



Environmental Assessment and Finding of No Significant Impact for the Christopher M. Crane Clean Energy Center Reauthorization of Power Operations Project Final Report

Docket Number: 50-289

Issued: September 2026



Cooperating Agency:



U.S. Department of Energy

EXECUTIVE SUMMARY

The Christopher M. Crane Clean Energy Center (CCEC) (formerly Three Mile Island Nuclear Station, Unit 1), located on Three Mile Island within the Susquehanna River in Londonderry Township, Dauphin County, Pennsylvania, consists of a single pressurized water nuclear reactor. The facility shut down on September 20, 2019. Prior to shutdown and in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.82(a)(1) (TN249), Exelon Generation Company, LLC (now Constellation Energy Generation, LLC [CEG]), as the licensee who operated the facility prior to entering decommissioning, on June 20, 2017, submitted a certification to the U.S. Nuclear Regulatory Commission (NRC or Commission) for the planned permanent cessation of operations on or about September 30, 2019 (Exelon 2017-TN5479). This was followed by the submittal of a certification of the permanent removal of fuel from the reactor vessel on September 26, 2019 (Exelon 2019-TN12751). As part of the transition from an operating reactor to a reactor in decommissioning status, the NRC issued a series of amendments to Renewed Facility Operating License (RFOL) No. DPR-50 to reflect the permanently defueled (possession-only) status of the facility. The current licensing status of the CCEC is that the RFOL remains in place and specifically authorizes CEG to perform decommissioning and associated activities, but does not authorize power operations.

In late 2024, CEG expressed its intent to resume power operations at the CCEC and submitted its proposed regulatory path for doing so in a letter dated November 4, 2024 (CEG 2024-TN12752). Throughout 2024 and 2025, CEG submitted to the NRC a set of licensing and regulatory requests to support reauthorizing power operations at the CCEC through April 19, 2034, the end of the current operating license term under the CCEC RFOL. These included a request to amend the CCEC RFOL to reflect the change of the facility's name from Three Mile Island Nuclear Station, Unit 1 to the CCEC; and the NRC approved this request on May 13, 2025 (NRC 2025-TN12753).

This environmental assessment (EA) summarizes the environmental review conducted by the NRC staff for the set of licensing and regulatory requests submitted by CEG in support of the reauthorization of power operations of the CCEC through April 19, 2034. In addition to the set of licensing and regulatory requests related to the potential reauthorization of power operations of the CCEC, CEG is requesting Federal financial assistance from the U.S. Department of Energy (DOE) Office of Energy Dominance Financing (formerly Loan Programs Office) to support the resumption of power generation activities of the CCEC 835 megawatts electric (MWe) nuclear generating station. As such, the DOE Office of Energy Dominance Financing is a cooperating agency for this environmental review.

This EA follows 10 CFR 51.30 (TN10253), "Environmental assessment," and 10 CFR 51.31, "Determinations based on environmental assessment," which are the NRC's regulations for preparing EAs in accordance with the National Environmental Policy Act of 1969 (TN661), as amended. As discussed in this EA, the NRC staff determined that the reasonably foreseeable environmental effects of the proposed restoration activities and resumption of power operations at the CCEC would not be significant for each potentially affected resource area and that, therefore, a Finding of No Significant Impact for the proposed actions is warranted.

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ABBREVIATIONS AND ACRONYMS

°C	degree(s) Celsius
°F	degree(s) Fahrenheit
ac	acre(s)
ACHP	Advisory Council on Historic Preservation
ADAMS	Agencywide Documents Access and Management System
AIS	aquatic invasive species
AMSL	above mean sea level
APE	area of potential effects
ARERR	annual radioactive effluent release report
AREOR	Annual Radiological Environmental Operating Report
AWMP	Avian and Wildlife Management Procedure
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CCEC	Christopher M. Crane Clean Energy Center
CDF	core damage frequency
CEG	Constellation Energy Generation, LLC
CFR	<i>Code of Federal Regulations</i>
cfs	cubic foot/feet per second
Ci	curie(s)
cm	centimeter(s)
CO	carbon monoxide
CRPP	cultural resources protection plan
CWA	Clean Water Act
dB	decibel(s)
dBA	A-weighted decibel(s)
DBA	design basis accident
DOE	U.S. Department of Energy
EA	environmental assessment
EDF	DOE Office of Energy Dominance Financing
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ER	environmental report
ESA	Endangered Species Act of 1973, as amended
Exelon	Exelon Generation Company, LLC

FES	final environmental statement
fps	foot/feet per second
ft	foot/feet
FONSI	Finding of No Significant Impact
FWS	U.S. Fish and Wildlife Service
gal	gallon(s)
GHG	greenhouse gas
gpm	gallon(s) per minute
GWd/MTU	gigawatt-day(s) per metric ton of uranium
GWL	global warming level
ha	hectare(s)
in.	inch/inches
km	kilometer(s)
km ²	square kilometer(s)
km/h	kilometer(s) per hour
L	liter(s)
LAR	license amendment request
LLD	lower limit of detection
Lpm	Liters per minute(s)
LR GEIS	<i>Generic Environmental Impact Statement for License Renewal of Nuclear Plants</i>
m	meter(s)
m ³ /s	cubic meter(s) per second
mi	mile(s)
mi ²	square mile(s)
MBTA	Migratory Bird Treaty Act of 1918, as amended
MCL	maximum contaminant level
Mgal	million gallon(s)
Mgd	million gallon(s) per day
MLd	million liter(s) per day
mph	mile(s) per hour
mps	meter(s) per second
MPT	main power transformer
mrem	millirem(s)
MSA	Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended
MT/year	metric ton(s) per year
MWe	megawatt(s) electric

N/A	not applicable
NDCT	natural draft cooling tower
NEPA	National Environmental Policy Act of 1969, as amended
NHPA	National Historic Preservation Act of 1966, as amended
NLF	nature-like fishway
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
PADEP	Pennsylvania Department of Environmental Protection
PA SHPO	Pennsylvania State Historic Preservation Office
pCi/L	picocurie(s) per liter
PFBC	Pennsylvania Fish and Boat Commission
PM	particulate matter
PNDI	Pennsylvania Natural Diversity Inventory Pennsylvania
PNHP	National Heritage Program
PRA	probabilistic risk assessment
PSDAR	post-shutdown decommissioning activities report
RAI	request for additional information
RCI	request for confirmation of information
RCP	representative concentration pathway
REMP	radiological environmental monitoring program
RGPP	radiological groundwater protection program
RFOL	Renewed Facility Operating License
SAMA	severe accident mitigation alternative
SEIS	supplemental environmental impact statement
SF ₆	sulfur hexafluoride
SHPO	State Historic Preservation Officer
SO ₂	sulfur dioxide
SO _x	sulfur oxides
SPCC	spill prevention control and countermeasures
SRBC	Susquehanna River Basin Commission
SSP	shared socioeconomic pathway
SWPPP	stormwater pollution prevention plan
TMI-1	Three Mile Island Nuclear Station, Unit 1
TMI-2	Three Mile Island Nuclear Station, Unit 2

	tons/year	tons per year
	USACE	U.S. Army Corps of Engineers
	U.S.C.	<i>United States Code</i>
	USGCRP	U.S. Global Change Research Program
	VOC	volatile organic compound
	wt%	weight percent

CONVERSION TABLE

To Convert English to Metric Equivalents

Multiply	By	To Obtain
acres (ac)	0.4047	hectares (ha)
cubic feet (ft ³)	0.02832	cubic meters (m ³)
cubic yards (yd ³)	0.7646	cubic meters (m ³)
curies (Ci)	3.7×10^{10}	becquerels (Bq)
degrees Fahrenheit (°F) –32	0.5555	degrees Celsius (°C)
feet (ft)	0.3048	meters (m)
gallons (gal)	3.785	liters (L)
gallons (gal)	0.003785	cubic meters (m ³)
inches (in.)	2.540	centimeters (cm)
miles (mi)	1.609	kilometers (km)
pounds (lb)	0.4536	kilograms (kg)
rads	0.01	grays (Gy)
rems	0.01	sieverts (Sv)
short tons (tons)	907.2	kilograms (kg)
short tons (tons)	0.9072	metric tons (t)
square feet (ft ²)	0.09290	square meters (m ²)
square yards (yd ²)	0.8361	square meters (m ²)
square miles (mi ²)	2.590	square kilometers (km ²)
yards (yd)	0.9144	meters (m)

Note: Not all units may appear in this document.

To Convert Metric to English Equivalents

Multiply	By	To Obtain
becquerels (Bq)	2.7×10^{-11}	curies (Ci)
centimeters (cm)	0.3937	inches (in.)
cubic meters (m ³)	35.31	cubic feet (ft ³)
cubic meters (m ³)	1.308	cubic yards (yd ³)
cubic meters (m ³)	264.2	gallons (gal)
degrees Celsius (°C) +17.78	1.8	degrees Fahrenheit (°F)
grays (Gy)	100	rads
hectares (ha)	2.471	acres
kilograms (kg)	2.205	pounds (lb)
kilograms (kg)	0.001102	short tons (tons)
kilometers (km)	0.6214	miles (mi)
liters (L)	0.2642	gallons (gal)
meters (m)	3.281	feet (ft)
meters (m)	1.094	yards (yd)
metric tons (t)	1.102	short tons (tons)
sieverts (Sv)	100	rems
square kilometers (km ²)	0.3861	square miles (mi ²)
square meters (m ²)	10.76	square feet (ft ²)
square meters (m ²)	1.196	square yards (yd ²)

Note: Not all units may appear in this document.

1 INTRODUCTION

The Christopher M. Crane Clean Energy Center (CCEC) (formerly Three Mile Island Nuclear Station, Unit 1 [TMI-1])¹, located on Three Mile Island within the Susquehanna River in Londonderry Township, Dauphin County, Pennsylvania, consists of a single pressurized-water nuclear reactor designed by Babcock & Wilcox. The U.S. Atomic Energy Commission originally granted the owner an initial operating license on April 19, 1974. The U.S. Nuclear Regulatory Commission (NRC or Commission) subsequently issued Renewed Facility Operating License (RFOL) No. DPR-50 on October 22, 2009, with the operating license term expiring on April 19, 2034 (NRC 2009-TN12754).

On June 20, 2017, the licensee at the time, Exelon Generation Company, LLC (now Constellation Energy Generation, LLC [CEG]), submitted the first of two certifications under Title 10 of the *Code of Federal Regulations* (10 CFR) 50.82(a)(1) (TN249) that operation would permanently cease on or about September 30, 2019 (Exelon 2017-TN5479), followed by a certification that fuel had been permanently removed from the reactor vessel on September 26, 2019 (Exelon 2019-TN12751). In accordance with 10 CFR 50.82(a)(2), upon the docketing of these certifications, the RFOL no longer authorized operation of the reactor or emplacement or retention of fuel into the reactor vessel.

As part of the transition from an operating reactor to a reactor in decommissioning status, the NRC issued several amendments (i.e., amendment nos. 295, 296, 297, 299, 300, 301, 303, 304, and 305) changing the operating license, and its included technical specifications, to reflect the authorities and requirements for a reactor in decommissioning status (NRC 2018-TN12755, NRC 2019-TN12756, NRC 2019-TN12757, NRC 2020-TN12758, NRC 2020-TN12759, NRC 2020-TN12760, NRC 2022-TN12761, NRC 2022-TN12762, NRC 2022-TN12763, NRC 2022-TN12750). Among other things, the amendments removed language from the license regarding the authority to operate the reactor and removed the technical specifications for an operating reactor that were not relevant to decommissioning. However, even after these amendments became effective during the decommissioning period, the license remained a 10 CFR Part 50 operating license in accordance with 10 CFR 50.51(b), albeit one that had been modified by regulation and licensing actions to no longer authorize power operations.

Subsequent to the cessation of power operations and the entering into decommissioning status, as well as the licensing actions to reflect the decommissioning status, CEG began to pursue a path to resume power operations at the CCEC. This environmental assessment (EA) summarizes the environmental review conducted by the NRC staff for the set of licensing and regulatory requests submitted by CEG in support of the reauthorization of power operations at the CCEC through April 19, 2034, as further described in Section 1.1.

¹ On January 3, 2025, CEG submitted to the NRC a request to amend the license to reflect the change of the facility's name from Three Mile Island Nuclear Station, Unit 1 to the Christopher M. Crane Clean Energy Center. The NRC approved this request by license amendment no. 306, dated May 13, 2025 (NRC 2025-TN12753). Additionally, on November 16, 2021, the NRC approved an indirect license transfer application, which included changing the name of "Exelon Generation Company, LLC" to "Constellation Energy Generation, LLC" (CEG) (NRC 2026-TN13256). While some actions or events referred to herein occurred under the names "Exelon Generation Company, LLC" and "Three Mile Island Nuclear Station, Unit 1," for clarity, "CEG" and "CCEC" will generally be used as the name of the licensee and the facility, respectively, unless referring to the title of previous documents or plans.

On November 4, 2024, CEG submitted to the NRC a letter outlining a proposed regulatory path encompassing the necessary NRC licensing and regulatory actions, including the submission of license amendment requests (LARs), for the reauthorization of power operations at the CCEC (CEG 2024-TN12752). Then, throughout 2024 and 2025, CEG engaged with the NRC and submitted a set of licensing and regulatory requests for NRC approval to support the reauthorization of power operations at the CCEC through April 19, 2034, the end of the current operating license term under the CCEC RFOL. This set of requests consists of:

- A November 19, 2024, request for an exemption (CEG 2024-TN12764) from the 10 CFR 50.82(a)(2) (TN249) restriction that prohibits power operations and emplacement or retention of fuel in the reactor vessel to allow for a one-time rescission of the docketed 10 CFR 50.82(a)(1) certifications.
- LARs under 10 CFR 50.90, as listed in Table 1-1 of this EA.

The exemption from 10 CFR 50.82(a)(2) would allow rescission of the 10 CFR 50.82(a)(1) certifications on the same date that the LARs would be implemented, if approved. It is on this date that the CCEC would transition from a facility in decommissioning status to a facility once again authorized for power operations.

Collectively, the requested NRC approvals identified above and listed in Table 1-1, including any revisions or supplements thereto or other regulatory or licensing requests submitted to the NRC that are necessary to reauthorize power operations at the CCEC, define the scope of the proposed NRC Federal actions to support the potential reauthorization of power operations under the CCEC RFOL.

By letter dated October 31, 2025, CEG also submitted an environmental report (ER) to support the NRC staff's environmental review related to the resumption of power operations under the CCEC RFOL (CEG 2025-TN12656, CEG 2025-TN12766).

For the NRC staff, evaluation of the exemption request and the LARs occurs simultaneously for both safety and environmental reviews through the NRC's Office of Nuclear Reactor Regulation. Therefore, in parallel with this environmental review, the NRC staff is conducting a detailed safety evaluation related to the exemption request and the LARs. Ultimately, through the exemption request and the LARs, CEG is seeking to (1) gain NRC approval to restore the licensing basis for the CCEC to an operational status; (2) return plant components to a status that supports safe operation; and (3) complete any upgrades necessary to meet the proposed operational licensing basis.

1.1 Proposed Federal Actions

In addition to the set of licensing and regulatory requests CEG submitted to the NRC related to the potential reauthorization of power operations at the CCEC, CEG submitted an application for an approximately \$1 billion loan from the U.S. Department of Energy (DOE) Office of Energy Dominance Financing (EDF) (formerly the Loan Programs Office), and on November 18, 2025, DOE EDF announced a conditional commitment and financial close of up to \$1 billion for a loan guarantee to CEG for financing the restart of the CCEC 835 megawatts electric (MWe) nuclear power plant (DOE 2025-TN12767).

Given that the two agencies' Federal actions that collectively support preparation for the resumption of power operations at the CCEC are related and both require an environmental review under the National Environmental Policy Act of 1969, as amended (NEPA) (42 *United*

States Code [U.S.C.] 4321 et seq. [TN661])—among other requirements—the NRC and DOE have exercised a joint Memorandum of Understanding reflecting the lead and cooperating roles of the agencies (DOE/NRC 2024-TN10597). The NRC is the lead agency. DOE EDF is a NEPA cooperating agency with the NRC for the environmental review of the CEG exemption request and LARs that must be approved to support the reauthorization of power operations at the CCEC (DOE 2025-TN12770). At the conclusion of the NRC environmental review, DOE would publish a separate notice or decision document, as appropriate. The following sections describe the separate, but related, proposed Federal actions (hereafter, proposed actions, and which is synonymous with proposed agency actions).

1.1.1 Proposed Actions of the NRC

The NRC’s proposed actions are decisions on whether to grant or deny CEG’s interdependent, connected licensing and regulatory requests (see Table 1-1), including any revisions or supplements thereto or other regulatory or licensing requests submitted to the NRC, that are necessary to support reauthorizing power operations and refueling of the CCEC reactor.

Table 1-1 Licensing and Regulatory Requests for the Christopher M. Crane Clean Energy Center Resumption of Power Operations Project

Document Description	ADAMS Accession No.
Request for Exemption from Certain Termination of License Requirements of 10 CFR 50.82, dated November 19, 2024.	ML24324A048
License Amendment Request—Application to Revise Renewed Facility License and Permanently Defueled Technical Specifications to Support Resumption of Power Operations, dated July 31, 2025.	ML25212A076
License Amendment Request—Proposed Changes to Christopher M. Crane Clean Energy Center (CCEC) Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan, dated October 24, 2025.	ML25300A118
License Amendment Request—Proposed Changes to Christopher M. Crane Clean Energy Center (CCEC) Site Emergency Plan and Emergency Action Level Scheme for an Operating Facility and Exemption Rescission Request, dated October 31, 2025.	ML25304A097 (package)
ADAMS = Agencywide Documents Access and Management System; CFR = <i>Code of Federal Regulations</i> ; RFOL = Renewed Facility Operating License. All documents are electronically available via ADAMS at https://www.nrc.gov/reading-rm/adams .	

1.1.2 Proposed Action of DOE

DOE EDF’s proposed action is a decision on providing Federal financial assistance for refueling and resumption of power operations at the CCEC pursuant to CEG’s loan guarantee agreement with DOE that was issued pursuant to the Energy Policy Act of 2005 (TN738).

1.2 Purpose and Need for the Proposed Federal Actions

1.2.1 Purpose and Need for the NRC Actions

The purpose and need for the NRC proposed actions (approval of the licensing and regulatory requests identified in Table 1-1), which would collectively support the reauthorization of power operations and refueling of the CCEC under the existing RFOL, is to provide 835 MWe of baseload power generation capability to the Pennsylvania, New Jersey, and Maryland electric grid (CEG 2025-TN12656). At the time that the CCEC, then TMI-1, was prematurely shut down

in September 2019, economic conditions did not support continued operation of the facility. However, the economic environment has changed (CEG 2025-TN12656). On September 20, 2024, CEG signed a 20-year power purchase agreement with Microsoft to supply carbon-free energy from the CCEC to Microsoft's data centers located within the PJM Interconnection LLC's electric power grid (Microsoft 2024-TN12771; CEG 2024-TN12772).

1.2.2 Purpose and Need for DOE Action

The purpose and need for DOE proposed action (Federal financial assistance in the form of a loan guarantee) is to implement DOE's authority under Title XVII of the Energy Policy Act of 2005, which was reauthorized, amended, and revised by the Inflation Reduction Act of 2022 (42 U.S.C. § 16517-TN10779) and the One Big Beautiful Bill Act (Public Law 119-21-TN12743 [July 4, 2025]) to create the EDF Program. The purpose of the EDF Program is to finance projects and facilities in the United States that (1) retool, repower, repurpose, or replace energy infrastructure that has ceased operations, or (2) enable operating energy infrastructure to increase capacity or output (42 U.S.C. § 16517(a)(2) and Pub. L. No. 119-21, 139 Stat. 72).

1.3 NEPA Process and Environmental Review

1.3.1 Level of NEPA Review

The NRC staff has determined that CEG's licensing and regulatory requests in support of the reauthorization of power operations at the CCEC, as listed in Table 1-1, are connected (i.e., interdependent) actions that should be considered together as part of the staff's environmental review with respect to evaluating their reasonably foreseeable environmental effects. After reviewing the criteria in 10 CFR 51.20 (TN249), 10 CFR 51.21, and 10 CFR 51.22 and internal guidance, the NRC staff determined that the preparation of an EA, with a draft comment period to ensure public participation, was appropriate for this environmental review. The proposed actions are not specifically covered by the criteria requiring the preparation of an environmental impact statement (EIS) as described in 10 CFR 51.20 without knowing the significance of the reasonably foreseeable environmental effects of the proposed actions.

In June 2026, the NRC staff published the *Draft Environmental Assessment and Draft Finding of No Significant Impact for the Christopher M. Crane Clean Energy Center Reauthorization of Power Operations Project* (NRC 2026-TN13586); provided the draft EA to Federal, State, local, and regional agencies and Indian Tribes as well as to interested members of the public; and issued a Notice of Availability of the draft EA in the *Federal Register* (FR) (91 FR 34658-TN13595). The public comment period was 30 days and ended on July 8, 2026. The NRC staff's consideration of and responses to substantive comments received on the draft EA are presented in Appendix F.

Changes made in response to comments in this final EA, as well as any changes made to include updated information, corrections, and substantial editorial revisions, are marked with a change bar (vertical line) on the side margin of the page where the changes or additions were made. Minor editorial revisions, including those limited to reference citations and formatting, are not marked.

1.3.2 Significance Determination

An EA is a decisional document for an action that either does not have a reasonably foreseeable significant effect on the quality of the human environment, or if the significance of

such effect is unknown. An EA is used to support a Federal agency's determination of whether to issue a Finding of No Significant Impact (FONSI) or to prepare an EIS.

In considering whether an adverse effect of the proposed actions is significant, the NRC staff evaluated the reasonably foreseeable environmental effects of the proposed actions in accordance with Sections 102 and 106 of NEPA, as amended (TN661), the NRC's regulations for implementing NEPA (10 CFR Part 51-TN10253), and applicable guidance. Accordingly, each resource area potentially impacted by the proposed actions is evaluated with a rationale provided to explain the determination of whether the impact(s) would be "SIGNIFICANT" or would be "NOT SIGNIFICANT." If impacts from the proposed actions are determined to be NOT SIGNIFICANT, then a FONSI is prepared; if impacts from the proposed actions are determined to be SIGNIFICANT, then an EIS is prepared.

In addition to these impact thresholds under NEPA and the NRC's regulations for implementing NEPA, there are other effects determination definitions that are applicable specifically for the Endangered Species Act of 1973, as amended (ESA) (TN1010), and the National Historic Preservation Act of 1966, as amended (NHPA) (TN4157), and their implementing regulations.

1.3.3 Analysis of the Environmental Effects of the Proposed Agency Actions

The reasonably foreseeable environmental effects (effects or impacts) of the proposed actions and their significance are determined by comparing the environmental conditions at the point in time prior to the commencement of the proposed actions, known as the environmental baseline or affected environment, with the degree of the effects on those environmental conditions following the commencement of the proposed actions. The affected environment for the potential reauthorization of power operations at the CCEC is the current decommissioning state of the site prior to implementing any of the activities related to the preparation for the resumption of power operations. The corresponding impact determination analysis for each potentially impacted resource area comprises the impacts in relation to the affected environment from both the activities related to the preparations for the resumption of power operations and those related to the resumption of power operations itself. The impact significance determination in Chapter 3 includes the following evaluations for each analyzed resource area:

- *Affected Environment*—provides a brief description of the affected environment.
- *Impacts from Preparations for the Resumption of Power Operations*—provides a description of the reasonably foreseeable environmental effects related to the preparations for the resumption of power operations.
- *Impacts from the Resumption of Power Operations*—provides a description of the reasonably foreseeable incremental environmental effects from the resumption of power operations for the remainder of the operating term of the CCEC RFOL.

Additionally, the environmental effects of greenhouse gas (GHG) emissions and climate change, as well as decommissioning activities are discussed for each analyzed resource area in Appendix D and Section 3.16, respectively.

1.3.4 Related Environmental Documents

Incorporation by reference is a tool that Federal agencies can use to improve the efficiency of their environmental review process to aid in the preparation of analytical, concise, and informative environmental documents. Incorporation by reference integrates material that is essential to the NEPA analysis, such as including planning studies, analyses, or other relevant

information, into environmental documents by reference. The effect will be to cut down on bulk without impeding agency and public review of the action (10 CFR Part 51-TN10253: Appendix A).

The NRC and other Federal agencies have prepared other NEPA and technical documents that contain information relevant to this environmental review of the licensing and regulatory requests in support of the reauthorization of power operations at the CCEC. Most notably, the NRC staff prepared NUREG-1437, Supplement 37, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 37, Regarding Three Mile Island Nuclear Station, Unit 1, Final Report* (the 2009 supplemental environmental impact statement [SEIS]) (NRC 2009-TN3684). This document was prepared as a plant-specific supplement to NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (the 1996 and 1999 LR GEIS) (NRC 1996-TN288, NRC 1999-TN289). The 2009 SEIS was prepared in response to an application to renew the operating license for the CCEC, then TMI-1, for an additional 20 years (i.e., from April 19, 2014 to April 19, 2034). Thus, the 2009 SEIS previously considered the environmental effects of facility operations through the end of the current CCEC RFOL term. Accordingly, in this EA, the NRC staff focuses its analysis on the reasonably foreseeable environmental effects of restoration activities, including any new construction, and the reasonably foreseeable incremental environmental effects of any proposed operational changes associated with the CCEC resumption of power operations (collectively, restart activities).

In August 2024, the NRC issued Revision 2 of NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (the 2024 LR GEIS) (NRC 2024-TN10161). The 2024 LR GEIS was prepared to identify and evaluate environmental issues for license renewal (i.e., power operations for an additional licensing term) and determine which could result in the same or similar impact (i.e., generic issues) at all nuclear power plants and which issues could result in different levels of impact. Many of the analyses presented in the 2024 LR GEIS may be relevant to the proposed actions related to the reauthorization of power operations at the CCEC through the end of the current RFOL term, and they also serve to update many of the findings in the 2009 SEIS.

To support the preparation of this EA, the NRC staff also conducted an environmental audit (NRC 2026-TN13338) to evaluate new information available since the development and issuance of the 2009 SEIS and the 2024 LR GEIS.

Other technical or professional studies, analyses, and input have been prepared by other agencies or interests that provide information that is relied upon, in whole or in part, or otherwise considered to support this EA. These include the 2025 CCEC ER (CEG 2025-TN12656) prepared by CEG to support the NRC staff's environmental review, as well as CEG's responses to the NRC staff's requests for confirmation of information (RCIs) and requests for additional information (RAIs) (CEG 2026-TN12942), which were issued following the completion of the NRC staff's environmental audit. Relevant documents, or portions thereof, relied upon by the NRC staff are referenced or incorporated by reference where appropriate in Chapters 2 and 3.

1.4 Regulatory Provisions, Permits, and Required Consultations

Appendix A lists environmental regulatory requirements, permits, and consultations necessary for the resumption of power operations at the CCEC. The NRC staff has also performed the consultations required under the ESA (TN1010) and the NHPA (TN4157), as applicable.

2 DESCRIPTION OF PLANT FACILITY AND ALTERNATIVES

2.1 Description of the Christopher M. Crane Clean Energy Center

Section 2.1 of the 2009 SEIS (NRC 2009-TN3684) provides a detailed description of the CCEC site vicinity. The NRC staff considered this information as well as the updated information in Section 2.1 of the 2025 CCEC ER (CEG 2025-TN12656). The information from these sources is incorporated here by reference and summarized in this EA to describe the facility and site characteristics and features that are relevant to the CCEC site.

The CCEC is a single pressurized water reactor. Prior to shutdown and the plant entering decommissioning in 2019, the plant was licensed to operate at 2,568 megawatts thermal (CEG 2025-TN12656; NRC 2009-TN3684). A description of the power generation and containment system is provided in Section 2.1.1 of the 2009 SEIS.

The CCEC is located in Londonderry Township of Dauphin County, Pennsylvania, on Three Mile Island within the Susquehanna River (Figure 2-1 and Figure 2-2). The CCEC site spans approximately 400 acres (ac) (160 hectares [ha]) across multiple parcels on and adjacent to the northern portion of Three Mile Island. This acreage is exclusive of undeveloped area or land associated with Three Mile Island Nuclear Station, Unit 2 (TMI-2), located just south of the CCEC (see Figure 2-2). The CCEC site lies about 3 miles (mi) (4.8 kilometers [km]) south of Middletown, Pennsylvania and approximately 10 mi (16 km) southeast of Harrisburg, Pennsylvania. The terrain across the island is generally flat, except where graded to support drainage and plant infrastructure, with elevations ranging from 295 to 300 feet (ft) (90 to 91 meters [m]) above mean sea level (AMSL). The nearby terrain beyond the river floodplain is gently rolling (CEG 2025-TN12656).

Major structures associated with the CCEC main plant complex on Three Mile Island include the reactor building, turbine building, auxiliary building and fuel handling building, intake screenhouse and pump house, two natural draft cooling towers (NDCTs) (i.e., cooling towers A and B), and circulating water pump house (Figure 2-2). Other structures include the cooling tower desilting basin, switchyard, independent spent fuel storage installation, long-term steam generator storage building, the diverse and flexible coping strategies storage facility, waste storage and handling buildings, and administrative buildings. In addition, the CCEC training center/simulator building is located east of the CCEC main plant complex on the mainland (CEG 2025-TN12656; NRC 2009-TN3684).

While the CCEC site and major structures are visible from the Susquehanna River, the site is partially shielded from view on the land side by vegetation along the river. However, the viewshed is dominated by the site's cooling towers, reactor containment structure, and turbine buildings associated with both the CCEC and TMI-2 (NRC 2009-TN3684). Access to Three Mile Island and the CCEC site is via two causeways (i.e., north and south access).

The CCEC uses a closed-cycle condenser cooling system relying on its two NDCTs to minimize surface water withdrawal and consumptive water use. CEG is restoring this system and other environmental systems to support the proposed restart of the CCEC. Makeup water for the condenser cooling system and service water would be withdrawn from the existing intake structure located on the western bank of the island. The effluent discharge structure and sump are located approximately 600 ft (180 m) downstream of the plant's intake structure (CEG 2025-TN12656; NRC 2009-TN3684).



Figure 2-1 Christopher M. Crane Clean Energy Center 6 mi Radius Map. Source: CEG 2025-TN12656.

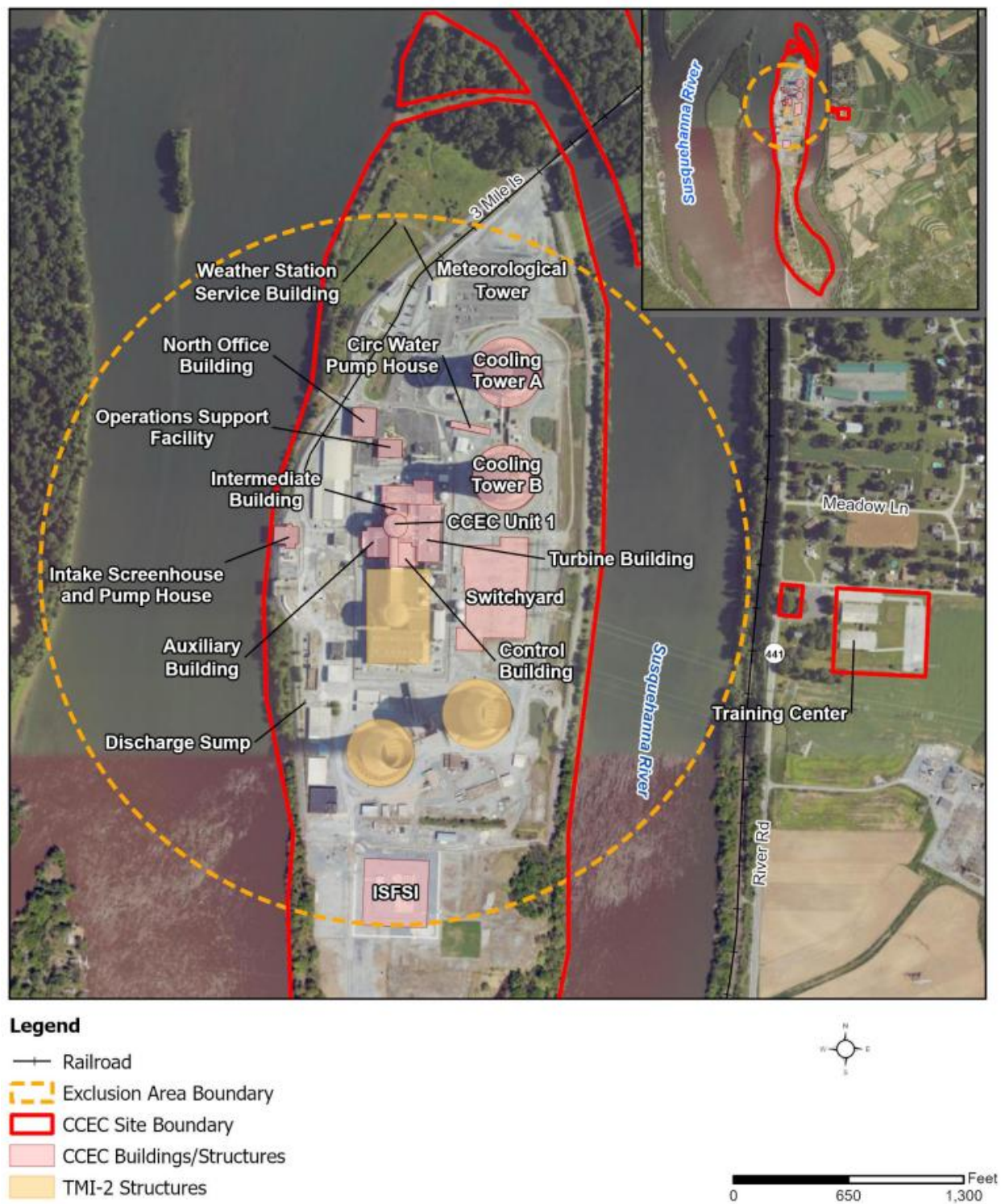


Figure 2-2 Christopher M. Crane Clean Energy Center Site Layout and Boundaries on Three Mile Island and Vicinity. Source: CEG 2025-TN12656.

2.2 Alternatives

The NRC regulations in 10 CFR 51.30(a)(1)(ii) (TN10253) state that an EA shall include a brief discussion of alternatives as required by NEPA. Although NEPA Section 102(2)(C) provides requirements for EISs rather than EAs, the NRC's consideration of alternatives in this EA was influenced by that section, with the understanding that the alternatives discussion in an EA does not need to be as extensive as would be required for an EIS. NEPA Section 102(2)(C)(iii) requires discussion of a reasonable range of alternatives to the proposed action, including an analysis of any negative environmental impacts of not implementing the proposed action (i.e., the no-action alternative), that are technically and economically feasible and meet the purpose and need of the proposal.

The NRC's decision-making authority for the proposed actions is limited to deciding whether to approve the licensing and regulatory requests in support of the reauthorization of power operations at the CCEC; therefore, there are no alternatives to the proposed actions that meet the purpose and need of the proposal. However, as part of its analysis of the no-action alternative, the NRC staff evaluates the environmental impacts of a reasonable range of replacement/offsetting options for satisfying electricity demand. This approach comports with the direction provided by the Commission in the Staff Requirements Memorandum for SECY-24-0046 (NRC 2025-TN12641).

2.2.1 No-Action Alternative

As described in Section 1, the CCEC, then TMI-1, was shut down and fuel was removed from the reactor vessel in 2019. Under the no-action alternative, the NRC would not approve the licensing and regulatory requests in support of the reauthorization of power operations at the CCEC. Under this scenario, the CCEC would not be reauthorized to resume power operations and would continue to function as a plant in decommissioning status as outlined in the facility's post-shutdown decommissioning activities report (PSDAR) (Exelon 2019-TN12795). The no-action alternative would not meet the purpose and need of the proposed actions. The NRC staff's analysis of any negative environmental impacts of not implementing the proposed actions considers two factors: impacts of not restarting the CCEC (i.e., continuing in decommissioning status) and impacts of energy generation options.

2.2.1.1 *Impacts of Not Restarting the CCEC*

Prior to the cessation of power generation activities and the removal of fuel from the reactor vessel in 2019, the licensee submitted a PSDAR to the NRC (Exelon 2019-TN12795), in accordance with 10 CFR 50.82(a)(4) (TN249), to outline the proposed decommissioning activities and describe potential associated environmental impacts. In the PSDAR submission, the licensee concluded that the environmental impacts associated with the planned site-specific decommissioning activities would be bounded by appropriate, previously issued environmental impact statements, including the 2009 SEIS (NRC 2009-TN3684). As described in Section 3.16 of this EA, Section 7.0 of the 2009 SEIS (NRC 2009-TN3684), which is incorporated here by reference, evaluates the impacts of decommissioning the CCEC at the end of its license renewal term in 2034. Based on information in NUREG-0586, Supplement 1, *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Regarding the Decommissioning of Nuclear Power Reactors, Final Report* (Decommissioning GEIS) (NRC 2002-TN7254), the PSDAR (Exelon 2019-TN12795), the 2013 LR GEIS (NRC 2013-TN2654), the 2024 LR GEIS (NRC 2024-TN10161), and NUREG-2266, *Environmental Evaluation of Accident Tolerant Fuels with Increased Enrichment and Higher Burnup Levels, Final Report* (NRC 2024-TN10333), the

NRC staff has determined that if the CCEC continues in its current decommissioning status, this would not alter the previously determined SMALL impacts from decommissioning identified in the 2009 SEIS (NRC 2009-TN3684). Therefore, under the no-action alternative, the environmental impacts of not restarting the CCEC would be NOT SIGNIFICANT.

2.2.1.2 Impacts of Energy Generation Options

As described in Section 1.2.1, CEG signed a 20-year power purchase agreement with Microsoft to supply carbon-free energy from the CCEC to Microsoft's data centers located within the PJM Interconnection LLC's power grid. In the ER (CEG 2025-TN12656), CEG stated that a reasonably foreseeable consequence of the no-action alternative is the pursuit of other energy options. However, CEG did not identify any energy generation options or non-generation options that it considered to be technically and economically feasible to meet the purpose and need of the proposed actions (i.e., capable of generating 835 MWe of baseload electrical power on or before the date that the NRC would potentially approve the set of licensing and regulatory requests supporting the reauthorization of power operations at the CCEC).

In the 2024 LR GEIS (NRC 2024-TN10161: Section 2.3, Section 2.4, Appendix D), the NRC staff describes energy sources potentially capable of replacing or offsetting the generating capacity of a nuclear reactor as well as their associated environmental impacts. These sections of the 2024 LR GEIS are incorporated here by reference. Table 2.4-1 and Table 2.4-2 of the 2024 LR GEIS summarize the construction and operational environmental impacts of replacement/offsetting energy options compared to the continued operation of a nuclear power plant. In most cases, the construction and operation of new power facilities would have greater environmental impacts than those associated with the continued operation of a nuclear power plant. For example, major construction projects would typically be required for new energy generation options (e.g., fossil fuel, new nuclear, renewables) whereas minor construction (e.g., refurbishment) could be needed for the license renewal of an existing nuclear power plant. However, the specific impacts of replacement/offsetting energy options would vary according to the specific technology selected and the site-specific resource conditions. Nonetheless, in most cases, replacement/offsetting energy options would have greater (potentially SIGNIFICANT) environmental impacts than those associated with both the activities related to the preparations for the resumption of power operations and the resumption of power operations at the CCEC.

2.2.2 Comparison of the Environmental Impacts of the Proposed Agency Actions and the No-Action Alternative

In Chapter 3, the NRC staff concludes that the potential effects from the proposed actions to prepare for and resume power operations at the CCEC would be NOT SIGNIFICANT. Under the no-action alternative, the reasonably foreseeable environmental effects of not restarting the CCEC (i.e., continuing in decommissioning status) would be NOT SIGNIFICANT. However, the no-action alternative would necessarily also include the pursuit of replacement/offsetting energy options. The ultimate decision about which energy option(s) to implement falls to the power plant owners and State, utility, system, and, where authorized, Federal (other than NRC) energy-planning decision-makers. As discussed in Section 2.2.1.2, energy generation options have the potential to have greater environmental impacts in any number of the applicable resource areas when compared to the proposed actions. Therefore, based on its review of the reasonably foreseeable environmental effects of the proposed actions and the no-action alternative, the NRC staff concludes that the environmentally preferred alternative comprises the proposed actions.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

3.1 Organizational Approach for Resource-Specific Environmental Impact Significance Determinations

This section provides the organizational structure for the NRC staff's analysis of the reasonably foreseeable environmental effects (impacts) of the proposed actions in accordance with the environmental review process summarized in Section 1.3. As stated in Section 1.3.3, the NRC staff considered the potential reasonably foreseeable environmental effects related to preparations for the resumption of power operations at the CCEC, including any new construction, and the potential reasonably foreseeable incremental environmental effects from the resumption of power operations for the remainder of the operating term of the CCEC RFOL. In doing so and based on the scope of the proposed actions, the NRC staff focused its EA analysis on resource areas with the potential for significant environmental impacts. The NRC staff evaluated previous environmental documents and effects analyses with regard to each resource area along with their relevance to the potential environmental effects of the proposed actions at the CCEC site. For the resource areas listed below, the NRC staff determined that the potential for significant impacts from the proposed actions was unlikely or that any impacts would be bounded by prior environmental review(s). Therefore, in Chapter 3 the NRC staff provides a more abbreviated discussion of the following resource areas:

- land use and visual resources (Section 3.2)
- socioeconomic conditions (Section 3.10)
- nonradiological human health (Section 3.11.2)
- uranium fuel cycle and transportation (Section 3.13)
- postulated accidents (Section 3.14)
- decommissioning (Section 3.16)

3.1.1 The Affected Environment of the Proposed Federal Actions

As described in Section 1.3.3, the environmental baseline or affected environment for the CCEC and the proposed actions under the NRC staff's evaluation are the environmental conditions at the point in time prior to the commencement of the CCEC restart project in 2024. Where appropriate, the NRC staff also considered reasonably foreseeable actions or projects and relevant ongoing environmental trends. Following the shutdown and removal of fuel in 2019, the licensee initiated planned decommissioning activities in accordance with the PSDAR that it had previously submitted to the NRC (Exelon 2019-TN12795). The licensee opted to pursue SAFSTOR for the facility, meaning that the reactor facility was placed and maintained in a safe condition that allows for decontamination at a later date. In this configuration, systems that are not required to support spent nuclear fuel storage, heating, ventilation, and air conditioning, emergency plan activities, or site security are drained, de-energized, and secured. As a result of these initial decommissioning efforts, the CCEC structures and facilities have largely been left intact and maintained in a stable condition. Specifically, no activities occurred during SAFSTOR such that the site structures and facilities necessary to operate the CCEC were left in an irretrievable condition (CEG 2026-TN12942).

The CCEC remains in a decommissioning status as of the date of this EA. Therefore, the affected environment is defined for each resource area given this baseline. In some instances, such as describing the human-built environment, substantial information from the 2009 SEIS

(NRC 2009-TN3684) has been cited or incorporated by reference, where appropriate and determined to remain valid. Some information was updated, as appropriate, with source documentation cited for clarity.

Following the announcement of its intent to restore the CCEC to a condition supporting power operations, CEG initiated staffing increases in 2024. By the first calendar quarter of 2025, more than 200 full-time employees had been hired (CEG 2025-TN12656). By the end of 2025, the peak workforce had grown to 536 active employees at the CCEC. Total onsite staffing is projected to peak around 1,200 during restart preparations and approximately 600 following the resumption of power operations (CEG 2026-TN12942).

While the present decommissioning status reflects the current affected environment at the CCEC, each resource area includes a specific and relevant discussion on various aspects of the affected environment to make an environmental significance determination for the following:

- Impacts from preparations for the resumption of power operations, described in Section 3.1.2.
- Impacts from the resumption of power operations, described in Section 3.1.3. These are incremental impacts as compared to the 2009 SEIS, which already evaluates the environmental impacts of power operations at the CCEC through the end of the current operating license term under the CCEC RFOL.
- GHGs and climate change, described in Appendix D.
- Activities related to the eventual return to decommissioning status, described in Section 3.16.

3.1.2 Impacts from Preparations for the Resumption of Power Operations

Following the decision to pursue the resumption of power operations at the CCEC in 2024, CEG initiated onsite activities that included conducting various tests and inspections to determine the status of systems, structures, and components, as well as performing general refurbishment and maintenance (CEG 2025-TN12656, CEG 2026-TN12942). CEG has performed material condition reviews of plant equipment to ensure the feasibility of plant restoration. Equipment such as the NDCTs, steam generators, main generator, main transformers, aboveground storage tanks, and the plant simulator have been reviewed (CEG 2025-TN12656). When considering the impacts related to the preparations for the resumption of power operations at the CCEC, CEG has identified the planned activities necessary to restore the CCEC to the operating condition under the RFOL in 2019 prior to shutdown, as described in Section 2.2.1 of the 2025 CCEC ER (CEG 2025-TN12656). In summary, these planned activities include, but are not limited to, the following:

- Reconfiguration and modification of site structures and facilities, as needed.
- Restoration of systems, structures, and components required for plant operation.
- Restoration of radioactive waste processing and release capability comparable to normal power operations in accordance with regulatory limits and requirements.
- Reestablishing operating procedures and regulatory-required programs necessary to support power operations.
- Obtaining State-level permits and approvals, as needed.

The NRC staff expects that the majority of the physical work required to support restart including plant equipment and system restoration, refurbishment, maintenance, and associated inspections would be performed indoors and/or within or immediately adjacent to existing facilities. As discussed in the CCEC ER, CEG has performed surveys and reviews of the material condition of the CCEC plant equipment to ensure the feasibility of restoration or replacement, as appropriate. In addition, and separate from and outside the scope of the NRC staff's environmental review as documented in this EA, the NRC staff will carefully review the regulatory and licensing documents for the plant, inspect new and restored components necessary to operate safely, and continue ongoing oversight to ensure the sufficiency of all plant systems and programs.

With respect to plant and site preparation activities exterior to existing facilities, CEG does not expect that such activities will involve major demolition activities or any new construction on undeveloped land. Ongoing and planned work will take place within the existing operational areas of the plant site or on previously disturbed land (CEG 2026-TN12942). In its 2025 ER, CEG states that the offsite training center (training center/simulator building), located east of Three Mile Island and shown in Figure 2-2, will be used to support preparation activities (i.e., focused on staff orientation and training) for the resumption of power operations (CEG 2025-TN12656). Several of the completed, ongoing, or planned plant modification activities have or would involve minor ground disturbance and are listed and described in Table 3-1. The NRC staff considered these activities when evaluating the reasonably foreseeable environmental effects of the proposed actions.

Table 3-1 Major Facility Modifications and Activities Supporting Preparations for the Resumption of Power Operations at the Christopher M. Crane Clean Energy Center

Activities	Area^(a)
NDCT A and B Modifications (Ongoing). NDCT A will be restored to its pre-shutdown counter flow, natural draft design. NDCT B will be restored and modified with a counter flow design and fitted with an internal fill structure similar to NDCT A. A drift eliminator will also be added to NDCT B, which will match the design of NDCT A. Work will be performed in and around the base of the existing cooling tower structure on previously disturbed land.	N/A
North Access Bridge Repairs (Complete). This activity involves rehabilitation of the bridge deck and piers to support delivery of two new MPTs. Activities are being performed in accordance with an existing PADEP maintenance permit. A debris containment system has been used to prevent debris from entering the Susquehanna River. The work involves no dredging or other disturbance of the underlying waterway.	N/A
Reactor Building (RB) Industrial Coolers (Demolition Completed, Replacement Planned). This RB industrial coolers, which provide non-emergency cooling water to the reactor building, were scheduled for replacement prior to shutdown. The previously demolished industrial coolers will be replaced with new units in the same location.	N/A
Structural Modifications for MPTs (Ongoing). The MPT base structure requires modifications to the existing foundations to accommodate the larger replacement MPTs. The replacement MPTs require extension of existing firewalls at the north and south ends of the main bay as well as the installation of a new firewall between the MPTs. Work is confined to the operational area on previously disturbed land.	N/A
New Emergency Diesel Storage Tank (DF-T-1) (Ongoing). A new 35,000-gallon, double-walled, safety-related underground storage tank will be installed in a previously disturbed area immediately adjacent to the former diesel storage tank (which was properly abandoned in accordance with PADEP requirements). Exploratory core boring for the new storage tank was	<0.1

Activities	Area ^(a)
performed in accordance with the CCEC's excavation and environmental review procedures and with the use of best management practices.	
Buried Piping Inspections and Repairs (Planned). Certain portions of buried piping within the operational area will be inspected, excavated, and repaired. Activities include (1) structural repairs in discrete locations of circulating water piping and (2) rerouting a portion of fire service piping around the decommissioning support building footprint associated with Three Mile Island Nuclear Station, Unit 2. Work will be performed in accordance with the CCEC's excavation and environmental review procedures.	<0.2
CCEC = Christopher M. Crane Clean Energy Center; MPT = main power transformer; NDCT = natural draft cooling tower; N/A = not applicable; PADEP = Pennsylvania Department of Environmental Protection.	
(a) The total area, in acres, of any new ground disturbance for each activity includes any associated laydown area(s).	
Sources: CEG 2025-TN12656, CEG 2026-TN12942, CEG 2026-TN13587.	

3.1.3 Impacts from the Resumption of Power Operations

Power operations could resume at the CCEC if the NRC were to approve the exemption request and the LARs. These approvals would permit CEG to transition the CCEC from a facility in decommissioning status to an operating facility under the CCEC RFOL. CEG plans to resume power operations using the same management practices that were in use prior to decommissioning (CEG 2025-TN12656).

When evaluating the potential reasonably foreseeable environmental effects (impacts) from the resumption of power operations, the NRC staff reviewed and cited or incorporated by reference, as appropriate, prior environmental analyses including those in the 2009 SEIS (NRC 2009-TN3684), and other relevant environmental documents, where appropriate. These previous NEPA analyses helped support the individual significance determinations for the proposed actions discussed in this EA. For example, in many instances, the NRC staff's impact determination of SMALL² in the 2009 SEIS for a particular resource area informed the NRC staff's basis for a "NOT SIGNIFICANT" determination for that resource area in this EA. This is because the impacts discussed for the resumption of power operations are largely the same as those discussed in the 2009 SEIS, which already evaluates the environmental impacts of power operations at the CCEC through the end of the current operating license term under the CCEC RFOL. The NRC staff considered if there were any incremental environmental impacts as compared to the 2009 SEIS and also considered any potential new and significant information that could affect the analysis for each resource area, including from other relevant NEPA documents as referenced in Section 1.3.4.

3.2 Land Use and Visual Resources

The NRC staff evaluated the potential land use and visual resources effects from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in

² The NRC regulations define SMALL environmental effects (impacts) as follows: 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.

Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for land use and visual resources effects.

3.2.1 Affected Environment

As described in the 2009 SEIS (NRC 2009-TN3684), the CCEC is located in Londonderry Township of Dauphin County about 3 mi (4.8 km) south of Middletown, Dauphin County, and about 1.25 mi (2 km) east of the community of Goldsboro, York County. The site is approximately 10 mi (16 km) southeast of Harrisburg, Pennsylvania (see Figure 2-1).

As described in Section 2.2.1 of the 2009 SEIS, the CCEC facilities are located about 900 ft (274 m) from the east bank of the Susquehanna River and approximately 6,500 ft (1,981 m) from the west bank of the river. The 200 ac (81 ha) industrial zoned portion of the CCEC site has remained unchanged since shutdown in 2019 (CEG 2025-TN12656).

The most visible structures at the CCEC are its two, 370 ft (113 m), hyperbolic, NDCTs. The two additional cooling towers visible to the south were used by the TMI-2 reactor system. The two northern cooling towers are associated with the CCEC reactor. Other noticeable buildings include the CCEC reactor building, auxiliary building, fuel-handling building, station blackout diesel generator building, intake screen and pump house, and turbine building (NRC 2009-TN3684). Figure 2-2 provides a general layout of the CCEC site.

The resumption of power operations would result in occasional reappearances of vapor plumes under certain atmospheric conditions (Ryznar et al. 1980-TN11923). Vapor plumes are more frequently seen in winter months, or during the night and early morning when temperatures are lower and humidity levels rise. Winds can cause plumes to dissipate close to the ground.

3.2.2 Environmental Impacts from Preparations for the Resumption of Power Operations

Preparations for the resumption of power operations activities, as summarized in Section 3.1.2, were reviewed to determine their land use or visual resources effects. These activities would be consistent with the human designated use and industrial appearance of the CCEC site. Based on this, the NRC staff has determined that the proposed actions would not alter the industrial land use and visual appearance of the CCEC and any impacts from restart preparation activities would be NOT SIGNIFICANT.

3.2.3 Environmental Impacts from the Resumption of Power Operations

Environmental impacts from the resumption of power operations would only occur within the developed areas of the CCEC site on land zoned for industrial use. Activities in support of the proposed actions would be consistent with the human designated use and industrial appearance of the nuclear power plant site and would be similar to those that occurred during previous operation.

The visual appearance of the CCEC has been well established and remains unchanged during decommissioning. The resumption of power operations would include the occasional reappearance of vapor plumes from the cooling towers. As explained in Section 3.2.1, vapor plumes are more frequently seen in winter months, or during the night and early morning when temperatures are lower and humidity levels rise.

Based on the above information, the NRC staff has determined that the proposed actions would not alter the industrial land use and visual appearance of the CCEC and any impacts related to the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.3 Meteorology, Air Quality, and Noise

The NRC staff evaluated the potential meteorological, air quality, and noise effects from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for meteorology, air quality, and noise effects.

3.3.1 Affected Environment

Regional Climatology

As described in NUREG-1437, Supplement 10, Second Renewal, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants Regarding Subsequent License Renewal for Peach Bottom Atomic Power Station Units 2 and 3*, dated January 2020 (NRC 2020-TN7402), the climate of Pennsylvania is heavily influenced by Lake Erie to the northwest, the Appalachian Mountains that cut across the center of the State, and the Atlantic Ocean's moderating effect on the State's eastern region. Consequently, Pennsylvania spans two major climate zones. The northern half of the State is predominantly characterized by a humid continental climate dominated by tropical air masses in summer and polar air masses in winter. The southern half of the State, where the CCEC is located, is predominantly characterized by a humid subtropical climate dominated by relatively hotter summers, milder winters, and year-round precipitation.

Meteorology

The NRC staff obtained climatological data from the Harrisburg, Pennsylvania weather station. This station is approximately 4.5 mi (7.2 km) northwest of the CCEC and is used to characterize the region's climate because of its relative location and long period of record. The NRC staff evaluated these data in context with the climatological record from the CCEC from the January 1, 2021 through August 28, 2023 period of record. The onsite meteorological tower was abandoned after August 28, 2023 (CEG 2026-TN12942).

The mean annual temperature from the Harrisburg weather station for the 1941–2024 period is 53.3 degrees Fahrenheit (°F) (11.8 degrees Celsius [°C]) with a mean monthly temperature ranging from a low of 30.4°F (−0.9°C) in January to a high of 75.9°F (24.3°C) in July (NOAA Undated-TN12926). The mean annual temperature from the CCEC meteorological tower for the 2021–2023 period is 54.7°F (12.6°C) with a mean monthly temperature ranging from a low of 33.8°F (1°C) in January to a high of 76.3°F (24.6°C) in July (CEG 2026-TN12942). The mean total precipitation from the Harrisburg weather station for the 1941–2024 period is 41.7 inches (in.) (105 centimeters [cm]), with a mean monthly total precipitation ranging from 2.63 in. (6.7 cm) in February to 4.06 in. (10.3 cm) in July (NOAA Undated-TN12926). The mean total precipitation from the CCEC meteorological tower for the period 2021–2023 is 36.9 in. (93.7 cm) with mean monthly total precipitation ranging from 1.8 in. (4.5 cm) in January to 6.3 in. (16.1 cm) in September (CEG 2026-TN12942). The mean annual wind speed from the Harrisburg weather station is 6.8 miles per hour (mph) (10.9 kilometers per hour [km/h]), with a prevailing wind

direction from the northwest (NOAA Undated-TN12926). The mean annual wind speed from the CCEC meteorological tower for the period 2021–2023 is 6.4 mph (10.3 km/h), with a prevailing wind direction from the northwest (CEG 2026-TN12942).

Dauphin County experiences severe weather. The following severe weather events have been reported in Dauphin County from January 1950 to December 2025 (NOAA 2026-TN12947):

- tornadoes: 19 events
- hail: 90 events
- thunderstorm winds: 378 events
- flash floods: 42 events

Regional Air Quality

The CCEC falls within the South-Central Pennsylvania Intrastate Air Quality Control Region (40 CFR 81.105) (TN7226). Dauphin County, Pennsylvania, where the plant is located, is in a designated maintenance area for particulate matter less than 2.5 microns (PM_{2.5}) and in attainment for the remaining criteria pollutants (EPA 2026-TN12948; 40 CFR 81.339). There are no Prevention of Significant Deterioration Class I areas located within a 100 mi (161 km) radius of the CCEC site. Table 3-2 presents Dauphin County air pollutant emissions.

Table 3-2 Annual Air Emissions^(a), Dauphin County, Pennsylvania (tons)

County	CO	SO ₂	NO _x	PM ₁₀	PM _{2.5}	VOCs
Dauphin	34,703	129	4,722	5,608	2,228	14,562

CO = carbon monoxide; NO_x = nitrogen oxides; PM₁₀ = particulate matter less than 10 microns; PM_{2.5} = particulate matter less than 2.5 microns; SO₂ = sulfur dioxide; VOC = volatile organic compounds.

(a) Emissions presented include mobile, nonpoint, and point source emissions for Dauphin County.

Source: EPA 2020-TN12931.

In accordance with the Clean Air Act (42 U.S.C. § 7401-TN4539), Federal agencies may not issue a license or a permit in a designated maintenance or nonattainment area that does not conform to an applicable State Implementation Plan. Under the General Conformity Rule, a conformity determination may need to be completed for projects that are located in or near a maintenance or nonattainment area. If project emissions are below de minimis levels (40 CFR 93.153) (TN2495), a conformity analysis is not required. As discussed above, Dauphin County is a designated maintenance area with respect to PM_{2.5}. The de minimis levels for PM_{2.5} and its precursors are 100 tons per year (tons/year) for maintenance areas (40 CFR 93.153). PM_{2.5} can be directly released into the air (primary emissions and through chemical reactions of precursors). Precursors of PM_{2.5} include sulfur dioxide, nitrogen oxides, and volatile organic compounds (VOCs). Ammonia can be a significant contributor to the formation of PM_{2.5}. States must demonstrate that ammonia significantly contributes to PM_{2.5} formation. The Pennsylvania Department of Environmental Protection (PADEP) has determined that changes in PM_{2.5} concentrations in the Harrisburg area (which includes Dauphin County) have not been driven by changes in ammonia emissions and, therefore, increases in ammonia do not appear to be an important factor for maintaining PM_{2.5} standards (PADEP 2014-TN12998, PADEP 2014-TN13003).

Noise

Noise is unwanted sound and can be generated by many sources. Sound intensity is measured in logarithmic units called decibels (dB). A dB is the ratio of the measured sound pressure level to a reference level equal to a normal person's threshold of hearing. Most people barely notice a difference of 3 dB or less. Another characteristic of sound is frequency or pitch. Noise may be composed of many frequencies, but the human ear does not hear very low or very high frequencies. To represent noise as closely as possible to the noise levels people experience, sounds are measured using a frequency-weighting scheme known as the A-scale. Sound levels measured on this A-scale are given in units of A-weighted decibels (dBA).

The immediate vicinity of the CCEC is characterized as agricultural with rural development and scattered communities. The primary noise sources in the immediate vicinity of the CCEC include vehicle traffic and air traffic. The nearest resident and residential community is approximately 0.4 mi (0.6 km) southeast of the reactor building (CEG 2023-TN12932).

3.3.2 Environmental Impacts from Preparations for the Resumption of Power Operations

Meteorology and Air Quality

The activities related to the preparations for the resumption of power operations, summarized in Section 3.1.2, were reviewed to determine any impacts related to meteorology or air quality. Ground-disturbing activities, operation of construction equipment, operation of onsite combustion equipment, and worker vehicles have the potential to affect air quality. The majority of preparation activities to support restart will be performed indoors. However, CEG will conduct some activities that involve ground disturbance that will result in fugitive dust emissions. Additionally, the associated earthmoving equipment will result in engine exhaust emissions. During restart preparations, onsite combustion equipment (two auxiliary boilers, two diesel fire pumps, and six diesel generators) will be periodically operated (CEG 2025-TN12656, CEG 2026-TN12942). The CCEC's previous minor synthetic air permit issued by the PADEP expired on October 31, 2022 (CEG 2025-TN12656). CEG submitted an air pollutant emissions plan approval application to the PADEP to reactivate these emission sources (Trinity 2025-TN12949; CEG 2026-TN12950). On May 19, 2026, the PADEP issued plan approval No. 22-05062A to CEG for this equipment (PADEP 2026-TN13596). Vehicle exhaust emissions will result from the workforce commuting to and from the site during restart preparations. Table 3-3 presents the maximum annual estimated emissions over the course of preparation activities at the CCEC from ground-disturbing activities, earthmoving equipment, onsite combustion equipment, and worker vehicles. As noted in Table 3-3, estimated emissions are below 100 tons/year (91 metric tons per year [MT/year]). NO_x emissions constitute the largest emitted pollutant from onsite combustion equipment because auxiliary boilers are anticipated to have additional run hours (up to 1,500 hours per year per boiler) to support plant startup such as functional testing (CEG 2026-TN12950). Dauphin County is a designated maintenance area with respect to PM_{2.5}. The de minimis levels for PM_{2.5} and its precursors (sulfur dioxide, nitrogen oxides, and VOCs) are 100 tons/year (91 MT/year) for maintenance areas (40 CFR 93.153) (TN2495). Based on the emissions presented in Table 3-3, a conformity analysis is not needed. Furthermore, estimated emissions from preparation activities represent less than 2 percent of county emissions (see Table 3-1 above). Based on this information, the NRC staff anticipates that the meteorology and air quality impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

Table 3-3 Maximum Emissions Estimates from Preparation Activities (tons/year) at the Christopher M. Crane Clean Energy Center

Activity	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	VOCs
Ground Disturbing Activities ^(a)	N/A	N/A	N/A	0.2	0.02	N/A
Earthmoving Equipment ^(b)	0.07	0.2	N/A	0.01	0.01	0.02
Onsite Combustion Equipment ^(c)	19.9	82.4	0.6	4.8	4.8	1.9
Worker Vehicles ^(d)	30.4	0.9	0.05	0.3	0.06	2.5
Total	50.4	83.5	0.7	5.3	4.9	4.4

CO = carbon monoxide; N/A = not applicable; NO_x = nitrogen oxides; PM₁₀ = particulate matter less than 10 microns; PM_{2.5} = particulate matter less than 2.5 microns; SO_x = sulfur oxides; VOCs = volatile organic compounds.

- (a) For fugitive dust, Constellation Energy Generation, LLC (CEG) estimated total suspended particulate (TSP) emissions of 0.4 tons. TSP calculations are based on U.S. Environmental Protection Agency (EPA) AP-42 emission factors, 0.3 ac of disturbance, and 1 month of activity, which is conservative due to inherent assumptions of semiarid climate. Of the TSP, only a portion will become airborne with aerodynamic diameters of less than 2.5 microns and 10 microns. The U.S. Nuclear Regulatory Commission (NRC) staff determined that 5 percent and 40 percent of TSP will result in PM_{2.5} and PM₁₀, respectively, based on Zhao et al. 2017 (TN12317).
- (b) CEG expects that ground disturbing activities will require use of an excavator, front-end loader, or backhoe. The NRC staff calculated exhaust emissions by applying 2007 composite emission factors for excavators from AQMD Undated-TN13007.
- (c) Equipment includes two auxiliary boilers, two diesel fire pumps, and six diesel generators. Estimates are potential to emit based on operation of up to 1,500 hours per year per boiler, up to 250 hours per year per diesel generator, and up to 250 hours per year per pump. PM₁₀ and PM_{2.5} emissions are conservative in that emissions calculated and presented here are for particulate matter. Detailed calculations and assumptions provided in CEG 2026-TN12950.
- (d) The NRC staff calculated worker vehicles exhaust emissions for 1,200 workers traveling 30 mi a day for a 260-day work year (CEG 2026-TN12942) and applied CO, NO_x, PM, and VOC emission factors from Burnham 2021-TN12951 and SO₂ emission factor from Cai et al. 2013-TN13008 for gasoline passenger car model year 2010.

Noise

Noise impacts from preparations for the resumption of power operations could result from the operation of construction equipment and worker vehicles. Noise from these activities would be intermittent and short-term. Any increases in noise levels as a result of additional vehicular noise would primarily occur along State Highway 441 during work shift schedules. CEG estimates a peak workforce of 1,200 individuals during preparation activities (CEG 2026-TN12942). These staffing levels are similar to those observed during outages at the CCEC and, therefore, noise levels from workforce vehicular traffic would be similar to those previously experienced during outages. As discussed in Section 3.1.2, CEG will conduct activities exterior to existing facilities that will require construction equipment such as an excavator, front-end loader, or backhoe (CEG 2026-TN12942). At a distance of 50 ft (15.2 m), sound levels can reach 81 dBA for this type of equipment (FHWA 2006-TN10181). Noise levels attenuate rapidly with distance. When distance is doubled from a point source, noise levels decrease by 6 dBA (DOT 2017-TN6567). At a distance of 1,000 ft (304 m), sound levels would drop to 55 dBA. Furthermore, increases in noise levels would be limited to the CCEC site and would be short-term and intermittent. For example, CEG anticipates that ground disturbing activities would be completed in one month (CEG 2026-TN12942). Based on this information, the NRC staff anticipates that noise impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.3.3 Environmental Impacts from the Resumption of Power Operations

Meteorology and Air Quality

The CCEC cooling system will consist of two NDCTs. Cooling towers remove excess heat by evaporating water. Upon exiting the tower, water vapor mixes with the surrounding air, and this process can lead to condensation and formation of a visible plume. In the 2009 SEIS, the NRC staff noted that plumes from cooling towers in the region in which the CCEC is located are visible under certain meteorological conditions (when relative humidity is high or air temperatures are low) and the visible plume can extend 1–2 mi (1.6–3.2 km) (NRC 2009-TN3684). The CCEC has two NDCTs, Tower A and B. As discussed in Section 3.1.2, CEG plans to equip Cooling Tower B with an internal fill structure to match that of Cooling Tower A. There are no anticipated changes to Cooling Tower A. This will result in Cooling Tower B having a counter flow design, a drift eliminator, and a lower drift rate, and CEG does not anticipate that the planned modifications to Cooling Tower B will substantially change the length of the visible plume (CEG 2026-TN12942, CEG 2026-TN12950). These modifications will result in a reduction of particulate air emissions. Cooling towers emit particulate matter as water evaporates from water droplets that contain dissolved solids. Both of the CCEC NDCTs will be equipped with drift eliminators and meet a drift rate of 0.001 percent (CEG 2026-TN12942, CEG 2026-TN12950). Drift eliminators reduce particulate matter emissions (CEG 2026-TN12950).

During power operations, CEG will operate combustion equipment onsite intermittingly. Onsite combustion equipment at the CCEC will include two auxiliary boilers, two diesel fire pumps, and six diesel generators. As discussed under Section 3.3.2, CEG submitted an air pollutant emissions plan approval application for the operation of this onsite equipment to the PADEP (Trinity 2025-TN12949). On May 19, 2026, the PADEP issued plan approval No. 22-05062A to CEG for this equipment (PADEP 2026-TN13596). CEG anticipates a power operations workforce of 600 employees. Table 3-4 presents estimated annual air emissions from the cooling towers, the operation of onsite combustion equipment, and worker vehicles.

Table 3-4 Air Pollutant Emissions from the Resumption of Power Operations (tons/year) at the Christopher M. Crane Clean Energy Center

Activity	CO	NO _x	SO _x	PM ₁₀	PM _{2.5}	VOCs
Cooling Towers^(a)	N/A	N/A	N/A	15.1	15.1	N/A
Onsite Combustion Equipment^(b)	12.1	44.3	0.3	1.7	1.7	1.6
Worker Vehicles^(c)	21.4	0.7	0.04	0.2	0.04	1.7
Total	33.5	45	0.34	17	16.8	3.3

CO = carbon monoxide; N/A = not applicable; NO_x = nitrogen oxides; PM₁₀ = particulate matter less than 10 microns; PM_{2.5} = particulate matter less than 2.5 microns; SO_x = sulfur oxides; VOC = volatile organic compound.

(a) Detailed calculations and assumptions can be found in CEG 2026-TN12950.

(b) Accounts for two auxiliary boilers, two diesel fire pumps, and six diesel generators. Estimates are potential to emit based on operation of up to 100 hours per year per boiler, up to 250 hours per year per diesel generator, and up to 250 hours per year per pump. PM₁₀ and PM_{2.5} emissions are conservative in that emissions calculated and presented here are for particulate matter. Detailed calculations and assumptions can be found at CEG 2026-TN12950.

(c) The U.S. Nuclear Regulatory Commission staff calculated worker vehicles exhaust emissions for 600 workers traveling 30 mi a day (CEG 2026-TN12942) for a 365-day work year and applied CO, NO_x, PM, and VOC emission factors from Burnham 2021-TN12951 and SO₂ emission factor from Cai et al. 2013-TN13008 for gasoline passenger car model year 2010.

Small amounts of ozone and substantially smaller amounts of nitrogen oxides are produced during corona, a phenomenon that occurs when air ionizes near isolated irregularities on the conductor surface of transmission lines. Field studies have shown that high voltage lines up to 765 kV do not generate emissions above ambient measurements (Lee et al. 1989-TN7481; TVA 2013-TN7899; NRC 2015-TN5842). CCEC transmission lines are 230 kV (NRC 2009-TN3684). Therefore, the review team does not expect that the transmission lines associated with operation of CCEC will be a significant contributor of ozone or nitrogen oxides.

As discussed in Section 3.3.1, Dauphin County is a designated maintenance area with respect to PM_{2.5}. The de minimis levels for PM_{2.5} and its precursors (sulfur dioxide, nitrogen oxides, and VOCs) are 100 tons/year (91 MT/year) for maintenance areas (40 CFR 93.153) (TN2495). Based on the emissions presented in Table 3-4, a conformity analysis is not needed. Furthermore, estimated emissions from the resumption of power operations represent less than 1 percent of county emissions (see Table 3-2).

Based on the above information, the NRC staff anticipates that meteorological and air quality impacts from the resumption of power operations would be NOT SIGNIFICANT.

Noise

Noise sources from the resumption of power operations will include cooling towers, turbines, pumps, motors, and worker vehicle traffic. The cooling towers are the primary noise source contributing to offsite noise to nearby sensitive noise receptors. Operation of NDCTs generates noise from the falling water. The nearest resident is approximately 0.3 mi (450 m) from the cooling towers (CEG 2026-TN12942). In the 2024 LR GEIS (TN10161), the NRC staff noted that at a distance of 230 ft (70 m), noise levels for an NDCT can reach 66 dBA. Assuming a steady and continuous equivalent sound intensity level of 66 dBA for every hour, the day-night sound level would be 72.4 dBA at a distance of 230 ft (70 m) from the cooling towers. Noise levels attenuate rapidly with distance. When distance is doubled from a point source, noise levels decrease by 6 dBA (DOT 2017-TN6567). Therefore, the NRC staff does not expect day-night sound level at the nearest residence to exceed 65 dbA, which the Federal Housing Administration guideline finds acceptable outside a residence (24 CFR Part 51-TN1016). During the 5-year period prior to shutdown, CEG did not receive any noise complaints with respect to the operations of the facility (CEG 2026-TN12942). Increases in noise levels as a result of additional vehicular noise would primarily occur along State Highway 441. Noise from worker vehicles would be intermittent during work shift schedules. Resumption of power operations will result in a peak workforce of 600. The peak workforce during 2024 was 132 active employees and the peak workforce during 2025 was 536 active employees (CEG 2026-TN12942). Given that vehicular noise would be intermittent and that the resumption of power operations would result in an increase of 12 percent in workforce from 2025 levels, vehicular traffic from the resumption of power operations would not result in noticeable increase in noise levels.

Based on the above information, the NRC staff concludes that noise impacts from the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.4 Surface Water Resources

The NRC staff evaluated the potential surface water resources effects from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for surface water resources effects.

3.4.1 Affected Environment

As shown in Figure 2-1, the CCEC is located on Three Mile Island, within the Susquehanna River, about 10 mi (16 km) south of the city of Harrisburg, Pennsylvania. Three Mile Island is located within the Piedmont physiographic province, characterized by rolling low hills and valleys (PA DCNR 2008-TN12935). The Susquehanna River Basin drains approximately 27,500 square miles (mi²) (71,224 square kilometers [km²]) within the States of New York, Pennsylvania, and Maryland (SRBC 2016-TN12952). The basin is divided into six major subbasins: (1) the Upper Susquehanna Subbasin, (2) the Chemung Subbasin, (3) the Middle Susquehanna Subbasin, (4) the West Branch Susquehanna Subbasin, (5) the Juniata Subbasin, and (6) the Lower Susquehanna Subbasin, which is where the CCEC is located (SRBC 2006-TN12954, SRBC 2016-TN12952). The Susquehanna River flows over 400 mi (644 km) from its origin at the outlet of Otsego Lake in Cooperstown, New York, until it discharges into Chesapeake Bay at Havre de Grace, Maryland. As shown in Figure 3-1, Three Mile Island is located within a reservoir portion of the river adjacent to two dams, the run-of-the-river York Haven Dam and the smaller Red Hill Dam. The Susquehanna River is generally a wide and shallow river under natural conditions with river depths and widths tending to increase upstream of dams.

Section 2.1 describes the location, layout, and cooling system of the CCEC, including the intake and discharge structures. Additional details are described in Section 2.1.6 of the 2009 SEIS (NRC 2009-TN3684), which is incorporated here by reference.

Susquehanna River flow is monitored approximately 11 mi (17.7 km) upstream of the CCEC by the United States Geological Survey (USGS) at station 01570500, which has a contributing drainage area of 24,100 mi² (62,418 km²). Figure 3-2 presents the average annual flow measured at this station for water years 1891–2024. The mean annual discharge over this time period is approximately 34,930 cubic feet per second (cfs) (989 cubic meters per second [m³/s]) (USGS 2026-TN13124). On average, March is the high-flow month and August is the low-flow month with approximate flows of 72,450 and 12,820 cfs (2,051 and 363 m³/s), respectively (USGS 2026-TN13124).

Prior to its 2019 shutdown, the CCEC held an approved surface water withdrawal allocation of 122.8 million gallons per day (Mgd) (865 million liters per day [MLd]) under Susquehanna River Basin Commission (SRBC) Docket No. 20110610. During the shutdown period, this allocation was reduced to 44 Mgd (166 MLd) by the SRBC. From 2020 through 2024, actual annual average withdrawals ranged between 10.06 and 15.28 Mgd (38 and 58 MLd) (CEG 2025-TN12656). Plant drinking water, station fire service water, and other industrial makeup water is supplied by groundwater, rather than by surface water.

The nature of the CCEC's permitted discharges is described in National Pollutant Discharge Elimination System (NPDES) permit No. PA 0009920. This permit was issued by the PADEP in 2009 and is under administrative extension. Plant discharges have decreased following plant shutdown in 2019 (CEG 2025-TN12656). The CCEC discharges into the Susquehanna River near river mile 58, an area that the PADEP has historically classified as impaired (AmerGen 2008-TN12956). This section of the river remains impaired for aquatic life due to high pH from agriculture and for fish consumption due to polychlorinated biphenyls and mercury from unknown sources (EPA 2026-TN13797). The developed portion of the CCEC site is surrounded by a flood protection dike system (AmerGen 2008-TN12956), which, along with the yard drain system and best management practices (BMPs), helps prevent potential spills from entering the river.

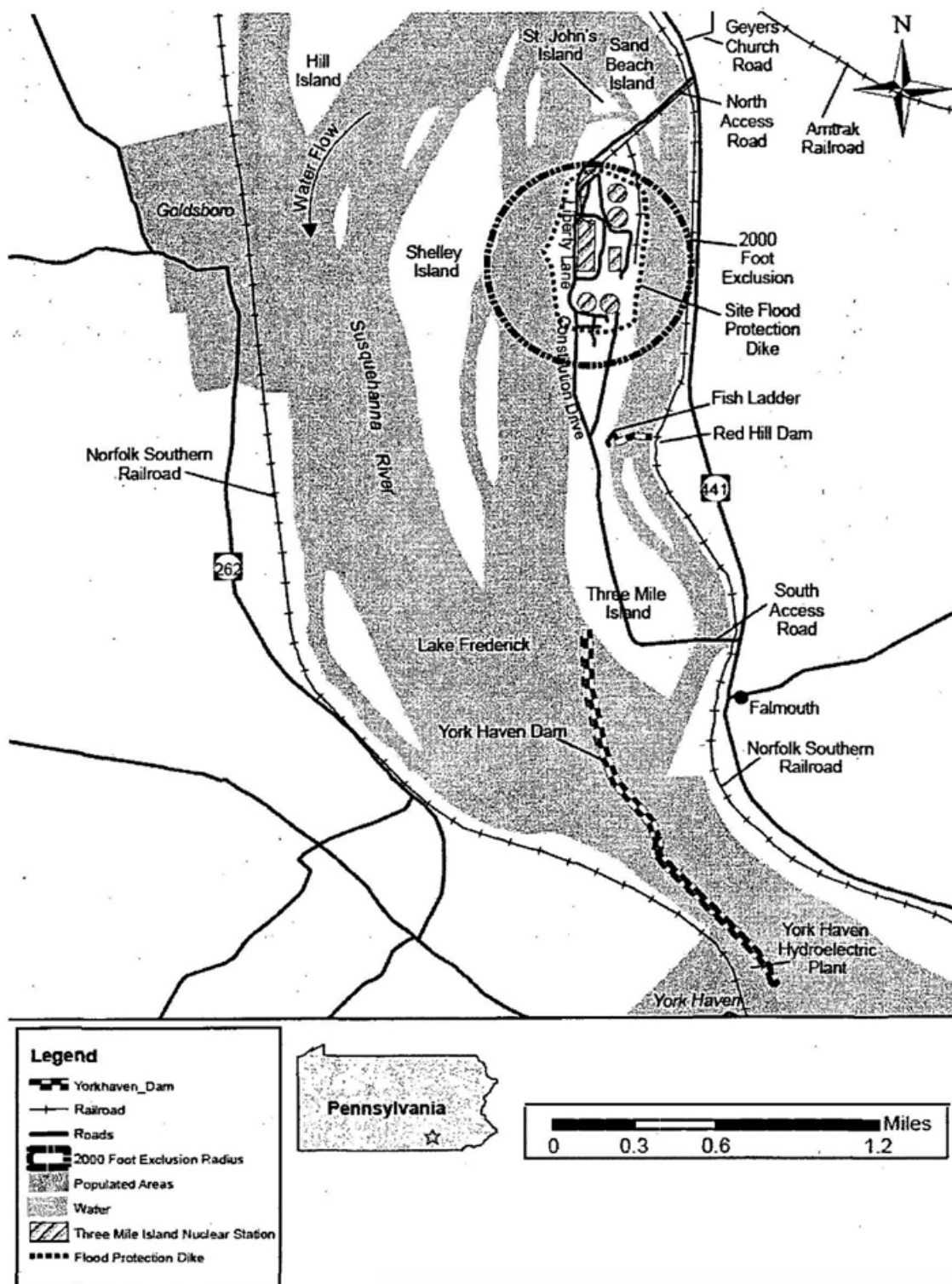


Figure 3-1 Location of Three Mile Island Relative to the York Haven and Red Hill Dams. Adapted from: NRC 2009-TN3684: Figure 2-6.

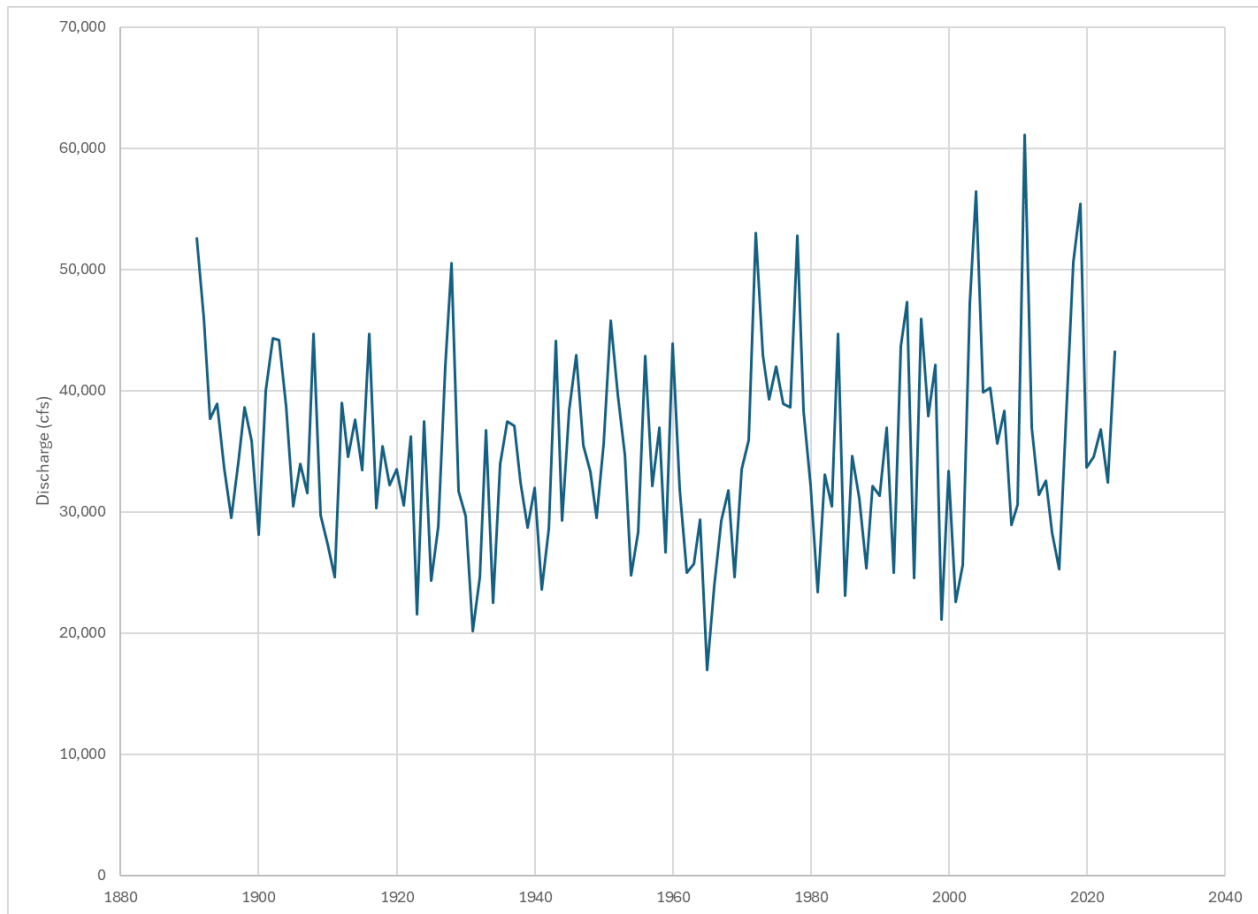


Figure 3-2 Annual Water Year Average for Susquehanna River Discharge at Harrisburg, Pennsylvania. Source: USGS 2026-TN13124.

3.4.2 Environmental Impacts from Preparations for the Resumption of Power Operations

The activities related to the preparations for the resumption of power operations at the CCEC are described in Section 3.1.2.

CEG anticipates that onsite staffing will peak at approximately 1,200 personnel during restart preparations and stabilize at around 600 following the resumption of power operations. Expected staffing levels during restart preparation activities are similar to those observed during previous outages, and the types and volumes of waste generated by the preparation activities are expected to be consistent with those typical of an operations outage year (CEG 2025-TN12656). Site potable water will be supplied from onsite groundwater sources rather than from surface water.

Preparation activities for the resumption of power operations may affect surface water quality by potentially altering drainage patterns and increasing the transport of sediment and other pollutants with surface runoff to the Susquehanna River. As described in Section 4.2.2 of the CCEC ER (CEG 2025-TN12656), CEG does not anticipate any major demolition activities, and all planned ground disturbing activities are expected to occur within previously disturbed areas. The NRC staff expects impacts on surface water resources from ground-disturbing activities to be temporary, localized, and minor due to CEG's use of existing internal procedures, including

BMPs, and compliance with applicable Federal, State, and local permit requirements. CEG consolidated the requirements of the individual pollution prevention and spill response programs into a single Environmental Emergency Response Plan. The plan identifies hazardous material storage areas at the CCEC, outlines pollution prevention and spill response resources, summarizes potential hazards, and provides procedures for preventing and responding to hazardous material incidents (CEG 2026-TN12942). As described, CEG's planned activities are similar to those outlined in Section 4.5.1.1.1 of the 2024 LR GEIS (NRC 2024-TN10161). In the 2024 LR GEIS, the NRC staff concluded that the impacts on surface water quality from non-cooling systems for license renewal are SMALL, provided that BMPs are implemented.

Water for construction-related activities (e.g., dust suppression, concrete mixing, etc.) will not be obtained from the Susquehanna River, but rather from offsite sources using tanker trucks. CEG stated that the amount of water required for construction-related activities is not known at this time (CEG 2026-TN12942). CEG will refill equipment and systems that were drained of water following the plant shutdown. The CCEC intends to utilize existing industrial groundwater wells, supplemented by water from the Susquehanna River in accordance with the site's permitted water withdrawal rates in the SRBC docket (see Table A-1). The two cooling tower basins, which require approximately 5.5 million gallons (Mgal) (20.8 million liters [L]) each, will be filled with water from the Susquehanna River only. The spent fuel pools require approximately 0.65 Mgal (2,460,000 L) of water (CEG 2026-TN12942, CEG 2026-TN13587). Authorized withdrawal rates under the SRBC docket represent a small fraction of river discharge, even under low flow conditions.

CEG has maintained the operability of the intake and discharge structures throughout facility decommissioning in accordance with the SRBC docket and the PADEP-issued NPDES permit. CEG has determined that dredging of the Susquehanna River that would require a permit from the U.S. Army Corps of Engineers (USACE) is not required prior to resuming power operations (CEG 2026-TN12942, CEG 2026-TN13587).

After plant shutdown in 2019, CEG modified its surface water withdrawal permit (SRBC docket approval) to reflect the decreased water demand to support decommissioning efforts. To support the resumption of power operations, CEG applied for a revised surface water withdrawal allocation. Although CEG proposes to operate the CCEC as it had operated the CCEC prior to shutdown, plant upgrades and water conservation measures enabled CEG to request an allocation of 73.2 Mgd (277 MLd), a 40 percent reduction compared to the pre-2022 allocation (CEG 2025-TN12656, CEG 2025-TN12981). On June 4, 2026, the SRBC issued Docket No. 20260607, effective July 1, 2026, to CEG. This new docket authorizes surface water withdrawal (peak day) of up to 73.2 Mgd (277 MLd) from the Susquehanna River (SRBC 2026-TN13598).

The consumptive use of surface water at the CCEC is associated with the operation of the circulating water system, including NDCT evaporation, in-stream evaporation, and cooling tower drift (CEG 2025-TN12981). After plant shutdown in 2019, the external fill structure of Cooling Tower B was removed. Rather than replacing the external fill structure, Cooling Tower B is expected to be fitted with a modification to match the counter flow design of existing Cooling Tower A. This modification is not expected to increase Cooling Tower B's consumptive water use compared to pre-2019 operations. The SRBC guidelines specify requesting a consumptive use amount that would account for "reasonably foreseeable needs" (i.e., normal operations, required testing of equipment, and planned increases in operation). Currently, CEG does not have any planned projects that would increase the actual consumptive use; however, the CCEC may require additional water in the future. Moreover, CEG will implement flow metering during the plant restart. Unlike previous estimates based on pump curves, flow metering will provide actual

consumptive use measurements. To account for potential future project demands and uncertainties in past estimates compared to upcoming metered data, CEG requested a consumptive use allocation of 21 Mgd (79 MLd)—a 9 percent increase over the allocation authorized in 2011 (CEG 2026-TN12942). This request was approved in new SRBC Docket No. 20260607 (SRBC 2026-TN13598).

The SRBC is an interstate agency that coordinates water resource management within the Susquehanna River Basin. Through its planning and regulatory roles, the SRBC monitors water use and availability across the basin and reviews projects involving water withdrawals, consumptive use, and diversions (SRBC 2021-TN12983). To guide these efforts, the SRBC has developed a comprehensive plan that provides a framework for managing the basin's water resources from 2021 through 2041.

Discharges from the CCEC to the Susquehanna River are authorized under NPDES Permit No. PA 0009920, originally issued in 2009. The CCEC continues to operate in compliance with this administratively extended permit while the PADEP reviews the permit renewal application submitted in March 2025. The NPDES application provides detailed information on facility discharges and chemical additives used to control system biofouling. CEG is providing additional information to the PADEP as needed to support its review of the application (CEG 2026-TN12942). CEG expects thermal discharge temperatures to be similar to those during previous power operations prior to plant shutdown. The maximum daily discharge temperature for power operations in the period 2014–2019 ranged from 98.2–103.1°F (36.8–39.5°C) (CEG 2026-TN12942). Given that prior power operating discharge temperatures were consistently below the existing NPDES limit of 115°F (46.1°C), CEG expects the PADEP to decrease the thermal discharge limit to 110°F (43.3°C), which would be consistent with limits imposed on other facilities in the region (CEG 2026-TN12942, CEG 2025-TN12656).

In November 2025, CEG applied to the PADEP for a Clean Water Act (CWA) Section 401 Water Quality Certification related to the resumption of the CCEC power operations (CEG 2025-TN12982, CEG 2026-TN12942). On March 10, 2026, via email correspondence with the PADEP, the NRC set the reasonable period of time for the PADEP to act on CEG's CWA Section 401 certification request as no later than August 15, 2026 (NRC 2026-TN12984). On August 14, 2026, the PADEP issued CEG a CWA Section 401 Water Quality Certification. As stated in the certification, the PADEP certified that the restart, operation, and maintenance of the CCEC complies with the applicable provisions of the CWA, appropriate requirements of State law, and additionally with the applicable Commonwealth water quality standards. The certification is contingent, in part, on CEG obtaining and complying with a PADEP-issued NPDES permit and an NPDES permit for stormwater associated with construction activities, developing an erosion and sediment control plan, and mitigating consumptive water use as approved and conditioned by the SRBC (PADEP 2026-TN13658). In accordance with 40 CFR 121.12 (TN6718), on August 17, 2026, the NRC provided written notification to U.S. Environmental Protection Agency (EPA) Region 3, stating that CEG had submitted to the NRC a set of licensing and regulatory requests supporting the reauthorization of power operations at the CCEC and had received an associated Water Quality Certification from the PADEP. On September 2, 2026, EPA Region 3 notified the NRC that the CCEC restart project would not affect any neighboring jurisdictions (EPA 2026-TN13727), thereby concluding the neighboring jurisdictions process as described in 40 CFR Part 121, Subpart B.

Based on its review of the information summarized above, including the authorizations and permits required to be obtained, the NRC staff concludes that surface water resources impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.4.3 Environmental Impacts from the Resumption of Power Operations

Upon the resumption of power operations at the CCEC, CEG anticipates employing approximately 600 full-time staff, consistent with staffing levels prior to plant shutdown. Accordingly, potable groundwater use is expected to be similar to historical operational levels. Surface water will not be used as a source of potable water. All sanitary wastewater generated onsite will continue to be managed through the plant's existing treatment system.

CEG does not expect any changes to environmental interfaces, new sources, or significant differences in emissions or effluents, including their volumes or mass, compared to operations before the 2019 plant shutdown (CEG 2025-TN12656). During power operations, impacts to surface water quality from plant discharges would be regulated under the CCEC's NPDES permit. CEG maintains a unified facility plan for environmental emergencies, combining stormwater pollution prevention plan (SWPPP) and spill prevention control and countermeasures (SPCC) requirements. CEG applies BMPs to prevent, manage, and treat stormwater pollution.

Upon the resumption of power operations at the CCEC, the volume of raw water withdrawn from the Susquehanna River is expected to be lower than previous operational levels due to CEG's plant upgrades and water conservation measures (CEG 2025-TN12981, CEG 2025-TN13018). The CCEC's peak surface water withdrawal rate (approximately 73 Mgd) (276 MLd) represents a small fraction of river discharge, even under low flow conditions. CEG's requested consumptive water use (32.5 cfs [0.9 m³/s]) represents less than 1 percent of the daily 90 percent exceedance flow (approximately 5,600 cfs [159 m³/s]) at the Harrisburg gaging station (USGS 2026-TN13108). The 90 percent exceedance flow value is one indicator of hydrologic drought as it signifies a rate of stream flow that is equaled or exceeded 90 percent of the time. In the 2009 SEIS, the NRC staff concluded that the impact of the CCEC's consumptive water use on the Susquehanna River would be SMALL (NRC 2009-TN3684). As described in Section 2.1.7.2 of the 2009 SEIS, the CCEC participates in the Cowanesque Lake water storage project where the SRBC monitors the flow of the Susquehanna River, and, in the event of a drought emergency, has the authority to request the USACE to release predetermined quantities of water from storage.

In the 2009 SEIS (NRC 2009-TN3684), the NRC staff concluded that the impact to surface water resources from operating the CCEC for an additional 20 years would be SMALL. Based on its review of the information summarized above, including the authorizations and permits required to be obtained, the NRC staff concludes that surface water resources impacts related to the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.5 Groundwater Resources

The NRC staff evaluated the potential groundwater resources effects from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for groundwater resources effects.

3.5.1 Affected Environment

The CCEC ER (CEG 2025-TN12656) does not contain a specific section on the geologic environment, but information on site-specific hydrogeology is included in Section 3.2.1 of the ER to inform the discussion of groundwater resources. Understanding site hydrogeology is important because hydrogeologic characteristics control groundwater flow and transport of radionuclides should spills or inadvertent releases occur during plant operation.

Section 4.5.1.2.7 of the 2024 LR GEIS (NRC 2024-TN10161) notes that the magnitude of impacts from inadvertent releases of radionuclides depends on the magnitude of the leak or spill, radionuclides involved and concentrations, hydrogeology, distance to receptors, and response time to identify and stop the leak (NRC 2024-TN10161).

Figure 3-3 is a north-south cross-section for the CCEC site. This cross-section illustrates the hydrogeologic units across the CCEC site. It shows the boreholes on which it is based, location of engineered backfill, groundwater potentiometric surface in the silty sand and gravel overburden overlying the Gettysburg Formation (the primary aquifer), and interpreted groundwater potentiometric contours and flow directions. The cross-section also illustrates the approximated dip of bedding planes in the Gettysburg Formation bedrock and predicted groundwater flow pathways that are not parallel to bedding, suggesting some fracture flow as reflected in the CCEC ER (CEG 2025-TN12656).

Materials at the CCEC site consist of overburden (i.e., some fill and silty sand and gravel), weathered bedrock (i.e., silt and clay), and unweathered bedrock composed of an alternating stratigraphic sequence of sandstones, shales, and siltstones of the Triassic (251.9 to 201.3 million years in age) Gettysburg Formation. Groundwater yields in the primary Gettysburg aquifer vary widely, with the sandstone facies normally forming the best aquifers (Exelon 2018-TN13019). In closely jointed and fractured shales in the Gettysburg Formation, relatively high yields occur where fracture flow exists. Drill hole data substantiated surface observation of joints and fractures in the Gettysburg Formation (CEG 2024-TN12987).

A positive groundwater head on Three Mile Island ensures that movement of groundwater from the CCEC site is toward the channels of the Susquehanna River. The water level of the Susquehanna River, which normally flows at elevation 277 ft (84.4 m) AMSL, controls Three Mile Island groundwater levels. Groundwater levels recorded around the plant site varied from 279 to 282 ft (85 to 86 m) AMSL with elevation and distance from the river. Groundwater from Three Mile Island does not flow to the mainland (CEG 2024-TN12987). Groundwater withdrawal at the CCEC has no effect on offsite groundwater wells or ground water supply (NRC 2009-TN3684).

Eight water supply wells are associated with the CCEC, six of which are located on Three Mile Island and two of which are located off of the island to the east at the visitor's center and training center/simulator building (see Figure 2-2). These wells draw water from the lower bedrock primary aquifer in the Gettysburg Formation (CEG 2025-TN12656). As described in Section 3.2.1.1 of the CCEC ER, two of the six wells on Three Mile Island that supply drinking water (the OSF [operations support facility] and 48S wells) are installed to depths of 775 and 996 ft (236 and 303.5 m), respectively, and have maximum pump capacities of 40 and 30 gallons per minute (gpm) (151 and 114 Liters per minute [Lpm]), respectively. The well that supplies potable water to the visitor's center is installed to a depth of 121 ft (37 m) and has a maximum design yield of about 10 gpm (38 Lpm). The well that provides potable water to the training center/simulator building is installed to a depth of 100 ft (30.5 m) and has a maximum design yield of 30 gpm (114 Lpm) (CEG 2025-TN12656).

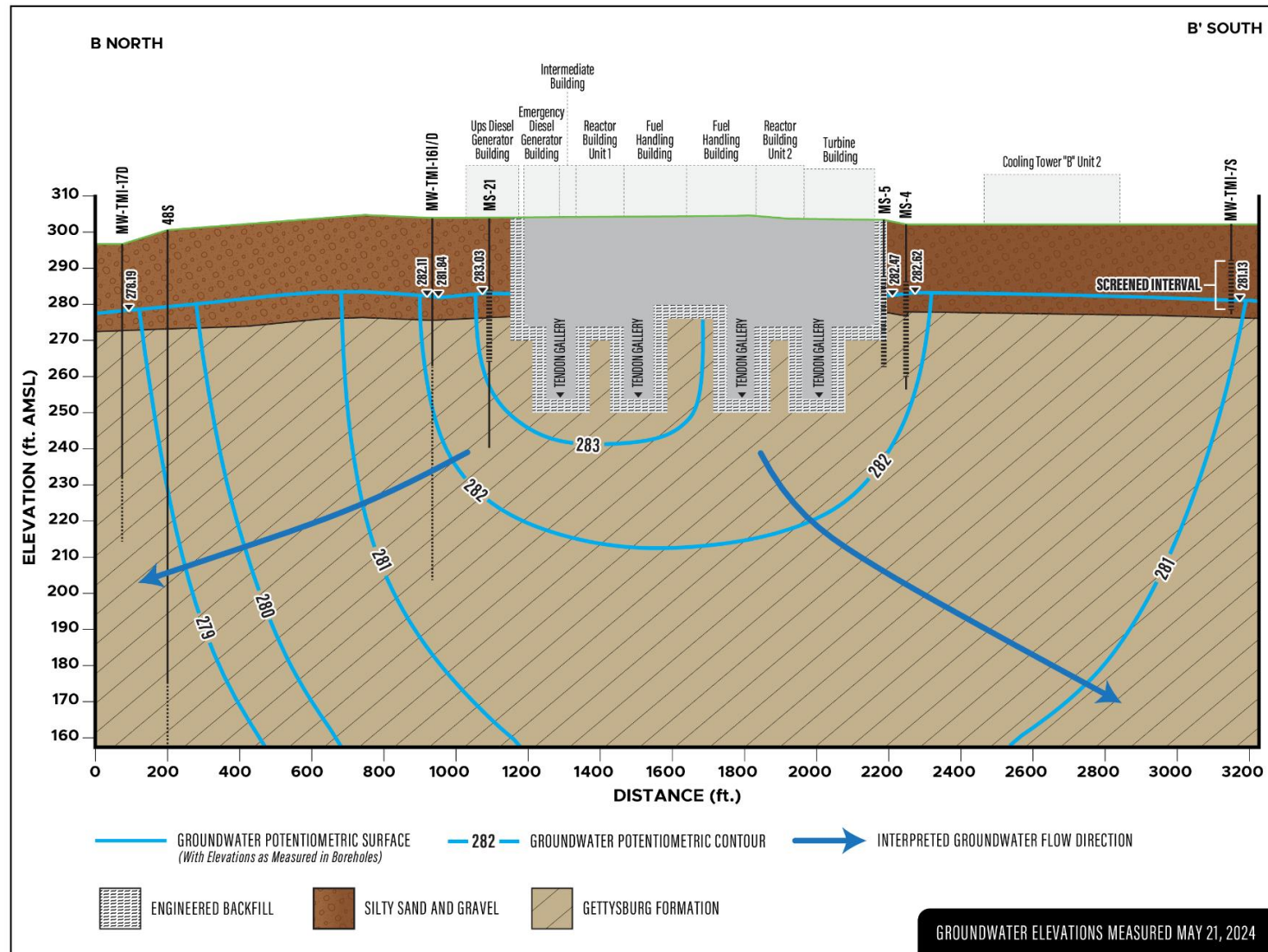


Figure 3-3 Hydrogeologic Cross-Section of the Christopher M. Crane Clean Energy Site. Adapted from: CEG 2026-TN12942.

The CCEC currently uses Wells A, B, and C to supply industrial makeup water that are installed to depths of 400 ft (122 m), 500 ft (152 m), and 400 ft (122 m), respectively (NRC 2009-TN3684). From 2020 through 2024, the average groundwater withdrawal rate per year for the three industrial supply wells ranged from 13,578 gpd (51,400 Lpd) in 2023 to 33,230 gpd (125,800 Lpd) in 2021, which is significantly less than the CCEC's approved groundwater withdrawal limit of 99,000 gpd (374,755 Lpd) (0.099 Mgd) under SRBC Docket No. 20221203 (CEG 2025-TN12656; SRBC 2022-TN13606). On June 4, 2026, the SRBC approved CEG's application for renewal and modification of its docket for surface water and groundwater withdrawal under new Docket No. 20260607. This approval, which was effective as of July 1, 2026, in part authorizes continued groundwater withdrawals at the previously approved rates. This includes a combined withdrawal (30-day average) of 0.099 Mgd (0.37 MLd) and a peak day withdrawal from all three wells of 0.225 Mgd (0.85 MLd) (see also Table A-1) (SRBC 2026-TN13598).

CEG has maintained 49 monitoring wells on Three Mile Island, inclusive of the CCEC and TMI-2, that are part of the radiological groundwater protection program (RGPP). The RGPP incorporates guidance as detailed in Nuclear Energy Institute standard 07-07, Industry Groundwater Protection Initiative. Monitoring results are reported in the site annual reports (CEG 2025-TN12656). The RGPP included 47 wells in 2025. Previous wells MW-TMI-6I and MW-TMI-6D were abandoned in the second quarter of 2024 associated with decommissioning activities at TMI-2, with replacement scheduled in 2026. For 2025, RGPP results were reported in the site annual radioactive effluent release report (ARERR) (CEG 2026-TN13589) as follows. Based on data derived from the 2025 RGPP sampling rounds, 125 samples were collected and analyzed from 47 wells with 13 positive results for tritium (i.e., exceeding the 200 picocuries per liter [pCi/L] lower limit of detection [LLD]) in 10 wells, all of which were well below the maximum contaminant level (MCL) of 20,000 pCi/L for tritium specified by the EPA. The maximum detected tritium values are shown in Table 3-5.

Table 3-5 Results for Maximum Tritium Concentration Measurements from 2025 Radiological Groundwater Protection Program Sampling at the Christopher M. Crane Clean Energy Center

Well Location	Tritium (pCi/L)
MS-8 ^(a)	358
MW-TMI-10I ^(b)	368
MW-TMI-10S ^(a)	221
MW-TMI-16D ^(b)	277
MW-TMI-1D ^(b)	251
MW-TMI-21D ^(b)	1,250
MW-TMI-21I ^(b)	223
MW-TMI-22D ^(b)	970
MW-TMI-3I ^(b)	238
NW-C ^(c)	597

(a) Overburden (surficial) well.

(b) Upper bedrock well.

(c) Lower bedrock well.

Source: CEG 2026-TN13589.

These results are similar to those reported for 2024, as summarized in the draft EA, when there were 16 positive results for tritium. The maximum observed tritium concentration in 2024 was 1,280 pCi/L in MW-TMI-22D (NRC 2026-TN13586).

In the 5-year period prior to shutdown in 2019, the highest tritium concentrations measured in plant groundwater were 37,200 pCi/L in MW-TMI-22S (sample from 04/21/2015) and 27,400 pCi/L in MW-TMI-22I (sample from 05/21/2015). The tritium was attributed to historical releases (TBEES 2016-TN13126). The well locations are adjacent to the CCEC auxiliary and fuel handling building. As shown in Table 3-5, tritium was detected in the overburden aquifer samples collected from two wells with a maximum concentration of 358 pCi/L from MS-8 during 2025. In 2025, the maximum observed tritium concentration in the upper bedrock aquifer was 1,250 pCi/L in MW-TMI-21D. The only lower bedrock well with a positive tritium result was NW-C at 597 pCi/L. As described in Section 3.2.1.2 of the CCEC ER (CEG 2025-TN12656), monitoring wells MW-TMI-21D and MW-TMI-22D are located near the borated water storage tank. There was a leak from the borated water storage tank flange in 2012 and elevated tritium concentrations in those wells are attributed to residual tritium from that leak. The maximum tritium detection from 2020 was 2,770 pCi/L measured in MW-TMI-21D, indicating that tritium values in the upper bedrock aquifer have also decreased with time. In 2020 through 2025, tritium was not detected in drinking water radiological environmental monitoring program (REMP) sampling locations above the LLD of 200 pCi/L (CEG 2025-TN12988, CEG 2026-TN13588). There does not appear to be an active source of tritium to groundwater in 2025, and the wells sampled effectively monitored groundwater conditions at the facility (CEG 2026-TN13589).

Station-related gamma radionuclides, hard-to-detects (iron-55 and nickel-63), and strontium-89 and strontium-90 were not detected at concentrations greater than their respective LLDs in any groundwater samples collected in 2024. Gross-alpha (dissolved and suspended) was not detected at concentrations that exceeded the alert level reported in 2024 (CEG 2025-TN12988). CEG conducts sampling for gamma and gross-alpha radionuclides every 2 years (CEG 2026-TN13589).

3.5.2 Environmental Impacts from Preparations for the Resumption of Power Operations

As indicated in Section 3.1.2 and further described in the CCEC ER (CEG 2025-TN12656), CEG is working to restore the CCEC to previous operating conditions that existed at the time of the 2019 shutdown with no major demolition activities anticipated and no new construction planned on undeveloped land. If needed, any new construction is expected to be on previously disturbed land to reduce the potential impacts on groundwater resources and would follow existing site procedures and environmental screening processes. Section 4.2.1.1 of the CCEC ER further notes that any potential impacts related to preparations for the resumption of power operations at the CCEC are expected to be local and of short duration and no geologic resources are expected to be altered or used during restart preparations (CEG 2025-TN12656).

In addition, CEG expects that the potential release of pollutants resulting from ground-disturbance activities would be mitigated through the CCEC NPDES permit, emergency environmental plans based on CEG procedures, State and local regulatory requirements, and associated BMPs. All previous procedures and processes related to radioactive, nonradioactive, and mixed waste are anticipated to remain in place for restart activities to minimize potential impacts to groundwater at the CCEC. The CCEC's current waste minimization plan written for decommissioning activities is being updated for restart activities (CEG 2025-TN12656).

Staffing for preparations for the resumption of power operations is expected to be similar to that needed during planned outages prior to decommissioning (i.e., approximately 1,200 total onsite staff). That temporary increase in staffing is expected to result in increased potable groundwater use. Groundwater withdrawal use rates during the preparations for the resumption of power operations are limited to the authorization in SRBC Docket No. 20221203 (SRBC 2022-TN13606), as superseded by SRBC Docket No. 20260607, effective July 1, 2026 (SRBC 2026-TN13598).

Based on its review of the information summarized above and other information sources cited in this EA, the NRC staff concludes that groundwater resources impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.5.3 Environmental Impacts from the Resumption of Power Operations

Upon the resumption of power operations at the CCEC, groundwater use is expected to be similar to that prior to the 2019 shutdown as stated in Section 4.2.1.2 of the CCEC ER (CEG 2025-TN12656). Specifically, CEG in its August 2025 application to the SRBC requested groundwater withdrawal rates similar to those in its 2011 SRBC docket (e.g., combined peak rate of 0.225 Mgd [0.85 MLd]) (CEG 2025-TN13018, CEG 2025-TN12981). On June 4, 2026, the SRBC approved CEG's application for renewal and modification of its docket for surface water and groundwater withdrawal under new Docket No. 20260607, including groundwater withdrawals at the previously approved rates (see Section 3.5.1), with the SRBC finding, in part, that no significant adverse impacts are anticipated by the operation of the CCEC as proposed (SRBC 2026-TN13598). This same volume of groundwater withdrawal (i.e., combined peak rate of 0.225 Mgd [0.85 MLd]) was evaluated by the NRC staff in Section 4.3.1 of the 2009 SEIS and determined to have a SMALL impact on nearby groundwater users (NRC 2009-TN3684); this determination is incorporated here by reference.

No water supply wells have been plugged and abandoned, placed temporarily out of service, repaired, or replaced and no plans to install additional water supply wells are anticipated for the resumption of power operations at the CCEC (CEG 2025-TN12656).

CEG monitors onsite groundwater in accordance with the CCEC RGPP, which is described in Section 3.2.1.2 of the CCEC ER (CEG 2025-TN12656), and groundwater monitoring results are reported in the ARERR, as described in Section 3.5.1.

As described in Section 3.2.1 of the CCEC ER, the hydrogeologic conditions of Three Mile Island and the CCEC site are such that any potential radiological release to groundwater would be expected to initially migrate downward to the water table and radially outward from the center of the island to ultimately discharge to the Susquehanna River. Groundwater does not migrate beneath the river from the island to the mainland or other nearby islands because of the flow of groundwater from upgradient areas (from higher land) on both sides of the river. Therefore, no radionuclides, including tritium, are expected to migrate to public groundwater supply wells or domestic wells located off the island (CEG 2025-TN12656).

Groundwater is monitored via the CCEC RGPP and monitoring results reported to track groundwater quality and assess any inadvertent radiological releases. CEG also maintains an Environmental Emergency Response Plan establishing procedures to manage nonradioactive materials (see Section 3.4.2).

The resumption of power operations is anticipated to require staffing levels similar to pre-decommissioning levels (i.e., approximately 600 full-time staff as seen during normal operation) and potable groundwater use for the resumption of power operations is expected to be similar to that prior to decommissioning. The NRC staff concluded in the 2009 SEIS (NRC 2009-TN3684) that impacts to groundwater availability and quality from continued operations would be SMALL.

Based on its review of the information summarized above and other information sources cited in this EA, the NRC staff concludes that groundwater resources impacts associated with the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.6 Terrestrial Ecological Resources

The NRC staff evaluated the potential terrestrial ecological resources effects from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for terrestrial ecological resources effects. Supplemental information describing the terrestrial environment to include State-listed species, invasive species, and more can be found in Appendix E.

3.6.1 Affected Environment

The CCEC terrestrial environment is described in Sections 2.2.6 and 2.2.7.2 of the 2009 SEIS (NRC 2009-TN3684) and in Section 3.3.1 of the CCEC ER (CEG 2025-TN12656). Those descriptions are incorporated here by reference. Supplemental information describing the terrestrial environment can be found in Appendix E.

3.6.1.1 *Eagles and Migratory Birds*

The Bald and Golden Eagle Protection Act (BGEPA) (TN1447) prohibits the take of bald or golden eagles including their parts, nests, or eggs without a permit from the Secretary of the Interior. The BGEPA defines "take" as any act to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb." The BGEPA defines "disturb" as to take action that causes, or is likely to cause, (1) injury to an eagle, (2) decreases its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment (50 CFR 22.3) (TN6580). Bald eagles are known to occur within the CCEC site, with two or more nests reported (one on the north end of Three Mile Island and at least one on the south end) and multiple individuals observed onsite (CEG 2025-TN12656, CEG 2026-TN12942; FWS 2024-TN12989). Similarly, the Migratory Bird Treaty Act of 1918 (MBTA) (TN3331) makes it illegal to take, possess, transport, or sell any migratory bird or its parts, nests, or eggs without a valid permit, including the peregrine falcon and osprey. An osprey pair is known to nest on top of the meteorological tower (CEG 2025-TN12656, CEG 2026-TN13587). CEG has documented five incidents involving protected birds at the CCEC site from 2015 to January 2026. Of these incidents, three involved peregrine falcons, which are protected under the MBTA, and two involved bald eagles, which are protected under the BGEPA and the MBTA. Table 3-6 provides additional information regarding these incidents. Sections 3.6.2.4 and 3.6.3.5 address potential impacts from bird collisions with site structures both during the preparation for the resumption of power operations and during the resumption of power operations and are incorporated here by reference (CEG 2025-TN12656, CEG 2026-TN12942).

Table 3-6 Documented Incidents Involving Protected Bird Species at the Christopher M. Crane Clean Energy Center (2015–January 2026)

Incident Date	Avian Species	Condition	Incident Details
06/18/2015	peregrine falcon (<i>Falco peregrinis</i>)	Entangled	One individual discovered in razor wire. Bird escaped. No signs of injury.
04/12/2018	bald eagle (<i>Haliaeetus leucocephalus</i>)	Injured; later euthanized	One individual discovered injured on north end of property with fractured wing (NRC 2026-TN13125). Notification made to certified wildlife rehabilitator.
06/02/2018	peregrine falcon (<i>Falco peregrinis</i>)	Injured	One individual discovered in razor wire. Certified wildlife rehabilitator contacted to remove/rescue bird. Bird returned to site.
06/18/2022	peregrine falcon (<i>Falco peregrinis</i>)	Deceased	One individual discovered in razor wire. Carcass left for natural degradation.
01/02/2026	bald eagle (<i>Haliaeetus leucocephalus</i>)	Deceased	One individual discovered on south end of property impaled on landscaping stake near reforestation area. Notification made to Pennsylvania Game Commission in accordance with CEG's existing Avian and Wildlife Management Procedure (EN-AA-100-2000).

CEG = Constellation Energy Generation, LLC.
Source: CEG 2026-TN12942.

CEG does not currently hold BGEPA or MBTA permits (CEG 2026-TN12942). Historically, CEG implemented a Raptor Monitoring Program, but does not plan to do so upon the reauthorization of power operations at the CCEC (CEG 2026-TN12942). Instead, CEG seeks to comply with Federal and State bird protection laws, including, but not limited to, the BGEPA and the MBTA, by maintaining an Avian and Wildlife Management Procedure (AWMP). This procedure, in part, contains measures, precautions, and guidance on how to properly respond when encountering injured or healthy wildlife. As part of its audit related to its environmental review of the set of licensing and regulatory requests supporting the reauthorization of power operations at the CCEC, the NRC staff notified CEG that the AWMP should be revised to ensure that notification of protected bird incidents is made to the FWS. Subsequently, CEG committed to (CEG 2025-TN12656, CEG 2026-TN12942, CEG 2026-TN13587) (1) maintaining an on-call relationship with a certified wildlife rehabilitator to respond to distressed or injured wildlife, including protected birds, and to provide treatment and rehabilitation, as appropriate; (2) implementing recommended FWS eagle avoidance measures, including conducting any loud or intrusive maintenance or restoration activities outside the breeding season when they occur within 660 ft (200 m) of a bald eagle nest, and maintaining existing landscape buffers that provide visual screening between project activities and the nest(s); and (3) revising the AWMP (EN-AA-100-2000, Revision 3) by March 31, 2026, to require immediate notification and coordination with the FWS for any bald eagle incident to determine whether additional measures or permits are required under the BGEPA or the MBTA. By letter dated March 31, 2026 (CEG

2026-TN12942, CEG 2026-TN13587), CEG confirmed that it currently maintains an on-call relationship with a certified wildlife rehabilitator and that EN-AA-100-2000, Revision 4 has been implemented and includes the clarification that a bird event involving a bald eagle necessitates contacting the FWS in addition to the Pennsylvania Game Commission.

As discussed above, incidents involving protected birds have occurred at the CCEC site, and CEG does not currently hold any permits under the BGEPA or the MBTA for activities at the facility. However, with respect to the preparations for and the resumption of power operations at the CCEC, CEG has committed to avoidance measures, maintains an on-call relationship with a certified wildlife rehabilitator, and has an AWMP that requires immediate notification and coordination with the FWS for any bald eagle incident. Based on these measures and its review of the information summarized above, the NRC staff concludes that the impacts on protected birds associated with the activities related to the preparations for the resumption of power operations at the CCEC and the resumption of power operations at the CCEC would be managed through the applicable regulatory requirements and agency oversight and, therefore, would be NOT SIGNIFICANT.

3.6.2 Environmental Impacts from Preparations for the Resumption of Power Operations

For the assessment of terrestrial ecological resources impacts associated with the preparation for the resumption of power operations, this analysis draws on both the 2024 LR GEIS (NRC 2024-TN10161) and NUREG-2249, *Generic Environmental Impact Statement for Licensing of New Nuclear Reactors* (2026 NR GEIS) (NRC 2026-TN12155). Crosscutting terrestrial issues identified in these documents include habitat loss, conversion, fragmentation, or wetland disturbance; disturbance from noise and human activity; injury or mortality from vehicular collisions; and bird collisions with structures. These four issues form the basis for evaluating impacts associated with preparation activities at the CCEC. These relevant issues were then applied to this project-specific analysis to ensure consistency with established NRC environmental reviews. Section 3.1.2 describes the specific activities associated with the preparations for the resumption of power operations at the CCEC.

3.6.2.1 *Habitat Loss, Conversion, Fragmentation, or Wetland Disturbance During Preparation Activities*

As described in the CCEC ER (CEG 2025-TN12656), all land-disturbing preparatory activities will be confined to the previously disturbed industrial portion of the project area. No additional tree clearing or additional land development is planned outside of the existing disturbed footprint. Consequently, no new habitat loss, conversion, or fragmentation is expected beyond what has already occurred (CEG 2025-TN12656). CEG is currently commissioning a wetland delineation survey to identify jurisdictional wetlands within the project area and will submit the completed report to the State when available (CEG 2026-TN12942). The applicant would continue routine application of commercial herbicides and other pesticides as necessary to maintain the grounds. Herbicide and pesticide use would be limited to ground-based applications in accordance with labels at labeled rates by certified applicators within the pre-disturbed industrial area.

3.6.2.2 *Disturbance from Noise and Human Activity During Preparation Activities*

Several project activities are anticipated to generate noise levels comparable to those experienced during previous operational phases of the CCEC, although these levels will exceed

those associated with the plant's current decommissioning status. Increased vehicular movement associated with plant personnel, equipment delivery, and material transport will contribute to elevated noise across the site. In addition, modifications and repairs to the structures listed in Section 3.1.2 will introduce intermittent construction-related noise above existing ambient conditions.

These activities will collectively produce short-term increases in background noise that may influence the behavior of terrestrial wildlife. Temporary displacement, alert responses, or minor alterations to foraging and movement patterns are possible within the immediate vicinity of the work zone. However, all planned activities will be confined to previously developed industrial areas where wildlife presence is limited, and where species that do occur are generally habituated to human activity. Noise levels are also expected to remain within the range associated with normal industrial operations at the site, reducing the likelihood of significant or sustained ecological impacts. Noise generating activities will be limited to discrete phases of the preparation for restart phase. Implementation of BMPs such as restricting high noise activities to daylight hours and maintaining equipment in good working condition will reduce the intensity and duration of acoustic disturbances.

3.6.2.3 Injury or Mortality from Vehicular Collisions During Preparation Activities

Preparation activities will increase onsite vehicle traffic, which elevates the potential for wildlife collisions with vehicles. Species that occasionally move through the industrial footprint could experience incidental injury or mortality if they enter active travel routes. However, this risk remains low because work is confined to previously established areas and roadways where wildlife presence is already limited. Implementation of standard traffic management practices such as controlled speed limits and minimizing unnecessary trips will further reduce the likelihood of collisions. Overall, impacts are expected to be minor and short term with no population level effects anticipated.

3.6.2.4 Bird Collisions with Structures During Preparation Activities

Tall structures and buildings can pose a collision hazard to avian species. Several species utilize tall structures at the CCEC such as an osprey pair that nests on top of the meteorological tower (CEG 2025-TN12656, CEG 2026-TN12942). See Section 3.6.1.1 for more information. The tallest structures onsite are the meteorological tower and the NDCTs. The CCEC's lighting configuration includes aircraft warning lights installed along the exterior of the cooling towers. Each tower contains 12 lights arranged as four at the top, four at two-thirds height, and four at one-third height. These are blinking red lights in compliance with Federal Aviation Administration requirements. The lights are controlled by a photoelectric sensor on the north side of the towers, which turns them on during low-light conditions and off during bright daylight. The cooling towers are the tallest structures on the site, and lighting on all structures is expected to remain consistent with the lighting regime used during previous plant operations (CEG 2026-TN12942). Additionally, CEG has installed bird diverters on the meteorological tower to reduce the potential for avian collisions with guy wires or tower components.

During preparation activities, one of the NDCTs will undergo modification as described in Section 3.1.2, which will increase human presence, equipment operation, and localized disturbance around the structure. These activities may temporarily discourage birds from approaching the tower, reducing the likelihood of collision during periods of active work. The work will not introduce new lighting regimes known to increase avian collision risk. While temporary construction equipment may add short term vertical elements to the work zone, this

equipment will be temporarily present during active work. Given the limited duration of these activities and the lack of new collision prone lighting or structure types, preparation modifications are not expected to substantially increase collision risk beyond existing levels.

Based on its review of the information summarized above, the NRC staff concludes that terrestrial ecological resources impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.6.3 Environmental Impacts from the Resumption of Power Operations

As part of its independent environmental review of the proposed actions, the NRC staff evaluated terrestrial ecological resources issues addressed in both the 2024 LR GEIS and the 2026 NR GEIS to determine which issues warrant detailed, project-specific analysis for the resumption of power operations at the CCEC. The NRC staff relied on the seven applicable terrestrial ecological resources issues summarized in the 2024 LR GEIS (NRC 2024-TN10161: p. 2-8) to identify issues that would not differ from past operations or current site conditions. Based on this review, the NRC staff concluded that two terrestrial ecological resources issues, transmission line right-of-way management impacts on terrestrial resources and electromagnetic effects on terrestrial plants and animals associated with in-scope transmission lines, would be minimal and consistent with previous operational conditions. Therefore, these issues did not require further detailed analysis. The NRC staff conducted detailed analyses of terrestrial ecological resources issues that were either not addressed in the 2009 SEIS or could differ under the resumption of power operations and whether any new and significant information should be considered. These issues are exposure of terrestrial organisms to radionuclides; non-cooling system impacts on terrestrial resources; cooling tower impacts on terrestrial plants; water use conflicts with terrestrial resources; and bird collisions with plant structures and transmission lines. Documents utilized by the NRC staff to support this review are the CCEC ER (CEG 2025-TN12656), CEG's NPDES permit renewal application (CEG 2025-TN13023), the 2009 SEIS (NRC 2009-TN3684), the 2019 TMI-1 PSDAR (Exelon 2019-TN12795), the TMI-2 Decommissioning EA (NRC 2024-TN12787), and 2014–2024 REMP data (NRC 2025-TN13020).

3.6.3.1 Exposure of Terrestrial Organisms to Radionuclides

Radionuclides may be released from nuclear power plants into the environment through several pathways (NRC 2024-TN10161: pp. 4-49 to 4-52). During normal operations, nuclear power plants can release gaseous emissions that deposit small amounts of radioactive particulates in the surrounding environment. Nuclear power plants can also release radionuclides as liquid effluents into water, and terrestrial plant roots can absorb radionuclides from shallow groundwater or surface waters. Animals may experience exposure to ionizing radiation through (1) inhalation; (2) direct contact with air, water, or other media; or (3) ingestion of contaminated food, water, or soil.

The NRC staff reviewed CEG's analysis of this issue (CEG 2025-TN12656) and reviewed CCEC REMP data, as reported in facility annual radiological environmental operating reports (AREORs), from 2014 to 2025 (NRC 2025-TN13020; CEG 2026-TN13588). A review of environmental monitoring data from 2014 through 2025 shows that all measured concentrations of strontium-90, cesium-137, tritium, and other radionuclides in air, soil, vegetation, and groundwater were well below ecological screening values for terrestrial organisms. The only exceedances over the regulatory limit were for tritium in two onsite groundwater wells in 2015 (see Section 3.5.1). These maximum exceedances did not result in offsite migration or ecological exposure (TBEES 2016-TN13126). No evidence of accumulation or an increasing

trend is observed in any terrestrial medium. Therefore, the risk to terrestrial organisms from CCEC operations is negligible and protective of ecological health. The NRC staff concludes that exposure to radionuclides by terrestrial organisms would be NOT SIGNIFICANT.

3.6.3.2 *Non-Cooling System Impacts on Terrestrial Resources*

Non-cooling system impacts on terrestrial resources can include impacts that result from the CCEC site and landscape maintenance activities, stormwater management, elevated noise levels, and other ongoing operations and maintenance activities that would occur during operations on and near a plant site. The NRC staff reviewed several documents related to this issue (CEG 2025-TN12656; Exelon 2019-TN12795; NRC 2009-TN3684).

Site-specific programs (e.g., SPCC, SWPPP, NPDES, AWMP) and BMPs such as environmental training are and will continue to be utilized at the CCEC to decrease environmental effects and reduce the occurrence of inadvertent releases of nonradiological contaminants (CEG 2025-TN12656, CEG 2026-TN12942). Additional permits would be sought accordingly. The NRC staff concludes that non-cooling system impacts on terrestrial resources would be NOT SIGNIFICANT.

3.6.3.3 *Cooling Tower Impacts on Terrestrial Plants*

Upon the resumption of power operations at the CCEC, both NDCTs A and B would return to service following an extended period of non-operation. During the shutdown period, terrestrial vegetation surrounding the facility acclimated to the absence of cooling tower drift, meaning that nearby plants were not exposed to fine water droplets or dissolved salts typically associated with cooling tower operations. Upon restart, both NDCTs would utilize drift eliminators, and no substantial increase in drift rate or drift chemical composition is expected compared to operations prior to the 2019 shutdown. Likewise, no substantial increase in particulate matter emissions is anticipated relative to pre-shutdown levels. Visual plume behavior is also expected to remain consistent with the 2009 SEIS, which documents plume lengths of approximately 1 to 2 mi (1.6 to 3.2 km) under certain meteorological conditions. Prior to the 2019 shutdown, no observable vegetation effects were attributed to NDCT operations (CEG 2026-TN12942).

The restoration of NDCT A to its original counterflow design and the modification of NDCT B to incorporate a similar fill structure and modern drift-elimination technology would further reduce drift and associated salt deposition. Although any renewal of drift represents a change from the conditions currently experienced during the shutdown period, deposition levels are expected to remain below thresholds associated with foliar injury or soil salinization for most plant species, consistent with findings in the 2009 SEIS (NRC 2009-TN3684). That document also notes the potential for minor, localized effects on drift-sensitive species situated immediately downwind of the towers if drift is not adequately controlled. Given that the surrounding environment has adjusted to several years without drift exposure, the reintroduction, even at low and well-controlled levels, may require a short period of readjustment for local vegetation. Continued monitoring of vegetation and soil conditions near the towers will therefore be important to ensure that salt deposition remains within acceptable limits and that no unexpected terrestrial impacts occur.

Overall, the renewal of cooling tower operation is expected to result in only minor impacts on terrestrial vegetation. Although nearby plant communities have acclimated to several years without cooling tower drift, both NDCTs will operate with modern drift-elimination technology that limits salt deposition to levels comparable to those prior to the 2019 shutdown, when no vegetation effects were observed. Any localized adjustment by vegetation to renewed drift is

expected to be small and temporary. In parallel, CEG will complete updated wetland delineation surveys in spring 2026 to confirm that areas adjacent to the facility, including those potentially influenced by drift or microclimate changes near the cooling towers, remain unaffected (CEG 2026-TN12942). These efforts will help ensure that resumed NDCT operations continue to pose minimal risk to terrestrial ecological resources. Therefore, the NRC staff concludes that cooling tower impacts on terrestrial plants would be NOT SIGNIFICANT.

3.6.3.4 Water Use Conflicts with Terrestrial Resources (Plants with Cooling Ponds or Cooling Towers Using Makeup Water from a River)

The resumption of power operations at the CCEC would result in a temporary increase in water withdrawals from the Susquehanna River during initial startup. However, these effects would occur over a short period of time and would return to baseline operational conditions once completed. As described in Section 3.4.2, upgrades to plant systems and CEG's implementation of water conservation measures are expected to reduce the volume of water withdrawal during normal operations compared to historic levels. Accordingly, any short-term increase in water demand during restart would be minor, temporary, and not expected to result in measurable terrestrial ecological resources impacts beyond those occurring during the previous operational period.

Potential interactions between water withdrawals and terrestrial habitats are expected to remain within the range of impacts historically associated with the CCEC's operations. No changes to land use are proposed that would increase risk to terrestrial communities. Moreover, no increases in water withdrawals as compared to prior operations will occur from the established intake infrastructure. However, a complete evaluation of potential effects on riparian and floodplain vegetation will require updated wetland information. CEG currently does not possess a recent wetland delineation for the areas adjacent to the intake and associated support facilities. A formal wetland delineation survey is planned for spring 2026, and results will be provided to the State once complete (CEG 2026-TN12942). Based on the currently available information, impacts on terrestrial ecological resources associated with water use are expected to be small, temporary during restart, and consistent with the previously established operational baseline thereafter. Therefore, the NRC staff concludes that water use conflicts with terrestrial resources would be NOT SIGNIFICANT.

3.6.3.5 Bird Collisions with Plant Structures and Transmission Lines

The NRC staff determined that the impacts from the resumption of power operations at the CCEC with respect to bird collisions with plant structures and transmission lines would be less than those identified in Section 3.6.2.4. This determination is based on the fact that the preparation activities described in Section 3.1.2 would be completed by this time and that the only potential remaining impacts would be comparable to those described in the 2009 SEIS (NRC 2009-TN3684). Therefore, the NRC staff concludes that bird collisions with plant structures and transmission lines would be NOT SIGNIFICANT.

3.6.3.6 Conclusion

Based on its review of the information summarized above, the NRC staff concludes that terrestrial ecological resources impacts related to the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.7 Aquatic Ecological Resources

The NRC staff evaluated the potential aquatic ecological resources effects from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for aquatic ecological resources effects.

3.7.1 Affected Environment

This section describes the aquatic ecological resources of the affected environment (i.e., the Susquehanna River). The CCEC aquatic ecological resources environment is described in Sections II.F.2 and 2.6.2 of the 1972 and 1976 final environmental statement (FES) documents (AEC 1972-TN12901; NRC 1976-TN12902), Section 2.2.5 of the 2009 SEIS (NRC 2009-TN3684), and Sections 3.2.2 and 3.3.2 of the CCEC ER (CEG 2025-TN12656). Those descriptions are incorporated here by reference. Supplemental information describing the aquatic ecological resources environment to include State-listed species, invasive species, and more can be found in Appendix E.

3.7.1.1 Site and Vicinity

The CCEC is located on Three Mile Island in the middle of the Susquehanna River, which provides the source and receiving body for the plant's cooling-water system. The Susquehanna River is 444 mi (715 km) long running from upstate New York to the Chesapeake Bay in Maryland. Susquehanna River is a broad, shallow river averaging 5–10 ft (1.5–3 m) in depth and about 1.5 mi (2.4 km) in width at Three Mile Island and is not commercially navigable. State and local agencies actively monitor water quality throughout the basin using tools like the SRBC's Water Quality Index and continuous in-stream monitoring stations, which measure parameters such as dissolved oxygen, pH, and water temperature to track ecological conditions (SRBC 2026-TN12775). The basin's overall water quality is mapped and scored using data collected from nearly 20,000 samples spanning decades. Water temperatures vary seasonally from average winter lows of 32–40°F (0–4°C) to summer averages that warm into the 75–81°F (24–27°C) range (USGS 2026-TN12786). This region of the Susquehanna River has been highly dammed, and this has historically caused population declines in multiple anadromous species, including American shad (*Alosa sapidissima*) and river herring. Intensive restoration efforts for these aquatic species, including construction of fish passage facilities at multiple dams in the 1990s and early 2000s, have recorded populations of American shad, river herring, striped bass, and American eel entering the York Haven Pool. Despite these habitat improvements, populations of American shad and American eel remain depleted (ASMFC 2026-TN13599).

The aquatic biological communities of the Susquehanna River, including plankton, macrophytes, benthic invertebrates, and fish, are described in more detail in Section E.2 to this EA and previously in Section 2.2.5 of the 2009 SEIS (NRC 2009-TN3684).

The aquatic action area covers about 28 ac (0.11 km²). This includes the existing intake structure located on the western bank of the island and the effluent discharge structure located approximately 600 ft (180 m) downstream of the plant's intake structure (CEG 2025-TN12656; NRC 2009-TN3684).

3.7.2 Environmental Impacts from Preparations for the Resumption of Power Operations

3.7.2.1 Site and Vicinity

Preparations to resume power operations at the CCEC will not involve any new ground disturbance, and activities will occur only in previously disturbed areas. Ongoing site-specific programs (e.g., SPCC, SWPPP, NPDES) will continue using BMPs and outfall monitoring to prevent pollutant discharge (CEG 2025-TN12656). The CCEC would have to withdraw approximately 11 Mgal (41.6 million L) of water from the Susquehanna River to initially fill the cooling tower basins and another approximately 0.649 Mgal (2,460,000 L) to fill the spent fuel pool (CEG 2026-TN12942). CEG intends to fill systems and components that were drained post-shutdown in accordance with the site's permitted water withdrawal rates in the existing SRBC docket (see Section 3.4.2). CEG plans no changes to the water intake system from the Susquehanna River, relative to the previously operating plant. A description of the cooling-water intake system can be found in Section 2.1.6 of the 2009 SEIS (NRC 2009-TN3684). CEG has maintained the intake and discharge structures at the CCEC throughout the time that the facility has been in decommissioning status and conducted regular inspections following existing CCEC procedures (CEG 2026-TN12942). Dredging of the intake bay in the Susquehanna River is anticipated to occur to support the resumption of power operations and is discussed in Section 3.7.3.1. The potential impacts related to withdrawals of water from the Susquehanna River, while not inconsequential, would be minimal following the site's permitted water withdrawal rates, as described above. Therefore, the NRC staff concludes that aquatic ecological resources impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.7.2.2 Important Aquatic Species and Habitats

Eight State-listed mussels and one State-listed fish species occur in Dauphin, Lancaster, and York Counties where the CCEC is located, although only one of the mussels, the green floater (*Lasmigona subviridis*), is believed to occur in the aquatic action area (CEG 2025-TN12656; PNHP 2007-TN13021; FWS 2026-TN12903). The green floater occurs in small streams to large rivers with stable flow regimes and substrates (i.e., sand and gravel), sometimes within pool and eddy areas. Threats to green floaters include excessive sedimentation, water quality degradation, alteration of water flows, loss of suitable habitat, invasive species, predation, and disease (FWS 2026-TN12903). This species is also proposed for Federal listing under the ESA. As explained in further detail in Section 3.8 and Appendix E, this species is likely extirpated from the area. While preparations for the resumption of power operations at the CCEC will result in increased removal of water, this will not exceed the site's permitted water withdrawal rates in the existing SRBC docket (see Section 3.4.2). In addition, CEG has not identified any State-listed species within the aquatic action area. Therefore, the NRC staff concludes that impacts to State-listed aquatic species from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.7.3 Environmental Impacts from the Resumption of Power Operations

The impacts from the resumption of power operation at the CCEC would be similar to those described in Section 4.5 of the 2009 SEIS (NRC 2009-TN3684), which is incorporated here by reference. In Section 3.3.2.3 of the CCEC ER (CEG 2025-TN12656), CEG states that no additional aquatic studies have been conducted since the 2024 EA for specific decommissioning activities at TMI-2 (NRC 2024-TN12787). The NRC staff has not identified any new and

significant information during its independent review of the CCEC ER, the 2026 environmental audit (NRC 2026-TN13338), and the staff's evaluation of other available information.

3.7.3.1 *Site and Vicinity*

For aquatic ecological resources, the primary concerns relate to water withdrawal and consumption, especially flow rate and whether there is ample water to operate the facility without a detrimental impact to the aquatic organisms living in the Susquehanna River. Susquehanna River water is drawn into the cooling-water intake system through the intake structure situated adjacent to the river along the western shore on the northern portion of Three Mile Island, with a skimmer wall, bar racks, and mesh screens filtering out debris and larger organisms (CEG 2025-TN13023). From 2007 through 2024, the plant's river water withdrawal rate of 28,050 gpm (106,180 Lpm) was approximately 0.16 percent of the mean annual flow of the Susquehanna River with a range between 0.09 to 0.33 percent depending on the time of year (CEG 2025-TN13023). Once operational, the facility could withdraw approximately 0.32 percent of the source waterbody, based on the design intake flow of 81.4 Mgd (308 MLd) and a mean annual river flow of 38,922 cfs (USGS gaging Station 01570500). While most of the water used for cooling would be returned to the river, the cooling system would lose approximately 10,250 gpm (38,800 Lpm) or approximately 0.06 percent of the mean annual river flow (17.15 million gpm [64.9 million Lpm]) to evaporation from the cooling towers. During the return to normal operations, approximately 28,050 gpm (40.39 Mgd) could be pumped from the river with a through screen velocity of approximately 0.58 feet per second (fps) (0.18 meters per second [mps]) under low water conditions and 0.27 fps (0.08 mps) under normal water conditions (CEG 2025-TN13023). The new SRBC Docket No. 20260607 authorizes surface water withdrawal of up to 73.2 Mgd (277 MLd) from the Susquehanna River (SRBC 2026-TN13598). These impacts could also be possible while initially filling the cooling tower basins during restart preparation activities at the CCEC (see Section 3.4.2).

Dredging of the intake bay in the Susquehanna River is anticipated to occur during the resumption of power operations at the CCEC. CEG has an existing maintenance dredging permit (No. 21275724, see Table A-1) from the PADEP that allows for dredging within the intake structure and intake channel. CEG has determined that dredging of the Susquehanna River that would require a permit from the USACE is not required prior to restart (see Section 3.4.2).

Impingement Mortality and Entrainment of Aquatic Organisms (Plants with Cooling Towers)

If approved and power operations resume, the resumed water intake would impinge and entrain aquatic organisms from the Susquehanna River. The 2025 NPDES permit renewal application (CEG 2025-TN13023), CWA Section 316(b) best technology available data, and 2009 SEIS (NRC 2009-TN3684) describe the CCEC cooling and auxiliary water systems in detail. Smaller aquatic organisms, such as fish eggs and larvae, can be entrained and pass through the system, where they are subjected to mechanical, thermal, and toxic stresses before the water is discharged back into the river. Impinged aquatic organisms are collected at the trash racks or traveling screens and are disposed of as solid waste.

A description of the susceptibility of aquatic organisms to impingement and entrainment can be found in Section 4.6.1.2 of the 2024 LR GEIS (NRC 2024-TN10161). The magnitude of the impact that impingement and entrainment create on the aquatic environment depends on the plant-specific characteristics of the cooling system as well as the local aquatic community. Relevant nuclear power plant-based characteristics include location of the cooling-water intake structure, intake velocities, withdrawal volumes, screening device technologies, and the

presence or absence of a fish return system. Relevant characteristics of the aquatic community include species present in the environment, life history characteristics, population abundances and distributions, special species statuses and designations, and regional management objectives.

Cooling-water intake from the Susquehanna River to the CCEC is authorized under NPDES permit no. PA 0009920. The NPDES permit expired in 2012 and is under administrative extension (PADEP 2010-TN12904). CEG requested a Water Quality Certification from the PADEP in support of the CCEC restart and which evaluates the project's overall compliance with State water quality standards (CEG 2025-TN12982). The updated NPDES permit renewal application package was submitted by CEG to the PADEP in 2025 and a final permit would be issued prior to the resumption of power operations (CEG 2025-TN13023). As part of the NPDES renewal application, CEG reviewed the cooling-water intake structures and available impingement and entrainment data to provide evidence that they comply with the best technology available standards for impingement mortality and entrainment to minimize adverse environmental impact in accordance with 40 CFR Subpart J under Section 316(b) of the CWA. The chosen method of compliance for impingement is 40 CFR Part 125.94(c)(1) (TN254)—closed-cycle recirculating system.

The impacts on impingement from the resumption of power operations at the CCEC would be similar to those described in Section V.C.2 of the 1972 FES, which analyzed impingement potential for principal fish species during operations of TMI-1 and TMI-2 in 1972 (AEC 1972-TN12901), and which is incorporated here by reference. This issue was also analyzed in Section 5.5.2 of the 1976 FES supplement (NRC 1976-TN12902) for the operation of TMI-2 but not in the 2009 SEIS because it was considered a generic issue. For the most part, fish and free-swimming aquatic organisms would avoid impingement because water enters the intake under a skimmer wall through two openings with two sets of bar racks, the first spaced 2 ft (0.6 m) on center and the second only 1 in. (2.5 cm) apart. In addition, the intake velocity is only approximately 0.09 fps (0.03 mps) at the skimmer wall, 0.15 fps (0.05 mps) at the bar racks, and 0.27 fps (0.08 mps) through-screen velocity during normal water conditions (0.58 fps [0.18 mps] low water). The location of the intake and the low intake water velocity would help prevent any large fish from being sucked into the intake bay and then the wetwell. Small fish and other aquatic organisms that are unable to swim against the 0.15 fps current at the bar racks could be drawn inside and potentially impinged on the traveling screens or entrained if they are small enough in size. EPA data shows that 96 percent of studied fish can avoid an intake structure when the intake velocity is 0.5 fps (0.15 mps) or less, hence the resulting impingement is expected to be a relatively small amount in relation to nearby populations within the river (EPA 2014-TN10834).

The impacts on entrainment from the resumption of power operations at the CCEC would be lower than those described in Section V.C.2 of the 1972 FES and Section 5.5.2 of the 1976 FES supplement, which analyzed entrainment potential for principal fish species in the vicinity of the CCEC for both TMI-1 and TMI-2, and which are incorporated here by reference (AEC 1972-TN12901; NRC 1976-TN12902). No fish studies have been completed at the CCEC since 1990. In 1989 and 1990, electrofishing and ichthyoplankton sampling was completed near TMI-1. Electrofishing captured 28 species in 1989 and 36 species in 1990 and ichthyoplankton sampling resulted in 26 different taxa in both years (CEG 2025-TN13023). Since 1990, the York Haven fish passage was opened allowing migratory aquatic species like the American shad, river herring, striped bass, and American eel to enter the York Haven Pool, where the CCEC is located. More recently in 2026, the nature-like fishway (NLF) opened at the end of Three Mile Island at the dam to allow additional migratory fish passage (IWP&DC 2026-TN13600). Most

fish species, including gizzard shad (the most common species entrained during a study at the nearby Peach Bottom Atomic Power Station intake), produce large numbers of offspring to offset high mortality rates in natural aquatic settings (CEG 2025-TN13023). Further, fish and free-swimming organisms would avoid entrainment because water enters the intake under a skimmer wall through two openings with two sets of bar racks, the second spaced only 1 in. (2.5 cm) apart. In addition, the intake velocity is only approximately 0.09 fps (0.03 mps) at the skimmer wall, 0.15 fps at the bar racks, and 0.27 fps through-screen velocity during normal water conditions (0.58 fps low water). As discussed above for impingement, the EPA recognizes that intake velocities not exceeding 0.5 fps (0.15 mps) are generally protective of aquatic biota from entrainment as well (EPA 2014-TN10834). Since plankton recover and reproduce rapidly, the small amount entrained and killed in the cooling-water system would have a minimal effect on the productivity of the river.

Based on its review of the information summarized above, the NRC staff concludes that the impacts of impingement and entrainment on aquatic organisms related to the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

Effects of Thermal Effluents on Aquatic Organisms (Plants with Cooling Towers)

The thermal impacts of discharges were assessed in the 1972 FES and the 1976 FES supplement (Sections V.C.2 and 9.5.1, respectively), which are incorporated here by reference (AEC 1972-TN12901; NRC 1976-TN12902). The size of the thermal plume for the CCEC has been mapped from the discharge to about 20 m (66 ft) into the river and downstream about 50 m (164 ft) with a maximum downstream distance of up to 400 m (1,320 ft) on occasion in the winter (NRC 1976-TN12902). The small width of the thermal plume covers less than 2 percent of the width of the river at the discharge and even at winter maximums does not extend far enough downstream to affect the NLF located a mile downstream at the end of Three Mile Island. Discharges from the CCEC to the Susquehanna River are authorized under NPDES Permit No. PA 0009920, originally issued in 2009 (AmerGen 2008-TN12905). The CCEC continues to operate in compliance with this administratively extended permit while the PADEP reviews the NPDES renewal application submitted in March 2025. CEG expects thermal discharge temperatures to be similar to those for previous operations prior to plant shutdown. The maximum daily discharge temperature for operations during 2014–2019 had a range of 98.2–103.1°F (36.8–39.5°C) (CEG 2026-TN12942). Given that these prior operating discharge temperatures were consistently below the existing NPDES limit of 115°F (46.1°C), CEG expects the PADEP to decrease the thermal discharge limit to 110°F (43.3°C). Based on compliance with the NPDES permit and the expected lower thermal discharge limit of 110°F (43.3°C), the NRC staff concludes that thermal impacts of discharges on aquatic organisms related to the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

Effects of Nonradiological Contaminants on Aquatic Organisms

The issue of the potential effects of nonradiological contaminants on aquatic organisms that could occur from nuclear power plant operations originated from the concern that some nuclear power plants used heavy metals in condenser tubing that could leach from the tubing and expose aquatic organisms to these contaminants (NRC 2024-TN10161). Because aquatic organisms can bioaccumulate heavy metals, even when exposed at low levels, this can be toxic to fish and other animals that consume contaminated organisms. However, the CCEC has steel condenser tubes that do not leach metals to the cooling-water discharge (AmerGen 2008-

TN13025). The NRC staff verified that the issue of chemical impacts associated with heavy metals leaching from condenser tubing does not apply to the CCEC.

For certain plant equipment and systems, the CCEC will use PADEP-approved chemical additives to control pH, scale, corrosion, and biofouling. Section 3.7.1.2 of the 2025 CCEC ER (CEG 2025-TN12656) and the 2025 NPDES permit renewal application (CEG 2025-TN13023) describe the chemicals used and are incorporated here by reference. While the resumption of power operations at the CCEC would mean restarting chemical discharges from the cooling-water intake structures into the Susquehanna River, the chemical concentrations at the outfall are regulated by the NPDES permit. Also, the NRC staff verified that no impacts to the aquatic environment from the use of chemicals were observed when TMI-1 was operating under its initial operating license (1974–2014) or under its RFOL (2014–2019, and expires 2034).

Exposure of Aquatic Organisms to Radionuclides

Another issue concerns the potential impacts on aquatic organisms from exposure to radionuclides from routine radiological effluent releases during nuclear power plant operations. The NRC requires nuclear power plants to maintain a REMP as per requirements specified in 10 CFR Part 50, Appendix I, 10 CFR Part 20 (TN283), and 10 CFR Part 72 (TN4884), and through plant-specific technical specifications. These collectively require that licensees establish and implement a REMP to obtain data on measurable levels of radiation and radioactive material. The 2018 and 2019 REMP reports identified that no strontium-90 activity was detected and that no fission or activation products were detected in fish located in the vicinity of the CCEC site (NRC 2025-TN13020). If approved and power operations resume, the CCEC would be required to remain in compliance with NRC radiological effluent limits and to continue the REMP to ensure that aquatic organisms' exposure to any radionuclides are within acceptable limits.

Based on its review of the information summarized above, the NRC staff concludes that the effects of nonradiological and radiological contaminants on aquatic organisms from discharges related to the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

Water Use Conflicts with Aquatic Resources (Plants with Cooling Ponds or Cooling Towers Using Makeup Water from a River)

Water use conflicts occur when the amount of water needed to support aquatic ecological resources is diminished from demand for agricultural, municipal, or industrial use, decreased water availability due to droughts, or a combination of these factors. In Section 4.6.1.2.10 of the 2024 LR GEIS (NRC 2024-TN10161), the NRC staff provides background information regarding water use conflicts, which is incorporated here by reference.

Surface water consumption at the CCEC results from operating the circulating water system, including evaporation from the NDCTs, in stream evaporation, and tower drift (CEG 2025-TN12981). To account for potential future water demands and uncertainty in past estimates compared to newly required metered data, CEG requested a consumptive use allocation of 21 Mgd (80 MLd), a 9 percent increase from the 2011 authorized allocation (CEG 2026-TN12942). As stated in Section 3.4.2, this request was approved in new SRBC Docket No. 20260607 (SRBC 2026-TN13598). The SRBC, which coordinates water resource management within the Susquehanna River Basin, must approve CEG's surface water withdrawals and consumptive use. Through its planning and regulatory roles, the SRBC monitors water use and availability across the basin and reviews projects involving water withdrawals, consumptive use, and diversions. To guide these efforts, the SRBC developed a comprehensive plan that provides a framework for managing the basin's water resources through 2041 and is protective of the aquatic environment (SRBC 2021-TN12983).

The USGS monitors Susquehanna River flow at station 01570500, located approximately 11 mi (17.7 km) upstream of the CCEC (see Section 3.4.1 for additional information). Over the last 133 years, the mean annual discharge was 34,930 cfs (22,580 Mgd) (USGS 2026-TN13124). On average, March is the highest flow month and August is the lowest flow month, with approximate flows of 72,450 and 12,820 cfs (46,820 Mgd and 8,280 Mgd), respectively (USGS 2026-TN13124). During the average low flow month, if the CCEC is withdrawing its maximum permitted amount (21 Mgd), it would remove about 0.16 percent of the river's flow.

Based on its review of the CCEC ER, available data, and site-specific information (see Section E.2), the NRC staff did not identify any significant water use conflicts with aquatic ecological resources. The NRC staff finds that impacts from the resumption of power operations at the CCEC would result in no more than minor, localized impacts on aquatic ecological resources. Water withdrawals are expected to be similar to prior operations and will be within permitted limits as directed by an SRBC consumptive use allocation under SRBC Docket No. 20260607. Water withdrawals are not expected to result in the measurable degradation of aquatic habitat or flow regimes. Therefore, the NRC staff concludes that for aquatic ecological resources water use conflicts, the impacts from the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

Impacts of Transmission Line Right-of-Way Management on Aquatic Resources

The CCEC will continue to use the vegetation management practices described in Section 2.1.5 of the 2009 SEIS, which is incorporated here by reference (NRC 2009-TN3684). The CCEC also follows administrative procedures for pesticides and herbicide management, environmental review, and environmental evaluations to minimize impacts (CEG 2025-TN12656). The CCEC will use BMPs and vegetation management protocols to minimize impacts to aquatic ecological resources (CEG 2025-TN12656). Therefore, the NRC staff concludes that the impacts of transmission line ROW management on aquatic ecological resources from the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.7.3.2 Important Aquatic Species and Habitats

As noted in Section 3.7.2.2, eight State-listed mussels and one fish species may occur in the vicinity of the CCEC, although only one mussel, the green floater, is believed to occur in the aquatic action area (CEG 2025-TN12656; PNHP 2007-TN13021; FWS 2026-TN12903). Threats to green floaters include excessive sedimentation, water quality degradation, alteration of water flows, loss of suitable habitat, invasive species, predation, and disease (FWS 2026-TN12903). Potential impacts to the green floater could include entrainment of the larval forms, entrainment or impingement of the fish host, and thermal or chemical impacts to individuals that settle near the discharge. CEG has not observed any State-listed green floater mussels in the aquatic action area and the species was not identified in the CCEC action area during the 2024 PADEP Pennsylvania Natural Diversity Inventory review (CEG 2025-TN12656). Further, this species is likely extirpated from the area (see Section 3.8 and Appendix E). As a result, the impacts to State-listed mussel species from entrainment, impingement, thermal or chemical discharges, or other operational activities related to the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.8 Federally Protected Ecological Resources

The NRC must consider the effects of the proposed actions on ecological resources protected under several Federal statutes and must consult with the FWS and the National Marine

Fisheries Service (NMFS) or the National Oceanic and Atmospheric Administration (NOAA) prior to acting in cases where an agency action may affect those resources. These statutes include the following:

- Endangered Species Act of 1973, as amended (TN1010)
- Magnuson-Stevens Fishery Conservation and Management Act (MSA) (TN9966)
- National Marine Sanctuaries Act (NMSA) (TN7197)

In the following sections, the NRC staff summarizes its findings with respect to federally protected ecological resources protected under these statutes and the outcome of the related consultations with the FWS, NMFS, and NOAA. Additional information, including the biological evaluation, concerning these resources can be found in Appendix E.

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

The NRC staff evaluated the potential effects of the proposed actions at the CCEC site on federally listed species and critical habitat under FWS jurisdiction. Table 3-7 identifies each applicable species, the NRC staff's ESA effect determination, the Federal status of the species, and whether the species is potentially present in the action area. As part of its consultation with the FWS, the NRC requested the FWS's concurrence with its ESA effect determinations on June 4, 2026 (NRC 2026-TN13590), and the FWS provided its concurrence on June 24, 2026 (FWS 2026-TN13604).

Table 3-7 Effect Determinations for Federally Listed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction Potentially Present in the Action Area of the Christopher M. Crane Clean Energy Center Restart

Species	Federal Status ^(a)	Potentially Present in the Action Area?	Service	Effect Determination ^(b)	Service Concurrence Date ^(c)
Indiana bat (<i>Myotis sodalis</i>)	FE	Yes	FWS	NLAA	06/24/2026
northern long-eared bat (<i>Myotis septentrionalis</i>)	FE	Yes	FWS	NLAA	03/30/2026
tricolored bat (<i>Perimyotis subflavus</i>)	FPE	Yes	FWS	NLAA	06/24/2026
green floater (<i>Lasmigona subviridis</i>)	FPT	Yes	FWS	NLAA	03/30/2026
monarch butterfly (<i>Danaus plexippus</i>)	FPT	Yes	FWS	NLAA	06/24/2026
northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	FE	Yes	FWS	NLAA	03/30/2026

FE = federally endangered; FPE = proposed for Federal listing as endangered; FPT = proposed for Federal listing as threatened; FWS = U.S. Fish and Wildlife Service; NLAA = may affect, not likely to adversely affect; NMFS = National Marine Fisheries Service; NRC = U.S. Nuclear Regulatory Commission; TBD = to be determined.

(a) Indicates protection status under the Endangered Species Act.

(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).

(c) Indicates the date that the FWS concurred with the NRC staff's effect determination (FWS 2026-TN13048). The ESA does not require Federal agencies to seek FWS concurrence for NLAA determinations for proposed species.

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

As part of its environmental review, the NRC staff evaluated whether any NMFS-listed species or critical habitats occur within the action area, including via a query of NMFS's ESA Section 7 Mapper (NOAA 2026-TN13601). The query identified no listed species or critical habitats in the area. Therefore, the NRC staff concludes that no further coordination or consultation with NMFS under ESA Section 7 is required for the proposed actions.

3.8.3 Magnuson-Stevens Fishery Conservation and Management Act: Essential Fish Habitat

Under the MSA (TN9966), the Fishery Management Councils and NMFS have designated essential fish habitat (EFH) for certain federally managed species by life stage. EFH is defined as the waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity (16 U.S.C. 1802(10)) (TN12474). The NRC staff verified that no EFH occurs within the affected area. Therefore, the NRC staff concludes that the proposed actions would have no effect on EFH.

3.8.4 National Marine Sanctuaries Act: Sanctuary Resources

Congress enacted the NMSA (TN7197) in 1972 to protect areas of the marine environment that have special national significance. The NMSA established the National Marine Sanctuary System and authorized the Secretary of Commerce to designate sanctuaries within that system, which now includes 18 sanctuaries covering more than 629,000 mi² (1,629,000 km²) of marine and Great Lakes waters (NOAA Undated-TN13145). No national marine sanctuaries occur within the affected area for the proposed actions; therefore, the NRC staff concludes that the proposed actions would have no effect on sanctuary resources.

3.9 Historic and Cultural Resources

The NRC staff evaluated the potential historic and cultural resources effects from the proposed actions as part of the NHPA Section 106 undertaking by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for historic and cultural resources effects.

3.9.1 Affected Environment

In Section 2.2.9 of the 2009 SEIS (NRC 2009-TN3684), which is incorporated here by reference, the NRC staff evaluated and described the historic and archaeological background, cultural resources surveys, and identified historic properties at the TMI-1 (now CCEC) site. The area of potential effects (APE) for the license renewal action evaluated in the 2009 SEIS included the approximately 400 ac (162 ha) plant site (i.e., the approximate size of Three Mile Island itself). The NRC staff identified, confirmed, and validated only minor changes in the known affected environment as part of its environmental review summarized in this EA. The following sections reflect new information since the publication of the 2009 SEIS (NRC 2009-TN3684).

3.9.1.1 Area of Potential Effects

The APE for the proposed actions includes the approximately 400 ac (162 ha) CCEC site and the affiliated offsite training center/simulator building (Figure 3-4) that may be affected by the activities related to both the preparations for and the resumption of power operations at the CCEC. The APE also includes a 1 mi (1.6 km) buffer, which allows the NRC staff to evaluate the potential impacts to historic properties located nearby but outside of the CCEC site boundary.

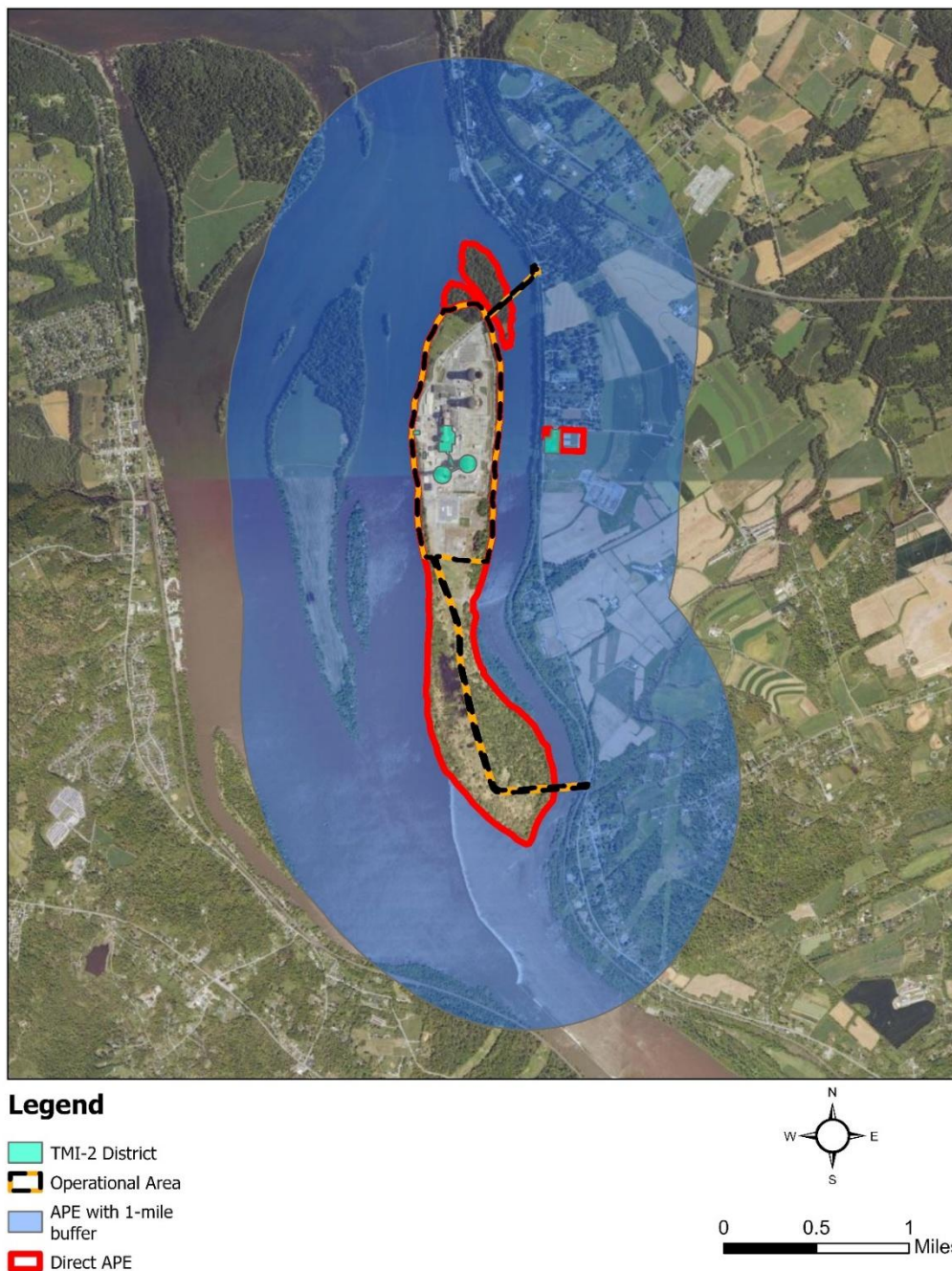


Figure 3-4 Area of Potential Effects and 1 mi Buffer Area at the Christopher M. Crane Clean Energy Site. Adapted from CEG 2025-TN12656: Figure 3.5-1.

3.9.1.2 *Cultural Background*

Section 2.2.9 of the 2009 SEIS (NRC 2009-TN3684) describes the detailed, long-term cultural history and chronology for this portion of eastern Pennsylvania and the Susquehanna River Valley (or Lower Susquehanna River basin) for at least the past 10,000 years. Recently published archaeological summaries of the cultural context within this region of the Susquehanna River Valley support this interpretation that Indigenous peoples have lived and subsisted within this region of Pennsylvania since the retreat of glacial ice during the terminal Pleistocene epoch (about 14,000 years ago) (see summaries in Franz and Stallings 2015-TN13115; Minderhout 2014-TN13114; Poplin 2023-TN13116). Following the Pennsylvania Historical and Museum Commission's framework (PHMC 2015-TN12796), the characterized cultural chronology includes a "Paleoindian" or "First Peoples" period between approximately 20,000–12,000 years Before Present (BP), an "Archaic" period between approximately 12,000–5000 BP, a "Transitional" period between approximately 5000–2800 BP, an "Early/Middle Woodland" period between approximately 2800–1000 BP, a "Late Woodland" period between approximately 1000 BP–400 BP (AD 1550), and a "Post-Contact" period over the last 500 years. Within this cultural background and context, recent historic and cultural resource surveys resulted in several updates to the known historic properties on Three Mile Island.

3.9.1.3 *Identified Historic and Cultural Resources and Historic Properties*

Historic properties are defined as cultural resources which are eligible or listed on the National Register of Historic Places (NRHP) (36 CFR 800.16(l)(1)) (TN513). The 2009 SEIS (NRC 2009-TN3684) and the 2025 CCEC ER (CEG 2025-TN12656) describe the extent of archaeological and architectural cultural resource surveys that occurred at Three Mile Island between 1967 and 2009. Since 2009, five additional archaeological and architectural resource surveys have updated the inventory of known historic properties on Three Mile Island. To confirm these updates, the NRC staff conducted a digital review of Pennsylvania's State Historic and Archaeological Resource Exchange archaeological and architectural site files between December 2025 and January 2026, along with a review of CEG's records as part of the CCEC ER (CEG 2025-TN12656). These updates primarily relate to the TMI-2 reactor building and associated facilities, and archaeological sites 38DA51, 38DA99, 38DA100, and 38DA101.

As part of the planned long-term decommissioning activities at TMI-2, General Public Utilities Corporation Nuclear (a subsidiary of FirstEnergy Corporation) completed a Pennsylvania Historic Resource Survey Form in 2010 to evaluate the NRHP eligibility of the TMI-2 reactor building and associated structures at Three Mile Island (NRC 2024-TN12787; Greenwalt 2022-TN13143). The Historic Resource Survey Form concluded that several structures and facilities associated with TMI-2—collectively referred to as the "TMI-2 Historic District"—were eligible for listing in the NRHP under Criterion A and Criteria Consideration G for the period of significance from March 28 to April 4, 1979, due to the accidental partial nuclear meltdown that occurred during that time at TMI-2. The evaluation determined that TMI-1 and associated facilities were not eligible (Greenwalt 2022-TN13143; PSHPO 2023-TN13119, PSHPO 2025-TN13120).

After Exelon submitted the TMI-1 PSDAR in 2019 (Exelon 2019-TN12795), which reconfirmed the eligibility of the TMI-2 Historic District, the NRC, the Pennsylvania State Historic Preservation Office (PA SHPO), and TMI-2 Solutions (a subsidiary of EnergySolutions and the current owner of the TMI-2 decommissioning site) began a multi-year effort to re-survey and consult on potential adverse effects to the historic district associated with future decommissioning activities (NRC 2024-TN12787; PSHPO 2026-TN13118). Ultimately, this led to

the development of a programmatic agreement to mitigate adverse effects to the TMI-2 Historic District during decommissioning, which was signed and executed in May 2024 (NRC 2024-TN13123).

CEG plans to complete all proposed activities as part of the CCEC restart outside of the TMI-2 facilities and the TMI-2 Historic District. This includes work at the offsite CCEC training center/simulator building located within the APE on the east bank of the Susquehanna River (opposite Three Mile Island). The training center was constructed in response to the 1979 TMI-2 accident to provide improved operator training using an onsite simulator. It was built in phases in the 1980s (CEG 2026-TN12942). The training center/simulator building is less than 50 years old and is located immediately adjacent to the Three Mile Island Observation Center, which is part of the TMI-2 Historic District (Greenwalt 2022-TN13143; Dauphin County 2026-TN13117). A review of historic documentation, initiated in consultation with the PA SHPO as part of this undertaking (NRC 2026-TN13184), confirms that the training center was initially constructed in 1981, with a second phase of construction occurring by at least 1985 (CEG 2026-TN12942; see also PSHPO 2023-TN13119; PSHPO 2025-TN13120). The training center/simulator building is not included in the TMI-2 Historic District because it was built after the 1979 period of significance and in response to the TMI-2 accident.

In addition to establishing the TMI-2 Historic District, two archaeological surveys conducted on the southern portion of Three Mile Island provide additional information regarding sites 36DA51, 36DA99, 36DA100, and 36DA101.

In 2014, Brockington and Associates, Inc. was contracted by the USACE to conduct an archaeological survey in support of NHPA Section 106 compliance for the proposed construction of an NLF at the York Haven Hydroelectric Project, located on the western and southern shore of Three Mile Island (Franz and Stallings 2015-TN13115). The survey included a surface and sub-surface pedestrian survey and shovel testing. The 2014 investigation recommended that site 36DA100, a prehistoric Archaic-age site with intact subsurface cultural deposits, is NRHP eligible. Site 36DA51, a non-diagnostic prehistoric site, remains ineligible for the NRHP. Sites 36DA99 and 36DA101 were not re-identified during the 2014 survey. In 2023, Brockington and Associates, Inc. completed a survey of a new and revised APE on Three Mile Island (Poplin 2023-TN13116). The survey focused on the northern end of 36DA100 and the southern end of 36DA99 and included test excavations. The results led to recommendations to avoid the NRHP-eligible portions of 36DA99 and 36DA100 during project activities and to develop a treatment plan for both sites (Poplin 2023-TN13116). Treatment and management efforts for these sites continue as part of the NLF. These sites are located outside of the “Operational Area” noted in Figure 3-4 for the purposes of this undertaking.

3.9.1.4 Consultation

The NRC notified and consulted with the Advisory Council on Historic Preservation (ACHP), the PA SHPO, and 15 federally recognized Indian Tribes. A record of each correspondence is provided in Appendix C. By letter dated February 2, 2026, the NRC initiated NHPA Section 106 consultation for the proposed CCEC restart undertaking. The Stockbridge-Munsee Community responded by email on February 3, 2026, stating that the undertaking was outside of their traditional homeland and area of interest and that they had no further comment regarding the project (Stockbridge-Munsee Community THPO 2026-TN13121). By letter dated February 11, 2026, the ACHP responded to the NRC’s NHPA Section 106 initiation, noting a potential inconsistency in the APE description and maps for the undertaking (ACHP 2026-TN13077). On March 2, 2026, the NRC staff met virtually with the PA SHPO staff to share information and

answer questions regarding the proposed undertaking. The PA SHPO subsequently responded by letter dated March 3, 2026, requesting modifications to the APE maps, requesting photographs and construction dates for the training center/simulator building, and recommending that local preservation interests be included in the consultation process (PSHPO 2026-TN13122). Additionally, one Indian Tribe responded to the NRC's NHPA Section 106 initiation letter by email on March 25, 2026, and requested a non-public virtual Tribal information meeting.

The NRC staff prepared additional maps that depicted the location of structures within the APE for the CCEC restart undertaking and transmitted those to all consulting parties by letter dated March 31, 2026. Additionally, the NRC invited four historic preservation organizations to participate in NHPA Section 106 consultation. On April 15, 2026, the Middletown Historical Restoration Commission accepted the NRC's invitation to participate in Section 106 consultation (PSU 2026-TN13078). The PA SHPO, by letter dated April 21, 2026, thanked the NRC staff for the updated APE maps, noted that the proposed project would largely be limited to the restart of the existing facility, and requested notification if any new visual features may be introduced as part of the restart (PSHPO 2026-TN13079). By letter dated April 27, 2026, the PA SHPO concurred with the NRC's APE (PSHPO 2026-TN13144).

In response to the PA SHPO request for additional information on the CCEC training center/simulation building, the NRC staff visited the training center/simulator building on April 8, 2026. Information gathered during that visit, including construction details and photographs, was transmitted to the PA SHPO by letter dated April 30, 2026 (NRC 2026-TN13184).

The NRC held a virtual Tribal information meeting on May 5, 2026, so that the NRC staff and DOE EDF staff could share information about the proposed CCEC restart undertaking and answer questions. While representatives from five Tribes accepted the meeting invitation, none participated (NRC 2026-TN13255). Following the meeting, on May 14, 2026, the NRC distributed the meeting presentation to all 15 federally recognized Indian Tribes (NRC 2026-TN13339).

By letter dated May 28, 2026, the PA SHPO stated that based on the information provided, the CCEC training center/simulation building(s) are not eligible for listing in the NRHP as they postdate the period of significance of the NRHP-eligible TMI-2 Historic District. Although these buildings are associated with TMI-2, they are not directly related to the events of March 28–April 4, 1979, and the immediate aftermath (PA SHPO 2026-TN13591). The PA SHPO noted, however, that should new information be identified in any future reviews of the property, a reevaluation of the significance, integrity, and/or overall NRHP eligibility may be necessary (PA SHPO 2026-TN13591).

On June 4, 2026, the NRC notified the ACHP, PA SHPO, and 14 federally recognized Indian Tribes of the issuance of the draft EA and draft FONSI for review and comment. By letter dated June 29, 2026, the PA SHPO concurred with the NRC's determination of no adverse effect on historic properties (i.e., TMI-2) and determined that the proposed project would have no effect on archaeological resources (PA SHPO 2026-TN13592). On July 8, 2026, the Absentee Shawnee Tribe stated that it had no objection to the proposed project at this time; however, as the site is within aboriginal Shawnee homelands, they requested a copy of the PA SHPO's report and any further archaeological surveys performed as the project moves forward. The Tribe also requested notification in the event of any inadvertent discovery of archaeological evidence, human remains, or cultural items (Absentee Shawnee Tribe 2026-TN13593). On

July 24, 2026, the Middletown Historical Restoration Commission stated that it has no issues with the project (MHRC 2026-TN13594).

3.9.2 Environmental Impacts from Preparations for the Resumption of Power Operations

Section 3.1.2 describes the activities that CEG would conduct to prepare for the resumption of power operations at the CCEC. Several of these activities involve limited ground disturbance within and around the CCEC site, specifically in areas that have been extensively disturbed by original facility construction and contain no known historic properties (i.e., within the “Operational Area” noted in Figure 3-4). Limited ground-disturbing activities include modifications to the NDCTs, north access bridge repairs, structural modifications for the main power transformers, installation of a new emergency diesel storage tank, and inspection and replacement of buried piping (see Table 3-1). These activities, as shown in this EA, are all occurring within the CCEC “Operational Area.”

In addition to having no planned construction activities outside of the CCEC “Operational Area”, CEG also maintains the active plans and procedures (CEG 2026-TN12942) for (1) a cultural resources protection plan (CRPP) developed during the 2009–2010 license renewal NHPA Section 106 consultation by Exelon Generation Company, LLC for TMI-1, (2) an excavation, trenching, and shoring procedure, (3) an archaeological resources erosion monitoring plan, and (4) several environmental procedures (e.g., environmental evaluations, screening checklist, and environmental issues and commitments). These plans and procedures provide a system of controls to ensure that CEG staff at the CCEC review and protect known historic and cultural resources at Three Mile Island during restart preparation activities and outline controls and processes for managing the inadvertent discovery of historic and cultural resources or human remains. There have been no inadvertent discoveries of human remains or archaeological resources resulting from erosion on Three Mile Island since the 2009 SEIS was prepared (CEG 2026-TN12942).

All planned ground-disturbing activities for this undertaking will occur within the CCEC “Operational Area”, which consists of previously disturbed locations on Three Mile Island. The buildings and facilities associated with the CCEC are not associated with the TMI-2 Historic District and are not eligible for listing on the NRHP (PSHPO 2023-TN13119, PSHPO 2025-TN13120). Because CEG will not conduct any activities in the TMI-2 Historic District and maintains active archaeological and historic and cultural resources protection procedures, the NRC staff determined that there are no impacts to historic properties or historic and cultural resources as part of these proposed project activities under the proposed actions.

Based on its review of the information summarized above, the NRC staff determines under Section 106 of the NHPA that the proposed undertaking will have no adverse effect on historic properties and concludes that the impacts to historic and cultural resources from restart preparation activities at the CCEC would be NOT SIGNIFICANT under NEPA.

3.9.3 Environmental Impacts from the Resumption of Power Operations

As part of the license renewal NHPA Section 106 consultations conducted in 2009–2010, the former CCEC licensee developed a CRPP, archaeological resources erosion monitoring plan, and several other site-wide environmental procedures to protect and manage historic and cultural resources on Three Mile Island (CEG 2025-TN12656). The CRPP and environmental procedures continue to provide a mechanism to protect known archaeological sites and other

cultural resources, and any historic and cultural resources that may be inadvertently encountered at the CCEC. The development and implementation of these procedures were key factors in the PA SHPO's concurrence with the NRC's determination of "no adverse effect" on historic properties from continued operations as part of the 2009 SEIS (NRC 2009-TN3684), as the licensee for TMI-1 established procedures to protect both known and unidentified historic and cultural resources. Upon returning to power operations, the CCEC would operate in a manner consistent with past operations prior to the 2019 shutdown, the environmental impacts of which were evaluated in the 2009 SEIS.

Based on its review of the information summarized above, the NRC staff determines under Section 106 of the NHPA that the proposed undertaking will have no adverse effect on historic properties and concludes that the impacts to historic and cultural resources associated with the resumption of power operations at the CCEC would be NOT SIGNIFICANT under NEPA. Activities would continue to occur within the CCEC "Operational Area" with no planned or anticipated ground-disturbing work within or near known historic properties on Three Mile Island. The NRC staff anticipates no additional impacts or effects on the TMI-2 Historic District associated with the resumption of power operations at the CCEC (see CEG 2025-TN12656).

3.10 Socioeconomic Conditions

The NRC staff evaluated the potential socioeconomic effects from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for socioeconomic effects.

3.10.1 Affected Environment

This section briefly describes certain socioeconomic conditions in the vicinity of the CCEC that could be affected by the proposed actions. Section 3.4 of the CCEC ER (CEG 2025-TN12656) provides more detailed information on regional and local socioeconomic conditions that could be affected by the CCEC restart. That information is incorporated here by reference.

The residential distribution of workers needed for the resumption of power operations would likely be the same as the residential distribution of the current CCEC workforce. Most CCEC workers reside in Lancaster County (25 percent) with other workers residing in Dauphin (23 percent), York (13 percent), and Cumberland (12 percent) Counties. Workers from these counties account for approximately 73 percent of total CCEC employment (225 workers). The remaining 27 percent of the workforce commutes from and lives in counties outside the four-county region. Because most of the CCEC workforce resides in Lancaster, Dauphin, York, and Cumberland Counties, these four counties represent the socioeconomic region of influence and the basis for evaluating the impacts of the proposed actions.

Operating expenditure at the CCEC is based on current staffing levels and annual property tax payments. The CCEC property tax payments have decreased every year during decommissioning (CEG 2025-TN12656).

3.10.2 Environmental Impacts from Preparations for the Resumption of Power Operations

The socioeconomic impacts from preparations for the resumption of power operations at the CCEC would be similar to those experienced during a typical refueling outage at the plant. CEG

expects that the site employment during these preparations would peak at 1,200 workers before ramping down to the previously established number of workers needed to support power operations. Preparations for the resumption of power operations would be temporary, and impacts would be similar to those that occurred during previous TMI-1 refueling outages as described in the 2009 SEIS (NRC 2009-TN3684). Additionally, CEG expects that tax payments would remain stable or could decrease during preparations for the resumption of power operations, corresponding with the expiration of a Payment in Lieu of Taxes agreement in 2026 (CEG 2025-TN12656). Based on its review of the information summarized above, the NRC staff concludes that the socioeconomic impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.10.3 Environmental Impacts from the Resumption of Power Operations

The socioeconomic impacts from the resumption of power operations at the CCEC would be similar to the socioeconomic impacts from the continued power operations at the CCEC described in the 2009 SEIS (NRC 2009-TN3684). CEG expects that site employment during CCEC operations would be 600 workers (CEG 2025-TN12656). CEG also expects that the operations workforce would reside in similar locations as when TMI-1 was operating prior to decommissioning, as described in the 2009 SEIS (NRC 2009-TN3684), and that after the resumption of power operations at the CCEC, property tax payments would return to levels similar to the last annual payment prior to decommissioning (CEG 2025-TN12656). Other socioeconomic impacts from the resumption of power operations at the CCEC would include the effects on community services, transportation (e.g., traffic volumes), and the economic impacts of expenditures for goods and services including labor. These socioeconomic impacts are described in Section 4.9 of the 2009 SEIS (NRC 2009-TN3684). Because CEG plans to operate the CCEC similarly to how it was operated previously, the NRC staff does not expect the socioeconomic impacts from power operations to noticeably differ from those of the previous power operations discussed in the 2009 SEIS. Therefore, the NRC staff concludes that the socioeconomic impacts from the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.11 Radiological and Nonradiological Human Health

The NRC staff evaluated the potential human health effects from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for radiological and nonradiological human health effects.

3.11.1 Radiological Human Health

3.11.1.1 *Affected Environment*

The affected environment with respect to radiological human health is described generically for all nuclear power plants in Section 3.9.1 of the 2024 LR GEIS (NRC 2024-TN10161) and generally in Section 4.8.1 of the 2009 SEIS (NRC 2009-TN3684) for the CCEC site. The CCEC site's REMP is also described in Section 4.8.1 of the 2009 SEIS (NRC 2009-TN3684).

Table 3.7-1 of the CCEC ER (CEG 2025-TN12656) presents the REMP sample results from 2020 through 2024, the time that the facility was in a decommissioning status. The NRC staff conducted a review of the facility's AREORs and ARERRs from 2014 to 2025. The NRC staff identified that the reported data is consistent with the data described in Table 3.7-1 of the CCEC

ER (CEG 2025-TN12656) and the 2009 SEIS (NRC 2009-TN3684). The NRC staff verified that both sets of reports indicated that effluent releases and emissions during power operations and subsequent decommissioning were in compliance with 10 CFR Part 20 (TN283), Appendix I of 10 CFR Part 50 (TN249), and 40 CFR Part 190 (TN739).

Specifically, the NRC staff verified that all annual (whole body) exposures to radioactive effluent releases by an individual member of the public were below 1 millirem (mrem) with an average annual individual exposure of approximately 0.135 mrem during the operational years of 2014 to 2019 and with an average annual individual exposure of approximately 0.02 mrem during the decommissioning phase (i.e., 2020–2023). The maximum hypothetical annual (whole body) exposure (radioactive effluent releases and direct radiation) to a member of the public from all radioactive emissions from 2014 to 2025 was approximately 1.09 mrem (2017) (NRC 2025-TN13020). This value is inclusive of the CCEC and TMI-2 maximum doses. While the value is above the 0.33 mrem stated in Section 4.8.1 of the 2009 SEIS (NRC 2009-TN3684), it is still well below the limits specified in 10 CFR Part 20 and 40 CFR Part 190. For occupational exposure, the facility's radiation protection program is implemented in accordance with 10 CFR Part 20. As submitted under 10 CFR 20.2206 and published in Appendix C of NUREG-0713, *Occupational Radiation Exposure at Commercial Nuclear Power Reactors and Other Facilities 2024* (NRC 2026-TN13049), average occupational doses for the period 2014–2024 during the facility's power operations and decommissioning were approximately 0.063 rem, significantly below the occupational exposure limit of 5 rem specified in 10 CFR 20.1201(a)(1).

3.11.1.2 Environmental Impacts from Preparations for the Resumption of Power Operations

The radiological impacts of normal facility operations are addressed in Section 4.9.1 of the 2024 LR GEIS (NRC 2024-TN10161) for all nuclear power plants and in Section 4.8.1 of the 2009 SEIS (NRC 2009-TN3684) for the CCEC. These sections are incorporated here by reference. CEG expects that any restart preparation activities at the CCEC are expected to be less than or bounded by those of a typical refueling outage. As no radiological releases are expected during the activities for preparations for the resumption of power operations described in Section 3.1.2, there would be no significant radiological impacts to members of the public. Occupational exposures would occur when working within radiation areas in the CCEC and would be controlled under 10 CFR Part 20. As a result, the NRC staff concludes that the radiological human health impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.11.1.3 Environmental Impacts from the Resumption of Power Operations

The radiological impacts of normal facility operations for the CCEC are addressed in Section 4.8.1 of the 2009 SEIS (NRC 2009-TN3684), where the NRC staff noted that there would be no impacts of radiation exposures to the public during the renewal term beyond those discussed in the 2009 SEIS. This section is incorporated here by reference. Because CEG plans to operate the CCEC similarly to how it was operated before facility shutdown in 2019, with no significantly different radiological environmental impacts, the NRC staff concludes that the environmental and human health impacts of radiological effluent releases from the resumption of power operation at the CCEC would be consistent with what was provided in the 2014 through 2019 AREORs (CEG 2025-TN12656), and therefore, would be NOT SIGNIFICANT. The operational impacts are minimized by compliance with radiation protection regulations in 10 CFR Part 20 (TN283) and 10 CFR Part 50 Appendix I (TN249) and Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1910-TN654) created by the Occupational Safety and Health Act of 1970 (TN4453).

3.11.2 Nonradiological Human Health

3.11.2.1 *Affected Environment*

The affected environment for nonradiological human health is described generically for all nuclear power plants in Section 3.9.2 of the 2024 LR GEIS (NRC 2024-TN10161) and is incorporated here by reference.

Chemical Hazards: Federal and State environmental agencies regulate the use, storage, and discharge or spills of chemicals at the CCEC site as outlined in Section 2.1.3 of the 2009 SEIS (NRC 2009-TN3684). Wastewater treatment discharge and management are regulated by an administratively extended NPDES permit, which is discussed further in Section 3.4.2. Occupational health impacts are managed through established industrial hygiene practices that comply with OSHA requirements (CEG 2025-TN12656). For example, CEG submits OSHA form 300A annually for reporting the number of recordable injuries and illnesses from hazards at the CCEC. The NRC staff verified that during the 5 years of decommissioning activities (i.e., 2020 to 2024), there were no worker deaths or serious injuries at the CCEC (CEG 2026-TN12942).

Microbiological Hazards: As described in Section 3.9.2.2 of the 2024 LR GEIS (NRC 2024-TN10161), microbiological hazards occur when workers or members of the public come into contact with disease-causing microorganisms, also known as etiological agents. Members of the public could be exposed to microorganisms in thermal effluents at nuclear power plants that use cooling ponds, lakes, canals, or that discharge to publicly accessible surface waters. Thermal discharge to surface waters near the CCEC is described in Section 3.7.3. The CCEC's thermal discharges would be regulated in accordance with the plant's PADEP-issued NPDES permit. Therefore, the water temperatures in the Susquehanna River near the discharge area are not expected to be conducive to etiological growth, and the public health impact is expected to be minimal.

As described in the 2024 LR GEIS, nuclear power plant workers can be exposed to *Legionella* spp. when performing cooling system maintenance through inhalation of cooling tower vapors because these vapors are often within the optimum temperature range for *Legionella* spp. growth. As discussed in Section 4.7.1.1 of the CCEC ER (CEG 2025-TN12656), occupational health impacts are managed through established industrial hygiene practices that comply with OSHA requirements. In Section 4.8.2 of the 2009 SEIS (NRC 2009-TN3684), the NRC concluded that microbiological organisms during the license renewal term are not likely to present a public health hazard as a result of facility discharges to the Susquehanna River. Additionally, CEG would mitigate any industrial safety risks from microbiological organisms in cooling systems using the CCEC OSHA-compliant program under 29 CFR Parts 1910 and 1926 (TN654; TN4455).

Physical Hazards: As described in Section 3.9.2.4 of the 2024 LR GEIS (NRC 2024-TN10161), a physical hazard is an action or condition that can cause harm upon contact. Nuclear power plants have many of the typical occupational hazards found at any other electric power generation sites as workers perform electrical and repair work and maintenance activities and may be exposed to potentially hazardous physical conditions (e.g., falls, excessive heat, cold, noise, electric shock, and pressure). In 2023, the U.S. Bureau of Labor Statistics reported that the national incidence rate for nonfatal occupational injuries and illnesses for the utility industry was 1.8 per 100 full-time workers (BLS 2024-TN11032).

Electric shock hazards and chronic exposure to electromagnetic fields that are produced by power transmission systems are discussed in Sections 3.9.2.4.1 and 3.9.2.3 of the 2024 LR GEIS (NRC 2024-TN10161) and Sections 4.8.3 and 4.8.4 of the 2009 SEIS (NRC 2009-TN3684). Occupational workers and members of the public could be exposed to acute electric shock from transmission lines or electrical equipment needed to support the CCEC. In-scope transmission lines at the CCEC (i.e., the transmission lines within the protected area from the reactor to the switchyard) satisfy National Electrical Safety Code standards (CEG 2026-TN12942). CEG follows an industrial safety program that includes electrical safety. Further, there are no Federal standards limiting exposure to electromagnetic fields from power lines in the United States. Finally, the NRC staff expects that other industrial safety risks, such as confined space entry or electrical system maintenance, would also be mitigated using the site's OSHA-compliant program.

3.11.2.2 Environmental Impacts from Preparations for the Resumption of Power Operations

Based on the information summarized above in Section 3.11.2.1, the NRC staff has determined that the proposed actions would not adversely alter nonradiological human health factors or conditions at the CCEC. Section 3.1.2 describes the activities that CEG is completing in preparation for the resumption of power operations at the CCEC. The CCEC continues to have a comprehensive industrial safety program that addresses all applicable OSHA standards. This program would ensure that physical safety risks are identified, controlled, and mitigated through administrative procedures, engineering controls, and personnel training (CEG 2025-TN12656). Therefore, the NRC staff concludes that the nonradiological human health impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.11.2.3 Environmental Impacts from the Resumption of Power Operations

The environmental effects of reactor operations on nonradiological human health resources as a result of reactor license renewal are described in Section 4.9.1 of the 2024 LR GEIS (NRC 2024-TN10161). As explained in the 2024 LR GEIS, continued reactor operations and refurbishment activities at nuclear power plants have had little or no measurable effect on the environment or human health. The NRC staff expects that the CCEC will continue to have a comprehensive industrial safety program that addresses all applicable OSHA standards, as described in the ER (CEG 2025-TN12656), including personal protective equipment (29 CFR 1910.132 [TN654]), eye and face protection (29 CFR 1910.133), respiratory protection (29 CFR 1910.134), and hearing protection (29 CFR 1910.95) following the resumption of power operations. Based on its review of the CCEC ER (CEG 2025-TN12656), the NRC staff has verified that the affected environment related to nonradiological human health resources at the CCEC has not changed to any significant degree since the 2009 SEIS (NRC 2009-TN3684). Therefore, the NRC staff concludes that nonradiological human health impacts from the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.12 Waste Management

The NRC staff evaluated the potential waste management effects from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for waste management effects.

3.12.1 Affected Environment

Complete descriptions of the CCEC radioactive waste management and effluent control systems are found in Section 2.1.2 of the 2009 SEIS (NRC 2009-TN3684). The systems include gaseous and liquid effluent control systems that prevent the release of waste emissions to the environment and must meet the regulatory requirements of 10 CFR Part 20 Appendix B (TN283). Additionally, the solid radioactive waste processing system encompasses the systems and processes used to capture and prepare solid waste for transport. As described in Section 2.2.3 of the CCEC ER (CEG 2025-TN12656), these systems have not been changed since the issuance of the 2009 SEIS and have been maintained in a preserved condition. Thus, the description from Section 2.2.3 of the CCEC ER is incorporated here by reference. As stated in Section 3.5, there has not been noted in the ARERRs any abnormal releases of tritium in groundwater released into the Susquehanna River from the facility. The NRC staff verified that since 2020, the quarterly release of tritium in this pathway to the river has been in the range of 2.7×10^{-3} to 2.8×10^{-3} curie (Ci) per quarter (CEG 2026-TN12942). Resulting tritium concentrations in surface water were below detectable levels of analysis, which is well in compliance with the EPA tritium drinking water limit of 20,000 pCi/L (CEG 2025-TN12988).

Mixed waste, regulated under the Resource Conservation and Recovery Act of 1976, as amended (TN1281) and the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.-TN663), includes both radioactive and hazardous waste (EPA 2019-TN6956). According to the CCEC ER (CEG 2025-TN12656), the CCEC has generated minimal mixed waste in the past 5 years.

Section 2.1.3 of the 2009 SEIS (NRC 2009-TN3684) provides a description of the nonradioactive waste generation and waste management practices at the CCEC prior to the start of plant decommissioning in 2019. Generated nonradioactive waste included chemical, biocide, sanitary, universal, site stormwater runoff, and lubrication oil waste. The CCEC has a nonradioactive waste management program and procedures to handle and dispose of this nonradioactive waste in accordance with Federal, State (i.e., PADEP, Bureau of Waste Management), and applicable local regulations. Solid waste is collected and stored onsite, then shipped offsite for disposal.

Section 3.8.2 of the CCEC ER (CEG 2025-TN12656) provides a review of waste management activities at the CCEC. Nonradioactive wastes generated at the CCEC are similar to those identified in the 2009 SEIS. The CCEC has historically been classified as a small quantity hazardous waste generator. Table 3.8-2 in the CCEC ER provides the type and quantity of nonradiological wastes shipped offsite where higher values were due to decommissioning activities in 2023 and 2024. Table 3.8-2 in the CCEC ER is incorporated here by reference (CEG 2025-TN12656). The NRC staff expects that CEG would continue to implement plans and procedures for management of its waste types (CEG 2025-TN12656). Procedures, such as SPCC and SWPPP plans, are in place at the CCEC for nonradioactive waste management and for the minimization and management of liquid chemical spills (CEG 2025-TN12656).

3.12.2 Environmental Impacts from Preparations for the Resumption of Power Operations

Section 3.1.2 lists the planned activities in preparation for the resumption of power operations at the CCEC. Both radioactive and nonradioactive wastes may be generated as a result of these activities. Section 4.8.1 of the CCEC ER states that the restored radioactive waste processing and release capability is anticipated to be comparable to normal power operations in

accordance with regulatory limits and requirements (CEG 2025-TN12656). CEG maintains plans and procedures for the management of radioactive and nonradioactive waste which are expected to be in place for restart activities (CEG 2025-TN12656). Restart activity waste volumes are expected to be similar to an outage year during operations, with the most recent being 2017. Applying the 2017 ARERR, the estimated amount of radioactive solid waste to be generated during refueling activities as part of the preparations for the resumption of power operations would be as follows (Exelon 2018-TN13152):

- 3,256 ft³ (92.2 m³) of spent resins, filter sludges, evaporator bottoms, etc.
- 13,914 ft³ (394 m³) of dry compressible waste, contaminated equipment, etc.
- 1.1 ft³ (0.03 m³) of irradiated components, control rods, etc.

Based on its review of the information in the CCEC ER (CEG 2025-TN12656), the NRC staff determined that the proposed actions would not alter the radiological or nonradiological waste management processes currently in place at the CCEC. Therefore, the NRC staff concludes that the radioactive and nonradioactive waste management impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

3.12.3 Environmental Impacts from the Resumption of Power Operations

Hazardous waste generation is not expected to increase during the resumption of power operations at the CCEC. As described in Section 4.8.2 of the CCEC ER (CEG 2025-TN12656), the CCEC is expected to continue as a low-level radioactive waste and small hazardous waste generator following restart. The type and quantity of waste would be as presented in past operational ARERRs, and CEG does not anticipate a significant increase in waste generation rates. The NRC staff expects that the radiological and nonradiological waste management impacts of operations would be consistent with those described in the 2009 SEIS (NRC 2009-TN3684).

In addition, the NRC staff determined that the radiological and nonradiological waste management impacts analyses in the 2024 LR GEIS (NRC 2024-TN10161) are relevant to the proposed actions, including the resumption of power operations at the CCEC. Section 4.11.1 of the 2024 LR GEIS describes the environmental effects of reactor operations on radiological and nonradiological waste management as a result of license renewal. As explained in the 2024 LR GEIS, continued reactor operations and refurbishment activities at nuclear power plants have had little or no environmental effect on waste management.

Based on its review of the information in the CCEC ER (CEG 2025-TN12656), the NRC staff determined that the waste management affected environment at the CCEC has not changed to any significant degree since the 2009 SEIS (NRC 2009-TN3684). As a result, the NRC staff concludes, based on the CCEC ER and the findings of the 2009 SEIS and the 2024 LR GEIS (NRC 2024-TN10161), that the radioactive and nonradioactive waste management impacts from the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.13 Uranium Fuel Cycle and Transportation

The NRC staff evaluated the potential effects associated with the uranium fuel cycle and related transportation from the proposed actions by comparing the effects of these activities with the effects from similar activities analyzed in other environmental documents including the information sources cited in Section 1.3.4. Other source documentation used is cited as applicable. This information supports the NRC staff's significance determination for the uranium fuel cycle and transportation effects.

The generic radiological and nonradiological environmental impacts of the uranium fuel cycle and transportation of nuclear fuel and wastes are described in detail in Section 4.14.1 of the 2024 LR GEIS (NRC 2024-TN10161) and based, in part, on the generic impacts provided in 10 CFR 51.51(b), Table S-3, "Table of Uranium Fuel Cycle Environmental Data," and in 10 CFR 51.52(c), Table S-4, "Environmental Impact of Transportation of Fuel and Waste to and from One Light-Water-Cooled Nuclear Power Reactor." This information is incorporated here by reference.

3.13.1 Affected Environment

With respect to the uranium fuel cycle and transportation impacts, the affected environment is considered to be common to all nuclear power plants. Table S-3 of 10 CFR Part 51.51(b) and Table S-4 of 10 CFR Part 51.52(c) (TN10253) provide bounding estimates of the impacts of the uranium fuel cycle and transportation of fuel and waste to and from a reactor. In NUREG-2266 (NRC 2024-TN10333), the NRC staff evaluated the impacts to the uranium fuel cycle for up to 10 weight percent (wt%) uranium-235 and transportation of fuel and waste for up to 8 wt% uranium-235 and burnup levels up to 80 gigawatt-days per metric ton of uranium (GWd/MTU). The analysis in NUREG-2266 demonstrates that 10 CFR Part 51 Tables S-3 and S-4 are still bounding under these conditions. Although CEG is not proposing to use accident tolerant fuels or increased enrichments or burnups as part of its requests related to the resumption of power operations at the CCEC, the NRC staff relied on NUREG-2266 because it contains the latest analysis and also bounds the proposed resumption of power operations at the CCEC. Additionally, the NRC staff determined that the information referenced in the CCEC ER (CEG 2025-TN12656) is consistent with the assumptions and descriptions found in Section 4.14.1 of the 2024 LR GEIS (NRC 2024-TN10161), which is incorporated here by reference.

3.13.2 Environmental Impacts from Preparations for the Resumption of Power Operations

CEG indicates that the activities to load fuel into the reactor would be similar to those for a typical refueling outage. Since all spent fuel at the site has been transferred from the spent fuel pool to the onsite independent spent fuel storage installation, there is not any prior fuel available to be used for the restart. Thus, CEG provides that the initial core loading would be a full core fueling, which would result in up to 177 new light-water reactor fuel assemblies being transported to the CCEC (CEG 2026-TN12942)³. Impacts from the uranium fuel cycle were analyzed in Section 6 of the 2009 SEIS (NRC 2009-TN3684), Section 4.14.1 of the 2024 LR GEIS (NRC 2024-TN10161), NUREG-2157, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel* (Continued Storage GEIS) (NRC 2014-TN4117), and Sections 2 and 3 of NUREG-2266 (NRC 2024-TN10333), which are incorporated here by reference. The CCEC would utilize the existing uranium fuel cycle front end for the up to 5 wt% U-235 fresh fuel. Thus, based on its review of the information contained in the CCEC ER (CEG 2025-TN12656), the NRC staff determined that the proposed actions would not alter previous conclusions regarding the uranium fuel cycle and transportation of fuel and waste to and from the CCEC site. Therefore, the NRC staff concludes that the uranium fuel cycle and transportation impacts from restart preparation activities at the CCEC would be NOT SIGNIFICANT.

³ On June 27, 2025, as supplemented by letter dated April 2, 2026, CEG submitted to the NRC a request to amend the CCEC license to allow for the receipt of new reactor fuel and new sealed neutron sources for reactor startup. The NRC approved this request by License Amendment No. 307, dated July 1, 2026 (NRC 2026-TN13605).

3.13.3 Environmental Impacts from the Resumption of Power Operations

The NRC staff finds that the impacts to the uranium fuel cycle and subsequent transportation of fresh nuclear fuel and spent fuel and radioactive waste during power operations at the CCEC would be consistent with those described in the 2009 SEIS (NRC 2009-TN3684), the 2024 LR GEIS (NRC 2024-TN10161), the Continued Storage GEIS (NRC 2014-TN4117), and the analyses in NUREG-2266 (NRC 2024-TN10333). These documents describe the impacts bounded by Table S-3 and Table S-4 of 10 CFR Part 51 and the impacts of spent fuel at-reactor and away-from-reactor storage. Additionally, consistent with 10 CFR 51.30(b), because the impacts of continued storage of spent fuel are relevant to the proposed actions, the NRC staff considered the generic impact determinations regarding the continued storage of spent fuel from the Continued Storage GEIS, and those determinations are incorporated here by reference. The documents listed above demonstrate that the continued power operations of nuclear power plants have had little or no environmental effects due to the uranium fuel cycle, spent fuel management, and transportation of fuel and waste.

Based on its review of the CCEC ER (CEG 2025-TN12656), the NRC staff determined that the uranium fuel cycle and transportation affected environment at the CCEC has not changed to any significant degree nor has any significant new information been identified since the 2009 SEIS (NRC 2009-TN3684) was prepared. Therefore, the NRC staff concludes that the uranium fuel cycle and the transportation of fuel and waste impacts from the resumption of power operations at the CCEC would be NOT SIGNIFICANT.

3.14 Postulated Accidents

The environmental impacts of design-basis accidents (DBAs) and severe accidents are considered for all nuclear power plants, including the CCEC. The effects of postulated accidents and consideration of severe accident mitigation alternatives (SAMAs) are discussed in Section 4.9.1.2 and Appendix E of the 2024 LR GEIS (NRC 2024-TN10161). A plant-specific analysis of the environmental impacts of postulated accidents, including consideration of SAMAs, was performed for the CCEC in Appendix F of the 2009 SEIS (NRC 2009-TN3684). The descriptions in these sections of the 2024 LR GEIS and the 2009 SEIS are discussed below and are incorporated here by reference.

The 2024 LR GEIS (NRC 2024-TN10161) summarizes the operational impacts of nuclear power plants within the United States and indicates that the environmental impacts of DBAs and the environmental impacts from the probability-weighted consequences of severe accidents are generic issues with a SMALL environmental impact. SAMAs were previously considered on a site-specific basis for the CCEC in the 2009 SEIS. The NRC staff reviewed the current site-specific information for the CCEC and found no new information that would change either the generic SMALL impact determinations for DBAs and severe accidents in the 2024 LR GEIS or the specific determinations of SMALL impacts for DBAs and severe accidents in the 2009 SEIS. CEG confirmed that there would be no changes to the facility's design basis that would require a reevaluation of the SAMA analysis (CEG 2026-TN12942). Additionally, the NRC has stated in Table B-1 of 10 CFR Part 51 (TN10253) Appendix B, that, so long as a previous SAMA analysis has been performed, SAMAs 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.

The CCEC (as TMI-1) is included in the NRC staff's generic evaluation presented in the 2024 LR GEIS (NRC 2024-TN10161), where the impacts of postulated accidents were determined to be SMALL for all of the evaluated nuclear power plants. Estimated population dose values for the CCEC are provided in Table E.3-1 of the 2024 LR GEIS. The reported values from the 2009 SEIS SAMA analysis illustrate the large reduction of the estimated population dose values from those used in the 1996 LR GEIS (NRC 1996-TN288) that resulted in the SMALL impact determination for severe accidents made generically for all plants. CEG confirmed to the NRC staff during the environmental audit (NRC 2026-TN13338) that the assumptions used by the NRC staff during the generation of values in Table E.3-1 of the 2024 LR GEIS remain valid. Additionally, the NRC staff verified that there was no new and significant information regarding the NEPA findings for DBAs or severe accidents since the NRC staff's previous environmental analysis of these accidents for the CCEC in the 2024 LR GEIS (CEG 2026-TN12942).

CEG confirmed that the 2024 LR GEIS (NRC 2024-TN10161) generic findings for severe accidents and SAMAs would remain applicable to the CCEC during resumed power operations for the remainder of the term of the CCEC RFOL (CEG 2026-TN12942). Both internal and external events were evaluated in the 2009 SEIS (NRC 2009-TN3684). As documented in CEG's responses to the NRC's RCIs, the current updated model of record for internal event and internal flood risk for the CCEC is $5.86 \times 10^{-6}/\text{yr}$, which is within the 2024 LR GEIS Table E.3-2 SAMA core damage frequency (CDF) range of $3.9 \times 10^{-6}/\text{yr}$ to $5.6 \times 10^{-5}/\text{yr}$ for pressurized-water reactors and is a reduction from values used at the time of reactor license renewal (i.e., $2.37 \times 10^{-5}/\text{yr}$) (CEG 2026-TN12942). The current updated seismic model of record CDF for the CCEC is $3.3 \times 10^{-5}/\text{yr}$, which is relatively unchanged from the $3.21 \times 10^{-5}/\text{yr}$ value from the 2009 SEIS (CEG 2026-TN12942). The current updated fire probabilistic risk assessment (PRA) model of record CDF for the CCEC is $9.39 \times 10^{-5}/\text{yr}$. This updated model value is higher than the 2009 SEIS value of $1.22 \times 10^{-5}/\text{yr}$, as it includes the application of NUREG/CR-6850 (EPRI/NRC 2005-TN7824, EPRI/NRC 2005-TN7823), which was done for a fire PRA peer review. Furthermore, a fire PRA update to incorporate the most recent state-of-the-art fire PRA methodology is currently in progress for the CCEC, which should have the effect of lowering the current CDF value of $9.39 \times 10^{-5}/\text{yr}$ (CEG 2026-TN12942).

A comprehensive analysis and review of the potentially cost-beneficial SAMAs for the CCEC (as TMI-1) was performed by the NRC staff in Appendix F of the 2009 SEIS (NRC 2009-TN3684). Based on NRC staff review and analysis of potential SAMAs and responses to NRC staff RAIs and as stated in Section 5.3.6 of the 2009 SEIS (NRC 2009-TN3684), it was concluded that the licensee made a reasonable, comprehensive effort to identify and evaluate SAMAs. Based on that information, the NRC staff concluded that none of the potentially cost-beneficial SAMAs related to adequately managing the effects of aging during the period of extended operation were warranted; therefore, they were not implemented as part of the 2009 license renewal pursuant to 10 CFR Part 54. As mentioned above, because the licensee considered SAMAs as part of the 2009 license renewal review, CEG need not consider them further.

On September 9, 2019, the Mitigation of Beyond-Design-Basis Events rule (10 CFR 50.155) (TN249) became effective. This rule primarily addresses mitigation strategies for a wide range of potential extreme events, including seismic events, fire, flooding, and other natural phenomena, requiring nuclear power plants to have plans in place to maintain core cooling, containment integrity, and spent fuel pool cooling even when facing events beyond their design basis, including large-scale natural disasters. If the proposed actions are approved, the CCEC will again be subject to 10 CFR 50.155 (TN249).

As a result of the NRC's ongoing safety oversight and updates to NRC regulatory requirements, the overall risk of a severe accident has been reduced. Because the NRC's regulations and safety oversight have provided additional severe accident mitigation and have further reduced the risk profile of operating reactors since the SAMA analysis documented in the 2009 SEIS, further SAMA analyses would be unlikely to find any cost-effective significant plant improvements, as discussed in the 2024 LR GEIS (NRC 2024-TN10161).

Based on information in the CCEC ER, information in the 2009 SEIS (NRC 2009-TN3684), and CEG's response to the NRC's RCIs (CEG 2026-TN12942) and the fact that the published impacts from postulated accidents are considered bounding, the NRC staff has determined that the proposed actions would not alter the previously determined impacts from DBAs and severe accidents, or the previous SAMA conclusions for the CCEC in the 2024 LR GEIS (NRC 2024-TN10161). Therefore, the NRC staff concludes that the postulated accidents impacts from the proposed actions at the CCEC would be NOT SIGNIFICANT.

3.15 Greenhouse Gas Emissions and Climate Change

The NRC staff's evaluation considers GHG emissions from the proposed actions including potential climate change effects in the environment through the remainder of the term of the CCEC RFOL. The climate change evaluation includes a description of how the baseline environment, defined in Chapter 3, might change as a result of climate change along with a discussion of how the impacts discussed in Chapter 3 would either increase, decrease, or remain the same in this new baseline environment. Potential GHG and climate change impacts are evaluated and described in Appendix D.

3.16 Decommissioning

This section describes the environmental effects associated with the permanent cessation of power operations and the return to the decommissioning of the CCEC at a future date. All operating nuclear power plants will permanently cease power operations and be decommissioned at the end of their operating life when a decision is made to permanently cease power operations.

As discussed in Chapter 1, TMI-1 ceased operations and removed fuel from the reactor in 2019. Prior to cessation of power generation activities and removal of all fuel, the licensee submitted a PSDAR to the NRC (Exelon 2019-TN12795), in accordance with 10 CFR 50.82(a)(4) (TN249), to outline the proposed decommissioning activities and describe the potential associated environmental impacts. In the PSDAR, the licensee concluded that the environmental impacts associated with the planned facility site-specific decommissioning activities would be bounded by appropriate, previously issued environmental impact statements, including the Decommissioning GEIS (NRC 2002-TN7254), the 2009 SEIS (NRC 2009-TN3684), and the 2013 LR GEIS (NRC 2013-TN2654).

The impacts of decommissioning nuclear power plants are evaluated in the Decommissioning GEIS (NRC 2002-TN7254). In the 2009 SEIS, the NRC staff concluded that there were no new and significant impacts beyond those discussed in the 1996 LR GEIS. In the 1996 LR GEIS, the NRC concluded that the impacts of license renewal on terminating reactor operations and decommissioning were SMALL for all nuclear power plants. Since the 2009 SEIS, the impacts of license renewal on terminating reactor operations and decommissioning were again considered to be SMALL for all nuclear power plants in the 2013 LR GEIS. Additionally, in the 2024 LR GEIS (NRC 2024-TN10161) the NRC, after review, reconfirmed decommissioning impacts to be

SMALL for all nuclear power plants. Also published in 2024, NUREG-2266 reached the same conclusion that the Decommissioning GEIS would still be bounding but for even higher enrichment and burnup levels (i.e., 10 wt% U-235 and 80 GWd/MTU, respectively) than the levels applicable to the CCEC (NRC 2024-TN10333).

Section 7 of the 2009 SEIS (NRC 2009-TN3684), which is incorporated here by reference, evaluated the impacts of decommissioning with the license renewal term ending in 2034. If the resumption of power operations at the CCEC occurs as a result of the proposed actions, then the term of that operation would still end in 2034. Based on the above information, the NRC staff determined that the proposed actions would not alter the previously determined SMALL impacts from decommissioning. Therefore, the NRC staff concludes that the environmental impacts from the proposed actions on eventual reactor shutdown and decommissioning of the CCEC would be NOT SIGNIFICANT.

4 CONCLUSIONS

This EA describes the environmental review conducted by the NRC and DOE EDF staff for evaluating the environmental effects of granting the licensing and regulatory requests necessary to reauthorize power operations at the CCEC through April 19, 2034, which is the end of the current operating license term under the CCEC RFOL. DOE EDF acted as a cooperating agency on this review. Procedurally, this document follows 10 CFR 51.30, “Environmental assessment” and 10 CFR 51.31, “Determinations based on environmental assessment” (TN249), which are the NRC’s regulations for preparing EAs in accordance with NEPA (TN661). Within this section of the EA, the NRC staff presents conclusions and recommendations based on its environmental review.

4.1 Environmental Impacts of the Proposed Federal Actions

The proposed set of Federal actions for the reauthorization of power operations at the CCEC consists of an exemption request and several LARs (see Section 1.1.1, Table 1-1). The purpose and need for these proposed actions is to provide an option for 835 MWe of baseload power generation capability to the Pennsylvania, New Jersey, and Maryland electric grid through the current licensing term of April 19, 2034 (see Section 1.2). Chapter 3 evaluates the reasonably foreseeable environmental effects (impacts) of the proposed actions, which would be from preparations for the resumption of power operations and from the resumption of power operations at the CCEC. The NRC staff also evaluated environmental effects associated with GHGs and climate change in Appendix D and with activities related to the eventual return to decommissioning in Section 3.16. As indicated in Chapter 3, the NRC staff concludes that the reasonably foreseeable environmental effects (impacts) of the proposed actions would be NOT SIGNIFICANT for each potentially affected environmental resource area. The NRC staff based this conclusion on an independent review of information provided in CEG’s licensing submittals, including the CCEC ER (CEG 2025-TN12656), as well as other relevant information and sources. Section 1.3.4 provides a summary of the most important sources for the NRC staff’s environmental review.

4.2 Comparison of Alternatives

In Section 2.2, the NRC staff considered possible alternatives to the proposed actions of reauthorizing power operations at the CCEC. Only one alternative was considered—the no-action alternative. As noted in Section 2.2.1, taking the no-action alternative would not meet the purpose and need for the proposed actions and could lead to a need to build new nuclear or non-nuclear power generation facilities. If the no-action alternative was selected and CEG would not build new power generation facilities, any avoidance of environmental impacts resulting from not implementing the proposed actions would be minimal, as indicated by the analysis of the environmental impacts of the proposed actions presented in Chapter 3. However, building new power generation facilities would result in additional environmental impacts related to land disturbance and use of construction equipment. These impacts would be greater than those needed to put the already built CCEC facility back into operation. Depending on the location or locations ultimately selected for the new power generation facilities, the environmental impacts could potentially be SIGNIFICANT. In contrast, the potential environmental impacts from the proposed actions of reauthorizing power operations at the CCEC would be NOT SIGNIFICANT for each potentially affected environmental resource area. Therefore, the NRC staff has determined that there are no environmentally preferable alternatives to the proposed actions.

5 FINDING OF NO SIGNIFICANT IMPACT

The proposed actions before the NRC are whether to grant requests for an exemption and license amendments that are necessary to reauthorize power operations at the CCEC through the remainder of its current operating license term (April 19, 2034). The NRC staff conducted an environmental review of these actions and prepared an EA. This FONSI incorporates by reference the EA in Chapters 1 through 4 of this document. On the basis of the EA and its determination that the environmental impacts of the proposed actions would be NOT SIGNIFICANT for each potentially affected resource area, the NRC staff concludes that the proposed actions will not have a significant effect on the quality of the human environment. Accordingly, the NRC staff has determined not to prepare an EIS for the proposed actions and that a FONSI is warranted.

This FONSI and the related environmental documents referenced throughout the EA are available for public review as discussed in the EA. At the conclusion of the NRC environmental review, DOE EDF would publish a separate notice or decision document, as appropriate.

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7 LIST OF PREPARERS

Members of the U.S. Nuclear Regulatory Commission staff prepared this environmental assessment with assistance from the U.S. Department of Energy and from Pacific Northwest National Laboratory. Table 7-1 identifies each preparer's name, affiliation, and summary of education and experience.

Table 7-1 List of Preparers

Name	Education and Experience
Briana Arlene, NRC	Masters Certification - National Environmental Policy Act BS Conservation Biology 20 years of experience in ecological impact analysis, Endangered Species Act Section 7 consultations, and Essential Fish Habitat consultations
Jennifer Davis, NRC	BA, Historic Preservation and Classical Civilization (Archaeology) 5 years of archaeological fieldwork; 23 years of experience in NEPA compliance, project management, cultural resources impact analysis, and National Historic Preservation Act Section 106 consultations
Mitchell Dehmer, NRC	PSM Environmental Science Graduate Certificate in Environmental Management Graduate Certificate in Energy Policy BS Biology 11 years of relevant experience in government, biology, and ecology
Lloyd Desotell, NRC	MS Civil Engineering MS Water Resources Management BA Environmental Studies Over 20 years of experience conducting surface and subsurface hydrologic analyses
Kevin Folk, NRC	MS Environmental Biology BA Geoenvironmental Studies 35+ years in NEPA compliance; project management; geologic, hydrologic, and water quality impacts analysis; utility infrastructure analysis, health and environmental regulatory compliance; and water supply and wastewater discharge permitting
Stephen Koenick, NRC	MS Environmental Engineering BS Mechanical Engineering 30+ years of government and supervisory experience
Nancy Martinez, NRC	BS Earth and Environmental Science MA Earth and Planetary Science 14 years of experience in environmental impact analysis
Donald Palmrose, NRC	PhD Nuclear Engineering MS Nuclear Engineering BS Nuclear Engineering 36 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
John Parillo, NRC	MS Environmental Engineering BS Mechanical Engineering 50 years of experience in nuclear power, primarily in design-basis and severe accident dose consequence analysis

Name	Education and Experience
William Rautzen, NRC	MS Health Physics BS Health Physics BS Industrial Hygiene 22 years of government experience including 15 years of environmental impact analysis
Jeffrey Rikhoff, NRC	Master of Regional Environmental Planning MS Development Economics BA English 45 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 historic and cultural resource impact assessments, consultation with American Indian Tribes, and comprehensive land use and development planning studies
Gerry Stirewalt, NRC	PhD Structural Geology Registered Professional Geologist Certified Engineering Geologist 50+ years of experience including geologic site characterization for nuclear energy facilities and high-level nuclear waste disposal facilities, 3-D geospatial modeling of subsurface geology, tectonic faults, and contaminated groundwater plumes, environmental geology, and assessment of groundwater
Ashley Waldron, NRC	BS Biology and Environmental Science 17 years of experience in NEPA and project management
Bradley Werling, NRC	BA Engineering Physics BS Chemistry MS Environmental Science Duke NEPA Certificate 25+ years of experience as an analytical chemist including air monitoring analyses and radionuclide transport studies with 20 years of experience preparing and reviewing NEPA documents
Alicia Williamson, DOE	MS Environmental Science BS Biology and Chemistry 24 years of relevant experience including nuclear facility licensing and siting, environmental impact analysis and environmental monitoring and compliance
Teresa Carlon, PNNL	BS Information Technology 30 years of experience as SharePoint administrator, project coordinator, and databases
Cyler Conrad, PNNL	PhD Anthropology (Archaeology) MA Anthropology (Archaeology) BA Anthropology 13 years of relevant experience Over 10 years of experience in archaeology, cultural resource management, National Historic Preservation Act Section 106, NEPA, and project management
Leah Hare, PNNL	MS Geographic Information Science BS Environmental Studies 10+ years of experience in environmental monitoring, regulatory compliance, project management, and environmental assessment
Hayley McClendon, PNNL	BS Environmental Science 9 years of experience in environmental compliance and technical document preparation and review

Name	Education and Experience
Mike Parker, PNNL	BA English Literature 25 years of experience copyediting, document design, and formatting and 20 years of experience in technical editing
Lindsey Renaud, PNNL	MA Anthropology BA Anthropology 15 years in cultural resource management, Section 106 and 110 compliance, and NEPA environmental impact assessments. Secretary of the Interior- qualified Registered Professional Archaeologist. Experience in Tribal engagement and Native American Graves Protection and Repatriation Act compliance and reference coordinator
Kacoli Sen, PNNL	PhD Cancer Biology MS Zoology (Specialization Ecology) BS Zoology Diploma in Environmental Law Over 7 years of document editing and production experience
Caitlin Wessel, PNNL	PhD Marine Science MS Coastal, Marine, and Wetland Science 13 years of relevant experience in ecology, habitat modeling, chemical analysis, physical processes, and environmental assessments
BA = Bachelor of Arts; BS = Bachelor of Science; DoD = U.S. Department of Defense; DOE = U.S. Department of Energy; DOI = U.S. Department of Interior; MA = Master of Arts; MS = Master of Science; NEPA = National Environmental Policy Act of 1969; NNSA = National Nuclear Security Administration; NRC = U.S. Nuclear Regulatory Commission; PhD = Doctor of Philosophy; PNNL = Pacific Northwest National Laboratory; PSM = Professional Science Master.	

APPENDIX A

APPLICABLE LAWS, REGULATIONS, AND OTHER REQUIREMENTS

A.1 Federal and State Requirements

Several Federal laws and regulations affect environmental protection, health, safety, compliance, and consultation at every U.S. Nuclear Regulatory Commission (NRC or Commission) licensed nuclear power plant. Some of them require permits by or consultation with other Federal, State, and local agencies and Indian Tribes. Certain Federal environmental requirements have been delegated to State authorities for enforcement and implementation. Furthermore, States have also enacted laws to protect public health and safety and the environment. It is the NRC's policy to make sure that nuclear power plants are operated in a manner that provides adequate protection of public health and safety and protection of the environment through compliance with applicable Federal and State laws, regulations, and other requirements, as appropriate.

Appendix F of Revision 2 of NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (the 2024 LR GEIS) (NRC 2024-TN10161) discusses Federal laws, regulations, and other requirements that may be applicable to the continued operation of nuclear power plants licensed by the NRC. These include Federal laws, regulations, and other requirements designed to protect the environment. The NRC staff relies upon and incorporates by reference herein the regulatory discussions and information presented in Appendix F, Sections F.2–F.7 of the 2024 LR GEIS (NRC 2024-TN10161: pp. F-1–F-24). Therefore, these Federal laws, regulations, and other requirements are not duplicated in this appendix, which instead focuses on facility-specific information.

In addition to carrying out some Federal programs, State legislatures develop their own laws. State statutes can supplement, as well as implement, Federal laws for the protection of air, surface water, and groundwater resources. State legislation may address solid waste management programs, locally rare or endangered species, and historic and cultural resources. Additionally, the Atomic Energy Act of 1954, as amended (42 *United States Code* [U.S.C.] 2011 et seq.-TN663), authorizes the NRC to enter into an agreement with any State that allows the State to assume regulatory authority for certain activities (see 42 U.S.C. 2021-TN10029). Pennsylvania is an NRC Agreement State. The Bureau of Radiation Protection within the Pennsylvania Department of Environmental Protection (PADEP) has regulatory responsibility over the radioactive materials program under the AEA Section 274b Agreement between the NRC and the Commonwealth of Pennsylvania.

The U.S. Environmental Protection Agency (EPA) has the primary responsibility to administer the Federal Water Pollution Control Act of 1972, as amended (33 U.S.C. 1251 et seq., herein referred to as the Clean Water Act [CWA]-TN662). The National Pollutant Discharge Elimination System (NPDES) Program addresses water pollution by regulating the discharge of potential pollutants to waters of the United States. The CWA allows for primary enforcement and administration through State agencies if the State program is at least as stringent as the Federal program. The EPA has delegated the authority to issue NPDES permits to Pennsylvania. Among other responsibilities, the PADEP provides oversight for public water supplies, issues permits to regulate the discharge of industrial and municipal wastewaters—including discharges to groundwater—and monitors State water resources for water quality. The PADEP issues NPDES permits to regulate and control water pollutants.

A.2 Operating Permits and Other Requirements

The Christopher M. Crane Clean Energy Center (CCEC) is subject to various Federal and State requirements. As a convenient source of references of environmental requirements, Table A-1 below lists principal Federal and State approvals necessary for the resumption of power operations at the CCEC through the end of the current renewed facility operating license. This list includes permits and licenses issued by Federal, State, and local authorities for activities at the CCEC. Listed information is principally derived from the CCEC environmental report (CEG 2025-TN12656) submitted by Constellation Energy Generation, LLC (CEG), with updates provided in response to the NRC staff's request for additional information (CEG 2026-TN12942). Where applicable, the status of the permit or approval is indicated.

Table A-1 Operating Permits and Other Requirements for the Reauthorization of Power Operations at the Christopher M. Crane Clean Energy Center

Permit/ Authorization	Agency	Authority	Number	Issuance/ Expiration Date	Authorized Activity
Renewed Facility Operating License	NRC	AEA (42 U.S.C. § 2011 et seq.); 10 CFR 50.10	DPR-50; Docket 50- 289	Issued: 04/19/1974; Renewed: 10/22/2009; Expires: 04/19/2034	Operation of the CCEC ^(a)
Pennsylvania, NPDES permit	PADEP; EPA	CWA (33 U.S.C. § 1251 et seq.); 40 CFR Part 122; Pennsylvania Clean Streams Law, as amended, 35 P.S. Section 691.1 et seq.	PA0009920	Issued: 10/30/2007 Expired: 10/31/2012; Administratively extended pending new permit issuance ^(b)	Discharge into waters of the United States (Susquehanna River) ^(b)
Section 401 Water Quality Certification	PADEP; EPA	CWA Section 401(a)(2) (33 U.S.C. § 1251 et seq.); 40 CFR Part 121	N/A	N/A; Pending ^(c)	Required for an applicant for a Federal license or permit to conduct any activity which may result in any discharge into navigable waters ^(c)

Permit/ Authorization	Agency	Authority	Number	Issuance/ Expiration Date	Authorized Activity
Surface water withdrawal, groundwater withdrawal, and consumptive use permit	SRBC	Susquehanna River Basin Compact, P.L. 91-575, Article 3, Section 3.10, P.L. 91-575, and Commission Regulation 803.61	Docket No. 20260607, superseding 20221203 as of 07/01/2026	Issued: 06/04/2026; Expires: 06/30/2041 ^(d)	Surface water withdrawal from the Susquehanna River, groundwater withdrawal from water supply wells, and consumptive water use from wells, the Susquehanna River, and stormwater ^(d)
Acknowledgement of notification of regulated waste activity	EPA	RCRA Section 310	PAR 000037861	Issued: 03/22/1999; Expires: No date listed on permit	Generation and transportation of hazardous waste
Hazardous materials certificate of registration	DOT	49 U.S.C. § 5108; 49 CFR Part 107, Subpart G	051022550113EG	Issued: 07/01/2025 Expires: 06/30/2028	Hazardous materials transportation
Maintenance dredging permit	USACE	CWA (33 U.S.C. § 1251 et seq.); 33 CFR Parts 323 and 330	CENAB-OPR-P-2016-00128-P04	N/A ^(e)	Maintenance dredging in the Susquehanna River ^(e)
Maintenance dredging permit	PADEP	25 PA Code 105	21275724	Issued: 01/13/1976 Expires: No date listed on permit	Maintenance dredging of the intake structure and intake channel
Synthetic minor operating permit	PADEP	Air Pollution Control Act, P.L. 2119 and 25 Pa. Code 127	N/A ^(f)	N/A; Pending ^(f)	Operation of air pollutant emission sources ^(f)
Public water supply permit	PADEP	Pennsylvania SDWA (P.L. 206, No. 43); 25 PA Code 109	22296501-T2	Issued: 08/07/2009; Expires: No date listed on permit	Operation of plant site drinking water system
Public water supply permit	PADEP	Pennsylvania SDWA (P.L. 206, No. 43); 25 PA Code 109	22295502-T1	Issued: 01/20/2000; Expires: no expiration date; Reactivation pending ^(g)	Operation of the training center drinking water system ^(g)

Permit/ Authorization	Agency	Authority	Number	Issuance/ Expiration Date	Authorized Activity
Storage tank registration/permit certificate	PADEP	Pennsylvania Storage Tank and Spill Prevention Act; 25 PA Code 245	22-60170	Issued: 06/04/2025; Expires: 06/04/2026 (annual renewal) ^(h)	Registration of storage tanks ^(h)
Storage tank site-specific installation permit	PADEP	Pennsylvania Storage Tank and Spill Prevention Act; 25 PA Code 245	26-22-010	Issued: 07/10/2026; Expires: 07/10/2031	Two ASTs: 200,000 gal and 50,000 gal ^(h)
Sewage sludge disposal agreement	PADEP	Water Quality Management Division	Letter Agreement	Issued: 06/20/2000; Expires: No date listed on permit	Disposal of sewage sludge
Environmental laboratory accreditation certification	PADEP	Bureau of Laboratory Certification	Reg. No. 22-00649	Renewed annually	Site chemistry laboratory certification to perform accredited analyses for NPDES reporting
Sewage disposal system permit modification	PADEP	Londonderry Township	C179678 and C21434	Issued: 01/01/1995; Expires: No date listed on permit	Approval of additional flows to visitor center and training center elevated sand mounds
On-lot sewage disposal system permit	PADEP	Londonderry Township	U003282	Issued: 08/10/2007; Expires: No date listed on permit	New sand mound system for training center
License to ship radioactive material	TDEC	TDEC Rule 0400-20-10-.32	T-PA007-L25	Renews annually	Shipment of radioactive material to a licensed disposal/processing facility in Tennessee
General site access permit for radioactive waste disposal	UDEQ	Utah Administrative Code R313-26	N/A ⁽ⁱ⁾	Approval expired ⁽ⁱ⁾	Delivery of radioactive waste to a land disposal facility in Utah ⁽ⁱ⁾

AEA = Atomic Energy Act; AST = aboveground storage tank; CFR = *Code of Federal Regulations*; CWA = Clean Water Act; CCEC = Christopher M. Crane Clean Energy Center; DOT = U.S. Department of Transportation;

EPA = U.S. Environmental Protection Agency; N/A = not applicable; NEPA = National Environmental Policy Act of 1969; NPDES = National Pollutant Discharge Elimination System; NRC = U.S. Nuclear Regulatory Commission; PA = Pennsylvania; PADEP = Pennsylvania Department of Environmental Protection; P.L. = Public Law; RCRA = Resource Conservation and Recovery Act; SDWA = Safe Drinking Water Act; SRBC = Susquehanna River Basin Commission; TDEC = Tennessee Department of Environment and Conservation; UDEQ = Utah Department of Environmental Quality; U.S.C. = *United States Code*; USACE = U.S. Army Corps of Engineers.

- (a) The Renewed Facility Operating License for the CCEC currently only authorizes decommissioning and associated activities and does not authorize power operations or fueling of the reactor.
- (b) Constellation Energy Generation, LLC (CEG) resubmitted a permit renewal application to the PADEP on March 7, 2025, to support the resumption of power operations at the CCEC. PADEP issued a draft permit for public comment on April 2, 2026 (PADEP 2026-TN13609).
- (c) CEG submitted a water quality certification application to the PADEP on November 21, 2025, and provided additional information in response to the PADEP's acceptance review on February 12, 2026 (CEG 2026-TN13151). The PADEP issued a draft Water Quality Certification for public comment on May 8, 2026 (WQC 203225-001) followed by the final Water Quality Certification on August 14, 2026 (PADEP 2026-TN13610, PADEP 2026-TN13658). On September 2, 2026, EPA Region 3 notified the NRC that the CCEC restart project would not affect any neighboring jurisdictions (EPA 2026-TN13727), thereby concluding the neighboring jurisdictions process as described in 40 CFR Part 121, Subpart B.
- (d) CEG submitted an application for a docket renewal with modification to the SRBC in August 2025 to increase withdrawal and consumptive use allowances. An updated application for renewal with modification was submitted on November 25, 2025, and CEG submitted updated groundwater attachments in January 2026 (CEG 2026-TN13151). SRBC Docket No. 20221203, which was superseded July 1, 2026, authorized CCEC surface water withdrawal (peak day) of up to 44 Mgd from the Susquehanna River; groundwater withdrawals (30-day average) of 0.072 Mgd from Well A, 0.044 Mgd from Well B, and 0.045 Mgd from Well C; combined groundwater withdrawal limit (30-day average) of 0.099 Mgd from Wells A, B, and C; and consumptive use (peak day) of up to 6 Mgd from Wells A, B, and C, and the Susquehanna River. SRBC Docket No. 20260607, effective July 1, 2026, authorizes surface water withdrawal (peak day) of up to 73.2 Mgd from the Susquehanna River; a maximum instantaneous rate of 50,800 gpm; groundwater withdrawals (30-day average) of 0.072 Mgd from Well A, 0.044 Mgd from Well B, and 0.045 Mgd from Well C; total peak day combined groundwater withdrawal of 0.225 Mgd; combined groundwater withdrawal limit (30-day average) of 0.099 Mgd; and consumptive use (peak day) of up to 21 Mgd from Wells A, B, and C, the Susquehanna River, and stormwater (SRBC 2026-TN13598).
- (e) The previous maintenance dredging permit (CENAB-OPR-P-2016-00128-P04, issued March 31, 2017 and expired June 30, 2021) authorized maintenance dredging in the Susquehanna River. CEG has determined that dredging within the Susquehanna River is not necessary to support restart and, therefore, no USACE permit is needed at this time (CEG 2026-TN13151).
- (f) The previous synthetic minor operating permit (22-05029, issued October 13, 2017, and expired October 31, 2022) was no longer needed after entering decommissioning status due to the removal of most of the air emissions sources at the CCEC. CEG submitted a new permit (plan approval) application to the PADEP on October 30, 2025 for new emission sources. On January 7, 2026, the PADEP approved CEG's request for temporary operation of three emergency diesel generators for maintenance testing. On May 19, 2026, the PADEP issued CEG Plan Approval No. 22-05062A for the CCEC startup and commissioning activities (PADEP 2026-TN13596).
- (g) The training center drinking water system is operational but has not been used to provide drinking water since entering decommissioning status. CEG is working with the PADEP to restore the public water supply permit.
- (h) CEG anticipates submittal of new applications as new storage tanks are brought to the CCEC. The PADEP issued an installation permit for two additional ASTs with capacities of 200,000 gal and 50,000 gal at the CCEC, on July 10, 2026 (PADEP 2026-TN13611).
- (i) The general site permit for radioactive waste disposal with the State of Utah expired. CEG has initiated the permit renewal process.

Sources: CEG 2025-TN12656, CEG 2026-TN13151; NRC 2009-TN3684; CP 2026-TN13612.

A.3 References

Cited references are included in Chapter 6.

APPENDIX B

AGENCIES, ORGANIZATIONS, INDIAN TRIBES, AND INDIVIDUALS CONTACTED

The U.S. Nuclear Regulatory Commission (NRC or Commission) contacted the Federal, State, local, and regional agencies and Indian Tribes listed in Table B-1 below during the NRC staff's environmental review of the licensing and regulatory requests that are necessary to support reauthorizing power operations at the Christopher M. Crane Clean Energy Center (CCEC). This list excludes the U.S. Department of Energy Office of Energy Dominance Financing because it is a cooperating agency for the NRC staff's environmental review. The NRC is providing electronic copies of this environmental assessment to the listed agencies and entities. The NRC is also distributing this environmental assessment to members of the public and other entities who requested that they be notified and who provided contact information.

Table B-1 List of Agencies, Organizations, Indian Tribes, and Individuals Contacted by the NRC during the Environmental Review for the Reauthorization of Power Operations at the Christopher M. Crane Clean Energy Center

Name	Affiliation
Jaime Loichinger	Advisory Council on Historic Preservation
Timothy Witman, Matthew Willson	U.S. Environmental Protection Agency
Pamela Schellenberger	U.S. Fish and Wildlife Service
Shaughn Galloway	U.S. Fish and Wildlife Service; Northeast Regional Eagle and Migratory Bird Coordinator
Todd D. Eaby	Susquehanna River Basin Commission
Andrea Blosser	Pennsylvania Department of Environmental Protection, Southcentral Regional Office
Scott R. Williamson	Pennsylvania Department of Environmental Protection, Waterways and Wetlands Program
Dwight A. Shearer	Pennsylvania Department of Environmental Protection, Bureau of Radiation Protection
Kate Hasapes	Pennsylvania Game Commission, Southeast Region
Andrea Lowery	Pennsylvania Historical and Museum Commission
John Raymond Johnson	Absentee Shawnee Tribe of Indians of Oklahoma
Clint Halftown	Cayuga Nation
Michael McLane	Delaware Nation
Brad KillsCrow	Delaware Tribe of Indians
Glenna J. Wallace	Eastern Shawnee Tribe of Oklahoma
Ray Halbritter	Oneida Indian Nation
Tehassi Hill	Oneida Nation of Wisconsin
Spencer Lyons, Alson Gibson, Shannon Booth	Onondaga Nation
J. Conrad Seneca	Seneca Nation of Indians
Charles Diebold	Seneca-Cayuga Nation
Ben Barnes	Shawnee Tribe

Name	Affiliation
Michael L. Conners, Ross Garrow, Donald Thompson, Jr.	Saint Regis Mohawk Tribe
Roger Hill	Tonawanda Seneca Nation
Tom Jonathan	Tuscarora Nation
David J. Morrison	Historic Harrisburg Association
Christine Turner	Historical Society of Dauphin County
Joanna Cain	Middletown Historical Restoration Commission
Benjamin Neely	York County History Center
NRC = U.S. Nuclear Regulatory Commission.	

APPENDIX C

CHRONOLOGY OF ENVIRONMENTAL REVIEW CORRESPONDENCE

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC or Commission) and Constellation Energy Generation, LLC (CEG) and other correspondence related to the NRC staff's environmental review for the reauthorization of power operations at the Christopher M. Crane Clean Energy Center (CCEC). All publicly available documents are electronically available via the NRC's Agencywide Document Access and Management System (ADAMS) at <https://www.nrc.gov/reading-rm/adams>. The NRC docket number for the CCEC is 05000289. Table C-1 below lists the environmental review correspondence, by date, along with the ADAMS accession number for each document.

Table C-1 Environmental Review Correspondence for the Reauthorization of Power Operations at the Christopher M. Crane Clean Energy Center

Date	Originator	Correspondence	ADAMS Accession Number
10/23/2024	Constellation Energy Generation, LLC	Notice of Intent to Pursue Subsequent License Renewal for Three Mile Island Nuclear Station, Unit 1	ML24297A029*
11/04/2024	Constellation Energy Generation, LLC	Regulatory Path to Reauthorize Power Operations, Three Mile Island Nuclear Station, Unit 1	ML24310A104
11/19/2024	Constellation Energy Generation, LLC	Request for Exemption from Certain Termination of License Requirements of 10 CFR 50.82	ML24324A048
01/13/2025	Constellation Energy Generation, LLC	License Amendment Request - Application to Approve Facility Name Change from Three Mile Island, Unit 1 to Christopher M. Crane Clean Energy Center	ML25013A311*
03/04/2025	U.S. Nuclear Regulatory Commission	Memorandum, Christopher M. Crane Clean Energy Center Restart Panel Charter	ML25013A196
03/20/2025	Constellation Energy Generation, LLC	Crane Clean Energy Center, Environmental Presentations	ML25077A097
05/13/2025	U.S. Nuclear Regulatory Commission	Issuance of Amendment No. 306, Facility Name Change from Three Mile Island Nuclear Station, Unit 1 To Christopher M. Crane Clean Energy Center	ML25100A006*
06/27/2025	Constellation Energy Generation, LLC	License Amendment Request - Application to Revise License Condition 2.b.(2) and Restore Technical Specification 5.4.1 to Allow Receipt of New Reactor Fuel	ML25178A294*

Date	Originator	Correspondence	ADAMS Accession Number
07/31/2025	Constellation Energy Generation, LLC	License Amendment Request - Application to Revise Renewed Facility License and Permanently Defueled Technical Specifications to Support Resumption of Power Operations	ML25212A076
09/25/2025	U.S. Department of Energy	Request to Become a National Environmental Policy Act Cooperating Agency on the Constellation Energy Generation LLC, Resumption of Power Operations at the Christopher M. Crane Clean Energy Center Project, Dauphin County, Pennsylvania	ML25325A174
10/16/2025	U.S. Nuclear Regulatory Commission	Preapplication Readiness Assessment Observations on Draft Environmental Report Related to Requests for Reauthorization of Power Operations	ML25288A093
10/24/2025	Constellation Energy Generation, LLC	License Amendment Request - Proposed Changes to Christopher M. Crane Clean Energy Center (CCEC) Security Plan, Training and Qualification Plan, and Safeguards Contingency Plan	ML25300A118
10/31/2025	Constellation Energy Generation, LLC	License Amendment Request - Proposed Changes to Christopher M. Crane Clean Energy Center (CCEC) Site Emergency Plan and Emergency Action Level Scheme for an Operating Facility and Exemption Rescission Request	ML25304A097 (Package)
01/02/2026	U.S. Nuclear Regulatory Commission	Environmental Regulatory Audit Regarding the Proposed Reauthorization of Power Operations for Crane Clean Energy Center Under Renewed Facility Operating License Number DPR-50	ML25364A023
01/07/2026	U.S. Nuclear Regulatory Commission	Christopher M. Crane Clean Energy Center – Estimated Hours and Review Schedule for Licensing Actions Submitted To Support Resumption of Power Operations	ML25345A027
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Pennsylvania Historical and Museum Commission, State Historic Preservation Office	ML26023A173
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Advisory Council on Historic Preservation	ML26023A174
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Absentee Shawnee Tribe of Indians of Oklahoma	ML26023A155
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Delaware Nation	ML26030A122

Date	Originator	Correspondence	ADAMS Accession Number
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Stockbridge-Munsee Community	ML26030A133
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Saint Regis Mohawk Tribe	ML26030A132
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Seneca Nation of Indians	ML26030A129
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Seneca-Cayuga Nation	ML26030A130
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Shawnee Tribe	ML26030A131
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Oneida Indian Nation	ML26030A126
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Tuscarora Nation	ML26030A135
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Cayuga Nation	ML26030A121
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Delaware Tribe of Indians	ML26030A123
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Tonawanda Seneca Nation	ML26030A134
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Eastern Shawnee Tribe of Oklahoma	ML26030A125
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Oneida Nation of Wisconsin	ML26030A127
02/02/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Onondaga Nation	ML26030A128
02/03/2026	Stockbridge-Munsee Community	Email response to Section 106 Initiation	ML26035A176
02/11/2026	Advisory Council on Historic Preservation	Letter response to Section 106 Initiation	ML26111A167
02/24/2026	U.S. Nuclear Regulatory Commission	<i>Federal Register</i> ; Constellation Energy Generation, LLC; Christopher M. Crane Clean Energy Center; Applications for Amendments to Renewed Facility License Involving Proposed No Significant Hazards Consideration Determination and Containing Safeguards Information and Order Imposing Procedures for Access to Safeguards Information; License amendment request (LAR); notice of opportunity to comment, request a hearing, and petition for leave to intervene; order imposing procedures	ML26013A106; 91 FR 8910

Date	Originator	Correspondence	ADAMS Accession Number
02/26/2026	U.S. Nuclear Regulatory Commission	Christopher M. Crane Clean Energy Center – Environmental Audit Summary Report for The Proposed Reauthorization of Power Operations Under Renewed Facility Operating License Number DPR-50	ML26055A068
03/03/2026	Pennsylvania Historical and Museum Commission, State Historic Preservation Office	Letter response to Section 106 Initiation	ML26062A273
03/10/2026	U.S. Nuclear Regulatory Commission	Email correspondence with Pennsylvania Department of Environmental Protection to establish the reasonable period of time to act under Clean Water Act Section 401	ML26084A080
03/24/2026	U.S. Nuclear Regulatory Commission	Crane Clean Energy Center Environmental Review - RCI to Support NHPA Section 106 Compliance	ML26084A075
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Pennsylvania Historical and Museum Commission, State Historic Preservation Office	ML26085A051
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Advisory Council on Historic Preservation	ML26085A053
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Absentee Shawnee Tribe of Indians of Oklahoma	ML26090A154
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Delaware Nation	ML26085A070
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Saint Regis Mohawk Tribe	ML26090A164
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Seneca Nation of Indians	ML26090A161
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Seneca-Cayuga Nation	ML26090A162
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Shawnee Tribe	ML26090A163
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Oneida Indian Nation	ML26090A158
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Tuscarora Nation	ML26090A166
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Cayuga Nation	ML26090A155
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Delaware Tribe of Indians	ML26090A156
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Tonawanda Seneca Nation	ML26090A165

Date	Originator	Correspondence	ADAMS Accession Number
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Eastern Shawnee Tribe of Oklahoma	ML26090A157
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Oneida Nation of Wisconsin	ML26090A159
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Additional APE Letter to the Onondaga Nation	ML26090A160
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Historic Harrisburg Association	ML26085A698
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Historical Society of Dauphin County	ML26096A416
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the Middletown Historical Restoration Commission	ML26096A419
03/31/2026	U.S. Nuclear Regulatory Commission	Section 106 Initiation Letter to the York County History Center	ML26096A418
03/31/2026	Constellation Energy Generation, LLC	Christopher M. Crane Clean Energy Center, Responses to NRC Requests for Confirmation of Information (RCIs) and Requests for Additional Information (RAIs)	ML26090A132 (package)
04/15/2026	Middletown Historical Restoration Commission	Email response to Section 106 invitation to participate as a consulting party	ML26111A093
04/21/2026	Pennsylvania Historical and Museum Commission, State Historic Preservation Office	Letter Response for Additional APE Map	ML26111A329
04/30/2026	U.S. Nuclear Regulatory Commission	Letter Response Providing Additional Information for the Christopher M. Crane Clean Energy Center Restart Section 106 Review	ML26119A714
05/14/2026	U.S. Nuclear Regulatory Commission	Summary of May 5, 2026, Virtual Meeting Between the U.S. Nuclear Regulatory Commission, U.S. Department of Energy, and Federally Recognized Indian Tribes Regarding the Christopher M. Crane Clean Energy Center Restart	ML26127A182
05/28/2026	Pennsylvania Historical and Museum Commission, State Historic Preservation Office	Letter Response for Training Center Eligibility	ML26149A290
06/04/2026	U.S. Nuclear Regulatory Commission	Letter to Constellation Energy Generation, LLC, Availability of the Draft Environmental Assessment and Draft Finding of No Significant Impact	ML26147A117
06/04/2026	U.S. Nuclear Regulatory Commission	Letter to U.S. Environmental Protection Agency, Availability of the Draft	ML26141A160

Date	Originator	Correspondence	ADAMS Accession Number
		Environmental Assessment and Draft Finding of No Significant Impact	
06/04/2026	U.S. Nuclear Regulatory Commission	Letter to Susquehanna River Basin Commission, Availability of the Draft Environmental Assessment and Draft Finding of No Significant Impact	ML26141A164
06/04/2026	U.S. Nuclear Regulatory Commission	Letter to Pennsylvania DEP, Bureau of Radiation Protection, Availability of the Draft Environmental Assessment and Draft Finding of No Significant Impact	ML26141A149
06/04/2026	U.S. Nuclear Regulatory Commission	Letter to Pennsylvania DEP, Southcentral Regional Office, Availability of the Draft Environmental Assessment and Draft Finding of No Significant Impact	ML26141A161
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Pennsylvania Historical and Museum Commission, State Historic Preservation Office	ML26149A204
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Advisory Council on Historic Preservation	ML26149A205
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Absentee Shawnee Tribe of Indians of Oklahoma	ML26155A364
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Delaware Nation	ML26149A274
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Saint Regis Mohawk Tribe	ML26155A402
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Seneca Nation of Indians	ML26155A372
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Seneca-Cayuga Nation	ML26155A373
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Shawnee Tribe	ML26155A374
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Oneida Indian Nation	ML26155A369
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Tuscarora Nation	ML26155A377
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Cayuga Nation	ML26155A365
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Delaware Tribe of Indians	ML26155A366
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Tonawanda Seneca Nation	ML26155A376
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Eastern Shawnee Tribe of Oklahoma	ML26155A368

Date	Originator	Correspondence	ADAMS Accession Number
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Oneida Nation of Wisconsin	ML26155A370
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Onondaga Nation	ML26155A403
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Historic Harrisburg Association	ML26149A293
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Historical Society of Dauphin County	ML26159A031
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the Middletown Historical Restoration Commission	ML26159A032
06/04/2026	U.S. Nuclear Regulatory Commission	Section 106 Effects Determination Letter to the York County History Center	ML26159A033
06/08/2026	U.S. Nuclear Regulatory Commission	<i>Federal Register</i> ; Constellation Energy Generation, LLC; Christopher M. Crane Clean Energy Center; Draft Environmental Assessment and Draft Finding of No Significant Impact	ML26149A334; 91 FR 34658
06/29/2026	Pennsylvania Historical and Museum Commission, State Historic Preservation Office	Letter Response for Section 106 Effects Determination	ML26180A256
07/01/2026	U.S. Nuclear Regulatory Commission	Issuance of Amendment No. 307, Receipt and Possession of New Reactor Fuel and Sealed Neutron Sources	ML26135A004*
07/08/2026	Absentee Shawnee Tribe of Indians of Oklahoma	Letter Response for Section 106 Effects Determination	ML26190A021
07/24/2026	Middletown Historical Restoration Commission	Email Response for Section 106 Effects Determination	ML26208A034

ADAMS = Agencywide Documents Access and Management System; APE = area of potential effects; CFR = *Code of Federal Regulations*; DEP = Department of Environmental Protection; LLC = Limited Liability Company; NHPA = National Historic Preservation Act of 1966, as amended.

*Denotes correspondence that is related to but outside the scope of the proposed actions considered in this environmental assessment (see Section 1.1).

APPENDIX D

GREENHOUSE GASES AND CLIMATE CHANGE

D.1 Greenhouse Gas Emissions

As described in Revision 2 of NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (the 2024 LR GEIS) (NRC 2024-TN10161), 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). These GHGs include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), water vapor (H₂O), and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF₆). Operations at nuclear power plants release GHGs from stationary combustion sources (e.g., diesel generators, pumps, diesel engines, boilers), refrigeration systems, electrical transmission and distribution systems, and mobile sources (worker vehicles). However, the GHG emissions from nuclear power plants are typically very minor because such plants do not normally combust fossil fuels to generate electricity.

GHG emissions associated with the proposed actions are related to preparations for the resumption of power operations, the resumption of power operations, and the return to decommissioning at the Christopher M. Crane Clean Energy Center (CCEC). Sources of GHG emissions associated with preparations for the resumption of power operations include worker vehicles, onsite stationary combustion sources (diesel generators, boilers, pumps), onsite electricity consumption, the CO₂ fire suppression system, and construction equipment (CEG 2025-TN12656, CEG 2026-TN12942).

During the resumption of power operations at the CCEC, sources of GHG emissions would include onsite stationary combustion equipment (auxiliary boilers, diesel generators, diesel pumps), onsite electricity usage, worker vehicles, and the CO₂ fire suppression system (CEG 2025-TN12656, CEG 2026-TN12942). Additionally, indirect GHG emissions from the resumption of power operations include the uranium fuel cycle and fuel and waste transportation. The U.S. Nuclear Regulatory Commission (NRC or Commission) staff has compiled updated estimates of GHG emissions from various activities associated with operating nuclear power plants. Appendix H in NUREG-2249, *Generic Environmental Impact Statement for Licensing of New Nuclear Reactors* (the 2026 NR GEIS) (NRC 2026-TN12155), discusses GHG emission estimates from fuel and waste transportation and the uranium fuel cycle. These estimates are based on a single installation of 1,000 megawatts electric (MWe) gross output with an 80 percent capacity factor (the reference 1,000 MWe reactor) and may be roughly linearly scaled from the reference 1,000 MWe reactor for other reactor outputs. The CCEC provides a net electrical power output of 835 MWe. Therefore, the total GHG emissions from power operations at the CCEC would be 1.04 times (835 MWe divided by 800 MWe yields 1.04) the values provided in Table H-4 of the 2026 NR GEIS.

Sources of GHG emissions associated with decommissioning activities include workforce for a period of 40 years and demolition activities for 10 years and include emissions from fossil fuel fired equipment and workforce. The NRC staff included an estimate of GHG emissions from decommissioning because the potential approval of the proposed actions would delay the impacts of the CCEC decommissioning.

Table D-1 below provides the GHG emissions estimates for each of the activities described above.

Table D-1 Nuclear Power Plant Life-Cycle Greenhouse Gas Emissions Estimates for Preparation Activities, Power Operations (7 years), and Decommissioning at the Christopher M. Crane Clean Energy Center

Phase	Activities	GHG Emissions (CO ₂ [eq]) T
Preparation Activities	Workforce ^(a)	3,270
Preparation Activities	Construction Equipment ^(b)	14
Preparation Activities	Onsite Equipment ^(c)	50,600
Power Operations	Plant Operations ^(d)	64,120
Power Operations	Uranium Fuel Cycle ^(e)	108,340
Power Operations	Operations Workforce ^(a)	42,870
Power Operations	Fuel and Waste Transportation ^(e)	2,810
Decommissioning	SAFSTOR Workforce ^(a)	11,020
Decommissioning	Decommissioning Equipment ^(f)	20,940
Decommissioning	Decommissioning Workforce ^(a)	8,820
Total	-	312,804

CCEC = Christopher M. Crane Clean Energy Center; CO₂eq = carbon dioxide equivalent; GHG = greenhouse gas; T = ton(s).

“-” denotes no data in table cell.

- (a) Workforce GHG emissions based on Table H-2 of NUREG-2249 (NRC 2026-TN12155). SAFSTOR refers to placing and maintaining a reactor facility in a safe condition that allows for decontamination at a later date.
- (b) Construction equipment accounts for equipment utilized for ground disturbing activities. Values from Table H-2 of NUREG-2249 are presented here in tons.
- (c) Emissions from onsite equipment, electricity usage, and the CO₂ fire suppression system. Equipment includes two auxiliary boilers, two diesel fire pumps, and six diesel generators. Equipment estimates assume operation of up to 1,500 hours per year per boiler, up to 250 hours per year per diesel generator, and up to 250 hours per year per pump (CEG 2026-TN12950). Emissions from electricity usage and the CO₂ fire suppression system based on historical data presented in Table 3.2-6 of the CCEC environmental report (ER) (CEG 2025-TN12656).
- (d) Emissions based on historical data from operations of the CCEC and presented in Table 4.6-3 of the CCEC ER (CEG 2025-TN12656). Highest value from Table 4.6-3 of the CCEC ER presented here, converted to tons, and rounded.
- (e) Uranium fuel cycle and fuel and waste transportation based on Appendix H of NUREG-2249 (NRC 2026-TN12155), scaled to 7 years of power operations, and applying a scaling factor of 1.04 given that the CCEC provides a net electrical power output 835 megawatts electric.
- (f) GHG emissions based on Appendix H, Table H-2 of NUREG-2249 (NRC 2026-TN12155) presented here in tons.

D.2 Affected Environment for Climate Change

The NRC staff has determined that climate change may alter the affected environment described in Chapter 3 of this environmental assessment during the period of preparation for the resumption of power operations and following the actual resumption of power operations at the CCEC (the renewed facility operating license issued in 2009 expires in 2034). Climate change is a global phenomenon, and the activities associated with the continued operation of the CCEC are not expected to appreciably alter these trends. However, climate change may create a new environment that could result in changed impacts from preparation activities and power operations at the CCEC or impose operational restrictions on the CCEC site’s safety and performance. This section documents the NRC staff’s assessment of the potential effects of climate change on its evaluation of the environmental impacts of the proposed actions.

The NRC staff references the fourth (NCA4) and fifth (NCA5) National Climate Assessment report (USGCRP 2017-TN5848 and USGCRP 2023-TN9762) and other supporting documents to provide the basis for assessing the likely climate change impacts around the CCEC site.

The climate change projections in the U.S. Global Change Research Program (USGCRP) reports are generally expressed as a change expected for the mid-21st century (e.g., 2036–2065) or late 21st century (e.g., 2071–2099) relative to the average conditions existing in the near-present (1991–2020). The NRC staff identified that the mid-21st century projections are relevant to the evaluation of the resumption of power operations at the CCEC through April 19, 2034, the end of the current operating license term under the CCEC renewed facility operating license.

The USGCRP's climate change impact reports include projections for various scenarios based on future emissions of heat-trapping gases. The NCA4 and NCA5 use shared socioeconomic pathways (SSPs), representative concentration pathways (RCPs), and/or global warming levels (GWLs) when presenting projected climate change. RCPs are based on the 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 RCP scenarios 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 (0.7°C) (IPCC 2014-TN7651). RCP 8.5 reflects a continued increase in global emissions resulting in increased warming by 2100. GWLs are used to describe the level of global temperature increase (e.g., 3.6°F [2°C] or 5.4°F [3°C]) relative to preindustrial temperature conditions (USGCRP 2023-TN9762). Five SSP (SSP1-1.9, SSP1-2.6, SSP2-4.5, SSP3-7.0, and SSP5-8.5) scenarios cover a range of GHG pathways and climate change mitigation. GWLs are used to describe the level of global temperature increase (e.g., 3.6°F [2°C] or 5.4°F [3°C]) relative to preindustrial temperature conditions. For example, under a very high emission scenario (SSP5-8.5) models project reaching 3.6°F (2°C) of global warming between 2033 and 2054; under an intermediate scenario (SSP2-4.5), models project reaching a 3.6°F (2°C) GWL between 2038 and 2085. The International Panel on Climate Change projects that a global warming of 3.6°F (2°C) will be exceeded during the 21st century unless substantial reductions in GHG emissions occur in the coming decades (IPCC 2021-TN7435). By the end of the century, a global warming of 5.4°F (3°C) can be exceeded under a high and very high scenario (SSP3-7.0 and SSP5-8.5) (USGCRP 2023-TN9762).

D.3 Observed and Expected Climatological Changes

The Intergovernmental Panel on Climate Change determined that the 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 that in the preindustrial period (1850–1900) (IPCC 2023-TN8557). From 1901 to 2023, global precipitation 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 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 increased at a rate of 0.18 in. (0.4 cm) per decade (EPA 2024-TN10205).

The annual average temperature data in the Pennsylvania region exhibited an increase of up to 2°F (1.1°C) between 2002–2021 relative to 1901–1960 (USGCRP 2023-TN9762: Figure 2.4). The number of hot days (days at or above 95°F [35°C]) in the Northeast has decreased by 1.3 days, the number of cold days (days at or below 32°F [0°C]) has decreased by 6.7 days, and the number of warm nights (nights at or above 70°F [21°C]) have increased by 2.1 nights in the Northeast from 2002–2021 relative to 1901–1960 (USGCRP 2023-TN9762: Figure 2.7).

Average annual precipitation from 2002–2021 (relative to the 1901–1960 average) for the Northeast exhibits increases, with Pennsylvania exhibiting an increase of up to 15 percent (USGCRP 2023-TN9762: Figure 2.4). The Northeast has experienced a 60 percent increase in the number of extreme precipitation days (defined as the top 1 percent of heaviest precipitation events) in the period between 1958–2021, higher than any other region in the United States (USGCRP 2023-TN9762: Figure 2.8).

The NRC staff used climate change projections for the mid-21st century (i.e., 2036–2065) and a GWL of 3.6°F (2°C) under a very high emission scenario as the bounding climate scenario for the time period covering the resumption of power operations at the CCEC. This assessment ensures that the potential environmental impacts for all resource areas under a changing climatic regime are conservatively considered in the context of the NRC’s evaluation of the environmental impacts of the reauthorization of power operations at the CCEC. Table D-2 summarizes the projected changes for various climate variables.

Table D-2 Climate Variables and Projected Changes for Dauphin County, Pennsylvania.

Climate Variables	Projected Changes Under a Global Warming Level of 3.6°F relative to the Period Between 1991–2020 or Under an Intermediate Emissions Scenario (RCP4.5) by Midcentury (2036–2065 relative to 1991–2020)
Average surface air temperature	Increase of 4°F
Hottest day of the year	Increase by 4°F
Annual number of days with temperatures above 95°F	Increase of 7 days
Annual number of days with temperatures below 32°F	A decrease of 24 days
Projected changes in precipitation	The annual total precipitation is projected to increase by 6 percent and the annual number of days with extreme precipitation (top 1 percent of historical rainfall events) is projected to increase by 18 percent
General/Other	Medium confidence that climate change is projected to worsen air quality in many regions of the United States. Increase in annual actual evapotranspiration of 1–2 in. for Pennsylvania Increase in annual runoff of up to 0.5 in. for Pennsylvania Decrease in average summer soil moisture of up to 0.2 in. for Pennsylvania Annual climatic water deficit of up to 1 in. in Pennsylvania

Source: USGCRP 2023-TN9762.

In addition to these precipitation changes, the Dauphin County, Pennsylvania region is expected to experience changes in the maximum annual snow water equivalent, summer soil moisture (June–August), annual actual evapotranspiration, and annual runoff (see Table D-2). Finally, the

projected annual climatic water deficit, which measures the gap between available water and vegetation demand, is expected to change by 0.5 to 1 in. (1.3 to 2.4 cm) by midcentury relative to 1991–2020, with the eastern portion of Pennsylvania experiencing the rise of 1 in. (2.5 cm).

D.4 Environmental Consequences of Preparations for the Resumption of Power Operations and the Resumption of Power Operations

Changes in climate could have broad implications for environmental resources. Climate change impacts can occur across resource areas that are affected by the proposed actions. The climate change analysis focuses on assessing the potential effects of climate on the resource area impact determinations (NOT SIGNIFICANT) assigned in Chapter 3. Below, the NRC staff considers the overlapping effects of climate change on the environmental resource areas that may also be directly affected by the proposed actions. In other words, the proposed actions must have an incremental new, additive, or increased physical effect or impact on the resource area and climate change is expected to have a reasonably foreseeable effect on that resource area. If both criteria are not present, then the NRC staff did not consider the overlapping impacts of the proposed actions and climate change. For example, climatological changes are not expected to affect noise levels or impact radiological exposure levels or doses and, therefore, they are not discussed below. Alternatively, as discussed in Chapter 3, the proposed actions would not alter the industrial land use and visual appearance as there is no new, additive, or increased physical effect on these resource areas. Therefore, the climate change impacts on land use and visual resource areas are not discussed below. This does not mean that climate change will not have a reasonably foreseeable effect on the land use resource area, but both criteria discussed above are not present and, therefore, overlapping impacts are not anticipated. For this reason, based on this framework and the NRC staff's analysis of the proposed actions in Chapter 3, climate change impacts to land use and visual resources, noise, terrestrial resources, historic and cultural resources, socioeconomic conditions, radiological and nonradiological human health, waste management, uranium fuel cycle and transportation, and postulated accidents are not discussed further.

Based on its review, the NRC staff has determined that the impact determinations (NOT SIGNIFICANT) assigned in Chapter 3 would not be altered by the projected effects of climate change. The NRC staff provides the following resource-specific justifications for this determination.

Meteorology and Air Quality

Climate change can impact air quality as a result of changes in meteorological conditions during the period of the resumption of power operations at the CCEC. Air pollutant concentrations are sensitive to winds, temperature, humidity, and precipitation. Ozone levels and particulate matter have been found to be particularly sensitive to climate change influences. Ozone is formed by the chemical reaction of nitrogen oxides and volatile organic compounds in the presence of heat and sunlight. The emission of ozone precursors also depends on temperature, wind, and solar radiation (NRC 2020-TN7241). Warmer temperatures, air stagnation, droughts, and wildfires are favorable conditions for higher levels of ozone and particulate matter less than 2.5 microns (PM_{2.5}) (USGCRP 2023-TN9762). The USGCRP reports that there is medium confidence that climate change is projected to worsen air quality in many regions of the United States (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, a rise in temperature increases atmospheric humidity; chemical reactions that result in the destruction of ozone increase with increasing humidity thereby

reducing ozone. However, greater humidity is expected to worsen PM_{2.5} in certain regions. As discussed in Section 3.3.2, the CCEC is in Dauphin County, Pennsylvania, which is designated as a maintenance area for PM_{2.5}. Climate change can worsen air quality by compromising the attainment status of counties. However, as presented in Table 3-3, the NRC staff determined that the PM_{2.5} emissions and its precursors from the resumption of power operations at the CCEC are projected to be well below 100 tons/year and represent less than 1 percent of Dauphin County's air pollutant emissions. Therefore, the NRC staff concludes that the air quality impacts from the resumption of power operations at the CCEC would not be exacerbated if climate change were to worsen the air quality in Dauphin County and that the air quality impact determinations (NOT SIGNIFICANT) assigned in Chapter 3 would not be altered by the projected effects of climate change.

Water Resources

Climatic changes, such as changes in air temperature and precipitation patterns, can affect the availability of water resources. The NRC staff determined that the climate model projections for Pennsylvania and Dauphin County indicate potential future changes to precipitation, runoff, and air temperature that could influence water availability and water quality. As noted in Table D-2, increases in annual precipitation and extreme precipitation events are projected. Increases in annual precipitation and extreme precipitation events can result in greater runoff and the potential for increased riverine flooding. In turn, these changes can result in the transport of a higher sediment load and other contaminants to surface waters, potentially degrading ambient water quality. During the resumption of power operations at the CCEC, impacts to surface water quality from plant discharges would be regulated under the CCEC's National Pollutant Discharge Elimination System (NPDES) permit. The NRC staff determined that the projected increases in ambient air temperature and the number of hot days may elevate surface water temperature and increase evaporation. As intake water temperatures warm, the volume of surface water needed for nuclear power plant cooling may increase. CEG's requested withdrawal rate (approximately 73 Mgd [276 MLd]) represents a small fraction of river discharge, even under low flow conditions. CEG's requested consumptive water use (32.5 cfs [0.9 m³/s]) represents less than 1 percent of the daily 90 percent exceedance flow (approximately 5,600 cfs [159 m³/s]) at the Harrisburg gaging station. Furthermore, CEG expects thermal discharge temperatures for the resumption of power operations at the CCEC to be similar to those for previous operations prior to plant shutdown. The NRC staff verified that the maximum daily discharge temperature for operations in 2014–2019 ranged from 98.2–103.1°F (36.8–39.5°C), which is consistently below the existing NPDES limit of 115°F (46.1°C). CEG expects the Pennsylvania Department of Environmental Protection to decrease the thermal discharge limit to 110°F (43.3°C) under a renewed NPDES permit.

For the groundwater resources area, precipitation and evapotranspiration are key drivers in groundwater recharge. A reduction in soil moisture due to higher temperature and reduced groundwater recharge, especially if runoff rates increase with heavier rainfall events, reduces groundwater availability to wells, reduces baseflow to streams, and can negatively affect groundwater quality. However, increases in precipitation, which are projected in Dauphin County, could partially offset reductions in water availability and groundwater recharge due to projected temperature increases. As discussed in Section 3.5.3, CEG identified that groundwater will continue to be used to support CCEC operations. Groundwater is used for industrial makeup water, potable water, and sanitary water. CEG requested that the Susquehanna River Basin Commission reinstate its prior groundwater allocation, which the SRBC approved in June 2026 (see Section 3.5.3). The NRC staff determined that the CCEC's

groundwater use is expected to be similar to that prior to its 2019 shutdown and reconfirmed that this level of groundwater withdrawal would have no impact on other groundwater users.

Based on the above information, the NRC staff concludes that surface water and groundwater impacts from the resumption of power operations at the CCEC would not be exacerbated if climate change were to worsen water availability or quality and that the surface water and groundwater effects determinations (NOT SIGNIFICANT) assigned in Chapter 3 would not be altered by the projected effects of climate change.

Ecological Resources

Changes in water temperature can alter the balance of aquatic ecosystems. Water temperature is an essential physical property of all aquatic environments on which aquatic ecological resources rely. The NRC staff determined that the ambient air temperature and the number of hot days in Dauphin County are projected to increase. Higher ambient air temperatures can increase surface water temperatures (USGCRP 2023-TN9762) and these temperatures directly affect water quality. Warming water temperatures may also influence the abundance and distribution of both native and invasive aquatic species, as well as result in earlier spawning times. Both native and invasive species may migrate or shift their ranges to cooler waters in response to habitat loss from warming waters (Phillips et al. 2018-TN10290). Simultaneously, increased water temperatures could lead to increased volumetric water withdrawal requirements and related increases in heated discharge. This in turn can lead to a proportional increase in the number of aquatic organisms impinged and entrained and may result in a larger area where aquatic organisms could experience elevated temperatures resulting from the CCEC's thermal effluent discharge. As discussed in Section 3.7.3, due to the skimmer wall, location of the intake, and the low intake water velocity, free-swimming aquatic organisms would avoid entrainment and impingement altogether or there would be minimal entrainment and impingement. The NRC staff confirmed that the prior operating discharge temperatures were consistently below the existing NPDES limit of 115°F (46.1°C), and CEG expects the Pennsylvania Department of Environmental Protection to decrease the thermal discharge limit to 110°F (43.3°C). Based on the above information, CEG's compliance with NPDES permit limits, a lower thermal discharge limit, and the design of the intake at the CCEC, the NRC staff concludes that the impacts to aquatic ecological resources from the resumption of power operations at the CCEC would not be exacerbated by the projected effects of climate change.

Overall, the NRC staff concludes that the ecological resources impact determination (NOT SIGNIFICANT) assigned in Chapter 3 would not be altered by the projected effects of climate change.

D.5 Conclusions

The NRC staff concludes that the potential effects of climate change would not alter the significance determinations in this environmental assessment for the preparations for the resumption of power operations and for the resumption of power operations at the CCEC.

D.6 References

Cited references are included in Chapter 6.

APPENDIX E

ECOLOGICAL CONSULTATIONS

This appendix of the environmental assessment outlines the ecological consultations conducted by the U.S. Nuclear Regulatory Commission (NRC or Commission) staff to inform its environmental review under the National Environmental Policy Act of 1969, as amended (NEPA) (TN661). It includes documentation of the NRC staff's compliance with applicable statutes, including the Endangered Species Act (ESA) (TN1010). These consultations assess the potential effects of the proposed actions on federally listed species and designated critical habitats.

To inform these consultations and the broader NEPA analysis, this appendix begins with information on terrestrial and aquatic ecological resources within the project area. This integrated ecological context provides the scientific basis for evaluating potential environmental impacts of the proposed actions, ensuring consistency with applicable Federal statutes and supporting a comprehensive understanding of the affected environment.

E.1 Terrestrial Ecological Resources

E.1.1 Terrestrial Environment

The Christopher M. Crane Clean Energy Center (CCEC) site lies within the Northern Piedmont U.S. Environmental Protection Agency (EPA) Level III ecoregion. The Northern Piedmont ecoregion is characterized by gently rounded hills, uneven plains, and broad valleys, built on a mix of metamorphic, igneous, and sedimentary rocks. Elevations generally range from about 325 ft (99 m) above mean sea level in limestone areas to around 1,300 ft (396 m) above mean sea level where tougher metamorphic rocks dominate. Scattered higher rocky hills and ridges, formed from diabase intrusions, also occur. The region has a humid continental climate with cold winters, hot summers, and roughly 170 to 210 frost-free days each year. Natural vegetation is primarily Appalachian Oak Forest, largely composed of white and red oaks. Along parts of the Susquehanna River, oak-hickory-pine forests are present, featuring hickories, Virginia and pitch pines, chestnut oak, white oak, and black oak. Additionally, serpentine barrens appear in parts of Chester, Delaware, and Lancaster Counties in Pennsylvania (CEG 2025-TN12656; EPA 2025-TN13071).

The CCEC site encompasses approximately 400 ac (162 ha) and includes all of Three Mile Island, St. John's and Evergreen Islands, and approximately 6 ac (2 ha) east on the mainland (CEG 2025-TN12656). The Susquehanna River runs on both sides of the island from north to south. On the southern portion of the island the York Haven Hydroelectric Power Company has an easement where the nature-like fishway exists.

Approximately 200 ac (81 ha) of natural habitat remain on the island (Exelon 2019-TN12795). The island contains wetlands, grassland, and forested areas. Three forest community types are present, bottomland hardwoods, stream terrace hardwoods, and black locust forest. As described in NUREG-1437, Supplement 37, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 37, Regarding Three Mile Island Nuclear Station, Unit 1, Final Report* (the 2009 supplemental environmental impact statement [SEIS]), the CCEC site upland habitats are dominated by Virginia pine, birch, dogwood, and several oak species, along with tuliptree. Common ground-layer plants include clubmoss, woodfern, ground

ivy, white avens, cinquefoil, blue violet, and Swan's sedge. Riparian forests support mixed maple, alder, birch, and sycamore. In nearby river floodplain forests, silver maple, river birch, and northern red oak are typical. Herbaceous species include ostrich fern, mayapple, dame's rocket, false mermaid, Dutchman's breeches, jumpseed, blue violet, and dogtooth violet. Grasslands dominate the Three Mile Island's southern end and are characterized by foxtail grasses, asters, goldenrod, sedges, and common pasture grasses. Sycamore, sweetgum, basswood, and locust occur along habitat edges (NRC 2009-TN3684).

Wildlife commonly observed on or near the site includes white-tailed deer, raccoon, gray squirrel, red fox, striped skunk, moles, shrews, bats, and small rodents. Snakes, turtles, lizards, salamanders, and toads also occur. Bird species include songbirds, game birds, waterfowl, and raptors. The licensee for the CCEC, Constellation Energy Generation, LLC (CEG), maintains nesting structures for osprey, peregrine falcon, mallard, and wood duck, with additional wood duck boxes installed in 2008 in coordination with the Susquehanna River Waterfowl Association (NRC 2009-TN3684).

The National Wetlands Inventory identifies several wetlands on the southern end of the site. The CCEC site contains freshwater emergent wetlands, freshwater forested/shrub wetland, and several freshwater ponds (FWS 2014-TN3788). These wetlands formed in former borrow pits created during dike construction and typically hold water for much of the year. Dragonflies, amphibians, frogs, and salamanders are common.

E.1.2 State-Listed Terrestrial Species

The NRC staff independently analyzed the potential for State-protected species to occur on the CCEC site. The Pennsylvania National Heritage Program (PNHP) lists State-listed species by county (PNHP 2025-TN13072). No surveys or studies for State threatened or endangered species have been conducted at the CCEC site post 2018.

Several terrestrial species designated by Pennsylvania natural resource agencies as State-threatened, State-endangered, or of greatest conservation need have been documented in unmanaged areas around the operational zone of the CCEC. American holly, listed as State-threatened, was recorded in the southern portion of Three Mile Island during ecological surveys conducted in 2008 for the license renewal of the CCEC, then the Three Mile Island Nuclear Station, Unit 1. Bald eagles, peregrine falcons, and ospreys, each protected under Pennsylvania's Game and Wildlife Code, also occur on Three Mile Island. The relatively undisturbed habitats in the southern half of the island and smaller northern island are expected to provide suitable conditions for these bird species (NRC 2024-TN12787).

E.1.3 Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act

Bald eagles, peregrine falcons, and ospreys are regularly present at the CCEC site, with two or more bald eagle nests reported (one on the north end of Three Mile Island and at least one on the south end) and with the osprey known to nest on top of the meteorological tower (CEG 2025-TN12656; Exelon 2019-TN12795). Bald eagles have been seen on the island since at least 1990 and have nested on the island since the early 2000s. Bald eagles, peregrine falcons, and ospreys are protected under the Migratory Bird Treaty Act of 1918 (MBTA), which makes it illegal to take, possess, transport, or sell any migratory bird or its parts, nests, or eggs without a valid permit. Bald eagles are also protected under the Bald and Golden Eagle Protection Act (BGEPA), which prohibits the take of bald or golden eagles including their parts, nests, or eggs without a permit. CEG's Avian and Wildlife Management Procedure guides its responses to and

documentation of incidents involving protected birds. Consistent with this procedure, CEG addressed at the CCEC site one incident in 2018 and one incident in 2026 involving bald eagles through coordination with a certified wildlife rehabilitator or Pennsylvania State wildlife personnel. All documented incidents involving protected birds since 2015 are summarized in Section 3.6.1.

CEG does not currently hold BGEPA or MBTA permits (CEG 2026-TN12942). However, CEG has committed to maintaining an on-call relationship with a certified wildlife rehabilitator to respond to distressed or injured wildlife, including protected birds, and to provide treatment and rehabilitation, as appropriate (CEG 2026-TN13587). Further, CEG has committed to implementing recommended U.S. Fish and Wildlife Service (FWS) eagle avoidance measures, including conducting any loud or intrusive maintenance or restoration activities outside the breeding season when they occur within 660 ft (200 m) of a bald eagle nest, and maintaining existing landscape buffers that provide visual screening between project activities and the nest(s). Additionally, CEG identified that the Avian and Wildlife Management Procedure includes the clarification that a bird event involving a bald eagle necessitates contacting the FWS in addition to the Pennsylvania Game Commission (CEG 2026-TN12942). Based on these measures, the NRC staff concludes that the impacts on protected birds associated with the proposed actions would be managed through the applicable regulatory requirements and agency oversight. See Section 3.6.1.1 for additional information and analysis.

E.1.4 Terrestrial Invasive Species

Invasive species are defined as a non-native organisms whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health (81 FR 88609-TN8375). Executive Order 13112, “Invasive Species,” directs each Federal agency, whose actions may affect the status of invasive species, to not authorize, fund, or carry out actions that are likely to cause or promote the introduction or spread of invasive species unless it determines that the benefits of the action clearly outweigh the harm from invasive species and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with these actions (64 FR 6183-TN4477: Section 2).

The NRC staff determined that the terrestrial invasive species associated with the region of the CCEC site include tree of heaven, Oriental bittersweet, garlic mustard, purple loosestrife, wild hops, eastern water-milfoil, and Japanese knotweed (NRC 2009-TN3684). However, the NRC staff confirmed that CEG is not required to track or manage terrestrial invasive species at the CCEC site.

E.1.5 Important Terrestrial Habitats

Important habitats include any wildlife sanctuaries, refuges, preserves, or habitats identified by Federal or State agencies as unique, rare, or of priority for protection; wetlands and floodplains; and land areas identified as critical habitat for species listed by FWS as threatened or endangered. The NRC staff determined that no critical habitat for federally protected terrestrial species, or important terrestrial habitats occur near the CCEC site.

E.2 Aquatic Ecological Resources

This section describes the aquatic environment at the CCEC site, as well as relevant ecological studies and surveys conducted at the CCEC site and within the surrounding area. This information supplements and supports the NRC staff’s analyses of potential impacts that the aquatic environment may experience as a result of the proposed CCEC restart, which are presented in Section 3.7.

The CCEC lies in the Susquehanna River in Dauphin County, Pennsylvania. The CCEC uses a closed-loop circulating water system and natural draft cooling towers with drift eliminators as a heat sink (CEG 2025-TN12656). When operating, the CCEC withdraws makeup water, at a rate of 28,050 gpm (106,180 Lpm), from the Susquehanna River for cooling and discharges heated effluent back into the river. This section describes the aquatic ecological resources of the Susquehanna River.

The NRC staff previously characterized these resources in Sections II.F.2 and 2.6.2 of the 1972 and 1976 final environmental statement documents (AEC 1972-TN12901; NRC 1976-TN12902) and Section 2.2.5 of the 2009 SEIS (NRC 2009-TN3684). This information is incorporated here by reference, with key, new, and updated information summarized below in the following subsections.

E.2.1 Freshwater Environment

E.2.1.1 Susquehanna River

The CCEC is located on Three Mile Island in the middle of the Susquehanna River, which provides the source and receiving body for the plant's cooling-water system. The Susquehanna River is 444 mi (715 km) long running from upstate New York to the Chesapeake Bay in Maryland. The Susquehanna River is a broad, shallow river averaging 5–10 ft (1.5–3 m) in depth and about 1.5 mi (2.4 km) in width at Three Mile Island and is not commercially navigable. State and local agencies actively monitor the water quality throughout the basin using tools like the Susquehanna River Basin Commission's Water Quality Index and continuous in-stream monitoring stations, which measure parameters such as dissolved oxygen, pH, and water temperature to track ecological conditions (SRBC 2026-TN12775). The basin's overall water quality is mapped and scored using data collected from nearly 20,000 samples spanning decades. Water temperatures vary seasonally from average winter lows of 32–40°F (0–4°C) to summer averages that warm into the 75–81°F (24–27°C) range (USGS 2026-TN12786). This region of the Susquehanna River has been highly dammed, and this has historically caused population declines in multiple anadromous species, including American shad and river herring. Intensive restoration efforts for these aquatic species, including construction of upstream fish passage facilities at multiple dams in the 1990s and early 2000s, have allowed these populations to rebound.

E.2.2 Aquatic Biological Communities

The trophic structure of the CCEC site aquatic environment includes primary producers (plankton, macrophytes, and periphyton), primary consumers (zooplankton and benthic macroinvertebrates), and bottom feeding, planktivorous, and piscivorous fish that serve as secondary and tertiary consumers. Primary producers are aquatic organisms that capture the sun's energy and synthesize organic compounds from inorganic chemicals. They form the trophic structure's foundation by producing the organic nutrients and energy used by consumers. Primary producers in river systems include phytoplankton, aquatic macrophytes, and periphyton. Of these three primary producers, phytoplankton and periphyton are the major producers in the Susquehanna River.

E.2.2.1 Primary Producers

This section characterizes important CCEC aquatic environment primary producers, which include phytoplankton, periphyton, and macrophytes.

Phytoplankton and Periphyton

Plankton are small and often microscopic organisms that drift or float in the water column. Phytoplankton are single-celled plant plankton and include diatoms (single-celled, yellow algae) and dinoflagellates (single-celled organism with two flagella). Phytoplankton live suspended in the water column and occur in the limnetic (open water) zone of a water body. Periphyton consist of single-celled or filamentous species of algae that attach to benthic or macrophytic surfaces. Periphyton occur in the littoral (nearshore and shallow) zone and tend to be highly productive because they have more access to nutrients through their roots than do phytoplankton. The phytoplankton community in the Susquehanna River is not regularly sampled but common phytoplankton and periphyton found in the CCEC site freshwater, cold water environment include Chlorophyta (green algae), Bacillariophyta (diatoms) and Cyanophyta (blue-green algae), Pyrophyta (dinoflagellates), Euglenophyta (euglenoids), and Chrysophyta (yellow-green algae) (NRC 2009-TN3684).

Macrophytes

Aquatic macrophytes are large plants, both emergent and submerged, that inhabit shallow water areas. Macrophytes occur in the littoral (nearshore and shallow) zone and tend to be highly productive because they have more access to nutrients through their roots than do phytoplankton. Aquatic vegetation in the Susquehanna River includes aquatic species adapted to both submerged conditions and periodically exposed areas like channel bars. The shallow nearshore waters of the Susquehanna River commonly support plants such as *Lemna perpusilla* (minute duckweed), *Myriophyllum sibiricum* (Northern Water-milfoil), *Najas gracillima* (bushy naiad), *Orontium aquaticum* (golden club), *Potamogeton illinoensis* (Illinois pondweed), and *Potamogeton robbinsii* (flat-leaved pondweed) (PA 2026-TN12854).

E.2.2.2 Primary Consumers

This section summarizes important CCEC site aquatic environment primary consumers, which include zooplankton and benthic invertebrates.

Zooplankton

Zooplankton are tiny invertebrates that provide essential food for larval fish and other small aquatic organisms. The zooplankton community in the Susquehanna River likely includes Cladocerans, rotifers, and copepods, which are common in freshwater systems. Zooplankton has not been sampled at the CCEC site since the 1970s, at that time those three groups made up 98.9 percent of the zooplankton that were identified (NRC 2009-TN3684).

Benthic Invertebrates (insects, mussels, crayfish, snails)

No benthic invertebrate surveys have been conducted at the CCEC site since 1990. Researchers sampled macroinvertebrates upstream and downstream of the facility's discharge pipes from 1974 to 1982 and 1986 to 1990. The researchers identified that aquatic tubeworms (*Limnodrilus hoffmeisteri*), midge larvae (Diptera; *Chironomus decorus*), and fingernail clams (*Pisidium* spp.) dominated the community, while the Virginia river snail (*Elimia virginica*) and red worm (*L. hoffmeisteri*) produced the highest biomass (NRC 2009-TN3684).

The Pennsylvania Fish and Boat Commission (PFBC) Division of Environmental Services has documented 11 native species of freshwater mussels in the Susquehanna River (PFBC 2018-

TN13073). The most abundant of these species is the Eastern elliptio (*Elliptio complanate*); other species include the elktote (*Alasmodonta marginata*), triangle floater (*Alasmodonta undulata*), brook floater (*Alasmodonta varicose*), alewife floater (*Utterbackiana implicata*), cylindrical papershell (*Anodontoides ferussacianus*), yellow lampmussel (*Lampsilis cariosa*), eastern lampmussel (*Lampsilis radiata*), green floater (*Lasmigona subviridia*), eastern floater (*Pyganodon cataracta*), creeper mussel (*Strophitus undulatus*), and rainbow mussel (*Villosa iris*). Mussels depend on host fish for completing their larval stage (glochidia). The host fish for these mussels in the Susquehanna River include the brook trout, blue gill, largemouth bass, alewife, American eel, and sunfishes (*Lepomis* spp.) among others (PFBC 2018-TN13073).

The invasive Asiatic clam (*Corbicula fluminea*) occurs in the Susquehanna River and has been previously reported on the CCEC intake structures (NRC 2009-TN3684).

E.2.2.3 Secondary and Tertiary Consumers

This section summarizes important CCEC site aquatic environment secondary and tertiary consumers, which include ichthyoplankton, juvenile fish, and adult fish.

Ichthyoplankton

Ichthyoplankton was sampled in 1989 and 1990 near the CCEC. This ichthyoplankton data is reported in Module 5 of the 2025 National Pollutant Discharge Elimination System (NPDES) permit renewal application (CEG 2025-TN13023). In 1989, researchers collected 9,537 individuals representing 26 taxa; in 1990, they collected 5,433 individuals from the same number of taxa. The sample composition differed by year, however, the researchers identified that the common carp and quillback dominated in 1989, while the pumpkinseed, bluegill, and common carp dominated in 1990 (CEG 2025-TN13023). The seasonal abundance patterns of ichthyoplankton also varied slightly by year. In 1989, ichthyoplankton larvae first appeared in mid-April, with peaks from mid-May through mid-June and again from mid-July through August. In 1990, ichthyoplankton larvae first appeared in early April, with higher abundance from late April through early May and from late May through August (CEG 2025-TN13023).

Since the 1989 and 1990 ichthyoplankton surveys were completed, the Susquehanna River's aquatic community has changed. The York Haven fish passage, which opened in 2000, now allows migratory aquatic species to move farther upstream and reach the York Haven Pool. Following the opening of the York Haven fish passage, the gizzard shad population increased, and monitoring documented American shad, river herring, striped bass, and American eel in the York Haven Pool (FERC 2015-TN13080). Flathead catfish have also entered the Susquehanna River and spread upstream through fish passages, and electrofishing near Brunner Island below York Haven Dam from 2002 to 2005 captured multiple size classes, indicating successful reproduction in the basin (Normandeau 2007-TN13081).

Juvenile and Adult Fish

The Susquehanna River and its tributaries support a diverse warmwater and coldwater fish community that includes many recreational and environmentally valuable species (see Table E-1). The CCEC is located in the York Haven Pool of the Susquehanna River, just upstream of the York Haven Dam and the East Channel Dam Fishway. The York Haven Pool supports a diverse fish community consisting of smaller minnows, shiners, chubs, and gizzard shad and bottom feeding suckers, redhorses, and catfish, to larger sportfish including bass,

walleye, perch, bluegill, and crappie (see Table E-1). The East Channel Dam Fishway, which was opened in 2000, allows passage for species like American shad, gizzard shad, carp, quillback, channel and flathead catfish, white sucker, and smallmouth bass (YHPC 2023-TN13082). A nature-like fishway, located at the southern end of Three Mile Island approximately 1 mi (1.6 km) south of the CCEC, opened in May 2026 and will provide additional opportunities for fish passage of migratory species including the American eel, American shad, alewife, and blueback herring (USACE 2023-TN13607).

Table E-1 Freshwater Fish Species Present in the Susquehanna River, 1989–2014

Common Name	Scientific Name	Non-Native Species
American eel*	<i>Anguilla rostrata</i>	-
American shad*	<i>Alosa sapidissima</i>	-
gizzard shad	<i>Dorosoma cepedianum</i>	-
alewife*	<i>Alosa pseudoharengus</i>	-
blueback herring*	<i>Alosa aestivalis</i>	-
rainbow smelt	<i>Osmerus mordax</i>	X
rainbow trout	<i>Oncorhynchus mykiss</i>	X
brown trout	<i>Salmo trutta</i>	X
brook trout	<i>Salvelinus fontinalis</i>	-
northern pike	<i>Esox lucius</i>	X
muskellunge	<i>Esox masquinongy</i>	X
chain pickerel	<i>Esox niger</i>	-
tiger muskellunge	<i>Esox lucius</i> × <i>E. masquinongy</i>	X
central stoneroller	<i>Campostoma anomalum</i>	-
goldfish	<i>Carassius auratus</i>	X
common carp	<i>Cyprinus carpio</i>	X
cutlips minnow	<i>Exoglossum maxillingua</i>	-
river chub	<i>Nocomis micropogon</i>	-
golden shiner	<i>Notemigonus crysoleucas</i>	-
comely shiner	<i>Notropis amoenus</i>	-
common shiner	<i>Luxilus cornutus</i>	-
spottail shiner	<i>Notropis hudsonius</i>	-
swallowtail shiner	<i>Notropis procne</i>	-
rosyface shiner	<i>Notropis rubellus</i>	-
spotfin shiner	<i>Cyprinella spiloptera</i>	-
simic shiner	<i>Notropis volucellus</i>	-
sluntnose minnow	<i>Pimephales notatus</i>	-
slacknose dace	<i>Rhinichthys atratulus</i>	-
longnose dace	<i>Rhinichthys cataractae</i>	-
creek chub	<i>Semotilus atromaculatus</i>	-
fallfish	<i>Semotilus corporalis</i>	-
quillback	<i>Carpionodes cyprinus</i>	-
white sucker	<i>Catostomus commersoni</i>	-
northern hogsucker	<i>Hypentelium nigricans</i>	-

Common Name	Scientific Name	Non-Native Species
shorthead redhorse	<i>Moxostoma macrolepidotum</i>	-
white catfish	<i>Ameiurus catus</i>	-
yellow bullhead	<i>Ameiurus natalis</i>	-
brown bullhead	<i>Ameiurus nebulosus</i>	-
channel catfish	<i>Ictalurus punctatus</i>	X
marginated madtom	<i>Noturus insignis</i>	-
flathead catfish	<i>Pylodictis olivaris</i>	X
banded killifish	<i>Fundulus diaphanus</i>	-
striped bass	<i>Morone saxatilis</i>	-
hybrid striped bass	<i>Morone saxatilis</i> × <i>M. chrysops</i>	-
rock bass	<i>Ambloplites rupestris</i>	-
redbreast sunfish	<i>Lepomis auritus</i>	-
green sunfish	<i>Lepomis cyanellus</i>	-
pumpkinseed	<i>Lepomis gibbosus</i>	-
bluegill	<i>Lepomis macrochirus</i>	-
smallmouth bass	<i>Micropterus dolomieu</i>	-
largemouth bass	<i>Micropterus salmoides</i>	-
white crappie	<i>Pomoxis annularis</i>	-
black crappie	<i>Pomoxis nigromaculatus</i>	-
tessellated darter	<i>Etheostoma olmstedii</i>	-
banded darter	<i>Etheostoma zonale</i>	-
yellow perch	<i>Perca flavescens</i>	-
shield darter	<i>Percina peltata</i>	-
walleye	<i>Sander vitreus</i>	-

“*” denotes migratory species, “X” denotes present, and “-” denotes absent.

Source: Table adapted from Table 4-1 in CEG 2025-TN13023.

E.2.2.4 Important Species and Habitats

The PFBC is responsible for fisheries management, regulations, and conservation in the Pennsylvania portion of the Susquehanna River and works with the Susquehanna River Anadromous Fish Restoration Cooperative, which includes Federal and State partners. The aquatic region of the action area encompasses the area of the Susquehanna River influenced by the intake and discharge systems which includes the intake structure dredging area and the thermal mixing zone which in previous studies extended 5 to 20 m (16 to 66 ft) into the river and downstream 25 to 50 m (82 to 164 ft) (NRC 1976-TN12902, NRC 2009-TN3684). These systems are described in Section 2.1.6 of the 2009 SEIS (NRC 2009-TN3684) and in the 2025 CCEC NPDES permit renewal application (CEG 2025-TN13023). The NRC staff determined that the only federally listed aquatic species that may be present is the green floater, which is under FWS jurisdiction. The NRC staff also determined that there are no federally listed species under National Marine Fisheries Service (NMFS) jurisdiction and no essential fish habitat or national marine sanctuaries located within action area (CEG 2025-TN12656; NRC 2024-TN12787). Additional information about federally listed aquatic species can be found in Sections E.3.2 and E.3.3.2

Commercially Important Fisheries

While historically there was commercial fishing (e.g., shad) on the Susquehanna River, it was largely eliminated due to 20th century dam construction. Efforts in the 21st century have worked to restore fish passage for migratory fisheries but fishing along the Susquehanna River remains recreational and for sport (FWS 2025-TN12788).

Recreationally Important Fisheries

Recreational fisheries in the Pennsylvania portion of the Susquehanna River are regulated by the PFBC. Popular sport fish include smallmouth bass, walleye, flathead catfish, channel catfish, muskellunge, yellow perch, striped bass, common carp, and sunfish (PFBC 2026-TN12789). The Susquehanna is known for the smallmouth bass, walleye, and, increasingly, trophy-sized flathead catfish fishing, with State-wide fishing licenses bringing in over \$32 million in 2025 (PFBC 2026-TN12790), and an estimated economic impact of \$5.7 billion (Erie Times-News 2025-TN12797).

State-Protected and Other Special Status Aquatic Species

The Pennsylvania Department of Conservation and Natural Resources is responsible for the conservation of rare, threatened, and endangered species in Pennsylvania. It works in partnership with the Western Pennsylvania Conservancy, PFBC, and the Pennsylvania Game Commission in cooperation with FWS under the PNHP (PA 2026-TN12854). The PNHP gathers and provides information on the location and status of important ecological resources which can be found in the Pennsylvania Natural Diversity Inventory (PNDI) and mapper (PNHP 2019-TN13083). The Wild Resource Conservation Act (32 Pa.C.S.A. § 5307) (PA P.L. 597, No. 170-TN1810) specifies the State's responsibility for conserving, protecting, restoring, and propagating endangered and threatened species. Under these laws, "endangered" indicates that the species is in danger of extinction throughout all or a significant portion of its range if critical habitat is not maintained or is greatly exploited by humans, "threatened" indicates that the species is likely to become endangered throughout all or most of its range if critical habitat is not maintained or is greatly exploited by humans. Pennsylvania last updated its State-listed species list in November 2025. The PNDI (PNDI-835538) completed by CEG in June 2025 does not report any State-listed aquatic species in the area around the CCEC (CEG 2025-TN13107). Additionally, CEG reports that as of 2024 no aquatic State-listed species were known to occur in the CCEC action area (CEG 2025-TN12656); however, according to the FWS, the current known range of the green floater (*Lasmigona subviridis*) overlaps with the CCEC aquatic action area (FWS 2026-TN13048, FWS 2026-TN12903).

The Susquehanna River also supports several ecologically important diadromous fish species whose historical and current distributions include the York Haven Pool (SRBC 2026-TN13608). American shad, alewife, and blueback herring migrate through the lower Susquehanna River during spring spawning runs, while American eel migrate upstream as juveniles and downstream as adults. Fish passage facilities at dams along the Susquehanna River, including York Haven Dam, are intended to restore access to historical habitats although populations of these migratory species remain below historical levels. None of these species are listed as threatened or endangered at the Federal or State level but are considered a trust resource that is protected by Federal and State agencies under the Susquehanna River Anadromous Fish Restoration Cooperative (SRBC 2026-TN13608).

E.2.2.5 Invasive and Nuisance Species

Part of the PFBC mission is to manage aquatic invasive species (AIS) to protect the natural resources and fisheries of Pennsylvania. AIS (also referred to as aquatic nuisance species) are in contrast to naturalized species, which are non-native but have reached an equilibrium with the ecosystems in which they occur (PA 2026-TN12855). Non-native species are those species that are present only because of introduction and that would not naturally occur either currently or historically in an ecosystem. Invasive species cause harm when they out-compete native species by reproducing and spreading rapidly in areas where they have no natural predators, thus changing the balance of the ecosystems. For purposes of this discussion, nuisance species are non-native species that alter the environment but do not rise to the level of invasive.

The Susquehanna River faces numerous threats from invasive aquatic species (PA 2026-TN12855). This includes AIS fish species like the flathead catfish, plants including American lotus (*Nelumbo lutea*), hydrilla (*Hydrilla verticillata*), and Eurasian water milfoil (*Myriophyllum spicatum*), and AIS invertebrates including crayfish, snails, and zebra mussels (*Dreissena polymorpha*). The primary AIS concern related to the CCEC operations is biofouling of the cooling-water intake system by invasive bivalves and floating plants, such as Asian clams, zebra mussels, or milfoil. Asian clams have been reported onsite at the CCEC (NRC 2009-TN3684).

E.3 Endangered Species Act Section 7 Consultation and Biological Evaluation

As a Federal agency, the NRC must comply with the ESA (TN1010) as part of any action authorized, funded, or carried out by the agency. In this case, the proposed actions are the decisions whether to grant or deny CEG's interdependent, connected licensing and regulatory requests (see Table 1-1), including any revisions or supplements thereto or other regulatory or licensing requests submitted to the NRC that are necessary to reauthorize power operations, that if approved, would collectively support reauthorizing power operations and refueling of the CCEC reactor. Under Section 7 of the ESA, the NRC must consult with the FWS and the NMFS ("the Services" [collectively] or "Service" [individually]), as appropriate, to ensure that the proposed actions are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

Biological assessments are required for any agency action that is a "major construction activity" (Title 50 of the *Code of Federal Regulations* [50 CFR] 402.12(b)) (TN4312). A major construction activity is a construction project or other undertaking having construction-type impacts that is a major Federal action significantly affecting the quality of the human environment under NEPA (TN661) (51 FR 19926-TN7600). Federal agencies may fulfill their obligations to consult with the Services under ESA Section 7 and to prepare a biological assessment, if required, in conjunction with the interagency cooperation procedures required by other statutes, including NEPA (50 CFR 402.06(a)). In such cases, the Federal agency should include the results of ESA Section 7 consultation(s) in the NEPA document (50 CFR 402.06(b)).

Licensing and regulatory requests in support of reauthorizing power operations do not require the preparation of a biological assessment because they are not a major construction activity. Nonetheless, the NRC staff must consider the impacts of its actions on federally listed species and designated critical habitats. For cases in which the NRC staff finds that the proposed action "may affect" ESA-protected species or habitats, ESA Section 7 requires the NRC to consult with the relevant Service(s).

For federally listed species and critical habitats under the FWS's jurisdiction, the NRC staff has incorporated its biological evaluation below, which considers the effects of the proposed actions on ESA-listed species. Table E-2 summarizes the species and habitats potentially present in the action area, the ESA effect determinations made by the NRC staff, and the status of FWS's concurrence.

There are no federally listed species or critical habitats under the NMFS's jurisdiction within the action area. Therefore, this issue is not addressed further in this biological evaluation.

Table E-2 Effect Determinations for Federally Listed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction Potentially Present in the Action Area of the Christopher M. Crane Clean Energy Center Restart

Species	Federal Status ^(a)	Potentially Present in the Action Area?	Service	Effect Determination ^(b)	Service Concurrence Date ^(c)
Indiana bat (<i>Myotis sodalist</i>)	FE	Yes	FWS	NLAA	06/24/2026
northern long-eared bat (<i>Myotis septentrionalis</i>)	FE	Yes	FWS	NLAA	03/30/2026
tricolored bat (<i>Perimyotis subflavus</i>)	FPE	Yes	FWS	NLAA	06/24/2026
green floater (<i>Lasmigona subviridis</i>)	FPT	Yes	FWS	NLAA	03/30/2026
monarch butterfly (<i>Danaus plexippus</i>)	FPT	Yes	FWS	NLAA	06/24/2026
northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	FE	Yes	FWS	NLAA	03/30/2026

ESA = Endangered Species Act; FE = federally endangered; FPE = proposed for Federal listing as endangered; FPT = proposed for Federal listing as threatened; FWS = U.S. Fish and Wildlife Service; N/A = not applicable; NLAA = may affect, not likely to adversely affect; NMFS = National Marine Fisheries Service; NRC = U.S. Nuclear Regulatory Commission.

(a) Indicates protection status under the Endangered Species Act.

(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).

(c) Indicates the date that the FWS concurred with the NRC staff's effect determination (FWS 2026-TN13048). The ESA does not require Federal agencies to seek FWS concurrence for NLAA determinations for proposed species.

E.3.1 Action Areas

The implementing regulations for ESA Section 7 define "action area" to mean all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02) (TN4312). The action area effectively bounds the analysis of federally listed species and critical habitats because only species and habitats that occur within the action area may be affected by the Federal action. The NRC staff recognizes that, although the described action area is stationary, federally listed species can move in and out of the action area. For instance, a migratory bird could occur in the action area seasonally as it forages or breeds within the action area. Thus, in its analysis, the NRC staff considers not only those species known to occur directly within the action area but also those species that may passively or actively move into the action area. The NRC staff then considers if the life history and habitat requirements of each species make it likely to occur in the action area where it could be affected by restart activities.

E.3.1.1 Terrestrial Action Area

The terrestrial portion of the action area includes the entirety of Three Mile Island as well as the small area on the mainland where the training building is located. This area encompasses the reactor and associated structures, intake and discharge facilities, parking areas, laydown yards, landscaped zones, and transportation infrastructure such as the North and South Access Roads and the rail junction at the North Access Road. Section E.1 describes the terrestrial environment in detail.

E.3.1.2 Aquatic Action Area

The aquatic portion of the action area includes portions of the Susquehanna River affected by the discharge structure thermal mixing zone, intake water withdrawals, and any potential effects from point-source discharge outfalls. Therefore, the NRC staff conservatively includes the entirety of the water directly surrounding Three Mile Island. Section E.2 describes the aquatic environment in detail.

E.3.2 Endangered Species Act—Federally Listed Species and Critical Habitats Under U.S. Fish and Wildlife Service Jurisdiction

The NRC staff identified six species under FWS jurisdiction that may occur in the action area. These include species that are federally listed as endangered under the ESA and species that are proposed for listing. The NRC staff reviewed CEG's ER, the FWS 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 (CEG 2025-TN12656). The NRC staff determined that no critical habitats occur within or near the action area.

Table E-3 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. The NRC staff's ESA effect determinations are discussed in detail below.

Table E-3 Occurrences of Federally Listed and Proposed Species Under U.S. Fish and Wildlife Service Jurisdiction in the Christopher M. Crane Clean Energy Center Restart Action Area

Species	Federal Status^(a)	Habitat	Type and Likelihood of Occurrence in Action Area
northern long-eared bat (<i>Myotis septentrionalis</i>)	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 (FWS 2022-TN11245).	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 are unlikely to be present during winter months. The action area's forested areas contain suitable habitat for foraging, mating, and sheltering. No surveys have been conducted to determine the species presence (CEG 2025-TN12656, CEG 2026-TN12942). CEG informally monitors for bats and has several bat boxes on the south end of the property. No listed bats have been observed. The NRC staff conservatively assumes that listed bats could occur within the action area in the spring, summer, and fall. If present during these seasons, individuals would only occur occasionally and in low abundance.
Indiana bat (<i>Myotis sodalis</i>)	FE	In non-hibernating seasons, Indiana bats typically roost underneath the bark of dead or dying trees within forested areas. Indiana bats primarily forage in forested habitats with open understory, forest edges, and riparian areas. In hibernating seasons, Indiana bats will occupy caves or cave-like locations, including abandoned mines, that have stable ambient temperatures between 50°F and 32°F.	Seasonal and Occasional. See northern long-eared bat.

Species	Federal Status ^(a)	Habitat	Type and Likelihood of Occurrence in Action Area
tricolored bat (<i>Perimyotis subflavus</i>)	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. See northern long-eared bat.
Green floater (<i>Lasmigona subviridis</i>)	FPT	Habitat includes small streams to larger rivers with slow to moderate flow in areas that provide flow refugia with stable sand and gravel substrate and good water quality. Presence of fish hosts (mottled sculpin, rock bass, central stoneroller, blacknose dace, and margined madtom) for reproduction. The condition category determined by abundance and trend of the green floater within the action area is historic/unknown or low (FWS 2021-TN13129).	Rare, Likely Extirpated. Shells have been found in the main channel and upper east channel of the Susquehanna River (YHPC 2012-TN13128); however, CEG reports no known observations of live individuals on the project site. The action area lacks suitable habitat for green floater, as the main channel contains fast, unstable flows and the east side channel is affected by a dam that disrupts flow, sediment stability, and habitat quality. Although historical shell evidence suggests past presence, this portion of the river now appears to be trending toward local extirpation. Based on these habitat limitations and survey information, the northeast determination key was completed and resulted in a may affect, not likely to adversely affect determination for the species (FWS 2026-TN13048).
monarch butterfly (<i>Danaus plexippus</i>)	FPT	Prairies, meadows, grasslands, and along roadsides across most of North America, especially in areas containing milkweed (<i>Asclepias</i> spp.).	Seasonal and Occasional. CEG reports no known observations of monarch within the action area (CEG 2025-TN12656). Due to suitable habitat present on the southern portion of Three Mile Island, the NRC staff conservatively assumes presence of the monarch butterfly within the action area seasonally when not absent from migrating south.

Species	Federal Status ^(a)	Habitat	Type and Likelihood of Occurrence in Action Area
northeastern bulrush (<i>Scirpus ancistrochaetus</i>)	FE	Habitat includes sunny, acidic to neutral seasonal wetlands with fluctuating water levels. It grows in open areas surrounded by forest and can occur from deep water to several feet upslope. It is typically absent from heavily shaded wetlands and requires vernal pools (FWS 2021-TN13129).	Rare. Upon discussion with FWS biologists, the northeastern bulrush is unlikely present in the action area (FWS 2026-TN13127). Upon completion of the northeastern determination key, NRC staff concludes the proposed actions may affect but is not likely to adversely affect the northeastern bulrush (FWS 2026-TN13048).

CEG = Constellation Energy Generation, LLC; ESA = Endangered Species Act; FE = federally endangered; FPE = federally proposed for listing as endangered; FPT = federally proposed for listing as threatened; FWS = U.S. Fish and Wildlife Service

(a) Indicates protection status under the ESA.

Sources: As cited above.

E.3.3 ESA: Effect Determinations for Federally Listed Species Under U.S. Fish and Wildlife Service Jurisdiction

In Section E.3.2, the NRC staff determined that six federally listed, or proposed for listing, species may occur in the action area. Below, the NRC staff analyzes the potential impacts of the proposed CCEC restart on these species. Table E-2 summarizes the NRC staff's ESA effect determinations for these species.

E.3.3.1 *Indiana Bat (FE), Northern Long-eared Bat (FE), and Tricolored Bat (FPE)*

In Section E.3.2, the NRC staff concludes that Indiana, northern long-eared, and tricolored bats may occur in the action area's forests in spring, summer, and fall. If present, bats would occur rarely and in low abundance.

The potential stressors that these bats could experience from the operation and restart of a nuclear power plant (generically) are as follows: (1) mortality or injury from collisions with nuclear power plant structures and vehicles; (2) habitat loss, degradation, disturbance, or fragmentation, and associated effects; and (3) behavioral changes resulting from restart or other site activities.

Mortality or Injury from Collisions with Plant Structures and Vehicles

Listed bats can be vulnerable to mortality or injury from collisions with plant structures and vehicles. The impacts associated with the proposed restart would be similar to those described in Section 3.6.3.1 of the 2024 LR GEIS (NRC 2024-TN10161: pp. 3-62 through 3-63), which is incorporated here by reference.

The tallest structures on the CCEC site are the meteorological tower and the two cooling towers (CEG 2026-TN12942). The turbine buildings, reactor buildings, and heating boiler stack are also prominent features at the CCEC site, with above ground level heights equal to or exceeding 100 ft (30 m). To date, CEG has reported no incidents of injury or mortality of any species of bat at the CCEC associated with site buildings or structures. Accordingly, the NRC staff finds the likelihood of future Indiana, northern long-eared, or tricolored bat collisions with site buildings or structures to be extremely unlikely and, therefore, is not considered further.

Vehicle collision risk for bats varies depending on factors including time of year, location of roads and travel pathways in relation to roosting and foraging areas, the characteristics of individuals' flight, traffic volume, and whether young bats are dispersing. Although vehicle collisions have been documented for several species of bats, the Indiana Bat Draft Recovery Plan (FWS 2007-TN934) indicates that bat species do not seem to be particularly susceptible to vehicle collisions. However, the FWS also finds it difficult to determine whether roads pose a greater risk for bats colliding with vehicles or a greater likelihood of decreasing risk of collision by deterring bat activity (FWS 2016-TN7400). In most cases, the FWS expects that roads of increasing size decrease the likelihood of bats crossing the roads and, therefore, reduce collision risk (FWS 2016-TN7400).

During the CCEC restart activities, vehicular traffic from truck deliveries, site maintenance activities, and personnel commuting to and from the site would increase until they reach levels similar to previous operations. Vehicle use would occur primarily in areas that bats would be less likely to frequent, such as along established county and State roads or within industrial-use areas of the CCEC site. Additionally, most vehicle activity would occur during daylight hours when bats are less active. There have been no documented bat incidents, including mortality or injury from collisions with plant structures and vehicles, at the CCEC (CEG 2025-TN12656). Accordingly, the NRC staff finds the likelihood of future bat collisions with vehicles to be extremely unlikely and, therefore, is not considered further.

Habitat Loss, Degradation, Disturbance, or Fragmentation, and Associated Effects

As presented in Table E-3, the CCEC action area includes a forested habitat that federally protected bats may rarely to occasionally inhabit in spring, summer, and fall. In its species status assessment for the tricolored bat (FWS 2021-TN8589), the FWS stated that forest removal may result in the following impacts to tricolored bats: loss of suitable roosting or foraging habitat, longer flights between suitable roosting and foraging habitats because of forest habitat fragmentation, fragmentation of maternity colonies due to loss/fragmentation of travel corridors, and direct mortality or injury during tree removal.

CEG identified that the proposed actions would not involve forest removal or management and would generally not disturb the existing forested habitat on the site. Other vegetation maintenance on the site over the course of the proposed restart period would be of grassy, mowed areas between buildings and along walkways within the industrial portion of the site (CEG 2026-TN12942). CEG does not propose land clearing, or other ground-disturbing activities outside of the pre-disturbed industrial area within the action area. Negative impacts on bats could result if roost trees are removed. Bats could also be directly injured during tree clearing. However, CEG states that tree removal is not expected to occur during restart activities (CEG 2025-TN12656, CEG 2026-TN12942).

The NRC staff finds that infrequent to rare hazardous tree removal in forested areas during the proposed restart activities would not measurably affect any potential bat habitat in the action

area. The continued preservation of the existing forested and natural areas on the site during the proposed restart would benefit bats if present within or near the action area.

CEG maintains bat boxes on the southern portion of the industrialized area at the CCEC site. Emergence surveys are informally conducted. CEG has yet to have a bat utilize the bat boxes. The continued efforts to provide habitat for bats onsite during restart activities would benefit bats if they were present within or near the action area (CEG 2025-TN12656, CEG 2026-TN12942).

Behavioral Changes Resulting from Refurbishment or Other Site Activities

Construction or refurbishment and other site activities, including site maintenance and infrastructure repairs as outlined in Section 3.1.2, could prompt behavioral changes in bats. Noise, vibration, and general human disturbance are stressors that may disrupt normal feeding, sheltering, and breeding activities (FWS 2016-TN7400). At low noise levels or farther distances, bats initially may be startled but would likely habituate to the low background noise levels. At closer range and louder noise levels, particularly if accompanied by physical vibrations from heavy machinery, many bats would likely be startled to the point of fleeing from their daytime roosts. Fleeing individuals could experience increased susceptibility to predation and would expend increased levels of energy, which could result in decreased reproductive fitness (FWS 2016-TN7400: Table 4-1). Increased noise may affect foraging success. Schaub et al. (2008-TN8867) found that the foraging success of the greater mouse-eared bat (*Myotis myotis*) diminished in areas with noise mimicking the traffic sounds that would be experienced within 49 ft (15 m) of a highway.

Within the CCEC action area, noise, vibration, and other human disturbances could dissuade bats from using the action area's forested habitat during migration, which could also reduce the fitness of migrating bats. However, bats that use the action area have likely become habituated to such disturbances due to the history of the site. According to FWS, bats that are repeatedly exposed to predictable, loud noises may habituate to such stimuli over time (FWS 2010-TN8537). For instance, Indiana bats have been documented as roosting within approximately 1,000 ft (300 m) of a busy State route adjacent to Fort Drum Military Installation and immediately adjacent to housing areas and construction activities on the installation (U.S. Army 2014-TN8512). Indiana, northern long-eared, and tricolored bats would likely respond similarly.

Restart activities for the CCEC would include limited refurbishment, such as repairing buildings and associated infrastructure needed to support plant startup, along with routine site activities and inspections. Noise, lighting, and human presence associated with these activities would remain within the already developed industrial portions of the site and would be similar in scale to existing baseline conditions. Although such disturbances could cause minor behavioral responses in migrating or summer-roosting bats, the NRC staff assumes that Indiana, northern long-eared, and tricolored bats occurring within the action area have already acclimated to long-standing site conditions. Thus, restart-related activities are not expected to cause behavioral changes in bats to a degree that would be able to be meaningfully measured, detected, or evaluated or that would reach the scale where a take might occur.

Conclusion for the Indiana Bat

All potential effects on the Indiana bat resulting from the proposed actions would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed actions may affect but is not likely to adversely affect the Indiana bat. On June 24, 2026, FWS concurred with the NRC staff's effect determination (FWS 2026-TN13604).

Conclusion for the Northern Long-Eared Bat

All potential effects on the northern long-eared bat resulting from the proposed actions would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed actions may affect but is not likely to adversely affect the northern long-eared bat. In a letter dated March 30, 2026, the FWS concurred with the NRC staff's effect determination for the northern long-eared bat through the applicable range wide determination key (FWS 2026-TN13048).

Conclusion for the Tricolored Bat

All potential effects on the tricolored bat resulting from the proposed actions would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed actions may affect but is not likely to adversely affect the tricolored bat. Because the tricolored bat is proposed for Federal listing as endangered, the ESA does not require the NRC to consult with or receive concurrence from the FWS regarding this species, as long as the continued existence of the species is not jeopardized. On June 24, 2026, FWS concurred with the NRC staff's effect determination (FWS 2026-TN13604).

E.3.3.2 Green Floater (FPT)

All potential effects on the green floater resulting from the proposed actions would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed actions may affect but is not likely to adversely affect the green floater. Because the green floater is proposed for Federal listing as threatened, the ESA does not require the NRC to consult with or receive concurrence from the FWS regarding this species, as long as the continued existence of the species is not jeopardized. As a result of filling out the northeastern determination key, by letter dated March 30, 2026, the FWS concurred that the proposed action(s) is not likely to result in jeopardy of the species (FWS 2026-TN13048).

E.3.3.3 Monarch Butterfly (FPT)

In Section E.3.2, the NRC staff concludes that the monarch butterfly may occur in the action seasonally. The primary drivers identified by FWS as commonly affecting the health of the monarch butterfly are (1) habitat loss, degradation, and modification, and (2) insecticide exposure (FWS 2024-TN11177).

Habitat Loss, Degradation, and Modification

Land use resulting in conversion of suitable habitat to other uses is the primary risk factor affecting the status of the monarch butterfly. Conversion of suitable habitat reduces the amount, availability, connectedness, size, and quality of habitat. While the primary cause of conversion throughout the species' range is agricultural activities, any development activity may reduce suitable habitat. This includes activities such as road construction, housing and commercial development, and energy projects. CEG has not proposed any activities that would result in habitat loss, land disturbance, or other activities that would degrade existing natural areas or potential habitats for butterflies during the proposed restart. Milkweed, which is essential for the monarch life cycle, is known to exist on the undeveloped southern portion of Three Mile Island (CEG 2025-TN12656). Onsite mowing is restricted to the industrialized area where the presence of monarch would be minimal. Continued preservation and enhancement of natural

areas onsite would benefit monarch butterflies. Invasive plant species and woody plant encroachment degrade monarch habitat quality and quantity. There are no activities proposed during restart activities that would increase the prevalence of invasive plants. Accordingly, the NRC staff finds the likelihood of adverse effects of habitat loss, degradation, and modification on the monarch butterfly from the proposed actions to be discountable, and therefore, is not considered further.

Insecticide Exposure

Most insecticides are nonspecific and broad-spectrum in nature. Furthermore, the larvae of many Lepidopterans are considered major pest species, and insecticides are specifically tested on this taxon to ensure that they will effectively kill individuals at the labelled application rates (FWS 2024-TN11177). Insecticide use is most often associated with agricultural production. Studies looking specifically at the dose response of monarchs to neonicotinoids, organophosphates, and pyrethroids have demonstrated monarch toxicity (e.g., Krischik et al. 2015-TN8596; James 2019-TN8595; Krishnan et al. 2020-TN8597; Bagar et al. 2020-TN8594). Moreover, the magnitude of risk posed by insecticides may be underestimated, as research usually examines the effects of the active ingredient alone, while many of the formulated products contain more than one active insecticide.

During the proposed restart, CEG would continue to apply herbicides as needed and according to labelled uses but has no plans to apply herbicides in natural areas. Continued herbicide application could directly affect butterflies in the action area by injuring or killing individuals exposed to these chemicals. Certain herbicides such as glyphosate (e.g., Round Up™) can kill milkweed, which could affect the ability of the species to lay eggs and the availability of larval food sources. Continued herbicide application could affect butterflies in the action area by indirect exposure to these chemicals. However, all herbicide applications would be targeted, applied following labelled instruction, applied within the pre-disturbed industrial area and, therefore, unlikely to result in hazardous levels of contaminant exposure (CEG 2026-TN12942). Accordingly, the NRC staff finds the likelihood of adverse effects of insecticides on the monarch butterfly from the proposed actions to be insignificant, and therefore, is not considered further.

Conclusion for the Monarch Butterfly

All potential effects on the monarch butterfly would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed actions may affect but is not likely to adversely affect the monarch butterfly. On June 24, 2026, FWS concurred with the NRC staff's effect determination (FWS 2026-TN13604).

E.3.3.4 Northeastern Bulrush (FE)

All potential effects on the northeastern bulrush resulting from the proposed actions would be insignificant or discountable. Therefore, the NRC staff concludes that the proposed actions may affect but is not likely to adversely affect the northeastern bulrush. On March 30, 2026, the FWS concurred with this conclusion via the northeastern determination key (FWS 2026-TN13048).

E.3.4 Chronology of Endangered Species Act Section 7 Consultation

The NRC, the action agency, will seek concurrence from the Services for the listed species for which the proposed actions may affect but is not likely to adversely affect (see Table E-2) in

accordance with 50 CFR 402.13(c) (TN4312). Table E-4 lists the correspondence relevant to the ESA Section 7 consultation that has transpired to date.

Table E-4 Endangered Species Act Section 7 Consultation Correspondence with the U.S. Fish and Wildlife Service for the Christopher M. Crane Clean Energy Center Restart

Date	Description	ADAMS Accession No.^(a)
March 30, 2026	FWS to NRC, Official Species List for Christopher M. Crane Clean Energy Center Restart	ML26089A066
March 30, 2026	Christopher M. Crane Clean Energy Center Endangered Species Act FWS Consultation Package	ML26089A063
March 30, 2026	FWS to NRC, NLAA Concurrence for Green Floater and Northeastern Bulrush, Northeastern Determination Key Results	ML26089A064
March 30, 2026	FWS to NRC, NLAA Concurrence for the Rangewide Northern Long-eared Bat and Tricolored Bat Determination Key Results	ML26089A065
June 4, 2026	NRC to FWS, Request for Concurrence with ESA Determinations for Christopher M. Crane Clean Energy Center Restart	ML26096A076
June 24, 2026	FWS to NRC, Concurrence with ESA Determinations for Christopher M. Crane Clean Energy Center Restart	ML26175A265

ADAMS = Agencywide Documents Access and Management System; FWS = U.S. Fish and Wildlife Service;

NLAA = may affect, not likely to adversely affect; NRC = U.S. Nuclear Regulatory Commission;

NMFS = National Marine Fisheries Service.

(a) Access these documents through the NRC's ADAMS at <https://adams-search.nrc.gov/home>.

E.4 References

Cited references are included in Chapter 6.

APPENDIX F

COMMENTS RECEIVED THROUGH PUBLIC REVIEW OF THE DRAFT ENVIRONMENTAL ASSESSMENT

F.1 Overview

This report summarizes the comments received on the draft environmental assessment (EA) and draft finding of no significant impact (FONSI) for the Christopher M. Crane Clean Energy Center (CCEC) reauthorization of power operations project and provides the U.S. Nuclear Regulatory Commission (NRC or Commission) staff's response to those comments.

F.2 Issuance

On June 8, 2026, the NRC staff published a Notice of Availability (NOA) of the draft EA and draft FONSI in the *Federal Register* (91 FR 34658-TN13595). In the NOA, the NRC provided information on how to submit comments, provided links to the draft EA and draft FONSI, and set July 8, 2026, as the closing date for submitting comments. Electronic versions of the draft EA and draft FONSI and supporting information were made accessible through the NRC's Agencywide Documents Access and Management System (ADAMS) website.

F.3 Public Comment Period

In the June 8, 2026 NOA, the NRC staff invited members of the public to submit comments on the draft EA and draft FONSI through the Federal Rulemaking website (<https://www.regulations.gov>), or via email to CCECRestartEnvironmental@nrc.gov, or by mail to the address provided in the NOA over a 30-day period ending on July 8, 2026. The NRC staff received 11 written comment documents, yielding 108 individual comments.

F.4 Comment Identification and Review Methodology

To identify each individual comment, the NRC staff reviewed each letter, email, and [Regulations.gov](https://www.regulations.gov) submittal related to the draft EA and draft FONSI, all of which are accessible in ADAMS. The NRC staff identified substantive statements related to the proposed agency actions and recorded the statements as comments and provided an appropriate response. A substantive comment is one which is within the scope of the proposed agency actions (and alternatives), is specific to the proposed agency actions, has a direct relationship to the proposed agency actions, and includes supporting reasons for the NRC staff to consider. Substantive comments raise, debate, or question a point of fact, analysis, or accuracy, or present potentially new and significant information. Comments of a general or non-substantive nature, as well as comments determined to be outside the scope of the draft EA and draft FONSI and the associated licensing and regulatory requests, were summarized and provided a general response by the NRC staff. Some comment submissions contained attachments, which provided supplemental material, or cited references. The NRC staff acknowledges the receipt of supplemental and reference material, which was reviewed and considered by the NRC staff. However, the NRC staff has not responded to comments contained in supplemental and reference material not directly related to the scope of the NRC's environmental review.

Comments submitted during the comment period and their associated correspondence received a unique comment identification number consisting of the correspondence identification number

and a number associated with the sequential order of the comment within the specific document. Table F-1 lists individuals that provided comments during the comment period, including their affiliation (if stated), the correspondence identification number, the comment source, and the ADAMS Accession Number for the comment. Where reproduced, the comments are recited verbatim from the comment source without editing (e.g., retaining any notations, subheadings, underlining, or emphasis in the original submittal), except for minor editorial changes to improve readability. In addition, while new or substantially revised text is marked with a change bar (vertical line) elsewhere in this final EA, this convention is not used in this appendix to improve readability and because the content of this appendix is entirely new. The comments and the NRC staff's responses are provided in Sections F.4.1 through F.4.22, following Table F-1.

Table F-1 Individuals Providing Comments on the Draft Environmental Assessment and Draft Finding of No Significant Impact

Commenter	Affiliation (if stated)	Correspondence ID	Comment Source	ADAMS Accession Number^(a)
Anonymous	None stated	3	Regulations.gov	ML26168A255
Anonymous	None stated	2	Regulations.gov	ML26168A258
Chu, Shannon	None stated	1	Regulations.gov	ML26168A259
Epstein, Eric	EFMR Monitoring, Inc.	9	Email	ML26190A088
Gordon, Alison	U.S. Geological Survey	4	Email	ML26182A045
Greene, Karen M.	National Oceanic and Atmospheric Administration	6	Email	ML26188A336
Mason, Jeffrey	None stated	10	Regulations.gov	ML26197A001
McManus, Mark	United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada	11	Regulations.gov	ML26190A175
Moore, Dennis M.	Constellation Energy Generation, LLC	5	Email	ML26188A334
Woolard, Angela	York Haven Power Company, LLC	8	Email	ML26190A002

Commenter	Affiliation (if stated)	Correspondence ID	Comment Source	ADAMS Accession Number ^(a)
Yamashita, Coja	Pennsylvania Fish and Boat Commission	7	Email	ML26188A335

ADAMS = Agencywide Documents Access and Management System; ID = identification number.

(a) Access these documents through the NRC's ADAMS at <https://adams-search.nrc.gov/home>.

F.4.1 Comments Concerning Accidents

Comment: The NRC's analyses of DBAs and SAMAs are cursory and flawed. TMI-Alert followed the NRC's lead and used Peach Bottom Atomic Power Station as a reference comparison. Please refer to TMIA's Testimony to the NRC, "Criticism on the Use of Probability Assessment," Scott Portzline, September 12, 2019.)

<https://www.nrc.gov/docs/ML1925/ML19256E385.pdf> (9-4-9 [Epstein, Eric])

Response: *The NRC staff has extensively evaluated the environmental impacts of design-basis accidents (DBAs) and severe accidents for all nuclear power plants, including the CCEC, and continues to evaluate any new and significant information. As referenced in Section 3.14, the licensee, as part of its initial license renewal application submitted in 2008, included an analysis of postulated accidents including severe accident mitigation alternatives (SAMAs) for TMI-1 (now CCEC) in the associated environmental report. The NRC staff documented its independent review and analysis of SAMAs in Appendix F of NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 37 Regarding Three Mile Island Nuclear Station, Unit 1 Final Report (the 2009 supplemental environmental impact statement [SEIS]) (NRC 2009-TN3684). More recently, as part of Revision 2 of NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants (the 2024 LR GEIS) (NRC 2024-TN10161) and an associated rulemaking, the CCEC (as Three Mile Island [TMI]-1) was included in the NRC staff's generic evaluation where the impacts of postulated accidents were determined to be SMALL for all of the evaluated nuclear power plants. During the environmental review for the proposed resumption of power operations at the CCEC, the NRC staff reviewed the current site-specific information for the CCEC and found no new and significant information that would change either the generic SMALL impact determinations for DBAs and severe accidents in the 2024 LR GEIS or the specific determinations of SMALL impacts for DBAs and severe accidents in the 2009 SEIS. Additionally, on September 9, 2019, the Mitigation of Beyond-Design-Basis Events rule (10 CFR 50.155) (TN249) became effective. That rule primarily addresses mitigation strategies for a wide range of potential extreme events, including seismic events, fire, flooding, and other natural phenomena, requiring nuclear power plants to have plans in place to maintain core cooling, containment integrity, and spent fuel pool cooling even when facing events beyond their design basis, including large-scale natural disasters. If the proposed actions are approved and the 10 CFR 50.82(a)(1) certifications are withdrawn, the CCEC will again be subject to the requirements of 10 CFR 50.155. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

F.4.2 Comments Concerning Alternatives—Other

Comment: CEG and the NRC failed to investigate current on-line generating assets. Please refer to discussion in 2.1. There are existing energy generating facilities down-stream and up-

stream of TMI. Including one that actually touches Three Mile Island, and another where you can see the plumes from the site. (9-1-15 [Epstein, Eric])

Comment: There are existing energy generators that provide the same amount or more megawatts proximate to Three Mile Island. Please refer to the discussion at 2.1. These resources are grid approved licensed, and located, in Dauphin, Lancaster, and Montgomery Counties. (9-1-17 [Epstein, Eric])

Response: *The decision to pursue restart of the CCEC to provide baseload power generation is a decision by Constellation Energy Generation, LLC (CEG), as the plant owner and operator, and subject to the purview of State and other Federal energy-planning decision-makers, and not the NRC. In Section 2.2.1.2, the NRC staff evaluates energy generation options under the no-action alternative (i.e., where the NRC would not approve the licensing and regulatory requests in support of the reauthorization of power operations at the CCEC). The NRC staff incorporates by reference a wide range of energy generation options detailed in the 2024 LR GEIS (NRC 2024-TN10161), including purchased power from other existing generating assets, which could be pursued in lieu of the restart of the CCEC. Further, the NRC staff's consideration of alternatives was based on the following requirements. The National Environmental Policy Act of 1969 (NEPA), as amended through the enactment of the Fiscal Responsibility Act of 2023 (TN9775), places a limitation on an agency's alternatives analysis to include only those alternatives "that are technically and economically feasible, and meet the purpose and need of the proposal." In addition, the NRC regulations governing the content of EAs in 10 CFR 51.30(a)(1) (TN10253) call for only a "brief discussion" of alternatives as required by NEPA. These comments provide no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of these comments.*

F.4.3 Comments Concerning Decommissioning

Comment: This claim is beyond the pale. The SAFSTOR phase is 60 to 90 years from the date of the plant closure. (9-2-2 [Epstein, Eric])

Response: *Section 3.16 describes the environmental effects associated with the permanent cessation of power operations and the return to the decommissioning of the CCEC at a future date. As stated in Section 3.1.1, the licensee opted to pursue SAFSTOR for the facility, where the facility was placed and maintained in a safe condition allowing for decontamination at a later date. Systems not required to support spent nuclear fuel storage, heating, ventilation, and air conditioning, emergency plan activities, or site security were drained, de-energized, and secured. As a result, the CCEC structures and facilities have largely been left intact and maintained in a stable condition. The NRC staff determined that restart preparation activities and the proposed resumption of power operations would not change the NRC staff's previous determination that the impacts from eventual decommissioning would be SMALL and, therefore, NOT SIGNIFICANT. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

F.4.4 Comments Concerning Ecology—Aquatic Resources

Comment: The Project's water intake and outfall structures are located in areas that provide spawning and rearing habitat and migration corridors for diadromous fish including American shad, river herring (alewife and blueback herring, collectively), and American eel. Currently,

upstream migrants (adult American shad, adult river herring, juvenile eels) are transported from collection facilities at Conowingo Dam and transported to reaches of the mainstem Susquehanna upstream of both the Safe Harbor Dam and York Haven Dam to complete their complex life histories. American shad and river herring that spawn and rear in the vicinity of the Project are currently at or near their lowest population levels in the Susquehanna River (ASMFC 2020, ASMFC 2024). Annual passage numbers [the commenter included a hyperlink to the following URL: <https://www.fws.gov/project/susquehanna-river-fish-passage>] at Conowingo Dam, the lowermost barriers on the Susquehanna River, illustrate that the number of returning spawning adults has diminished from recent highs in the early 2000's. The Susquehanna River has the largest unrealized production potential for American shad across their U.S. Atlantic Coast range (Zydlowski et al. 2021). As such, juvenile survival and recruitment into the adult coastal population is critical to the persistence and recovery of these species in the watershed and contributes to the health of the Chesapeake Bay stocks. The [draft] EA describes these populations "recovered," which is not reflective of their current status in the Susquehanna River or Chesapeake Bay more broadly.

While the [draft] EA does describe American eel in the project vicinity, it does not describe the status of the species in the Susquehanna River. Their populations have shown promising signs of improvement in the Susquehanna River watershed due to sustained stocking efforts but are still far below their historical abundances. In the recent benchmark stock assessment (ASMFC 2023), the Atlantic States Marine Fisheries Commission (ASMFC) determined that this species was overfished and that overfishing was likely occurring. ASMFC also notes the substantial difficulty in assessing the status of the species given its complex life history and extensive distribution. In the Susquehanna, these species migrate past the Project intakes/outfalls to complete their life histories and are susceptible to intake-related mortality and behavioral modification due to water quality (i.e., temperature) modifications.

We have worked in coordination with the state and federal resource agencies through the Susquehanna River Anadromous Fish Restoration Cooperative (SRAFRFC) to restore migratory fish populations in the Susquehanna River Basin for several decades. SRAFRFC (2010) set several goals intended to support the recovery of these species. We note that extensive work remains to address habitat-related challenges in pursuit of these goals. Recent efforts have included the construction of a nature-like fishway at York Haven Dam along the southern end of Three Mile Island, approximately one mile downstream from CCEC. We wish to draw proactive attention to the current status of migratory fish in the Susquehanna River and the sustained efforts of state and federal partners in cooperation with hydropower facilities to meet these restoration goals. For additional information regarding the current status of migratory fish species in the Susquehanna River and associated management activities, please see the Susquehanna River Basin Commission SRAFRFC webpage [NRC team note: the commenter included a hyperlink to the following URL: <https://www.srbcc.gov/srafrfc/>].
(6-2 [Greene, Karen M.]

Comment: Lastly, section 3.7.1.1 states that populations of American Shad within the Susquehanna River have rebounded due to the construction of upstream passage facilities. This is inaccurate. The ASMFC's 2020 Benchmark Stock Assessment and Peer Review Report states that stocks of American Shad in their native range along the North American East Coast are likely at all-time lows (https://asmfc.org/wp-content/uploads/2025/01/AmShadBenchmarkStockAssessment_PeerReviewReport_2020_web.pdf). The NRC should not consider the Susquehanna River American Shad population to have rebounded and as a result, any impingement, entrainment, and thermal impacts to the species

could result in a reasonably foreseeable significant effect to the struggling population and the human environment in which they are a part. (7-4 [Yamashita, Coja])

Response: *In response to these comments, the NRC staff revised Section 3.7.1.1 to align with the information provided by the Pennsylvania Fish and Boat Commission and the National Oceanic and Atmospheric Administration regarding populations of the American shad, river herring, striped bass, and American eel.*

Comment: As indicated in E1.1 (Terrestrial Environment), a newly constructed nature-like fishway (NLF) exists on the southern portion of the CCEC site and the structure is within the 1-mile buffer area indicated in figure 3-4. The construction of this NLF was negotiated and undertaken over the last several years as provided for in the 2015 Federal Energy Regulatory Commission (FERC) relicensing of the York Haven hydroelectric project (FERC #: P-1888). The potential for withdrawal/discharge from the CCEC and its impact to aquatic life utilizing the NLF was not fully considered during its design. The construction of the NLF returned historic riverine functionality to this reach of the Susquehanna River and its operation is critical to the long-term restoration of migratory fish populations within the Susquehanna Basin. The PFBC considers the NLF to be a significant aquatic ecological resource within the CCEC site and is deeply concerned that the existence of the NLF is not acknowledged, and the potential impacts from the proposed action are not further analyzed in applicable sections of the EA. The PFBC is further concerned that the reauthorization of the CCEC and the associated effluent may result in significant alterations to the thermal profile of the NLF deterring migratory and resident species from utilizing the NLF, thus reducing the ability of these species to access critical spawning habitat or directing migrating fish towards the York Haven Hydroelectric Project which has been shown to be a significant source of mortality for out-migrating American Eel and American Shad. Specifically, the PFBC recommends that NRC include the following in the final EA:

- An assessment for the potential for alterations to the thermal profile within the NLF resulting from the CCEC's discharge during critical annual migration periods for migratory and fragile fish species such as American Shad and American Eel,

- Acknowledgement of the NLF in the various sections of the EA addressing impacts of the CCEC on the Commonwealth's aquatic resources (e.g., 3.7 and E2). (7-3 [Yamashita, Coja])

Comment: The intakes and outtakes of the Christopher M. Crane Clean Energy Center are not far upstream of the newly constructed NLF. The NRC's Draft EA states several times (on pages 3-16, 3-33, and D-6) that the thermal discharge temperatures are expected to be similar to those during previous power operations prior to plant shutdown, and that the maximum daily discharge temperature for power operations in the period 2014-2019 ranged from 98.2-103.10F. While YHPC is not requesting additional analysis or studies as part of this proceeding, we believe it is important to acknowledge the proximity of the thermal discharge to the newly constructed NLF and the potential for thermal conditions to influence fish behavior and fishway performance. Under its FERC license, YHPC is required to conduct effectiveness monitoring of the NLF beginning in 2027. To the extent thermal discharges associated with the Christopher M. Crane Clean Energy Center influence fish movement or fishway utilization, those conditions could affect the results of the required FERC monitoring. Accordingly, YHPC requests that the NRC recognize this potential interaction in the final Environmental Assessment so that it is appropriately documented as the project moves forward. (8-1 [Woolard, Angela])

Response: *In response to these comments, the NRC staff revised Section 3.7.3.1 under "Effects of Thermal Effluents on Aquatic Organisms (Plants with Cooling Towers)" to provide*

additional information on the mapped extent of the thermal plume for the CCEC in relation to the location of the NLF. Information about the newly constructed NLF was also added to Section E.2.2.3, and information about the size of the thermal plume was added to Section E.2.2.4.

Comment: The Fish and Wildlife Coordination Act (FWCA), requires that all federal agencies, such as NRC, consult with us when proposed actions might result in modifications to a natural stream or body of water. It also requires that they consider the effects that these projects would have on fish and wildlife and must also provide for the improvement of these resources. Under this authority, we work to protect, conserve and enhance species and habitats for a wide range of aquatic resources such as shellfish, diadromous species, and other commercially and recreationally important species that are not managed by the federal fishery management councils and do not have designated essential fish habitat (EFH). The Susquehanna River serves as important habitat for several migratory fishes including American shad (*Alosa sapidissima*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), and American eel (*Anguilla rostrata*). As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, we provide the following comments pursuant to the authority of the FWCA. We note that the FWCA is not described in the [draft] EA and should be considered for inclusion. Also, we confirm that the descriptions of the species that NOAA Fisheries manages under the Endangered Species Act (Section 3.8.2) and Magnuson Stevens Fishery Conservation and Management Act (Section 3.8.3) and the distribution of their respective habitats are accurately represented in the [draft] EA as they relate to the Project. (6-1 [Greene, Karen M.]

Response: *This comment describes consultation under the Fish and Wildlife Coordination Act (FWCA). The FWCA consultation requirement applies when a Federal agency proposes or authorizes an action and that action involves the impoundment, diversion, deepening, or controlling or modification of a body of water. The proposed actions that are the subject of this EA (the reauthorization of power operations at the CCEC) would not involve the impoundment, diversion, deepening, or controlling or modification of a body of water; they would support the resumption of facility operations using already-existing infrastructure, including the existing intake and discharge systems. Further, the NRC's proposed actions would amend an existing license rather than result in the NRC's issuance of a new license. Therefore, FWCA consultation is not required. However, as part of the NEPA process, the NRC requested comments from Federal and State agencies with special expertise, including on aquatic and surface water resources, the public, and other interested parties on the NRC staff's evaluation of environmental effects summarized in the draft EA. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

Comment: The EA acknowledges that the U.S. Environmental Protection Agency recognizes intake velocities below 0.5 feet per second (fps) are considered protective for aquatic biota from entrainment and impingement. As indicated in the EA, the intake through-screen velocity will be 0.27 fps (0.08 meters per second [mps]) during normal water conditions and 0.58 fps (0.18 mps) during low water conditions. To accurately assess whether reauthorization of the CCEC will result in a reasonably foreseeable significant effect on the quality of the human environment the PFBC recommends that the NRC's EA:

- Establish and include criteria for what is considered normal and low flow conditions,
- Analyze historical flow data and provide an estimate of the percentage of time that through-screen flows would exceed the recommended 0.5 fps,

- Provide and evaluate the estimated percentage of time through-screen flows would exceed the recommended 0.5 fps specific to the juvenile American Shad out migration period.
(7-2 [Yamashita, Coja])

Response: *This comment is concerned with potential effects to aquatic biota due to impingement and entrainment at the cooling water intake. In Pennsylvania, the Pennsylvania Department of Environmental Protection (PADEP) and the Susquehanna River Basin Commission (SRBC) issue permits related to the Clean Water Act (CWA) (TN662) and the management of resources within the Susquehanna River Basin, respectively. The approvals include National Pollutant Discharge Elimination System (NPDES) permits that regulate the withdrawal and discharge of cooling water and SRBC authorizations that allocate the use of surface water and groundwater within the river basin. As part of issuing an NPDES permit, the PADEP must ensure that the requirements of CWA Section 316(a) and (b), which concern impingement mortality, entrainment, and effects of thermal effluent discharges, are met. Functionally, these requirements are implemented through both the NPDES permit and the surface water withdrawal allocation (SRBC docket), which sets limits on the volume of water withdrawn and its consumptive use. Section 3.4 discusses these requirements, as well as the associated regulatory structure of the CWA. Section 3.7.3 discusses the impacts of impingement mortality, entrainment, and thermal effluents on aquatic resources as a result of the resumption of power operations at the CCEC. This section summarizes available scientific studies on the effects of cooling water withdrawal and discharge and acknowledges that the proposed resumption of power operations along with that of the CCEC's cooling water intake system would result in the loss of fish and other aquatic organisms.*

At this time, CEG is in compliance with all requirements that have been imposed under the CCEC NPDES permit and SRBC docket. The NPDES permit renewal application package was submitted by CEG to the PADEP in 2025 and a final permit would be issued prior to the resumption of power operations (CEG 2025-TN13023). On June 4, 2026, the SRBC issued new Docket No. 20260607, effective July 1, 2026, to CEG (SRBC 2026-TN13598). This new docket authorizes surface water withdrawal (peak day) of up to 73.2 Mgd (277 MLd) from the Susquehanna River.

This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment. However, the NRC staff has forwarded this comment to the PADEP for its consideration as part of the NPDES permit renewal.

Comment: We anticipate that the Project may adversely affect NOAA trust resources (i.e., migratory fish) in the Susquehanna River primarily through impingement/entrainment related mortality at the Project's intake. The [draft] EA considers this potential source of mortality, though NRC implies that high fecundity may offset any mortality. However, given the low adult returns to suitable spawning habitat in the Susquehanna River, any additional sources of juvenile mortality will challenge the recovery of these species. The 2020 American shad benchmark stock assessment (ASMFC 2020) notes that, in certain systems, fish mortality due to freshwater intakes has been estimated to be substantial. A paucity of data at the Project challenges our ability to fully quantify these impacts. In the Mid-Atlantic, resource agencies have identified best management practices (BMPs) for water intakes to minimize the entrainment and impingement of fish at different life history stages. New water intake structures proposed under the U.S. Army Corps of Engineers (USACE) Nationwide Permit (NWP) Program are required to meet the following associated regional conditions [the commenter included a hyperlink to the following URL:

<https://www.nap.usace.army.mil/Portals/39/docs/regulatory/publicnotices/2026/Special%20PN%20March%202026/Regional%20Conditions%20for%20Pennsylvania.pdf> in the Commonwealth of Pennsylvania:

- Intake velocities should not exceed 0.5 feet per second
- A 1 mm wedge wire screen or better technology be installed at the intake origin
- Intakes should be designed such that sweeping velocities across the intake screen are generally greater than intake velocities.

These BMPs are generally included in the regional conditions for all states in the Mid-Atlantic and New England regions, although Virginia requires more conservative modeling (See: Qin et al. 2022) and design standards [the commenter included a hyperlink to the following URL: https://townhall.virginia.gov/L/GetFile.cfm?File=C:/TownHall/docroot/GuidanceDocs_Proposed/403/GDoc_DWR_6693_20231017.pdf] under their NPDES permitting process. The information presented in the [draft] EA regarding the Project's existing intake structure suggests that these BMPs may not be fully met. We encourage and support any efforts to evaluate intake impingement and entrainment of Alosines (eggs, larvae, juvenile) and American eel (juvenile and adult) during the initial years of operation to determine whether the Project represents a significant source of mortality for these species and if additional measures can be implemented to reduce this mortality.

The discharge of heated effluent from the facility may also affect fish migrations. The Project will discharge heated effluent approximately one mile directly upstream from the newly-constructed Nature-Like Fishway (NLF) at the York Haven Dam. The construction of this NLF was negotiated and undertaken over the last several years and the potential for additional withdrawal/discharge from the Project was not fully considered during its design because the reauthorization of power operations at the CCEC were not contemplated at that time. As a result, we are concerned that the Project discharges may increase the temperature of water in the vicinity of the newly-constructed fishway that may impede fish use of this passage facility during both upstream and downstream migration. We encourage and support efforts to monitor the Project's effects on local water quality during these critical periods for fish movement (i.e., spring, fall). Such studies may inform the need for additional mitigative measures to sustain existing migratory fish populations and support their restoration and could include temperature monitoring at various locations downstream of the Project discharge, including, but not limited to the vicinity of the NLF, to determine the extent of thermal impacts from the Project.

(6-3 [Greene, Karen M.]

Response: *This comment is concerned with potential effects to migratory fish due to impingement and entrainment at the cooling water intake and through thermal discharges. In Pennsylvania, the PADEP issues permits related to the CWA, including NPDES permits that regulate the withdrawal and discharge of cooling water. As part of issuing these permits, the PADEP must ensure that the requirements of CWA Section 316(a) and (b), which concern impingement mortality, entrainment, and effects of thermal effluent discharges, are met. Functionally, these requirements are implemented through NPDES permits. Section 3.4 discusses these requirements, as well as the associated regulatory structure of the CWA. Section 3.7.3 discusses the impacts of impingement mortality, entrainment, and thermal effluents on aquatic resources as a result of the resumption of power operations at the CCEC. This section summarizes available scientific studies on the effects of cooling water withdrawal and discharge and acknowledges that the proposed resumption of power operations along with that of the CCEC's cooling water intake system would result in the loss of fish and other aquatic organisms.*

At this time, CEG is in compliance with all requirements that have been imposed under the CWA and the CCEC NPDES permit. The NPDES permit renewal application package was submitted by CEG to the PADEP in 2025, and the PADEP must issue a new permit prior to the resumption of power operations (CEG 2025-TN13023). The NRC staff reasonably assumes that any additional requirements that the PADEP may impose in a new permit would further minimize the impacts of impingement mortality, entrainment, and thermal effluents in accordance with CWA Section 316(a) and (b) requirements.

This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment. However, the NRC staff has forwarded this comment to the PADEP for its consideration as part of the NPDES permit renewal.

Comment: The PFBC recommends that the NRC take the following additional factors into consideration through their analysis prior to a final determination being made on the proposed action having no significant impact:

- Impingement and entrainment of aquatic organisms,
- Thermal impacts of discharges,
- Site vicinity to other resources of interest. (7-1 [Yamashita, Coja])

Response: *This comment concerns impingement, entrainment, thermal discharges, and site vicinity to other resources of interest. Section 3.7.3 discusses these impacts. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

Comment: We recommend including additional detail in the final EA regarding the migratory species presence and status, the particular importance of this reach of the river for these species, and the potential Project impacts on migratory fish in the Susquehanna River. We will continue to work with the SRAFRFC partners to evaluate information available related to the Project and provide technical assistance to support the recovery of migratory fish species in the watershed. (6-4 [Greene, Karen M.])

Response: *This comment concerns migratory fish species in the Susquehanna River and potential impacts from the proposed actions. In response to this comment, the NRC staff revised Section 3.7.3 to include the NLF and Section E.2.2.4 to include a paragraph about diadromous fish species under "State-Protected and Other Special Status Aquatic Species."*

Comment: There is no proof that Module 5 demonstrated that Three Mile Island Unit-1's updates since 2015 serve as the Best Technology Available. Constellation is providing a narrative of TMI-1 utilizing Best Technology Available consistent with the 2014 CWA 316(b) rule for impingement mortality and entrainment compliance. (9-3-7 [Epstein, Eric])

Comment: The data obtained from Peach Bottom's most recent Environmental Impact Statement has been rejected by the NRC. Constellation has been mandated to produce an updated site-specific Environmental Impact Study with data obtained after 2020.

The Clean Water Act 316(b) does not prescribe the Best Technology Available ("BTA") for entrainment; therefore, it must be determined on a site-specific basis. This submittal

demonstrates that TMI-1 does not achieve the BTA for entrainment. However, Constellation is creating a narrative of Crane utilizing Best Technology Available consistent with the 2014 CWA 316(b) rule for impingement mortality and entrainment compliance. CEG arrives at a hypothetical conclusion based on conjecture, and overly reliant on data from Peach Bottom and York Haven. There is no proof that Module 5 demonstrated that Three Mile Island Unit-1's updates since 2015 serve as the Best Technology Available.

This new NEPA arrives at a hypothetical conclusion based on conjecture based on a heavy reliance on data from Peach Bottom and York Haven. Peach Bottom is not a valid proxy. It is a boiling water reactor located 48 miles south of TMI. The reference comparisons are older and smaller hydroelectric generating stations that are in Lancaster and York Counties downstream from Three Mile Island. The Holtwood Dam, ("Holtwood"), the Safe Harbor Dam ("Safe Harbor"), and the York Haven Dam ("York Haven") are located in Lancaster and York Counties. The distance between the Conowingo Dam and TMI is 33 miles. The distance between the Holtwood Dam and TMI is 41.1 miles from TMI-1. The Safe Harbor Dam is 13 mile south of TMI.
(9-3-19 [Epstein, Eric])

Response: *In conducting its NEPA reviews, the NRC staff appropriately relies on the expertise and authority of the NPDES permitting authority when evaluating the impacts of impingement mortality and entrainment. If the NPDES permitting authority has made best technology available determinations for a facility under CWA Section 316(b) in accordance with the current regulations at 40 CFR Part 122 (TN2769), "EPA Administered Permit Programs: the National Pollutant Discharge Elimination System," and 40 CFR Part 125 (TN254), "Criteria and Standards for the National Pollutant Discharge Elimination System," and that facility has implemented any associated requirements, then the NRC staff concludes that adverse impacts on the aquatic environment will be minimized or regulated by the cognizant regulatory authority.*

In Pennsylvania, the PADEP issues permits related to the CWA, including NPDES permits that regulate the withdrawal and discharge of cooling water. As part of issuing these permits, this agency must ensure that the requirements of CWA Section 316(a) and (b), which concern impingement mortality, entrainment, and effects of thermal effluent discharges, are met. Section 3.4 discusses these requirements, as well as the associated regulatory structure of the CWA.

At this time, CEG is in compliance with all requirements that have been imposed under the CWA and NPDES permit for the CCEC. The NPDES permit renewal application package was submitted by CEG to the PADEP in 2025 (CEG 2025-TN13023), and a final permit would be issued prior to the resumption of power operations. On June 4, 2026, the SRBC issued new Docket No. 20260607, effective July 1, 2026, to CEG (SRBC 2026-TN13598). This new docket authorizes surface water withdrawal (peak day) of up to 73.2 Mgd (277 MLd) from the Susquehanna River.

These comments provide no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of these comments.

F.4.5 Comments Concerning Ecology—Terrestrial Resources

Comment: Section: 3.6.1.1, 3.6.2.4, E.1.3

Page: 3-22, 3-23, 3-25, E-2

Line: 42, 1-2, 36, 37

There currently are no known peregrine falcons nesting on the reactor building.

Section: 3.6.1.1

Page: 3-24

Line: 1, 10-11, 17-18

To clarify previously submitted RCI TER-06 response, the CCEC maintains an on-call relationship with a local certified wildlife rehabilitator that is available to assist and respond to distressed or injured wildlife but does not have a written contract with the rehabilitator.

(5-8 [Moore, Dennis M.])

Response: *The NRC staff revised the text in Sections 3.6.1.1, 3.6.2.4, and E.1.3 in response to these comments.*

Comment: Please refer to discussion in 3.6 of injured, killed and trapped Endangered Species in razor wire. It does not appear that Constellation has a contract with a wildlife specialist. Impediments to migratory pathways continue harm the bird population on TMI. (3.6.1.1 Eagles and Migratory Bird). (9-2-12 [Epstein, Eric])

Comment: Constellation should procure permits under the BGEPA or the MBTA for activities at the facility. (9-3-16 [Epstein, Eric])

Response: *Section 3.6.1.1 and Section E.1.3 discuss the status of compliance with the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA) (TN1447; TN3331). As stated in Section 3.6.1.1, the NRC staff concluded that impacts on protected birds associated with the activities related to the preparations for the resumption of power operations at the CCEC and the resumption of power operations would be managed through the applicable regulatory requirements and agency oversight and, therefore, would be NOT SIGNIFICANT. CEG maintains an Avian and Wildlife Management Procedure to guide its responses to and documentation of incidents involving protected birds. In addition to implementing eagle avoidance measures, CEG has modified its Avian and Wildlife Management Procedure to require immediate notification and coordination with the U.S. Fish and Wildlife Service regarding any incidents involving bald eagles. The U.S. Fish and Wildlife Service is responsible for administering permits under the two statutes. The NRC staff revised the text in Section 3.6.1.1 and Section E.1.3 based on updated information provided by CEG regarding the nature of its use of a certified wildlife rehabilitator.*

F.4.6 Comments Concerning General Editorial Matters

Comment: Section: Table 3.1

Page: 3-3

Line: North Access Bridge Repairs

The status of these repairs can be updated to complete instead of ongoing.

Table 3-1

Page: 3-4

Planned buried piping inspections and repairs are listed at five discrete locations of circulating water piping. The references for this table are the ER and RAI and RCI responses. These documents indicate that buried piping inspections and repairs are planned for circulating water piping, but they do not indicate there are structural repairs at five discrete locations of circulating water piping. (5-1 [Moore, Dennis M.])

Response: *The NRC staff reviewed and revised the text in Table 3-1 in response to these comments.*

Comment: Section: 3.3.1

Page: 3-8

Line: 14-16

The provisions defining prohibited acts in Londonderry Township Code, Chapter 10 § 104 apply to Pennsylvania Liquor Control Board licensed facilities, as stated in Chapter 10 § 101. This ordinance does not pertain to CCEC. **(5-2** [Moore, Dennis M.]

Response: *The NRC staff reviewed the applicability of the cited ordinance and deleted the statement in Section 3.3.1 along with the related reference in Chapter 6 in response to this comment.*

Comment: Section: 3.3.2

Page: 3-8

Line: 30-32

The final CCEC Plan Approval was issued by the PADEP on 5/19/26 under Plan Approval No. 22-05062A.

Section: 3.3.3

Page: 3-10

Line: 21-23

The final CCEC Plan Approval was issued by the PADEP on 5/19/26 under Plan Approval No. 22-05062A. **(5-3** [Moore, Dennis M.]

Response: *In response to these comments, the NRC staff revised the text in Section 3.3.2 and Section 3.3.3 to reflect the issuance of the plan approval. The NRC staff also made appropriate revisions in Table A-1 to reflect this updated information.*

Comment: Section: 3.4.1

Page: 3-12

Line: 5

The intext citation "PA DCNR 2008-TN12935" does not match TN number for this reference in the references on page 6-15, where it is listed as TN12934.

Section: 3.4.1

Page: 3-12

Line: 11

The six Susquehanna River subbasins, including the subbasin where CCEC is located, are identified in reference SRBC 2016-TN12952. However, the document cited is SRBC 2006-TN12954, which is older and provides less clarity. **(5-4** [Moore, Dennis M.]

Response: *The NRC staff reviewed the applicability of the reference cited and made appropriate changes to the reference citations in Section 3.4.1 in response to these comments. The reference list was also updated.*

Comment: Section: 3.4.2

Page: 3-15

Line: 18

SRBC Docket No. 20221203 will remain effective through June 30, 2026, whereupon it will be superseded by finalized and approved SRBC Docket No. 20260607.

Section: 3.4.2

Page: 3-15

Line: 23-25

For clarity, the following change in **bold** is suggested: "CEG has determined that dredging of the **Susquehanna River** that would require a permit from the U.S. Army Corps of Engineers (USACE) is not required prior to resumption of power operations (CEG 2026-TN12942)." (5-6 [Moore, Dennis M.]

Response: *The NRC staff revised the text in Section 3.4.2 for clarity with respect to the need for a U.S. Army Corps of Engineers permit and to reflect the issuance of new Docket No. 20260607 by the SRBC (SRBC 2026-TN13598) in response to these comments.*

Comment: Section: A.2

Page: A-3

Line: SRBC

The SRBC has approved the new docket for CCEC. SRBC Docket No. 20221203 will remain effective through June 30, 2026, whereupon it will be superseded by finalized and approved SRBC Docket No. 20260607.

Section: A.2

Page: A-3

Line: Synthetic Minor Operating Permit

The final CCEC Air Plan Approval was issued by the PADEP on 5/19/26 under Plan Approval No. 22-05062A. CCEC will apply for a Synthetic Minor Operating Permit as the station moves toward restart. (5-12 [Moore, Dennis M.]

Response: *The NRC staff revised Table A-1 to reflect the issuance of new Docket No. 20260607 by the SRBC (SRBC 2026-TN13598) and the final plan approval issued by the PADEP (PADEP 2026-TN13596). The NRC staff also made appropriate changes throughout the EA in response to these comments.*

Comment: Section: D.4

Page: D-6

Line: 45-47

The SRBC has approved the new docket for CCEC. The new SRBC Docket No. 20260607 allots 0.225 mgd peak-day withdrawal, and 0.099 mgd combined 30-day average withdrawal. (5-13 [Moore, Dennis M.]

Response: *The NRC staff revised Section D.4 for clarity in response to this comment and made appropriate changes throughout the EA to reflect the issuance of new Docket No. 20260607 by the SRBC (SRBC 2026-TN13598).*

Comment: The NRC provided two lists of abbreviations, acronyms, and metric equivalents, but was silent on the meaning or value of terms relied on repeatedly throughout the document, i.e., "affected environment," "as applicable," "as appropriate," "bulk," "considered any potential new

and significant information," de minimis levels," "diverse and flexible coping strategies," "efficiency," "environmental baseline," "environmental effect," "has been cited or incorporated by reference, where appropriate," "incorporation by reference," "has been cited or source documentation, "localized," and minor due," "non-significant" versus "significant," "other source documentation used is cited as applicable," "potential new and significant information," "previously disturbed land," "reasonably foreseeable," "small amounts of ozone and substantially temporary, be small and temporary [versus precise measurements for emissions]," and "will carefully review." (9-1-3 [Epstein, Eric])

Response: *The NRC acknowledges this comment and notes that the NRC staff followed the applicable requirements specified in 10 CFR Part 51 (TN10253) and other relevant agency guidance documents, including the use of plain language whenever possible, when using and defining specific terms in the EA. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

Comment: Section: 3.7.2.1 & 3.7.2.2

Page: 3-30

Line: 14-16 & 37-39

SRBC Docket No. 20221203 will remain effective through June 30, 2026, whereupon it will be superseded by finalized and approved SRBC Docket No. 20260607.

Section: 3.7.3.1

Page: 3-34

Line: 30-31

The SRBC has approved the new docket for CCEC. SRBC Docket No. 20221203 will remain effective through June 30, 2026, whereupon it will be superseded by finalized and approved SRBC Docket No. 20260607. (5-9 [Moore, Dennis M.]

Response: *The NRC staff reviewed the statements provided with respect to the status of the SRBC dockets for the CCEC and made appropriate changes in Sections 3.4.1, 3.4.2, 3.5.1, 3.5.2, 3.5.3, 3.7.2, 3.7.3, and Table A-1 to reflect the issuance of new Docket No. 20260607 by the SRBC (SRBC 2026-TN13598).*

F.4.7 Comments Concerning Geologic Environment

Comment: J. Douglas Glaeser of the Pennsylvania Geological Survey observed true argillite does not occur naturally in the Lower Susquehanna River Valley. What is found at Three Mile Island is metamorphosed silt. That is, a silt which has solidified after coming into contact with the heated intrusive dikes to the north and south of the island. (9-3-18 [Epstein, Eric])

Response: *Section 3.5 provides a general description of the geologic environment of the CCEC site and vicinity, including of the Gettysburg Formation which underlies the CCEC site. The description is based on the best available information. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

F.4.8 Comments Concerning Human Health—Radiological

Comment: Section: 3.11.1.1

Page: 3-44

Line: 34-39

Although the section earlier indicates that the NRC reviewed data from 2014-2024, this statement could be misinterpreted as representing the average occupational dose over the facility's entire operational life. The reported average of 0.063 rem applies only to the 2014-2024 period. (5-10 [Moore, Dennis M.]

Response: *The NRC staff revised Section 3.11.1.1 to clarify the reported timeframe in response to this comment.*

Comment: Unlike the Department of Energy, CEG does not maintain a health or cancer registry.

University of North Carolina epidemiologist Dr. Steven Wing conducted a study that correlated meteorological data from the time of the accident (which way the wind was blowing) with increased cancers and other adverse health effects compared to those in the area, but not under the plume.

A 2009 study in Germany found a 60 percent increase in cancers and a 120 percent increase in leukemia among children living within five kilometers of a nuclear power plant.

More recently, researchers at the Penn State Milton S. Hershey Medical Center have pointed to a possible correlation between TMI and an increase in thyroid cancers in the area surrounding the plant. (9-4-8 [Epstein, Eric])

Response: *The NRC has regulated the safety of U.S. nuclear power plants for more than 50 years using rigorous oversight, monitoring, and independent analysis to ensure protection of public health and safety. Decades of environmental monitoring data required by the NRC and collected by Federal and State authorities consistently show that routine releases from operating reactors result in extremely small public radiation doses, far below levels associated with measurable health effects and significantly lower than common sources of background radiation and medical exposure. Studies that do not account for these well-established data and scientific standards risk creating unnecessary public concern rather than contributing meaningfully to the scientific understanding of radiation health effects or the NRC's longstanding mission to protect people and the environment. While the NRC understands that people who lived near Three Mile Island at the time of the 1979 TMI-2 accident still have concerns, the amount of radiation released from the accident, initial cleanup, and decommissioning was small and is not believed to have caused cancer or to have affected public health and the environment. In the nearly 50 years since the accident, the NRC has not seen any evidence to suggest otherwise. CEG has continued to maintain a radiological environmental monitoring program at the CCEC to monitor for any radiological impacts to public health and the environment as compared to NRC standards, as well as to determine whether there is any buildup of long-lived radionuclides in the environment and changes in background radiation levels. These annual environmental operating reports are submitted to the NRC and are publicly available at <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/ccec>. In addition, the Commonwealth of Pennsylvania separately conducts confirmatory environmental monitoring at each of the State's nuclear power plants. Additional information is available at <https://www.pa.gov/agencies/dep/programs-and-services/radiation->*

[protection/decommissioning-and-environmental-surveillance/environmental-surveillance-section](#). Finally, while the NRC's regulations do not require reactor licensees to maintain a cancer registry, the Pennsylvania Department of Health maintains a cancer registry. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.

Comment: Three Mile Island has no off-site or real time radiation monitoring. CEG and the NRC review is optimistic and speculative. (9-2-18 [Epstein, Eric])

Response: The NRC's mission is to protect public health and safety. Nuclear power reactors routinely release radioactive gaseous and liquid effluents into the environment. The NRC requires these effluents to be monitored and controlled at the source in accordance with its radiation protection standards specified in the 10 CFR Part 20 (TN283). Each nuclear power plant has radiation monitoring instruments and procedures to control the release of these radioactive effluents. If radiation measurements exceed preset limits, alarms warn plant personnel of the problem in order for them to take action. Each nuclear power plant operator must submit an annual radioactive effluent release report to the NRC summarizing the types and quantities of radioactive materials released into the environment. For the CCEC, these reports are publicly available at <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/ccec>. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.

F.4.9 Comments Concerning Hydrology—Groundwater Resources

Comment: Three Mile Island-1 found elevated tritium levels onsite during the fall of 2005. The Elevated levels were due to a leak at one well traced to a sump from an auxiliary boiler in the turbine building (East Side). TMI's data, which was reviewed by the DEP, found tritium levels to be about 19,000 pCi/liter. The contaminated water did not commingle with onsite groundwater or broach the site boundary. TMI had announced that they may drill two additional wells. (9-3-21 [Epstein, Eric])

Response: The NRC staff revised Section 3.5.1 to include published 2025 groundwater monitoring data collected in accordance with the CCEC's radiological groundwater protection plan. These reports are publicly available at <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/ccec>. In the EA, the NRC staff has considered the best available data concerning inadvertent releases of radionuclides to groundwater at the CCEC site. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.

Comment: Section: 3.5.1

Page: 3-19

Line: 25-27

The new SRBC Docket No. 20260607 allots 0.225 mgd peak-day withdrawal, and 0.099 mgd combined 30-day average[.]

Section: 3.5.2

Page: 3-21

Line: 18-21

CEG reevaluated projected groundwater use and determined that an increase in withdrawal is not necessary. Instead, CEG requested a special condition to allow brief increases in withdrawal to support non-typical and maintenance activities, which may be necessary. The SRBC agreed to this condition and included it in the new SRBC Docket (No. 20260607) that was approved on 6/4/2026. SRBC Docket No. 20221203 will remain effective through June 30, 2026, whereupon it will be superseded by SRBC Docket No. 20260607.

Section: 3.5.3

Page: 3-21

Line: 28-29

The new SRBC Docket No. 20260607 allots 0.225 mgd peak-day withdrawal, and 0.099 mgd combined 30-day average[.] **(5-15 [Moore, Dennis M.]**)

Response: *The NRC staff revised the discussions in Sections 3.4.1, 3.4.2, 3.5.1, 3.5.2, 3.5.3, 3.7.2, and 3.7.3 and Table A-1, as appropriate, in response to these comments and to reflect the issuance of new Docket No. 20260607, effective July 1, 2026, to CEG (SRBC 2026-TN13598).*

Comment: Figure 3-3

Page: 3-18

In Section 3.5.1, page 3-17, line 34, it is indicated that the cross-section illustrates the approximated dip of bedding planes in the Gettysburg Formation bedrock; however, the dip of bedding planes is not indicated in the legend for Figure 3-3. **(5-14 [Moore, Dennis M.]**)

Response: *While the legend notation was omitted in the reproduced figure, the legend notation in the original figure that is cited and used as the source for the figure in the EA states that the depicted pattern reflects the “approximate bedding plane orientation in Gettysburg Formation (40°NW).” This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

F.4.10 Comments Concerning Hydrology—Surface Water Resources

Comment: Section: 3.4.1

Page: 3-12

Line: 40-42

In addition to high pH and PCBs reported in the Draft EA, this section of the Susquehanna River is also listed as impaired for mercury.

Section: 3.4.2

Page: 3-15

Line: 13-16

For clarity, the following change in **bold** is suggested: "CEG will refill equipment and systems that were drained of water following the plant shutdown. **CCEC intends to utilize existing industrial groundwater wells, supplemented by water from the Susquehanna River in accordance with the site's permitted water withdrawal rates in the existing SRBC docket.**

The two cooling tower basins, requiring approximately 5.5 million gallons (Mgal) (20.8 million liters [L]) each, and the spent fuel pools, will require a total of approximately 0.65 Mgal (2,460,000 L), will be filled from the Susquehanna River (CEG 2026- TN12942).

(5-5 [Moore, Dennis M.])

Response: *The NRC staff reviewed the suggested corrections and made appropriate changes in Sections 3.4.1 and 3.4.2 in response to these comments.*

Comment: Lake Cowanesque availability may suffer from a double count. The water in the event of an emergency is committed to the Susquehanna Steam Electric Station and Three Mile Island. (9-3-5 [Epstein, Eric])

Comment: This information is incorrect.

TMI: Consumptive Water Use:

2018: 19.2 MGD per monthly average.

2019: 6.0 MGD per monthly average.

2026: 21.0 MGD peak day.

Application increase:

1.8 million gallons or a 9% increase over 2022.

TMI: Surface Water Use:

2018: 122.8 MGD per monthly average.

2019: 44 .0 MGD per monthly average.

2026: 73.2 MGD per day

Application increase:

27.8 million gallons.

Ground-Water Withdrawals:

2018: .255 MGD per monthly average.

2019: .099 MGD per monthly average.

2026: .171 MGD per monthly average.

Application increase:

.72 million gallons. (9-3-8 [Epstein, Eric])

Response: *The NRC staff has performed a thorough analysis of projected water use and potential water use conflicts associated with the proposed resumption of power operations at the CCEC in Section 3.4. Section 3.4.1 was revised to reflect the issuance of new Docket No. 20260607, effective July 1, 2026, to CEG by the SRBC. This new docket authorizes the CCEC to withdraw up to 73.2 Mgd (peak day) of water from the Susquehanna River, which is a reduction of 40 percent as compared to that authorized prior to facility shutdown (SRBC 2026-TN13598). With respect to groundwater, the new docket authorizes continued groundwater withdrawals at the previously approved rates. This includes a combined withdrawal (30-day average) of 0.099 Mgd and a peak day withdrawal from all three supply wells of 0.225 Mgd (see also Table A-1). Section 3.5.1 was revised to reflect this new information. As indicated in Section 3.4.2, it is the SRBC that has the responsibility for managing the water resources of the Susquehanna River Basin including their allocation. Otherwise, these comments provide no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of these comments.*

Comment: The permit expired. The NRC conclusion is fallacious. Please refer to Appendix B for a discussion on the Clean Water Act, Section 401. (9-3-10 [Epstein, Eric])

Response: *The NRC staff assumes that the comment regarding an expired permit is in reference to the administratively continued NPDES permit governing effluent discharges from the CCEC and the NRC staff's conclusion in Section 3.4.2. As stated in Section 3.4.2 and elsewhere in the EA, CEG has applied for a new NPDES permit to support the resumption of power operations at the CCEC. Meanwhile, the current NPDES permit (issued in 2009) remains valid and in effect. In addition, the SRBC has issued new Docket No. 20260607, effective July 1, 2026, to CEG (SRBC 2026-TN13598). This new docket authorizes the CCEC to withdraw up to 73.2 Mgd (peak day) of water from the Susquehanna River, which is a reduction of 40 percent as compared to that authorized prior to facility shutdown. In addition, on August 14, 2026, the PADEP issued CEG a CWA Section 401 Water Quality Certification to support the restart, operation, and maintenance of the CCEC. As stated in the certification, the PADEP determined that the CCEC restart project complies with the applicable provisions of the CWA, appropriate requirements of state law, and further with Commonwealth applicable water quality standards. While the NRC staff appropriately assumes that CEG will comply with all permits and authorizations, the staff's conclusion with respect to projected surface water resources impacts from restart preparation activities and the resumption of power operations is based on the underlying data presented in Sections 3.4.2 and 3.4.3. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

Comment: This statement is also false. Constellation has expressed interest in uprating Three Mile Island Unit-1. (9-3-9 [Epstein, Eric])

Response: *The NRC staff has appropriately considered in the EA the reasonably foreseeable environmental effects of the proposed agency actions of restart preparation activities and the resumption of power operations. With regard to any other planned projects that would increase actual consumptive water use, water withdrawals for the CCEC's operations are subject to the new SRBC Docket No. 20260607 (SRBC 2026-TN13598), which authorizes the CCEC to withdraw up to 73.2 Mgd (peak day) of water from the Susquehanna River, which is a reduction of 40 percent as compared to that authorized prior to facility shutdown. The new docket also sets limits on site groundwater withdrawals (see Sections 3.4 and 3.5). Should CEG pursue a power uprate at the CCEC, a license amendment would be required in accordance with the NRC's regulations in 10 CFR 50.90 through 50.92 (TN249) and would be subject to a separate environmental review. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

Comment: The Environmental Assessment incorrectly states "restart activities and the resumption of power operations will not have any water obstruction(s), encroachment activities, or dams" when, at a minimum, maintenance dredging and modifications to the north bridge are proposed. Provide revisions to the Environmental Assessment to ensure that all modules are completed and are consistent with the instructions and appendices. The Environmental Assessment should discuss and quantify all potential impacts to waters of the Commonwealth associated with this project. (Christopher M. Crane Clean Energy Center, Application Number, WQC2203225-001.) (9-3-6 [Epstein, Eric])

Response: *It appears that this comment conflates elements of CEG's application to the PADEP for a CWA Section 401 Water Quality Certification and the associated Environmental Assessment Form that is part of CEG's application to the PADEP with the NRC staff's analysis in the EA. The contents of CEG's application are outside the scope of the NRC's environmental review. The statement provided in the comment that "restart activities and the resumption of*

power operations will not have any water obstruction(s), encroachment activities, or dams” does not appear in the EA. Nevertheless, CEG’s plans for maintenance dredging in support of restart preparation activities and the resumption of power operations are described in Section 3.4.2. Table 3-1 describes the major facility modifications and activities identified by CEG to support restart and evaluated by the NRC staff. As noted in Table 3-1, repairs to the north access bridge have now been completed. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.

F.4.11 Comments Concerning Meteorology and Air Quality

Comment: Has the onsite meteorological tower been relocated or replaced?
(9-2-13 [Epstein, Eric])

Response: *Section 3.3.1 discusses the current status of the onsite meteorological tower. As described in Section 3.1.2, CEG is working to determine the status of systems, structures, and components, as well as performing general refurbishment and maintenance to restore the CCEC to the operating conditions in 2019 prior to shutdown. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

Comment: Section: 6 Page: 6-6
Line(s): 7-12

Values in Table 3-2 (page 3-7) are different than the values found in the cited webpage. The reference citation directs the reader to the "2020 County-Level Process Data for Mobile and Nonpoint Emissions (Does Not Include Point Emissions)" Database. The table also uses the "2020 Facility-Level Data for Point Emissions" not cited in the reference.
(5-11 [Moore, Dennis M.]

Response: *The NRC staff revised Table 3-2 by adding a footnote to clarify that emissions presented include mobile, nonpoint, and point source emissions. Table 3-2 was also updated to reflect the correct emissions, and the reference listing in Chapter 6 was updated to appropriately indicate that Table 3-2 also includes 2020 facility-level data for point source emissions.*

Comment: Do either CEG or the NRC have proof Constellation with the state implementation plan? (9-2-15 [Epstein, Eric])

Comment: A conformity analysis is warranted. CEG and the NRC's miss the mark. Dauphin County is one three failing Pennsylvania counties according to the American Lung Association.
(9-3-2 [Epstein, Eric])

Response: *Section 3.3.1 includes a discussion of regional air quality including the attainment status of Dauphin County with respect to National Ambient Air Quality Standards (criteria pollutants). Dauphin County, where the CCEC is located, is in a designated maintenance area for particulate matter less than 2.5 microns (PM_{2.5}) and in attainment for the remaining criteria pollutants with respect to the State Implementation Plan (EPA 2026-TN12948; 40 CFR 81.339 [TN7226]). Sections 3.3.2 and 3.3.3 present the NRC staff’s analysis of projected air pollutant emissions associated with restart preparation activities and following the resumption of power operations. Based on the projected emissions, the NRC staff determined that it did not need to conduct a Clean Air Act conformity determination for the proposed actions since projected emissions do not exceed threshold levels listed in 40 CFR 93.153(b) (TN2495). States are*

responsible for ensuring compliance with State Implementation Plans through emission testing, facility permitting, and ambient air monitoring. Sections 3.3.2 and 3.3.3, in addition to Table A-1, reference the air pollutant emission permits applicable to the CCEC restart activities. These comments provide no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of these comments.

Comment: It is the 2007 composite emission factors the most up to date standard? It is unclear if CEG or the NRC factored daily deliveries or monthly EDG emissions. **(9-2-17 [Epstein, Eric])**

Response: *The NRC staff applied 2007 emission factors as a conservative (bounding) assumption because more recent emission factors are lower and the exact selection of earthmoving equipment to support restart preparation activities is not known at this time. With respect to deliveries, Table 3-3 and Table 3-4 present mobile emissions from frequent vehicular traffic, which consist of workers commuting to and from the site daily. With respect to emergency diesel generator emissions, these are accounted for in both Table 3-3 and Table 3-4 under "Onsite Combustion Equipment." As stated in the footnotes of each table, diesel generator emissions are based on 250 hours of operation per year per generator. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

F.4.12 Comments Concerning Noise

Comment: Constellation and the NRC failed examine noise ordinances for municipalities close or contiguous to TMI. Three Miles Island is located in Dauphin and Lancaster Counties, and York County is west of the Susquehanna River. Decibel levels vary based as does enforcement.

Dauphin County.

Londonderry Township. (Revised 2006-03).

[Ord. 2011-3, 9/6/2011]

1. No PLCB-licensed facility shall operate or cause to be operated any source of sound in such a manner as to create a sound level which exceeds 67 dB(A) when measured at or across the property line (boundary) from the noise source. Any sound source, whether stationary or nonstationary, that produces sound in excess of those levels shall constitute a noise disturbance.

2. When Exceeded. The sound level limit of 67 dB(A) shall be exceeded when any one or more of the following occur:

A. The sound at any one point in time exceeds 67 dB(A) by a measured sound level of 15 dB(A); or,

B. The sound exceeds 67 dB(A) by a measured sound level of 10 dB(A) for a cumulative period of one minute or more out of any ten-minute period.

3. Ambient Sound. In the event that the background ambient sound levels in an area of suspected noise disturbance exceed 67 dB(A), the sound level of the intrusive sound source shall be measured with the ambient background sound level being substituted for 67 dB(A).

Borough of Middletown.

Adopted 7-12-2004 by Ord. No. 1180, approved 7-12-2004]

(b) At any time other than the times set forth in Subsection A(1)(a) herein, such that the sound level at or across a real property line (boundary) exceeds 85 dB(A) for a period of one hour or longer.

Lancaster County.

Falmouth.

Falmouth, is an unincorporated village located within Londonderry Township, Dauphin County. Noise issues and public disturbances are governed by the township's Health and Safety Ordinances. Key specifics of the local regulations include:

- Decibel Limits: Commercial facilities must not operate sound sources that exceed 67 dB(A)
- General Nuisances: Unreasonable or unnecessary noise that disturbs the peace, rest, or sleep of neighborhood residents is generally prohibited.

York County.

Goldsboro.

The borough enforces noise limits via its zoning Zoning Hearing Board -Goldsboro Borough and ordinances using a "plainly audible" and "nuisance" standard rather than specific sound meters Goldsboro Borough -Zoning Ordinance.

The regulations governing noise and sound disturbances are defined as follows:

- Zoning Nuisance Rules: Under the Goldsboro Borough -Zoning Ordinance, no use is permitted that creates a nuisance, hazard, or substantial adverse effect on property value and the reasonable enjoyment of surrounding properties due to excessive noise.

unincorporated village located within Londonderry Township, Dauphin County. Noise issues and public disturbances are governed by the township's Health and Safety Ordinances. Key specifics of the local regulations include:

- Decibel Limits: Commercial facilities must not operate sound sources that exceed 67 dB(A).

- General Nuisances: Unreasonable or unnecessary noise that disturbs the peace, rest, or sleep of neighborhood residents is generally prohibited. (9-2-16 [Epstein, Eric])

Comment: There are no tracking mechanisms to confirm noise complaints in the surrounding communities during the five-year period the plant was shut down. How is this an achievement? The EA ignores deliveries and noise spikes when the plant restarts after a scram. Moreover, 1,200 additional trips will occur during refueling. (9-3-3 [Epstein, Eric])

Comment: Ignores deliveries and well documented noise spikes when the plant restarts after a scram. (9-3-4 [Epstein, Eric])

Response: *The NRC staff evaluated the potential reasonably foreseeable incremental environmental effects from restart preparation activities and from the resumption of power operations for the remainder of the operating term of the CCEC renewed facility operating license. Specifically, the NRC staff considered any new and significant information as to whether there could be operational impacts that would be new or different, including those resulting in a greater effect, as compared to the analysis of the term of the CCEC renewed facility operating license presented in the 2009 SEIS (NRC 2009-TN3684). This analysis included noise impacts as presented in Section 3.3. As stated in Section 3.3.3, CEG did not receive any noise complaints during the 5-year period prior to shutdown, when offsite noise impacts would likely*

be greatest. With respect to noise sources following the resumption of power operations, Section 3.3.3 notes that noise sources would include cooling towers, turbines, pumps, motors, and worker vehicle traffic. The NRC staff does not expect that noise generated in association with unusual events or refueling outages would be significantly different than that generated during prior operations. After restart, the NRC staff does not expect day-night sound level at the nearest residence to exceed 65 dBa, which the Federal Housing Administration guideline finds acceptable outside a residence. While the NRC staff did not consider individual municipal noise ordinances in detail, the 65 dBa standard used by the staff in assessing potential noise impacts ensures compliance with local ordinances with margin. While noise associated with the delivery of fresh fuel is not discussed, this activity is expected to occur during restart preparation activities, prior to the resumption of power operations. Further, this activity was evaluated by the NRC staff as part of a separate license amendment request and was approved by the NRC on July 1, 2026 (NRC 2026-TN13605). These comments provide no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of these comments.

F.4.13 Comments Concerning Process—Licensing Actions

Comment: The Environmental Assessment for TMI-1 underscores the need for a site-specific Environmental Impact Statement ("EIS"). This current compilation is based on bounded and outdated references, reference comparisons from outside of Three Mile Island ("TMI"), hopeful claims of environmental ambience, remote regulation, and unsubstantiated and vague terms. TMI-Alert documented the assumptions that lay the groundwork for this document. The Environmental Assessment along with the Draft Environmental Audit Summary Report released on February 26, 2026 - are cursory summaries, deficient, non-credible and lack scientific rigor. The EA more resembles a promotional industry publication rather than an empirical and site-specific assessment. The requisite due diligence required to examine an aging reactor -standing next to an identical Babcock & Wilcox reactor design that melted down on March 28, 1979 - requires a consequential study: It is difficult to distinguish the regulator from the regulated. **(9-1-1 [Epstein, Eric])**

Comment: If this is the case, why does the EA predate other necessary "interconnected parts" that have not been approved or fully litigated? **(9-1-5 [Epstein, Eric])**

Comment: The exemptions Constellation seeks, pursuant to 10 C.F.R. 50.12, as governed by explicit requirements. The District of Columbia Circuit has limited the granting of exemptions to "exigent circumstances": Section 50.12 provides a mechanism for obtaining an exemption from the procedures incorporated in section 50.10, but one that may be invoked only in extraordinary circumstances. The Commission has made clear that section 50.12 is available "only in the presence of exigent circumstances, such as emergency situations in which time is of the essence and relief from the Licensing Board is impossible or highly unlikely." Citing Washington Public Power Supply System, NRC 719, 723 (1977)]. NRDC v. NRC, 695 F.2d 623 (D.C. Cir. 1982).

The Commission has similarly emphasized that 50.12 exemptions are to be granted sparingly and only in cases of undue hardship. 39 Fed. 2 Letter, "Certifications of Permanent Cessation of Power Operations and Permanent Removal of Fuel from the Reactor Vessel," June 13, 2022, ADAMS ML22164A067. Reg. 14,506, 14,507 (1974).

Constellation bears a substantial burden to justify its request for an exemption. The three license amendments requested by Constellation must comply with the requirements

considerations which govern the issuance of an initial license. The Atomic Energy Act requires that an initial license for a nuclear plant must ensure that the plant will follow safety standards to protect health and to minimize danger to life or property. (9-1-6 [Epstein, Eric])

Comment: The National Environmental Policy Act NEPA "declares a broad national commitment to protecting and promoting environmental quality." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989) (citing 42 U.S.C. 4331). NEPA's "sweeping policy goals" are "realized through a set of 'action-forcing' procedures that require agencies to take a 'hard look' at environmental consequences" and "provide for the broad dissemination of environmental information." *Id.* at 350 (quoting *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976)).

Thus, NEPA requires agencies to prepare an environmental impact statement ("EIS") for every "major [f]ederal action" significantly affecting the environment. *Id.* at 348-49 (citing 42 U.S.C. 4332). "Major federal actions" include NRC's issuance or re-issuance of reactor licenses. *New York v. Nuclear Regulatory Com'n*, 681 F.3d 471, 476 (D.C. Cir. 2012) (citing *New York v. U.S. Nuclear Regulatory Com'n*, 589 F.3d 551, 553 (2d Cir. 2009)).

Constellation and the Commission must also satisfy the requirements of the National Environmental Policy Act, set forth in Part 51 of the NRC regulations. Pursuant to 10 C.F.R. 51.53, an environmental report is required for an operating license or the renewal of an operating license. Regarding Constellation's proposal to restart Three Mile Island Unit-1, Constellation has not submitted an Environmental Assessment.

Constellation and the Commission must also satisfy the requirements of the National Environmental Policy Act, set forth in Part 51 of the NRC regulations. The NRC has determined that it will only prepare an environmental assessment ("EA") and not an environmental impact statement. The Petitioner contends that the requested license amendments must not be granted because they violate the Atomic Energy Act, the National Environmental Policy Act and NRC regulations.

NRC's obligations under NEPA are "independent" of its Atomic Energy Act-based obligations, and nothing in the Atomic Energy Act precludes or limits NEPA. *Limerick Ecology Action*, 869 F.2d at 729-31. See also *Fla. Power & Light*, 54 N.R.C. at 13. Moreover, in *McGuire*, Units 1 and 2; *Catawba*, Units 1 and 2, CLI-02-17, 56 NRC 1, 10 (2002) emphasized NEPA's goal to "ensure that the agency does not act upon incomplete information, only to regret its decision after it is too late to correct.") (9-1-9 [Epstein, Eric])

Comment: Please provide the criteria and metrics used to determine "Significant" versus "Non-Significant."

The three NRC significance levels are delineated on the basis of what constitutes a "noticeable" impact (delineates SMALL from MODERATE) and a "destabilizing" impact (delineates MODERATE from LARGE). The interpretation of what is "noticeable" or "destabilizing" is no less subjective than the interpretation of what is "significant," although the expanded palette of possible conclusions allows for an expanded ability to resolve differences. Having three rather than two possible significance determinations conveys more information by way of a single conclusory word.

Interestingly, the NRC definitions do not identify a point where the traditional NEPA significance threshold lies. Clearly, SMALL impacts are not significant and LARGE impacts are significant.

The NEPA significance threshold must theoretically therefore fall somewhere within the range of MODERATE impacts: "somewhere between the point where an impact becomes noticeable and where it causes environmental destabilization. (2)

2 "Uses of Tiered Significance Levels in of New Reactors, United States Nuclear Regulatory Commission NEPA Document," J. Peyton Doub, PWS, CEP Environmental Scientist Office Rockville, Maryland. Capstone paper submitted in partial fulfillment of the requirements for the Certificate in NEPA. (Duke Environmental Leadership Program Nicholas School of the Environment at Duke University, 2014). (9-1-10 [Epstein, Eric])

Comment: "Incorporation by reference" appears to be a scheme where older and existing documents are accepted as a guiding reference point. This allows the licensee to avoid conducting a fresh analysis because that would impair "effectiveness." There is no evidence indicated that "bounded" documents have been reviewed. (9-1-12 [Epstein, Eric])

Comment: Who or what determines applicability? Please provide a checklist for the Consultations, permits, and regulatory requirements necessary for the resumption of power operations," including consultant, correspondence with regulatory agency, and date approved. (9-1-13 [Epstein, Eric])

Comment: Please identify agency, document, and date of the documents. Many of these documents were published before climate change awareness and fracking. The reference sheet is a hodgepodge of documents and includes incomplete data points, (absence of a wetland delineation and Endangered Species actions), outdated assumptions (employment levels and extreme weather event patterns), and a general lack of context (regional water pollution and radioactive waste part of the fuel cycle). (9-1-19 [Epstein, Eric])

Comment: What is the timeline? Where are the old Reactor Building Coolers stored? Are the BMPs the same as the management practices in 2019? What is the potential new and significant information that post-dated the SEIS in 2019? What are the incremental environmental impacts? (9-2-11 [Epstein, Eric])

Comment: What is the back-up plan if the authorizations and required permits are not attained? (9-3-12 [Epstein, Eric])

Comment: The Environmental Assessment for TMI-1 underscores the need for a site-specific Environmental Impact Statement ("EIS"). This current compilation is based on bounded and outdated references, reference comparisons from outside of Three Mile Island ("TMI"), hopeful claims of environmental ambience, remote regulation, and unsubstantiated and vague terms.

TMI-Alert documented the assumptions that lay the groundwork for this document. The Environmental Assessment - along with the Draft Environmental Audit Summary Report released on February 26, 2026 - are cursory summaries, deficient, non-credible, and lack scientific rigor. The EA more resembles a promotional industry publication rather than an empirical and site-specific assessment. The requisite due diligence required to examine an aging reactor -standing next to an identical Babcock & Wilcox reactor design that melted down on March 28, 1979 - requires a consequential study: It is difficult to distinguish the regulator from the regulated.

The NRC should supplant the Environmental Assessment with a dedicated, site-specific Environmental Impact Statement. (9-4-11 [Epstein, Eric])

Response: *The NRC staff reviewed and considered the comments concerning the decision to complete an EA to determine whether an EIS is required instead of completing an EIS in the first instance. The NRC staff prepared this EA in accordance with the NRC's regulations in 10 CFR Part 51 for implementing NEPA (TN661). The specific requirements applicable to the preparation of EAs are in 10 CFR 51.30 (TN10253). The NRC performed a detailed assessment to determine the most appropriate level of initial NEPA review for evaluating the proposed Federal actions, as described in Section 1.3.1. NRC actions explicitly requiring the preparation of an EIS in the first instance are specified in 10 CFR 51.20. As explained in Section 1.3.1, the proposed Federal actions are not specifically covered by the criteria for an EIS as delineated in 10 CFR 51.20 without knowing the significance of potential impacts from the proposed Federal actions. If the NRC staff were to determine in the EA that significant environmental impacts may result from the proposed actions, then the NRC staff would prepare an EIS. In Commission Legal Issuance (CLI)-26-7 (NRC 2026-TN13684), the Commission determined that an EIS is not required in the first instance for the environmental review of restart-related requests. As mentioned above, an EA is prepared to determine whether a proposed action would be likely to have a significant impact on the human environment, or where the significance of the impacts are not known. Within the NRC's NEPA framework and practices, a SMALL impact finding in an EIS is equivalent to a NOT SIGNIFICANT finding in an EA. Regarding the use of incorporation by reference as described in Section 1.3.4, this is a well-established and supported practice and directive under NEPA when the effect will be to cut down on bulk without impeding agency and public review of the action. As further described in Section 1.3.4, the NRC staff's analysis focused on the reasonably foreseeable environmental effects of restoration activities, including any new construction, and the reasonably foreseeable incremental environmental effects of any proposed operational changes associated with the resumption of power operations at the CCEC as compared to the NRC staff's findings in the 2009 SEIS (NRC 2009-TN3684). These resource-specific findings are described and quantified where applicable throughout Chapter 3. In the context of this EA, incremental effects or impacts are those that are generally new, different, or additive in nature to the effects previously identified by the NRC staff in the 2009 SEIS. Specific to the consultations, permits, and regulatory requirements necessary for the resumption of power operations, these activities and requirements are described principally in Chapter 3 and further in the supporting appendices. Table A-1 provides a summary of applicable permits and other requirements that pertain to the CCEC and those, where indicated, that are particularly relevant to the NRC's approval of the licensing and regulatory requests that are necessary to support reauthorizing power operations. However, while each nuclear power plant licensee must conduct its operations in accordance with all applicable Federal, State, and local permits and regulations, the majority of the permits and approvals listed fall outside the NRC's regulatory authority. As such, CEG's failure to obtain and/or comply with such permits or approvals would fall on the appropriate Federal or State regulatory agency to enforce. With respect to the scope and permissibility of the licensing and regulatory requests under consideration by the NRC, the Commission previously determined that restart requests are to be evaluated using the NRC's existing regulatory framework.*

These comments provide no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of these comments.

F.4.14 Comments Concerning Purpose and Need

Comment: "Given that two agencies' Federal actions collectively support preparation for resumption of power operations" is a retreat from oversight, and a clear admission of the NRC staff's role in support - prior to a review - of the restart. (9-1-4 [Epstein, Eric])

Response: *The NRC and the U.S. Department of Energy proposed Federal actions, as further described in Section 1.1, collectively support activities for the reauthorization of power operations at the CCEC to provide 835 MWe of baseload power generation capability. However, as stated in Section 2.2.2, the decision to pursue the restart of the CCEC is a decision by CEG, as the plant owner and operator, and is subject to the purview of State and other Federal energy-planning decision-makers, and not the NRC. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

F.4.15 Comments Concerning Socioeconomics

Comment: Traditional staffing levels have been 525, and the revised emergency planning protocol will eliminate positions. The current staffing is between 536 to 1,200. The numbers don't work unless there is an accelerated ramp-up and an accelerated power-down.
(9-2-1 [Epstein, Eric])

Response: *Section 3.1.1 describes projected staffing trends to support restart preparation activities with a workforce stabilizing around 600 following the resumption of power operations. A workforce of 600 is similar to that evaluated by the NRC staff in the 2009 SEIS (NRC 2009-TN3684), where a permanent workforce of 525 was cited. As with all environmental reviews, the NRC staff relies upon information from license applicants with independent verification by the staff as to the reliability of the information. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

F.4.16 Comments Concerning Waste Management—Radioactive Waste

Comment: Section 3.13.3 indicates that the continued storage Generic Environmental Impact Statement (GEIS) demonstrates that the continued power operations of nuclear power plants have had little or no environmental effects due to the uranium fuel cycle, spent fuel management, and transportation of fuel and waste. This is not true. The environmental impacts of on-site storage continuing indefinitely have not been demonstrated to have little or no environmental effects. The resumption of power generation at Crane Clean Energy center would result in the need for additional spent fuel to be stored on site, thus increasing the source term for potential releases that have not been analyzed. (1-1 [Chu, Shannon])

Response: *Spent nuclear fuel management will continue as discussed in Section 3.13. The environmental impacts of spent nuclear fuel management were previously assessed for the CCEC in the 2009 SEIS (NRC 2009-TN3684), generically in the 2024 LR GEIS (NRC 2024-TN10161) for continued operations, and generically in NUREG-2157, Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel (Continued Storage GEIS) (NRC 2014-TN4117) for the time period beyond the licensed life for reactor operations and prior to ultimate disposal. The management of spent nuclear fuel must be in accordance with NRC regulations including placement into the spent fuel pool and later transfer to and storage in the onsite independent spent fuel storage installation (ISFSI). Specifically, for the period after the licensed life for reactor operations, the Continued Storage GEIS addresses the environmental impacts of three storage timeframes: short-term, long-term, and indefinite storage. In accordance with 10 CFR 51.23(b) (TN249), the impact determinations in the Continued Storage GEIS regarding continued storage have been appropriately considered in this EA. This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

Comment: The restart will double the number of casks which are currently stored on a parking lot and below the floodplain. (9-1-20 [Epstein, Eric])

Response: *Section 3.13 includes the NRC staff's analysis of the environmental impacts of spent nuclear fuel generation as part of the overall uranium fuel cycle. As referenced in Section 3.13.2 and shown in Figure 2-2, the site's ISFSI is a secure, engineered facility located on the south end of Three Mile Island. Following the shutdown of the CCEC, the construction of the ISFSI was completed in 2022. All spent nuclear fuel from the CCEC has been transferred into dry cask storage at the ISFSI, and the spent fuel pool is currently empty. Spent nuclear fuel is stored in accordance with the NRC's regulations specified in 10 CFR Part 72, Subpart K (TN4884). This comment provides no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of this comment.*

F.4.17 General Comments in Support of the Licensing Actions

Summary: These comments express general support for the reauthorization of power operations at the CCEC.

Comments: (11-1) (11-2) (11-4) (11-5) (11-6)

Response: *The NRC acknowledges these comments.*

F.4.18 General Comments in Opposition to the Licensing Actions

Summary: These comments express opposition to the reauthorization of power operations at the CCEC. Reasons for opposition include safety concerns, other clean energy preferences, nuclear waste concerns, chemical discharge concerns, and the general timeline for the proposed project.

Comments: (2-2) (9-1-16) (9-1-18) (10-1)

Response: *The NRC acknowledges these general comments. In this EA, the NRC staff evaluated the potential environmental effects of the proposed Federal actions on all applicable resource areas and determined that they were all not significant. Since these comments are general in nature and do not provide any new and significant information related to the environmental effects of the proposed actions, no changes were made to the EA as a result of these comments.*

F.4.19 Comments Concerning General Environmental Concerns

Summary: These comments express a range of general environmental concerns regarding the potential reauthorization of power operations at the CCEC. In general, the comments disputed the finding of no significant impact as part of the EA and the NRC's understanding of various geographic characteristics of Three Mile Island and nearby associated infrastructure, requested copies of environmental permits and best management practices, and raised concerns over water use and the total area of disturbance at the site, over radioactive and other chemical releases from other nuclear power plants, over tax subsidies, over the underlying geology and potential for radon exposure, and over regional electricity demands on the grid.

Comments: (9-1-2) (9-1-14) (9-2-3) (9-2-9) (9-2-10) (9-3-11) (9-3-15) (9-3-20) (9-4-3) (9-4-5) (9-4-6) (9-4-7) (11-3)

Response: *These comments express general concerns regarding the potential reauthorization of power operations at the CCEC. The NRC acknowledges these comments and considered the topics identified in these comments. Several comments also overlap with NRC staff evaluations documented in Chapter 3, which the NRC staff has revised in response to other comments discussed in this appendix. Since these comments are general in nature and do not provide any new and significant information related to the environmental effects of the proposed actions, no changes were made to the EA as a result of these comments.*

F.4.20 Comments Concerning Out-of-Scope Concerns—Aging Management

Summary: These comments express concerns about the safety and storage of spent nuclear fuel and aging canisters at the CCEC. The comments focus on the information and assumptions presented in the NRC's Continued Storage GEIS and the potential risk of a possible loss of integrity and confinement of radioactive material in the canisters.

Comments: (1-2) (1-3)

Response: *The NRC staff is conducting both an environmental review and a safety review related to the requests in support of the reauthorization of power operations at the CCEC. The NRC staff's safety review is conducted in accordance with 10 CFR Part 50 (TN249), and the results of that review are documented in a safety evaluation issued separately from the environmental review. Operational safety issues related to the management of aging structures, systems, and components as well as the integrity of dry cask storage systems located in the onsite ISFSI on Three Mile Island are outside the scope of the environmental review. These comments provide no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of these comments.*

F.4.21 Comments Concerning Out-of-Scope Concerns—Miscellaneous

Summary: These comments express concerns about a variety of issues, including nuclear leadership, nuclear energy in general, funding and financial considerations, applicant business decisions, the speed of the environmental and safety reviews, background radiological monitoring near Three Mile Island, automated intelligence, and other environmental and socioeconomic concerns.

Comments: (2-1) (3-1) (9-1-7) (9-1-8) (9-1-11) (9-2-19) (9-2-20) (9-3-1) (9-3-17) (9-4-1) (9-4-2) (9-4-4)

Response: *The purpose of this EA is to determine whether the reasonably foreseeable environmental effects of the proposed agency actions could have a significant effect on the quality of the human environment and, therefore, warrant the preparation of an EIS. Business decisions or practices, financial concerns, and other related items are not within the NRC's regulatory authority or within the scope of an EA. The NRC is an independent agency and conducts its activities in an open and transparent manner. These comments provide no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of these comments.*

F.4.22 Comments Concerning Out-of-Scope Concerns—Safety

Summary: These comments express several safety-related concerns, including the need for copies of safety surveys, concerns regarding the weight limit of the Three Mile Island bridges, timelines for the replacement of certain buildings and structures, climate change concerns related to safety, and piping, corrosion, and other infrastructure concerns.

Comments: (9-2-4) (9-2-5) (9-2-6) (9-2-7) (9-2-8) (9-2-14) (9-3-13) (9-3-14) (9-4-10)

Response: *The NRC staff is conducting both an environmental review and a safety review related to the requests in support of the reauthorization of power operations at the CCEC. The NRC staff's safety review is conducted in accordance with 10 CFR Part 50 (TN249), and the results of that review are documented in a safety evaluation issued separately from the environmental review. Additionally, the NRC staff continues to perform inspections and to conduct other oversight activities to assess CEG's readiness to restart the CCEC. Inspection reports are public documents meant to capture the scope, observations, and findings of NRC inspections. They are comprised of results of both resident and regional inspections, including team activities. The results from the inspection reports will be publicly available and will be included on the NRC public website at <https://www.nrc.gov/info-finder/reactors/ccec>. With respect to climate change effects, the NRC staff considers the potential effects of climate change on environmental resource areas in combination with the proposed actions in Appendix D. However, the effects of climate change on the CCEC's infrastructure and operations are outside the scope of the NRC staff's environmental review. This is because an operating nuclear power plant is subject to continuous NRC oversight, as would be the case for the CCEC following the resumption of power operations, if approved by the NRC. NRC regulations require that plant systems, structures, 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 their NRC operating licenses, 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. If new information about changing environmental conditions becomes available, the NRC will evaluate the new information to determine whether any safety-related changes are needed at licensed nuclear power plants. This is a separate and distinct process from the NRC staff's environmental review that it conducts in accordance with NEPA (TN661) and the NRC's regulations for implementing NEPA. These comments provide no new and significant information related to the environmental effects of the proposed actions; therefore, no changes were made to the EA as a result of these comments.*