east central Wisconsin. The plant lies 29 miles (mi) (47 kilometers (km)) southeast of Green Bay, Wisconsin (WI), which is the largest population center in the region; 90 mi (145 km) north-northeast of Milwaukee, WI; and 200 mi (322 km) southwest of the Canadian border (NextEra 2020-TN11241). This section describes onsite and offsite (within a 6-mi (10-km) radius) land uses in the affected area. This section also describes the Wisconsin coastal zone, with an emphasis on the statutory and regulatory provisions that govern its use.

3.2.1.1 Onsite Land Use

~~According to NextEra (ER 2020b),~~ Point Beach Units 1 and 2 are located in northeastern Manitowoc County, WI, on the western shore of Lake Michigan, which provides cooling and

auxiliary water for the plant. The nearest towns are Two Creeks, WI, approximately 2 mi (3.2 km) northwest and Mishicot, WI, approximately 6 mi (9.7 km) west-southwest (NextEra 2020-TN11241). See Figure 3.1-3 (NextEra 2020-TN11241: **p**. 3-8), which the staff incorporates here by reference.

For the paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the preceding and the following.

The first solar facility, Two Creeks Solar Farm, began operating in November 2020, as Wisconsin's first utility-scale solar plant. Madison Gas and Electric and the Wisconsin Public Service Corp. co-own this 150-megawatt facility. The second, Point Beach Solar Project, is a 100-megawatt facility that **became operational** in **September** 2021 (NextEra 2024-TN11258). Together, both solar projects ~~are expected to~~ change 885–1,235 acres (ac) (358–500 hectares (ha)) of mostly agricultural lands both on and around the Point Beach site (NextEra 2020-TN11241). See the map of the solar facilities in Figure 3.**1-3**, "PBN Site and 6-mile Radius," in NextEra's ER (NextEra 2020-TN11241: **p.** 3-8), which the staff incorporates here by reference.

In general, the ~~plans for both~~ solar facilities use mainly former agricultural lands and are expected to impact less than 0.1 ac of wetlands total (NextEra 2020-TN11241). ~~The Point Beach Solar Project application states that no wetlands will be permanently impacted although one farmed wetland may be temporarily impacted (PSC 2019a). Some farmed wetland areas will be behind the fenced area although these wetland areas will not be disturbed or covered by solar panels (PSC 2019a). The application also states that tree clearing will be minimized.~~ Under the terms of the solar lease, NextEra still maintains the legal authority to determine all activities on its property, but the solar lease holders are responsible for land management including obtaining permits and establishing programs for adhering to applicable State and Federal regulations. ~~Construction of the solar facilities on the Point Beach site will change onsite land use. However,~~ After construction, the solar facility will follow a vegetation management plan seeding a non-native low turf under and between panel rows. ~~(PSC 2019a)~~ Only limited areas such as solar facility access roads will remain permanently cleared. ~~(PSC 2019a)~~ Point Beach Solar states that it will use best management practices to minimize impacts to soil and potentially improve soil health over the lease term. Upon decommissioning, the land will be tilled to break new vegetative growth and enhance topsoil in order to return the land to agricultural use (PSC 2019-TN11259).

3.2.1.2 Coastal Zone

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

In a letter dated November 10, 2020, NextEra submitted a CZMA consistency certification package to the Wisconsin Coastal Management Program (WCMP) in support of the subsequent renewal of the Point Beach operating licenses (NextEra 2020-TN11241: Appendix F). This letter states, "[t]he proposed continued operation of [Point Beach] complies with the policies of the [WCMP] and will continue to be conducted in a manner consistent with such policies" and provides supporting information. ~~The NRC has not been notified by the WCMP that the WCMP concurs with or objects to this NextEra consistency certification.~~ **The WCMP responded by letter dated March 26, 2021, that it had no comments on the project and would not need to conduct a formal federal consistency review. The WCMP stated that its determination was subject to NextEra ensuring that discharges from the facility would continue to be covered by a Wisconsin Pollutant Discharge Elimination System permit and that NextEra**

and the NRC consult with the State Historic Preservation Office (NextEra 2024-TN11258**: Attachment 26).** Therefore, the WCMP's concurrence with the certification is presumed and the requirements of the CZMA relevant to the Point Beach **SLR** are satisfied.

3.2.1.3 Offsite Land Use

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

Although the surrounding area is primarily rural agricultural, several industrial sites exist in the 6-mi (10-km) vicinity of the Point Beach site. Since 2019, portions of the Point Beach and Two Creeks solar generation facilities **were constructed** ~~have been in construction or operation~~ on land within and near to Point Beach site boundaries. Two Creeks Solar Farm began operating in November 2020, with 500,000 solar panels spread across approximately 800 ac (324 ha) mainly in Manitowoc County with a small area in Kewaunee County (GRN 2020-TN11260). The smaller, 100-megawatt Point Beach Solar Project **comprises** ~~will occupy~~ approximately 565 ac (229 ha) in Manitowoc County (PSC 2019-TN11259). **It became operational in September 2021 (**NextEra 2024-TN11258**).** Together, the two solar projects **converted** ~~will change~~ approximately 885–1,235 ac (358–500 ha) of mostly agricultural lands (NextEra 2020-TN11241). However, since the 6-mi radius contains 29,672 ac (12,008 ha) of agricultural land (NextEra 2020-TN11241) and Manitowoc County contains over 230,000 ac (93,077 ha) of land managed by farming operations (Manitowoc County 2020-TN11261), the loss of 1,235 ac **does** not noticeably impact the rural agricultural nature of the area.

There are no further substantive changes to this section of the 2021 DSEIS.

3.2.2 Visual Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.2.3 Proposed Action

As described in the LR GEIS (NRC 2013-TN2654**,** NRC 2024-TN10161**) and as cited** in Table 3-1 **and Section 3.1 of this SEIS**, the impacts of **nuclear power plant license renewal and continued operations and refurbishment for** all generic land use or visual resource issues ~~for the proposed action of Point Beach subsequent license renewal~~ would be SMALL. **The NRC staff's review did not identify any new and significant information that would change the conclusion in the LR GEIS. This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** The **recent** changes in onsite land use from the solar lease and easement agreement ~~will~~ place 215 ac (87 ha) of Point Beach land behind solar array fence lines (NextEra 2021-TN11262). However, the NRC staff does not foresee this change creating potential land use conflicts between the solar facilities and the continued operation of the plant. If NextEra needs to expand the Point Beach spent nuclear fuel storage during the subsequent license term, there is sufficient land to do so in the ISFSI-defined area west of the existing ISFSI without disturbing solar leased areas (NextEra 2020-TN11241). **Thus, as concluded in the LR GEIS for these Category 1 (generic) issues, the impacts of Point Beach SLR on land use and visual resources would be SMALL**. There are no site-specific (Category 2) land use or visual resource issues, as shown in Table 3-2 of this SEIS.

3.2.4 No-Action Alternative

3.2.4.1 Land Use

There are no substantive changes to this section of the 2021 DSEIS.

3.2.4.2 Visual Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.2.5 Replacement Power Alternatives: Common Impacts

3.2.5.1 Land Use

There are no substantive changes to this section of the 2021 DSEIS.

3.2.5.2 Visual Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.2.6 New Nuclear (Small Modular Reactor) Alternative

3.2.6.1 Land Use

There are no substantive changes to this section of the 2021 DSEIS.

3.2.6.2 Visual Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.2.7 Natural Gas Combined-Cycle Alternative

3.2.7.1 Land Use

There are no substantive changes to this section of the 2021 DSEIS.

3.2.7.2 Visual Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.2.8 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

3.2.8.1 Land Use

There are no substantive changes to this section of the 2021 DSEIS.

3.2.8.2 Visual Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.3 Meteorology, Air Quality, and Noise

There are no substantive changes to this section of the 2021 DSEIS.

3.3.1 Meteorology and Climatology

There are no substantive changes to this section of the 2021 DSEIS.

3.3.2 Air Quality

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

In Wisconsin, air quality designations are made at the county level. For the purpose of planning and maintaining ambient air quality with respect to the NAAQS, the EPA has developed air quality control regions. Air quality control regions are intrastate or interstate areas that share a common airshed. Point Beach is located in Manitowoc County, WI. Manitowoc County is within the Lake Michigan intrastate Air Quality Control Region (40 CFR 81.67 [TN7226]). With regard to NAAQS, Manitowoc County is designated as nonattainment for the 8-**hour** (hr) ozone 2015 standard and maintenance area for the 1-hr ozone 1979 standard and 8-hr ozone 1997 standard (EPA 2025-TN11263).

The Wisconsin Department of Natural Resources (WDNR) regulates air emissions at Point Beach under an Air Pollution Control Operation Permit (Permit No. 436034500-P**40**). Point Beach's air pollution control operation permit expires on **April 12, 2028** (WDNR 2023-TN11264). Table 3-3 lists permitted air emission sources and air permit-specific conditions.

NextEra submits annual emission reports to the WDNR in accordance with the Air Pollution Control Operation Permit. Table 3-4 shows annual emissions from the air permitted sources at Point Beach (NextEra 2021-TN11262; WDNR 2024-TN11265). The contribution of air emissions from sources at Point Beach constitute less than 2 percent of Manitowoc County's annual emissions of each criteria pollutant. Greenhouse gas emissions from operation of Point Beach are discussed in Section 3.15.3 of this SEIS. NextEra identified ~~in its ER~~ that between 2014–20**24**, it received one notice of non-compliance **and one identified deviation** from the WDNR pertaining to its air permit. The notice of non-compliance was as a result of failing to limit the hours of operation of a diesel engine for non-emergencies in accordance with the conditions of the air permit and for operating the diesel engine for an activity not permitted in its air permit (NextEra 2020-TN11241). To resolve the non-compliance, NextEra applied for a revision to its air permit conditions to WDNR (NextEra 2020-TN11241). The revised air permit was issued to NextEra and WDNR closed the non-compliance on November 30, 2018 (NextEra 2020-TN11241). **On February 7, 2024, WDNR identified a deviation with respect to Point Beach's air permit that involved the use of an ASTM standard for the determination of sulfur content not listed in Point Beach's most recent renewed air permit (436034500-P40). The deviation was resolved by implementing the use of one of the ASTM standards defined in the most recent renewed air permit (**NextEra 2024-TN11258**).** The NRC staff's review of EPA's Enforcement and Compliance History Online (ECHO) 3-year compliance history (**10/2021**-6/**2024**) revealed no notice of violation or permit exceedance related to Point Beach's air permit (EPA 2024-TN11266).

1 **Table 3-3 Permitted Air Emissions Sources at Point Beach, Units 1 and 2**

Equipment	Air Permit Condition
One (1) Oil-fired stationary gas turbine	SO_2: may burn only distillate fuel oil with sulfur content of less than 0.0015 percent (15 ppm) by weight NO_x: 0.1232 lb/gal of distillate oil burned PM: 22.0 lb/hour PM_{10}: 22.0 lb/hour $PM_{2.5}$: 9.0 lb/hour
Two (2) Diesel generators	SO_2: may burn only distillate fuel oil with sulfur content of less than 0.0015 percent (15 ppm) by weight PM: 11.5 lb/hour for each generator
Two (2) Diesel generators	SO_2: may burn only distillate fuel oil with sulfur content of less than 0.0015 percent (15 ppm) by weight PM: 2.9 lb/hour for each generator
Two (2) Oil-fired boilers	SO_2: may burn only distillate fuel oil with sulfur content of less than 0.0015 percent (15 ppm) by weight PM: 1.7 lb/hour for each boiler
Two (2) Diesel engines (to start gas turbine and used as auxiliary power source)	SO_2: may burn only distillate fuel oil with sulfur content of less than 0.0015 percent (15 ppm) by weight PM: 2.8 lb/hour for diesel engine used to start the gas turbine, and 1.4 lb/hour for diesel engine used as auxiliary power source
One (1) Air-cooled diesel engine used to drive a fire pump	~~SO_2: may only be fired with diesel fuel that meets the requirements of 40 CFR 80.510(b) for non-road diesel fuel.~~ PM: **0.050 lb/MBtu and may only be fired with distillate oil with sulfur content less than 0.0015 percent (15 ppm) by weight** ~~NO_x and Non-Menthane Hydrocarbons (combined): 4.0 g/KWh~~
One (1) Emergency diesel engine	~~SO_2: may only be fired with diesel fuel that meets the requirements of 40 CFR 80.510(b) for non-road diesel fuel~~ PM: 0.50 lb/MBtu **and may only be fired with distillate oil with sulfur content less than 0.0015 percent (15 ppm) by weight** ~~NO_x and Non-Menthane Hydrocarbons (combined): 4.0 g/KWh~~ ~~CO: 3.5 g/KWh~~
One (1) Emergency generator	~~SO2:~~ **M**ay only be fired with propane PM: 0.15 lb/MBtu heat input **and may only burn propane**
One (1) Emergency Engine	**PM: May only burn propane**

NO_x = nitrogen oxide; PM = particulate matter; PM_{10} = particulate matter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns; SO_2 = sulfur dioxide; ppm = parts per million; lb/ga = pounds per gallon; lb/MBtu = pounds per million British thermal units; g/KWh = grams per kilowatt-hour.

Source: WDNR 2023-TN11264 ~~2018 and NextEra 2020b~~.

Table 3-4 Reported Air Pollutant Emissions from Point Beach

Emission Source	Year	SO_2 (tons/year)	NO_x (tons/year)	CO (tons/year)	PM_{10} (tons/year)
Point Beach	2014	0.007	12.8	2.5	0.4
Point Beach	2015	0.004	10.5	2.4	0.3
Point Beach	2016	0.004	7.6	1.3	0.3
Point Beach	2017	0.005	11.8	2.7	0.3
Point Beach	2018	0.004	8.7	2.1	0.2
Point Beach	**2019**	**N/A**	**6.7**	**N/A**	**N/A**
Point Beach	**2020**	**0.00006**	**10.2**	**2.4**	**0.3**
Point Beach	**2021**	**0.00006**	**8.3**	**1.8**	**0.2**
Point Beach	**2022**	**0.00006**	**6.5**	**1.4**	**0.2**
Point Beach	**2023**	**0.006**	**9.0**	**2.2**	**0.2**
Manitowoc County	~~2019~~	~~848~~	~~719~~	~~397~~	~~152~~
Manitowoc County	**2022**	**1,117**	**795**	**386**	**160**

CO = carbon monoxide; NOx = nitrogen oxides; SO_2 = sulfur dioxide; PM_{10} = particulate matter less than or equal to 10 micrometers; VOC = volatile organic compounds.
To convert tons per year to metric tons per year, multiply by 0.90718.
N/A= emissions not available
Source for Point Beach Air Emissions: NextEra 2021-TN11262, WDNR 2020-TN11267, WDNR 2024-TN11265;
Source for Manitowoc Annual Air Emissions: WDNR Undated-TN11268.

The EPA promulgated the Regional Haze Rule to improve and protect visibility in national parks and wilderness areas from haze, which is caused by numerous, diverse air pollutant sources located across a broad region (40 CFR 51.308–309; TN1090). Specifically, 40 CFR Part 81 Subpart D (TN7226), "Identification of Mandatory Class I Federal Areas Where Visibility Is an Important Value," lists mandatory Federal areas where visibility is an important value. The Regional Haze Rule requires states to develop State Implementation Plans to reduce visibility impairment at Class I Federal Areas. There are no Class 1 Federal Areas in Wisconsin. The nearest Class 1 Federal Area to Point Beach is Seney Wilderness Area, which is approximately 150 mi (241 km) from Point Beach. Federal land management agencies that administer Federal Class I areas consider an air pollutant source that is located greater than 31 mi (50 km) from a Class I area to have negligible impacts with respect to Class I areas if the total sulfur dioxide, nitrogen oxide, particulate matter less than 10 microns, and sulfuric acid annual emissions from the source are less than 500 tons per year (70 FR 39104-TN8374; NPS 2010-TN7925). Given the distance of Point Beach to Class I areas and the air emissions presented in Table 3-4, there is little likelihood that ongoing activities at Point Beach adversely affect air quality in any such designated area.

3.3.3 Noise

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

As discussed in Section 3.2.1 of this SEIS, Point Beach's designated land use is industrial. The area in the vicinity is primarily rural and characterized by farmland and small residential communities (NextEra 2020-TN11241). Manitowoc County has an ordinance that prohibits noise levels above certain thresholds for motor vehicles, radios, television, sound speaker systems, and record and tape equipment (Manitowoc County 2022-TN11274). Primary offsite noise sources in the vicinity of Point Beach include vehicular traffic and farm machinery (PSC 2018-

TN11269). The nearest resident is approximately 1.2 mi (1.9 km) west of Point Beach's reactor containment buildings (NextEra 2020-TN11241, NextEra 2024-TN11258).

Primary noise sources at Point Beach include emergency diesel generators, turbine generators, transformers, speakers, transmission lines, firing range, and mainsteam safety valves (NextEra 2020-TN11241, NextEra 2024-TN11258). Between 2014–**December 2024**, NextEra did not receive offsite noise complaints as a result of Point Beach operations (NextEra 2024-TN11258**)**. NextEra does not anticipate refurbishment activities during the proposed **SLR** term (NextEra 2020-TN11241, NextEra 2024-TN11258). Therefore, the NRC staff expects that noise sources would remain similar to those currently at Point Beach.

3.3.4 Proposed Action

3.3.4.1 Air Quality

As described in the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) and as cited in Table 3-1 **and Section 3.1 of this SEIS** for generic issues related to air quality, the impacts of nuclear power plant license renewal and continued operations **and refurbishment** would be SMALL. The NRC staff's review did not identify any new and significant information that would change the conclusion in the **LR** GEIS. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** Thus, as concluded in the **LR** GEIS for these Category 1 (generic) issues, the impacts of ~~continued operation of~~ Point Beach **SLR** on air quality would be SMALL. There are no site-specific (Category 2) air quality issues applicable to Point Beach (Table 3-2).

3.3.4.2 Noise

As described in the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) and as cited in Table 3-1 **and Section 3.1 of this SEIS** for **the generic issue** related to noise, the impacts of nuclear power plant license renewal and continued operations **and refurbishment** would be SMALL. The NRC staff's review did not identify any new and significant information that would change the conclusion in the **LR** GEIS. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** Thus, as concluded in the **LR** GEIS for this Category 1 (generic) issue, the impacts of ~~continued operation of~~ Point Beach **SLR** on noise would be SMALL. There are no site-specific (Category 2) noise issues applicable to Point Beach (Table 3-2).

3.3.5 No-Action Alternative

3.3.5.1 Air Quality

There are no substantive changes to this section of the 2021 DSEIS.

3.3.5.2 Noise

There are no substantive changes to this section of the 2021 DSEIS.

3.3.6 Replacement Power Alternatives: Common Impacts

3.3.6.1 Air Quality

There are no substantive changes to this section of the 2021 DSEIS.

3.3.6.2 Noise

There are no substantive changes to this section of the 2021 DSEIS.

3.3.7 New Nuclear (Small Modular Reactor) Alternative

3.3.7.1 Air Quality

There are no substantive changes to this section of the 2021 DSEIS.

3.3.7.2 Noise

There are no substantive changes to this section of the 2021 DSEIS.

3.3.8 Natural Gas Combined-Cycle Alternative

3.3.8.1 Air Quality

There are no substantive changes to this section of the 2021 DSEIS.

3.3.8.2 Noise

There are no substantive changes to this section of the 2021 DSEIS.

3.3.9 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

3.3.9.1 Air Quality

There are no substantive changes to this section of the 2021 DSEIS.

3.3.9.2 Noise

There are no substantive changes to this section of the 2021 DSEIS.

3.4 Geologic Environment

There are no substantive changes to this section of the 2021 DSEIS.

3.4.1 Physiography and Geology

There are no substantive changes to this section of the 2021 DSEIS.

3.4.2 Geologic Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.4.3 Soils and Erosion

There are no substantive changes to this section of the 2021 DSEIS.

3.4.4 Seismic Setting

There are no substantive changes to this section of the 2021 DSEIS.

3.4.5 Proposed Action

As evaluated and described in the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) and as cited in Table 3-1 **and Section 3.1 of this SEIS**, the impacts of nuclear power plant license renewal and continued operations **and refurbishment** on geology and soils would be SMALL. The NRC staff's review did not identify any new and significant information that would change the conclusion in the **LR** GEIS. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** Thus, as concluded in the **LR** GEIS, the staff finds that the impacts of Point Beach **SLR** ~~continued operation~~ on the geologic environment would be SMALL. There are no site-specific (Category 2) geologic environment issues, as shown in Table 3-2.

3.4.6 No-Action Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.4.7 Replacement Power Alternatives: Common Impacts

There are no substantive changes to this section of the 2021 DSEIS.

3.4.8 New Nuclear (Small Modular Reactor) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.4.9 Natural Gas Combined-Cycle Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.4.10 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.5 Water Resources

This section describes surface water and groundwater resources at and around the Point Beach site. The description of the resources is followed by the NRC staff's analysis of the potential impacts on surface water and groundwater resources from the proposed action (**SLR**) and alternatives to the proposed action.

3.5.1 Surface Water Resources

Surface water encompasses all water bodies that occur above the ground surface, including rivers, streams, lakes, ponds, and man-made reservoirs or impoundments.

3.5.1.1 Surface Water Hydrology

There are no substantive changes to this section of the 2021 DSEIS.

3.5.1.2 Surface Water Use

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

Point Beach's peak (nominal) surface water withdrawal rate is 769,160 **gallons per minute** (gpm) (2.92 million **liters per minute** (Lpm)), or approximately 1,108 **million gallons per day** (mgd) (4,190 **million liters per day** (mLd)) (see Section 2.1.3.1 of this SEIS). In the SEIS for initial license renewal for Point Beach, the NRC staff cited a maximum total intake rate of 1,554 cubic feet per second, which is approximately 698,000 gpm (2,640 million Lpm) (NRC 2005-TN7595). Table 3-5 summarizes Point Beach's actual surface water withdrawals **from 2016 through 2023**.

Table 3-5 Surface Water Withdrawals, Point Beach (2016–2023)

Year	Yearly Withdrawals (mgy)	Daily Withdrawals (mgd)[(a)]
2016	345,360	946
2017	330,693	906
2018	330,882	907
2019	333,952	915
2020	339,066	929
2021	**342,139**	**937**
2022	**345,011**	**945**
2023	**333,497**	**914**
Average	**338,733**	**928**

(a) All values are rounded. To convert million gallons per year (mgy) to million cubic meters, divide by 264.2. To convert million gallons per day (mgd) to million liters per day (mLd), multiply by 3.7854.

Source: NextEra 2020-TN11241; ~~WDNR 2021a,~~ WDNR 2025-TN11275**.**

NextEra monitors Point Beach's surface water withdrawals from Lake Michigan and submits annual reports to the WDNR in accordance with Wisconsin's "Water Use Registration and Reporting" regulations (WI Admin. Code NR 856-TN11295) (NextEra 2020-TN11241; WDNR 2025-TN11275). Point Beach's surface water withdrawals are subject to a State-issued Water Use Individual Permit, which was **re**issued **to NextEra** in **November 2021**, and the State's regulation at WAC NR 860 (TN11296). The **renewed** permit expires on **December 8, 2031**. The ~~modified~~ permit **continues to authorize total** water withdrawals from all surface water and groundwater sources **at Point Beach** up to a maximum of 1,251,823,000 **gallons per day** (gpd), or approximately 1,251.8 mgd (4,738.6 mLd). The permit also **requires compliance with applicable water conservation and water use efficiency requirements of an approved water conservation plan (**WDNR 2021-TN11276**).** ~~sets a limit on water loss (consumptive use) of 12,537,480 gpd, or about 12.5 mgd (47.3 mLd) (NextEra 2020b).~~ This usage and **associated** consumptive use are almost exclusively related to Point Beach's cooling water intake system (see Section 3.5.2.2 of this SEIS regarding Point Beach groundwater use).

As evaluated by the NRC staff in Sections 3.5.1.1 and 4.5.1.1 of the **LR** GEIS, surface water withdrawals by operating nuclear power plants with once-through heat dissipation systems have

not been found to result in water use conflicts with other users. This is because, as reflected in Point Beach's permit limits, such systems inherently return all but a very small fraction of the water they withdraw to the water source, as compared to closed-cycle systems (NRC 2013-TN2654, NRC 2024-TN10161).

3.5.1.3 Surface Water Quality and Effluents

Water Quality Assessment and Regulation

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

Wisconsin has designated the open waters of Lake Michigan for recreation use, fish and aquatic life, and public water supply (WI Admin. Code NR 104-TN11298). Overall, the waters of Lake Michigan support their designated uses. **WDNR submitted the 2024** 303(d) list of impaired waters **to EPA on April 1, 2024** (WDNR 2024-TN11277). **The 2024 report data indicate** that the waters of Lake Michigan lying within Manitowoc County continue to be impaired for fish consumption due to polychlorinated biphenyls and mercury in fish tissue **from atmospheric deposition (**EPA 2024-TN11278). In addition, and as summarized in the ER, a number of lakeshore beaches in Manitowoc County have **had** impaired water quality due to high bacterial levels (i.e., *E. coli*), attributable to point source and non-point source runoff (NextEra 2020-TN11241).

Wisconsin Pollutant Discharge Elimination System Permitting Status and Plant Effluents

To operate a nuclear power plant, NRC licensees must comply with the Federal Water Pollution Control Act (i.e., Clean Water Act) of 1972, as amended (33 U.S.C. 1251–1387) (CWA) (TN662), including associated requirements imposed by EPA or the State, as part of the National Pollutant Discharge Elimination System (NPDES) permitting system under CWA Section 402. The Federal NPDES permit program addresses water pollution by regulating point sources (i.e., pipes, ditches) that discharge pollutants to waters of the United States. NRC licensees must also meet state water quality certification requirements under CWA Section 401. EPA or the States, not the NRC, sets the limits for effluents and operational parameters in plant-specific NPDES permits. Nuclear power plants require a valid NPDES permit and a current Section 401 Water Quality Certification to operate.

EPA authorized the state of Wisconsin to assume NPDES program responsibility. WDNR administers the program as the Wisconsin Pollutant Discharge Elimination System (WPDES). The State's regulations for administering the WPDES program are contained in the Wisconsin Administrative Code at WAC NR 200-299 (TN11333). WDNR issues WPDES permits on a 5-year cycle. **A site visit performed by WDNR in July 2023 found that NextEra was in substantial compliance with its 2016 WPDES permit (WI-0000957-08-0) (**WDNR 2024-TN11279**).**

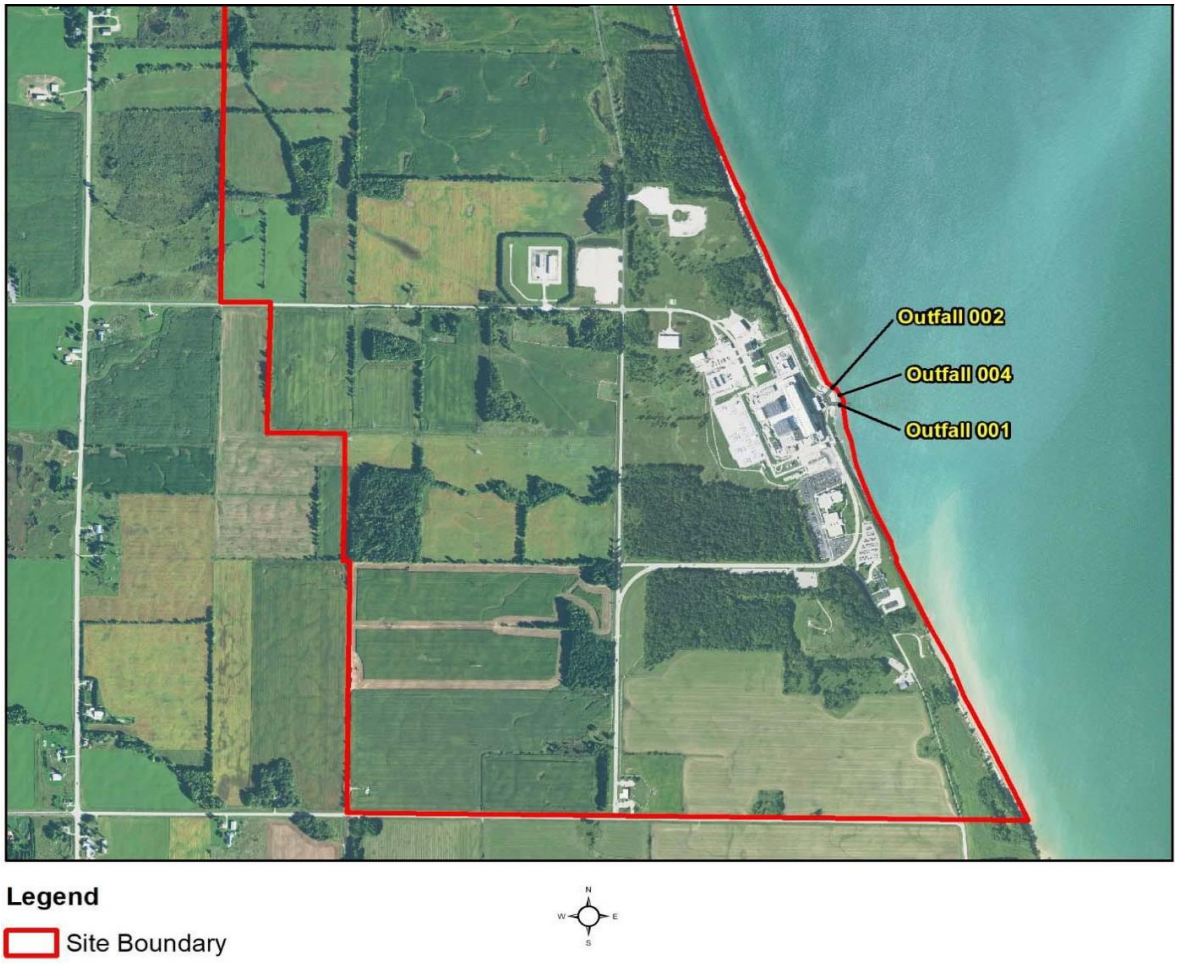
Point Beach is authorized to discharge various wastewater (effluent) streams under WPDES individual (site-specific) permit WI-0000957-0**9**-0, **which was reissued by WDNR in 2024**. This r**enewed** permit has an effective date of **October** 1, 20**24**, and it expires on **September** 30, 202**9** (WDNR 2024-TN11280). ~~NextEra submitted a timely permit renewal application to WDNR in December 2020 (NextEra 2020c) in accordance with Wisconsin's regulations specified at WAC NR 200.06. Therefore, NextEra's 2016 permit remains valid and in force. The~~ **Based on the** NRC staff's review of NextEra's **2020** WPDES renewal application **and the reissued permit**, **there are no** substantial changes in Point Beach's effluent discharges with

consequences for the proposed **SLR** term. **However, WDNR imposed additional sampling points and monitoring requirements (**WDNR 2024-TN11279**,** WDNR 2024-TN11280**).**

The **reissued** WPDES permit authorizes monitored discharge from 1**7** outfalls **or sampling points**, including **4** external outfalls and **11** internal **or in-plant** outfalls, and **2 miscellaneous sampling points**. External outfalls discharge directly to a surface water body or to a feature that connects directly to a water body, while internal outfalls contribute flow to other waste stream(s) before collectively discharging into an external outfall **or otherwise document a specific monitoring point or requirement**. At Point Beach, external Outfalls 001 and 002 are the condenser cooling water return flows for Units 1 and 2 to Lake Michigan through the south and north flume structures, respectively (see Figure 3-**1**).

NextEra's **reissued** WPDES permit ~~(WDNR 2016a)~~ further specifies the pollutant-specific discharge limitations and monitoring requirements for effluents discharged through each outfall to ensure that Point Beach's discharges comply with applicable water quality standards. Depending on the outfall, NextEra is required to monitor flow rate, pH, total suspended solids, heat rejection, average and maximum temperature, effluent toxicity, total residual halogen (as total residual chlorine), oil and grease, phosphorus, biochemical oxygen demand, **mercury, polyfluoroalkyl compounds**, and other specified parameters. In addition, under its WPDES permit, NextEra must notify and seek approval from WDNR before using any new water treatment chemicals (e.g., biocides or chemical additives) or to increase quantities used, as such changes could alter Point Beach's permitted effluent quality (WDNR 2024-TN11280). ~~Table 3.6-2 in NextEra's ER (NextEra 2020b) summarizes applicable effluent (water quality) monitoring requirements under Point Beach's WPDES permit including a description of the processes that contribute flow to each outfall. The NRC staff incorporates the information in ER Table 3.6-2 (NextEra 2020b: Table 3.6-2, 3-79–3-81), here by reference.~~

The current WPDES permit also sets an upper limit on the heat rejected from the plant's condenser cooling water flow to Lake Michigan. This limit is 8,273 MBTU/hr. NextEra must calculate the heat load value daily based on flow rate and the average intake and discharge water temperatures (NextEra 2020-TN11241; WDNR 2024-TN11280). This limit accounts for operational changes implemented at Point Beach associated with the extended power uprate (EPU) that the NRC approved in 2011, and the supporting NRC environmental assessment (NRC 2011-TN11281; 76 FR 22928-TN11282). As documented in **the reissued** WPDES permit WI-0000957-0**9**-0 (WDNR 2024-TN11280), the WDNR had determined that the **alternative** heat load limit on Point Beach's cooling water discharge satisfies CWA Section 316(a) variance requirements **and ensures the protection and propagation** ~~protective~~ **of a** balanced, indigenous **population** of shellfish, fish, and wildlife ~~in and on Lake Michigan and that no temperature limit is needed for Point Beach's thermal discharges~~. **The NRC staff's review of EPA's ECHO 5-year compliance history (12/2020-12/2024)** shows that Point Beach's cooling water discharges **have not exceeded** the 8,273 MBTU/hr permit **limit** ~~over the last 5 years~~ **(**EPA 2024-TN11283**).** NextEra does not plan any facility modifications or operational changes during the proposed **SLR** term that would change Point Beach's thermal discharges (NextEra 2020-TN11241).



Source: Modified from NextEra 2020-TN11241

Figure 3-1 Point Beach Major Permitted WPDES Outfalls [Figure 3-2 in the 2021 DSEIS; there are no substantive changes to this figure.]

Treated and monitored, low-level radioactive liquids are intermittently discharged from the plant liquid waste disposal system to the environment. Such discharges must be **as low as is reasonably achievable** and meet 10 CFR Part 20 (TN283) limits. The plant's liquid wastes are collected in tanks where NextEra chemistry personnel sample and analyze the liquids to determine if the liquids are suitable for release. If suitable for discharge and other plant operating conditions are met, the liquids are pumped from the tanks through a flow meter and radiation monitor. The release point is to the service water discharge header, which leads to the circulating cooling water discharge flow to Outfall 001. As a safeguard, the radiation monitoring system will close the discharge **valve** if radioactivity is detected at levels exceeding preset values (NextEra 2020-TN11241).

For all monitored effluent parameters, NextEra submits discharge monitoring reports to the WDNR in accordance with the reporting schedule specified in its WPDES permit. NextEra

reports that it has not received any notices of violation from regulatory agencies between 2015 and **September 2024** (NextEra 2020-TN11241, ~~2021a~~ NextEra 2024-TN11258). The NRC staff's review of EPA's ECHO 5-year compliance history (**12/2020-12/2024**) **also** revealed no notices of violation (EPA 2024-TN11266). However, **NextEra has self-reported several effluent exceedances to the WDNR in discharge monitoring reports over the last 5 years. These include exceedances for total suspended solids in December 2020, January 2021, and January 2022, associated with turbidity in Lake Michigan and an exceedance for biochemical oxygen demand in March 2023. All exceedances were associated with the sewage treatment plant (**NextEra 2024-TN11258**). EPA's ECHO system reports also document these exceedances (**EPA 2024-TN11266**). None of these minor, self-reported exceedances resulted in NextEra receiving a notice of violation (**NextEra 2024-TN11258**).** ~~exceeding the total residual halogen concentration in the cooling water outfalls in December 2018 (Outfall 001) and in March 2020 (Outfall 002), and exceeding several total suspended solids limits in April 2016 (Outfall 104, sanitary effluent); March 2019 (Outfall 104); and December 2020 (Outfall 105) (NextEra 2020b, 2021a; EPA 2021d).~~

Industrial stormwater discharges from the Point Beach plant site are regulated under a separate WPDES general permit, **WI-S067857-5 (see Appendix B, Table B-2).** ~~As cited in NextEra's ER, WPDES general permit WI-S067857-4 expired on May 31, 2021 (NextEra 2020b, NextEra 2021a). However, the WDNR automatically extended coverage to permit holders upon issuance of new general permits for Tier 2 industrial facilities, with an effective date of May 31, 2021 (NextEra 2021a; WDNR 2021d). Therefore, Point Beach is now covered under general permit WI-S067857-5.~~

In summary, NextEra maintains four stormwater retention ponds that mainly receive runoff from site parking lots. A total of 13 stormwater outfalls (numbers 01 through 09, Parking Lots A through C, and Warehouse 7) receive flow from industrial areas of the plant site as well as collected groundwater. NextEra conducts quarterly inspections of the outfalls as prescribed in the WPDES general permit. NextEra also maintains and implements a Stormwater Pollution Prevention Plan ~~(SWPP)~~ for Point Beach operations that identifies the sources of stormwater pollution and documents control measures, including **best management practices** (BMPs) to eliminate or reduce pollutants in all stormwater discharges from the facility (NextEra 2020-TN11241).

Other Surface Water Resources Permits and Approvals

An applicant (in this case, NextEra) for a Federal license to conduct activities that may cause a discharge of regulated pollutants into navigable waters of the United States is required by CWA Section 401 to provide the Federal licensing agency (in this case, the NRC) with water quality certification from the responsible certifying authority (in this case, the State of Wisconsin). This certification denotes that discharges from the project or facility to be licensed will comply with CWA requirements and will not cause or contribute to a violation of State water quality standards. If the applicant has not received Section 401 certification, the NRC cannot issue a renewed license unless the State has otherwise waived the requirement.

In July 2020, EPA published a final rule revising the procedural requirements for CWA Section 401 certifications at 40 CFR Part 121 (85 FR 42210-TN6394). The final rule became effective on September 11, 2020.[3] **In 2021, EPA initiated a process to reconsider and revise**

[3] ~~In 2021, the EPA initiated a process to reconsider and revise the 2020 CWA Section 401 Certification Rule (86 FR 29541).~~

the 2020 CWA Section 401 Certification Rule (86 FR 29541-TN7623**). A final rule was issued in September 2023 (**88 FR 66558-TN9620**). To initiate the certification process, Federal license or permit applicants must submit a "request for certification" to the appropriate certifying authority (40 CFR 121.5).** The revised regulations at 40 CFR 121.6 (TN6718) **also provide** ~~require~~ that the Federal licensing agency **and certifying authority may** establish the "reasonable period of time" ~~and communicate that deadline to the appropriate certifying authority within 15 days of receiving notice of the applicant's certification request~~. Under the revised regulations, under no circumstances can the certifying authority take more than 1 year to issue the requested certification, deny certification, or waive its right to certify. ~~The certifying authority's failure or refusal to act on a certification request within the reasonable period of time is considered a waiver.~~

The NRC recognizes that some NPDES-delegated states explicitly integrate their CWA Section 401 certification process with NPDES permit issuance. As indicated in its regulations at WAC NR 299 (WI Admin. Code NR 299-TN11316), it is the policy of the State of Wisconsin to waive CWA Section 401 certification for any wastewater discharge associated with an activity that will be regulated by the permit authority under Chapter 283 (Pollutant Discharge Elimination) of the Wisconsin statutes. NextEra states in its ER (NextEra 2020-TN11241) that in support of the initial license renewal of Point Beach, the previous plant owner/operator received confirmation from the State that CWA Section 401 certification was met by issuance of a WPDES permit and the State waived certification. Nevertheless, NextEra sought confirmation from the WDNR that no new CWA Section 401 certification was required for **SLR**. By letter dated January 22, 2021 (NextEra 2021-TN11289), NextEra requested consultation with WDNR on the Point Beach **SLR** application and to confirm its interpretation of the CWA Section 401 certification waiver provisions at WAC NR 299. In correspondence dated February 9, 2021, in response to NextEra's request, the WDNR Bureau of Waterways provided confirmation that WAC NR 299 provides the WDNR the ability to waive certification for facilities that have a WPDES permit. Further, WDNR indicated that no separate CWA Section 401 water quality certification would be required for a WPDES permitted facility (WDNR 2021-TN11290).

The NRC staff received a copy of NextEra's consultation request letter to the State of Wisconsin on January 26, 2021. On February 9, 2021, in accordance with the requirements of the CWA Section 401 certification regulations, the NRC staff sent a letter dated February 8, 2021 (via e-mail correspondence) to the WDNR to notify them of the reasonable period of time for the State to act on NextEra's CWA Section 401 certification request for **SLR** (NRC 2021-TN11291). Specifically, the staff established a timeframe of 6 months from the date of NextEra's January 26, 2021, request for the State certifying authority to act. In response, the WDNR directed the staff to its February 9, 2021, reply to NextEra, as described above. The NRC staff concludes that the documentation referenced above as provided by the WDNR in response to NextEra's request for consultation on Point Beach **SLR** provides the necessary certification waiver pursuant to CWA Section 401(a)(1) to support license renewal.

CWA Section 404 governs the discharge of dredge and fill materials to navigable waters, including wetlands, primarily through permits issued by the **U.S. Army Corps of Engineers** and applicable state-level permitting programs. ~~NextEra has USACE permit authorization to conduct bank stabilization activities at Point Beach, as previously described in Section 3.4.3 of this SEIS.~~ However, no maintenance dredging has occurred at Point Beach and NextEra has no plans to conduct dredging in the vicinity of plant intake and discharge facilities during the **SLR** term (NextEra 2020-TN11241).

3.5.2 Groundwater Resources

This section describes the groundwater flow systems (aquifers) and water quality in and around the Point Beach site. Aquifers are a formation, group of formations, or part of a formation that contain sufficient saturated, permeable material to yield significant quantities of water to wells and springs.

3.5.2.1 Local and Regional Groundwater Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.2.2 Local and Regional Water Consumption

The main source of water in the northern portion of the Central Lowlands physiographic province of eastern Wisconsin is the Silurian aquifer. On the Point Beach site, groundwater is supplied from this aquifer from five onsite domestic water supply wells permitted through the WDNR to supply the site with potable/drinking water and sanitary and fire suppression water. These wells are the E-10 site supply well, Energy Information Center well, Site Boundary Control Center well, Warehouse 6 well, and Warehouse 7 well **(Figure 3-2)**. Section 3.6.3.2 of NextEra's ER further summarizes the construction details, uses, and applicable permits regarding these wells (NextEra 2020-TN11241). The approved maximum withdrawals rates range from 2,000 gpd (1.4 gpm) to 100,000 gpd (69.4 gpm) (WDNR 2011-TN11292). The ~~average~~ groundwater withdrawals rate by **all** Point Beach **wells** in 20**23** was **approximately 18,100** ~~10,205~~ gpd (**12.6** gpm) and averaged 12,**182** gpd (8.**5** gpm) between 201**9** and 20**23** (WDNR 2024-TN11344).

There are no further substantive changes to this section of the 2021 DSEIS.

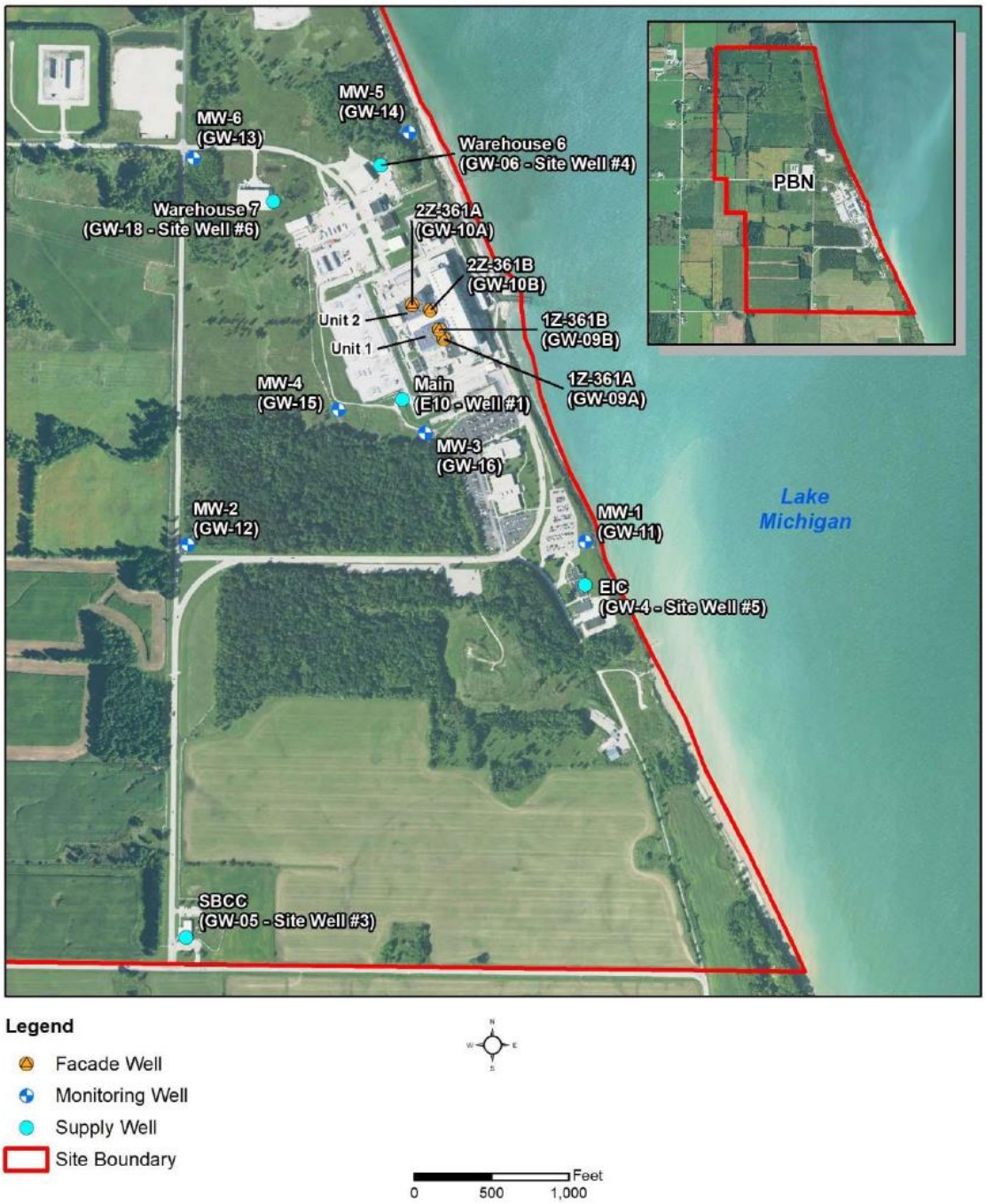
3.5.2.3 Groundwater Quality

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

Groundwater Protection Program

Groundwater quality at the Point Beach site is monitored through the Point Beach groundwater protection program, which is described in Section 3.6.2.4 of NextEra's ER (NextEra 2020-TN11241). This program was implemented in 2008 based on the updated Industry Groundwater Protection Initiative–Final Guidance Document (NEI 2007-TN1913, NEI 2019-TN6775), which requires that that the program address site geology, hydrology, groundwater, risk assessment, and remediation and identify actions to effectively respond, manage, and communicate incidents involving impact on the subsurface and groundwater from inadvertent release of radioactive materials.

The NRC staff determined that the potential radiological sources identified at Point Beach include the spent fuel pool under the plant, the Unit 1 and Unit 2 reactor containment area, and the earthen retention pond (which is no longer in operation). Groundwater impacted by potential releases from these sources would likely flow to the beach drains, which collect stormwater runoff from the site and receive recharge from groundwater from the shallow surficial aquifer.



Source: NextEra 2020-TN11241

Figure 3-2 Point Beach Monitoring Wells, Facade Wells, and Water Supply Wells [Figure 3-4 in the 2021 DSEIS; there are no substantive changes to this figure.]

Under the Point Beach groundwater protection program, onsite sampling is performed at 44 locations that include beach drains, intermittent stream and bog locations, drinking water wells, facade wells, yard electrical manhole covers, groundwater monitoring wells, and the

subsurface drainage sump located in the Unit 2 facade. Monitoring well construction data are provided in Table 3.7-3 of the applicant's ER (NextEra 2020-TN11241). A total of **18 locations** ~~wells~~ were monitored in 20**23** (except the beach drains, subsurface drainage system (SSD), and manholes) (NextEra 2020-TN11241: ER Figure 3.6-6 and Table 3.6-3 ~~of the ER;~~ NextEra 2024-TN11257**: Figure 13-1**). Among monitoring locations/wells installed to monitor the groundwater under the plant foundation, four shallow wells, two in each facade, are located at Unit 1 (1Z-361A, 2Z-361B) and Unit 2 (2Z-361A and 2Z-361B), and an SSD associated with each unit, as well as the auxiliary and turbine buildings. The SSD **sump** is in the Unit 2 facade and was sampled 12 times during 202**3** (NextEra 2024-TN11257). ~~Repairs to beach drain access in November 2019 allowed for monthly sampling of S-1 and S-3 locations throughout 2020 (NextEra 20**24a**).~~

Monitoring locations downgradient of the former operable, earthen retention pond include two bogs/ponds at GW-08 and GW-07, located southeast and north of the former retention pond between Warehouses 6 and 7. Other intermittent stream locations are GW-01 (E-01) at **Creek** confluence, GW-02 (E. Creek), GW-03 (W. Creek), and GW-17 (STP). Water samples collected from these locations are for tritium monitoring only, and gamma emitter and hard-to-detect (HTD) radionuclides are not available. Groundwater samples are collected quarterly, semi-annually, or annually from selected onsite monitoring wells/locations. The water samples are analyzed for radionuclides (tritium and gamma scan) to monitor potential impacts to groundwater from inadvertent leaks or spills at the facility. Results of this sampling have been submitted to the NRC in yearly monitoring reports (~~NextEra 2016, 2017, 2018, 2019,~~ NextEra 2020-TN11249, NextEra 2021-TN11250, NextEra 2022-TN11252, NextEra 2023-TN11254, NextEra 2024-TN11257) and are discussed in the section below.

Based on its review of the Point Beach groundwater monitoring program, the NRC staff concludes that the current groundwater monitoring network is strategically located to promptly detect and monitor any potential impacts to groundwater at the site.

Nonradiological Spills

Within the **2018-2023 period, the following** inadvertent nonradioactive release**s** as an incidental spill at the Point Beach site **have occurred**. Petroleum-contaminated soil was found in one of the boreholes during a site excavation activity involving cathodic protection installation on December 7, 2018. A soil sample from 3-4 **feet (ft) (0.9-1.2 m)** below grade was collected and analyzed for diesel range organics, gasoline range organics ~~(GRO)~~, and metals in the laboratory. The laboratory results showed **diesel range organics** at 171 mg/kg and **gasoline range organics** at 44.9 mg/kg. Approximately 600 lbs. of contaminated soil were excavated and disposed of offsite. There was no indication of any active leakage. WDNR closed the case on March 20, 2019 (NextEra 2020-TN11241).

NextEra has documented one reportable inadvertent nonradioactive release at Point Beach since 2020. A reportable spill occurred in January 2021 when approximately 8 gallons (30 liters) of diesel fuel was released due to a hose failure on a pickup truck. Information reviewed by the NRC staff indicates that the soil was excavated and disposed of offsite. There have been no additional inadvertent nonradioactive releases that have impacted soil or groundwater at Point Beach from 2020 through October 2023, and no groundwater remediation activities for nonradioactive environmental concerns have been conducted since 2015 or are ongoing. No other reportable spills have occurred between October 2023 and September 17, 2024 (NextEra 2024-TN11258**).**

Radiological Spills

No spills to groundwater have occurred at Point Beach within the last 5 years, and concentrations of tritium have remained below the EPA-established maximum contaminant level for drinking water of 20,000 picocuries per liter (pCi/L) (40 CFR Part 141-TN4456) (NextEra 2020-TN11241, NextEra 2024-TN11257, NextEra 2024-TN11258).

Tritium in Groundwater

Tritium is a byproduct of nuclear reactors, but it is also produced naturally in the upper atmosphere when cosmic rays strike nitrogen molecules in the air. Tritium also occurs naturally at very low concentrations in groundwater (EPA 2002-TN8480). Tritium emits a weak form of radiation in the form of a low-energy beta particle, which is like an electron. This radiation does not travel very far in air and cannot penetrate human skin. If tritium enters the body, it disperses quickly, being uniformly distributed throughout the soft tissues. Tritium decays into a nonradiological form of helium with a half-life of approximately 12.3 years; after this time, half of the tritium will have decayed to a nonradiological form. If ingested, the human body excretes half of the ingested tritium within approximately 10 days (NRC 2024-TN11293).

Tritium was initially detected in the late 1970s in the Point Beach drains, which serve as the discharge points for the yard drainage system carrying stormwater and groundwater. It was not realized until the 1980s that this leakage may have leaked from the onsite spent fuel pool into the surficial groundwater that flowed to the beach drains, where it was detected. After improvements were made to the pool, tritium concentrations decreased below the effluent lower limit of detection (NextEra 2020-TN11241). In 2019, tritium concentrations in the **six** beach drains were observed from 186 **±**79 pCi/L to 631 **±**103 pCi/L, significantly below the EPA drinking water standard of 20,000 pCi/L (NextEra 2020-TN11241). Results from 202**3** are **generally** similar, **with a maximum observed monthly sample of 1,716 ±153 pCi/L at S-3 in February 2023 and with an annual average of 397 ±214 pCi/L. These concentrations are** ~~and~~ well below the EPA drinking water standard for tritium (NextEra 2024-TN11257). Tritium detected in the beach drains may also have originated from the former earthen retention pond.

Tritium was detected in the intermittent streams that pass on the eastern and western sides of the retention pond in the late 1990s (NextEra 2020-TN11241). Concentrations in the streams have been very low since 2016 and, **in 2023**, tritium concentrations ~~in monitoring results~~ ranged from **near the minimum detectable concentration (MDC) up** to an average of **309 ±76** pCi/L (at GW-17) (NextEra **2024a**). Tritium concentrations in bog sampling locations are well below the EPA drinking water standard and are also down significantly from those observed before the retention pond was remediated (NextEra 2024-TN11257).

Other locations close to the plant with detected low tritium include the yard manholes, ranging from **108 ±**8**6** to **603 ±108** pCi/L in 202**3**, the plant foundation from the SSD sump varying from **462 ±104** to **2,339 ±169** pCi/L in 202**3**, and the facade wells between non-detectable and **353 ±96** pCi/L in 202**3** (NextEra 2024-TN11257).

In summary, tritium has been detected at levels far below the EPA ~~safe~~ drinking water **standard** ~~levels~~ in the surficial groundwater at Point Beach and has not been detected in the onsite drinking water located in the deeper Silurian dolomite aquifer. This indicates that the low permeable surficial deposits (over 100 ft) at Point Beach act as a barrier to prevent radionuclides in the surficial groundwater from impacting the underlying Silurian aquifer. In addition, because shallow onsite groundwater flows east, toward Lake Michigan, offsite groundwater users are not expected to be impacted.

Monitoring of Other Radionuclides

The Point Beach groundwater protection program evaluates site groundwater for a suite of radionuclides; however, tritium was the only radionuclide detected above its respective ~~minimum detectable concertation (~~MDC~~)~~ (NextEra 2020-TN11241). As discussed earlier, some monitoring locations downgradient of the formerly operable, earthen retention pond are for tritium monitoring only, and gamma emitter and HTD radionuclides are not available. Results from the 20**23** annual monitoring (NextEra 2024-TN11257) performed as part of the Point Beach groundwater protection program include:

- In 2019, gamma emitters Ba-La-140, Co-58, Co-60, and Fe-59 were detected in beach drain samples, which are collected monthly from six locations (S-1, S-12, S-8, S-9, S-13, and S-3), at concentrations that are below their respective MDCs. **NextEra concluded** (NextEra 2020-TN11249) that the detected gamma emitters **were** false positives. **In results** from sampling conducted in 202**3, concentrations** also were below their respective MDCs, **except for Co-58 and Fe-59 in one sample in which their MDCs were slightly exceeded. Those results** were determined to be false positives (NextEra 2024-TN11257).
- In April 2019, elevated Co-58 was detected in a Unit 2 facade well (2Z-361A). However, the results of subsequent confirmatory sampling at this well in late April and May 2019 did not exceed the MDC for gamma and HTD radionuclides. Since no other facade well locations were observed with these gamma emitter radionuclides, since there are no known leaks in the general area, and since tritium was not also detected, it was concluded that the water sample collected from 2Z-361A in April 2019 did not indicate an impact or leakage from plant operation (NextEra 2020-TN11249). Results from the facade wells were found to be below MDCs for gamma emitters in 202**3** (NextEra 2024-TN11257).
- Gamma emitters were not detected above the MDC in the SSD sump samples in 202**3** (NextEra 2024-TN11257).

The NRC staff reviewed these results and agrees with the conclusions reached in the ER and documented in the bulleted information above.

3.5.3 Proposed Action

3.5.3.1 Surface Water Resources

As described in the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) and as cited in Table 3-1 **and Section 3.1 of this SEIS** for generic surface water resources issues, the impacts of nuclear power plant license renewal and continued operations **and refurbishment** would be SMALL. No significant surface water impacts with respect to Category 1 (generic) issues are anticipated during the **SLR** term that would be different from those occurring during the current license term. The NRC staff's review did not identify any new and significant information **with respect to water withdrawals or effluent discharge** that would change the conclusion**s** in the **LR** GEIS. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** Thus, as concluded in the **LR** GEIS for these Category 1 (generic) issues, the impacts of ~~continued operation of~~ Point Beach **SLR** on surface water resources would be SMALL. There are no site-specific (Category 2) surface water resources issues applicable to Point Beach (Table 3-2).

3.5.3.2 Groundwater Resources

As documented in the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) and as cited in Table 3-1 **and Section 3.1 of this SEIS** for generic groundwater resources issues, the impacts of nuclear power plant license renewal and continued operations **and refurbishment** would be SMALL for the Category 1 issues applicable to Point Beach. These issues include:

- groundwater contamination and use (non-cooling system impacts)
- groundwater-use conflicts (plants that withdraw less than 100 gpm)

~~Both of these Category 1 issues were determined to result in a SMALL impact in 10 CR Part 51, Subpart A, Appendix B, Table B-1.~~ No significant groundwater impacts with respect to Category 1 (generic) issues are anticipated during the **SLR** term that would be different from those occurring during the current license term. As discussed in Section 3.5.2.3 of this SEIS, the NRC staff performed a review of groundwater use and quality. This review did not identify any new and significant information during its independent review of the ER, the scoping process, the audit**s**, and evaluation of available information that would change the conclusion in the **LR** GEIS. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** During the audit, the staff confirmed that:

- No discharges to groundwater requiring permits by regulatory agencies are expected to occur throughout the **SLR** period (NextEra 2021-TN11262, NextEra 2024-TN11258).
- There are no foreseeable conditions during the **SLR** term under which onsite groundwater withdrawal increases above the 100-gpm limit included in the **LR** GEIS conclusion (NextEra 2021-TN11262, NextEra 2024-TN11258).

As a result, as concluded in the LR GEIS ~~(NRC 2013a)~~ for these Category 1 (generic) issues, ~~which are reported in Table 3-1,~~ the impacts of ~~continued operation of~~ Point Beach **SLR** on groundwater resources would be SMALL.

As shown in Table 3-2, the NRC staff identified one site-specific, Category 2, issue related to groundwater resources applicable to Point Beach during the **SLR** term. This issue is analyzed below.

Radionuclides Released to Groundwater

This issue was added for consideration as part of the groundwater review for license renewal in the 2013 **LR** GEIS revision (NRC 2013-TN2654) because of accidental releases of liquids containing radioactive material into the groundwater at power reactor sites. The majority of the inadvertent releases involved leakage of water containing tritium or other radioactive isotopes from spent fuel pools, buried piping, and failed valves on effluent discharge lines. In 2006, the NRC released a report documenting lessons learned from a review of these incidents that ultimately concluded that these instances had not adversely impacted public health and safety (NRC 2006-TN1000). This report concluded, in general, that impacted groundwater is expected to remain onsite; however, instances of offsite migration have occurred. The **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) determined and **reaffirmed** that impacts to groundwater quality from the release of radionuclides could be SMALL or MODERATE, depending on the magnitude of the leak **or spill**, the radionuclides involved **and their concentrations**, hydrogeologic factors, distance to receptors, and the response time of plant personnel to identify and stop the leak in a timely fashion. **The NRC staff will consider whether the release has caused or could cause substantial impairment or noticeable alteration of**

groundwater quality in an aquifer with respect to designated use classification or applicable drinking water or other applicable standards. As a result, this issue is considered Category 2 requiring a site-specific evaluation.

This issue was discussed and evaluated in Sections 3.6.4.2 and 4.5.5 of NextEra's ER (NextEra 2020-TN11241) and is summarized in Section 3.5.2.3 of this SEIS. Point Beach monitors groundwater for inadvertent releases as part of the Point Beach groundwater protection program, which was implemented in 2008 under NEI 07-07 and in conjunction with 10 CFR 20.1501 (TN283). Tritium is the only radionuclide that has been detected above MDC, but all previous and current measurements are in the shallow upper soil layer at concentrations well below the EPA safe drinking water standard of 20,000 pCi/L. Site hydrogeologic evaluations indicate that the impacted groundwater is migrating east to Lake Michigan where it will be greatly diluted. In addition, the absence of tritium in the deeper monitored drinking water wells near the power block and at the site boundary, indicates it is not migrating deeper into the drinking water aquifer or offsite and does not impact onsite and offsite water uses and users.

The NRC staff has evaluated and verified this information as part of its review. In addition, the staff has identified no new and significant information during the audit**s**, scoping process, or review of available information cited in this SEIS. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** The staff has concluded that, over the **SLR** period, potential groundwater contamination would likely remain onsite, and no offsite wells should be affected. Point Beach has implemented a groundwater protection program to identify and monitor leaks and the monitoring well network and the groundwater protection program sampling strategy is robust enough that potential future releases of tritium into the groundwater would be readily detected. Therefore, over the **SLR** period, there is little chance of significant impacts on the groundwater quality of onsite and offsite aquifers. Based on this, the NRC staff concludes that the impacts on groundwater use and quality related to radionuclide release from **Point Beach** continued operations would be SMALL.

3.5.4 No-Action Alternative

3.5.4.1 Surface Water Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.4.2 Groundwater Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.5 Replacement Power Alternatives: Common Impacts

3.5.5.1 Surface Water Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.5.2 Groundwater Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.6 New Nuclear (Small Modular Reactor) Alternative

3.5.6.1 Surface Water Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.6.2 Groundwater Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.7 Natural Gas Combined-Cycle Alternative

3.5.7.1 Surface Water Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.7.2 Groundwater Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.8 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

3.5.8.1 Surface Water Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.5.8.2 Groundwater Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.6 Terrestrial Resources

This section describes the terrestrial resources of the Point Beach site and surrounding landscape. Following this description, the NRC staff analyzes potential impacts on terrestrial resources from the proposed action (**SLR**) and alternatives to the proposed action.

3.6.1 Ecoregion

There are no substantive changes to this section of the 2021 DSEIS.

3.6.2 Point Beach Site

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

NextEra's recent solar lease and easement agreement allows for the construction and operation of two independent solar power facilities partially on the Point Beach site and partially on adjacent and nearby lands. Both facilities **have become** operational ~~by 2021~~, and the lease term is 30 years with optional extensions of up to 20 additional years (PSC 2019-TN11259). The state applications of both solar projects **indicated** that they **would** have minimal impact on wildlife species or their preferred habitats because the majority of impacts will be on actively tilled agricultural land (PSC 2018-TN11269, PSC 2019-TN11259). The applications also state**d**

that tree clearing **would** be minimized. If necessary, tree clearing **would** occur only after appropriate surveys, outside of the roosting and nesting seasons of affected migratory birds of concern, and under U.S. Fish and Wildlife Service guidelines for acceptable clearing dates in Wisconsin (PSC 2019-TN11259). Under the terms of the solar lease, NextEra (NextEra 2020-TN11241) still maintains the legal authority to determine all activities on its properties. However, the operators of the solar plants will conduct their own ecological management programs, including vegetation management, herbicide application, wildlife monitoring, and compliance with state and Federal laws (e.g., the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act). After construction, the Point Beach solar facility **operator is expected to** follow a vegetation management plan seeding graminoids (grasses, sedges, and rushes) under and between panel rows to create a dense, low, non-native turf mix (PSC 2019-TN11259). In areas outside of a 20-foot **(6-m)** buffer from the panel arrays, **the plan includes revegetation** with an upland pollinator-friendly seed mix containing wildflowers, native grasses, and sedges to encourage insect nesting habitat. Herbicide treatments will control weedy and invasive plant species. Only limited areas such as solar facility access roads will remain permanently cleared (PSC 2019-TN11259). ~~NextEra states that 215 ac (87 ha), or about 17 percent, of the Point Beach site area will lie behind solar array fence lines (NextEra 2021a).~~

3.6.3 Important Species and Habitats

3.6.3.1 Federally Listed Species

For a discussion of terrestrial species and habitats that are federally protected under the Endangered Species Act of 1973, as amended, see Section 3.8, "**Federally Protected Ecological Resources**," of this SEIS.

3.6.3.2 State-Listed Species

Based on a search of the Wisconsin National Heritage Inventory, **the NRC staff** identified **32** State-listed species known to occur or to potentially occur in Kewaunee or Manitowoc counties. Of these **32** State-listed species, **4** species are also federally listed as threatened or endangered. As explained above, the NRC staff addresses the ~~four~~ federally listed species in Section 3.8 of this SEIS. Table 3-6 below shows State-listed species for Kewaunee and Manitowoc counties that are not also federally listed. The descriptions of the following State-listed species in NextEra's ER (NextEra 2020-TN11241: pp. 3-136–3-157) are incorporated here by reference.

Table 3-6 State-Listed Species for Manitowoc or Kewaunee Counties, WI, Potentially Occurring in the Point Beach Vicinity (That Are Not Also Federally Listed) [Table 3-7 in the 2021 DSEIS]

Common Name	Scientific Name	Class	State Legal Status
Peregrine falcon	*Falco peregrinus*	Bird	State Endangered
Red-shouldered hawk	*Buteo lineatus*	Bird	State Threatened
Black tern	*Childonias niger*	Bird	State Endangered
~~Caspian tern~~	~~*Hydroprogne caspia*~~	~~Bird~~	~~State Endangered~~
Upland sandpiper	*Bartramia longicauda*	Bird	State Threatened
Acadian flycatcher	*Empidonax virescens*	Bird	State Threatened
Henslow's sparrow	*Ammodramus henslowii*	Bird	State Threatened
Cerulean warbler	*Setophaga cerulea*	Bird	State Threatened

Table 3-6 State-Listed Species for Manitowoc or Kewaunee Counties, WI, Potentially Occurring in the Point Beach Vicinity (That Are Not Also Federally Listed) [Table 3-7 in the 2021 DSEIS] (Continued)

Common Name	Scientific Name	Class	State Legal Status
Streambank wheatgrass/thickspike wheatgrass	*Elymus lanceolatus (=Elytrigia dasystachhya) ssp. Psammophilus*	**plant**	State Threatened
Hooded warbler	*Setophaga citrina*	bird	State Threatened
~~Tri-colored bat~~	~~*Perimyotis subflavus subflavus*~~	~~mammal~~	~~State Threatened~~
Big brown bat	*Eptesicus fuscus*	mammal	State Threatened
Little brown bat	*Myotis lucifugus*	mammal	State Threatened
Blanchard's cricket frog	*Acris blanchardi*	amphibian	State Endangered
Redfin shiner	*Lythrurus umbratilis*	ray-finned fish (Actinopterygii)	State Threatened
~~Longear sunfish~~	~~*Lepomis megalotis*~~	~~ray-finned fish (Actinopterygii)~~	~~State Threatened~~
~~Pugnose shiner~~	~~*Notropis anogenus*~~	~~ray-finned fish (Actinopterygii)~~	~~State Threatened~~
Slippershell mussel	*Alasmidonta viridis*	bivalve	State Threatened
Monkeyface mussel	*Theliderma metanevra*	bivalve	State Threatened
Ellipse mussel	*Venustaconcha ellipsiformis*	bivalve	State Threatened
Hairy-necked tiger beetle	*Cidindela hirticollis rhodensis*	insect	State Endangered
Hubricht's vertigo/Midwest Pleistocene vertigo	*Vertigo hubrichti*	gastropod	State **Threatened**
Cherrystone drop snail	*Hendersonia occulta*	gastropod	State Threatened
Prairie sandreed/sand reedgrass	*Calamovilfa longifolia var.magna*	**plant**	State Threatened
~~Fairy slipper orchid/calypso orchid~~	~~*Calypso bulbosa*~~	~~monocot~~	~~State Threatened~~
Shore sedge	*Carex lenticularis*	**plant**	State Threatened
Cooper's milkvetch	***Astragalus neglectus***	**plant**	**State Endangered**
Prairie dunewort	***Botrychium campestre***	**plant**	**State Endangered**
Clustered broomrape	*Orobanche fasciculata*	**plant**	State Threatened
~~Shore buttercup/seaside crowfoot~~	~~*Ranunculus cymbalaria*~~	~~dicot~~	~~State Threatened~~
Heartleaf willow/sand dune willow	*Salix cordata*	**plant**	State Endangered
~~Sticky tofieldia/False asphodel~~	~~*Triantha glutinosa*~~	~~monocot~~	~~State Threatened~~
Snow trillium	*Trillium nivale*	**plant**	State Threatened
Harbinger-of-spring	*Erigenia bulbosa*	**plant**	State Endangered
Forked aster	*Eurybia furcata*	**plant**	State Threatened

Source: NextEra 2020-TN11241; WDNR Undated-TN11294

~~The 33 State-listed species above include birds, bats, fish, mussels, snails, and plants as well as one amphibian and one insect species. This SEIS will not discuss further any of the fish, mussel, or snail species because they were not observed within the 6-mi (10-km) vicinity of the~~

Point Beach site based on NextEra's (2020b) search of the Wisconsin Natural Heritage Inventory species observation data.

Of the nine State-listed bird species, six species have been documented to occur within a 6-mi (10 km) radius of Point Beach. These are the peregrine falcon, red-shouldered hawk, upland sandpiper, Acadian flycatcher, Henslow's sparrow, and hooded warbler. These species are also protected under the Migratory Bird Treaty Act (FWS 2020a).

The three State-listed mammal species that are not also federally listed are all bats—the tri-colored bat, the little brown bat, and the big brown bat. All three bats are known to occur in Manitowoc County but not Kewaunee County. Because of the sensitive nature of these species, their locations are not publicly released below the county level. Threats to all three bat species include lack of information of the species' basic ecology, the fungal white-nose syndrome, wind power, habitat degradation, pesticide exposure, and hibernaculum disturbance. All three bats feed primarily on insects such as beetles, wasps, flies, and mosquitoes, which they hunt using echolocation. Their natural predators include owls, hawks, snakes, and racoons. Feral domestic cats have also been observed gathering to prey on bats as they leave the hibernaculum (WDNR 2017a, 2017b, 2017c)

The smallest of the three bats species is the tri-colored bat. Weighing just 0.1–0.3 oz (4–8 grams), it is the smallest bat species in Wisconsin (WDNR 2017b). Once a common bat species, the tri-colored bat was listed as a species of least concern by the International Union for Conservation of Nature (IUCN) as recently as 2006. However, since then, its population has been severely reduced, and its Federal status is now under review. Slightly larger than the tri-colored bat is the little brown bat, which weighs 0.25–0.35 oz (7–10 grams) (WDNR 2017c). It feeds mainly on soft-bodied aquatic insects such as moths, wasps, gnats, mosquitoes, and crane flies. In Wisconsin, little brown bats leave their hibernacula in April and will migrate great distances (sometimes hundreds of miles) to summer roosting and foraging sites. They generally live over 10 years, although Wisconsin identification band recoveries have found bats with bands up to 25-years old. Until recently, the little brown bat was one of the most common bat species in North America, but the fungal white-nose syndrome has decimated its population such that it now faces regional or global extinction (Maslo et al 2015). The IUCN listed the little brown bat as endangered in 2018. The U.S. Fish and Wildlife Service will review the little brown bat's Endangered Species Act status in 2023 (FWS 2016b). Finally, big brown bats are the largest of the three State-threatened bat species, generally weighing between 0.42–1.0 oz (12–30 grams). They prefer deciduous forests and can live to about 19 years (WDNR 2017a). Compared to the previous two State-listed species, the big brown bat has more resistance to the fungal white-nose syndrome and is not in danger of extinction (WDNR 2017a).

One State-listed amphibian and one State-listed insect species have been documented to occur within the 6-mi (10-km) radius of Point Beach. These are the State-endangered Blanchard's cricket frog and the State-endangered hairy-necked tiger beetle. Blanchard's cricket frog is a small treefrog that was once one of the most abundant frogs in southern Wisconsin (WDNR 2017d). Adult frogs are found in shallow waters of ponds, lakes, streams, rivers, and wetlands, but they will migrate into adjacent open or semi-open canopy habitats and hibernate in the winter (WDNR 2017d). After a rapid decline in abundance and distribution, Wisconsin listed Blanchard's cricket frog as endangered in 1982. The causes of its rapid decline in abundance and distribution are not known, but they could include agricultural runoff, shoreline disturbance, water turbidity, habitat alteration, and invasive species. The frog's short lifespan of 4 to 16 months and limited dispersal ability also may have made it vulnerable to local extinction (WDNR 2017d). The endangered hairy-necked tiger beetle is a ground beetle about ½-in.

~~(1.27-cm) long. They favor sandy beaches on large lakes and are also found in Great Lakes dunes. Threats to the species include human beach-related activities such as vehicle traffic, beach grooming, and beach stabilization.~~

~~Eleven State-listed plant species occur in Manitowoc and Kewaunee counties. Of these, six plant species have been documented within the 6-mi (10-km) radius of Point Beach according to NextEra's (2020b) review of the Wisconsin Natural Heritage Inventory (NextEra 2020b). These are the State-threatened prairie sandreed/sand reedgrass, shore sedge, streambank wheatgrass, clustered broomrape, snow trillium, and the State-endangered heartleaf willow.~~

3.6.3.3 Species Protected under the Bald and Golden Eagle Protection Act

There are no substantive changes to this section of the 2021 DSEIS.

3.6.3.4 Species Protected under the Migratory Bird Treaty Act

There are no substantive changes to this section of the 2021 DSEIS.

3.6.3.5 Invasive Species

There are no substantive changes to this section of the 2021 DSEIS.

3.6.3.6 Important Habitats

There are no substantive changes to this section of the 2021 DSEIS.

3.6.4 Proposed Action

As described in the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) and as cited in Table 3-1 **and Section 3.1 of this SEIS**, the impacts of **nuclear power plant license renewal and continued operations and refurbishment for** all generic (Category 1) terrestrial resources issues would be SMALL. **The NRC staff's review did not identify any new and significant information that would change the conclusion in the LR GEIS. This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**). Thus, as concluded in the LR GEIS for these Category 1 (generic) issues, the impacts of Point Beach SLR on terrestrial resources would be SMALL.** Table 3-2 identifies only one site-specific (Category 2) issue related to terrestrial resources applicable to the Point Beach **SLR**. ~~— Effects on terrestrial resources from non-cooling system impacts.~~This issue is analyzed below. The Point Beach site uses a once-through cooling system to remove waste heat from the reactor steam electric system and plant auxiliary (service water) systems and does not use cooling ponds or cooling towers (see Section 2.1.3). Therefore, the Category 2 issue described in the **LR** GEIS related to the effects of water use conflicts with terrestrial resources does not apply.

*3.6.4.1 Category 2 Issue Related to Terrestrial Resources: **Non-Cooling System Impacts** ~~Effects~~ on Terrestrial Resources ~~(Non-Cooling System Impacts)~~*

According to the **LR** GEIS, non-cooling system impacts on terrestrial resources can include those impacts that result from site and landscape maintenance activities, stormwater management, elevated noise levels, and other ongoing operations and maintenance activities that would occur during the license renewal period on and near a plant site. The NRC staff

based its analysis in this section on information derived from NextEra's ER (NextEra 2020-TN11241) unless otherwise cited. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** NextEra has not identified any refurbishment activities during the proposed **SLR** term (NextEra 2020-TN11241, NextEra 2024-TN11258). ~~Therefore, no further analysis of potential impacts from refurbishment activities is necessary.~~

In its ER, NextEra (2020-TN11241) states that it will conduct ongoing operational and maintenance activities at Point Beach throughout the **SLR** term, including landscape maintenance activities, stormwater management, piping installation, and fencing. NextEra states that it would confine these activities to previously disturbed areas. The NRC staff expects that physical disturbance would be limited to paved or disturbed areas or to areas of mowed grass or early successional vegetation and not encroach into wetlands or into the remaining areas of mixed forest. Therefore, the staff concurs with NextEra that the anticipated activities would have only minimal effects on terrestrial resources.

NextEra (2020-TN11241) states that it has administrative controls in place at Point Beach to ensure that it reviews operational changes or construction activities and minimizes environmental impacts through BMPs, permit modifications, or new permits, as needed. NextEra (2020-TN11241) further states that regulatory programs for issues like stormwater management, spill prevention, dredging, and herbicides further minimize impacts on terrestrial resources (NextEra 2020-TN11241). The NRC staff concurs that continued adherence to environmental management practices and BMPs already established for Point Beach would continue to protect terrestrial resources during the **SLR** period.

The NRC staff presumes that NextEra will continue to comply with applicable requirements of the State of Wisconsin's regulatory programs. Furthermore, the staff presumes that if appropriate, NextEra will obtain required incidental take permits for impacts on bald eagles.

Operational noise from Point Beach facilities extends into the remaining natural areas on the site. However, Point Beach has exposed these habitats to similar operational noise levels since it began construction well over 50 years ago. The NRC staff therefore expects that wildlife in the affected habitats have long ago acclimated to the noise and human activity of Point Beach operations and adjusted behavior patterns accordingly. Extending the same level of operational noise levels over the 20-year **SLR** period is therefore unlikely to noticeably change the patterns of wildlife movement and habitat use.

Based on its independent review, the NRC staff concludes that the landscape maintenance activities, stormwater management, elevated noise levels, and other ongoing operations and maintenance activities that NextEra might undertake during the **SLR** term would primarily be confined to already disturbed areas of the Point Beach site. These activities would not have noticeable effects on terrestrial resources or destabilize any important attribute of the terrestrial resources on or in the vicinity of the site. **Further, NextEra did not identify any new and significant information related to landscape and grounds maintenance, stormwater management, elevated noise levels and vibrations, and ground disturbing activities (**NextEra 2024-TN11258**).** Accordingly, the NRC staff concludes that non-cooling system impacts on terrestrial resources from non-cooling system activities during the **Point Beach SLR** term would be SMALL.

3.6.5 No-Action Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.6.6 Replacement Power Alternatives: Common Impacts

There are no substantive changes to this section of the 2021 DSEIS.

3.6.7 New Nuclear (Small Modular Reactor) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.6.8 Natural Gas Combined-Cycle Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.6.9 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.7 Aquatic Resources

3.7.1 Lake Michigan

There are no substantive changes to this section of the 2021 DSEIS.

3.7.2 Proposed Action

As described in the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) and as cited in Table 3-1 **and Section 3.1 of this SEIS**, the impacts of **nuclear power plant license renewal and continued operations and refurbishment** for all Category 1 (generic) aquatic resources issues would be SMALL. **The NRC staff's review did not identify any new and significant information that would change the conclusion in the LR GEIS. This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**). Thus, as concluded in the LR GEIS for these Category 1 (generic) issues, the impacts of Point Beach SLR on aquatic resources would be SMALL.** Table 3-2 identifies two Category 2 issues applicable to Point Beach that require site-specific analysis ~~for each proposed license renewal~~ to determine whether impacts would be SMALL, MODERATE, or LARGE. These issues are (1) impingement **mortality** and entrainment of aquatic organisms and (2) **effects of** thermal **effluents** on aquatic organisms. The sections below analyze these issues in detail.

*3.7.2.1 Impingement **Mortality** and Entrainment of Aquatic Organisms (Plants with Once-Through Cooling Systems or Cooling Ponds)*

For plants with once-through cooling systems or cooling ponds such as Point Beach, the NRC has determined in the **LR** GEIS that impingement and entrainment of aquatic organisms is a Category 2 issue that requires site-specific evaluation (NRC 2013-TN2654). In 2005, the NRC evaluated the impacts of the Point Beach initial license renewal on aquatic organisms as two issues: "impingement of fish and shellfish" and "entrainment of fish and shellfish in early life stages." For both issues, the NRC determined that the impacts of continued operation of Point Beach would be SMALL during the initial license renewal term (i.e., 2010–2030 for Unit 1 and 2013–2033 for Unit 2) (NRC 2005-TN7595). In 2013, the NRC issued Revision 1 of the **LR** GEIS (NRC 2013-TN2654). In the **2013 LR** GEIS, the NRC staff combined the two aquatic issues into a single site-specific issue: "impingement and entrainment of aquatic organisms

(plants with once-through cooling systems or cooling ponds)." **Revision 2 of the LR GEIS (**NRC 2024-TN10161**) refined the title of this issue to include impingement mortality, rather than simply impingement. This change is consistent with EPA's 2014 CWA Section 316(b) regulations and the EPA's assessment that impingement reduction technology is available, feasible, and has been demonstrated to be effective**. This section evaluates this ~~consolidated~~ issue as it applies to the continued operation of Point Beach for the proposed **SLR** term (i.e., 2030–2050 for Unit 1 and 2033–2053 for Unit 2).

There are no further substantive changes to this section of the 2021 DSEIS.

Point Beach Cooling Water Intake System

There are no substantive changes to this section of the 2021 DSEIS.

Clean Water Act Section 316(b) Requirements for Existing Facilities

There are no substantive changes to this section of the 2021 DSEIS.

Analysis Approach

There are no substantive changes to this section of the 2021 DSEIS.

Baseline Condition of the Resource

There are no substantive changes to this section of the 2021 DSEIS.

Impingement Mortality BTA

The WDNR has not made an impingement mortality BTA determination for Point Beach. Point Beach's **previous** WPDES permit (issued in 2016) **represented** interim BTA (NextEra 2020-TN11241: **ER** Attachment B). The WDNR made its interim BTA determination in accordance with its 2009 guidance for evaluating cooling water intake structures using best professional judgement. Because Point Beach's previous WPDES permit (issued in 2004) expired before the effective date of the 2014, final rule establishing CWA Section 316(b) regulations for existing facilities, the 2014 requirements did not yet apply to Point Beach during the last WPDES permit renewal.

Point Beach's **2016** ~~current~~ WPDES permit expire**d** on June 30, 2021. NextEra submitted a renewal application to the WDNR on December 18, 2020 (NextEra Energy 2021-TN7529: Attachment 4). In its application, NextEra selected a combination of technologies, management practices, and operational measures under 40 CFR 125.94(c)(6) (TN254) as its chosen method of complying with the impingement mortality BTA standard. As assessed in NextEra's CWA Section 316(b) compliance submittal (NextEra Energy 2021-TN7529**: Attachment 12**), this option consists of an offshore intake location, acoustic deterrent system, and cooling water flow reductions. **Environmental Consulting & Technology, Inc.** (ECT) made the following conclusions regarding each component of this option (NextEra Energy 2021-TN7529**: Attachment 12**):

- The offshore intake reduces impingement by an estimated 79 percent compared to an onshore location.

- Seasonal operation of the acoustic deterrent system reduces impingement by an estimated 82.2 percent based on comparisons with similar systems at other Lake Michigan facilities.
- Flow reductions from a combination of scheduled refueling outages and the use of a single intake pump in the winter reduce flow by approximately 16 percent, which equates to a reduction in impingement mortality of 2.5 percent.

In combination, ECT ~~(2018a)~~ estimates that these three measures reduce impingement mortality by a total of 96.1 percent (NextEra Energy 2021-TN7529**: Attachment 12**). If the WDNR agrees that this option complies with the impingement mortality BTA standard, implementation would effectively be immediate because each of these features are already in place and functioning to reduce impingement. No further cooling water intake system upgrades or modifications would take place. However, NextEra would be required to perform a 2-yr impingement characterization study to evaluate the effectiveness of this option.

As an alternative compliance option, NextEra evaluated installing modified traveling water screens (MTWS) and an organism return system under 40 CFR 125.94(c)(5) (TN254). MTWS is a common approach to impingement mortality reduction for non-fragile species. If the WDNR were to select this option as impingement mortality BTA, NextEra would replace the existing traveling water screens with MTWS. The MTWS would be made of smooth mesh to reduce descaling and other damage to impinged organisms. A low-pressure wash would precede a high-pressure wash so that impinged organisms would be less likely to be damaged during screen wash-off, and buckets at the lower edge of the screen panel would collect fish washed off the screens. Other components of the system would be replaced to allow for continuous or near-continuous operation. A 400-ft (122-m) long fish return would return impinged organisms to Lake Michigan. In its assessment of this compliance option, ECT ~~(2018a)~~ noted that the fish return would need to be placed beyond the surf zone and designed to deal with seasonal icing (NextEra Energy 2021-TN7529**: Attachment 12**). Placing the fish return between the two thermal discharges could reduce ice concerns, but an ice barrier would still be necessary.

The MTWS option would generally not result in a high live return rate of the fragile species alewife, rainbow smelt, and gizzard shad, which comprise 99 percent of impingement at Point Beach (NextEra Energy 2021-TN7529**: Attachment 12**) ~~(ECT 2018a)~~. Survival of these species upon return to the source water is estimated to be 15 percent. If survival of the remaining (non-fragile) impinged species is conservatively assumed to be 100 percent, this option would result in an overall estimated impingement mortality reduction of 15.2 percent. Importantly, this number is based on the relative numbers of fish impinged in the 2006–2007 impingement sampling effort, most of which were fragile species. Under the 2014 CWA Section 316(b) final rule, the performance and optimization standard for MTWS does not extend to any fragile species. Because most fish impinged at Point Beach are fragile, implementation of this option would not result in significant additional protection of the most commonly impinged species. This option would require NextEra to perform an optimization study to assess the effectiveness of the MTWS, including the survival of non-fragile species. NextEra (NextEra Energy 2021-TN7529: Attachment 4) would complete installation of the new technology in summer 2023 and would perform the optimization study by summer 2025.

Following its review of NextEra's 2020 renewal application, the WDNR issued a renewed WPDES permit on September 16, 2024, with effective dates of October 1, 2024, through September 30, 2029. As part of permit issuance, the WDNR conditionally approved NextEra's proposed system of technologies as impingement mortality BTA subject to submission of an impingement technology performance optimization study plan by

September 30, 2026; impingement reduction verification sampling by December 31, 2026; optimization study progress report by December 31, 2027; and a final report by March 31, 2029 (WDNR 2024-TN11279**).**

After its review of the study results, the WDNR **will make a final impingement mortality BTA determination. The WDNR** may impose additional requirements to reduce or mitigate the effects of impingement mortality at Point Beach. Such requirements **could** be incorporated as **amendments to** the renewed WPDES permit. **Additional requirements, if imposed, would likely** take effect prior to the **proposed SLR** period**, which begins in October 2030 for Unit 1 and in March 2033 for Unit 2**. The NRC staff assumes that any additional requirements that the WDNR imposes would **further** minimize the impacts of impingement mortality over the course of the proposed **SLR** term in accordance with CWA Section 316(b) requirements.

Because the WDNR's impingement mortality BTA determination is **conditional**, the NRC staff also considers results of impingement and entrainment studies and finfish monitoring trends below to more fully evaluate the magnitude of impact that impingement and entrainment would represent during the proposed **SLR** period.

Impingement Studies

There are no substantive changes to this section of the 2021 DSEIS.

Entrainment BTA

The WDNR has ~~not~~ made a **conditional** entrainment BTA determination for Point Beach. As explained in Section 3.7.2.1~~.1~~ under "Impingement Mortality BTA," the WDNR **made this determination in the most recently issued WPDES permit, which was issued on September 16, 2024. To support the WDNR's final entrainment BTA determination, the 2024 permit requires NextEra to perform an alternatives analysis for compliance with the entrainment BTA requirements. This analysis must evaluate, at a minimum, closed-cycle recirculating systems, fine mesh screens with a mesh size of 2 millimeters (0.8 inch (in.)) or smaller, variable speed pumps, water reuse or alternate sources of cooling water, and any additional technology identified by the WDNR at a later date. The compliance schedule for this analysis is the same as the schedule summarized for the impingement mortality technology performance optimization study, which is summarized in Section 3.7.2.1 above under "Impingement Mortality BTA" (**WDNR 2024-TN11280**).**

In its WPDES permit renewal application, NextEra assesses several options that could potentially reduce entrainment at Point Beach. These options are: (a) closed-cycle cooling retrofit, (b) fine-mesh screen retrofit, and (c) use of alternative cooling water sources to replace some or all the water used in the once-through cooling system. NextEra determined that these three options were the most appropriate to evaluate based on conversations with the WDNR. With respect to the first two options, NextEra found certain construction and operational factors to make these options infeasible, impractical, or both. However, NextEra performed a detailed assessment of the implementation, cost, and efficiency of each. With respect to the third option, NextEra did not identify any reasonable alternative water supplies, including Ranney-type wells, that could replace even a small fraction of the intake flow.

Following its review of the required alternatives analysis, the WDNR will make a **final** entrainment BTA determination. The CWA Section 316(b) regulations direct the permitting authority to establish BTA entrainment requirements for each facility on a site-specific basis. When the WDNR makes this determination, it may impose additional requirements to reduce or

mitigate the effects of entrainment at Point Beach. Such requirements **could** be incorporated as **amendments to** the renewed WPDES permit**. Additional requirements, if imposed**, **would likely** take effect **prior to** the **proposed SLR** period**, which begins in October 2030 for Unit 1 and in March 2033 for Unit 2**. The NRC staff assumes that any additional requirements that the WDNR imposes would **further** minimize the impacts of entrainment over the course of the proposed **SLR** term in accordance with CWA Section 316(b) requirements.

Because the WDNR's entrainment BTA determination is ~~currently pending~~ **conditional**, the NRC staff also **considers** results of entrainment studies and finfish monitoring trends below to more fully evaluate the magnitude of impact that entrainment would represent during the proposed **SLR** period.

Entrainment Studies

There are no substantive changes to this section of the 2021 DSEIS.

Finfish Monitoring Trends

There are no substantive changes to this section of the 2021 DSEIS.

Impingement and Entrainment Conclusion

Impingement and entrainment studies indicate that alewife and rainbow smelt are most affected by impingement and entrainment at Point Beach. These species have exhibited variable but declining population densities according to **U.S. Geological Survey** trawl data near Point Beach. However, these declines appear to mirror long-term, lake-wide declines. Impingement and entrainment alone **do** not appear to create observable effects on the local populations. The remaining impinged and entrained species comprise a very small component of total impingement or entrainment, and the NRC staff identified no information indicating that Point Beach water withdrawals are measurably affecting these species' populations.

Because water withdrawals, and the associated risk of impingement and entrainment, would remain the same under the proposed action, the NRC staff anticipates similar (i.e., non-detectable) effects during the proposed **SLR** period. Further, the WDNR will make **final** BTA determinations for impingement mortality and entrainment **following NextEra's submission of information required as conditions of the 2024** WPDES permit. **Additional requirements, if imposed, would likely take effect prior to the proposed SLR period.** The NRC staff assumes that any additional requirements**, if imposed,** would further minimize the impacts of impingement mortality and entrainment over the course of the proposed **SLR** term in accordance with CWA Section 316(b) requirements. For these reasons, the NRC staff concludes that the impacts of impingement **mortality** and entrainment of aquatic organisms resulting from the proposed Point Beach **SLR** would be SMALL.

*3.7.2.2 **Effects of** Thermal **Effluents** ~~Impacts~~ on Aquatic Organisms (Plants with Once-Through Cooling Systems or Cooling Ponds)*

For plants with once-through cooling systems such as Point Beach, the NRC has determined in the **LR** GEIS (NRC 2024-TN10161) that **the effects of** thermal **effluents** ~~impacts~~ on aquatic organisms is a Category 2 issue that requires site-specific evaluation. In 2005, the NRC evaluated the thermal impacts of the Point Beach initial license renewal on aquatic organisms under the issue "heat shock." The NRC determined that the impacts of continued operation of Point Beach would be SMALL during the initial license renewal term (i.e., 2010–2030 for Unit 1

and 2013–2033 for Unit 2) (NRC 2005-TN7595). In 2013, the NRC issued Revision 1 of the **LR** GEIS (NRC 2013-TN2654). In the **2013 LR** GEIS, the NRC staff renamed the issue of "heat shock" to "thermal impacts on aquatic organisms." The renaming did not affect the scope of the issue for license renewal. **Revision 2 of the LR GEIS (**NRC 2024-TN10161**) refined the title of this issue from "Thermal impacts on aquatic organisms (plants with once-through cooling systems or cooling ponds)" to "Effects of thermal effluents on aquatic organisms (plants with once-through cooling systems or cooling ponds)" for clarity and consistency with other ecological resource LR GEIS issue titles. This renaming also did not affect the scope of the issue for license renewal.**

This section evaluates **the effects of** thermal **effluents** ~~impacts~~ on aquatic organisms as they apply to continued operation of Point Beach during the proposed **SLR** term (i.e., 2030–2050 for Unit 1, and 2033–2053 for Unit 2).

There are no further substantive changes to this section of the 2021 DSEIS.

3.7.3 No-Action Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.7.4 Replacement Power Alternatives: Common Impacts

There are no substantive changes to this section of the 2021 DSEIS.

3.7.5 New Nuclear (Small Modular Reactor) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.7.6 Natural Gas Combined-Cycle Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.7.7 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.8 Federally Protected Ecological Resources

The NRC must consider the effects of its actions on ecological resources protected under several Federal statutes and must consult with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) or the National Oceanic and Atmospheric Administration (NOAA) prior to taking action in cases where an agency action may affect those resources. These statutes include the following:

- **ESA (16 U.S.C. § 1531 et seq.-**TN1010**)**
- **Magnuson–Stevens Fisheries Conservation and Management Act (MSA) of 1976, as amended (16 U.S.C. § 1801 et seq**.-TN7841**)**
- **National Marine Sanctuaries Act (NMSA) (16 U.S.C. § 1431 et seq**.-TN4482**)**

This section describes the species and habitats that are federally protected under these statutes and analyzes how the proposed SLR and alternatives may affect these

resources ~~This section addresses species and habitats that are federally protected under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA), and the Magnuson–Stevens Fishery Conservation and Management Reauthorization Act, as amended (16 U.S.C. 1801–1884) (MSA). Before taking a Federal action, such as the issuance of the proposed subsequent renewed licenses for Point Beach, the NRC has direct responsibilities under these statutes. Sections 3.6 and 3.7 of this SEIS address terrestrial and aquatic species and habitats protected by other Federal statutes and the State of Wisconsin under which the NRC does not have such responsibilities~~.

3.8.1 Endangered Species Act: Federally Listed Species and Critical Habitats

Congress enacted the ESA in 1973 to protect and recover imperiled species and the ecosystems upon which they depend. The ESA provides a program for the conservation of endangered and threatened plants and animals (collectively, listed species) and the habitats in which they are found. The FWS and the NMFS are the lead Federal agencies for implementing the ESA, and these agencies are charged with identifying species that warrant listing. ~~The U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) jointly administer the ESA. The FWS manages the protection of, and recovery effort for, listed terrestrial and freshwater species, and the NMFS manages the protection of, and recovery effort for, listed marine and anadromous species.~~ The following sections describe the Point Beach action area and the species and habitats that may occur in the action area under **each of the Services'** jurisdictions.

3.8.1.1 Endangered Species Act: Action Area

There are no substantive changes to this section of the 2021 DSEIS.

3.8.1.2 Endangered Species Act: Federally Listed Species and Critical Habitats under U.S. Fish and Wildlife Service Jurisdiction

The NRC staff identified four federally listed and proposed to be listed species that may occur in the action area. These species are the northern long-eared bat (*Myotis septentrionalis*), piping plover (*Charadrius melodus*), tricolored bat (*Perimyotis subflavus*), and monarch butterfly (*Danaus plexippus*). The NRC staff reviewed the ER (NextEra 2020-TN11241**), supplemental information provided by NextEra (**NextEra 2024-TN11258**), FWS's Information for Planning and Conservation database, available ecological surveys, and other records to determine whether suitable habitat for each species occurs in the action area and whether the species itself may occur in the action area. No designated or proposed** ~~This section primarily evaluates two federally listed species that may be present in the action area:~~

~~northern long-eared bat (*Myotis septentrionalis*)~~

~~piping plover (Charadrius melodus)~~

~~The NRC staff determined that these species were relevant to this review based on desktop analysis of the Point Beach action area, available scientific literature and studies, and the results of past ESA Section 7 consultations in connection with the Point Beach site. No candidate species, proposed species, or~~ critical habitats ~~(proposed or designated)~~ occur within the action area ~~(FWS 2021a)~~. However, critical habitat of the piping plover occurs outside of the action area but within Manitowoc County along the coastline approximately 3 mi (5 km) south of the action area. ~~This critical habitat is described in further detail below.~~ **Table 3-7 summarizes the results of the NRC staff's evaluation, including the habitat requirements and**

information on the occurrence of each species within the action area, as well as information on relevant critical habitats.

In 2004, the NRC staff evaluated the effects of Point Beach operation on federally listed species as part of the staff's environmental review for the Point Beach initial license renewal term. The NRC staff prepared a biological assessment that evaluated Pitcher's thistle (*Cirsium pitcheri*), dwarf lake iris (*Iris lacustris*), piping plover, and the bald eagle (*Haliaeetus leucocephalus*) (NRC 2005-TN7595**: Appendix E**). The NRC staff concluded that continued operation would have no effect on either plant species because neither had been identified on the site and suitable habitat does not exist. The NRC staff concluded that continued operation during the initial license renewal term *may affect but is not likely to adversely affect* **(NLAA)** the piping plover and bald eagle. Effects to these species were expected to consist of occasional habitat disturbances associated with plant operation and maintenance activities or transmission line maintenance. The FWS concurred with the NRC staff's findings in letters dated January 31, 2005, and May 5, 2005 (FWS 2005-TN11297, FWS 2005-TN11303). The FWS's concurrence, in part, relied upon the applicant's development and implementation of a piping plover monitoring framework during the initial license renewal license term. This framework is further described within the piping plover discussion below.

With respect to the Pitcher's thistle and dwarf lake iris, the NRC staff identified no new information during its review of the proposed **SLR** indicating occurrences of these species or of suitable habitat within the action area. ~~Accordingly, these species are not considered in any further detail in this SEIS.~~

With respect to the bald eagle, the FWS delisted this species in 2007 due to recovery. The bald eagle remains federally protected under the Bald and Golden Eagle Protection Act, which is discussed in Section 3.6.4 of this SEIS.

~~The NRC staff has not evaluated the northern long-eared bat during any previous environmental reviews related to Point Beach because the FWS did not list the species under the ESA until 2015. Accordingly, the NRC staff addresses this species in this SEIS and evaluates the potential effects of subsequent license renewal on this species.~~

~~NextEra's environmental report addresses two additional federally listed species—rusty patched bumblebee (*Bombus affinis*) and Hine's emerald dragonfly (*Somatochlora hineana*). However, the Wisconsin Natural Heritage Inventory identifies no occurrences of these species within 6 mi (10 km) of the Point Beach action area (WNHI 2021a), and the action area does not contain habitat features closely associated with either species. Accordingly, the NRC staff does not consider these species in any further detail in this SEIS.~~

In its 2021 evaluation of the northern long-eared bat and piping plover, the NRC staff found that the Point Beach action area falls within the general range of these species. Northern long-eared bats could occur within the action area in the spring, summer, and fall in forested areas of the action area that contain suitable foraging, mating, and sheltering habitat. Piping plovers may occur in the action area from March to early September within areas of suitable beach habitat of sufficient width to support nesting and foraging. If present, individuals of both species would occur very occasionally and in very low numbers. The NRC staff concluded that the proposed Point Beach SLR *may affect but is not likely to adversely affect* these species. In a letter dated February 9, 2021, the FWS concurred with this determination for the northern long-eared bat on the basis that activities associated with the proposed SLR with the potential to affect the species

are consistent with the activities analyzed in the FWS's January 5, 2016, programmatic biological opinion (FWS 2016-TN7400**,** FWS 2021-TN9740**). In correspondence dated November 9, 2021, the NRC staff requested the FWS's concurrence with its NLAA determination for the piping plover (**NRC 2021-TN9162**). The FWS concurred with the NRC staff's determination on November 10, 2021 (**FWS 2021-TN7606**).**

NextEra's ER addresses two additional federally listed species: rusty patch bumblebee (*Bombus affinis*) and Hine's emerald dragonfly (*Somatochlora hineana*). However, the Wisconsin Natural Heritage Inventory identifies no occurrences of these species within either the Point Beach action area or Manitowoc County (WDNR Undated-TN11294**), and the action area does not contain habitat features closely associated with either species.**

The NRC staff has not evaluated the northern long-eared bat, tricolored bat, or monarch butterfly during any previous environmental reviews related to Point Beach because the FWS had not listed, proposed, or identified these species as candidates for listing until more recently. Accordingly, the NRC staff addresses these species in this SEIS and evaluates the potential effects of SLR on these species. Information regarding the tricolored bat and the monarch butterfly and the potential effects of SLR on these species is below and in SEIS Table 3-7 and Table 3-8.

Northern Long-eared Bat (*Myotis septentrionalis*)

There are no substantive changes to this section of the 2021 DSEIS.

Piping Plover (*Charadrius melodus*)

There are no substantive changes to this section of the 2021 DSEIS.

Designated Critical Habitat of the Piping Plover

There are no substantive changes to this section of the 2021 DSEIS.

Summary of Potential Species Occurrence in the Action Area

Table 3-7 below summarizes the potential for each federally listed species and critical habitat discussed in this section to occur in the action area for the proposed Point Beach **SLR**.

Table 3-7 Occurrences of Federally Listed and Proposed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction in the Point Beach Subsequent License Renewal Action Area [Table 3-20 in the 2021 DSEIS]

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
northern long-eared bat (*Myotis septentrionalis*)	FE	In non-hibernating seasons, northern long-eared bats typically roost individually or in colonies underneath bark or in cavities or crevices of both live trees and snags. Males and nonreproductive females may also roost in cooler locations, including caves and mines. Individuals may use caves and mines during fall swarming.	Seasonal and occasional. The action area falls within the general range of the species but does not contain caves, mines, or other features suitable for hibernating. Therefore, bats would not be present in winter. The action area's forested areas contain suitable habitat to support foraging, mating, and sheltering. Because no surveys have been conducted to determine the species' presence, the NRC staff conservatively assumes that the northern long-eared bat could occur within the action area in the spring, summer, and fall. If present during these seasons, individuals would only occur very occasionally and in very low numbers.
tricolored bat (*Perimyotis subflavus*)	FPE	In non-hibernating seasons, tricolored bats primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees. Additionally, species may roost during summer among pine needles, within artificial roosts like barns, beneath porch roofs, bridges, and concrete bunkers.	Seasonal and occasional. Same as northern long-eared bat above.

Table 3-7 Occurrences of Federally Listed and Proposed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction in the Point Beach Subsequent License Renewal Action Area [Table 3-20 in the 2021 DSEIS] (Continued)

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
piping plover (*Charadrius melodus*)	FE	Coastal habitats include sand spits, small islands, tidal flats, shoals and sandbars with inlets. Primary foraging habitats include sandy mud flats, ephemeral pools, and seasonally emergent seagrass beds with abundant invertebrates. In the Northern Great Plains, piping plovers nest on the unvegetated shorelines of alkaline lakes, reservoirs, or river sandbars.	Seasonal and occasional. The action area falls within the general range of the species. However, the WDNR does not currently have records of this species occurring in Manitowoc County. Suitable habitat exists within the action area along the shoreline of Lake Michigan. Additionally, the FWS has designated critical habitat for the species approximately 3 mi (5 km) south of the Point Beach site along the shoreline and within Point Beach State Forest. During the NRC's review of the Point Beach initial license renewal, the FWS noted that the Great Lakes population may expand into areas of suitable beach habitat within this critical habitat or within the Point Beach action area during the initial license renewal term (FWS 2005-TN11297). During the ESA Section 7 consultation associated with that Federal action, NextEra committed to performing piping plover breeding censuses in June of each year as part of a piping plover monitoring framework. NextEra began these surveys in 2005, and no piping plover individuals or nests have been identified on the Point Beach site since that time (NextEra 2021-TN11262). Regardless, the NRC staff conservatively assumes that piping plovers may

Table 3-7 Occurrences of Federally Listed and Proposed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction in the Point Beach Subsequent License Renewal Action Area [Table 3-20 in the 2021 DSEIS] (Continued)

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
			occur in the action area from March to early September within areas of suitable beach habitat of sufficient width to support nesting and foraging. If present, individuals would occur very occasionally and in very low numbers.
Hine's emerald dragonfly (*Somatochlora hineana*)	FE	Spring fed wetlands, wet meadows, and marshes within Illinois, Michigan, Missouri, Wisconsin.	Not present. The Wisconsin Natural Heritage Inventory identifies no occurrences of this species within 6 mi (10 km) of the Point Beach action area (WDNR Undated-TN11294), and the action area does not contain habitat features closely associated with this species.
monarch butterfly (*Danaus plexippus*)	FPT	Prairies, meadows, grasslands and along roadsides across most of North America, especially in areas containing milkweed.	Seasonal and occasional. The action area is within the known range of the species, although NextEra has no specific records or observations documented of the species or its host plant, milkweed (NextEra 2024-TN11258). Nonetheless, the NRC staff conservatively assumes that monarchs may occur in the action area during migration from mid-May to early October within natural areas of the Point Beach site.
rusty patch bumblebee (*Bombus affinis*)	FE	Prairies, woodlands, marshes, agricultural landscapes and residential parks and gardens containing diverse and abundant flowers supplying nectar and pollen.	Not present. The Wisconsin Natural Heritage Inventory identifies no occurrences of this species within 6 mi (10 km) of the Point Beach action area (WDNR Undated-TN11294), and the action area does not contain habitat features

Table 3-7 Occurrences of Federally Listed and Proposed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction in the Point Beach Subsequent License Renewal Action Area [Table 3-20 in the 2021 DSEIS] (Continued)

Species or Critical Habitat	Federal Status[(a)]	Habitat	Type and Likelihood of Occurrence in Action Area
			closely associated with this species.
dwarf lake iris (*Iris lacustris*)	FT	Shallow, moist shoreline soil over gravel, sands, and limestone crevices; in clearings within balsam fir or eastern white cedar forests; and sporadically on former beach ridges in Michigan and Wisconsin.	Not present. The species has not been identified at the Point Beach site, and the action area does not contain suitable habitat for the species (NRC 2005-TN7595: Appendix E; FWS 2005-TN11297, FWS 2005-TN11303).
Pitcher's thistle (*Cirsium pitcheri*)	FT	Open, sandy habitats along the Great Lakes, particularly on coastal sand dunes and low beach ridges in Indiana, Michigan, Wisconsin, and Ontario, Canada.	Not present. The species has not been identified at the Point Beach site, and the action area does not contain suitable habitat for the species (NRC 2005-TN7595: Appendix E; FWS 2005-TN11297, FWS 2005-TN11303).
Critical habitat of the piping plover	FD	Critical Habitat Unit WI-5	Not present. Critical habitat Unit WI-5 lies approximately 3 mi (5 km) south of the Point Beach action area. It is contained wholly within Point Beach State Forest and is, therefore, State owned and managed. The FWS identifies piping plover use of the unit as "suitable," meaning that there are no known records of use, but habitat appears suitable for nesting and is within the historic range of the piping plover (66 FR 22938-TN9904).

(a) Indicates protection status under the Endangered Species Act. FD = federally designated; FE = federally endangered; FPE = federally proposed for listing as endangered; FPT = federally proposed for listing as threatened; and FT = federally threatened.

Sources: FWS 2024-TN11304; NextEra 2024-TN11258.

3.8.1.3 Endangered Species Act: Federally Listed Species and Critical Habitats under National Marine Fisheries Service Jurisdiction

There are no substantive changes to this section of the 2021 DSEIS.

3.8.1.4 Magnuson–Stevens Act: Essential Fish Habitat

There are no substantive changes to this section of the 2021 DSEIS.

3.8.1.5 National Marine Sanctuaries Act: Sanctuary Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.8.2 Proposed Action

The following sections address the environmental impacts of Point Beach SLR on the environmental issues related to federally protected ecological resources.

3.8.2.1 Endangered Species Act: Federally Listed Species and Critical Habitats under U.S. Fish and Wildlife Jurisdiction

In Section 3.8.1.2 **of this SEIS**, the NRC staff **determined that four federally listed or proposed species under FWS jurisdiction** ~~establishes that two listed species~~ may occur in the action area**:** northern long-eared bat**, tricolored bat,** piping plover**, and monarch butterfly**. Section 3.8.1.2 **summarizes the habitat requirements and type and likelihood of occurrence of these species in the action area. This section analyzes the potential impacts of the proposed Point Beach SLR on these species.**

Table 3-8 identifies the NRC staff's ESA effect determination **for each species evaluated and provides a brief justification for the staff's findings.**

Table 3-8 Effect Determinations for Federally Listed and Proposed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction for Point Beach Subsequent License Renewal [Table 3-21 in the 2021 DSEIS]

Species or Critical Habitat	Federal Status[(a)]	Summary of Effects	ESA Effect Determination[(b)]
northern long-eared bat (*Myotis septentrionalis*)	**FE**	**Bat collisions with nuclear power plant structures in the United States are rare, and no collisions have been reported at Point Beach. Vehicle collisions attributable to the proposed action also are unlikely, and none of have been reported at Point Beach. The proposed action would not involve any construction, land clearing, or other ground-disturbing activities. Continued preservation of the existing forested areas on the site would result in positive impacts to northern long-eared bats. Bats, if present in the action area, have likely already acclimated to the noise, vibration, and general human disturbances associated with site maintenance, infrastructure repairs, and other site activities. During the SLR term, such disturbances and activities would continue at current rates and would be limited to the industrial-use portions of the site.**	**NLAA**

Table 3-8 Effect Determinations for Federally Listed and Proposed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction for Point Beach Subsequent License Renewal [Table 3-21 in the 2021 DSEIS] (Continued)

Species or Critical Habitat	Federal Status[a]	Summary of Effects	ESA Effect Determination[b]
tricolored bat (*Perimyotis subflavus*)	FPE	Same as northern long-eared bat.	NLAA
piping plover (*Charadrius melodus*)	FE	Piping plovers generally fly close to the ground and are, therefore, adept at navigating various flight hazards, such as the Point Beach site's tall buildings and structures. Piping plovers exhibit high flight speeds, which makes individuals unlikely to collide with site vehicles. The proposed action would not involve any construction, land clearing, or other ground-disturbing activities. Thus, shoreline habitat would be unaffected. Piping plovers, if present in the action area, have likely already acclimated to the noise, vibration, and general human disturbances associated with site maintenance, infrastructure repairs, and other site activities. During the proposed SLR term, such disturbances and activities would continue at current rates and would be limited to the industrial-use portions of the site.	NLAA
monarch butterfly (*Danaus plexippus*)	FPT	The proposed action would not involve any habitat loss, land-disturbing activities, or any activities that would degrade existing natural areas or potential habitat for monarchs. Continued preservation of the existing natural areas on the site would result in positive impacts on monarchs. Herbicides would only be applied according to labeled uses in developed and manicured areas of the site. Herbicides would not be applied in natural areas. Monarchs would only have the potential to occur in the action area seasonally and infrequently, making the likelihood of herbicide exposure low. This represents an insignificant effect because it is unlikely to reach the scale where a take might occur. The contribution of Point Beach operations to climate-change-related effects on monarchs would be too small to be meaningfully measured, detected, or evaluated.	NLAA

Table 3-8 Effect Determinations for Federally Listed and Proposed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction for Point Beach Subsequent License Renewal [Table 3-21 in the 2021 DSEIS] (Continued)

Species or Critical Habitat	Federal Status[a]	Summary of Effects	ESA Effect Determination[b]
Hine's emerald dragonfly (*Somatochlora hineana*)	FE	Species does not occur in action area.	NE
rusty patch bumblebee (*Bombus affinis*)	FE	Species does not occur in action area.	NE
dwarf lake iris (*Iris lacustris*)	FT	Species does not occur in action area.	NE
Pitcher's thistle (*Cirsium pitcheri*)	FT	Species does not occur in action area.	NE
Critical habitat of the piping plover	FD	Critical habitat does not occur in action area.	NE

SLR = subsequent license renewal.
(a) Indicates protection status under the Endangered Species Act. FD = federally designated; FE = federally endangered; FPE = federally proposed for listing as endangered; FPT = federally proposed for listing as threatened; and FT = federally threatened.
(b) The NRC staff makes its effect determinations for federally listed species in accordance with the language and definitions specified in the FWS and NMFS Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031). NE = no effect and NLAA = may affect but is not likely to adversely affect.

Northern Long-Eared Bat ~~(*Myotis septentrionalis*)~~

There are no substantive changes to this section of the 2021 DSEIS, other than the conclusion section, which is as follows.

Conclusion for Northern Long-eared Bat

All potential effects on the northern long-eared bat resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the northern long-eared bat.

In a letter dated February 9, 2021, the FWS concurred with this determination on the basis that activities associated with the proposed **SLR** with the potential to affect the northern long-eared bat are consistent with the activities analyzed in the FWS's January 5, 2016, programmatic biological opinion (FWS 2016-TN7400, FWS 2021-TN9740). **The NRC staff re-evaluated the northern long-eared bat under the FWS's Rangewide Northern Long-eared Bat and Tricolored Bat Determination Key (DKey), which was released in October 2024. The DKey resulted in a determination of *may affect but is not likely to adversely affect*, and the FWS concurred with this determination in a letter dated December 3, 2024 (**FWS 2024-TN11313**).**

Tricolored Bat

The NRC staff evaluated several potential stressors that tricolored bats could experience from operation of a nuclear power plant, including mortality or injury from collisions with plant structures and vehicles; habitat loss, degradation, disturbance, or fragmentation,

and associated effects; and behavioral changes resulting from refurbishment or other site activities. As summarized above in Table 3-8, these effects are unlikely to result in effects on the tricolored bat that could be meaningfully measured, detected, or evaluated or that stressors are otherwise unlikely to occur.

Conclusion for Tricolored Bat

All potential effects on the tricolored bat resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the tricolored bat.

The NRC staff evaluated the tricolored bat under the FWS's Rangewide Northern Long-eared Bat and Tricolored Bat Determination Key (DKey), which was released in October 2024. The DKey resulted in a determination of *may affect but is not likely to adversely affect*, and the FWS concurred with this determination in a letter dated December 3, 2024 (FWS 2024-TN11313**).**

Piping Plover ~~*(Charadrius melodus)*~~

There are no substantive changes to this section of the 2021 DSEIS, other than the conclusion section, which is as follows.

Conclusion for Piping Plover

All potential effects on the piping plover resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the piping plover.

In correspondence dated November 9, 2021, the NRC requested the FWS's concurrence with this determination (NRC 2021-TN9162). The FWS concurred with the NRC staff's determination on November 10, 2021 (FWS 2021-TN7606). **The NRC staff has not identified any new information that would change this determination or otherwise necessitate the staff to reinitiate consultation with the FWS concerning this species.**

Monarch Butterfly

The NRC staff evaluated several potential stressors that the monarch butterfly could experience from operation of a nuclear power plant, including mortality or injury from collisions with plant structures and vehicles; habitat loss, degradation, disturbance, or fragmentation, and associated effects; herbicide application; and climate-change related effects. As summarized above in Table 3-8, these effects are unlikely to result in effects on the monarch butterfly that could be meaningfully measured, detected, or evaluated or that stressors are otherwise unlikely to occur.

Conclusion for Monarch Butterfly

All potential effects on the monarch butterfly resulting from the proposed action would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed action *may affect but is not likely to adversely affect* the monarch butterfly. ESA regulations in 50 CFR 402.10(a) (TN4312**) require Federal agencies to confer with the Services on any agency action that is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed**

critical habitat. Therefore, based on its NLAA determinations, the NRC is not required to confer with the FWS on the monarch butterfly.

3.8.2.2 Endangered Species Act: Federally Listed Species and Critical Habitats under National Marine Fisheries Service Jurisdiction

There are no substantive changes to this section of the 2021 DSEIS.

3.8.2.3 Endangered Species Act: Cumulative Effects

There are no substantive changes to this section of the 2021 DSEIS.

3.8.2.4 Magnuson–Stevens Act: Essential Fish Habitat

There are no substantive changes to this section of the 2021 DSEIS.

3.8.2.5 National Marine Sanctuaries Act: Sanctuary Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.8.3 No-Action Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.8.4 Replacement Power Alternatives: Common Impacts

There are no substantive changes to this section of the 2021 DSEIS.

3.8.5 New Nuclear (Small Modular Reactor) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.8.6 Natural Gas Combined-Cycle Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.8.7 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.9 Historic and Cultural Resources

This section describes the cultural background and the historic and cultural resources found at Point Beach and in the surrounding area. The description of the resources is followed by the NRC staff's analysis of the potential impacts on historic and cultural resources from the proposed action (**SLR**) and alternatives to the proposed action.

3.9.1 Cultural Background

There are no substantive changes to this section of the 2021 DSEIS.

3.9.2 Historic and Cultural Resources at Point Beach

For the previous paragraphs and tables in this section that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

There are historic properties located near the Point Beach site. The following historic properties are within a 6-mi radius of the Point Beach site and are listed on the **NRHP** ~~National Register of Historic Places~~: the Pathfinder shipwreck (approximately 2.5 mi (4 km) from Point Beach), Rouse Simmons shipwreck (approximately 6 mi (9.6 km) from Point Beach), Continental shipwreck (approximately 3.5 mi (4.8 km) from Point Beach), and Rawley Point Light Station (approximately 5 mi (8.0 km) from Point Beach) (NextEra 2020-TN11241; WHS 2025-TN11309).

In June 2021, under the NMSA, NOAA designated a 962-mi^2 (1,550-km^2) area of Lake Michigan as the Wisconsin Shipwreck Coast National Marine Sanctuary (86 FR 32737-TN11310). The area includes waters off Ozaukee, Sheboygan, Manitowoc, and Kewaunee counties of Wisconsin. Within this boundary are 36 known shipwrecks (including 21 listed on the NRHP), about 59 suspected shipwrecks, and other underwater cultural resources (submerged aircraft, docks, piers, and isolated artifacts). The shipwrecks in the sanctuary consist of vessels that sailed Lake Michigan, carrying grain and raw materials, and they retain historical and archaeological value (NOAA 2020-TN11311). The primary objective of the NMSA is to protect the sanctuary's biological and cultural resources (see additional discussion in Sections 3.8.1.5 and 3.8.2.5 of this SEIS). The designation will provide long-term resource protection and management for the shipwrecks and other underwater cultural resources (NOAA 2020-TN11311).

In November 2023, NextEra commissioned a search of the Wisconsin Historic Preservation Geographic Information Systems Database for a 1-mi (1.6-km) buffer around the Point Beach site boundary. This search did not identify any newly recorded archaeological sites or historic structures within the boundaries of the plant site. A single new cultural resource assessment study was conducted in the area adjacent to Point Beach. The Wisconsin Department of Transportation conducted an archaeological survey for proposed improvements to State Highway 42 along the western boundary of the Point Beach site in 2021. No new archaeological sites were identified within the plant site boundary; however, the boundary of a previously recorded site 47MN185 (William Schroeder Farm) was adjusted, and a portion of this site now extends into the northwestern corner of the Point Beach site (NextEra 2024-TN11258**).**

3.9.3 Procedures and Integrated Cultural Resources Management Plan

There are no substantive changes to this section of the 2021 DSEIS.

3.9.4 Proposed Action

Table 3-2 identifies one site-specific (Category 2) issue related to historic and cultural resources applicable to Point Beach during the **SLR** term. This issue is analyzed below.

3.9.4.1 Category 2 Issue Related to Historic and Cultural Resources: Historic and Cultural Resources

There are no substantive changes to this section of the 2021 DSEIS.

3.9.4.2 Consultation

There are no substantive changes to this section of the 2021 DSEIS.

3.9.4.3 Findings

Section 3.9.2 of this SEIS discusses cultural resources on the Point Beach property. NextEra does not anticipate physical changes or ground-disturbing activities at Point Beach or any location outside the property boundary to support **SLR** (NextEra 2020-TN11241). Additionally, no periodic maintenance dredging or shoreline stabilization is anticipated during the **SLR** term (NextEra 2020-TN11241, NextEra 2021-TN11289). **The NRC staff also considered additional information provided by NextEra (**NextEra 2024-TN11258**). Finally,** NextEra has procedures in place to manage and protect cultural resources at Point Beach. If cultural or historic resources are inadvertently encountered, work should be stopped and the **State Historic Preservation Office** ~~SHPO~~ should be contacted to determine the appropriate next steps. ~~(NextEra 2020b)~~

Given that (1) no new ground disturbance or modifications are anticipated during the **SLR** period, (2) no periodic maintenance dredging or shoreline stabilization is anticipated during the **SLR** term, and (3) NextEra has procedures in place to manage and protect cultural resources, the NRC staff concludes that the proposed Point Beach **SLR** would not adversely affect any known historic properties or historic and cultural resources.

3.9.5 No-Action Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.9.6 Replacement Power Alternatives: Common Impacts

There are no substantive changes to this section of the 2021 DSEIS.

3.9.7 New Nuclear (Small Modular Reactor) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.9.8 Natural Gas Combined-Cycle Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.9.9 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.10 Socioeconomics

This section describes current socioeconomic factors that have the potential to be affected by changes in power plant operations at Point Beach, Units 1 and 2. Point Beach and the communities that support it can be described as a dynamic socioeconomic system. The communities supply the people, goods, and services required to operate the nuclear power plant. An operating power plant, in turn, provides wages and benefits to the people and pays money for goods and services. The measure of a community's ability to support Point Beach

power plant operations depends on its ability to respond to changing environmental, social, economic, and demographic conditions.

3.10.1 Power Plant Employment

There are no substantive changes to this section of the 2021 DSEIS.

3.10.2 Regional Economic Characteristics

Goods and services are needed to operate Point Beach. Although procured from a wider region, some portion of these goods and services are purchased directly from within the socioeconomic region of influence. These transactions sustain existing jobs and maintain income levels in the local economy. This section presents information on employment and income in the Point Beach socioeconomic region of influence.

3.10.2.1 Regional Employment and Income

There are no substantive changes to this section of the 2021 DSEIS.

3.10.2.2 Unemployment

There are no substantive changes to this section of the 2021 DSEIS.

3.10.3 Demographic Characteristics

There are no substantive changes to this section of the 2021 DSEIS.

3.10.3.1 Transient Population

There are no substantive changes to this section of the 2021 DSEIS.

3.10.3.2 Migrant Farm Workers

There are no substantive changes to this section of the 2021 DSEIS.

3.10.4 Housing and Community Services

This section presents information on housing and local public services, including education and water supply.

3.10.4.1 Housing

There are no substantive changes to this section of the 2021 DSEIS.

3.10.4.2 Education

There are no substantive changes to this section of the 2021 DSEIS.

3.10.4.3 Public Water Supply

There are no substantive changes to this section of the 2021 DSEIS.

3.10.5 Tax Revenues

In Wisconsin, public utilities are taxed by the State and are exempt from paying local property taxes. Instead, NextEra pays an annual gross-receipts license fee for Point Beach based on prior year's electricity sales. The annual fee is equivalent to 1.59 percent of the nuclear power plant's gross revenues for the previous calendar year. The annual fees are paid to the Wisconsin Department of Revenue and deposited in the State general fund. NextEra annual license fee payments to the Wisconsin Department of Revenue on behalf of Point Beach ranged from $7,279,882 in 2015, to **$9,703,433,** in 20**23 (**NextEra 2024-TN11258**)**.

There are no further substantive changes to this section of the 2021 DSEIS.

3.10.6 Local Transportation

3.10.7 Proposed Action

As described in the LR GEIS (NRC 2013-TN2654**,** NRC 2024-TN10161**) and as cited in Section 3.1 and Table 3-1 of this SEIS, the impacts of nuclear power plant license renewal and continued operations and refurbishment for all Category 1 (generic) socioeconomic issues would be SMALL. The NRC staff's review did not identify any new and significant information that would change the conclusion in the LR GEIS. This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** Socioeconomic effects of ongoing reactor operations at Point Beach have become well established as regional socioeconomic conditions have adjusted to the presence of the nuclear power plant. Changes in employment and tax revenue could impact the availability of community services and housing, as well as traffic on roads near Point Beach. ~~Therefore, the impact of continued reactor operations during the subsequent license renewal term would not exceed the Category 1 (generic) socioeconomic impacts predicted in the GEIS. For these issues, the GEIS predicted socioeconomic impacts would be SMALL for all nuclear plants.~~

NextEra indicated in its ER that it has no plans to add non-outage workers during the **SLR** term and that increased maintenance and inspection activities could be managed using the current workforce (NextEra 2020-TN11241). Consequently, people living near Point Beach would not experience any changes in socioeconomic conditions during the **SLR** term beyond what is currently being experienced. **Therefore, as concluded in the LR GEIS for these Category 1 (generic) issues, the impacts of Point Beach SLR on socioeconomic issues would be SMALL. There are no site-specific (Category 2) socioeconomic issues (Table 3-2)**.

3.10.8 No-Action Alternative

3.10.8.1 Socioeconomics

There are no substantive changes to this section of the 2021 DSEIS.

3.10.8.2 Transportation

There are no substantive changes to this section of the 2021 DSEIS.

3.10.9 Replacement Power Alternatives

There are no substantive changes to this section of the 2021 DSEIS.

3.10.9.1 Socioeconomics

There are no substantive changes to this section of the 2021 DSEIS.

3.10.9.2 Transportation

There are no substantive changes to this section of the 2021 DSEIS.

3.11 Human Health

Point Beach is both an industrial facility and a nuclear power plant. Similar to any industrial facility or nuclear power plant, the operation of Point Beach over the **SLR** period will produce various human health risks for workers and members of the public. This section describes the human health risks resulting from the operation of Point Beach, including from radiological exposure, chemical hazards, microbiological hazards, electromagnetic fields, and other hazards. The description of these risks is followed by the NRC staff's analysis of the potential impacts on human health from the proposed action (**SLR**) and alternatives to the proposed action.

3.11.1 Radiological Exposure and Risk

For the previous paragraphs and tables in this section that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

For radiation exposure to Point Beach personnel, the NRC staff reviewed the data contained in NUREG-0713, Volume 4**4**, *Occupational Radiation Exposure at Commercial Nuclear Power Reactors and other Facilities 20**22**: Fifty-**Fifth** Annual Report* (NRC 2024-TN11165). The 5**5th** annual report was the most recent annual report available at the time of this environmental review. It summarizes the occupational exposure data in the NRC's Radiation Exposure Information and Reporting System database through 20**22**. Nuclear power plants are required by 10 CFR 20.2206 (TN283), "Reports of individual monitoring," to report their occupational exposure data to the NRC annually.

NUREG-0713 calculates a 3-yr average collective dose per reactor for workers at all nuclear power reactors licensed by the NRC. The 3-year average collective dose is one of the metrics that the NRC uses in the Reactor Oversight Process to evaluate the applicant's **as low as is reasonably achievable** (ALARA) program. Collective dose is the sum of the individual doses received by workers at a facility licensed to use radioactive material over a 1-yr time period. There are no NRC or EPA standards for collective dose. Based on the data for operating pressurized-water reactors like the ones at Point Beach, the average annual collective dose per reactor year was **32** person-rem (NRC 2024-TN11165). In comparison, Point Beach had a reported **3-year** annual collective dose per reactor year of **approximately 40** person-rem **(**NRC 2024-TN11165**). The 2020–2022 three-yr annual collective dose is higher than that in the 2021 DSEIS due to outage work and dry fuel campaigns during this 3-yr period (**NextEra 2024-TN11258**).**

In addition, as reported in NUREG-0713, for 20**22**, **three** worker**s** at Point Beach received an annual dose greater than 1.0 rem (0.01 Sv), which is less than the NRC occupational dose limit of 5.0 rem (0.05 Sv) in 10 CFR 20.1201, "Occupational dose limits for adults" (TN283).

Section 2.1.4, “Radioactive Waste Management Systems,” of this SEIS discusses offsite dose to members of the public.

3.11.2 Chemical Hazards

There are no substantive changes to this section of the 2021 DSEIS.

3.11.3 Microbiological Hazards

There are no substantive changes to this section of the 2021 DSEIS.

3.11.4 Electromagnetic Fields

There are no substantive changes to this section of the 2021 DSEIS.

3.11.5 Other Hazards

There are no substantive changes to this section of the 2021 DSEIS.

3.11.6 Proposed Action

According to the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) **and as cited in Section 3.1 and Table 3-1 of this SEIS, the impacts of nuclear power plant license renewal and continued operations and refurbishment for all** ~~the generic~~ Category 1 (**generic**) issues related to human health would **be** SMALL. As discussed in Section 3.11 above, the NRC staff identified no new and significant information for these issues **that would change the conclusion in the LR GEIS. This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**). NextEra has no plans at present to make changes or incorporate future updates to Point Beach’s occupational and electrical safety programs.** Thus, as concluded in the **LR** GEIS for these Category 1 (generic) issues, **the impacts of Point Beach SLR on human health would be SMALL**.

Table 3-2 identifies one uncategorized issue (~~chronic effects of~~ electromagnetic fields (EMFs)) and two site-specific (Category 2) issues (microbiological hazards to the public and electric shock hazards) related to human health applicable to Point Beach **SLR**. These issues are analyzed below.

3.11.6.1 Category 2 Issue Related to Human Health: Microbiological Hazards to the Public

In the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161), the NRC staff determined that **human health** effects of thermophilic microorganisms on the public **from nuclear power** plants using cooling ponds, lakes, or canals, or that ~~cooling towers that~~ discharge **thermal effluents to publicly accessible surface waters** ~~a river~~ is a Category 2 issue that requires site-specific evaluation during each license renewal review. **The NRC staff’s review for Point Beach SLR included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).**

Based on the information presented in **Section 3.11.3** of this SEIS, the thermophilic organisms most likely to be of potential concern in Lake Michigan are *N. fowleri*, a free-living amoeba that causes the infection **primary amebic meningoencephalitis**, and cyanobacteria, which can cause harmful algal blooms that can result in skin rash and gastrointestinal illnesses in exposed

individuals. The public could be exposed to these microorganisms during swimming, boating, fishing, and other recreational uses of Lake Michigan. During its environmental review, the NRC staff identified no cases reported to the WDNR of cyanobacteria and related algal blooms along the shores of Lake Michigan. **Further, neither the WDNR nor the Manitowoc County Health Department has reported the presence of harmful algal blooms in the waters near the coast of Lake Michigan where Point Beach is located. NextEra states that it is not aware of any algal or bacteria blooms in Lake Michigan in the vicinity of Point Beach's discharge. NextEra also uses water quality maintenance chemicals in its service and circulating water systems that control microorganisms, bacteria, and algae (**NextEra 2024-TN11258**).**

As explained in Section 3.11.3 **of this SEIS**, all other thermophilic microorganisms identified in the **LR** GEIS that may be associated with thermal effluents of nuclear power plants are not specifically of concern at Point Beach or within Lake Michigan. These could include *Salmonella typhimurium, Shigella* species, *Pseudomonas aeruginosa*, and *Legionella* species.

Naegleria fowleri

As previously discussed, Point Beach's thermal effluent discharge is below *N. fowleri's* optimal growth temperature of 115°F (46°C). **NextEra also reports that the maximum thermal discharge temperature recorded at Point Beach for the period 2021–2023 was 84°F (28.9°C) (**NextEra 2024-TN11258**).** Thus, the Point Beach thermal discharges are not high enough in temperature to facilitate proliferation of this microorganism or to cause a public health concern. There have been no known occurrences of **primary amebic meningoencephalitis** from Lake Michigan, and the proposed action would not result in any operational changes that would affect thermal effluent temperature or otherwise create favorable conditions for *N. fowleri* growth. During the proposed **SLR** term, the public health risk from *N. fowleri* exposure in Lake Michigan remains extremely low.

Conclusion

The thermophilic microorganisms *N. fowleri* can pose public health concerns in recreational-use waters when these organisms are present in high enough concentrations to cause infection. Based on the NRC staff's preceding analysis, continued thermal effluent discharges from Point Beach during the proposed **SLR** term would not contribute to the proliferation in Lake Michigan of *N. fowleri*. No infections are known from Lake Michigan, and none are expected during the proposed **SLR** term.

The NRC staff concludes that the impacts of thermophilic microorganisms on the public **continues to be** SMALL for the proposed Point Beach **SLR**.

*3.11.6.2 Uncategorized Issue Related to Human Health: ~~Chronic Effects of~~ Electromagnetic Fields **(EMFs)***

The **LR** GEIS and the NRC's regulations (NRC 2013-TN2654, NRC 2024-TN10161; 10 CFR Part 51 (TN10253), Subpart A, Appendix B) do not designate the ~~chronic~~ effects of 60-hertz EMFs from powerlines **and other components of a nuclear plant's power transmission systems** as either a Category 1 or 2 issue. Until a scientific consensus is reached on the health implications of EMFs, the NRC will not include them as Category 1 or Category 2 issues.

The potential for **adverse** ~~chronic~~ effects from EMFs continues to be studied and is not known at this time. **The potential health effects from EMF exposure have been the subject of published studies. A discussion of some of these studies was presented in the 2013 LR GEIS (**NRC 2013-TN2654**).** The National Institute of Environmental Health Sciences (NIEHS) directs related research through the DOE. The NIEHS report (NIEHS 1999-TN78) contains the following conclusion:

> The NIEHS concludes that ELF-EMF (extremely low frequency-electromagnetic field) exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or noncancer health outcomes provide sufficient evidence of a risk to currently warrant concern.

This statement was not sufficient to cause the NRC to change its position with respect to the **human health** ~~chronic~~ effects of EMFs. The NRC staff **finds that** the **LR** GEIS finding of "UNCERTAIN" **is** still appropriate**, and the staff** will continue to follow developments on this issue.

3.11.6.3 Category 2 Issue Related to Human Health: Electric Shock Hazards

Based on the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161), the NRC staff found that electric shock resulting from direct access to energized conductors or from induced charges in metallic structures has not been identified as a problem at most operating nuclear power plants and generally is not expected to be a problem during the license renewal term. However, a site-specific review is required to determine the significance of the electric shock potential along the portions of the transmission lines that are within the scope of the Point Beach **SLR** review. **The NRC staff's review for Point Beach SLR included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).**

As discussed in Section 3.11.4 of this SEIS, there are no offsite transmission lines that are in scope for this SEIS. Therefore, there are no potential impacts on members of the public. There are two onsite overhead transmission lines with the potential for electric shock to workers through induced currents. To address this occupational hazard, NextEra adheres to **the National Electrical Safety Code** for clearances and OSHA compliance requirements for shock hazard avoidance (NextEra 2020-TN11241**,** NextEra 2024-TN11258). As discussed in Section 3.11.5, Point Beach maintains an occupational safety program in accordance with OSHA regulations for its workers, which includes protection from acute electric shock. **NextEra has no plans at present to make changes or incorporate future updates to Point Beach's occupational and electrical safety programs (**NextEra 2024-TN11258**).** Therefore, the NRC staff concludes that the potential impacts from electric shock hazards during the **SLR** term would **continue to** be SMALL.

3.11.6.4 Environmental Consequences of Postulated Accidents

The **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) evaluates the following two classes of postulated accidents as they relate to license renewal:

- Design-Basis Accidents: Postulated accidents that a nuclear facility must be designed and built to withstand without loss to the systems, structures, and components necessary to ensure public health and safety.
- Severe Accidents: Postulated accidents that are more severe than design-basis accidents because they could result in substantial damage to the reactor core.

As shown in Appendix B to Subpart A of 10 CFR Part 51 (TN10253) Table B-1, the **LR** GEIS ~~(NRC 2013a)~~ addresses design-basis accidents as a Category 1 (generic) issue and concludes that the environmental impacts of design-basis accidents are of SMALL significance for all nuclear power plants.

The 2024 LR GEIS, which supports the updated list of environmental issues and associated environmental impact findings contained in Table B-1 in Appendix B to Subpart A of the revised 10 CFR Part 51 for both initial license renewals and SLR, reclassified the issue of severe accidents as Category 1 (89 FR 64166-TN10321**).** ~~In Table B-1, the GEIS (NRC 2013a) designates severe accidents as a Category 2 issue that requires site-specific analysis.~~ Based on revised information ~~in the GEIS~~, the NRC **has** determined ~~in 10 CFR Part 51, Subpart A, Appendix B~~ that for all nuclear power plants, the environmental impacts of severe accidents associated with license renewal are SMALL~~, with a caveat~~. Specifically, the NRC's regulations at 10 CFR Part 51 state, in part:

> The probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are SMALL for all plants. **Severe accident mitigation alternatives do not warrant further plant-specific analysis because the demonstrated reductions in population dose risk and continued severe accident regulatory improvements substantially reduce the likelihood of finding cost-effective significant plant improvements.** ~~However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives. (NRC 2013a)~~

NextEra's 2004 ER submitted as part of its initial license renewal application for Point Beach included an assessment of severe accident mitigation alternatives (SAMAs) for Point Beach (NMC 2004-TN11312). The NRC staff at that time reviewed NextEra's 2004 analysis of SAMAs and documented this review in its SEIS for the initial license renewal, which the NRC published in 2005, as Supplement 23 to NUREG-1437 (NRC 2005-TN7595). Since the NRC staff has previously considered SAMAs for Point Beach, NextEra was not required to perform another SAMA analysis for its **SLR** application (see 10 CFR 51.53(c)(3)(ii)(L)-TN10253).

However, the NRC's regulations at 10 CFR Part 51, which implement Section 102(2) of NEPA, require that all applicants for license renewal submit an **ER** to the NRC and in that report identify "any new and significant information regarding the environmental impacts of license renewal of which the applicant is aware" (10 CFR 51.53(c)(3)(iv)). This includes new and significant information that could affect the environmental impacts related to **the Category 1 issue of** postulated severe accidents or that could affect the results of a previous SAMA assessment. Accordingly, in its **SLR** application **ER** (NextEra 2020-TN11241), NextEra evaluated areas of new and potentially significant information that could affect the environmental impact of postulated severe accidents during the **SLR** period. The NRC staff provides a discussion of new information pertaining to SAMAs in Appendix F, "Environmental Impacts of Postulated Accidents," of this SEIS. **Additionally, subsequent to the NRC's issuance of the 2024 LR GEIS (**NRC 2024-TN10161**) and revised findings in Table B-1 in Appendix B to Subpart A**

of 10 CFR Part 51 (89 FR 64166-TN10321), NextEra performed an evaluation for potential new and significant information for Category 1 issues, including for the recategorized severe accidents issue. NextEra did not identify any new and significant information regarding Category 1 issues and determined that the generic conclusions in the 2024 LR GEIS are appropriate for Point Beach SLR (NextEra 2024-TN11258).

The 2024 LR GEIS (NRC 2024-TN10161) and 10 CFR Part 51 now disposition design basis accidents and severe accidents as Category 1 issues and conclude that the environmental impacts of design-basis accidents and severe accidents are of SMALL significance for all nuclear power plants.

The NRC staff did not identify any new and significant information related to design-basis accidents during its independent review of NextEra's ER, through the scoping process, during the NRC staff's environmental audits, or in its evaluation of other available information (generic and plant-specific). This included consideration of additional, updated information provided by NextEra (NextEra 2024-TN11258). Therefore, the NRC staff concludes that there is no new and significant information on the environmental impacts of design-basis accidents at Point Beach during the SLR period that are not already discussed in the SEIS for initial license renewal (NRC 2005-TN7595) or generically evaluated for all nuclear power plants in the 2024 LR GEIS. Thus, the NRC staff concludes that the potential impacts from design-basis accidents during the SLR term would be SMALL.

Regarding severe accidents, Point Beach was specifically included in the plants evaluated in the 2024 LR GEIS. Point Beach values (i.e., population dose risk, core damage frequency, and large early release frequency) are presented in 2024 LR GEIS Tables E.3-1, E.3-10, and E.3-16. As provided in Table E.3-1 of the 2024 LR GEIS, the 4 person-rem/reactor year calculated in the 2005 Point Beach SAMA analysis is two orders of magnitude lower than the 1996 LR GEIS (NRC 1996-TN288) estimate of the Point Beach population dose risk value of 309 person rem/reactor year.

The NRC staff did not identify any new and significant information related to severe accidents during its independent review of NextEra's 2020 ER, through the scoping process, during the NRC staff's environmental audits, or in its evaluation of other available information that would significantly increase the environmental impact associated with severe accidents above the values previously projected in the 1996 LR GEIS (NRC 1996-TN288). This included consideration of additional, updated information provided by NextEra (NextEra 2024-TN11258). Therefore, the aggregate effect of new information related to Point Beach SLR is consistent with the expectations of the 2013 LR GEIS (NRC 2013-TN2654) and the 2024 LR GEIS (NRC 2024-TN10161), which is that the probability-weighted consequences of severe accidents for Point Beach are bounded by the 1996 LR GEIS estimates. This reflects a substantial decrease in risk associated with a better understanding of new information and the Point Beach probabilistic risk assessments. The NRC staff conclusion is that the overall impact of new and significant information available since initial license renewal on the environmental impacts of severe accidents at Point Beach continues to be well below the impact previously evaluated in the 1996 GEIS. Thus, the conclusion in the 1996, 2013, and 2024 LR GEISs that "the probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are SMALL" continues to apply for Point Beach during the SLR period.

As part of its initial license renewal application submitted in 2004, the applicant included a SAMA analysis for Point Beach in the associated ER, and the NRC staff documented its analysis of SAMAs in initial license renewal Supplement 23 to NUREG-1437 (NRC 2005-TN7595).

In its ER submitted with its SLR application, NextEra evaluated areas of new and potentially significant information that could affect the environmental impact of postulated severe accidents during the SLR period (NextEra 2020-TN11241). NextEra stated in its ER that it used the methodology in NEI 17-04, Revision 1, "Model SLR New and Significant Assessment Approach for SAMA" (NEI 2019-TN6815), to evaluate new and significant information as it relates to the Point Beach SLR SAMAs. NEI 17-04 is approved by the NRC in RG 4.2, Supplement 1, Revision 2 (NRC 2024-TN10280). In its most recent submittal regarding Point Beach SLR (NextEra 2024-TN11258), NextEra confirmed, and the NRC staff verified, that there was no new and significant information that would change any of the postulated accidents or SAMA conclusions. Specifically, the NRC staff reviewed NextEra's information process for Point Beach postulated accidents during a supplemental environmental audit and did not find any new and significant SAMAs. As quoted above, the 2024 LR GEIS and associate final rule (89 FR 64166-TN10321) maintain that the probability-weighted consequences from severe accidents are SMALL for all plants and that severe accident mitigation alternatives do not warrant further plant-specific analysis.

Based on the NRC staff's review and evaluation of NextEra's analysis of new and potentially significant information regarding postulated accidents and SAMAs and the staff's independent analyses as described above, the staff finds that there is no new and significant information for Point Beach related to postulated accidents and SAMAs. The prior Category 2 related new and significant evaluation presented in Appendix F of this SEIS is within the confines of the revised Category 1 determination of SMALL in the 2024 LR GEIS (NRC 2024-TN10161) and 10 CFR Part 51.

3.11.7 No-Action Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.11.8 Replacement Power Alternatives: Common Impacts

There are no substantive changes to this section of the 2021 DSEIS.

3.11.9 New Nuclear (Small Modular Reactor) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.11.10 Natural Gas Combined-Cycle Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.11.11 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.12 Reserved

10 CFR Part 51 (TN10253), Subpart A, Appendix B, Table B-1, "Summary of Findings on NEPA Issues for License Renewal of Nuclear Power Plants," requires an EIS for license renewal to include an analysis for the Category 2 issue of "Environmental Justice—Impacts on minority populations, low-income populations, and Indian Tribes." Executive Order 14173 (90 FR 8633-TN11607), "Ending Illegal Discrimination and Restoring Merit-Based Opportunity," issued January 21, 2025, revoked Executive Order 12898 (59 FR 7629-TN1450), "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," issued February 11, 1994, among other things. Based on Executive Order 14173, and pursuant to 10 CFR 51.6 (TN10253), "Specific exemptions," the NRC staff has, upon its own initiative, determined that an exemption from the requirement to address environmental justice in this SEIS is authorized by law and otherwise in the public interest. Accordingly, this SEIS does not address that issue.

~~Under EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (59 FR 7629), Federal agencies are responsible for identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental effects of agency actions on minority and low-income populations. Independent agencies, such as the NRC, are not bound by the terms of EO 12898 but are "requested to comply with the provisions of [the] order." In 2004, the Commission issued the agency "Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions" (69 FR 52040-TN1009), which **provides that the NRC will analyze whether there are disproportionately high and adverse impacts on low-income and minority populations as part of its NEPA obligations**. states, "The Commission is committed to the general goals set forth in EO 12898 and strives to meet those goals as part of its NEPA review process."~~

~~The following information is adapted from the Council on Environmental Quality (CEQ) "Environmental Justice: Guidance Under the National Environmental Policy Act" (CEQ 1997-TN452).~~

~~Disproportionately High and Adverse Human Health Effects~~

~~Adverse health effects are measured in risks and rates that could result in latent cancer fatalities, as well as other fatal or nonfatal adverse impacts on human health. Adverse health effects may include bodily impairment, infirmity, illness, or death. Disproportionately high and adverse human health effects occur when the risk or rate of exposure to an environmental hazard for a minority or low-income population is significant (as employed by NEPA) and appreciably exceeds the risk or exposure rate for the general population or for other appropriate comparison group (CEQ 1997-TN452).~~

~~Disproportionately High and Adverse Environmental Effects~~

~~A disproportionately high environmental impact that is significant (as employed by NEPA) refers to an impact or risk of an impact on the natural or physical environment in a low-income or minority community that appreciably exceeds the environmental impact on the larger community. Such effects may include ecological, cultural, human health, economic, or social impacts. An adverse environmental impact is an impact that is determined to be both harmful and significant (as employed by NEPA). In assessing cultural and aesthetic environmental impacts, impacts that uniquely affect geographically dislocated or dispersed minority or low-income populations or American Indian Tribes are considered (CEQ 1997-TN452).~~

This environmental justice analysis assesses the potential for disproportionately high and adverse human health or environmental effects on minority and low-income populations that could result from the continued operation of Point Beach associated with the proposed action (**SLR**) and alternatives to the proposed action. In assessing the impacts, the following definitions of minority individuals, minority populations, and low-income population were used (CEQ 1997-TN452):

Minority Individuals

Individuals who identify themselves as members of the following population groups: Hispanic or Latino, American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, or two or more races, meaning individuals who identified themselves on a Census form as being a member of two or more races, for example, White and Asian.

Minority Populations

Minority populations are identified when (1) the minority population of an affected area exceeds 50 percent or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

Low-income Population

Low-income populations in an affected area are identified with the annual statistical poverty thresholds from the U.S. Census Bureau's (USCB's) Current Population Reports, Series P60, on Income and Poverty.

Minority Population

According to the USCB's **2020** Census data, approximately **17** percent of the population residing within a 50-mi (80-km) radius of Point Beach identified themselves as minority individuals. The largest minority populations were Hispanic, Latino, or Spanish origin of any race (approximately 7 percent), and Asian (approximately 3 percent) (USCB 2020-TN11300).

According to the CEQ definition, a minority population exists if the percentage of the minority population of an area (e.g., census block group) exceeds 50 percent or is meaningfully greater than the minority population percentage in the general population. The NRC staff's environmental justice analysis applied the meaningfully greater threshold in identifying higher concentrations of minority populations; the meaningfully greater threshold is any percentage greater than the minority population within the 50-mi (80-km) radius. Therefore, for the purposes of identifying higher concentrations of minority populations, census block groups within the 50-mi (80-km) radius of Point Beach were identified as minority population block groups if the percentage of the minority population in the block group exceeded **17** percent, the percent of the minority population within the 50-mi (80-km) radius of Point Beach.

As shown in Figure 3-3, high population minority block groups (race and ethnicity) are predominantly clustered northwest and west in the cities of Green Bay and Appleton, respectively. The nearest minority block groups are clustered south-southwest of Point Beach in the city of Manitowoc, WI. Based on this analysis, Point Beach is not located in a minority population block group. The Oneida Nation has Tribal lands located southwest of the city of Green Bay in Outagamie and Brown counties.

According to **2020** Census data, minority populations in the socioeconomic region of influence (Brown and Manitowoc counties) comprised **20** percent of the total two-county population (USCB 2020-TN11301Table 3-26). Figure 3-3 shows predominantly minority population block groups, using 20**20** Census data for race and ethnicity, within a 50-mi (80-km) radius of Point Beach.

According to the USCB's 2019 American Community Survey 1-Year Estimates (USCB 2021), since 2010, minority populations in the region of influence increased by nearly 14,000 persons and now comprise approximately 18 percent of the population (Table 3-27).

Low-Income Population

The USCB's 201**9**–20**23** American Community Survey data identify approximately **8.4** percent of individuals and **5.8** percent of families residing within a 50-mi (80-km) radius of Point Beach as living below the Federal poverty threshold in 20**23** (MCDC 2023-TN11315). The 20**23** Federal poverty threshold was **$30,000** for a family of four (USCB 2025-TN11305; MCDC 2023-TN11315).

Figure 3-4 shows the location of low-income block groups within a 50-mi (80-km) radius of Point Beach. Census block groups were considered low-income population block groups if the percentage of individuals living below the Federal poverty threshold within the block group exceeded **8.4** percent, the percent of the individuals living below the Federal poverty threshold within the 50-mi (80-km) radius of Point Beach.

As shown in Figure 3-4, low-income block groups are predominantly clustered northwest and west in the cities of Green Bay and Appleton, respectively. The nearest low-income block groups are located south of Point Beach in the city of Two Rivers, Wisconsin. Based on this analysis, Point Beach is not located in a low-income population block group.

According to the USCB's 20**23** American Community Survey 1-Year Estimates, **6.6** percent of families and 10.**7** percent of people in Wisconsin were living below the Federal poverty threshold, and the median household and per capita incomes for Wisconsin were $**74,631** and $**41,785**, respectively (USCB 2023-TN11306). In the socioeconomic region of influence, people living in Manitowoc County have a lower median household and per capita incomes ($**68,611** and $**37,639**, respectively), with lower percentages of families and people (**6.3** percent and **9.8** percent, respectively) living below the poverty level. People living in Brown County have a slightly higher median household ($**77,490**) and lower per capita incomes ($**40,907**), with lower percentages of families and people (**6.0** percent and **9.8** percent, respectively) living below the poverty level (USCB 2023-TN11307).

3.12.1 Proposed Action

The NRC's environmental justice impacts analysis under its NEPA obligations (1) identifies minority populations, low-income populations, and Indian Tribes that could be affected by continued reactor operations during the SLR term and refurbishment activities at a nuclear power plant; (2) determines whether there would be any human health or environmental effects to these populations; and (3) determines whether these effects may be disproportionately high and adverse. The NRC addresses environmental justice matters for license renewal by (1) identifying the location of minority and low-income populations that may be affected by the continued operation of the nuclear power plant during the license renewal term, (2) determining whether there would be any potential human health or environmental effects to these populations and special pathway receptors (groups or individuals with unique consumption

practices and interactions with the environment), and (3) determining whether any of the effects may be disproportionately high and adverse.

Figure 3-3 2020 Census—Minority Block Groups Within a 50-mi (80-km) Radius of Point Beach (Source: USCB 2020-TN11300) [Figure 3-10 in the 2021 DSEIS]

Figure 3-4 2019–2023, American Community Survey 5-Year Estimates—Low-Income Block Groups Within a 50-mi (80-km) Radius of Point Beach (Source: USCB 2023-TN11308) [Figure 3-11 in the 2021 DSEIS]

Adverse health effects are measured in terms of the risk and rate of fatal or nonfatal adverse impacts on human health. Disproportionately high and adverse human health effects occur when the risk or rate of exposure for a minority population, low-income population, or Indian Tribe to an environmental hazard for a minority or low-income population is significant and exceeds the risk or exposure rate for the general population or for another appropriate comparison group. Disproportionately high and adverse environmental effects refer to impacts or risks of impacts on the natural or physical environment in a minority or low-income community that are significant and appreciably exceed the environmental impact on the larger community. Such effects may include biological, cultural, economic, or social impacts.

Figure 3-3 and Figure 3-4 show the locations of the minority and low-income population block groups within a 50-mi (80-km) radius of Point Beach. This area of impact is consistent with the 50-mi (80-km) impact analysis for public and occupational health and safety. The preceding sections in this chapter of the SEIS present the assessment of environmental and human health impacts for each resource area. The analyses of impacts for all environmental resource areas indicated that the impact from SLR would be SMALL.

Potential impacts on minority populations, low-income populations, and Indian Tribes (including migrant workers or Native Americans) would mostly consist of socioeconomic and radiological effects; however, radiation doses from continued operations during the SLR term are expected to continue at current levels, and they would remain within regulatory limits. Section 3.11.6.4 of this SEIS discusses the environmental impacts from postulated accidents that might occur during the SLR term, which include both design-basis and severe accidents. In both cases, the NRC has generically determined that impacts associated with design-basis accidents are SMALL because nuclear plants are designed and operated to withstand such accidents, and the probability-weighted consequences of severe accidents are SMALL.

Therefore, based on this information and the analysis of human health and environmental impacts presented in this chapter, there would be no disproportionately high and adverse human health and environmental effects on minority populations, low-income populations, and Indian Tribes from the proposed Point Beach SLR.

Subsistence Consumption of Fish and Wildlife

As part of addressing environmental justice concerns associated with license renewal, the NRC also assesses the potential radiological risk to special population groups (such as migrant workers or Native Americans) from exposure to radioactive material received through their unique consumption practices and interactions with the environment, including the subsistence consumption of fish and wildlife; native vegetation; contact with surface waters, sediments, and

local produce; absorption of contaminants in sediments through the skin; and inhalation of airborne radioactive material released from the plant during routine operation. The special pathway receptors analysis is an important part of the environmental justice analysis because consumption patterns may reflect the traditional or cultural practices of minority and low-income populations in the area, such as migrant workers or Native Americans. The results of this analysis related to the proposed Point Beach SLR are presented here.

Section 4-4 of EO 12898 directs Federal agencies, whenever practical and appropriate, to collect and analyze information about the consumption patterns of populations that rely principally on fish and wildlife for subsistence and to communicate the risks of these consumption patterns to the public. In this SEIS, the NRC staff considered whether there were any means for minority or low-income populations to be disproportionately affected by examining impacts on Native Americans, Hispanics, migrant workers, and other traditional lifestyle special pathway receptors. The assessment of special pathways considered the levels of radiological and nonradiological contaminants in fish, sediments, water, milk, and food products on or near Point Beach.

Radionuclides released to the atmosphere may deposit on soil and vegetation and may therefore eventually be incorporated into the human food chain. To assess the impact of reactor operations on humans from the ingestion pathway, NextEra collects and analyzes samples of air, water, milk, soil, shoreline sediment, aquatic biota, leafy vegetation (grasses, weeds, and crops), fish samples, and direct exposure for radioactivity as part of its ongoing comprehensive radiological environmental monitoring program.

To assess the impact of nuclear power plant operations, samples are collected annually from the environment and analyzed for radioactivity. A plant effect would be indicated if the radioactive material detected in a sample was higher than background levels. Two types of samples are collected. The first type, a control sample, is collected from areas beyond the influence of the nuclear power plant or any other nuclear facility. These control samples are used as reference data to determine normal background levels of radiation in the environment. The second type of samples, indicator samples, are collected near the nuclear power plant from areas where any radioactivity contribution from the nuclear power plant will be at its highest concentration. These indicator samples are then compared to the control samples, to evaluate the contribution of nuclear power plant operations to radiation or radioactivity levels in the environment. An effect would be indicated if the radioactivity levels detected in an indicator sample were larger or higher than the control sample or background levels.

NextEra collects samples from the aquatic and terrestrial environment near Point Beach. The aquatic environment includes precipitation, surface, lake, and well water, shoreline sediments, algae, and fish from Lake Michigan. Aquatic monitoring results for 20**23** showed only naturally occurring radioactivity and radioactivity associated with fallout from past atmospheric nuclear weapons testing and were consistent with levels measured before Point Beach began operating. NextEra detected no radioactivity greater than the minimum detectable activity in any aquatic sample during 20**23** and identified no adverse long-term trends in aquatic monitoring data (NextEra 2024-TN11257).

The terrestrial environment includes airborne particulates, food products (milk, corn, hay, alfalfa, and soybeans), and other vegetation. Terrestrial monitoring results for 20**23** showed only naturally occurring radioactivity. The radioactivity levels detected were consistent with levels measured prior to the operation of Point Beach. NextEra detected no radioactivity greater than the minimum detectable activity in any terrestrial samples during 20**23**. The terrestrial

~~monitoring data also showed no adverse trends in the terrestrial environment (NextEra 2024-TN11257).~~

~~Analyses performed on all samples collected from the environment at Point Beach, in 20**23**, showed no significant measurable radiological constituent above background levels**, except for tritium, which is confined to the upper soil layer near the plant (see Section 3.5.3.2)**. Overall, radioactivity levels, detected in 20**23**, were consistent with previous levels as well as radioactivity levels measured prior to the operation of Point Beach. Radiological environmental monitoring program sampling in 20**24** did not identify any radioactivity above background or the minimum detectable activity (NextEra 2024-TN11257).~~

~~The Radiation Protection Unit of the Wisconsin Department of Health and Family Services maintains a radiological environmental monitoring program to confirm the results from the Point Beach program. As a courtesy to the state of Wisconsin, NextEra collects samples for the State from sites near or co-located with Point Beach sampling locations (NextEra 2024-TN11257).~~

~~Based on the radiological environmental monitoring data, the NRC staff concludes that disproportionately high and adverse human health impacts are not expected in special pathway receptor populations in the region because of subsistence consumption of water, local food, fish, or wildlife. In addition, the continued operation of Point Beach would not have disproportionately high and adverse human health and environmental effects on these populations.~~

3.12.2 No-Action Alternative

This section of the 2021 DSEIS has been deleted.

3.12.3 Replacement Power Alternatives: Common Impacts

This section of the 2021 DSEIS has been deleted.

3.12.4 New Nuclear (Small Modular Reactor) Alternative

This section of the 2021 DSEIS has been deleted.

3.12.5 Natural Gas Combined-Cycle Alternative

This section of the 2021 DSEIS has been deleted.

3.12.6 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

This section of the 2021 DSEIS has been deleted.

3.13 Waste Management and Pollution Prevention

Like any operating nuclear power plant, Point Beach will produce both radioactive and nonradioactive waste during the **SLR** period. This section describes waste management and pollution prevention at Point Beach. The description of these waste management activities is followed by the NRC staff's analysis of the potential impacts of waste management activities from the proposed action (**SLR**) and alternatives to the proposed action.

3.13.1 Radioactive Waste

There are no substantive changes to this section of the 2021 DSEIS.

3.13.2 Nonradioactive Waste

For the previous paragraphs that do not appear here, there are no substantive changes to this section in the 2021 DSEIS. Changes are limited to the following.

Point Beach is subject to the EPA reporting requirements in 40 CFR Part 110 (TN8485), "Discharge of Oil," under CWA Section 311(b)(4). Under these regulations, Point Beach must report to the National Response Center any discharges of oil if the quantity may be harmful to the public health or welfare or to the environment. Based on the NRC staff's review of Section 9.5.3.6 of the ER (NextEra 2020-TN11241) and a review of records from 201**9**–202**3**, no spills reportable under 40 CFR Part 110 occurred. In addition, the applicant confirmed that no reportable spills have triggered this notification requirement **as of September 17, 2024** (NextEra 2020-TN11241, NextEra 2024-TN11258).

Point Beach is also subject to the reporting provisions of the Wisconsin Statute 292.11 and Wisconsin Administrative Code Ch. NR 706. This reporting provision requires that any release of oil in a quantity of 1 gallon **(3.8 L)** of gasoline or more than 5 gallons **(19 L)** of petroleum product other than gasoline that spills onto a pervious surface or runs off an impervious surface must be reported to the WDNR, the coordinator of emergency services of the locality that could reasonably be expected to be impacted, and appropriate Federal authorities. Based on the NRC staff's review of Section 9.5.3.7 of the ER (NextEra 2020-TN11241) and a review of records from 201**9**–202**3**, no reportable spills under the Wisconsin Statute 292.11 and Wisconsin Administrative Code Ch. NR 706 (WI Admin. Code NR 706-TN11314) occurred. In addition, the applicant confirmed that there have been no reportable spills that would trigger this notification requirement **as of September 17, 2024** (NextEra 2024-TN11258).

3.13.3 Proposed Action

According to the **LR** GEIS (~~NRC 1996,~~ NRC 2013-TN2654, NRC 2024-TN10161**) and as cited in Section 3.1 and Table 3-1 of this SEIS**, **the impacts of nuclear power plant license renewal and continued operations and refurbishment for all Category 1 (generic)** issues related to waste management **would be SMALL**. **The NRC staff's review did not identify any new and significant information that would change the conclusion in the LR GEIS. This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** Thus, as concluded in the **LR** GEIS **for these Category 1 (generic) issues**, **the impacts of Point Beach SLR on** waste management would be SMALL.

As shown in Table 3-2, **there are no** site-specific (Category 2) waste management issues ~~resulting from issuing a subsequent renewed license for an additional 20 years of operations~~.

3.13.4 No-Action Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.13.5 Replacement Power Alternatives: Common Impacts

There are no substantive changes to this section of the 2021 DSEIS.

3.13.6 New Nuclear (Small Modular Reactor) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.13.7 Natural Gas Combined-Cycle Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.13.8 Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

There are no substantive changes to this section of the 2021 DSEIS.

3.14 Evaluation of New and Significant Information

As stated in Section 3.1 of this SEIS, for Category 1 (generic) issues, the NRC staff can rely on the analysis in the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161) unless otherwise noted. Table 3-1 lists the Category 1 issues that apply to Point Beach during the proposed **SLR** period. For these issues, the NRC staff did not identify any new and significant information based on its review of the applicant's ER, the environmental site audits, the review of available information as cited in this SEIS, or arising through the environmental scoping process, that would change the conclusions presented in the **LR** GEIS. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).**

New and significant information must be new, based on a review of the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161), as codified in Table B-1 of Appendix B to Subpart A of 10 CFR Part 51 (TN10253). Such information must also bear on the proposed action or its impacts, presenting a seriously different picture of the impacts from those envisioned in the **LR** GEIS (i.e., impacts of greater severity than impacts considered in the **LR** GEIS, considering their intensity and context).

The NRC defines new and significant information in Regulatory Guide 4.2, Supplement 1, **Revision 2,** *Preparation of Environmental Reports for Nuclear Power Plant License Renewal Applications* (NRC 2024-TN10280), as (1) information that identifies a significant environmental ~~impact~~ issue that was not considered or addressed in the **LR** GEIS and, consequently, not codified in Table B-1 in Appendix B to Subpart A of 10 CFR Part 51 or (2) information not considered in the assessment of impacts evaluated in the **LR** GEIS leading to a seriously different picture of the environmental consequences of the action than previously considered, such as an environmental impact finding different from that codified in Table B-1. Further, a significant environmental issue includes, but is not limited to, any new activity or aspect associated with the nuclear power plant that can act upon the **affected** environment in a manner or ~~with~~ an intensity ~~or scope (context)~~ not previously recognized **or quantified**.

In accordance with 10 CFR 51.53(c) (TN10253), "Operating license renewal stage," the applicant's ER (NextEra 2020-TN11241) must analyze the Category 2 (**plant-** or site-specific) issues in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B. Additionally, the applicant's ER must discuss actions to mitigate any adverse impacts associated with the proposed action and environmental impacts of alternatives to the proposed action. In accordance with 10 CFR 51.53(c)(3), the applicant's ER does not need to analyze any Category 1 issue unless there is new and significant information on a specific issue.

NUREG-1555, Supplement 1, Revision **2**, *Standard Review Plans for Environmental Reviews for Nuclear Power Plants for Operating License Renewal*, describes the NRC process for identifying new and significant information (NRC 2024-TN10251). The search for new information includes:

- review of an applicant's ER (NextEra 2020-TN11241) and the process for identifying and evaluating the significance of new information
- review of public comments
- review of environmental quality standards and regulations
- coordination with Federal, State, and local environmental protection and resource agencies
- review of technical literature as documented through this SEIS

New information that the NRC staff discovers is evaluated for significance using the criteria set forth in the **LR** GEIS. For Category 1 issues for which new and significant information is identified, reconsideration of the conclusions for those issues is limited in scope to assessment of the relevant new and significant information; the scope of the assessment does not include other facets of an issue that the new information does not affect.

The NRC staff reviewed the discussion of environmental impacts associated with **continued** operation**s and any refurbishment** during the renewal term in the **LR** GEIS and has conducted its own independent review, including a public involvement process (e.g., public meetings and comments) to identify new and significant issues for the Point Beach **SLR**. ~~subsequent license renewal application environmental review.~~ The assessment of new and significant information for each resource is addressed within each resource area discussion.

3.15 Impacts Common to All Alternatives

This section describes the impacts that the NRC staff considers common to all alternatives discussed in this SEIS, including the proposed action and replacement power alternatives. In addition, the following sections discuss termination of operations, the decommissioning of a nuclear power plant and potential replacement power facilities, and greenhouse gas **(GHG)** emissions.

3.15.1 Fuel Cycle

There are no substantive changes to this section of the 2021 DSEIS.

3.15.1.1 Uranium Fuel Cycle

The **LR GEIS (**NRC 2024-TN10161**) presents the current conditions of the uranium fuel cycle and** ~~uranium fuel cycle includes uranium mining and milling, the production of uranium hexafluoride, isotopic enrichment, fuel fabrication, reprocessing of irradiated fuel, transportation of radioactive materials, and management of low-level wastes and high-level wastes related to uranium fuel cycle activities. Section 4.12.1.1 of the 2013 license renewal GEIS~~ describes in detail the generic potential radiological and nonradiological environmental impacts of the uranium fuel cycle and transportation of nuclear fuel and wastes ~~(NRC 2013a)~~. The NRC staff incorporates the information in NUREG-1437, Revision **2**, Section 4.**14**.1 (NRC 2024-TN10161: 4-**150**–4-**164**) here by reference. The **LR** GEIS does not identify any site-specific (Category 2) uranium fuel cycle issues.

As stated in the **LR** GEIS (NRC 1996-TN288, NRC 2013-TN2654, NRC 2024-TN10161), the generic issues related to the uranium fuel cycle as identified in Table 3-1 **and described in Section 3.1 of this SEIS** would not be affected by continued operations **and refurbishment** associated with license renewal. The NRC staff identified no new and significant information for these issues **that would change the conclusion in the LR GEIS**. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** Thus, as concluded in the **LR** GEIS, the **environmental** impacts **of Point Beach SLR associated with** ~~generic issues related to~~ the uranium fuel cycle **are generic in nature and** would **generally** be SMALL.

3.15.1.2 Replacement Power Plant Fuel Cycles

New Nuclear Energy Alternatives

There are no substantive changes to this section of the 2021 DSEIS.

Fossil Fuel Energy Alternatives

Fuel cycle impacts for a fossil fuel-fired power plant result from the initial extraction of fuel, cleaning and processing of fuel, transport of fuel to the facility, and management and ultimate disposal of any solid wastes from fuel combustion. These impacts are discussed in more detail in **Appendix D, Section D.4.12.1** of the **LR** GEIS (NRC 2024-TN10161) and can generally include the following:

- significant changes to land use and visual resources
- impacts to air quality, including release of criteria pollutants, fugitive dust, volatile organic compounds, and methane into the atmosphere
- noise impacts
- geology and soil impacts due to land disturbances and mining
- water resource impacts, including degradation of surface water and groundwater quality
- ecological impacts, including loss of habitat and wildlife disturbances
- historic and cultural resources impacts within the mine or pipeline footprint
- socioeconomic impacts from employment of both the mining workforce and service and support industries
- ~~environmental justice impacts~~
- health impacts to workers from exposure to airborne dust and methane gases
- generation of industrial wastes

Renewable Energy Alternatives

For renewable energy technologies that rely on the extraction of a fuel source (e.g., biomass), such alternatives may have fuel cycle impacts with some similarities to those associated with the uranium fuel cycle. However, as stated in **Appendix D, Section D.4.12.3** of the LR GEIS (NRC 2024-TN10161) ~~(subsection, "Renewable Energy Alternatives")~~, the fuel cycle for renewable technologies such as wind, solar, geothermal, and ocean wave and current is difficult to define. This is because the associated natural resources continue to exist (i.e., the resources are not consumed or irreversibly committed) regardless of any effort to harvest them for

electricity production. Impacts from the presence or absence of these renewable energy technologies are often difficult to determine. ~~(NRC 2013a)~~

3.15.2 Terminating Power Plant Operations and Decommissioning

This section describes the environmental impacts associated with the termination of operations and the decommissioning of a nuclear power plant and replacement power alternatives. All operating power plants will terminate operations and be decommissioned at some point after the end of their operating life or after a decision is made to permanently cease operations. For the proposed action at Point Beach, **SLR** would delay this eventuality for an additional 20 years beyond the current license periods, to end in 2050 (Unit 1) and 2053 (Unit 2).

3.15.2.1 Existing Nuclear Power Plant

Decommissioning would occur whether Point Beach is shut down at the end of its current renewed licenses or at the end of the **SLR** term. The decommissioning GEIS (NUREG-0586) (NRC 2002-TN665) evaluates the environmental impacts from the activities associated with the decommissioning of any reactor before or at the end of an initial or renewed license. Additionally, Section 4.**14**.2.1 of the **LR** GEIS (NRC 2024-TN10161) summarizes the incremental environmental impacts associated with nuclear power plant decommissioning activities. As noted in Table 3-1 **and described in Section 3.1 of this SEIS**, there is one Category 1 issue, "Termination of plant operations and decommissioning," applicable to Point Beach decommissioning following the **SLR** term. This issue states that license renewal is expected to have a negligible effect on the impacts of terminating operations and decommissioning on all resources. **Thus, the impacts are projected to be SMALL. The NRC staff identified no new and significant information for this issue that would change the conclusions in the LR GEIS. This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).**

3.15.2.2 Replacement Power Plants

<u>New Nuclear and Fossil Fuel Energy Alternatives</u>

The environmental impacts from the termination of power plant operations and decommissioning of a power generating facility are dependent on the facility's decommissioning plan. The decommissioning plan outlines the actions necessary to restore the site to a condition equivalent in character and value to the site on which the facility was first constructed (NRC 2013-TN2654, NRC 2024-TN10161). General elements and requirements for a thermoelectric power plant decommissioning plan are discussed in **Appendix D, Section D.4.13.1** ~~Section 4.12.2.2~~ of the **LR** GEIS (NRC 2024-TN10161) and can include the removal of structures to at least 3 ft (1 m) below grade, the removal of all accumulated waste materials, the removal of intake and discharge structures, and the cleanup and remediation of incidental spills and leaks at the facility. The environmental consequences of decommissioning can generally include the following:

- short-term impacts on air quality and noise from the deconstruction of facility structures
- short-term impacts on land use and visual resources
- long-term reestablishment of vegetation and wildlife communities
- socioeconomic impacts due to decommissioning the workforce and the long-term loss of jobs

- elimination of health and safety impacts on operating personnel and the general public

The NRC staff incorporates the information in the **LR** GEIS, **Appendix D, Sections D.4.13.1 and D.4.13.2** (NRC 2024-TN10161: **D-44–D-45**), here by reference.

Activities that are unique to the termination of operations and decommissioning of a nuclear power generating facility include the safe removal of the facility from service and the reduction of residual radioactivity to a level that permits release of the property under restricted conditions or unrestricted use and termination of the license.

Renewable Energy Alternatives

Termination of power plant operations and decommissioning for renewable energy facilities would generally be similar to the activities and impacts discussed for new nuclear and fossil fuel energy alternatives above. Decommissioning would involve the removal of facility components and any operational wastes and residues to restore sites to a condition equivalent in character and value to the site on which the facility was first constructed. In other circumstances, supporting infrastructure (e.g., buried utilities and pipelines) could be abandoned in place. ~~(NRC 2013a)~~ The range of possible decommissioning considerations and impacts, depending on the renewal energy alternative considered, are discussed in **Appendix D, Section D.4.13.3** of the **LR** GEIS ~~(see subsection, "Renewable Alternatives") (NRC 2013a)~~. The NRC staff incorporates the information in the **LR** GEIS, **Appendix D, Section D.4.13.3** (NRC 2024-TN10161: **D-45–D-46**), here by reference.

3.15.3 Greenhouse Gas Emissions and Climate Change

The following sections discuss ~~greenhouse gas~~ GHG emissions and climate change impacts. Section 3.15.3.1 evaluates GHG emissions associated with the operation of Point Beach and replacement power alternatives. Section 3.15.3.2 discusses the observed changes in climate**,** and potential future climate change during the **SLR** term, based on climate model simulations under future global GHG emissions scenarios**, and climate change impacts on environmental resources**. ~~In Section 3.16, "Cumulative Impacts," of this SEIS, the NRC staff considers the potential cumulative, or overlapping, impacts from climate change on environmental resources where there are incremental impacts of the proposed action (subsequent license renewal).~~

3.15.3.1 Greenhouse Gas Emissions from the Proposed Action and Alternatives

Gases found in the Earth's atmosphere that trap heat and play a role in the Earth's climate are collectively termed ~~greenhouse gases~~ GHGs. GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), water vapor (H_2O), and fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The Earth's climate responds to changes in concentrations of GHGs in the atmosphere because these gases affect the amount of energy absorbed and heat trapped by the atmosphere. Increasing concentrations of these gases in the atmosphere generally increase the Earth's surface temperature. Atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have significantly increased since 1**8**50 (IPCC 2007-TN7421, IPCC 2013-TN7434). **For instance, since 1850, CO_2 concentrations have increased by almost 50 percent (**USGCRP 2023-TN9762**). In 2019, atmospheric concentrations of CO_2 (measured at 410 ppm) were higher than any time in at least 2 million years (**IPCC 2023-TN8557**). The annual rate of increase in atmospheric CO_2 over the last 60 years is 100 times faster than previous natural increases (**USGCRP 2023-TN9762**).**

Carbon dioxide, methane, nitrous oxide, and fluorinated gases (termed long-lived greenhouse gases) are well mixed throughout the Earth's atmosphere, and their impact on climate is long lasting and cumulative in nature as a result of their long atmospheric lifetime (EPA 2016-TN7561). Therefore, the extent and nature of climate change is not specific to where GHGs are emitted. Carbon dioxide is of primary concern for global climate change because it is the primary gas emitted as a result of human activities. **In 2019, global net GHG emissions were estimated to be 59 ± 6.6 gigatons of CO_2 equivalents (CO_2eq), with the largest share in gross GHG emissions being CO_2 from combustion of fossil fuels and industrial processes (**IPCC 2023-TN8557**). The Intergovernmental Panel on Climate Change Working Group contribution to the Sixth Assessment report states that "[i]t is unequivocal that human influence has warmed the atmosphere, ocean, and land" (**IPCC 2021-TN7435**).** ~~The most recent report from the Intergovernmental Panel on Climate Change (IPCC) states that "[i]t is unequivocal that human influence has warmed the global climate system since pre-industrial times." (IPCC 2021). The EPA has determined that greenhouse gases "may reasonably be anticipated both to endanger public health and to endanger public welfare" (74 FR 66496).~~

~~Proposed Action~~

The operation of Point Beach results in both direct and indirect GHG emissions. NextEra has calculated direct (i.e., stationary combustion sources) and indirect (i.e., workforce commuting) GHG emissions, which are provided in Table 3-9. NextEra does not maintain an inventory of GHG emissions resulting from visitor and delivery vehicles (NextEra 2020-TN11241). Fluorinated gas emissions from refrigerant sources and from electrical transmission and distribution systems can result from leakage, servicing, repair, or disposal of sources. In addition to being GHGs, chlorofluorocarbons and hydrochlorofluorocarbons are ozone-depleting substances that are regulated by the Clean Air Act under Title VI, "Stratospheric Ozone Protection." NextEra maintains a program to manage stationary refrigeration appliances at Point Beach to recycle, recapture, and reduce emissions of ozone-depleting substances. **NextEra is not required to report fugitive emissions of ozone depleting substances in refrigeration appliances at Point Beach and it does not track annual refrigerant fugitive emissions** (NextEra 2024-TN11258). Therefore, Table 3-**9** below does not account for any potential emissions from stationary refrigeration sources at Point Beach (NextEra 2020-TN11241). **Sulfur hexafluoride is used in circuit breakers, circuit switchers, and in condenser tube leak detection at Point Beach. NextEra is not required to record the loss or leakage of sulfur hexafluoride and therefore emissions from circuit breakers and switchers are not available (**NextEra 2024-TN11258**).**

Proposed Action

As described in the LR GEIS (NRC 2024-TN10161**) and as cited in Section 3.1 and Table 3-1 of this SEIS, GHG impacts on climate change from nuclear power plant license renewal and continued operations and refurbishment would be SMALL. The NRC staff's review did not identify any new and significant information that would change the conclusion in the LR GEIS. This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**). GHG emissions from routine operations at Point Beach include diesel generators, auxiliary boilers, as well as mobile sources; the emissions are minor in nature. NextEra does not anticipate future upgrades or replacement activities of emission sources during the SLR term to support plant operation that could result in a significant increase in GHG emissions. Thus, as concluded in the LR GEIS, for the "Greenhouse gas impact on climate change" generic issue, the impacts of Point Beach SLR on climate change would be SMALL.**

Table 3-9 Annual Greenhouse Gas Emissions[(a)] from Operation at Point Beach, Units 1 and 2 [Table 3-33 in the 2021 DSEIS]

Year	Onsite Combustion Sources[(a)] (tons)	Workforce Commuting[(b)] (tons)	Total CO_2eq (tons)
2014	1,110	3,460	4,570
2015	820	3,460	4,280
2016	830	3,460	4,290
2017	930	3,460	4,390
2018	660	3,460	4,120
2019	**570**	**3,460**	**4,030**
2020	**770**	**3,460**	**4,230**
2021	**710**	**3,460**	**4,170**
2022	**520**	**3,460**	**3,980**
2023	**620**	**3,460**	**4,080**

Note: ~~GHG emissions are reported in metric tons and converted to short tons.~~ All reported values are rounded. To convert tons **to metric tons** ~~per year~~, multiply by 0.90718. Expressed in carbon dioxide equivalents (CO_2eq), a metric used to compare the emissions of greenhouse gases (GHG) based on their global warming potential (GWP). The GWP is a measure used to compare how much heat a GHG traps in the atmosphere. The GWP is the total energy that a gas absorbs over a period of time compared to carbon dioxide. CO_2eq is obtained by multiplying the amount of the GHG by the associated GWP. For example, the GWP of methane is 21; therefore, 1 ton of methane emission is equivalent to 21 tons of carbon dioxide emissions.

(a) Onsite combustion sources include Point Beach turbines, diesel generators, boilers, and diesel engines. **GHG emissions calculated based on Point Beach's annual emission inventory reports (**WDNR 2020-TN11267**,** WDNR 2021-TN11336**,** WDNR 2022-TN11337**,** WDNR 2023-TN11338**,** WDNR 2024-TN11265**) and EPA's emission factors for GHGs Inventories (**EPA 2024-TN11335**).**

(b) Emissions consider Point Beach permanent full-time employees and supplemental staff (667 passenger vehicles per day based on a 3.1 percent carpool rate for 681 employees) and does not include additional contractor workers during refueling outages. Refueling outages occur on an 18-month schedule and last approximately 25 days per unit.

Source: NextEra 2020-TN11241, NextEra 2021-TN11289.

No-Action Alternative

Under the no-action alternative, the NRC would not issue subsequent renewed licenses, and Point Beach would permanently shut down on or before the expiration of the current renewed licenses. At some point, all nuclear plants will terminate operations and undergo decommissioning. The decommissioning GEIS (NUREG-0586) (NRC 2002-TN665) considers the environmental impacts from decommissioning. Therefore, the scope of impacts considered under the no-action alternative includes the immediate impacts resulting from activities at Point Beach that would occur between plant shutdown and the beginning of decommissioning (i.e., activities and actions necessary to cease operation of Point Beach). Facility operations would terminate at or before the expiration of the current renewed licenses. When the facility stops operating, a reduction in GHG emissions from activities related to plant operation, such as the use of diesel generators and employee vehicles, would occur. The NRC staff anticipates that GHG emissions for the no-action alternative would be less than those presented in Table 3-9, which shows the estimated direct GHG emissions from operation of Point Beach and associated mobile emissions. **Therefore, the NRC staff concludes that the impacts of the no-action alternative on climate change would be SMALL.**

Since the no-action alternative would result in a loss of power generating capacity due to shutdown, the sections below discuss GHG emissions associated with replacement baseload power generation for each replacement power alternative analyzed.

New Nuclear (Small Modular Reactor) Alternative

The **2013 LR** GEIS (NRC 2013-TN2654) presents life-cycle GHG emissions associated with nuclear power generation. As presented in Tables 4.12-4 through 4.12-6 of the **2013 LR** GEIS, life-cycle GHG emissions from nuclear power generation can range from 1 to 288 grams carbon equivalent per kilowatt-**hour** (g Ceq/kWh). **Construction of the new nuclear alternative would be similar to the construction of an industrial facility and would include construction equipment, engine exhaust, and workforce commuting. The NRC staff has estimated that GHG emissions for a reference 1,000 megawatts electric (MWe) nuclear reactor would be approximately 6,140 tons of CO_2eq (5,571 MT) (**NRC 2019-TN6136**). These emissions are comparable to the 1,200 MWe new nuclear alternative considered in this SEIS.** Nuclear power plants do not burn fossil fuels to generate electricity. Sources of GHG emissions from the new nuclear alternative would include diesel generators, auxiliary boilers, and gas turbines, similar to existing sources at Point Beach. Therefore, the NRC staff estimates that GHG emissions from the new nuclear alternative would be similar to Point Beach **(see Table 3-10). If Point Beach's generating capacity were to be replaced by the new nuclear alternative, there would be no significant increase in GHG emissions. Therefore, the NRC staff concludes that the impacts of the new nuclear alternative on climate change would be SMALL.**

Table 3-10 Direct Greenhouse Gas Emissions from Facility Operations Under the Proposed Action and Alternatives [Table 3-34 in the 2021 DSEIS]

Technology/Alternative	CO_2eq[(a)] (tons/year)
Proposed Action (Point Beach subsequent license renewal)[(b)]	1,110
No-Action Alternative[(c)]	<1,110
New Nuclear Alternative[(d)]	1,110
Natural Gas Combined-Cycle Alternative[(e)]	4.5 million
Combination Alternative[(f)]	<1,110

Note: All reported values are rounded. To convert tons per year to metric tons per year, multiply by 0.90718

(a) Carbon dioxide equivalent (CO_2eq) is a metric used to compare the emissions of greenhouse gases (GHG) based on their global warming potential (GWP). The GWP is a measure used to compare how much heat a GHG traps in the atmosphere. The GWP is the total energy that a gas absorbs over a period of time compared to carbon dioxide. CO_2eq is obtained by multiplying the amount of the GHG by the associated GWP. For example, the GWP of methane is 21; therefore, 1 ton of methane emission is equivalent to 21 tons of carbon dioxide emissions.
(b) Greenhouse gas emissions include direct emissions from onsite combustion sources. Highest value presented in Table 3-**9** was used.
(c) Emissions resulting from activities at Point Beach that would occur between plant shutdown and the beginning of decommissioning and assumed not to be greater than greenhouse gas emissions from operation at Point Beach.
(d) Emissions assumed to be similar to Point Beach operation.
(e) Emissions from direct combustion of natural gas. Greenhouse gas emissions estimated using emission factors developed by the U.S. Department of Energy's (DOE's) National Energy Technology Laboratory (NETL 2012)
(f) Emissions primarily from the new nuclear portion, assumed to be similar to but less than the new nuclear alternative.

Natural Gas Combined-Cycle Alternative

The **2013 LR** GEIS (NRC 2013-TN2654) presents life-cycle GHG emissions associated with natural gas power generation. As presented in Table 4.12.5 of the **2013 LR** GEIS, life-cycle GHG emissions from natural gas can range from 120 to 930 g Ceq/kWh. **GHG emission**

sources during construction would be similar to the construction of any industrial facility and would include construction equipment, engine exhaust, and workforce commuting. Applying emission factors developed by the DOE's National Energy Technology Laboratory (NETL 2012-TN9604**) for plant construction of the natural gas alternative, the NRC staff estimates that construction of the natural gas alternative would emit approximately 3,510 tons of CO_2eq [3,180 MT]).** The NRC staff estimates that direct emissions from the operation of three 460 MWe natural gas combined-cycle units would total ~~3.9~~ **4.5** million tons (~~3.5~~ **4.1** million MT) of CO_2eq per year. **If Point Beach's generating capacity were to be replaced by the natural gas alternative, there would be a significant increase in GHG emissions (see Table 3-10). Therefore, given the potential for a significant increase in GHG emissions, the NRC staff concludes that the impacts of the natural gas alternative on climate change would be MODERATE.**

Combination (Small Modular Reactor, Solar, and Onshore Wind) Alternative

The combination alternative **would consist of small modular reactors that would supply 800 MWe, solar photovoltaic facilities that would supply 200 MWe, and onshore wind facilities would supply 200 MWe. The 2013 LR GEIS (**NRC 2013-TN2654**) presents life-cycle GHG emissions (e.g., material production, system and plant component manufacturing, installation and plant construction, operation, decommissioning) associated with nuclear, solar photovoltaic, and wind power generation. Life-cycle GHG emissions from nuclear, solar photovoltaic, and wind power generation can range from 1 to 288, 5 to 217, and 2 to 81g Ceq/kWh, respectively. GHG emission sources during construction of the combination alternative would be similar to the construction of an industrial facility and would include construction equipment, engine exhaust, and workforce commuting. GHG emissions from construction of the combination alternative would depend on the construction duration and the equipment usage of each component (i.e., nuclear, solar, wind). Facility construction is responsible for 24 percent of wind life-cycle GHG emissions and 19 percent of solar photovoltaic life-cycle GHG emissions (**Nuget and Sovacool 2014-TN10553**).**

GHG **emissions associated with operation** would primarily be emitted from the nuclear portion of **the combination** alternative. Therefore, the NRC staff estimates that GHG emissions from **operation of** the combination alternative would be similar to, but less than, the new nuclear alternative since the combination alternative would consist of two (as opposed to three) small modular reactor units. **If Point Beach's generating capacity were to be replaced by the combination alternative, there would be no significant increase in GHG emissions (see Table 3-10). Therefore, the NRC staff concludes that the impacts of the combination alternative on climate change would be SMALL.**

~~Summary of Greenhouse Gas Emissions from the Proposed Action and Alternatives~~

~~Table 3-34 below presents the direct GHG emissions from facility operations under the proposed action of subsequent license renewal and alternatives to the proposed action. GHG emissions from the natural gas combined-cycle alternative are several orders of magnitude greater than those from continued operation of Point Beach. If Point Beach's generating capacity were to be replaced by the NGCC alternative, there would be an increase in GHG emissions. Therefore, the NRC staff concludes that the continued operation of Point Beach (the proposed action) results in GHG emissions avoidance as compared to the natural gas combined-cycle alternative. However, the proposed action, the no-action alternative, the new nuclear alternative, and the combination alternative would have similar and comparable GHG emissions. If Point Beach's generating capacity were to be replaced by either the new~~

~~nuclear alternative or the combination alternative, there would be no significant increase in GHG emissions.~~

3.15.3.2 Climate Change

Climate change is the decades or longer change in climate measurements (e.g., temperature and precipitation) that has been observed on a global, national, and regional level (IPCC 2007-TN7421; EPA 2016-TN7561; USGCRP 2014-TN3472). Climate change can vary regionally, spatially, and seasonally, depending on local, regional, and global factors. Just as regional climate differs throughout the world, the impacts of climate change can vary among locations.

Observed Trends in Climate Change Indicators

Global surface temperature has increased faster since 1970 than in any other 50-year period over at least the last 2,000 years (IPCC 2023-TN8557**). From 2011 through 2020, the global surface temperature was 2°F (1.1°C) warmer than the preindustrial period (1850–1900) (**IPCC 2023-TN8557**). From 1901 to 2023, global precipitation has increased at an average rate of 0.03 in. (0.08 cm) per decade (**EPA 2024-TN10205**). From 1901 to 2023, average surface temperature across the contiguous United States has increased by 0.17°F (0.09°C) per decade (**EPA 2024-TN10205**). From 1901 to 2023, total annual precipitation in the contiguous United States has increased at a rate of 0.18 in. (0.45 cm) per decade (**EPA 2024-TN10205**).** ~~On a global level, from 1901 to 2016 average temperature has increased by 1.8 °F (1.0 °C) (USGCRP 2018). The year 2020 was the second warmest year in a 140-year climate record; the top five warmest years (in order) are 2016, 2020, 2019, 2015, and 2017 (NOAA 2020b, 2020c). Since 1901, precipitation has increased at an average rate of 0.1 in. (0.25 cm) per decade on a global level (EPA 2021e).~~ The observed global change in average surface temperature and precipitation has been accompanied by an increase in sea surface temperatures, a decrease in global glacier ice, an increase in sea level, and changes in extreme weather events. Such extreme events include an increase in the frequency of heat waves, very heavy precipitation (defined as the heaviest 1 percent of all daily events), and recorded maximum daily high temperatures (IPCC 2007-TN7421; EPA 2016-TN7561; USGCRP 2009-TN18, USGCRP 2014-TN3472).

The U.S. Global Change Research Program (USGCRP) compiles the best available information and maintains the current state of knowledge regarding climate change trends and effects at the regional and national level. The USCGRP reports **that since 1970, the contiguous United States is warming at faster than the global average. Since 1970, global temperature has increased by 1.7°F (0.9°C) while average surface temperature in the contiguous United** States has increased by 2.5°F (1.4°C) (USGCRP 2023-TN9762). ~~that from 1901 to 2016, average surface temperatures have increased by 1.8 °F (1.0 °C) across the contiguous United States (USGCRP 2018, Chapter 2, Key Message 5). Since 1901, average annual precipitation has increased by 4 percent across the United States, comprised of increases in the northern and eastern United States and decreases across the Southern and Western United States (USGCRP 2018, Chapter 2 Key Message 6).~~ Since the 1980s, data show an increase in the length of the frost-free season, the period between the last occurrence of 32°F (0°C) in the spring and first occurrence of 32°F (0°C) in the fall, across the contiguous United States. Over the period 1991 through 2011, the average frost-free season was 10 days longer than between 1901 and 1960 (USGCRP 2014-TN3472). **More generally, the frequency and intensity of extreme heat has increased over much of the United States while those of extreme cold have declined** (USGCRP 2023-TN9762).

Climate change and its impacts can vary regionally, spatially, and seasonally, depending on local, regional, and global factors. Observed climate changes and impacts have not been uniform across the United States. Annual average temperature data for the Midwest between 2002 and 2021 (compared to 1901 to 1960) exhibit an increase of more than 2.0°F (1.1°C), and winter is warming nearly twice as fast as summer (USGCRP 2023-TN9762**: Figure 2.4). The number of hot days (days at or above 95°F (35°C)) has decreased by 5.6 days and the number of cold days (days at or below 32°F (0°C)) has decreased by 4.9 days in the Midwest from 2002 to 2021 compared to 1901 through 1960 (**USGCRP 2023-TN9762**). Average annual precipitation from 2002 to 2021 for the Midwest was 5 to 15 percent higher compared to the 1901 to 1960 average (**USGCRP 2023-TN9762**: Figure 2.4). The Midwest has experienced a 45 percent increase in the number of extreme precipitation days (defined as the top 1 percent of heaviest precipitation events) from 1958 to 2021 (**USGCRP 2023-TN9762**).** ~~Across the Midwest region, annual average temperature from 1905–2012 has warmed by 1.5 °F (0.5 °C). The rate of warming over recent decades has accelerated, with average temperatures increasing twice as quickly between 1950 and 2010 (USGCRP 2014; NOAA 2013). For the Midwest, the length of the frost-free season has increased by 9 days from 1991–2012 relative to 1901–1960 (USGCRP 2018). Precipitation in the Midwest from 1895–2011 has increased 0.31 in. (0.78 cm) per decade (NOAA 2013).~~

The Great Lakes have exhibited increases in surface temperatures, declining lake ice cover, increasing summer evaporation rates, and earlier seasonal stratification of temperatures (USGCRP 2018-TN5847). **Between 1991 and 2020, water temperatures across the Great Lakes Basin increased by 0.43°C (0.77°F) per decade (**ECCC/NOAA 2023-TN10049**). Water levels in the Great Lakes have fluctuated since 1860, but annual average water levels over the last decades have declined (**EPA 2024-TN10022**;** NOAA 2024-TN10023**). Between 1973 and 2023, annual maximum ice coverage for the Great Lakes has decreased by approximately 5 percent per decade (**NOAA 2024-TN10025**).** ~~For example, average annual maximum ice coverage for the Great Lakes from 2003–2013 was 43 percent and for 1962–2013 the average annual maximum ice coverage was 52 percent (NOAA 2017b).~~ For the 1995–2019 period, Lake Michigan average surface water rate of warming has been 0.56–**0.612**°F per decade (0.31–0.**3**4°C per decade), with the greatest warming occurring in October (Anderson et al. 2021-TN10715). Lake Michigan-Huron water level hydrographs show a significant downward trend for the period of 1860–2010 and historic lows in 2013 (NOAA 2013-TN7441). Since 2013, however, Lake Michigan-Huron water levels have experienced a rise of more than 3 ft (NOAA 2022-TN11345; USACE 2025-TN11317).

The NRC staff used the National Oceanic and Atmospheric Administration's (NOAA) Climate at a Glance tool to analyze temperature and precipitation trends for the 1895–202**3** period in the Wisconsin East Central Climate Division. A trend analysis shows that the average annual temperature has increased at a rate of 0.2°F (0.1°C) per decade, while average annual precipitation has increased at a rate of 0.3**3** in. (0.8**3** cm) per decade (NOAA 2025-TN11327).

Climate Change Projections

Future global GHG emission concentrations (emission scenarios) and climate models are commonly used to project possible climate change. Climate models indicate that over the next few decades, temperature increases will continue due to current GHG emission concentrations in the atmosphere (USGCRP 2014-TN3472). This is because it takes time for Earth's climate system to respond to changes in GHG concentrations; if GHG concentrations were to stabilize at current levels, this would still result in at least an additional 1.1°F (0.6°C) of warming over this century (USGCRP 2018-TN5847). Over the longer term, the magnitude of temperature

increases and climate change effects will depend on future global greenhouse gas emissions (IPCC 2007-TN7421, IPCC 2013-TN7434; USGCRP 2009-TN18, USGCRP 2014-TN3472, USGCRP 2018-TN5847). Climate model simulations often use GHG emission scenarios to represent possible future social, economic, technological, and demographic development that, in turn, drive future emissions. Consequently, the GHG emission scenarios, their supporting assumptions, and the projections of possible climate change effects entail substantial uncertainty.

The Intergovernmental Panel on Climate Change (IPCC) has generated various representative concentration pathway (RCP) scenarios commonly used by climate modeling groups to project future climate conditions (IPCC 2000-TN7652, IPCC 2013-TN7434; USGCRP 2017-TN5848, USGCRP 2018-TN5847). For instance, the A2 scenario is representative of a high-emission scenario under which GHG emissions continue to rise during the 21st century from 40 gigatons (GT) of ~~carbon dioxide equivalents~~ CO_2eq per year in 2000 to 140 GT of CO_2eq per year by 2100. The B1 scenario, on the other hand, is representative of a low-emission scenario in which emissions rise from 40 GT of CO_2eq per year in 2000, to 50 GT of CO_2eq per year mid-century before falling to 30 GT of CO2eq per year by 2100 (IPCC 2000-TN7652; USGCRP 2014-TN3472). In the IPCC Fifth Assessment Report, four RCPs were developed and are based on predicted changes in radiative forcing (a measure of the influence that a factor, such as GHG emissions, has in changing the global balance of incoming and outgoing energy) in the year 2100, relative to preindustrial conditions. The four RCPs are numbered in accordance with the change in radiative forcing measured in watts per square meter (i.e., +2.6 (very low), +4.5 (lower), +6.0 (mid-high), and +8.5 (higher)) (USGCRP 2018-TN5847). For example, RCP 2.6 is representative of a mitigation scenario aimed at limiting the increase of global mean temperature to 1.1°F (2°C) (IPCC 2014-TN7651). RCP 8.5 reflects a continued increase in global emissions resulting in increased warming by 2100. Most recently, the **USGCRP** and IPCC have used the RCPs and associated modeling results as the basis for their climate change assessments (IPCC 2013-TN7434, USGCRP 2017-TN5848, USGCRP 2018-TN5847). **In the IPCC Working Group contribution to the Sixth Assessment Report, five shared socioeconomic pathways (SSPs) and associated modeling results are used as the basis for their climate change assessments (**IPCC 2021-TN7435**). These five pathways (SSP1-1.9, SSP1-2.6, SSP2-4.5, SSP3-7.0, and SSP5-8.5) cover a range of GHG scenarios and climate change mitigation**.

Since the effects of climate change can vary regionally, climate change information at the regional and local scale is necessary to assess the impacts on the human environment for a specific location. Therefore, the NRC staff considered the best available climate change studies performed by the USGCRP and partner agencies as part of its assessment of potential changes in climate indicators during the Point Beach SLR terms (2030–2050 for Unit 1, and 2033–2053 for Unit 2). The results of these studies are summarized below.

As input to the Third National Climate Assessment report (USGCRP 2014-TN3472). NOAA analyzed future regional climate change scenarios based on climate model simulations using a high (A2) and low (B1) emission scenarios (NOAA 2013-TN7441). NOAA climate model simulations (for the period between 2021 and 2050, 2035 midpoint, relative to the 1971–1999 reference period) indicate the following. Annual mean temperature is projected to increase by 2.5–3.5°F (1.3–1.9°C) across the Midwest under both a low and high-emission scenario. Increases in temperature during this timeframe are projected to occur for all seasons. The Fourth National Climate Assessment (USGCRP 2017-TN5848) provides regional projections for annual temperature based on the RCP 4.5 and RCP 8.5 scenarios for the mid-century (2036–

2065) as compared to the average for 1976–2005. The modeling predicts increases of 4–6°F (2.2–3.3°C) in Wisconsin under both scenarios (USGCRP 2017-TN5848). As for precipitation, **projections based on the intermediate (RCP 4.5) emission scenario for the mid-century (2036–2065), indicate precipitation increases across the Midwest ranging from 0.5 to 2 in. (1.3 to 5.0 cm) related to the previous five decades (**USGCRP 2023-TN9762**).** ~~the climate model simulations suggest spatial difference in annual mean precipitation across the Midwest. For the 2021–2050 period, annual mean precipitation is projected to increase 3 to 6 percent under a high emissions scenario (A2) across Wisconsin, and under a low emissions scenario annual mean precipitation is projected to increase 0 to 3 percent (NOAA 2013).~~

Future long-term water level projections for the Great Lakes are highly uncertain (USGCRP 2014-TN3472, USGCRP 2023-TN9762). Model simulations have resulted in a wide distribution in magnitude and sign (declines/increases) for water level projections. ~~For instance, Angel and Kunkel (2010) estimated possible future average water levels of Lake Michigan-Huron under three emission scenarios (low emission scenario (B1), intermediate emission scenario (A1B), and high-emission scenario (A2)) for three future periods (2005–2034, 2035–2064, and 2065–2094) relative to the 1970–1999 reference period. The model simulations primarily resulted in a reduction of lake levels and wide range in lake level changes. For example, 75 percent of the model simulations estimate declining lake levels for Lake Michigan-Huron. The 2050–2064 model-simulated average lake-level changes ranged from -5.8 ft to +2.9 ft (-1.77 m to +0.89 m).~~ **S**tudies indicate that earlier approaches overestimated evaporation losses and therefore declines in water levels (USGCRP 2014-TN3472; MacKay and Seglenieks 2012-TN11328). Recent water level projections primarily indicate small declines in average water levels for Lake Michigan-Huron by mid-century across various GHG scenarios, but simulations continue to generate a range in sign and magnitude lake level response (USGCRP 2018-TN5847; Lofgren and Rouhana 2016-TN11329). **Based on the Great Lakes-Atmosphere Regional Model,** Kayastha et al. 2022-TN10037 **reported projections in Lake Michigan-Huron by 2040–2049 (relative to 2010–2019) under an RCP 8.5 scenario ranging from 0.42–2.6 ft (0.13–0.80 m), with an average increase of 1.3 ft (0.44 m). Under RCP 4.5 and RCP 8.5 scenarios, annual Lake Michigan surface temperatures are projected to increase by 1.28–2.56°F (0.71-1.42°C) and 1.92–3.24°F (1.07–1.8°C), respectively, by mid-century (2030–2049 relative to 2000–2019) (**Xue et al. 2022-TN10039**).**

3.15.3.3 Climate Change Impacts on Environmental Resources

As described in the LR GEIS (NRC 2024-TN10161**) and as cited in Table 3-2 of this SEIS, the Category 2 issue, "Climate change impacts on environmental resources," is applicable to all nuclear power plants. This is because the impacts of climate change on environmental resources during the SLR term are location-specific and cannot be evaluated generically. Changes in climate can have broad implications for certain resource areas. Climate change may impact the affected environment in a way that alters the environmental resources that are impacted by the proposed action of Point Beach SLR. For there to be a climate change impact on an environmental resource within the scope of Point Beach SLR, the proposed action must have an incremental new, additive, or increased physical effect or impact on the resource or environmental condition beyond what is already occurring. As presented below, the NRC staff considers the effects of climate change on environmental resource areas that may also be directly affected by Point Beach continued operations during the SLR term. It is important to note that the potential effects of climate change could occur irrespective of the proposed action.**

The effects of climate change on Point Beach structures, systems, and components are outside the scope **of this Category 2 issue.** The environmental review documents the potential effects from continued nuclear power plant operation on the environment. Site-specific environmental conditions are considered when siting nuclear power plants. This includes the consideration of meteorological and hydrologic siting criteria as set forth in 10 CFR Part 100 (TN282), "Reactor site criteria." NRC regulations require that plant structures, systems, and components important to safety be designed to withstand the effects of natural phenomena, such as flooding, without loss of capability to perform safety functions. Further, nuclear power plants are required to operate within technical safety specifications in accordance with the NRC operating license, including coping with natural phenomena hazards. The NRC conducts safety reviews prior to allowing licensees to make operational changes due to changing environmental conditions. Additionally, the NRC evaluates nuclear power plant operating conditions and physical infrastructure to ensure ongoing safe operations under the plant's initial and renewed operating licenses through the NRC's Reactor Oversight Process. If new information about changing environmental conditions (such as rising sea levels that threaten safe operating conditions or challenge compliance with the plant's technical specifications) becomes available, the NRC will evaluate the new information to determine if any safety-related changes are needed at licensed nuclear power plants. This is a separate and distinct process from the NRC staff's **SLR** environmental review that it conducts in accordance with NEPA. ~~Nonetheless, as discussed below in Section 3.16, the NRC staff considers the impacts of climate change in combination with the effects of subsequent license renewal in assessing cumulative impacts to the environment.~~

Air Quality: Climate change can impact air quality as a result of changes in meteorological conditions. The formation, transport, dispersion, and deposition of air pollutants depend, in part, on weather conditions (IPCC 2007-TN7421**). Ozone and particulate matter less than or equal to 2.5 microns ($PM_{2.5}$) concentrations are particularly sensitive to climate change (**IPCC 2007-TN7421**;** EPA 2009-TN9068**;** USGCRP 2023-TN9762**). Ozone is formed by the chemical reaction of nitrogen oxides and volatile organic compounds in the presence of heat and sunlight. Sunshine, high temperatures, and air stagnation are favorable meteorological conditions for higher levels of ozone (**IPCC 2007-TN7421**;** EPA 2009-TN9068**). The emission of ozone precursors also depends on temperature, wind, and solar radiation (**IPCC 2007-TN7421**). According to the EPA, both nitrogen oxide and biogenic volatile organic compound emissions are expected to be higher in a warmer climate (**EPA 2009-TN9068**). USGCRP reports that there is medium confidence that climate change is projected to worsen air quality in many U.S. regions (**USGCRP 2023-TN9762**). This is due to the uncertainty in how meteorology will respond to climate change and how these meteorological conditions will in turn change air pollutant concentrations. For instance, while warmer average temperatures are projected to increase seasonal mean daily maximum 8-hour average ozone and $PM_{2.5}$ concentrations, increases in annual average precipitation could decrease $PM_{2.5}$ concentrations. Nolte et al. examined the impact of climate change on ozone and $PM_{2.5}$ under RCP 4.5, RCP 6.0, and RCP 8.5 scenarios for 2025–2035 relative to 1995–2005 (**Nolte et al. 2018-TN8571**). For the Upper Midwest, increases in spring, autumn, and summer mean maximum daily 8-hour ozone was projected by 2030 under the RCP 4.5 and RCP 8.5 scenarios, with summer increases under the RCP 8.5 scenario being statistically significant. Under the RCP 6.0 scenario, however, a decrease in the spring mean maximum daily 8-hour ozone was projected by 2030. With respect to $PM_{2.5}$, concentrations exhibited decreases depending on the scenario considered under the RCP 4.5 and RCP 8.5 scenarios for the Midwest.**

Water Resources: Climate change can impact surface water resources as a result of changes in temperature, precipitation, and other parameters. The USGCRP projects that water demand across the states bordering Lake Michigan, including Wisconsin, Illinois, Indiana, and Michigan, will increase by 0 to 10 percent by 2060, relative to 2005, based on combined changes in population, socioeconomic conditions, and climate (USGCRP 2014-TN3472**: Figure 3.11).**

Elevated surface water temperatures can decrease the cooling efficiency of thermoelectric power generating facilities and plant capacity. Therefore, as intake water temperatures warm, the volume of surface water needed for power plant cooling can increase (USGCRP 2014-TN3472**). Regulatory agencies would need to account for changes in water availability in their water resources allocation and environmental permitting programs. Regardless of water use permitting constraints, power plant operators would have to account for any changes in water temperature in operational practices and procedures.**

Since 1958, heavy precipitation (i.e., the amount of annual precipitation falling in the heaviest 1 percent of events) has increased by an average of 42 percent across the Midwest region (USGCRP 2018-TN5847**: Figure 2.6). Observed increases in heavy precipitation events are projected to continue across the Midwest, including eastern Wisconsin. Increases in annual precipitation and heavy precipitation events can result in greater runoff from the land while increasing the potential for riverine flooding. In turn, these changes can result in the transport of a higher sediment load and other contaminants to surface waters with potential degradation of ambient water quality.**

3.16 Cumulative Effects

Cumulative **effects (impacts)** may result when the environmental effects associated with the proposed action (**SLR**) are added to the environmental effects from other past, present, and reasonably foreseeable ~~future~~ actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. As explained in the **LR** GEIS (NRC 2013-TN2654, NRC 2024-TN10161), the effects of the license renewal action, combined with the effects of other actions, could generate cumulative impacts on a given resource.

For the purposes of this analysis, past actions are those that occurred since the commencement of Point Beach reactor operations and before the submittal of the **SLR** application. Older actions are considered as part of the affected environment analyses presented in Sections 3.2 through 3.13 of this SEIS. Present actions are those that are occurring during current power plant operations. Reasonably foreseeable ~~future~~ actions are those that would occur through the end of power plant operation, including the period of extended operation. Therefore, the cumulative impacts analysis considers potential effects through the end of the current license term, as well as through the end of the 20-year **SLR** term.

The cumulative impacts analysis accounts for both geographic (spatial) and time (temporal) considerations of past, present, and reasonably foreseeable ~~future~~ actions to determine whether other potential actions are likely to contribute to the total environmental impact. In addition, because cumulative impacts accrue to resources and focus on overlapping impacts with the proposed action, no cumulative impacts analysis was performed for resource areas where the proposed action is unlikely to have any incremental impacts on that resource. Consequently, no cumulative impacts analysis was performed for the following resource areas: land use **and**

visual resources, noise, geologic environment, terrestrial resources, aquatic resources, federally protected ecological resources, historic and cultural resources, and postulated accidents.

Separately, Section 3.15.3~~.2, "Climate Change,"~~ of this SEIS **presents the NRC staff's analysis of GHG impacts on climate change for the proposed action, observed changes** in climate ~~could have broad implications for certain resource areas. Accordingly, a climate change impact discussion is provided for those resource areas that could be incrementally affected by the proposed action (subsequent license renewal). It is also important to note that the potential effects of climate change could occur irrespective of the proposed action.~~ **and potential future climate change during the SLR term, based on climate model simulations under future global GHG emissions scenarios, and potential climate change impacts on environmental resources also potentially impacted by the proposed action.**

Information from NextEra's ER (NextEra 2020-TN11241); responses to requests for additional information; information from other Federal, State, and local agencies; scoping comments; and information gathered during the environmental site **audits** at Point Beach were used to identify past, present, and reasonably foreseeable ~~future~~ actions in the cumulative **effects** analysis. **This included consideration of additional information provided by NextEra (**NextEra 2024-TN11258**).** To evaluate cumulative **effects** resulting from the **SLR** of Point Beach, the incremental impacts of the proposed action, as described in Sections 3.2 through 3.13 of this SEIS, are combined with the impacts of other past, present, and reasonably foreseeable ~~future~~ actions, regardless of which agency (Federal or non-Federal) or person undertakes such actions. In general, the effects of past actions have already been described and accounted for in each resource-specific description of the existing (i.e., affected) environment, which serves as the environmental baseline for the cumulative **effects** analysis.

Appendix E describes other actions, including new and continuing activities and specific projects that the NRC staff identified during this environmental review and that were considered in the analysis of potential cumulative impacts.

3.16.1 Air Quality

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

~~Climate change can impact air quality as a result of changes in meteorological conditions. The formation, transport, dispersion, and deposition of air pollutants depend, in part, on weather conditions (IPCC 2007). Ozone is particularly sensitive to climate change (IPCC 2007; EPA 2009a). Ozone is formed by the chemical reaction of nitrogen oxides and volatile organic compounds in the presence of heat and sunlight. Sunshine, high temperatures, and air stagnation are favorable meteorological conditions for higher levels of ozone (IPCC 2007; EPA 2009a). The emission of ozone precursors also depends on temperature, wind, and solar radiation (IPCC 2007). According to the EPA, both nitrogen oxide and biogenic volatile organic compound emissions are expected to be higher in a warmer climate (EPA 2009a). Modeled studies of climate-related ozone changes for the Midwest project increases in summer averages of the maximum daily 8-hour ozone concentrations (USGCRP2018; EPA 2017; Nolte et al. 2018).~~

3.16.2 Water Resources

3.16.2.1 Surface Water Resources

There are no substantive changes to this section of the 2021 DSEIS.

Water Use Considerations

There are no substantive changes to this section of the 2021 DSEIS.

Water Quality Considerations

For the previous paragraphs that do not appear here, there are no substantive changes to this section of the 2021 DSEIS. Changes are limited to the following.

~~Climate Change and Related Considerations~~

~~Climate change can impact surface water resources as a result of changes in temperature, precipitation, and other parameters, as discussed in Section 3.15.3.2 of this SEIS.~~

~~The U.S. Global Change Research Program (USGCRP) projects that water demand across the states bordering Lake Michigan, including Wisconsin, Illinois, Indiana, and Michigan, will increase by 0 to 10 percent by 2060, relative to 2005, based on combined changes in population, socioeconomic conditions, and climate (USGCRP 2014: Figure 3.11).~~

~~Elevated surface water temperatures can decrease the cooling efficiency of thermoelectric power generating facilities and plant capacity. Therefore, as intake water temperatures warm, the volume of surface water needed for power plant cooling can increase (USGCRP 2014). Regulatory agencies would need to account for changes in water availability in their water resources allocation and environmental permitting programs. Regardless of water use permitting constraints, power plant operators would have to account for any changes in water temperature in operational practices and procedures.~~

~~Since 1958, heavy precipitation (i.e., the amount of annual precipitation falling in the heaviest 1 percent of events) has increased by an average of 42 percent across the Midwest region (USGCRP 2018: Figure 2.6). Observed increases in heavy precipitation events are projected to continue across the Midwest, including eastern Wisconsin. Increases in annual precipitation and heavy precipitation events can result in greater runoff from the land while increasing the potential for riverine flooding. In turn, these changes can result in the transport of a higher sediment load and other contaminants to surface waters with potential degradation of ambient water quality.~~

3.16.2.2 Groundwater Resources

Section 3.5.2, “Groundwater Resources,” of this SEIS describes regional groundwater water systems and water use. As discussed in that section, water is withdrawn from the Silurian aquifer through five onsite wells for drinking water, sanitary use, and fire suppression. Between 201**9** and 20**23**, water was withdrawn from these onsite supply wells at an average rate of 12,**182** gpd (around 8.**5** gpm). Onsite groundwater use is not expected to increase significantly during the **SLR** period.

As discussed in Section 3.5.3, the impact of current plant operations and groundwater withdrawals on the aquifer is considered to be SMALL and the NRC staff did not identify any

new and significant information to indicate the possibility of groundwater use conflicts during the **SLR** term beyond those discussed in the **LR** GEIS. There are no known current or planned projects requiring groundwater withdrawals in the vicinity of Point Beach that, if implemented in addition to **SLR**, would potentially cause an adverse impact on groundwater use and quality.

In Section 3.5.3, the NRC staff also addressed the impact of past and future operation of the plant on groundwater quality. Point Beach has implemented a groundwater protection program to identify and monitor leaks and the monitoring well network. The staff determined that the groundwater protection program sampling strategy is robust enough that potential future releases into groundwater, while not expected, would likely be readily detected. In addition, because the low permeability surficial deposits (over 100 ft) at Point Beach act as a barrier to prevent radionuclides in the surficial groundwater from impacting the underlying Silurian aquifer and shallow onsite groundwater flows east toward Lake Michigan, offsite groundwater users are not expected to be impacted. Therefore, over the period of **SLR**, there is little chance of significant impacts on the groundwater quality of onsite and offsite aquifers.

~~Therefore, the NRC staff concludes that the cumulative impacts of continued operation of Point Beach on groundwater use and quality during the subsequent license renewal period would be SMALL and that no mitigation measures are warranted.~~

3.16.3 Socioeconomics

There are no substantive changes to this section of the 2021 DSEIS.

3.16.4 Human Health

There are no substantive changes to this section of the 2021 DSEIS.

3.16.5 Reserved

Analysis of this issue has been removed from this SEIS. See Section 3.12 of this SEIS for more information.

3.16.6 Waste Management and Pollution Prevention

There are no substantive changes to this section of the 2021 DSEIS.

3.17 Resource Commitments Associated with the Proposed Action

This section describes the NRC staff's consideration of potentially unavoidable adverse environmental impacts that could result from implementation of the proposed action and alternatives; the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity; and the irreversible and irretrievable commitments of resources.

3.17.1 Unavoidable Adverse Environmental Impacts

There are no substantive changes to this section of the 2021 DSEIS.

3.17.2 Relationship between Short-Term Use of the Environment and Long-Term Productivity

There are no substantive changes to this section of the 2021 DSEIS.

3.17.3 Irreversible and Irretrievable Commitment of Resources

There are no substantive changes to this section of the 2021 DSEIS.

4 CONCLUSION

There are no substantive changes to Chapter 4 of the 2021 draft supplemental environmental impact statement (DSEIS; NRC 2021-TN7293).

5 REFERENCES

10 CFR Part 20. *Code of Federal Regulations*, Title 10, *Energy*, Part 20, “Standards for Protection Against Radiation.” TN283.

10 CFR Part 50. *Code of Federal Regulations*, Title 10, *Energy*, Part 50, “Domestic Licensing of Production and Utilization Facilities.” TN249.

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions.” TN10253.

10 CFR Part 54. *Code of Federal Regulations*, Title 10, *Energy*, Part 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants.” TN4878.

10 CFR Part 100. *Code of Federal Regulations*, Title 10, *Energy*, Part 100, “Reactor Site Criteria.” TN282.

40 CFR Part 51. *Code of Federal Regulations*, Title 40, Protection of Environment, Part 51, “Requirements for Preparation, Adoption, and Submittal of Implementation Plans.” TN1090.

40 CFR Part 81. *Code of Federal Regulations*, Title 40, *Air Programs*, Subchapter C, *Protection of Environment*, Part 81, “Designation of Areas for Air Quality Planning Purposes.” TN7226.

40 CFR Part 110. *Code of Federal Regulations*, Title 40, Protection of Environment, Part 110, “Discharge of Oil.” TN8485.

40 CFR Part 121. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 121, “State Certification of Activities Requiring a Federal License or Permit.” TN6718.

40 CFR Part 125. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 125, “Criteria and Standards for the National Pollutant Discharge Elimination System.” TN254.

40 CFR Part 141. *Code of Federal Regulations*, Title 40, *Protection of Environment*, Part 141, “National Primary Drinking Water Standards.” TN4456.

50 CFR Part 402. *Code of Federal Regulations,* Title 50, *Wildlife and Fisheries*, Part 402, “Interagency Cooperation—Endangered Species Act of 1973, as amended.” TN4312.

59 FR 7629. February 16, 1994. “Executive Order 12898 of February 11, 1994: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.” *Federal Register*, Office of the President. TN1450.

66 FR 22938. May 7, 2001. “Endangered and Threatened Wildlife and Plants; Final Determination of Critical Habitat for the Great Lakes Breeding Population of the Piping Plover.” *Federal Register*, Fish and Wildlife Service. TN9904.

~~69 FR 52040. August 24, 2004. "Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions." *Federal Register*, Nuclear Regulatory Commission. TN1009.~~

70 FR 39104. July 6, 2005. "Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations." *Federal Register*, Environmental Protection Agency. TN8374.

76 FR 22928. April 25, 2011. "Nextera Energy Point Beach, LLC; Point Beach Nuclear Plant, Units 1 and 2; Environmental Assessment and Finding of No Significant Impact Related to the Proposed License Amendment to Increase the Maximum Reactor Power Level." *Federal Register*, Nuclear Regulatory Commission. TN11282.

85 FR 42210. July 13, 2020. "Clean Water Act Section 401 Certification Rule." Final Rule, *Federal Register*, Environmental Protection Agency. TN6394.

86 FR 29541. June 2, 2021. "Notice of intention to reconsider and 17 revise the Clean Water Act Section 401 Certification Rule." *Federal Register*, Environmental Protection Agency. TN7623.

86 FR 32737. June 23, 2021. "Wisconsin Shipwreck Coast National Marine Sanctuary Designation; Final Regulations." *Federal Register*, Office of National Marine Sanctuaries, National Ocean Service, National Oceanic and Atmospheric Administration, Department of Commerce. TN11310.

88 FR 66558. September 27, 2023. "Clean Water Act Section 401 Water Quality Certification Improvement Rule." *Federal Register*, Environmental Protection Agency (EPA). TN9620.

89 FR 64166. August 6, 2024. "Renewing Nuclear Power Plant Operating Licenses - Environmental Review." Final rule and guidance; issuance, *Federal Register*, Nuclear Regulatory Commission. TN10321.

89 FR 67522. August 21, 2024. "Renewing Nuclear Power Plant Operating Licenses—Environmental Review." *Federal Register*, Nuclear Regulatory Commission. TN10823.

90 FR 8633. January 31, 2025. "Executive Order 14173 of January 21, 2025, Ending Illegal Discrimination and Restoring Merit-Based Opportunity." Federal Register, Presidential Documents. TN11607.

Anderson, E.J., C.A. Stow, A.D. Gronewold, L.A. Mason, M.J. McCormick, S.S. Qian, S.A. Ruberg, K. Beadle, S.A. Constant, and N. Hawley. 2021. "Seasonal overturn and stratification changes drive deep-water warming in one of Earth's largest lakes." *Nature Communications* 12(1688), London, United Kingdom. TN10715.

Atomic Energy Act of 1954. 42 U.S.C. § 2011 et seq. Public Law 112-239, as amended. TN663.

~~CEQ (Council on Environmental Quality). 1997. *Environmental Justice Guidance under the National Environmental Policy Act*. Washington D.C. ADAMS Accession No. ML103430030. TN452.~~

ECCC/NOAA (Environment and Climate Change Canada and the U.S. National Oceanic and Atmospheric Administration). 2022. *2021 Annual Climate Trends and Impacts Summary for the Great Lakes Basin*. Ottawa, Ontario and Silver Spring, Maryland. Available at https://glisa.umich.edu/summary-climate-information/annual-climate-trends/. TN10049.

Eckerman, K.F. and J.C. Ryman. 1993. *External Exposures to Radionuclides in Air, Water, and Soil*. EPA-402-R-93-081, U.S. Environmental Protection Agency, Washington, D.C. ADAMS Accession No. ML101590169. TN8.

Endangered Species Act of 1973. 16 U.S.C. § 1531 et seq. TN1010.

EPA (U.S. Environmental Protection Agency). 2002. *EPA Facts about Tritium*. Washington, D.C. TN8480.

EPA (U.S. Environmental Protection Agency). 2009. *Assessment of the Impacts of Global Change on Regional U.S. Air Quality: A Synthesis of Climate Change Impacts on Ground-Level Ozone (An Interim Report of the U.S. EPA Global Change Research Program)*. EPA/600/R-07/094F. Washington, D.C. TN9068.

EPA (U.S. Environmental Protection Agency). 2016. *Climate Change Indicators in the United States 2016*. Fourth Edition, EPA 430-R-16-004, Washington D.C. Accessed June 7, 2022, at https://www.epa.gov/sites/default/files/2016-08/documents/climate_indicators_2016.pdf. TN7561.

EPA (U.S. Environmental Protection Agency). 2024. *Climate Change Indicators in the United States*, *Fifth Edition*. EPA 430-R-24-003, Washington, D.C. TN10205.

EPA (U.S. Environmental Protection Agency). 2024. "Climate Change Indicators: Great Lakes Water Levels and Temperatures." Washington, D.C. Accessed May 1, 2024, at https://www.epa.gov/climate-indicators/great-lakes#:~:text=In%20recent%20years%2C%20warmer%20surface,extends%20the%20season%20for%20evaporation. TN10022.

EPA (U.S. Environmental Protection Agency). 2024. *Emission Factors for Greenhouse Gas Inventories, Last Modified: June 5, 2024*. Washington, D.C. Available at https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf. TN11335.

EPA (U.S. Environmental Protection Agency). 2024. "Enforcement and Compliance History Online, Detailed Facility Report, Point Beach Nuclear Plant." Washington, D.C. Accessed January 31, 2025, at https://echo.epa.gov/detailed-facility-report?fid=110002433304. TN11266.

EPA (U.S. Environmental Protection Agency). 2024. "Enforcement and Compliance History Online, DMR Exceedances Report, Point Beach Nuclear Plant, Two Rivers, WI, 54241." Washington, D.C. Accessed January 31, 2025, at https://echo.epa.gov/trends/loading-tool/reports/effluent-exceedances?permit_id=WI0000957. TN11283.

EPA (U.S. Environmental Protection Agency). 2024. "Waterbody Report, Lake Michigan, Assessment Unit ID: WI10008956." Washington, D.C. Accessed January 31, 2025, at https://mywaterway.epa.gov/waterbody-report/WIDNR/WI10008956/2024. TN11278.

EPA (U.S. Environmental Protection Agency). 2025. "Wisconsin Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants." Washington, D.C. Accessed January 31, 2025, at https://www3.epa.gov/airquality/greenbook/anayo_wi.html. TN11263.

Federal Water Pollution Control Act of 1972 (commonly referred to as the Clean Water Act). 33 U.S.C. § 1251 et seq. TN662.

Florida State Parks. 2012. "San Pedro Underwater Archaeological Preserve State Park." Tallahassee, Florida. ADAMS Accession No. ML14206B121. TN1125.

FWS (U.S. Fish and Wildlife Service). 2005. Letter from J.M. Smith, Field Supervisor, to P.-T. Kuo, License Renewal and Environmental Impacts Program, Office of Nuclear Reactor Regulation, NRC, dated May 5, 2005, regarding "Biological Assessment, License Renewal, Point Beach Nuclear Plant, Units 1 and 2, Manitowoc County, Wisconsin." Green Bay ES Field Office, New Franken, Wisconsin. ADAMS Accession No. ML051330355. TN11303.

FWS (U.S. Fish and Wildlife Service). 2005. Letter from J.M. Smith, Field Supervisor, to P.-T. Kuo, Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation, NRC, dated January 31, 2005, regarding "Request for Concurrence, Biological Assessment for Point Beach Nuclear Plant, Units 1 and 2 License Renewal, Manitowoc County, Wisconsin." Green Bay ES Field Office, New Franken, Wisconsin. ADAMS Accession No. ML050480192. TN11297.

FWS (U.S. Fish and Wildlife Service). 2016. *Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions*. Midwest Regional Office, Bloomington, Minnesota. TN7400.

FWS (U.S. Fish and Wildlife Service). 2021. Letter from D. Simpkins, FWS, to A. Briana, NRC, dated November 10, 2021, regarding "NRC Request for Concurrence with Endangered Species Act Determination for Point Beach Subsequent License Renewal, Issuance of Draft Supplemental Environmental Impact Statement, and Opportunity for Public Comment." FWS No. 03E17000-2021-SLI-0702. Washington, D.C. ADAMS Accession No. ML21314A421. TN7606.

FWS (U.S. Fish and Wildlife Service). 2021. Letter from Green Bay Ecological Services Field Office to B. Grange, dated February 9, 2021, regarding "Verification letter for the 'Point Beach Nuclear Plant, Units 1 and 2, Subsequent License Renewal' project under the January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-eared Bat and Activities Excepted from Take Prohibitions." New Franken, Wisconsin. ADAMS Accession No. ML21040A485. TN9740.

FWS (U.S. Fish and Wildlife Service). 2024. Letter from FWS to B. Arlene, NRC, dated December 3, 2024, regarding "Federal agency coordination under the Endangered Species Act, Section 7 for 'Point Beach Nuclear Plant, Units 1 and 2, Subsequent License Renewal'." Minnesota-Wisconsin Ecological Services Field Office, Bloomington, Minnesota. ADAMS Accession No. ML24338A144. TN11313.

FWS (U.S. Fish and Wildlife Service). 2024. Letter from FWS to NRC dated December 3, 2024, regarding "List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project." Minnesota-Wisconsin Ecological Services Field Office, Bloomington, Minnesota. ADAMS Accession No. ML24338A145. TN11304.

FWS and NMFS (U.S. Fish and Wildlife Service and National Marine Fisheries Service). 1998. *Endangered Species Act Consultation Handbook, Procedures for Conducting Section 7 Consultation and Conference*. Washington, D.C. ADAMS Accession No. ML14171A801. TN1031.

GRN (Global Renewable News). 2020. "Madison Gas and Electric, Wisconsin's First Large-Scale Solar Facility Producing Clean Energy." Brossard, Quebec, Canada. Accessed January 31, 2025, at https://globalrenewablenews.com/article/energy/category/Solar/87/869299/Wisconsin-s-First-Large-Scale-Solar-Facility-Producing-Clean-Energy.html. TN11260.

IPCC (Intergovernmental Panel on Climate Change). 2000. *Summary for Policymakers, Emissions Scenarios, A Special Report of IPCC Working Group III*. Intergovernmental Panel on Climate Change, Geneva, Switzerland. Accessed June 11, 2022, at https://www.ipcc.ch/site/assets/uploads/2018/03/sres-en.pdf. TN7652.

IPCC (Intergovernmental Panel on Climate Change). 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. ADAMS No. ML112710385. Accessed May 23, 2022, at https://www.ipcc.ch/site/assets/uploads/2018/05/ar4_wg1_full_report-1.pdf. TN7421.

IPCC (Intergovernmental Panel on Climate Change). 2013. *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. T.F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex, and P.M. Midgley, eds. Cambridge University Press, Cambridge, United Kingdom. Accessed May 25, 2022, at https://www.ipcc.ch/report/ar5/wg1/. TN7434.

IPCC (Intergovernmental Panel on Climate Change). 2014. *Climate Change 2014, Synthesis Report*. Geneva, Switzerland. Accessed June 11, 2022, at https://ar5-syr.ipcc.ch/ipcc/ipcc/resources/pdf/IPCC_SynthesisReport.pdf. TN7651.

IPCC (Intergovernmental Panel on Climate Change). 2021. "Climate Change 2021: The Physical Science Basis." Accessed May 24, 2022, at https://www.ipcc.ch/report/ar6/wg1/. TN7435.

IPCC (Intergovernmental Panel on Climate Change). 2023. *AR6 Synthesis Report: Climate Change 2023.* Intergovernmental Panel on Climate Change, Geneva, Switzerland. TN8557.

Kayastha, M.B., X. Ye, C. Huang, P. Xue. 2022. "Future Rise of the Great Lakes Water Levels Under Climate Change." *Journal of Hydrology* 612(B), Amsterdam, Netherlands. https://doi.org/10.1016/j.jhydrol.2022.128205. TN10037.

Lofgren, B.M. and J. Rouhana. 2016. "Physically Plausible Methods for Projecting Changes in Great Lakes Water Levels under Climate Change Scenarios." *Journal of Hydrometeorology* 17(8):2209-2223, American Meteorological Society, Boston, Massachusetts. DOI 10.1175/JHM-D-15-0220.1. TN11329.

MacKay M. and F. Seglenieks. 2012. "On the simulation of Laurentian Great Lakes water levels under projections of global climate change." *Climatic Change* 117:55-67, Springer Science+Business Media, Berlin, Germany. DOI 10.1007/s10584-012-0560-z. TN11328.

Magnuson Stevens Fishery Conservation and Management Reauthorization Act of 2006. 16 U.S.C. 1801 Note. Public Law 109-479, January 12, 2007, 120 Stat. 3575. TN7841.

Manitowoc County. 2020. *Manitowoc County 20-Year Comprehensive Plan Update*. Manitowoc, Wisconsin. Available at https://storymaps.arcgis.com/stories/17e4aa656e0e4ed29973397a9ea1965e. TN11261.

Manitowoc County. 2022. "County Code, Chapter 6, Police Ordinances." Manitowoc, Wisconsin. Accessed January 31, 2025, at https://manitowoccountywi.gov/departments/corporation-counsel/county-code/. TN11274.

~~MCDC (Missouri Census Data Center). 2023. "Circular Area Profiles - ACS, Center Point Name: PB, Latitude: 44.281, Longitude: 87.5366, Selected radii: 50." Columbia, Missouri. Accessed February 14, 2025, at https://mcdc.missouri.edu/cgi-bin/broker?_PROGRAM=apps.capsACS.sas&_SERVICE=MCDC_long&latitude=44.281&longitude=87.5366&radii=50&sitename=PB&state=55&dprofile=on&eprofile=on&sprofile=on&hprofile=on&units=bgs. TN11315.~~

National Environmental Policy Act of 1969 (NEPA), as amended. 42 U.S.C. § 4321 et seq. TN661.

National Historic Preservation Act. 54 U.S.C. § 300101 et seq. TN4157.

National Marine Sanctuaries Act, as amended. 16 U.S.C. § 1431 et seq. TN4482.

NEI (Nuclear Energy Institute). 2007. *Industry Ground Water Protection Initiative—Final Guidance Document.* NEI 07–07, Washington, D.C. ADAMS Accession No. ML091170588. TN1913.

NEI (Nuclear Energy Institute). 2019. *Industry Groundwater Protection Initiative – Final Guidance Document, Rev. 1.* NEI-07-07, Revision 1, Washington, D.C. ADAMS Accession No. ML19142A071. TN6775.

NEI (Nuclear Energy Institute). 2019. Letter from C. Earls, Senior Director Regulatory Affairs, to R. Elliott, Division of Rulemaking, Environmental, and Financial Support Office of Nuclear Material, Safety, and Safeguards, dated November 12, 2019, regarding "NRC Review and Endorsement of NEI 17-04, Model SLR New and Significant Assessment Approach for SAMA, Revision 1." Washington, D.C. ADAMS Accession No. ML19316C713. TN6815.

NETL (National Energy Technology Laboratory). 2012. *Life Cycle Analysis: Natural Gas Combined Cycle (NGCC) Power Plant*. DOE/NETL-403-110509, Pittsburgh, Pennsylvania. Accessed January 8, 2023, at https://www.netl.doe.gov/projects/files/FY13_LifeCycleAnalysisNaturalGasCombinedCycle(NGCC)PowerPlantFinal_060113.pdf. TN9604.

NextEra (NextEra Energy). 2020. Letter from E. Schultz, Licensing Manager, NextEra Energy Point Beach, LLC, to NRC Document Control Desk, dated April 27, 2020, regarding "Point Beach Nuclear Plan Units 1 and 2, 2019 Annual Monitoring Report." Two Rivers, Wisconsin. ADAMS Accession Package No. ML20119A480. TN11249.

NextEra (NextEra Energy). 2020. Letter from M. Strope, Site Vice President, NextEra Energy Point Beach, LLC, to NRC Document Control Desk, dated November 16, 2020, regarding "Point Beach Nuclear Plant Units 1 and 2, Application for Subsequent Renewed Facility Operating Licenses." Two Rivers, Wisconsin. ADAMS Accession Package No. ML20329A292. TN11241.

NextEra (NextEra Energy). 2021. Letter from E. Schultz, Licensing Manager, NextEra Energy Point Beach, LLC, to NRC Document Control Desk, dated April 29, 2021, regarding "Point Beach Nuclear Plant, Units 1 and 2, 2020 Annual Monitoring Report." Two Rivers, Wisconsin. ADAMS Accession No. ML21119A257. TN11250.

NextEra (NextEra Energy). 2021. Letter from W.D. Maher, Senior Licensing Director, to J. Knutson, WI Department of Natural Resources Division of Environmental Management, dated January 22, 2021, regarding "NextEra Energy Point Beach - Point Beach Nuclear Plant - Units 1 and 2 Subsequent License Renewal." PBNDNR-21-0004, Two Rivers, Wisconsin. ADAMS Accession No. ML21033A402. TN11289.

NextEra (NextEra Energy). 2021. Letter from W.D. Maher, Licensing Director, Nuclear Licensing Projects, to NRC Document Control Desk, dated June 10, 2021, regarding "Point Beach Nuclear Plant Units 1 and 2, Subsequent License Renewal Application - Environmental Report Review Requests for Confirmation of/Additional Information (RCI/RAI) Set 1 Responses." L-2021-116, Two Rivers, Wisconsin. ADAMS Accession No. ML21161A214. TN11262.

NextEra (NextEra Energy). 2022. Letter from E. Schultz, Licensing Manager, NextEra Energy Point Beach, LLC, to NRC Document Control Desk, dated April 14, 2022, regarding "Point Beach Nuclear Plant, Units 1 and 2, 2021 Annual Monitoring Report." Two Rivers, Wisconsin. ADAMS Accession No. ML22104A074. TN11252.

NextEra (NextEra Energy). 2023. Letter from D. Strand, General Manager Regulatory Affairs, to NRC Document Control Desk, dated April 10, 2023, regarding "2022 Annual Monitoring Report." Two Rivers, Wisconsin. ADAMS Accession No. ML23101A021. TN11254.

NextEra (NextEra Energy). 2024. Letter from P. Rasmus, General Manager, Regulatory Affairs, to NRC Document Control Desk, dated April 26, 2024, regarding "2023 Annual Monitoring Report." Two Rivers, Wisconsin. ADAMS Accession No. ML24117A243. TN11257.

NextEra (NextEra Energy). 2024. Letter from K.A. Mack, Director, Licensing and Regulatory Compliance, to NRC Document Control Desk, dated December 2, 2024, regarding "Point Beach Nuclear Plant, Units 1 and 2, Subsequent License Renewal Application Environmental Review, Supplemental Environmental Audit, Response to Requests for Confirmation of Information and Requests for Additional Information." Two Rivers, Wisconsin. ADAMS Accession No. ML24337A109. TN11258.

NextEra Energy. 2021. Letter from W. Maher, Licensing Director, to NRC dated May 10, 2021, regarding "Subsequent License Renewal Application - Environmental Report Supplement 1, Point Beach Nuclear Plant Units 1 and 2, Dockets 50-266 and 50-301. Renewed License Nos. DPR-24 and DPR 27. L-2021-100." Juno Beach, Florida. ADAMS Accession No. ML21131A105. TN7529.

NIEHS (National Institute of Environmental Health Sciences). 1999. *NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*. NIH Publication No 99–4493, National Institutes of Health, Research Triangle Park, North Carolina. ADAMS Accession No. ML093240277. TN78.

NMC (Nuclear Management Company, LLC). 2004. Letter from G.D. Van Middlesworth, Site Vice-President, Point Beach Nuclear Plant, to NRC Document Control Desk, dated February 25, 2004, regarding "Point Beach Nuclear Plant, Units 1 and 2, Application for Renewed Operating License." Two Rivers, Wisconsin. ADAMS Accession Package No. ML040580020. TN11312.

NOAA (National Oceanic and Atmospheric Administration). 2013. *Regional Climate Trends and Scenarios for the U.S. National Climate Assessment, Part 3. Climate of the Midwest U.S.* Technical Report NESDIS 142-3. Washington, D.C. TN7441.

NOAA (National Oceanic and Atmospheric Administration). 2020. *Wisconsin Shipwreck Coast National Marine Sanctuary Designation, Final Environmental Impact Statement and Final Management Plan*. Office of National Marine Sanctuaries, Silver Spring, Maryland. Available at https://repository.library.noaa.gov/view/noaa/25595. TN11311.

NOAA (National Oceanic and Atmospheric Administration). 2022. *Wisconsin, State Climate Summary 2022*. NOAA Technical Report 150-WI, Silver Spring, Maryland. Available at https://statesummaries.ncics.org/downloads/Wisconsin-StateClimateSummary2022.pdf. TN11345.

NOAA (National Oceanic and Atmospheric Administration). 2024. "The Great Lakes Water Level Dashboard." Silver Spring, Maryland. Accessed May 1, 2024, at https://www.glerl.noaa.gov/data/wlevels/dashboard/. TN10023.

NOAA (National Oceanic and Atmospheric Administration). 2024. "Why Low Ice Coverage on the Great Lakes Matters." Silver Spring, Maryland. Accessed May 1, 2024, at https://research.noaa.gov/2024/01/18/why-low-ice-coverage-on-the-great-lakes-matters/. TN10025.

NOAA (National Oceanic and Atmospheric Administration). 2025. "Divisional Time Series, Wisconsin, Climate Division 6 Precipitation, Period of Record 1895 - 2023." Silver Spring, Maryland. Accessed December 17, 2024, at https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/divisional/time-series/4706/pcp/12/1/1895-2023?trend=true&trend_base=10&begtrendyear=1895&endtrendyear=2024. TN11327.

Nolte, C.G., T.L. Spero, J.H. Bowden, M.S. Mallard, and P.D. Dolwick. 2018. "The potential effects of climate change on air quality across the conterminous US at 2030 under three Representative Concentration Pathways." *Atmos Chem Phys.* 18(20):15471-15489. TN8571.

NPS (National Park Service). 2010. *Federal Land Managers' Air Quality Related Values Work Group (FLAG). Phase I Report-Revised (2010), Natural Resource Report NPS/NRPC/NRR-2010/232*. Hopkins, South Carolina. ADAMS Accession No. ML22118A305. TN7925.

NRC (U.S. Nuclear Regulatory Commission). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. Volumes 1 and 2, NUREG-1437, Washington, D.C. ADAMS Accession Nos. ML040690705, ML040690738. TN288.

NRC (U.S. Nuclear Regulatory Commission). 1999. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants Addendum to Main Report, NUREG–1437, Volume 1, Addendum 1.* Washington, D.C. ADAMS Accession No. ML040690720. TN289.

NRC (U.S. Nuclear Regulatory Commission). 2002. "Final Generic Environmental Impact Statement of Decommissioning of Nuclear Facilities (NUREG-0586)." NUREG–0586, Supplement 1, Volumes 1 and 2, Washington, D.C. ADAMS Accession Nos. ML023470327, ML023500228. TN665.

NRC (U.S. Nuclear Regulatory Commission). 2005. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23 Regarding Point Beach Nuclear Plant Units 1 and 2, Final Report*. NUREG–1437, Supplement 23, Washington, D.C. ADAMS Accession No. ML052230490. TN7595.

NRC (U.S. Nuclear Regulatory Commission). 2006. *Liquid Radioactive Release Lessons Learned Task Force Final Report*. Washington, D.C. ADAMS Accession No. ML083220312. TN1000.

NRC (U.S. Nuclear Regulatory Commission). 2011. Letter from T.A. Beltz, Senior Project Manager, Plant Licensing Branch III-1, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation, to L. Meyer, Site Vice President, NextEra Energy Point Beach, LLC, dated May 3, 2011, regarding "Point Beach Nuclear Plant (PBNP), Units 1 and 2 - Issuance of License Amendments Regarding Extended Power Uprate (TAC NOS. ME1044 and ME1045)." Washington, D.C. ADAMS Accession Package No. ML111170513. TN11281.

NRC (U.S. Nuclear Regulatory Commission). 2013. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Revision 1, Washington, D.C. ADAMS Accession No. ML13107A023. TN2654.

NRC (U.S. Nuclear Regulatory Commission). 2014. *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel.* Final Report, NUREG–2157, Washington, D.C. ADAMS Accession No. ML14198A440. TN4117.

NRC (U.S. Nuclear Regulatory Commission). 2019. *Environmental Impact Statement for an Early Site Permit (ESP) at the Clinch River Nuclear Site*. NUREG-2226, Washington, D.C. ADAMS Package Accession No. ML19087A266. TN6136.

NRC (U.S. Nuclear Regulatory Commission). 2021. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23: Second Renewal Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2, Draft Report for Comment.* NUREG-1437, Supplement 23, Second Renewal, Washington, D.C. ADAMS Accession No. ML21306A226. TN7293.

NRC (U.S. Nuclear Regulatory Commission). 2021. Letter from R.B. Elliott, Chief, Environmental Review License Renewal Branch, Division of Rulemaking, Environmental and Financial Support, Office of Nuclear Material Safety and Safeguards, to J. Knutson, Wastewater Section Chief, Wisconsin Department of Natural Resources, dated February 8, 2021, regarding "Clean Water Act Section 401 Reasonable Period of Time Concerning the Point Beach Nuclear Plant Units 1 and 2 Subsequent License Renewal Application." Washington, D.C. ADAMS Accession No. ML21033B090. TN11291.

NRC (U.S. Nuclear Regulatory Commission). 2021. Email from B. Arlene, to S. Quamme, dated November 9, 2021, regarding "NRC Request for Concurrence with Endangered Species Act Determination for Point Beach Subsequent License Renewal, Issuance of Draft Supplemental Environmental Impact Statement, and Opportunity for Public Comment (Consultation Code: 03E17000-2021-SLI-0702)." Washington, D.C. ADAMS Accession No. ML21307A152. TN9162.

NRC (U.S. Nuclear Regulatory Commission). 2022. "Memorandum and Order in the Matter of Florida Power & Light Co. (Turkey Point Nuclear Generating Units 3 and 4)." CLI-22-02, Rockville, Maryland. ADAMS Accession No. ML22055A496. TN8182.

NRC (U.S. Nuclear Regulatory Commission). 2022. "Memorandum and Order in the Matter of Duke Energy Carolinas, LLC (Oconee Nuclear Station, Units 1, 2,and 3); Exelon Generating Company, LLC (Peach Bottom Atomic Power Station, Units 2 and 3); Florida Power & Light Co. (Turkey Point Nuclear Generating Units 3 and 4); Nextera Energy Point Beach, LLC (Point Beach Nuclear Plant, Units 1 and 2); Virginia Electric and Power Company (North Anna Power Station, Units 1 and 2)." CLI-22-03, Rockville, Maryland. ADAMS Accession Nos. ML22055A533. TN8272.

NRC (U.S. Nuclear Regulatory Commission). 2022. "Memorandum and Order in the Matter of "Exelon Generation Company LLC, (Peach Bottom Atomic Power Station, Units 2 and 3)." CLI–22–04, Rockville, Maryland. ADAMS Accession No. ML22055A557. TN9553.

NRC (U.S. Nuclear Regulatory Commission). 2024. *Backgrounder, Tritium, Radiation Protection Limits, and Drinking Water Standards*. Washington, D.C. ADAMS Accession Package No. ML062020079. TN11293.

NRC (U.S. Nuclear Regulatory Commission). 2024. Letter from K.T. Folk, Senior Environmental Project Manager, Environmental Project Management Branch 1, Division of Rulemaking, Environmental, and Financial Support, Office of Nuclear Material Safety and Safeguards, to K.A. Mack, Director, Licensing and Regulatory Compliance, Florida Power & Light Company, dated October 31, 2024, regarding "Point Beach Nuclear Plant, Units 1 and 2 - Summary of the 2024 Supplemental Environmental Audit Related to the Review of the Subsequent License Renewal Application (EPID Number: L-2020-SLE-0002) (Docket Numbers: 50-266 and 50-301)." Washington, D.C. ADAMS Accession Package No. ML24296A072. TN11299.

NRC (U.S. Nuclear Regulatory Commission). 2024. *Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities 2022, Fifty-Fifth Annual Report*. NUREG-0713, Volume 44, Washington, D.C. ADAMS Accession No. ML24303A136. TN11165.

NRC (U.S. Nuclear Regulatory Commission). 2024. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Volume 1-3, Revision 2, Washington, D.C. ADAMS Accession No. ML24087A133. TN10161.

NRC (U.S. Nuclear Regulatory Commission). 2024. *Regulatory Guide 4.2 – Supplement 1, Revision 2, Preparation of Environmental Reports for Nuclear Power Plant License Renewal Applications*. Washington, D.C. ADAMS Accession No. ML23201A144. TN10280.

NRC (U.S. Nuclear Regulatory Commission). 2024. *Standard Review Plans for Environmental Reviews for Nuclear Power Plants, Supplement 1: Operating License Renewal, Final Report*. NUREG-1555, Revision 2, Washington, D.C. ADAMS Accession No. ML23201A227. TN10251.

Nuget, D. and B.K. Sovacool. 2014. "Assessing the Lifecycle Greenhouse Gas Emissions from Solar PV and Wind Energy: A Critical Meta-Survey." *Energy Policy* 65:229-244, Elsevier, Amsterdam, Netherlands. https://doi.org/10.1016/j.enpol.2013.10.048. TN10553.

PSC (Public Service Commission of Wisconsin). 2018. *Two Creeks Solar, LLC, Solar CPCN Application, Manitowoc and Kewaunee Counties, Wisconsin PSC Docket No. 9696-CE-100, September 21, 2018*. Madison, Wisconsin. Available at https://apps.psc.wi.gov/ERF/ERFview/viewdoc.aspx?docid=350302. TN11269.

PSC (Public Service Commission of Wisconsin). 2019. *Point Beach Solar, LLC, Solar CPCN Application, Manitowoc County, Wisconsin, PSC Docket No. 9802-CE-100*, *May 3, 2019*. Madison, Wisconsin. Available at https://apps.psc.wi.gov/ERF/ERFview/viewdoc.aspx?docid=365755. TN11259.

USACE (U.S. Army Corps of Engineers). 2025. "Detroit District." Great Lakes and Ohio River Division, Detroit, Michigan. Accessed February 14, 2025, at https://www.lrd.usace.army.mil/detroit/. TN11317.

~~USCB (U.S. Census Bureau). 2020. "Decennial Census, DEC Redistricting Data (PL 94-171), Table P2, Hispanic or Latino, and Not Hispanic or Latino by Race for All Blocks within Wisconsin." Washington, D.C. Accessed January 31, 2025, at https://data.census.gov/table/DECENNIALPL2020.P2?g=040XX00US55$1500000&d=DEC%20Redistricting%20Data%20(PL%2094-171). TN11300.~~

~~USCB (U.S. Census Bureau). 2020. "Decennial Census, DEC Redistricting Data (PL 94-171), Table P2, Hispanic or Latino, and Not Hispanic or Latino by Race for Brown County and Manitowoc County, Wisconsin." Washington, D.C. Accessed January 31, 2025, at https://data.census.gov/table/DECENNIALPL2020.P2?g=050XX00US55009,55071&y=2020&d=DEC%20Redistricting%20Data%20(PL%2094-171). TN11301.~~

~~USCB (U.S. Census Bureau). 2023. "American Community Survey, ACS 1-Year Estimates Data Profiles, Table DP03, Selected Economic Characteristics for Wisconsin." Washington, D.C. Accessed January 31, 2025, at https://data.census.gov/table/ACSDP1Y2023.DP03?g=040XX00US55&y=2023&d=ACS%201-Year%20Estimates%20Data%20Profiles&moe=false. TN11306.~~

~~USCB (U.S. Census Bureau). 2023. "American Community Survey, ACS 5-Year Estimates Data Profiles, Table C17002, Selected Economic Characteristics for All Groups within Wisconsin." Washington, D.C. Accessed January 31, 2025, at https://data.census.gov/table/ACSDT5Y2023.C17002?g=C17002:%20RATIO%20OF%20INCOME%20TO%20POVERTY%20LEVEL%20IN%20THE%20PAST%2012%20MONTHS&g=040XX00US55$1500000&y=2023&moe=false. TN11308.~~

~~USCB (U.S. Census Bureau). 2023. "American Community Survey, ACS 5-Year Estimates Data Profiles, Table DP03, Selected Economic Characteristics for Wisconsin, Brown County and Manitowoc County, Wisconsin." Washington, D.C. Accessed January 31, 2025, at https://data.census.gov/table/ACSDP5Y2023.DP03?g=040XX00US55_050XX00US55009,55071&y=2023&d=ACS%205-Year%20Estimates%20Data%20Profiles&moe=false. TN11307.~~

~~USCB (U.S. Census Bureau). 2025. "Census Data Tables, Poverty Thresholds." Washington, D.C. Accessed January 31, 2025, at https://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html. TN11305.~~

USGCRP (U.S. Global Change Research Program). 2009. *Global Climate Change Impacts in the United States*. T.R. Karl, J.M. Melillo, and T.C. Peterson (editors). Cambridge University Press, New York, New York. ADAMS Accession No. ML100580077. TN18.

USGCRP (U.S. Global Change Research Program). 2014. *Climate Change Impacts in the United States: The Third National Climate Assessment*. J.M. Melillo, T.C. Richmond, and G.W. Yohe (eds.). U.S. Government Printing Office, Washington, D.C. ADAMS Accession No. ML14129A233. TN3472.

USGCRP (U.S. Global Change Research Program). 2017. *Climate Science Special Report: Fourth National Climate Assessment*. Volume I. Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.). Washington, D.C. ADAMS Accession No. ML19008A410. doi: 10.7930/J0J964J6. TN5848.

USGCRP (U.S. Global Change Research Program). 2018. *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment*. Volume II. D.R. Reidmiller, C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.). Washington, D.C. ADAMS Accession No. ML19008A414. doi: 10.7930/NCA4.2018. TN5847.

USGCRP (U.S. Global Change Research Program). 2023. *The Fifth National Climate Assessment*. A.R. Crimmins, C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. Washington, D.C. Available at https://doi.org/10.7930/NCA5.2023. TN9762.

WDNR (Wisconsin Department of Natural Resources). 2011. *A Conditional High Capacity Well Approval for One Potable Well to be Located in the Town of Two Creeks, Manitowoc County, dated December 7, 2011*. Madison, Wisconsin. TN11292.

WDNR (Wisconsin Department of Natural Resources). 2020. *2019 Air Emissions Inventory Summary Report*. Waukesha, Wisconsin. Available at https://apps.dnr.wi.gov/warp_ext/AM_PermitTracking2.aspx?id=3001458. TN11267.

WDNR (Wisconsin Department of Natural Resources). 2021. *2020 Air Emissions Inventory Summary Report*. Waukesha, Wisconsin. Available at https://apps.dnr.wi.gov/warp_ext/AM_PermitTracking2.aspx?id=3001458. TN11336.

WDNR (Wisconsin Department of Natural Resources). 2021. Email from A.L. Minks, Waterway and Wetland Section Chief - Bureau of Waterways, to R. Orthen, and J.R. Knutson, dated February 8, 2021, regarding "Point Beach Nuclear Plant Subsequent License Renewal Application - Consultation Request." Madison, Wisconsin. ADAMS Accession No. ML21057A259. TN11290.

WDNR (Wisconsin Department of Natural Resources). 2021. Letter from A. Freihoefer, Chief, Water Use Section, Bureau of Drinking Water and Groundwater, to NextEra Energy Point Beach LLC, dated November 15, 2021, regarding "Water Use Individual Permit, Water Use Property #: 10208." Madison, Wisconsin. ADAMS Accession No. ML25035A046. TN11276.

WDNR (Wisconsin Department of Natural Resources). 2022. *2021 Air Emissions Inventory Summary Report*. Waukesha, Wisconsin. Available at https://apps.dnr.wi.gov/warp_ext/AM_PermitTracking2.aspx?id=3001458. TN11337.

WDNR (Wisconsin Department of Natural Resources). 2023. *2022 Air Emissions Inventory Summary Report*. Waukesha, Wisconsin. Available at https://apps.dnr.wi.gov/warp_ext/AM_PermitTracking2.aspx?id=3001458. TN11338.

WDNR (Wisconsin Department of Natural Resources). 2023. Letter from E.S. Effiong, Air Management Engineer-Adv, to M. Strope, Site Vice President, NextEra Energy Point Beach, LLC, dated April 12, 2023, regarding "Final Permit 436034500-P40." Waukesha, Wisconsin. Available at https://apps.dnr.wi.gov/warp_ext/AM_PermitTracking2.aspx?id=3001458. TN11264.

WDNR (Wisconsin Department of Natural Resources). 2024. *2023 Air Emissions Inventory Summary Report*. Waukesha, Wisconsin. Available at https://apps.dnr.wi.gov/warp_ext/AM_PermitTracking2.aspx?id=3001458. TN11265.

WDNR (Wisconsin Department of Natural Resources). 2024. "Drinking & Ground Water Use Information System, Registered Groundwater Sources, Owner: NextEra Energy Point Beach LLC." Waukesha, Wisconsin. Accessed February 18, 2025, at https://apps.dnr.wi.gov/waterusepub/Source. TN11344.

WDNR (Wisconsin Department of Natural Resources). 2024. "Water Condition Lists, Impaired Waters, Waters in Restoration, and Waters Attaining Standards." Madison, Wisconsin. Accessed January 31, 2025, at https://dnr.wisconsin.gov/topic/SurfaceWater/ConditionLists.html. TN11277.

WDNR (Wisconsin Department of Natural Resources). 2024. *WPDES Permit No. WI-0000957-09-0, NextEra Energy Point Beach LLC, Permit Fact Sheet*. Madison, Wisconsin. Available at https://apps.dnr.wi.gov/potw/Document/List. TN11279.

WDNR (Wisconsin Department of Natural Resources). 2024. *WPDES Permit No. WI-0000957-09-0, NextEra Energy Point Beach LLC, Permit to Discharge Under the Wisconsin Pollutant Discharge Elimination System*. Madison, Wisconsin. Available at https://apps.dnr.wi.gov/potw/Document/List. TN11280.

WDNR (Wisconsin Department of Natural Resources). 2025. "Drinking and Ground Water Use Information System, Yearly Water Consumption for NextEra Energy Point Beach LLC, Period of Record 2010 - 2024." Waukesha, Wisconsin. Accessed January 31, 2025, at https://apps.dnr.wi.gov/waterusepub/WaterReport/History?SourceSeqNo=15492&PropSeqNo=10208. TN11275.

WDNR (Wisconsin Department of Natural Resources). Undated. “Historical Air Emissions Information.” Waukesha, Wisconsin. Accessed January 31, 2025, at https://dnr.wisconsin.gov/topic/AirEmissions/Historical.html. TN11268.

WDNR (Wisconsin Department of Natural Resources). Undated. “Natural Heritage Inventory (NHI) County Data.” Madison, Wisconsin. Accessed January 31, 2025, at https://dnrx.wisconsin.gov/nhiportal/public/data/county. TN11294.

WHS (Wisconsin Historical Society). 2025. “Wisconsin Historical Society Records Search Homepage.” Madison, Wisconsin. Accessed January 31, 2025, at https://www.wisconsinhistory.org/Records. TN11309.

WI Admin. Code NR 104. Department of Natural Resources, Environmental Protection - General, Chapter NR 104, “Uses and Designated Standards.” Wisconsin Administrative Code, Madison, Wisconsin. TN11298.

WI Admin. Code NR 299. Department of Natural Resources, Environmental Protection - Chapter NR 299, “Water Quality Certification.” Wisconsin Administrative Code, Madison, Wisconsin. TN11316.

WI Admin. Code NR 706. Department of Natural Resources, Environmental Protection - General, Chapter NR 706, “Hazardous Substance Discharge Notification and Source Confirmation Requirements.” Wisconsin Administrative Code, Madison, Wisconsin. TN11314.

WI Admin. Code NR 856. Department of Natural Resources, Environmental Protection - Water Supply, Chapter NR 856, “Water Use Registration and Reporting.” Wisconsin Administrative Code, Madison, Wisconsin. TN11295.

WI Admin. Code NR 860. Department of Natural Resources, Environmental Protection - Water Supply, Chapter NR 860, “Water Use Permitting.” Wisconsin Administrative Code, Madison, Wisconsin. TN11296.

WI Admin. Code NR 200-299. Department of Natural Resources, Environmental Protection - Chapters 200 - 299, “Wisconsin Pollutant Discharge Elimination System.” Wisconsin Administrative Code, Madison, Wisconsin. TN11333.

Xue, P., X. Ye, J.S. Pal, P.Y. Chu, M.B. Kayastha, C. Huan. 2022. “Climate Projections Over the Great Lakes Region: Using Two-Way Coupling of a Regional Climate Model with a 3-D Lake Model.” *Geoscientific Model Development* 15:4425–4446, Göttingen, Germany. https://doi.org/10.5194/gmd-15-4425-2022. TN10039.

6 LIST OF PREPARERS[1]

Members of the U.S. Nuclear Regulatory Commission's (NRC's) Office of Nuclear Material Safety and Safeguards prepared this document with assistance from other NRC organizations **and Pacific Northwest National Laboratory (PNNL)**. Table 6-1 identifies each contributor's name, education and experience, and function or expertise.

Table 6-1 List of Preparers

Name	Education and Experience	Function or Expertise
Briana Arlene**, NRC**	Masters Certification, National Environmental Policy Act; B.S. Conservation Biology; 1**9** years of experience in ecological impact analysis, Endangered Species Act Section 7 consultations, and Essential Fish Habitat consultations	Aquatic Resources, Special Status Species and Habitats, Microbiological Hazards; Endangered Species Act Section 7 Consultation; Essential Fish Habitat Consultation
Daniel Barnhurst**, NRC***	MS Geology BS Environmental Geology; Licensed Professional Geologist; 18 years of experience with geological and environmental reviews	Groundwater Hydrology
Phyllis Clark**, NRC***	MS Nuclear Engineering; MBA Business Administration; BS Physics; 39 years of industry and Government experience including nuclear power plant and production reactor operations, systems engineering, reactor engineering, fuels engineering, criticality, power plant emergency response, and project management	Radiological Nonradiological Waste Management, Uranium Fuel Cycle, Spent Fuel, Postulated Accidents and Lead Project Manager
Peyton Doub**, NRC***	MS Plant Physiology (Botany); BS Plant Sciences (Botany); Duke NEPA Certificate; Professional Wetland Scientist; Certified Environmental Professional; 30 years of experience in terrestrial and wetland ecology and NEPA	Terrestrial Ecology, Land Use, and Visual Resources
Jerry Dozier**, NRC**	MS Reliability Engineering; MBA Business Administration; BS Mechanical Engineering; 30+ years of experience including operations, reliability engineering, technical reviews, and NRC branch management	Severe Accident Mitigation Alternatives (SAMA), Postulated Accidents

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

Table 6-1 List of Preparers (Continued)

Name	Education and Experience	Function or Expertise
Robert Elliott, NRC*	BS Marine Engineering; Licensed Professional Engineer; 29 years of Government experience including containment systems analysis, balance of plant analysis, evaluation of integrated plant operations/technical specifications, and project management, with 13 years of management experience	Management Oversight
Kevin Folk, NRC	MS Environmental Biology; BA Geoenvironmental Studies; 35 years of experience in NEPA compliance; geologic, hydrologic, and water quality impacts analysis; utility infrastructure analysis, environmental regulatory compliance; and water supply and wastewater discharge permitting	**Senior Environmental Project Manager,** Geologic Environment, Cooling and Auxiliary Water Systems Surface Water Resources, **Groundwater Resources,** Termination of Operations and Decommissioning
Lifeng Guo, NRC*	PhD, MS Geology; B.S. Hydrogeology and Engineering Geology; Certified Professional Geologist; Over 30 years of combined experience in hydrogeologic investigation, remediation, and research.	Groundwater Hydrology
Robert Hoffman, NRC	BS Environmental Resource Management; 35+ years of experience in NEPA compliance, environmental impact assessment, alternatives identification and development, and energy facility siting	Cumulative **Effects**, Replacement Power Alternatives
Caroline Hsu, NRC	BS Molecular Biology; BA English Literature; 13 years of government experience; 3 years of management experience	Land Use and Visual Resources, Terrestrial Ecology
Stacey Imboden, NRC*	BS Meteorology; MS Environmental Engineering; 20 years of experience in NEPA reviews	Project Management
Stephen Koenick, NRC	**MS Environmental Engineering; BS Mechanical Engineering; Over 30 years of government experience**	**Management Oversight**
Karen Loomis, NRC	**MS Environmental Science and Technology; BS Environmental Resource Management; BS Agriculture and Extension Education; 15 years of government experience in environmental compliance, program management, and project management**	**Environmental Project Manager (Support)**
Nancy Martinez, NRC	BS Earth and Environmental Science; AM Earth and Planetary Science; 13 years of experience in environmental impact analysis	Air Quality, Meteorology and Climatology, Noise, Greenhouse Gases, Climate Change~~, Historic and Cultural Resources~~

Table 6-1 List of Preparers (Continued)

Name	Education and Experience	Function or Expertise
Donald Palmrose, NRC	BS Nuclear Engineering; MS Nuclear Engineering; PhD Nuclear Engineering; 35+ years of experience including operations on U.S. Navy nuclear powered surface ships, technical and NEPA analyses, nuclear authorization basis support for DOE, and NRC project management	Human Health
Jeffrey Rikhoff, NRC	MRP Regional Planning; MS Economic Development and Appropriate Technology; BA English; 44 years of combined industry and government experience in NEPA compliance for DOE Defense Programs/NNSA and Nuclear Energy, DoD, and DOI; project management; socioeconomics and impact analysis, historic and cultural resource impact assessments, consultation with American Indian tribes, and comprehensive land-use and development planning studies	Historic and Cultural Resources, Socioeconomics
David Anderson, PNNL	MS Forest Economics; BS Forest Resources; 33 years of experiences in NEPA planning, national and regional economic impact modeling, socioeconomics, and environmental impact analysis	Socioeconomic mapping and analysis
Dan Nally, PNNL	MA Urban and Environmental Policy and Planning; BS Biology; 11 years of experience in preparation and review of NEPA documents, related regulatory compliance, and conducting public outreach and engagement	Project Management, Ecological Resources

*These individuals supported the preparation of the November 2021 first draft report for comment (NRC 2021-TN7293) but not the second draft report for comment.

7 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM THE NRC SENDS COPIES OF THIS SEIS[1]

Table 7-1 List of Agencies, Organizations, and Persons to Whom the NRC Sends Copies of this SEIS

Name and Title	Affiliation
Kenneth A. Mack **Director, Licensing and Regulatory Compliance**	**Florida Power & Light Company**
Alauna Keeley NEPA Team	U.S. Environmental Protection Agency, Region 5
Jason Knutson Wastewater Section Chief	Wisconsin Department of Natural Resources
Kate Angel **Program Manager**	Wisconsin Coastal Management Program
U.S. Fish and Wildlife Service	Green Bay Ecological Services Field Office
Reid Nelson Director	Office of Federal Agency Programs Advisory Council on Historic Preservation
Daina Penkiunas State Historic Preservation Officer	State Historic Preservation Office Wisconsin Historical Society
Tyler B. Howe, PhD State Archaeologist Compliance Section Manager	State Historic Preservation Office Wisconsin Historical Society
Robert Blanchard Chairman	Bad River Band of Lake Superior Chippewa
John Barrett Chairman	Citizen Potawatomi Nation
James A. Crawford Chairman	Forest County Potawatomi Community
Jeffrey Stiffarm President	Fort Belknap Indian Community
Kenneth Meshigaud Chairperson	Hannahville Indian Community
John Greendeer President	Ho-Chunk Nation
Louis Taylor Chairman	Lac Courte Oreilles Band of Lake Superior Chippewa Indians
John D. Johnson, Sr. President	Lac Du Flambeau Band of Lake Superior Indians

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

Table 7-1 List of Agencies, Organizations, and Persons to Whom the NRC Sends Copies of this SEIS (Continued)

Name and Title	Affiliation
Regina Gasco-Bentley Chairperson	Little Traverse Bay Bands of Odawa Indians
Bob Peters, Chairman	Match-e-be-nash-she-wish Band of Pottawatomi
Gena Kakkak Chairman	Menominee Indian Tribe of Wisconsin
Douglas G. Lankford Chief	Miami Tribe of Oklahoma
Dorie Rios Chairperson	Nottawaseppi Huron Band of the Potawatomi
Tehassi Hill Chairman	Oneida Nation of Wisconsin
Kalisha Dixon Pheasant Chief	Ottawa Tribe of Oklahoma
Matthew J. Wesaw Chairman	Pokagon Band of Potawatomi Indians
Joseph Rupnick Chairperson	Prairie Band Potawatomi Nation
Nicole L. Boyd Chairwoman	Red Cliff Band of Lake Superior Chippewa Indians
Robert VanZile, Jr. Chairman	Sokaogon Chippewa Community
Susan Lowe Chairwoman	St. Croix Chippewa Indians of Wisconsin
Shannon Holsey President	Stockbridge-Munsee Community Band of Mohican Indians
Victoria Kitcheyan Chairwoman	Winnebago Tribe of Nebraska

Note: This table includes recipients specified by 10 CFR 51.74 (TN10253**).** The NRC staff has listed the names of commenters during the scoping in the scoping summary report (Agencywide Documents Access and Management System Accession No. ML21194A166). **Distribution was made** to those commenters who provided contact information. **Additionally, while also not listed, the NRC staff made distribution to individuals and organizations who provided comments on the November 2021 first draft report for comment** (NRC 2021-TN7293) **if contact information was provided (see ML25063A120). The NRC staff made every reasonable effort to update recipient information.**

8 INDEX

Chapter 8 of the 2021 draft supplemental environmental impact statement (DSEIS; NRC 2021-TN7293) has been deleted.

APPENDIX A

COMMENTS RECEIVED ON THE POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2 ENVIRONMENTAL REVIEW

There are no substantive changes to Appendix A of the 2021 draft supplemental environmental impact statement (DSEIS; NRC 2021-TN7293).

A.1 References

NRC (U.S. Nuclear Regulatory Commission). 2021. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23: Second Renewal Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2, Draft Report for Comment.* NUREG-1437, Supplement 23, Second Renewal, Washington, D.C. ADAMS Accession No. ML21306A226. TN7293.

APPENDIX B

APPLICABLE LAWS, REGULATIONS, AND OTHER REQUIREMENTS[1]

There are no substantive changes to this section of Appendix B of the 2021 draft supplemental environmental impact statement (DSEIS; NRC 2021-TN7293).

B.1 Federal and State Requirements

Point Beach Nuclear Plant, Units 1 and 2 (Point Beach), is subject to various Federal and State requirements. Table B-1 lists the principal Federal and State regulations and laws that are used or mentioned in this supplemental environmental impact statement (SEIS) for Point Beach.

Table B-1 Federal and State Requirements [There are no changes to this table in the 2021 DSEIS]

B.2 Operating Permits and Other Requirements

Table B-2 lists the permits and licenses issued by Federal, State, and local authorities for activities at Point Beach~~, as identified in Chapter 9 of NextEra's Environmental Report~~.

Table B-2 Operating Permits and Other Requirements

Permit	Responsible Agency	Number	Expiration Date	Authorized Activity
Point Beach Nuclear License to Operate Unit 1	NRC	DPR-24	10/5/2030	Operation of Unit 1
Point Beach Nuclear License to Operate Unit 2	NRC	DPR-27	3/8/2033	Operation of Unit 2
General license for storage of spent fuel at power reactor sites	NRC	General Permit	NA	Storage of power reactor spent fuel and other associated radioactive materials in an **independent spent fuel storage installation**.
Notification of Regulated Waste Activity	EPA	EPA ID Number: WID093422657	NA	Hazardous Waste Generation and Transport

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

Table B-2 Operating Permits and Other Requirements (Continued)

Permit	Responsible Agency	Number	Expiration Date	Authorized Activity
~~Clean Water Act Section 404~~	~~USACE~~	~~MVP-2014-01045-SJW~~	~~3/18/2022~~	~~Permit to perform bank stabilization activities on the shoreline of Lake Michigan at PBN.~~
Generator Site Access Permit	State of Utah DEQ	0906005280	~~7/26/2022~~ **7/26/2025**	Radioactive waste disposal at site in Utah
License to ship radioactive material	TN Dept. of Environment and Conservation	~~T-WI002-L21~~ **T-WI002-L24**	~~12/31/2021~~ **12/31/2024**	Shipment of radioactive material to processing facility in Tennessee.
Hazardous waste transportation/ shipment	U.S. Department of Transportation	~~051121550052D~~ **052623550096F**	~~6/30/2022~~ **7/26/2025**	Hazardous materials shipments
Underground Storage Tank Registration	WI Department of Commerce	Owner ID: 1114232 Site ID: 652382 Tank IDs: 285454, 764837, 764843	NA	Storage of flammable material in underground tanks
Aboveground Storage Tank Registration	WI Department of Commerce	Owner ID: 1114232 Site ID: 652382. Tank IDs: 206578, 206579, 206581, ~~206582,~~ 206583, 206615, 206616, 206690, 455264, 455274, 1131794, 1131800, 1131801, 1131802, 1131803, 1131804, 1131805, 1131806, 1131807, 1325478, 1325484, 1370484, 1599013		Storage of flammable material in aboveground tanks
Scientific Collectors Permit	WDNR	~~SCP-FM-2021-006~~ **SCP-FM-2024-009**	~~Expires 12/31/2021~~ **12/31/2024**	Collection of fish for scientific purposes.
~~Permit~~	~~WDNR~~	~~IP-NE-2019-36-03112~~	~~10/23/2024~~	~~Permit to install riprap on the banks of Lake Michigan at PBN.~~

Table B-2 Operating Permits and Other Requirements (Continued)

Permit	Responsible Agency	Number	Expiration Date	Authorized Activity
Individual WPDES permit	WDNR	~~WI-0000957-08-0~~ **WI-0000957-09-0**	~~6/30/2021 (Applied for under current permit, awaiting new permit)~~ **9/30/2029**	PBN discharges to Lake Michigan
General WPDES industrial stormwater discharge permit (Tier 2)	WDNR	WI-S067857-5	6/2/2025	Stormwater runoff from industrial facilities.
Air Pollution Control Operation Permit and Air Operation Permit Compliance Certification	WDNR	~~436034500-P32~~ **436034500-P40**	~~7/6/2022~~ **4/12/2028**	Air emissions from gas turbines, boilers, generators, and fire pumps; certification that PBN complies with Wisconsin's administrative code.
Registration	WDNR	61469 ~~60465~~ ~~61745~~	**5/1/2025** ~~5/1/2022~~ ~~2/1/2024~~ ~~11/1/2021~~	Non-transient non-community water supply registration/ small water system operator certification.
Registration/License	WDNR	Laboratory ID: 436034500	~~Expect confirmation of permit renewal in August 2021; Expected Expiration 8/31/2022~~ **8/31/2025**	Registers NextEra Point Beach as a laboratory licensed to perform environmental sample analysis in support of covered environmental programs.
Registration/License	WDNR	Laboratory ID: 436034500	~~Expect confirmation of permit renewal in August 2021; Expected Expiration 8/31/2022~~ **8/31/2025**	Registers NextEra Point Beach as a laboratory licensed to perform environmental sample analysis in support of covered environmental programs.
Drinking water/ groundwater wells	WDNR	36-3-0017, Approval numbers: 52826, 68865, 52824, 71777, 01176	NA	Approval for high-capacity well with listing of previously approved wells.

Table B-2 Operating Permits and Other Requirements (Continued)

Permit	Responsible Agency	Number	Expiration Date	Authorized Activity
Registration to withdrawal water in an amount averaging 100,000 gallons per day or more in any 30-day period from the Great Lakes Basin	WDNR	10208	~~5/23/2023~~ **12/8/2031**	Groundwater withdrawal for use as potable, process, and cooling water.
Authorization to operate a wastewater treatment plant	WDNR	23750 ~~18490~~ ~~34859~~	**7/1/2027** ~~7/1/2024~~ ~~12/1/2023~~ ~~**5/1/2022**~~	Wastewater treatment plant operating permit.
Manitowoc County Zoning Ordinance	Manitowoc County	66-66	NA	Use of property for electric power plant.

NA = not applicable
Source: NRC 2021-TN11331, NextEra 2024-TN11258.

B.3 References

NextEra (NextEra Energy). 2024. Letter from K.A. Mack, Director, Licensing and Regulatory Compliance, to NRC Document Control Desk, dated December 2, 2024, regarding "Point Beach Nuclear Plant, Units 1 and 2, Subsequent License Renewal Application Environmental Review, Supplemental Environmental Audit, Response to Requests for Confirmation of Information and Requests for Additional Information." Two Rivers, Wisconsin. ADAMS Accession No. ML24337A109. TN11258.

NRC (U.S. Nuclear Regulatory Commission). 2021. Letter from A.H. Bradford, Director, Division of New and Renewed Licenses, Office of Nuclear Reactor Regulation, to D. Moul, Executive Vice President, Nuclear Division and Chief Nuclear Officer, Florida Power & Light Company, dated January 15, 2021, regarding "Point Beach Nuclear Plant, Units 1 and 2 - Determination of Acceptability and Sufficiency for Docketing, Proposed Review Schedule, and Notice of Opportunity to Request a Hearing Regarding the NextEra Energy Point Beach, LLC Application for Subsequent License Renewal (EPID No. L-2020-SLR-0002)." Washington, D.C. ADAMS Accession Package No. ML21006A427. TN11331.

NRC (U.S. Nuclear Regulatory Commission). 2021. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23: Second Renewal Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2, Draft Report for Comment.* NUREG-1437, Supplement 23, Second Renewal, Washington, D.C. ADAMS Accession No. ML21306A226. TN7293.

APPENDIX C

CONSULTATION CORRESPONDENCE[1]

C.1 Endangered Species Act Section 7 Consultation

There are no substantive changes to this section of Appendix C of the 2021 draft supplemental environmental impact statement (DSEIS; NRC 2021-TN7293).

C.2 Federal Agency Obligations under Section 7 of the Endangered Species Act

There are no substantive changes to this section of the 2021 DSEIS.

C.3 Biological Evaluation

Subsequent license renewal **(SLR)** does not require the preparation of a biological assessment because it is not a major construction activity. Nonetheless, the NRC staff must consider the impacts of its actions on federally listed species and designated critical habitats. In cases where the staff finds that **SLR** "may affect" ESA-protected species or habitats, ESA Section 7 requires the NRC to consult with the relevant Service(s).

To support such consultations, the NRC staff has incorporated its analysis of the potential impacts of the proposed **SLR** into Section 3.8 of this supplemental environmental impact statement (SEIS). The NRC staff refers to its ESA analysis as a "biological evaluation."

The NRC staff structured its evaluation in accordance with the Services' suggested biological assessment contents described at 50 CFR 402.12(f) (TN4312). Section 3.8.1 of this SEIS describes the action area as well as the ESA-protected species and habitats potentially present in the action area. Section 3.8.2 assesses the potential effects of the proposed **SLR** on the ESA-protected species and habitats present in the action area and contains the NRC's effect determinations for each of those species and habitat. ~~This section also addresses cumulative effects.~~ Finally, Sections 3.8.3 through 3.8.6 address the potential effects of the no-action alternative and the replacement power alternatives. **The results of the NRC staff's analysis are summarized in Table C-1.**

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

Table C-1 Effect Determinations for Federally Listed and Proposed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction for Point Beach Subsequent License Renewal

Species or Critical Habitat	Federal Status[a]	Potentially Present in the Action Area?	ESA Effect Determination[b]	FWS Concurrence Date[c]
northern long-eared bat (*Myotis septentrionalis*)	FE	Occasionally	NLAA	2/09/2021, 12/03/2024
tricolored bat (*Perimyotis subflavus*)	FPE	Occasionally	NLAA	12/03/2024
piping plover (Charadrius melodus)	FE	Occasionally	NLAA	11/09/2021
Hine's emerald dragonfly (*Somatochlora hineana*)	FE	No	NE	N/A
monarch butterfly (*Danaus plexippus*)	FPT	Occasionally	NLAA	N/A
rusty patch bumblebee (*Bombus affinis*)	FE	No	NE	N/A
dwarf lake iris (*Iris lacustris*)	FT	No	NE	N/A
Pitcher's thistle (*Cirsium pitcheri*)	FT	No	NE	N/A
Critical habitat of the piping plover	FD	No	NE	N/A

(a) Indicates protection status under the Endangered Species Act. FD = federally designated; FE = federally endangered; FPE = federally proposed for listing as endangered; FPT = federally proposed for listing as threatened; and FT = federally threatened.
(b) The NRC staff makes its effect determinations for federally listed species in accordance with the language and definitions specified in the FWS and NMFS Endangered Species Consultation Handbook (FWS and NMFS 1998-TN1031). NE = no effect and NLAA = may affect but is not likely to adversely affect.
(c) The ESA does not require Federal agencies to seek FWS concurrence for "no effect" determinations for federally listed species and designated critical habitats or for agency actions that are not likely to jeopardize the continued existence of proposed species. N/A = not applicable.

C.4 Chronology of Endangered Species Act Section 7 Consultation

Endangered Species Act Section 7 Consultation with the U.S. Fish and Wildlife Service

~~As part of its environmental review, the NRC staff considered whether any federally listed, proposed, or candidate species or proposed or designated critical habitats may be present in the action area (as defined at 50 CFR 402.02 and described in Section 3.8.1.1 of this SEIS) for the proposed action of Point Beach subsequent license renewal. With respect to species under the FWS's jurisdiction, the NRC staff submitted project information to the FWS's Environmental Conservation Online System Information for Planning and Conservation system. The FWS provided the NRC with a list of threatened and endangered species that may occur in the action area. The list included two species: the northern long-eared bat (*Myotis septentrionalis*) and the piping plover (*Charadrius melodus*). In addition to these species, the NRC considered whether federally listed species assessed in previous NRC reviews in connection with Point Beach actions were relevant to the current review. However, the NRC staff determined that those species had been delisted or did not have the potential to occur in the action area based on available survey or ecological information. The staff also performed a preliminary analysis of piping plover critical habitat. Critical habitat Unit WI-5 lies approximately 3 mi (5 km) south of the~~

~~Point Beach action area. However, the staff determined that this critical habitat is not relevant to the current subsequent license renewal review because it is outside of the action area and would be unaffected by the proposed action.~~

The NRC staff evaluated the potential impacts of the proposed action on northern long-eared bat**, tricolored bat, ~~and~~** piping plover**, and monarch butterfly** in Section 3.8.2 of this SEIS. The staff concluded that the proposed **SLR** *may affect but is not likely to adversely affect* these species.

In 2021, the NRC staff consulted with the FWS concerning the potential impacts of Point Beach SLR on the northern long-eared bat. In a letter dated February 9, 2021, the FWS concurred with the **NRC staff's *may affect but is not likely to adversely affect* (NLAA) determination for this species** on the basis that activities associated with the proposed **SLR** with the potential to affect the **species** are consistent with the activities analyzed in an FWS 2016 programmatic biological opinion (FWS 2016-TN7400, FWS 2021-TN9740). **The NRC staff re-evaluated the northern long-eared bat under the FWS's Rangewide Northern Long-eared Bat and Tricolored Bat Determination Key (DKey), which was released in October 2024. The DKey resulted in an NLAA determination, and the FWS concurred with this determination in a letter dated December 3, 2024 (**FWS 2024-TN11313)**.** The FWS's February 9, 2021, **and December 3, 2024,** letter**s** document that the NRC staff has fulfilled its ESA Section 7(a)(2) obligations with respect to this species.

In correspondence dated November 9, 2021, the NRC requested the FWS's concurrence with its **NLAA** determination concerning **the** piping plover (NRC 2021-TN9162). The FWS concurred with the staff's determination on November 10, 2021 (FWS 2021-TN7606). **The NRC staff has not identified any new information that would change this determination or otherwise necessitate the staff to reinitiate consultation with the FWS concerning this species.** Th**e FWS's November 10, 2021,** letter documents that the NRC staff has fulfilled its ESA Section 7(a)(2) obligations with respect to this species.

ESA regulations in 50 CFR 402.10(a) (TN4312**) require Federal agencies to confer with the Services on any agency action that is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat. Therefore, based on its NLAA determinations, the NRC is not required to confer with the FWS on the tricolored bat or the monarch butterfly. However, the NRC staff evaluated the tricolored bat under the FWS's Rangewide Northern Long-eared Bat and Tricolored Bat Determination Key (DKey), which was released in October 2024. The DKey resulted in an NLAA determination, and the FWS concurred with this determination in a letter dated December 3, 2024. The NRC staff has fulfilled its ESA Section 7(a)(2) obligations with respect to these species.**

Table C-2 lists the correspondence relevant to the NRC's ESA Section 7 consultation with the FWS.

Table C-2 Endangered Species Act Section 7 Consultation Correspondence with the U.S. Fish and Wildlife Service [Table C-1 in the 2021 DSEIS]

Date	Description	ADAMS Accession No.[(a)]
Feb 9, 2021	Wisconsin Ecological Services Field Office (FWS) to B. Arlene (NRC), List of threatened and endangered species for the proposed Point Beach subsequent license renewal	ML21040A484
Feb 9, 2021	Wisconsin Ecological Services Field Office (FWS) to B. Arlene (NRC), Verification letter for the proposed Point Beach subsequent license renewal under the January 5, 2016, programmatic biological opinion on final 4(d) rule for northern long-eared bat and activities excepted from take prohibition	ML21040A485
Nov 9, 2021	**B. Arlene (NRC) to S. Quamme (FWS), Request for concurrence with ESA determination for Point Beach subsequent license renewal, issuance of draft SEIS, and opportunity for public comment**	**ML21307A152**
Nov 10, 2021	**D. Simpkins (FWS) to B. Arlene (NRC), Concurrence with ESA determination for Point Beach subsequent license renewal**	**ML21314A421**
Dec 3, 2024	**Wisconsin Ecological Services Field Office (FWS) to B. Arlene (NRC), Updated list of threatened and endangered species for the proposed Point Beach subsequent license renewal**	**ML24338A145**
Dec 3, 2024	**Wisconsin Ecological Services Field Office (FWS) to B. Arlene (NRC), Federal agency coordination under ESA Section 7 for Point Beach SLR and concurrence with "not likely to adversely affect" finding for northern long-eared and tricolored bats**	**ML24338A144**

ESA = Endangered Species Act; FWS = U.S. Fish and Wildlife Service; NRC = U.S. Nuclear Regulatory Commission; SLR = subsequent license renewal.

(a) These documents are accessible through the NRC's Agencywide Documents Access and Management System (ADAMS) at https://adams.nrc.gov/wba/.

Endangered Species Act Section 7 Consultation with the National Marine Fisheries Service

There are no substantive changes to this section of the 2021 DSEIS.

C.5 Magnuson–Stevens Act Essential Fish Habitat Consultation

There are no substantive changes to this section of the 2021 DSEIS.

C.6 National Marine Sanctuaries Act Consultation

There are no substantive changes to this section of the 2021 DSEIS.

C.7 National Historic Preservation Act Section 106 Consultation

There are no substantive changes to this section of the 2021 DSEIS.

C.8 References

50 CFR Part 402. *Code of Federal Regulations,* Title 50, *Wildlife and Fisheries*, Part 402, "Interagency Cooperation—Endangered Species Act of 1973, as amended." TN4312.

FWS (U.S. Fish and Wildlife Service). 2021. Letter from D. Simpkins, FWS, to A. Briana, NRC, dated November 10, 2021, regarding "NRC Request for Concurrence with Endangered Species Act Determination for Point Beach Subsequent License Renewal, Issuance of Draft Supplemental Environmental Impact Statement, and Opportunity for Public Comment." FWS No. 03E17000-2021-SLI-0702. Washington, D.C. ADAMS Accession No. ML21314A421. TN7606.

FWS and NMFS (U.S. Fish and Wildlife Service and National Marine Fisheries Service). 1998. *Endangered Species Act Consultation Handbook, Procedures for Conducting Section 7 Consultation and Conference*. Washington, D.C. ADAMS Accession No. ML14171A801. TN1031.

NRC (U.S. Nuclear Regulatory Commission). 2021. Email from B. Arlene, to S. Quamme, dated November 9, 2021, regarding "NRC Request for Concurrence with Endangered Species Act Determination for Point Beach Subsequent License Renewal, Issuance of Draft Supplemental Environmental Impact Statement, and Opportunity for Public Comment (Consultation Code: 03E17000-2021-SLI-0702)." Washington, D.C. ADAMS Accession No. ML21307A152. TN9162.

NRC (U.S. Nuclear Regulatory Commission). 2021. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23: Second Renewal Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2, Draft Report for Comment.* NUREG-1437, Supplement 23, Second Renewal, Washington, D.C. ADAMS Accession No. ML21306A226. TN7293.

APPENDIX D

CHRONOLOGY OF ENVIRONMENTAL REVIEW CORRESPONDENCE[1]

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC) and external parties as part of the agency's environmental review of the Point Beach Nuclear Plant Units 1 and 2 (Point Beach) subsequent license renewal application. This appendix does not include consultation correspondence or comments received during the scoping process. For a list and discussion of consultation correspondence, see Appendix C of this supplemental environmental impact statement (SEIS). For scoping comments, see Appendix A of this SEIS and the NRC's, "Scoping Summary Report" (Agencywide Documents Access and Management System (ADAMS) Accession No. ML21194A166 (NRC 2021-TN11332). All documents are available electronically from the NRC's Public Electronic Reading Room at https://www.nrc.gov/reading-rm.html. From this site, the public can gain access to ADAMS, which provides text and image files of the NRC's public documents. The ADAMS accession number for each document is included in the following table.

D.1 Environmental Review Correspondence

Table D-1 lists the environmental review correspondence, by date, beginning with the request by NextEra for subsequent **license** renewal of the operating licenses for Point Beach.

Table D-1 Environmental Review Correspondence

Date	Correspondence Description	ADAMS Accession No.[(a)]
11/16/2020	Point Beach Nuclear Plant, Units 1 and 2–Transmittal Letter regarding Application for Subsequent License Renewal	ML20329A293
11/16/2020	Point Beach Nuclear Plant, Units 1 and 2 Subsequent License Renewal Application	ML20329A247
11/16/2020	Appendix E: Applicant's Environmental Report Subsequent Operating License Renewal Point Beach Nuclear Plant, Units 1 and 2	ML20329A248
12/22/2020	Letter from NRC to NextEra regarding receipt and availability of Point Beach subsequent license renewal application	ML20328A075
1/8/2021	E-mail from NRC to NextEra transmitting acceptance of Point Beach Nuclear Plant, Units 1 and 2 Subsequent License Renewal Application for docketing	ML21012A365

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

Table D-1 Environmental Review Correspondence (Continued)

Date	Correspondence Description	ADAMS Accession No.[(a)]
1/15/2021	Point Beach Nuclear Plant, Units 1 and 2–Determination of Acceptability and Sufficiency for Docketing, Proposed Review Schedule, and Notice of Opportunity to Request a Hearing Regarding the NextEra Energy Point Beach, LLC Application for Subsequent License Renewal (EPID NO. L-2020-SLR-0002)	ML21006A417
1/15/2021	Point Beach Units 1 and 2 Subsequent License Renewal Application Online Reference Portal	ML21005A058
1/22/2021	*Federal Register* Notice for Opportunity to Request a Hearing and Petition for Leave to Intervene	ML21015A214; 86 FR 6684
1/26/2021	Meeting Notice: Environmental Scoping Meeting Related to the Point Beach Nuclear Plant, Unit Nos. 1 and 2 (Point Beach), Subsequent License Renewal Application	ML21034A458
1/26/2021	Point Beach Nuclear Plant, Unit Nos. 1 and 2: Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process	ML20351A392
2/1/2021	Federal Register Notice of Intent to Prepare an Environmental Impact Statement and Conduct Scoping Process for Point Beach Nuclear Plant Units 1 and 2	ML20351A395; 86 FR 7747
2/8/2021	Letter to Wisconsin Department of Natural Resources regarding Point Beach Nuclear Plant, Units 1 and 2, Clean Water Act Section 401 Permit	ML21033B090
2/17/2021	Environmental Scoping Meeting Related to Point Beach Nuclear Plant, Units 1 and 2, Meeting Presentation Slides	ML21042B945
3/3/2021	Environmental Scoping Comments from EPA Region 5	ML21069A228
3/15/2021	Site Audit Plan for Environmental Site Audit	ML21070A207
3/17/2021	Summary of February 17, 2021, Scoping Meeting	ML21075A333
5/10/2021	Letter from NextEra to NRC Document Control Desk transmitting Subsequent License Renewal Application- Environmental Report Supplement 1	ML21131A105
5/11/2021	Summary of Environmental Site Audit	ML21124A031
5/15/2021	Point Beach Nuclear Plant, Units 1 and 2, Requests for Confirmation of Information and Requests for Additional Information	ML21134A058; ML21134A061
6/10/2021	Point Beach Nuclear Plant, Units 1 and 2, Response to Requests for Confirmation of Information and Requests for Additional Information	ML21161A214
8/4/2021	Submittal of Subsequent License Renewal Application-Environmental Report Environmental Authorizations Update	ML21006A417
8/12/2021	Issuance of Scoping Summary Report	ML21194A166
6/25/2024	**Letter from NextEra to Document Control Desk, Schedule for Subsequent License Renewal Environmental Review for Point Beach Units 1 and 2**	**ML24177A223**

Table D-1 Environmental Review Correspondence (Continued)

Date	Correspondence Description	ADAMS Accession No.[(a)]
8/22/2024	**Letter from NRC to NextEra, Response to Request for Re-Engagement Regarding the Subsequent License Renewal Environmental Review for Point Beach Nuclear Plant, Units 1 and 2**	**ML24207A020**
09/05/2024	**Email from NRC to NextEra: Supplemental Audit Information Needs (Data Gaps), Point Beach Nuclear Plant, Units 1 and 2 Update to Environmental Review, 2024**	**ML24256A137**
10/02/2024	**Federal Register Notice of Intent to Prepare Supplement to the Supplemental Environmental Impact Statement; NextEra Energy Point Beach, LLC; Point Beach Nuclear Plant, Units 1 and 2**	**ML24239A363; 89 FR 80269**
10/24/2024	**Federal Register Notice of Intent to Prepare Supplement to the Supplemental Environmental Impact Statement; NextEra Energy Point Beach, LLC; Point Beach Nuclear Plant, Units 1 and 2; Correction**	**ML24291A011; 89 FR 84938**
10/31/2024	**September 2024 Point Beach Supplemental Environmental Audit Summary**	**ML24296A072**
12/02/2024	**Subsequent License Renewal Application Environmental Review, Supplemental Environmental Audit Response to Requests for Confirmation of Information and Requests for Additional Information**	**ML24337A109**

(a) These documents are accessible through the NRC's Agencywide Documents Access and Management System (ADAMS) at https://adams.nrc.gov/wba/.

D.2 References

NRC (U.S. Nuclear Regulatory Commission). 2021. Letter from R.B. Elliott, Chief, Environmental Review License Renewal Branch, Division of Rulemaking, Environment, and Financial Support, Office of Nuclear Material Safety and Safeguards, to M. Strope, Site Vice President, NextEra Energy Point Beach, LLC, dated August 12, 021, regarding "Issuance of Environmental Scoping Summary Report Associated with the U.S. Nuclear Regulatory Commission Staff's Review of the Point Beach Nuclear Plant, Units 1 and 2, Subsequent License Renewal Application (EPID No. L-2020-SLE-0002) (Docket Nos. 50-266 and 50-301)." Washington, D.C. ADAMS Accession Package No. ML21194A166. TN11332.

APPENDIX E

PROJECTS AND ACTIONS CONSIDERED IN THE CUMULATIVE IMPACTS ANALYSIS[1]

E.1 Overview

Table E-1 identifies other past, present, and reasonably foreseeable ~~future~~ projects and actions that the U.S. Nuclear Regulatory Commission (NRC) staff considered when analyzing potential cumulative environmental impacts related to the continued operation of Point Beach Nuclear Plant, Units 1 and 2 (Point Beach) for an additional 20 years. The staff generally considered projects and actions within a 30-mi (48-km) radius of the Point Beach site. The staff's analysis of potential cumulative impacts associated with the proposed action (subsequent license renewal) is presented in Section 3.16 of this supplemental environmental impact statement. However, because of the uniqueness of each environmental resource area evaluated and its associated geographic area of analysis, Section 3.16 does not consider or explicitly evaluate every project and action listed in Table E-1.

Table E-1 Projects and Actions NRC Staff Considered in the Point Beach Cumulative Impacts Analysis

Project Name	Summary of Project	Location (Relative to Point Beach)	Status
Point Beach Bank Stabilization Project	Installation of approximately 430 linear ft. (130 m) of shoreline riprap, and 1,200 linear ft (370 m) fill material to create offshore wave barrier/breakwater	Onsite, along, and in Lake Michigan	Project completed August 2020 (NextEra 2021-TN11262)
Point Beach Solar Facility	Solar photovoltaic facility with 100 MW generating capacity on approximately 500 ac (200 ha)	Onsite, spread across multiple areas south, southwest, and northwest of the Point Beach power block	**Project completed September 2021** ~~Under construction, with operations scheduled to commence in late 2021~~ (NextEra 2020-TN11241, NextEra 2021-TN11262; NextEra 2024-TN11258)

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

Table E-1 Projects and Actions NRC Staff Considered in the Point Beach Cumulative Impacts Analysis (Continued)

Project Name	Summary of Project	Location (Relative to Point Beach)	Status
Two Creeks Solar Facility	Solar photovoltaic facility with 150 MW generating capacity on approximately 800 ac (320 ha)	Located primarily on acreage adjacent to the Point Beach site, with supporting components traversing portions of the property	Commenced operations in 2020 (NextEra 2020-TN11241, NextEra 2021-TN11262; NextEra 2024-TN11258; WSJ 2020-TN11339)

There are no further substantive changes to Table E-1 of Appendix E of the 2021 draft supplemental environmental impact statement (DSEIS; NRC 2021-TN7293).

E.2 References

NextEra (NextEra Energy). 2020. Letter from M. Strope, Site Vice President, NextEra Energy Point Beach, LLC, to NRC Document Control Desk, dated November 16, 2020, regarding "Point Beach Nuclear Plant Units 1 and 2, Application for Subsequent Renewed Facility Operating Licenses." Two Rivers, Wisconsin. ADAMS Accession Package No. ML20329A292. TN11241.

NextEra (NextEra Energy). 2021. Letter from W.D. Maher, Licensing Director, Nuclear Licensing Projects, to NRC Document Control Desk, dated June 10, 2021, regarding "Point Beach Nuclear Plant Units 1 and 2, Subsequent License Renewal Application - Environmental Report Review Requests for Confirmation of/Additional Information (RCI/RAI) Set 1 Responses." L-2021-116, Two Rivers, Wisconsin. ADAMS Accession No. ML21161A214. TN11262.

NextEra (NextEra Energy). 2024. Letter from K.A. Mack, Director, Licensing and Regulatory Compliance, to NRC Document Control Desk, dated December 2, 2024, regarding "Point Beach Nuclear Plant, Units 1 and 2, Subsequent License Renewal Application Environmental Review, Supplemental Environmental Audit, Response to Requests for Confirmation of Information and Requests for Additional Information." Two Rivers, Wisconsin. ADAMS Accession No. ML24337A109. TN11258.

NRC (U.S. Nuclear Regulatory Commission). 2021. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23: Second Renewal Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2, Draft Report for Comment.* NUREG-1437, Supplement 23, Second Renewal, Washington, D.C. ADAMS Accession No. ML21306A226. TN7293.

WSJ (Wisconsin State Journal). 2020. "Wisconsin's first large-scale solar plant enters service; Two Creeks plant to power 33,000 homes." Madison, Wisconsin. Accessed January 31, 2025, at https://madison.com/news/local/environment/wisconsins-first-large-scale-solar-plant-enters-service-two-creeks-plant-to-power-33-000/article_f9dcad75-f8a7-5806-a26b-23ad8e020d6b.html. TN11339.

APPENDIX F

ENVIRONMENTAL IMPACTS OF POSTULATED ACCIDENTS[1]

This appendix describes the environmental impacts from postulated accidents that may occur at Point Beach Nuclear Plant Units 1 and 2 (Point Beach) during the subsequent license renewal period. The term "accident" refers to any unintentional event outside the normal plant operational envelope that could result in either (a) an unplanned release of radioactive materials into the environment, or (b) the potential for an unplanned release of radioactive materials into the environment.

NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (**LR** GEIS) (NRC 1996-TN288, NRC 2013-TN2654, NRC 2024-TN10161), evaluates in detail the following two classes of postulated accidents as they relate to license renewal. The **LR** GEIS conclusions are codified in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions" (TN10253).

- Design-Basis Accidents: Postulated accidents that a nuclear facility must be designed and built to withstand without loss to the systems, structures, and components necessary to ensure public health and safety.
- Severe Accidents: Postulated accidents that are more severe than design-basis accidents because they could result in substantial damage to the reactor core~~, with or without serious offsite consequences~~.

This appendix first describes the U.S. Nuclear Regulatory Commission (NRC) staff's evaluation of new and significant information related to design-basis accidents at Point Beach and then describes the staff's evaluation of new and significant information related to postulated severe accidents at Point Beach.
There are no further substantive changes to Appendix F of the 2021 draft supplemental environmental impact statement (DSEIS; NRC 2021-TN7293).

F.1 References

10 CFR Part 51. *Code of Federal Regulations*, Title 10, *Energy*, Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." TN10253.

NRC (U.S. Nuclear Regulatory Commission). 1996. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. Volumes 1 and 2, NUREG-1437, Washington, D.C. ADAMS Accession Nos. ML040690705, ML040690738. TN288.

[1] For the convenience of the reader, where this supplemental environmental impact statement, second draft report for comment retains the language of the November 2021 first draft report for comment, it identifies substantive changes to that language including text corrections or updates using red bold text for additions and red strikeout text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. In some instances, text that has not otherwise changed has been retained to provide context. Otherwise, for clarity, instead of repeating language from the November 2021 first draft report for comment, the second draft report for comment simply states that there are no substantive changes to that language.

NRC (U.S. Nuclear Regulatory Commission). 2013. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Revision 1, Washington, D.C. ADAMS Accession No. ML13107A023. TN2654.

NRC (U.S. Nuclear Regulatory Commission). 2021. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23: Second Renewal Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2, Draft Report for Comment.* NUREG-1437, Supplement 23, Second Renewal, Washington, D.C. ADAMS Accession No. ML21306A226. TN7293.

NRC (U.S. Nuclear Regulatory Commission). 2024. *Generic Environmental Impact Statement for License Renewal of Nuclear Plants*. NUREG-1437, Volume 1-3, Revision 2, Washington, D.C. ADAMS Accession No. ML24087A133. TN10161.

NRC FORM 335 **U.S. NUCLEAR REGULATORY COMMISSION**

(12-2010)

NRCMD 3.7

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

1. REPORT NUMBER
(Assigned by NRC, Add Vol., Supp., Rev., and Addendum Numbers, if any.)

NUREG-1437, Supplement 23, Second Renewal, Second Draft Report for Comment

2. TITLE AND SUBTITLE

Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 23, Second Renewal, Regarding Subsequent License Renewal for Point Beach Nuclear Plant, Units 1 and 2

Second Draft Report for Comment

3. DATE REPORT PUBLISHED

MONTH	YEAR
April	2025

4. FIN OR GRANT NUMBER

5. AUTHOR(S)

See Chapter 6

6. TYPE OF REPORT

Technical

7. PERIOD COVERED (Inclusive Dates)

8. PERFORMING ORGANIZATION - NAME AND ADDRESS (If NRC, provide Division, Office or Region, U. S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)

Division of Rulemaking, Environmental, and Financial Support
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

9. SPONSORING ORGANIZATION - NAME AND ADDRESS (If NRC, type "Same as above", if contractor, provide NRC Division, Office or Region, U. S. Nuclear Regulatory Commission, and mailing address.)

Same as above

10. SUPPLEMENTARY NOTES

Docket Nos. 50-266 and 50-301; SEIS-429-00-000-1730167609

11. ABSTRACT (200 words or less)

This is the second draft report for comment on the NRC staff's environmental review of the Point Beach subsequent license renewal application. This report for comment includes the staff's evaluation of new information obtained since the issuance of the November 2021 first draft report for comment. This information includes the new and revised environmental issues and impact determinations contained in the NRC's 2024 final rule revising its environmental protection regulation, Title 10 of the Code of Federal Regulations Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," and NUREG-1437, Revision 2. The staff also considered any new and significant information with respect to generic (i.e., Category 1) environmental issues and determinations. For the convenience of the reader, where this report retains the language of the November 2021 report, it identifies substantive changes to that language including text corrections or updates using red **bold** text for additions and red ~~strikeout~~ text for deletions. Minor editorial revisions and revisions limited to formatting are not marked. Some text that has not otherwise changed has been retained to provide context.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

NextEra Energy Point Beach
NextEra
Nuclear Regulatory Commission (NRC)
Point Beach Nuclear Plant
Point Beach
Subsequent License Renewal
Supplemental Environmental Impact Statement
National Environmental Policy Act (NEPA)

13. AVAILABILITY STATEMENT

unlimited

14. SECURITY CLASSIFICATION

(This Page)

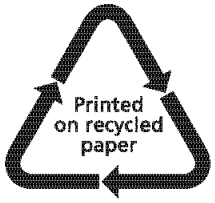
unclassified

(This Report)

unclassified

15. NUMBER OF PAGES

16. PRICE



Federal Recycling Program

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, DC 20555-0001

OFFICIAL BUSINESS

NUREG-1437
Supplement 23
Second Renewal
Second Draft

Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Supplement 23, Second Renewal, Regarding Subsequent License Renewal for Point Beach Nuclear Plant Units 1 and 2

April 2025