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Environmental Impact Statement for the Combined License Application for the Project Matador Advanced Energy and Intelligence Campus AP1000 Units 1–4

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Office of Advanced Reactors

COVER SHEET

Responsible Agency: U.S. Nuclear Regulatory Commission, Office of Advanced Reactors

Title: Environmental Impact Statement for the Combined License Application for the Project Matador Advanced Energy and Intelligence Campus AP1000 Units 1–4

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ABSTRACT

The U.S. Nuclear Regulatory Commission (NRC, the Commission) prepared this environmental impact statement (EIS) in response to a combined license application (COLA) submitted by Fermi America, LLC for the proposed construction and operation of four AP1000 advanced passive pressurized water reactors—designated as Project Matador Nuclear (PMN) Units 1–4. PMN Units 1–4 would be located at the Project Matador Advanced Energy and Intelligence Campus (Project Matador Campus) in Carson County, Texas, adjacent to the U.S. Department of Energy's (DOE's) Pantex Nuclear Weapons Facility (Pantex Plant).

This EIS evaluates the environmental impacts of the proposed action and the no-action alternative. After weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, the review team's preliminary recommendation is that the NRC issue the requested combined license to Fermi America, LLC contingent upon successful completion of the safety review and unless safety issues mandate otherwise. The NRC staff based its preliminary recommendation on:

- the NRC staff's independent environmental review
- the NRC staff's assessment of the applicant-prepared EIS
- the NRC staff's consultation with Federal, State, and local agencies and Indian Tribes
- the NRC staff's consideration of public comments received during the scoping process

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EXECUTIVE SUMMARY

On June 17, 2025, Fermi America, LLC (Fermi America) submitted the initial portion of its combined operating license application (COLA) for four AP1000 reactors, Project Matador Nuclear (PMN) Units 1–4 (FA 2025-TN13728) to the U.S. Nuclear Regulatory Commission (NRC, the Commission). On August 20, 2025, Fermi America submitted the second part of the COLA (FA 2025-TN13779). In a letter dated November 4, 2025, Fermi America agreed to participate in the NRC's voluntary pilot program for the preparation of an applicant-prepared National Environmental Policy Act of 1969, as amended (NEPA) document, pursuant to 42 *Unites States Code* (U.S.C.) 4336a(f), "Sponsor preparation" (TN661; NRC 2025-TN12678). The sponsor preparation provision allows a lead agency such as NRC to prescribe procedures to allow a project sponsor or applicant such as Fermi America to prepare a NEPA document (42 U.S.C. 4336a(f)-TN661). As lead agency, the NRC staff provided guidance, feedback and oversight in the preparation of this environmental impact statement (EIS). The NRC staff independently evaluated this EIS and assumes responsibility for its content. The NRC has responsibility for the NEPA EIS contents (NRC 2025-TN12678).

The proposed Federal action is the NRC's decision on whether to issue the combined operating licenses (COLs) to Fermi America, under the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52 (TN251), for the proposed construction and operation of four AP1000 reactors, PMN Units 1–4, located at the Project Matador Advanced Energy and Intelligence Campus (Project Matador Campus) in Carson County, Texas (FA 2025-TN12676). PMN Units 1–4 are intended to provide a reliable, secure, and carbon-free baseload power source that will be directly integrated into Project Matador's behind-the-meter data infrastructure. Project Matador includes up to an estimated 18 million square feet (Msf) of hyperscale computing space (FA 2025-TN12677, FA 2025-TN12679).

NRC's implementing regulations for NEPA under 10 CFR Part 51 require that the NRC staff publish a notice of intent to prepare an EIS in the *Federal Register* seeking public comments for scoping purposes (TN10253). The Notice of Intent was published March 20, 2026, and provided guidance on how to submit comments on the proposed action (91 FR 13641-TN13265). The NRC staff considered the comments received from interested stakeholders and the public, which are detailed in Appendix B, during the scoping process. Additionally, this EIS is being issued for public comment, and the NRC staff will consider comments received prior to publishing the final EIS.

After weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, the review team preliminarily recommends that the NRC issue the requested COL to Fermi America contingent upon successful completion of the safety review and unless safety issues mandate otherwise.

ABBREVIATIONS AND ACRONYMS

°C	degree(s) Celsius
°F	degree(s) Fahrenheit
µg/m^3	microgram(s) per cubic meter
µm	micrometer(s)
AADT	annual average daily traffic
ADAMS	Agencywide Documents Access and Management System
ac	acre(s)
ACC	air-cooled condenser
ACHP	Advisory Council on Historic Preservation
AEC	Atomic Energy Commission
AI	artificial intelligence
ALARA	as low as reasonably achievable
ANS	American Nuclear Society
APE	area of potential effects
AQCR	air quality region control
B&W Pantex	Babcock and Wilcox Technical Services Pantex, LLC
BA	biological assessment
bgs	below ground surface
BGEPA	Bald and Golden Eagle Protection Act
BLS	U.S. Bureau of Labor Statistics
BMPs	best management practices
BNSF	Burlington Northern Sante Fe Railway Company
BP	Before Present
BTS	U.S. Bureau of Transportation Statistics
BWR	boiling water reactor(s)
CAA	Clean Air Act
CDFs	cored-damage frequency
CDP	census designated place
CEDS	Comprehensive Economic Development Strategy
CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
CGP	Stormwater General Permit for Construction Activities
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
COL	combined license
COLA	combined license application
CRMWA	Canadian River Municipal Water Authority
CRP	Conservation Reserve Program

CWA	Clean Water Act
dBA	A-weighted decibel
DBAs	design-basis accidents
DCD	design control document
DoD	U.S. Department of Defense (now U.S. Department of War)
DOE	U.S. Department of Energy
DoW	U.S. Department of War
EIS	environmental impact statement
EMF	electromagnetic field
EPA	U.S. Environmental Protection Agency
EPZ	emergency planning zone
ESA	Endangered Species Act of 1973
ESP	early site permit
ETJ	extraterritorial jurisdiction
FEMA	Federal Emergency Management Agency
FEIS	final environmental impact statement
Fermi America	Fermi America, LLC
FGZ	fine-grained zone
FM	Farm to Market
FRA	Fiscal Responsibility Act
FSAR	final safety analysis report
ft	foot/feet
ft/mi	foot/feet per mile
FWS	U.S. Fish and Wildlife Service
FY	fiscal year
gal	gallon(s)
GEIS	generic environmental impact statement
GHGs	greenhouse gases
GMI	Geo-Marine, Inc.
gpd	gallon(s) per day
gpm	gallon(s) per minute
GW	gigawatt(s)
GWd/MTU	gigawatt-day(s) per metric ton of uranium
GWLs	Global Warming Levels
H_2O	water vapor
ha	hectare(s)
HABs	harmful algal blooms
HE	high explosives
HVAC	heating, ventilation, and air conditioning

Hz	Hertz
I-40	Interstate Route 40
IAEA	International Atomic Energy Agency
IBR	incorporation (or incorporate) by reference
in	inch(es)
IPaC	Information for Planning and Consultation
IPCC	International Panel on Climate Change
ISD	Independent School District
ISFSI	independent spent fuel storage installation
KAMA	Amarillo National Weather Service Station
km	kilometer(s)
kW	kilowatt(s)
LERF	large early release frequency
LLW	low-level radioactive waste
LR GEIS	*Generic Environmental Impact Statement for License Renewal of Nuclear Plants*
LRWS	liquid radioactive waste system
LULC	land use and land cover
LWR	light-water reactor(s)
m	meter(s)
Ma	million years
MACCS	MELCOR Accident Consequence Code System
MB	maximum benefit
MBTA	Migratory Bird Treaty Act of 1918
MCLs	maximum contaminant levels
MEI	maximally exposed individual
Mgal	million gallon(s)
Mgd	million gallon(s) per day
mi	mile(s)
mph	mile(s) per hour
mrad/d	millirad per day
mrem/y	millirem per year
MRLC	Multi-Resolution Land Characteristic
Msf	million square feet
msl	mean sea level
MT	metric ton(s)
MW	megawatt(s)
MWe	megawatt(s) electric
MWt	megawatt(s) thermal

NAAQS	National Ambient Air Quality Standards
NCDC	National Climatic Data Center
NCRP	National Council on Radiation Protection and Measurements
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act of 1969
NESC	National Electrical Safety Code
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act of 1966
NIDIS	National Integrated Drought Information System
NNSA	National Nuclear Security Administration
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NR	not reported
NR GEIS	*Generic Environmental Impact Statement for Licensing New Nuclear Reactors*
NRC	U.S. Nuclear Regulatory Commission, the Commission
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWS	National Weather Service
ODCM	Offsite Dose Calculation Manual
OSHA	Occupational Safety and Health Administration
Palo Verde	Palo Verde Nuclear Generating Station
Pantex Plant	Pantex Nuclear Weapons Facility
Pb	lead
PGCD	Panhandle Groundwater Conservation District
PHMSA	Pipeline and Hazardous Materials Safety Administration
PILOT	payment in lieu of taxes
PM	particulate matter
PM_{10}	particulate matter with a mean aerodynamic diameter of 10 µm or less
$PM_{2.5}$	particulate matter with a mean aerodynamic diameter of 2.5 µm or less
PMN	Project Matador Nuclear
PMN Units 1–4	Project Matador Nuclear Units 1–4
PPE	plant parameter envelope
ppm	parts per million
PRA	probabilistic risk assessment
Project Matador Campus	Project Matador Advanced Energy and Intelligence Campus
PRPC	Panhandle Regional Planning Commission
PWCD	Panhandle Water Conservation District
PWRs	pressurized water reactor(s)

Q2	second quarter
RC	release category
RCRA	Resource Conservation and Recovery Act
REMP	radiological environmental monitoring program
RG	Regulatory Guide
RIMS II	Regional Input-Output Modeling System
RRS	Risk Reduction Standards
SAMA	severe accident mitigation alternative
SAMDA	severe accident mitigation design alternative
SD	school district
SF_6	sulfur hexafluoride
SFP	spent fuel pool
SHP	Southern High Plains
SHPO	State Historic Preservation Office
SME	subject matter expert
SMR	small modular reactor
SO_2	sulfur dioxide
SPCC	spill prevention control and countermeasure
SPE	site parameter envelope
SSP	shared socioeconomic pathways
SWPP	Stormwater Pollution Prevention Plan
T/yr	ton(s) per year
TAC	*Texas Administrative Code*
TCEQ	Texas Commission on Environmental Quality
TDEM	Texas Division of Emergency Management
TDS	total dissolved solids
THC	Texas Historic Commission
TIGER	Topographically Integrated Geographic Encoding and Referencing
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TTRF	Texas Tech University Research Farm
TTU	Texas Tech University
Turkey Point	Turkey Point Nuclear Plant
TWDB	Texas Water Development Board
TXDOT	Texas Department of Transportation
U-235	uranium-235
UIC	underground injection control
UO_2	uranium dioxide
U.S.-60	U.S. Highway 60
USACE	U.S. Army Corps of Engineers

USCB	U.S. Census Bureau
USDA	U.S. Department of Agriculture
USDM	U.S. Drought Monitor
USGS	U.S. Geological Survey
U.S.C.	*United States Code*
VMTs	vehicle mile(s) traveled
VOC	volatile organic compound
wt%	weight percent
WSC	Water Supply Corporation
WWII	World War II

1 INTRODUCTION

On June 17, 2025, Fermi America, LLC (Fermi America), a Texas-based limited liability company, submitted to the U.S. Nuclear Regulatory Commission (NRC, the Commission) the initial portion of combined operating license application (COLA) for the proposed construction and operation of four AP1000 advanced passive pressurized water reactors by Westinghouse Electric Company LLC, designated as Project Matador Nuclear Units 1–4 (PMN Units 1–4). The NRC acknowledged receipt of the initial submittal in a letter dated July 7, 2025 (NRC 2025-TN12921). Fermi America has opted for a phased approach to licensing the facility. As such, on August 20, 2025, Fermi America submitted the second part of the COLA (FA 2025-TN13779), which included non-site-specific technical chapters of the final safety analysis report (FSAR) under Submission Number 1. The application letter (FA 2025-TN12676) notes that several Final Safety Analysis sections with site or other information with environmental significance would be provided at a later date as Future Submission Number 2.

1.1 Proposed Federal Action

The proposed Federal action is the NRC's decision on whether to issue the combined operating licenses (COLs) to Fermi America, under the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52 (TN251), for the proposed construction and operation of four AP1000 reactors, PMN Units 1–4, located at the Project Matador Campus in Carson County, Texas (FA 2025-TN12676). These units would be located at the proposed Project Matador Advanced Energy and Intelligence Campus (Project Matador Campus) in Carson County, Texas, adjacent to the U.S. Department of Energy's (DOE's) Pantex Nuclear Weapons Facility (Pantex Plant) (FA 2025-TN12676, FA 2025-TN12677).

1.2 Purpose and Need

1.2.1 Purpose and Need Statement

The purpose of PMN Units 1–4 would be to provide onsite energy generation for the Project Matador Campus–to provide a reliable, secure, and carbon-free baseload power source that will be directly integrated into Project Matador's behind-the-meter data infrastructure. Project Matador includes up to an estimated 18 million square feet (Msf) of hyperscale computing space (FA 2025-TN12677, FA 2025-TN12679). The units would provide 4 gigawatts (GW) of power directly used to support Project Matador. The units would be part of Project Matador's onsite generation and serve onsite energy needs (FA 2025-TN12677 Part 1, footnote 1 page 1-3; FA 2025-TN12677).

The proposed Federal agency action, NRC issuance of the COLs, would support national policy goals for decarbonization, artificial intelligence (AI) infrastructure expansion, and energy security. PMN Units 1–4 would address the need for hyperscale data center-aligned, non-interruptible, and scalable power in the United States. Supporting and modernizing the United States' AI infrastructure are directives in the following executive orders:

- Executive Order 14141 (TN12680), "Advancing United States Leadership in Artificial Intelligence Infrastructure." Section 2 of this Executive Order states that it is the "policy of the United States to enable the development and operation of AI infrastructure, including data centers, in the United States in accordance with five guiding principles." A guiding principle (Section 2(c)) included development of clean energy inclusive of nuclear energy to power the AI infrastructure.

- Executive Order 14179 (TN12681), “Removing Barriers to American Leadership in Artificial Intelligence”, issued on January 23, 2025. Executive Order 14179 (TN12681) established that it is the “policy of the United States to sustain and enhance America’s global AI dominance in order to promote human flourishing, economic competitiveness, and national security.”

Additionally, the *Texas Code* Chapter 483, Texas Nuclear Energy Office, codifies a framework to support development and deployment of advanced nuclear reactor projects for electric generation. The framework supports advanced nuclear generation technologies while delivering safe, reliable, and clean energy solutions that address the State’s growing demands, enhancing energy security, and fostering economic growth (Texas 2025-TN12682: Chapter 483).

1.2.2 Need for the Project

The PMN Units 1–4 power generation would serve the onsite Project Matador data center loads, grid connections and controls to enable effective balancing and ensure onsite and grid power stability (FA 2025-TN12677). New data centers can require from 100 megawatts (MW) to 1,000 MW of power. Aggregate data center consumption can potentially account for up to 20 percent of a State’s total power consumption, with the need for behind-the-meter solutions that do not rely on grid expansion (FA 2025-TN12679).

Project Matador’s planned buildout is 11 GW of onsite power generation to support AI infrastructure. Texas’ grid operator, Electric Reliability Council of Texas, Inc., has a projected 2030 total summer capacity of 111 GW. Project Matador’s buildout to 11 GW would require approximately 10 percent of that capacity (FA 2025-TN12677) in the absence of onsite power generation. If Project Matador were to draw such a large amount of the available power generation capacity from the grid, it could lead to increased energy prices borne by residents and other businesses and potentially result in an increased risk of brownouts during periods of peak demand. Additionally, there would likely be a need to build increased transmission capacity to convey this amount of power to a relatively remote location. These factors support the need for Project Matador to supply its own power and not draw from the State’s capacity. Even with the four proposed AP1000 units (PMN Units 1–4), the potential increased capacity provided by the proposed action would still only supply approximately 4 GW of this projected need. The remaining Project Matador energy demand would need to be met by additional nuclear and non-nuclear power generation sources that Fermi America seeks to build on the Project Matador Campus.

1.3 NEPA Process

This section of the environmental impact statement (EIS) discusses the NRC’s National Environmental Policy Act of 1969, as amended (NEPA) processes and obligations, followed by a description in Section 1.3.2 of the processes behind preparation of this EIS as a pilot project using the applicant-prepared NEPA document process. Scoping and public involvement are discussed in Section 1.3.3.

NEPA requires Federal agencies to evaluate and disclose the environmental effects of a proposed Federal action on the human environment. The NRC complies with NEPA through its regulations in 10 CFR Part 51. Pursuant to NEPA, as amended; specifically, 42 *United States Code* (U.S.C.) § 4336a(f); project sponsors (applicants) may prepare environmental documents under the supervision of a lead agency, e.g., the NRC. The lead agency must independently evaluate the environmental document and assume responsibility for its content (TN10253).

Although current NRC regulations under 10 CFR Part 51 (TN10253) do not explicitly provide for applicant-prepared EISs, the Fiscal Responsibility Act (FRA) amendments to NEPA (TN10672), as implemented through the ADVANCE Act (TN11938), direct the NRC to consider authorizing the use of an applicant-prepared environmental document as NRC's draft environmental document. In compliance with NRC regulations specified in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," the applicant-prepared draft EIS includes all information required by 10 CFR 51.45, "Environmental report" (TN10253).

1.3.1 Level of NEPA Review

The level of environmental review associated with proposed NRC licensing actions is determined by the appropriate NRC staff director in collaboration with appropriate environmental subject matter experts (SMEs). There are three different levels of review under NEPA:

- categorical exclusion
- environmental assessment/Finding of No Significant Impact
- EIS/Record of Decision

The NRC established an interdisciplinary team of environmental SMEs to determine the appropriate level of review for this action. In consideration of current regulatory requirements, recent legislation, and Commission direction, the NRC staff reviewed the relevant documents. Based on this evaluation, the NRC staff has determined that preparation of an EIS is the appropriate level of NEPA review for this action.

1.3.2 Pilot Project

In a letter dated November 4, 2025, Fermi America agreed to participate in the NRC's voluntary pilot program for the preparation of an applicant-prepared NEPA document, pursuant to 42 U.S.C. 4336a(f), "Sponsor preparation" (TN661; NRC 2025-TN12678). The sponsor preparation provision allows a lead agency such as NRC to prescribe procedures to allow a project sponsor or applicant such as Fermi America to prepare a NEPA document (42 U.S.C. 4336a(f)-TN661). As lead agency, the NRC staff provided guidance, feedback and oversight in the preparation of this draft EIS. The NRC staff then independently evaluated the environmental document—this draft EIS—and assumes responsibility for its content (NRC 2025-TN12678). The NRC and the applicant, i.e., Fermi America, form the review team for this EIS.

1.3.3 Scoping and Public Involvement

NRC's implementing regulations for NEPA under 10 CFR Part 51 require that the NRC staff publish a notice of intent to prepare an EIS in the *Federal Register* seeking public comments for scoping purposes (TN10253). The Notice of Intent was published March 17, 2026, and provided guidance on how to submit comments on the proposed action (91 *Federal Register* [FR] 13641-TN13265). The NRC staff considered the comments received from interested stakeholders and the public, which are detailed in Appendix B, during the scoping process. Additionally, this draft EIS is issued for public comment, and the NRC staff will again consider comments received prior to publishing the final EIS.

1.3.4 Significance Determination

To guide its assessment of environmental impacts, three levels of significance for potential impacts were used: SMALL, MODERATE, or LARGE, which are defined as follows (10 CFR Part 51-TN10253: Appendix B to Subpart A):

> SMALL: Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. For the purpose of assessing radiological impacts, the NRC has concluded that those impacts that do not exceed permissible levels in the NRC's regulations are considered SMALL.
>
> MODERATE: Environmental effects are sufficient to noticeably alter important attributes of the resource but not to destabilize them.
>
> LARGE: Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

This draft EIS presents the review team's analysis that considers and weighs the reasonably foreseeable environmental effects or impacts of the proposed Federal action. It also includes information that the NRC staff believes is needed by agencies consulting under other environmental statutes such as the Endangered Species Act (ESA) of 1973, as amended (TN1010), and National Historic Preservation Act (NHPA) of 1966, as amended (TN4157). Finally, it provides the review team's preliminary recommendation regarding the issuance of COLs for PMN Units 1–4 at the Project Matador Campus in Carson County, Texas.

1.3.5 Analysis of Environmental Effects

Congress revised Section 102 of NEPA through the FRA of 2023 to specify how Federal agencies identify and disclose environmental effects in EISs. The amendment replaced the prior statutory language with the requirement to evaluate and disclose, among other things, "(i) the reasonably foreseeable environmental effects of the proposed agency action;" and "(ii) any reasonably foreseeable adverse environmental effects which cannot be avoided should the proposal be implemented" (42 U.S.C. § 4332(2)(C)(i)–(ii) TN4880).

The Council on Environmental Quality (CEQ) defines "effects or impacts" as changes to the human environment from the proposed action or its alternatives that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives (CEQ 2025-TN12366). CEQ further defines "reasonably foreseeable" as sufficiently likely to occur such that a person of ordinary prudence would take it into account in making a decision and explains that environmental effects should not be considered in an EIS if they are "remote in time, geographically remote, or the product of a lengthy causal chain" (CEQ 2025-TN12366). When defining the scope of analysis, CEQ advises agencies to document in the EIS where and how they drew a reasonable and manageable line relating to consideration of any environmental effects from the action or project at hand that extend outside the project's geographic boundaries or might materialize later in time (CEQ 2025-TN13266).

In accordance with these requirements, the NRC has scoped the reasonably foreseeable environmental effects analysis in this EIS to focus on reasonably foreseeable environmental effects of the proposed agency action—issuance of the COLs—and any reasonably foreseeable adverse environmental effects which cannot be avoided if the COLs are issued and the proposed project is constructed and operated, pursuant to 42 U.S.C. § 4332(C) (TN4880).

In Chapter 3 each environmental resource area covered includes a description of the affected environmental baseline ("affected environment") followed by a description of the future environmental setting and planned actions, followed by a description of reasonably foreseeable environmental effects ("environmental consequences") from implementation of the proposed NRC licensing action and any reasonably foreseeable adverse environmental effects which cannot be avoided, should the proposed licensing action be approved. Additionally, the environmental effects of greenhouse gas emissions (GHGs) and the impacts of climate change on environmental resources are considered in Appendix E.

Consistent with the principle of a "reasonable and manageable" line, and in consideration of the NRC's regulations at 10 CFR Part 51, preconstruction activities are included in the reasonably foreseeable environmental analysis (TN10253). Although preconstruction activities fall outside the NRC's regulatory definition of "construction," they remain relevant to the evaluation of reasonably foreseeable environmental effects because they are reasonably foreseeable adverse environmental effects which cannot be avoided should the proposal be implemented. This approach reflects CEQ's guidance to Federal agencies for implementing NEPA (CEQ 2025-TN12366) and NRC's regulatory framework as discussed above.

The NRC staff has also determined that certain present and future actions could substantially affect the same environmental resources as the proposed action and would therefore assist in reasoned decision-making. The future environmental setting and planned actions that may be considered interrelated are also discussed before the reasonably foreseeable environmental effects analysis to provide context to the reasonably foreseeable environmental effects analysis.

1.3.6 Incorporation by Reference and Use of the New Reactor Generic EIS

Incorporation by reference (or incorporate by reference - IBR) is a tool that Federal agencies can use to improve efficiency in writing analytical, concise, and informative environmental documents. IBR integrates material that is essential to a NEPA analysis, such as planning studies, analyses, or other relevant information, into the text of environmental documents. It reduces page length and increases readability without impeding agency and public review (10 CFR Part 51-TN10253: Appendix A). To ensure that this EIS stands alone and provides sufficient analysis for decision-making, the NRC staff has adhered to three principles, identified in NRC's regulations and guidance (NRC 2020-TN6710: Appendix A; 10 CFR Part 51-TN10253: Appendix A), when using IBR:

1. *Citation Specificity, Public Availability:* Prior to IBR of any material in this EIS, the NRC staff assured that the source document is publicly available. To assist readers in accessing the referenced material, the EIS provides hyperlinks to source documents in the reference section of the EIS. In instances where only a portion of a document is used for IBR, the pertinent text section(s), figures, and tables of the source document are cited.
2. *Summarize and Independently Verify:* Appropriate SMEs on the NRC staff independently evaluated and verified the technical reliability of all information included in this EIS by IBR. The EIS text includes a brief summary of the referenced material immediately following the citation. The EIS does not IBR conclusions from any referenced sources. All conclusions presented in this EIS were drawn independently by qualified SMEs working with the applicant and were reviewed by appropriate SMEs on the NRC staff.
3. *New Information and Relevance to Proposed Federal Action:* Appropriate SMEs on the NRC staff identified and discussed any new circumstances or information relevant to material included in this EIS by IBR. The experts ensured that the referenced material is not obsolete and that its context is appropriate to the proposed action or alternative addressed in the EIS.

This EIS frequently IBRs NUREG-2249*, Generic Environmental Impact Statement for Licensing of New Nuclear Reactors* (2026 NR GEIS) published in April 2026 (NRC 2026-TN12155). The NR GEIS generically evaluates the potential environmental impacts of 122 issues relevant to building and operating a new nuclear reactor, using assumptions related to plant design (the plant parameter envelope [PPE]) and site conditions (site parameter envelope [SPE]). The NR GEIS determined that of the 122 environmental issues considered, impacts from 100 issues may be generically determined to not be significant for any proposed new nuclear reactor meeting specific assumptions regarding the PPE and SPE. Because the NR GEIS and associated rulemaking was not complete during the drafting of this EIS, this EIS IBRs from the NR GEIS in the same manner as it does from other source documents. This EIS references relevant technical information and analyses from the NR GEIS, but the NRC staff uses the material from the NR GEIS in conjunction with other information when developing conclusions. More detailed information on how the NR GEIS was used in this EIS is provided in the introduction to Chapter 3.

1.3.6.1 Regulatory Provisions, Permits, and Required Consultations

Before building and operating new units, Fermi America would be required to obtain certain Federal, State, and local environmental permits, as well as meet applicable statutory and regulatory requirements. A list of environmental potential authorizations, permits, and certifications relevant to the proposed COLs are included in Appendix H. Fermi America identified each environmental regulatory requirement, permit, and consultations necessary for the construction. The NRC staff have performed the consultations required under the ESA and the NHPA. Consultation correspondence is contained in Section 3.7, Appendix C, Appendix D, and Appendix J.

Report Contents

The sections of this EIS are organized as follows: Chapter 1 is an introduction. Chapter 2 provides a description of the proposed four AP1000 reactors (PMN Units 1–4), as part of the larger Project Matador Advanced Energy and Intelligence Campus, summarizing key elements of the design needed by the NRC staff to evaluate potential environmental impacts; presents the review team's evaluation of a range of reasonable alternatives to the proposed action; and provides a description and assessment of the need for power of the proposed facility. Chapter 3 describes the affected environment for each of the environmental resource areas identified by the review team through its scoping process, followed by potential environmental impacts on each resource area. The review team independently verified the affected environment descriptions and environmental impacts on each resource area. Chapter 4 summarizes the review team's conclusions and recommendation based on the environmental review. Chapter 5 provides references to documents cited throughout the document. The appendices to this EIS contain additional information and are as follows:

Appendix A—List of Preparers and Contributors to the Environmental Impact Statement

Appendix B—Public Comments Received on Project Matador Nuclear Units 1–4 Environmental Review

Appendix C—State Endangered, Threatened, and Conservation Concern Species in Carson and Potter Counties, Texas

Appendix D—ESA-Listed Species Effects Evaluations

Appendix E— Greenhouse Gas Emissions Estimates for Project Matador Nuclear Units 1–4 and Climate Change Impacts

Appendix F—Socioeconomics Information

Appendix G—Applicant-Generated Image Sources and Attributions

Appendix H—Regulatory Compliance and List of Federal, State, and Local Permits and Approvals

Appendix I—Meteorology Information

Appendix J—Chronology of Environmental Review Correspondence

2 THE PROPOSED PROJECT

2.1 Site

2.1.1 Site Location and Layout

Fermi America proposes to construct and operate four AP1000 reactors (PMN Units 1–4), located at the Project Matador Advanced Energy and Intelligence Campus in Carson County, Texas. The proposed units would be located within the Project Matador Campus.

The PMN Units 1–4 site encompasses an area of 881 acres (ac) situated in the northwest portion of the larger Project Matador Campus, which totals 5,236 ac. The project site is bound by Farm to Market (FM) Road 683 to the west, DOE's Pantex Plant to the north and east, and the remainder of the proposed Project Matador Campus to the south (FA 2026-TN13483). Figure 2-1 depicts the site's location.

The PMN Units 1–4 site lies approximately 17 miles (mi) northeast of Amarillo, Texas, the largest city in the 50 mi region. The geographic coordinates of the proposed PMN Units 1–4 site center point is 35.311174° N latitude and 101.600779° W longitude (FA 2026-TN13483). The entire Project Matador Campus, inclusive of the 881 ac PMN Units 1–4 site, is under institutional control via a 99-year lease with Texas Tech University (TTU) and has undergone environmental and geotechnical study, including soil borings, aquifer assessments, and cultural resource surveys (NRC 2025-TN12677). Figure 2-2 shows the existing site features and proposed plant arrangement within the site, and Figure 2-3 depicts the site and associated topographic features.

2.1.2 Offsite Project Matador Facilities

This EIS considers Fermi America's plans for the Project Matador Campus as detailed to the NRC during preparation of this EIS. The Project Matador Campus is slated to include data centers, substations, solar facilities, natural gas infrastructure, utility areas, water treatment and recycling systems, and other supporting facilities. Construction of permanent facilities would be in phases within the designated project area. Fermi America's design and engineering plans for the campus continue to mature and evolve as the project progresses. As such, supplements to this EIS may be necessary as plans for both PMN Units 1–4 and the larger Project Matador Campus evolve.

2.1.3 Vicinity

A 6 mi radius centered on the PMN Units 1–4 site center point includes portions of Carson and Potter Counties, Texas. The area surrounding the PMN Units 1–4 site consists of agricultural/vacant lands, rural residential areas, and several industrial areas, including DOE's Pantex Plant. Figure 2-4 depicts the nearby towns, major highways, and recognizable landmarks within the vicinity.

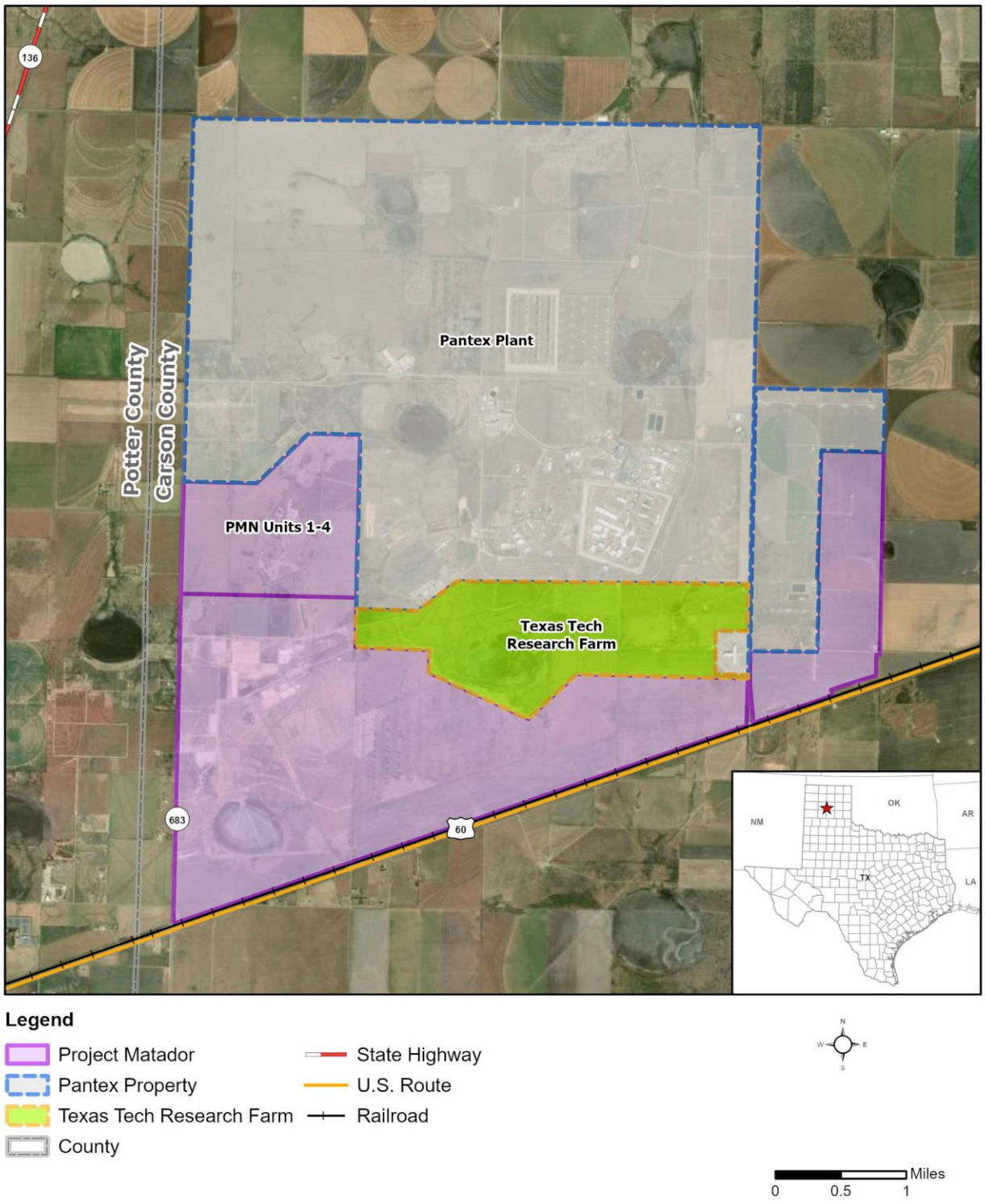


Figure 2-1 Map Showing the Project Matador Nuclear Units 1–4 Site Layout

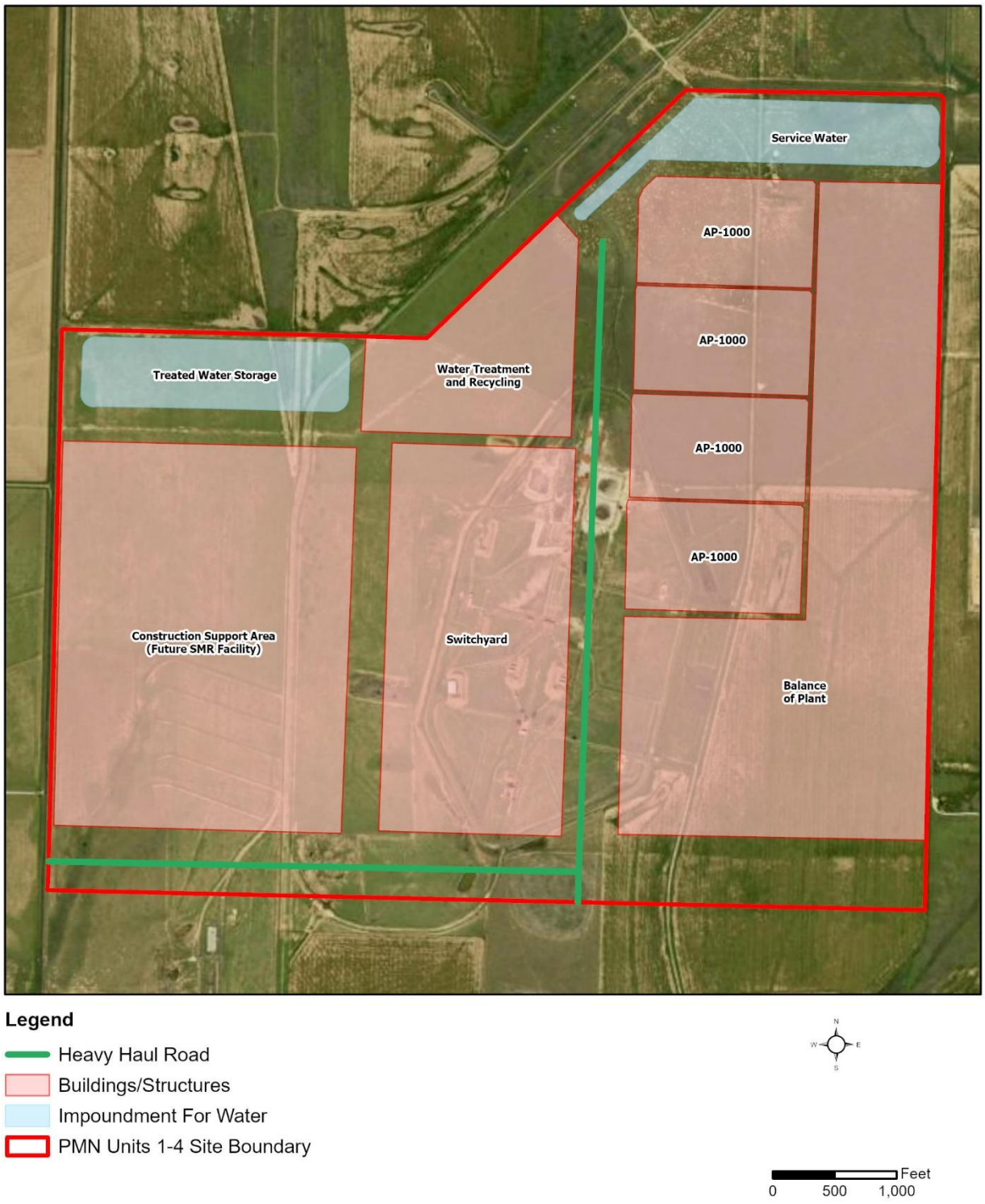


Figure 2-2 Project Matador Nuclear Units 1–4 Site Features

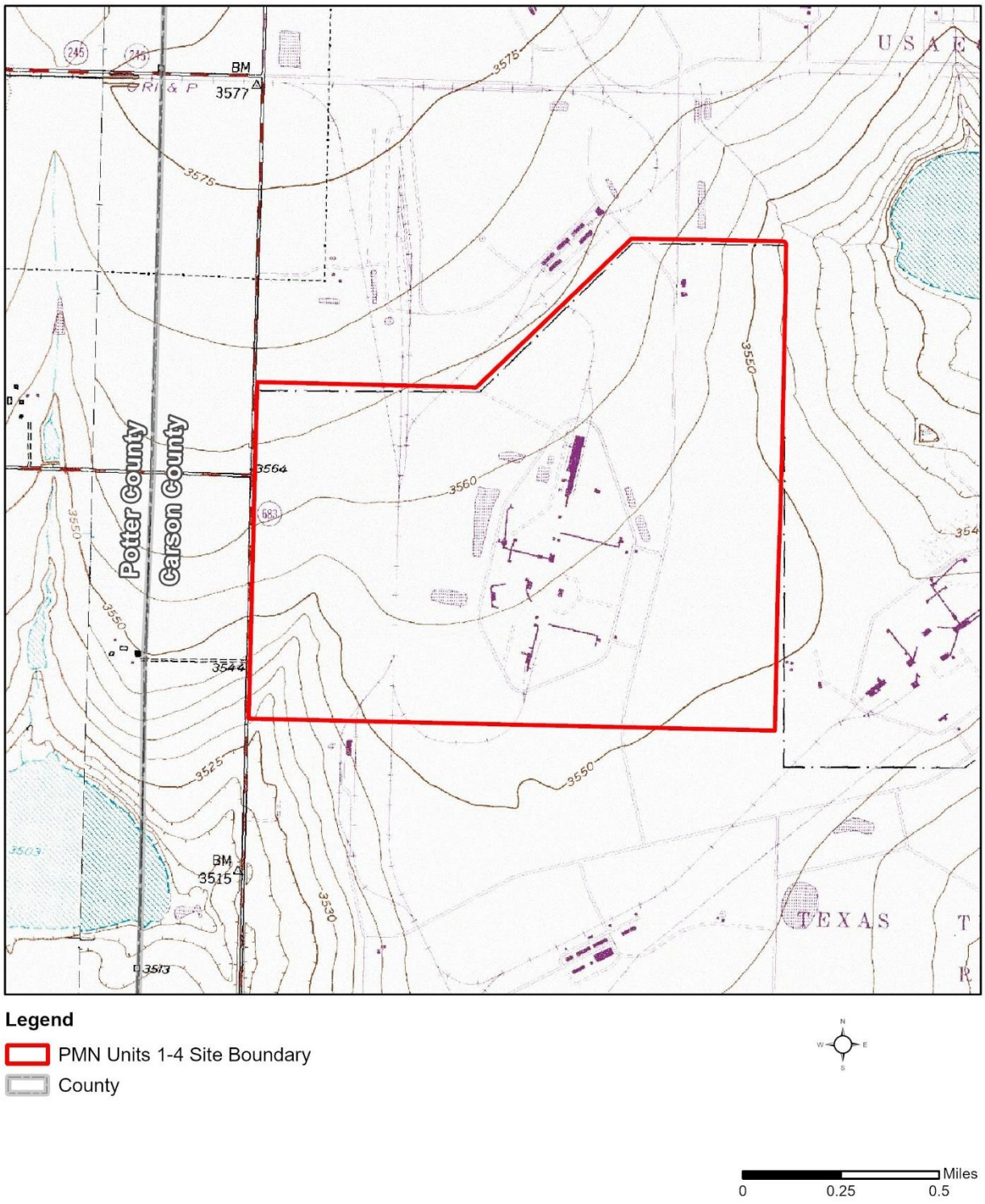


Figure 2-3 Topographic Map of Sevenmile Basin, Texas. Source: USGS 1953 (Photo Revised 1967 and 1973) (USGS 2026-TN13509).

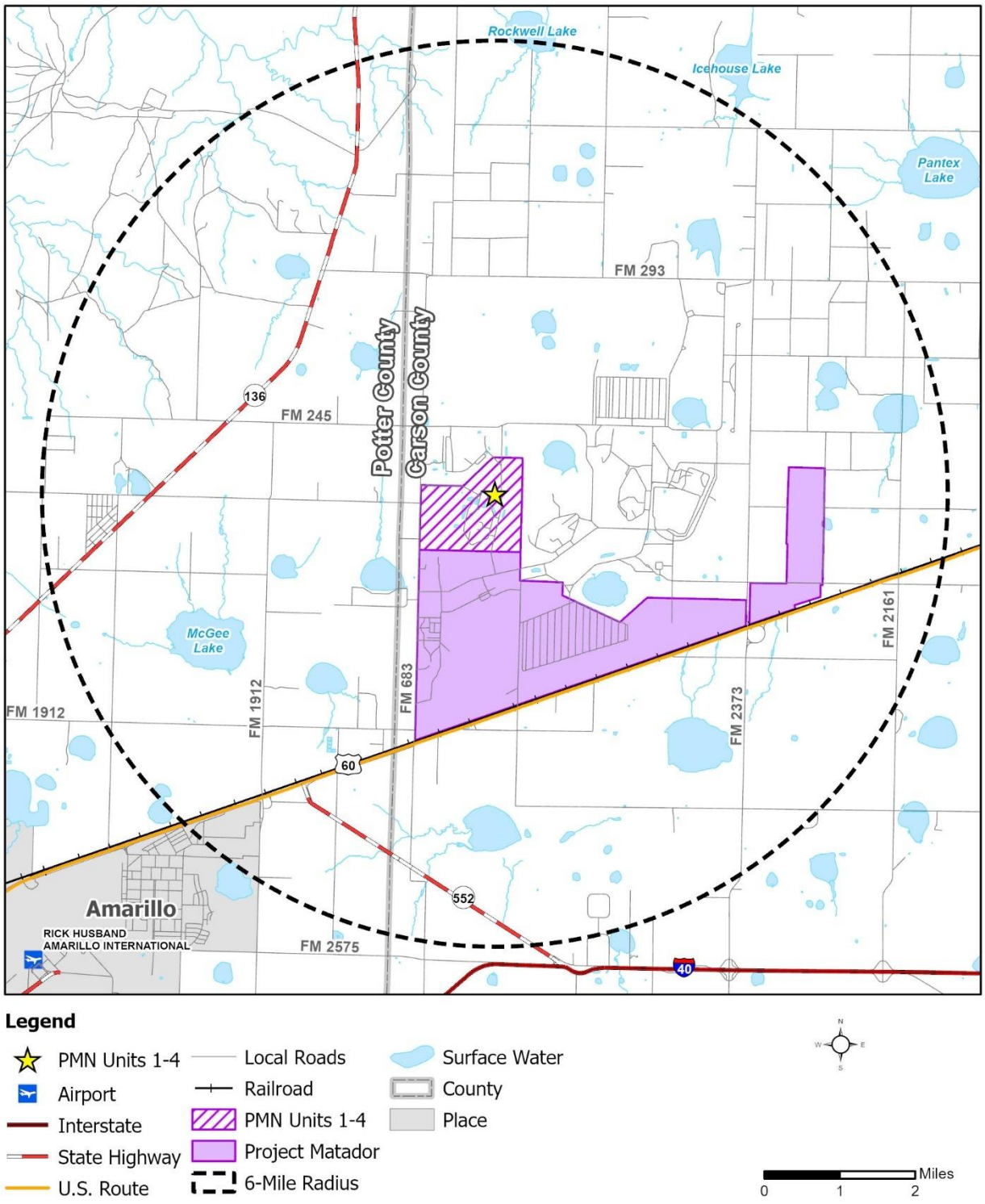


Figure 2-4 Map Showing the Vicinity (6 mi Radius) of the Project Matador Nuclear Units 1–4 Site

The Pantex Plant is a superfund site located immediately north and east of the PMN Units 1–4 site. It is an active Federal complex owned by DOE National Nuclear Security Administration (NNSA) and managed and operated by Babcock and Wilcox Technical Services Pantex, LLC (B&W Pantex). The complex covers approximately 16,000 ac of which 10,000 ac is owned by DOE and 6,000 ac is leased from TTU. The acreage leased from TTU serves as a buffer zone for site safety and security (EPA 2026-TN13380). The PMN Units 1–4 site is located to the northwest of the Texas Tech University Research Farm (TTRF). Figure 2-5 shows the 50 mi radius surrounding the PMN Units 1–4 site. The next nearest industrial location is the Tyson Foods, Inc. beef processing plant located approximately 4.3 mi to the southwest of the PMN Units 1–4 site center point (ACC 2026-TN13498).

U.S. Highway 60 (U.S.-60) traverses northeast to southwest approximately 2.8 mi at its closest point to the PMN Units 1–4 site center point and is used for both commercial and private traffic. A Burlington Northern Santa Fe (BNSF) Railway Company freight rail line runs parallel to U.S.-60.

The PMN Units 1–4 site is situated near multiple natural gas pipelines including interstate and intrastate corridors. All pipelines are designed and maintained under Pipeline and Hazardous Materials Safety Administration (PHMSA) pressure integrity requirements (NRC 2025-TN12677).

2.1.4 Region

The region, as defined by NRC for environmental review purposes in NRC's Regulatory Guide (RG) 4.2, includes the area within 50 mi of the PMN Units 1–4 site center point (shown in Figure 2-5). The region encompasses all or portions of 15 counties, which include Armstrong, Briscoe, Carson, Castro, Deaf Smith, Donley, Gray, Hartley, Hutchinson, Moore, Oldham, Potter, Randall, Roberts, and Swisher (TXDOT 2026-TN13377). The region is characterized by broad, flat terrain interspersed with shallow, closed drainage depressions known as playas, and underlain by the Ogallala and Dockum Aquifers (FA 2025-TN13779). Information on land use plans for these counties is provided in Section 3.2.

Major transportation routes include Interstate Route 40 (I-40) along with several U.S. and State highways. There are 22 airports within the region; 13 of these airports are public facilities and 9 are privately owned. The Rick Husband Amarillo International Airport, located approximately 8.7 mi southwest of the PMN Units 1–4 site center point, is the nearest and only full-services airport in the region. All other airport facilities are located more than 10 mi from the PMN Units 1–4 site center point and represent small airfields and air strips (AirNav 2026-TN13374). Major transportation routes and the nearest airport in the region are shown in Figure 2-5.

Recreational areas and parks in the region are depicted in Figure 2-6. There are six Federal and two State Parks along with numerous local parks and public lands. No military bases or Tribal lands are in the region (USDA 2026-TN13372).

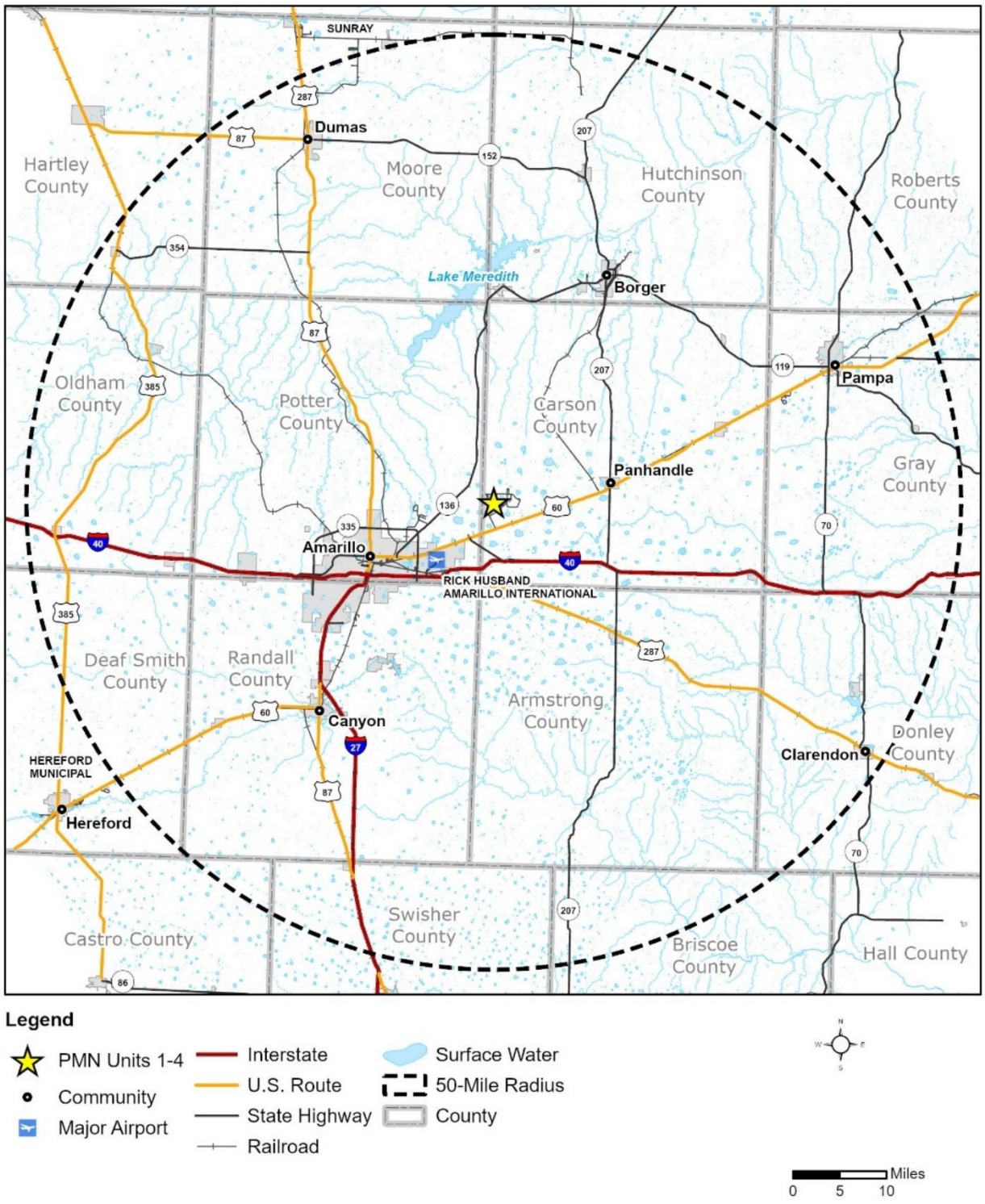


Figure 2-5 Map Showing 50 mi Radius of the Project Matador Nuclear Units 1–4 Site

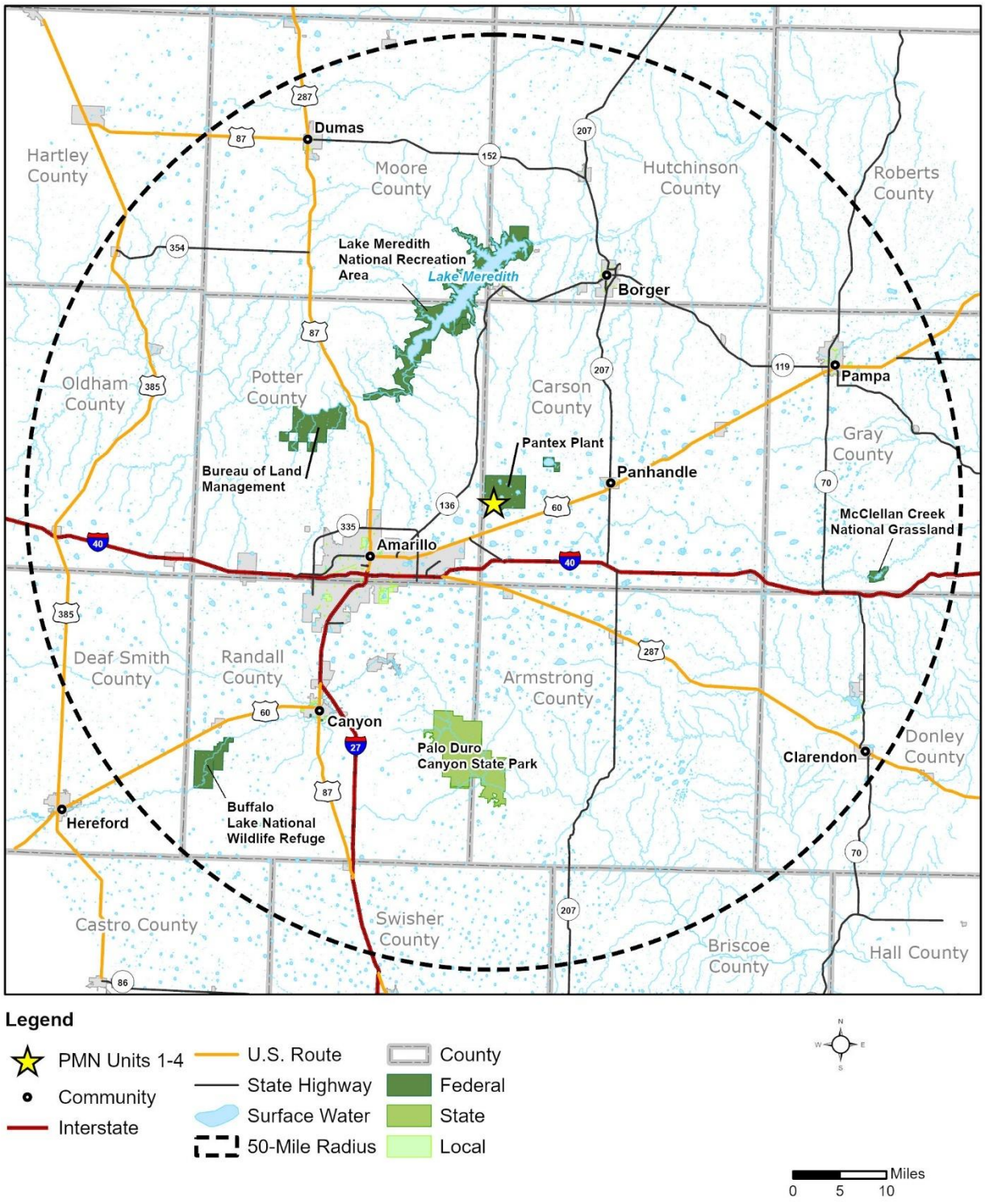


Figure 2-6 Federal, State, and Local Lands in Vicinity of the Project Matador Nuclear Site (50 mi)

2.2 Reactor Information

Fermi America has proposed building and operating four Westinghouse AP1000 nuclear power reactors at the Project Matador Nuclear site. An applicant or licensee intending to construct and operate a nuclear power plant based on the AP1000 standard design may do so by referencing the rule certifying that design, which is set forth in Appendix D of 10 CFR Part 52 (TN251). The standard design control document (DCD) for the AP1000 standard reactor design referenced in the application is DCD Revision 19 (Westinghouse 2011-TN261). Note that changes that could affect the environmental analysis that come from updates from the applicant or as a part of the safety analysis would be re-analyzed to determine if the impact analysis in this EIS is affected.

The major components of each AP1000 reactor include a single reactor pressure vessel, two steam generators, four reactor coolant pumps, and supporting piping. Each reactor core is housed inside its reactor pressure vessel and contains 157 nuclear fuel assemblies, each consisting of 264 fuel rods.

Each AP1000 reactor pressure vessel is connected to two steam generators via two hot legs and four cold legs. A reactor coolant pump is located on each cold leg to circulate pressurized reactor coolant through the reactor core. Within the primary system, coolant passes through the reactor core, where heat generated by nuclear fission is transferred to the coolant water. This thermal energy is subsequently transported by the circulating coolant to the steam generators, where it is transferred to feedwater supplied by the secondary system. The reactor coolant is then returned to the reactor pressure vessel by the reactor coolant pumps, where it is once again heated as it passes through the reactor core.

Within the steam generators, heat transferred from the primary system to the secondary system feedwater produces steam. This steam is conveyed via main steam piping from the steam generators to high-pressure and low-pressure turbines, which drive an electric generator to produce electricity. Steam exhausted from the turbines is condensed back to liquid water in the main condenser, then heated and pumped back to the steam generators, thereby completing the thermodynamic cycle. As discussed in Section 2.6.2.1, PMN Units 1–4 total water demand is estimated to be 1.4 million gallons per day (Mgd).

The AP1000 design has a thermal power rating of 3,415 megawatts thermal (MWt), and a net electrical power output of at least 1,000 megawatts electric (MWe) (Westinghouse 2011-TN261).

2.3 Cooling System

PMN Units 1–4 would use dry cooling for heat dissipation and would have no demand for cooling water. Each AP1000 unit would have its own air-cooled condenser (ACC) field (FA 2026-TN13483). The process water circulating in the condenser loop would pass through the unit's ACC system to transfer heat between the water circulating in the condenser loop and the ambient air. After passing through the ACC field, the cooled and condensed water would be recirculated back to the condenser to complete the closed-cycle cooling water loop.

Each ACC system would have an ACC field configured of 10 rows (i.e., "streets") of mechanical draft A-frame structures. Each street would have 16 cells with ACC tube bundles including tube sheets, headers, and fins. Each cell would have one approximately 33 feet (ft) diameter fan. Windwalls would be required and would extend 26–40 ft above the fan deck. Each field would be connected to the unit's condenser by a common steam header corridor and condenser return. The parameters of the ACC field are presented in Table 2-1. Figure 2-2 identifies an area labeled balance of plant, and the ACC fields would be located within this area. The ACC system vendor would provide separation distances, orientation, and configuration for the ACC fields.

Table 2-1 Cooling System Parameters for the Project Matador Nuclear Units 1–4

Parameter	Per Unit
Heat dissipation capacity	1,850 MWt per field 7,400 MWt for all four units
Configuration	10 streets of 16 cells, 1 fan per cell (160 total fans per unit)
Acreage	About 10 ac within the site for each grouping of cooling equipment with a common steam header corridor and condenser return commonly called a field (additional acreage needed for separation between fields to accommodate the 4 fields needed for the 4 units. The separation needed between fields is estimated at up to 1,150 ft) (SCGECS 2009-TN13371).
Height	115 ft (fan deck–60 ft)
Noise	Perimeter/operator areas: ~85–92 A-weighted decibels (dBA) (summer/high speed) (~1,000 m): ~50–58 dBA (summer/high speed) (FA 2026-TN13483)
Water demand	Cooling water: Fermi America reports that no cooling water will be used with the ACC designs (FA 2026-TN13483).
Energy demand (to be sourced from onsite generation)	Fans: 20–40 MW per unit (250 kW per installed fan) Other: 1.5 MW per unit

ACC systems are completely closed systems and would not require makeup water demand and would have no continuous blowdown discharge (NRC 2006-TN8385).

2.4 Transmission System

As presented in Section 1.2, PMN Units 1–4 are proposed to provide electricity to the Project Matador Campus. As shown in Figure 2-2, the PMN Units 1–4 nuclear site includes an onsite switchyard to provide power to the Project Matador Campus transmission system. This switchyard would be the connection to the private Project Matador grid and transmission infrastructure from the nuclear units; this onsite switchyard is in-scope for the proposed action. The transmission lines extending from the PMN Units 1–4 onsite switchyard to the Project Matador transmission system are not considered to be in-scope for the NRC license application. As required for any electrical infrastructure development, the transmission lines to support PMN Units 1–4 would be designed, installed, and maintained in compliance with the National Electrical Safety Code (NESC) and applicable Texas and local electrical standards.

2.5 Building Activities

Building PMN Units 1–4 would include site preparation and other activities that are not subject to NRC licensing, as well as construction activities that do require NRC authorization, prior to start, as indicated in 10 CFR 50.10(c) (TN249). The term “Construction” for the purposes of 10 CFR 50.10(c) is defined in 10 CFR 50.10(a) (TN249) to cover structures, systems, and components that have a reasonable nexus to radiological health and safety and/or common defense and security.

Building activities for the proposed PMN Units 1–4 would occur within the PMN Units 1–4 site boundary shown in Figure 2-2, with the exception of certain activities beyond the nuclear site but within the boundaries of Project Matador Campus. These activities would include connections to Project Matador infrastructure such as roads, water lines, electrical connections to support construction, and fiber optic lines with building activities likely extending outside of

the nuclear area to make these connections. Also, as discussed below, soil disposition and fill borrow areas could involve Project Matador areas outside of the nuclear site. Finally, construction workers would create Project Matador Campus parking areas which would be established outside of the nuclear site.

Past activities at the PMN Units 1–4 site resulted in nonradiological contamination that will require proper soil handling and disposal during building activities. PMN Units 1–4 site was previously used for cattle grazing and crop cultivation prior to World War II (WWII). During WWII, the U.S. Army Pantex Plant was located on the current-day Pantex Plant and the Project Matador Campus. The portion of the ordnance plant located at the nuclear site was Zone 9, a bomb loading line area. Historically, the nuclear site had legacy structures which included 39 buildings and foundations, concrete, and support structures. After WWII, the site of the proposed Project Matador Campus was purchased by TTU and used for agricultural research. Following TTU's acquisition of the property in 1949, the nuclear site was utilized for a research project regarding a herd of 1,000 sheep until approximately 1963. Hay and grain were stored in various buildings during this time. In the early 1950s through 1969, TTU leased some of the buildings of the PMN Units 1–4 site area to Phillips Chemical Company for carbon black and ammonium nitrate storage. During the 1970s and 1980s, hide rendering operations were conducted at the nuclear site area and human-made lagoons for holding brine water were installed on the property (Terracon 2025-TN12633).

Various environmental investigations have been carried out at the TTU property. Two recognized environmental concern sites are located within the PMN Units 1–4 site: Zone 9 and the Rockpile Area. As mentioned above, Zone 9 was a bomb loading area and later used for hide rendering operations and carbon black and ammonium nitrate storage. Zone 9 is approximately 100 ac. The Rockpile Area is approximately 1 ac and received drainage flow from Zone 9. Contaminants of concern include metals, explosives, and volatile organic compounds (VOCs) (Terracon 2025-TN12633).

During Cold War operations and until 1999 at the adjacent Pantex Plant, industrial process wastewaters were discharged directly to the unlined ditches that were used to carry water from effluent sources (i.e., industrial wastewater, treated sanitary wastewater, cooling water discharge, and storm water runoff) at the Pantex Plant to Playas 1, 2, and 4. The high volume of treated and untreated wastewater discharge that entered Playa 1 and its ditch system impacted perched groundwater beneath the Pantex Plant. In 1994, the Pantex Plant was placed on the Comprehensive Environmental Response, Compensation, and Liability Act's National Priorities List making the Pantex Plant a Superfund Site. As a result, a Record of Decision was executed establishing perched groundwater restrictions that extend into the eastern side of the PMN Units 1–4 area. This is further discussed in Section 3.5.2 (DOE 2008-TN12848).

The Pantex Plant's Superfund designation also concerned soil contamination. Deed recorded soil restrictions were established, affecting approximately 500 ac of the Project Matador Campus. The soil restriction areas are restricted to industrial or commercial land use. The soil restriction applies to a small area in the northeast corner of the PMN Units 1–4 site that extends from a Pantex Plant landfill operation (DOE 2008-TN12848; Terracon 2025-TN12633).

Fermi America conducted asbestos abatement activities for contaminated soils containing asbestos-related materials from historical buildings on the site in 2025–2026. Additional soil remediation activities would be conducted for contaminated soils due to other past activities at Zone 9 as site preparation activities progress. During building activities, Fermi America would

implement procedures to identify, segregate, characterize, and properly manage any soils exhibiting evidence of contamination.

2.5.1 Preconstruction

Preconstruction activities at the PMN Units 1–4 site would include site preparation activities such as:

- land clearing and grading and installation of stormwater controls
- building of site access roads
- establishing unloading and laydown areas, including spoils management areas
- erection of fences and other access control measures
- preparations for excavation and excavation
- construction of parking lots, temporary construction equipment storage sheds, warehouse and shop facilities
- installation of utility interconnections with PMN infrastructure (i.e., potable water system, sanitary sewerage treatment, electrical power, fiber optics)
- building of PMN Units 1–4 transmission infrastructure

The construction support area is depicted in Figure 2-2.

As discussed in Section 2.5, Fermi America initiated asbestos abatement activities at Zone 9 in late 2025 and early 2026 due to asbestos contamination remaining from previous buildings. The asbestos abatement activities were conducted under authorizations from the Texas Department of State Health Services. If needed, Fermi America would obtain necessary authorizations for additional soil remediation activities as appropriate. Site preparation work at the nuclear site is expected to be completed in approximately second quarter (Q2) 2028. See Table 2-2 for the PMN Units 1–4 schedule.

Table 2-2 Major Project Milestones for Project Matador Nuclear Units 1–4

Activity or Milestone	Unit 1 (Quarter and Year)	Unit 2 (Quarter and Year)	Unit 3 (Quarter and Year)	Unit 4 (Quarter and Year)
Preconstruction Start	Q4 2025	Site work completed during Unit 1 preconstruction	Site work completed during Unit 1 preconstruction	Site work completed during Unit 1 preconstruction
Preconstruction Finish	Q2 2028	-	-	-
Construction Start	Q2 2027[(a)]	Q2 2029	2031	2033
Construction Finish	Q1 2032	2034	2036	2038
Operations	2032	2034	2036	2038

Q = quarter.
"-" denotes no data in table cell.
(a) Data provided by applicant.

Site preparation includes ground-disturbing activities such as clearing and grubbing, site grading, soil excavation, and backfill placement. This site preparation would employ conventional heavy construction equipment including bulldozers, dump trucks, hydraulic

excavators, motor graders, and scrapers. Sound levels for construction equipment are discussed in Section 3.9.2. Materials and equipment are planned to be transported to the nuclear site via the transportation network shown in Figure 2-5. A heavy haul route utilizing existing roadways was established by the Texas Department of Transportation. The route is State Highway 136 to FM 293 to FM 683.

Before ground-disturbing activities occur, Fermi America would mark deed restriction areas to protect groundwater and recorded waste and legacy material burial sites (see Section 3.2). Fermi America obtained a construction stormwater Texas Pollutant Discharge Elimination System (TPDES) permit for Project Matador inclusive of the PMN Units 1–4 site. The required erosion control measures per the permit would be installed on the nuclear site. Clearing and grubbing is assumed to occur within the nuclear site (i.e., 881 ac) (Figure 2-1). Soils suitable for backfill would be stockpiled on the site for future use. Grading (cut and fill) would create proper site drainage and a base for building pads. Uncontaminated soils not used for backfill within the PMN Units 1–4 site boundary would be used for site preparation and construction activities elsewhere on the Project Matador Campus. If encountered, contaminated soils would be managed in accordance with applicable Federal and State requirements, including waste determinations, documentation, and disposal at permitted facilities.

Fermi America would install temporary concrete batch plants at the nuclear site and estimates that up to three concrete batch plants during construction would be needed concurrently. No specific locations within the nuclear site have been designated at this early stage of construction planning for the AP1000 units. Air emissions from the concrete batch plants are addressed in Section 3.3.1. Water usage during preconstruction and construction including water for concrete mixing is addressed in Section 3.5.2.1.

To support PMN Units 1–4 construction activities in advance of the onsite power generation reaching operational status, a transmission line from existing Xcel Energy's power infrastructure was recently installed and connected to a newly constructed Project Matador substation south of the nuclear site boundary. This external power transmission infrastructure would support PMN Units 1–4 building activities prior to the onsite natural gas-fired generation reaching operational status. In addition, if needed, portable generator(s) could be used.

Excavation preparation and excavation for the nuclear island (the area that includes structures, systems, and equipment that are safety related) structures would be initiated and proceed as allowed during preconstruction per 10 CFR 50.10(c) (TN249) and be completed as construction activities. Deep excavation for the nuclear island structures is expected to minimally extend 40 ft below grade (Westinghouse 2011-TN261). Groundwater deed restrictions are in place and provisions applicable to excavation activities are discussed in Section 3.5.2. Fermi America would install dewatering systems and collect, test, manage, and dispose of dewatering water as required. If fill from the PMN Units 1–4 site does not meet NRC requirements for fill specifications, fill would be sourced from the Project Matador Campus provided the soil meets specifications. However, if soil from the PMN Units 1–4 site or the Project Matador Campus does not meet specifications, Fermi America proposes that fill would be sourced from established regional sources and transported over existing roadways within the region. In addition, preconstruction activities would include initiation of building/installation of non-safety related systems such as the condenser cooling system, service and process water systems and associated treatment and storage facilities.

2.5.2 Construction Activities

Fermi America would initiate construction activities subject to NRC approval once a COL is issued by the NRC. After receiving a COL for PMN Units 1–4, Fermi America would continue preconstruction activities not yet completed and initiate construction of structures, systems, and components that have a reasonable nexus to radiological health and safety and/or common defense and security.

Construction activities are expected to employ conventional heavy equipment including bulldozers, dump trucks, hydraulic excavators, motor graders, scrapers, compactors, concrete trucks, and pile drivers. Previously established areas for laydown and spoils are anticipated to continue to be utilized, and no changes to preconstruction travel pathways for materials and workers are anticipated.

Construction activities at the PMN Units 1–4 site would include building the foundation for nuclear island structures and subsequent completion of all AP1000 plant structures. The AP1000 plant arrangement is comprised of five principal building structures: the nuclear island, the turbine building, the annex building, the diesel generator building, and the radioactive waste building. The nuclear island consists of a free-standing steel containment building, a concrete shield building, and an auxiliary building. The foundation for the nuclear island is an integral basemat that supports these buildings (Westinghouse 2011-TN261). In addition, during the construction timeframe, Fermi America would complete building the balance of plant structures including the condenser cooling system, service and process water systems, and associated treatment and storage facilities.

The peak construction workforce is estimated to be 2,200 construction workers per unit with construction starts being staggered by approximately 2 years (FA 2026-TN13483). The number of employees onsite during the construction duration is estimated to peak at 8,200 and fluctuate per the schedule presented in Table 2-2, which is subject to change. The peak number of workers onsite during operations includes the following estimates: 600 workers for operations of Unit 1 and 230 workers for each additional AP1000 unit and an additional 1,000 workers during outages (FA 2026-TN13483). Figure 2-7 presents the peak workforce by type for the approximately 12-year construction of PMN Units 1–4 timeframe.

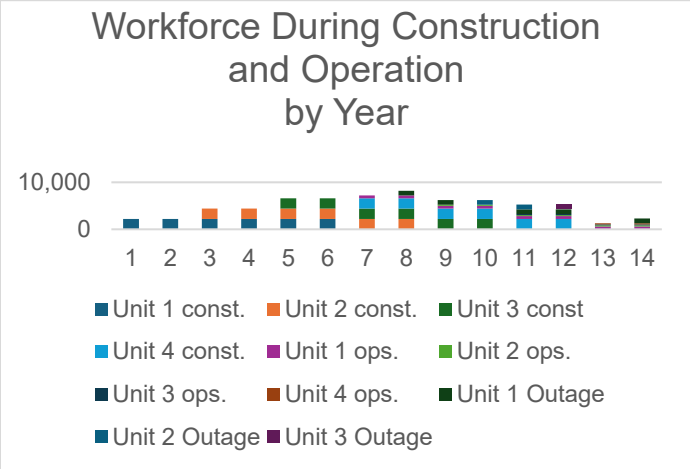


Figure 2-7 Estimated Peak Workforce During Construction and Operation Based Activities for Project Matador Nuclear Units 1–4. Adapted from: FA 2026-TN13483.

2.5.3 Resource Parameters for Building Activities

Wastes generated during preconstruction and construction would primarily include nonradioactive, nonhazardous construction and demolition debris from removing existing abandoned structures, municipal-type solid wastes and universal waste. Construction activities would generate typical industrial wastes such as metal, wood, paper, municipal solid wastes (i.e., food wastes), and solvents and industrial gases used in construction. Where practicable, solid waste would be recycled based on the capacity of local facilities. Universal wastes (i.e., batteries, pesticides) generated onsite would be managed using an approved vendor in accordance with local rules and regulations. Any used oil from equipment maintenance would be disposed of using an approved vendor. Any hazardous wastes generated during construction activities, as defined by 40 CFR Part 261 (TN5092), would be managed appropriately and shipped offsite for treatment and disposal as appropriate. All waste disposals would occur in permitted nonradioactive, nonhazardous, and hazardous waste facilities.

Table 2-3 provides a list of the significant resource commitments or parameters associated with building activities. The values in the table combined with the affected environment described in Chapter 3 provide the basis for the construction and preconstruction impacts assessed in Chapter 3.

Table 2-3 Summary of Resource Parameters During Building Activities for Project Matador Nuclear Units 1–4

Resource Area	Value	Parameter Description
All resource areas	2027–2038	Duration of construction activities from Unit 1 through Unit 4
Land Use, Terrestrial Ecology, Historic and Cultural Resources	881 ac including a construction support area of approximately 170 ac (not to be restored but repurposed for other Project Matador Campus use) (FA 2026-TN13483).	Disturbed area on the nuclear site
Water Resources (Groundwater)	40 ft (excavation)	Minimum excavation depth for nuclear island (Westinghouse 2011-TN261) Note: Groundwater was not encountered during subsurface exploration up to 100 ft (FA 2026-TN13483).
Water Resources (Groundwater)	Not to exceed 2.5 Mgd (FA 2026-TN13483).	Construction water would be obtained from Project Matador supply sourced from City of Amarillo potable water and/or municipal industrial water supply and is not expected to require withdrawal of surface water or groundwater from onsite wells or surface water bodies (FA 2026-TN13483). 2.3 Mgd is estimated to be consumed (e.g., dust suppression, concrete, washdown). 0.2 Mgd is estimated for sanitary and non-process wastewater flows.
Water Resources (Stormwater)	Collected water is intended for reuse rather than discharge	Routed to nuclear site or Project Matador engineered stormwater basin.
Socioeconomics	8,200 workers	Peak workforce during construction period (includes operations and outage workers) (FA 2026-TN13483).

Resource Area	Value	Parameter Description
Socioeconomics	180 shipments per day	Peak construction truck shipments of equipment and materials (FA 2026-TN13483).

2.6 Operational Activities

The operational activities considered in the environmental review are those associated with PMN Units 1–4 structures that interface with the environment, as described in Chapter 3. Examples of such operational activities are water use and discharge of waste heat to the atmosphere. Safety activities within the plant are discussed by Fermi America in the final safety analysis report (FSAR) portion of the application. The results of NRC's safety review will be documented in its safety evaluation report.

The operational workforce is estimated at 600 workers for operations of Unit 1 and 230 workers for each additional AP1000 unit with an additional 1,000 workers during outages. Outages for the AP1000 units are expected to occur at approximately 18-month intervals (FA 2026-TN13483). The bar graph in Figure 2-7 depicts the estimated peak workforce during construction for years 1 to 12 and for operations in years 13 and 14. Conservatively, Fermi America is assuming 100 percent of the operations workforce to in-migrate with families into a three-county economic region (see Section 3.8).

The following sections describe the operational activities, including operational modes (Section 2.6.1), plant-environmental interfaces during operations (Section 2.6.2), and radioactive and nonradioactive waste management systems (Sections 2.6.3 and 2.6.4).

2.6.1 Description of Operational Modes

The operational modes for the proposed PMN Units 1–4 considered in the assessment of operational impacts on the environment (Chapter 3) are normal operating conditions and emergency shutdown conditions. These are considered the conditions under which the maximum water requirement and heat dissipation occur. Cooldown, refueling, and accidents are alternative modes to normal plant operation. During these alternative modes of operation, water quantities, heat dissipation, and radioactive releases may change from normal operating conditions.

2.6.2 Plant-Environmental Interfaces During Operation

This section describes activities related to structures that have an interface to the environment during operation of the proposed PMN Units 1–4.

2.6.2.1 Water Use and Wastewater Discharge

Waste heat is a byproduct of normal power generation at a nuclear power plant. The proposed PMN Units 1–4 would use an ACC system to transfer heat from the main condenser to the atmosphere as described in Section 2.3; thus, the water uses and discharges for the proposed plant are process water and potable water for sanitary and drinking water. Potable water for sanitary use and drinking water for Project Matador inclusive of PMN Units 1–4 would be supplied by the City of Amarillo through a newly installed water pipeline. Process water for the operation of PMN Units 1–4, estimated at 1.4 million gallons per day (Mgd), would be supplied through municipal supply (FA 2026-TN13483). Nonradiological wastewater from the units' processes would be treated and recycled back into the process to minimize water use, and

blowdown from the water treatment would be discharged through a Texas-approved wastewater disposal system. Water use and wastewater management is further discussed in Section 3.5. A simplified water flow diagram is presented in Figure 2-8.

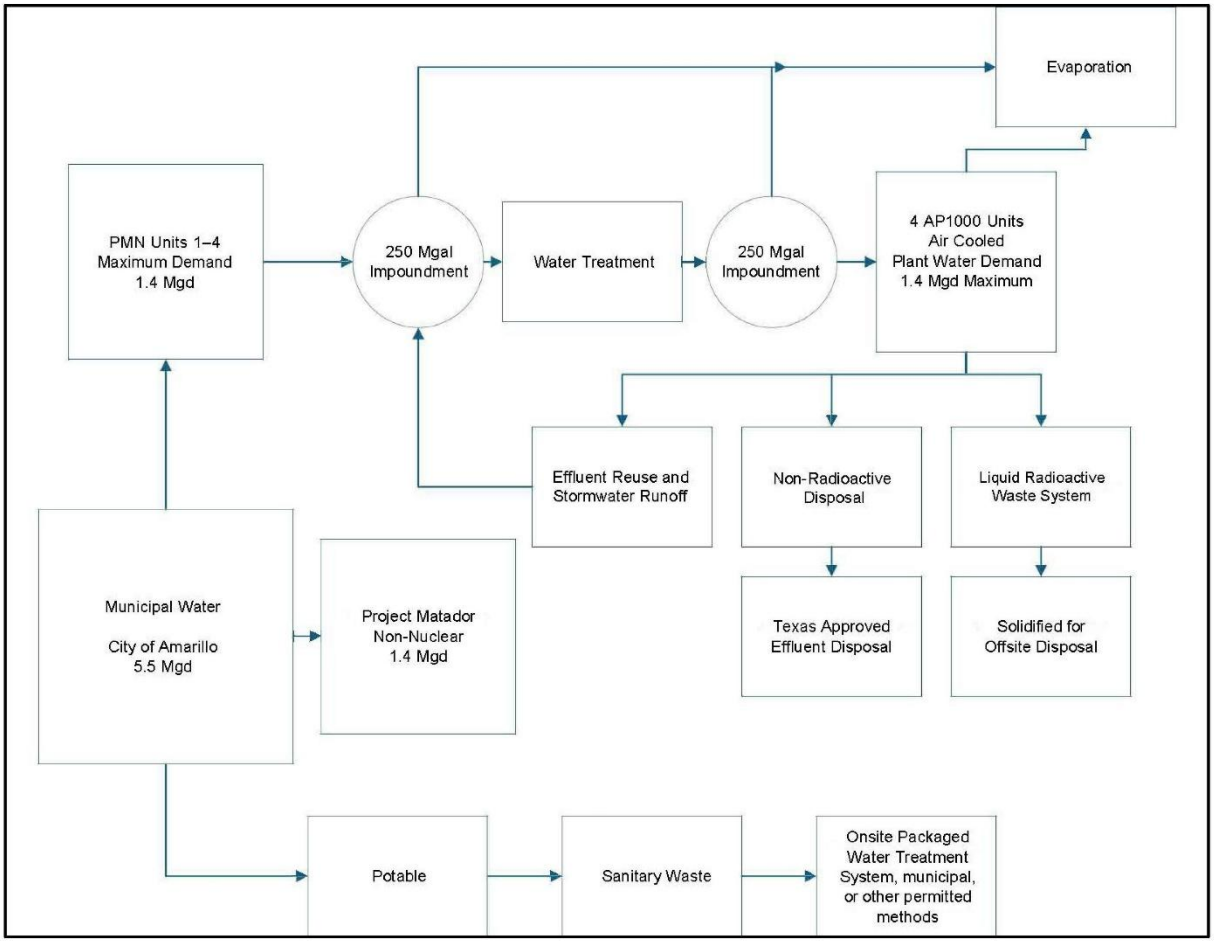


Figure 2-8 Simplified Water Flow Diagram for the Project Matador Campus. Source: FA 2026 TN-13483.

2.6.2.2 Power Transmission System

Transmission lines and corridors are considered to interface with the environment during plant operation because there are potential continuing impacts from electric fields, noise, and corridor maintenance. As noted in Section 2.4, the in-scope transmission lines connect PMN Units 1–4 to the Project Matador Campus transmission system at a switchyard on the nuclear site. The area traversed by these transmission lines would not be expected to require much vegetation maintenance, if any, beyond general landscaping maintenance for the data center campus.

2.6.2.3 Emergency Diesel Generators

The proposed AP1000 units would each be supported by two 4,000 kilowatts (kW) standby generators and two 35 kW ancillary diesel generators (Westinghouse 2011-TN261). Emissions from these generators would include particulates, sulfur oxides, carbon monoxide,

hydrocarbons, nitrogen oxides, and carbon dioxide. Combustion emissions from the generators would be released to the atmosphere only during emergency operations and periodic testing (Westinghouse 2011-TN261).

2.6.3 Radioactive Waste Management System

Liquid, gaseous, and solid radioactive waste management systems would be used to collect and treat radioactive materials produced as byproducts of operating the proposed AP1000 units. These systems would process radioactive, liquid, gaseous, and solid effluents to maintain releases within regulatory limits and to levels as low as is reasonably achievable (ALARA). Waste-processing systems would be designed to meet the design objectives of 10 CFR Part 50, Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low as is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents" (TN249). Radioactive material in the reactor coolant would be the primary source of liquid, gaseous, and solid radioactive wastes from operation of light-water reactors (LWRs). Radioactive fission products would build up within the fuel as a consequence of the fission process. These fission products would be contained in the sealed fuel rods, but small quantities could escape the fuel rods and contaminate the reactor coolant. Neutron activation of the primary coolant system would also add radionuclides to the coolant.

Prior to fuel load, Fermi America would develop an Offsite Dose Calculation Manual (ODCM) describing the methods and parameters used for calculating offsite radiological doses from effluents. The ODCM would describe the methodology for calculating monitoring alarm/trip set points for release of effluent from the nuclear site and specify the operational limits for releasing effluent to ensure compliance with NRC regulations.

The systems used to process liquid, gaseous, and solid wastes are described in the following sections. A more detailed description of these systems for the proposed AP1000 units is provided in Chapter 11 of the AP1000 Design Control Document, which is incorporated by reference (Westinghouse 2011-TN261).

2.6.3.1 Liquid Radioactive Waste Management System

In accordance with the requirements of 10 CFR 20.1406, "Minimization of contamination," the liquid radioactive waste system is designed to minimize, to the extent practicable, contamination of the facility and the environment, facilitate decommissioning, and minimize, to the extent practicable, the generation of radioactive waste (Westinghouse 2011-TN261).

The AP1000 liquid radioactive waste management system is designed to control, collect, process, handle, store, and dispose of liquid radioactive waste generated as the result of normal operation, including anticipated operational occurrences (Westinghouse 2011-TN261). The liquid radioactive waste management system includes tanks, pumps, ion exchangers, filters, and radiation monitors. Normal operations would include processing of (1) borated, reactor-grade wastewater, (2) wastes collected through floor drains and other wastes with a potentially high suspended solids content, (3) detergent wastes, and (4) chemical wastes (Westinghouse 2011-TN261). Fermi America plans to operate PMN Units 1–4 with zero liquid radioactive waste discharges. Each unit's liquid radioactive waste management system would collect, process, and treat all potentially contaminated liquid streams. Any liquid effluent that does not meet applicable radiological and environmental release criteria after treatment would not be discharged but recycled back through the system, ultimately being concentrated and solidified (FA 2026-

TN13483). These solids would be compacted and managed as solid radioactive waste and be disposed of offsite at an NRC-licensed disposal facility.

Additionally, the liquid radioactive waste management system is expected to be able to handle effluent streams that do not typically contain radioactive material, but that may, on occasion, become radioactive, such as from steam generator blowdown as a result of steam generator tube leakage. If radioactivity is detected in secondary system waste, the waste would be diverted to the liquid radioactive waste system (Westinghouse 2011-TN261).

2.6.3.2 Gaseous Radioactive Waste Management System

The gaseous radioactive waste management system would function to collect, process, and discharge radioactive or hydrogen-bearing gaseous wastes. During reactor operation, radioactive isotopes of xenon, krypton, and iodine are created as fission products. A portion of these radionuclides would be released to the reactor coolant. Airborne releases could be limited both by restricting reactor coolant leakage and by limiting the concentrations of radioactive noble gases and iodine in the reactor coolant system (Westinghouse 2011-TN261).

The AP1000 gaseous radioactive waste management system is a once-through, ambient-temperature, activated carbon delay system. The system includes a gas cooler, a moisture separator, an activated carbon-filled guard bed, and two activated carbon-filled delay beds. The system also includes an oxygen analyzer subsystem and a gas sampling subsystem (Westinghouse 2011-TN261).

Iodine is removed by ion exchange in the chemical and volume control system. Removal of the noble gases from the reactor coolant system is not normally necessary because the gases do not build up to unacceptable levels when fuel defects are within normally anticipated ranges. If noble gas removal is required because of high reactor coolant system concentration, the chemical and volume control system can be operated in conjunction with the liquid radioactive waste system degasifier to remove the gases (Westinghouse 2011-TN261).

Releases from the gaseous radwaste system are continuously monitored by a radiation detector in the discharge line. In addition, the system includes provisions for taking grab samples of the discharge flow stream for analysis (Westinghouse 2011-TN261).

Releases of radioactive effluent by way of the atmospheric pathway occur due to ventilation discharges from the containment, auxiliary and turbine building, as well as from the condenser air removal system and gaseous radioactive waste system discharges (Westinghouse 2011-TN261). The plant vent provides the release path for containment venting releases, auxiliary building ventilation releases, annex building releases, radioactive waste building releases, and gaseous radioactive waste system discharge. The turbine building vents provide the release path for the condenser air removal system, gland seal condenser exhaust, and the turbine building ventilation releases (Westinghouse 2011-TN261).

These releases are ongoing throughout normal plant operations. There is no gaseous waste holdup capability in the gaseous waste management system and thus no criteria are required for determining the timing of releases or the release rates to be used (Westinghouse 2011-TN261). Information about monitoring effluent releases within regulatory limits can be found in Section 3.9.1.3.2.

2.6.3.3 Solid Radioactive Waste Management System

The solid radioactive waste management system is designed to collect and accumulate spent ion exchange resins and deep bed filtration media, spent filter cartridges, dry active wastes, and mixed wastes generated as a result of normal plant operation, including anticipated operational occurrences. The system is located in the auxiliary and radioactive waste buildings. Processing and packaging of wastes are by mobile systems in the auxiliary building railcar bay and in the mobile systems facility part of the radioactive waste building. The packaged waste is stored in the auxiliary and radwaste buildings until it is shipped offsite to a licensed disposal facility. The AP1000 solid radioactive waste-management system releases no gaseous or liquid effluent directly to the environment. This system discharges its effluent to the liquid and gaseous waste management systems (Westinghouse 2011-TN261). Radiological waste is further discussed in Section 3.10.

2.6.4 Nonradioactive Waste Management System

The following sections describe the proposed nonradioactive waste-management systems, including systems for solid waste, liquid waste, gaseous waste, hazardous waste, and mixed waste.

2.6.4.1 Liquid Waste Management

The expected nonradioactive liquid waste streams include cooling-water blowdown, auxiliary-boiler blowdown, water-treatment wastes, discharge from floor and equipment drains, effluent from the sanitary sewage treatment system, and stormwater runoff. The AP1000 design consolidates the plant-related nonradioactive liquid effluent streams (other than sanitary waste and stormwater runoff) into a single stream from multiple other plant systems.

The service water system supplies cooling water to the closed-loop component cooling water system. A small portion of the service water flow is normally diverted to the circulating water system, to control levels of solids concentration in the service water system. An alternate flow path is provided to the wastewater system (Westinghouse 2011-TN26). The turbine island chemical feed system equipment injects the required chemicals into the service water system. This injection maintains a noncorrosive, nonscale forming condition and limits biological film formation. Specific chemicals used within the system are determined by the site water conditions (Westinghouse 2011-TN261).

The plant wastewater system is designed to manage liquid effluent streams that would contain pollutants from system flushing wastes during startup; oil, grease, and suspended solids from floor drains; corrosion and wear of plant piping and equipment; and liquid waste generated during maintenance or inspection activities. These waste streams, along with discharges from the demineralized-water-treatment system and the fire protection water system, are collected in the turbine building sumps for each unit. Wastewater pumped from the sumps would then be transferred to the water treatment system (Westinghouse 2011-TN261).

A radiation monitor located on the common discharge piping of the sump pumps provides an alarm upon detection of radioactivity in the wastewater. In the event radioactivity is present in the turbine building sumps, the wastewater is diverted from the sumps to the liquid radwaste system for processing and disposal (Westinghouse 2011-TN261).

The sanitary drainage system collects sanitary waste from plant restrooms and locker room facilities in the turbine building, auxiliary building, and annex building (Westinghouse 2011-TN261). The wastewater would be transferred to the Project Matador sanitary wastewater system.

Fermi America intends to implement an operational stormwater management program designed to capture, control, and reuse stormwater generated within the facility footprint. The stormwater system would be designed to support environmental compliance, minimize pollutant transport, and maintain stormwater as a managed resource rather than an uncontrolled discharge. All stormwater is intended to be captured and reused onsite (there is no planned offsite discharge under normal operating conditions) (see Section 3.5).

2.6.4.2 Gaseous Waste Management

Nonradioactive gaseous emissions would result from testing and operating each AP1000 unit's two standby diesel generators, two ancillary diesel generators, and one secondary diesel-driven fire pump (Westinghouse 2011-TN261). Operation of the equipment would be infrequent and typically of short duration. Emissions would include particulates, sulfur oxides, carbon monoxide, hydrocarbons, nitrogen oxides, and carbon dioxide. These would be discharged through exhaust systems vented to the atmosphere.

2.6.4.3 Solid Waste Management

The expected nonradioactive solid waste streams during operational activities include water-treatment wastes, laboratory wastes, typical municipal solid waste (e.g., metal, wood, paper), and nonradioactive spent resin from the demineralized-water deionization process.

Solid waste generated during operation would be segregated and recycled to the extent practicable, with the balance disposed of in an offsite permitted landfill. Recyclable materials would be collected and recycled by a commercial recycler. None of these solid wastes would be burned or disposed of onsite.

2.6.4.4 Hazardous and Mixed Waste Management

Hazardous waste generated during operations could include waste industrial cleaning products, petrochemical products, water-treatment chemicals, used antifreeze, and small quantities of additional regulated substances, such as laboratory chemicals. Petroleum wastes could include waste gasoline, diesel fuel, oils, solvents, and grease. Rags or other materials contaminated with these substances could also be considered hazardous waste.

Hazardous waste generated by PMN Units 1–4 would be temporarily stored onsite and then disposed of offsite by a contractor at a licensed, permitted facility. Hazardous wastes would be managed in compliance with the Federal Resource Conservation and Recovery Act of 1976 (42 U.S.C. § 6901 et seq.) and the federally approved Texas hazardous waste program, including Title 30 of the *Texas Administrative Code* (30 TAC) 335 (Industrial Solid Waste and Municipal Hazardous Waste) and Texas Health and Safety Code § 361 (Solid Waste Disposal Act).

Mixed wastes contain both hazardous and low-level radioactive waste (LLW). Small amounts of mixed solid waste could be generated during maintenance, refueling, and laboratory activities. The AP1000 design includes a solid-waste management system that is designed to collect and store mixed wastes generated during normal plant operation. The packaged waste would be

stored in the auxiliary and radioactive waste buildings until it is shipped offsite to a licensed disposal facility (Westinghouse 2011-TN261).

2.7 Alternatives

NEPA Section 102(2)(C)(iii) requires that an EIS include a discussion of a reasonable range of alternatives to the proposed action that are technically and economically feasible and meet the purpose and need of the proposal. These discussions should include an analysis of any negative environmental impacts of not implementing the proposed action (i.e., the no-action alternative). The NRC's decision-making authority is limited to deciding whether or not to issue licenses for the proposed nuclear power plants; therefore, there are no alternatives to that proposed action that meet the purpose and need of the proposed action.

However, as part of its analysis of the no-action alternative, the NRC staff still considers the environmental impacts of a reasonable range of energy alternatives to generate the needed energy. For an energy alternative to be considered reasonable, it must be economically viable, on the appropriate scale to meet Project Matador's energy needs, and operational to meet the energy demands and timeframe of the proposed project. Comparing the environmental impacts of issuing the licenses for PMN Units 1–4 to the environmental impacts of the potential consequences of not issuing those licenses (i.e., the environmental impacts of the construction and operation of reasonable energy alternatives or new energy generation under the no-action alternative) helps inform the NRC's determination under 10 CFR 51.103(a)(5). This determination considers whether or not the adverse environmental impacts of constructing and operating PMN Units 1–4 at Project Matador are so great that the proposed action is unreasonable (TN10253). The ultimate decision about which energy alternative(s) to implement falls to the power plant owners and is shaped by compatibility with State, and, where authorized, Federal (other than NRC) energy-planning decision-makers.

2.7.1 No-Action Alternative

Under the no-action alternative, the NRC would not issue construction and operation licenses for the four proposed AP1000 units. The no-action alternative would not meet the purpose and need for the proposed nuclear reactors. Fermi America would have to curtail Project Matador's data center plans or secure an alternative energy supply.

2.7.2 Reactor Placement

Given the purpose of PMN Units 1–4 to provide onsite power generation for Project Matador, locations away from the Project Matador Campus were not considered. The Project Matador Campus location offers sovereign control, institutional oversight via TTU, completed environmental and geotechnical evaluations, and Federal infrastructure adjacency. Regarding placement within the Project Matador Campus, Fermi America prioritized separation of nuclear assets from data centers to facilitate safety and security and leveraged proximity to other onsite power generation for transmission assets.

PMN Units 1–4 have been sited on the northwest side of the Project Matador Campus to support safety, operational independence, and long-term expansion while still allowing electrical integration with other generation sources. Positioning the four AP1000 units away from the hyperscale data centers they serve creates clear physical and security separation between nuclear operations and customer infrastructure. This distance reduces potential conflicts from construction, maintenance, and emergency planning activities. At the same time, the PMN Units

1–4 site remains close enough to the other project matador energy generating facilities to allow all to connect to a shared high voltage switchyard and private transmission network.

2.7.3 Energy Alternatives

Based on the reasonable assumption that there would be a need to generate power to meet Project Matador's energy needs, the no-action alternative (not to issue construction and operation licenses) would necessitate an alternative energy supply. The alternative energy supply options could be (1) purchasing power from the regional grid under a long-term purchase agreement, or (2) expansion of Project Matador's energy generation capacity. Regarding the first option, as presented in Section 1.2.2, Project Matador's power demand supports the need for Project Matador to supply its own power and not draw from the State's capacity. Thus, purchase of power from the regional grid is not a reasonable alternative. Regarding the second option, expansion of Project Matador's generation capacity, the following criteria were considered:

- The need or expectation to be technically feasible and commercially viable on a utility scale.
- The need to provide the electrical power generation of PMN Units 1–4 (approximately 4 GW).
- The need for 1 GW to be available to Project Matador by 2032 (the projected operational date for PMN Unit 1) with an additional 3 GW being available from 2034 to 2038, taking into consideration the development of the generation facilities, permitting, land acquisition for generation units and electrical connection to Project Matador (if deployed elsewhere), and construction of the facility or facilities.
- The large land requirements of solar and wind generation that would be needed to supply 4 GW of power.

Based on the above criteria, the only reasonable alternative is additional natural gas-fired units located at Project Matador.

The NRC staff relies upon the description of energy alternatives and their environmental impacts to each resource area that would be associated with their construction and operation in NUREG-1437, Supplement 1, Revision 2, *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (2024 LR GEIS) (NRC 2024-TN10161) Sections 2.3, 2.4 and Appendix D. Accordingly, the information regarding the construction and operation of natural gas-fired power generation is incorporated by reference into this EIS (see Section 1.3.6).

2.7.4 System Alternatives (Condenser Cooling)

The section discusses alternatives to the proposed heat-dissipation system at the proposed site. Alternatives considered include once-through cooling, mechanical draft wet cooling towers, natural draft cooling towers (including fan assisted towers), wet/dry cooling towers, dry cooling towers, cooling ponds, and spray ponds. These alternatives are considered in light of whether the technology (1) is feasible and practical given conditions at the proposed site, and (2) could meet the requirements of Clean Water Act (CWA) Section 316 and associated Federal and State implementing regulations.

Once-through cooling, mechanical draft wet cooling towers, and natural draft cooling towers (including fan assisted towers) have a large water demand that would need to be met by a sufficient water supply. The closest surface water resource of potentially sufficient capacity is

the Canadian River, whose closest approach to the PMN Units 1–4 site is approximately 15 mi. Further, regulations pursuant to CWA Section 316(b) require a new generation facility to utilize a closed-cycle recirculating system. Once-through cooling would not comply with these CWA Section 316(b) regulations. Groundwater supply in the area is subject to the Panhandle Water Conservation District requirements designed for long-term preservation of supply as further discussed in Section 3.5.2.

Cooling ponds and spray ponds occupy many acres and would require initial filling from surface water or groundwater supplies, as well as ongoing water additions to offset evaporation and maintain adequate cooling capacity. Dresden Nuclear Power Station, with two operating large water reactors of approximately 925 and 920 MW net generating capacity, has a condenser cooling system that utilizes a cooling pond. The makeup water demand for water lost to evaporation and seepage from the cooling pond is 20,196 gallons per minute (gpm). The cooling pond is 1,142 ac and supports cooling for two reactors (CEG 2024-TN11348). The Palo Verde Nuclear Generating Station (Palo Verde) has a condenser cooling system that utilizes spray ponds (referred to as evaporation ponds). The Palo Verde evaporation ponds require approximately 15,000 gpm of makeup water per reactor unit and the spray ponds supporting the three reactors are 250, 230, and 180 ac in size. The Palo Verde reactors are large light water reactors with net generation capacity of 1,346 MW each (APS 2008 TN13360). This initial and ongoing water demand would be challenging in the semiarid climate of Project Matador.

Wet/dry cooling towers and dry cooling use air-cooling, resulting in less water usage and are suitable heat dissipation options for sites that have cooling water availability challenges. As presented in Section 2.3, the PMN Units 1–4 are proposed with air cooling for heat dissipation. Thus, of the available condenser cooling technologies, wet/dry cooling towers and dry cooling would be both compliant with the CWA Section 316 regulations and feasible given the site conditions.

The NRC staff discussed hybrid wet/dry cooling towers as a system alternative for the Vogtle Electric Generating Plant Units 3 and 4 in Section 9.3.2 of the Final Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site (NRC 2008-TN673). A hybrid wet/dry cooling system employs a cooling tower that has both a wet section and a dry section. As compared to a wet cooling tower, a hybrid cooling tower reduces or eliminates the visible plumes associated with wet cooling towers. Compared to the wet cooling towers, less evaporation, make-up water, and blowdown are involved in the hybrid wet/dry process, therefore reducing water-related impacts (NRC 2008-TN673).

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Organizational Approach

To provide a complete environmental review, this EIS evaluates the potential impacts of building (preconstruction and construction), operation, and decommissioning of PMN Units 1–4. This section describes the organizational framework used to determine the significance of the reasonably foreseeable environmental effects for each identified resource area. Chapter 3 is organized into sections that address the reasonably foreseeable environmental effects relevant to each resource area associated with the proposed action.

The integrated discussion of preconstruction and construction impacts is addressed in subsections on building PMN Units 1–4. Where potential impacts to a resource area are identified, applicable measures and controls that would mitigate or limit adverse environmental impacts are described.

The NRC staff determined that environmental effects from the proposed action are primarily limited to those environmental resources present on the proposed PMN Units 1–4. The extent of other actions that are affecting, or could potentially affect, the same environmental resources as the proposed action is discussed in the future environmental setting and planned actions sections as necessary by resource.

Reasonably close interrelated actions to the proposed action include the continued operation by DOE of the Pantex Plant and proposed building and operation of the remainder of the Project Matador Campus, such as the data centers and other energy generation facilities supporting those data centers.

For each resource area, the impact determination analysis includes:

- **Affected Environment**—A brief description of baseline conditions prior to commencement of the Federal action is presented.
- **Future Environmental Setting and Planned Actions**—Describes other actions that are affecting, or could potentially affect, the same environmental resources as the proposed action in order to understand the context for the effects of the proposed action on those same resources.
- **Reasonably Foreseeable Environmental Effects Analysis:**
  - **Impacts from Building PMN Units 1–4**—Describes reasonably foreseeable environmental effects from building PMN Units 1–4 which include preconstruction and NRC-authorized construction. Mitigation to reduce adverse environmental impacts is discussed following those impacts for which it is proposed. Some activities required to build a nuclear project fall outside the NRC's regulatory definition of "construction" in 10 CFR 50.10 (TN249) and 10 CFR 51.4 (TN10253) and are defined as "preconstruction." Although these are not part of the proposed Federal action, NRC evaluates their reasonably foreseeable environmental effects because they are closely and causally related to the project. Identifying these effects also establishes context for the assessment of NRC-authorized construction and meets NRC regulatory requirements related to preconstruction analyses.

- **Impacts from Operating PMN Units 1–4**—Describes the reasonably foreseeable environmental effects of operation. Mitigation to reduce adverse environmental impacts is discussed following those impacts for which it is proposed.
- **Impacts from Decommissioning PMN Units 1–4**—Describes the reasonably foreseeable effects from decommissioning activities.
- **Summary of Reasonably Foreseeable Environmental Effects**

Where appropriate, specific analyses included in the 2026 NR GEIS (NRC 2026-TN12155), are incorporated by reference (see Section 1.3.6 for additional discussion of IBR)

3.2 Land Use and Visual Resources

This section describes land use characteristics for the PMN Units 1–4 site and the surrounding vicinity and region, and potential impacts from the construction and operation of PMN Units 1–4.

3.2.1 Affected Environment

3.2.1.1 Site

As described in Chapter 2, the PMN Units 1–4 project site comprises approximately 881 ac of undeveloped land in the northwestern portion of the Project Matador Campus (Figure 2-1 and Figure 2-2). Fermi America leases the entirety of the PMN Units 1–4 site, directs land management activities, and controls all access. The nearest occupied residence is approximately 1.73 mi southwest of the PMN Units 1–4 center point (FA 2026-TN13483).

Baseline land use designations within the PMN Units 1–4 site are characterized based on the Multi-Resolution Land Characteristic (MRLC) consortium's national land use/land cover data and represent conditions as of 2023. As shown in Table 3-1 and illustrated in Figure 3-1, grassland/herbaceous is the predominant land use/land cover category, at approximately 724 ac (82 percent). Cultivated crops represent the next largest category, covering approximately 148 ac (17 percent). Fermi America has indicated that no crops are being planted on the site in 2026. The remaining three categories (various intensities of developed land use) account for approximately 1 percent of onsite land use/land cover (USGS 2023-TN13009).

Table 3-1 Project Matador Nuclear Units 1–4 Site Land Use/Land Cover

Category	Acres	Percentage
Developed, Open Space	3	0.3
Developed, Low Intensity	6	0.7
Developed, Medium Intensity	<1	0.0
Grassland/Herbaceous	724	82.2
Cultivated Crops	148	16.8
Total	**881**	**100.0**

Source: USGS 2023-TN13009.



Figure 3-1 Land Use/Land Cover on the Project Matador Nuclear Units 1–4 Site. Source: USGS 2023-TN13009. Note: Land Cover as Depicted Is Based on 2023 Raster Data and Provides a General Overview of Principal Land Uses.

The PMN Units 1–4 site is in an unincorporated portion of Carson County. Counties in Texas do not have the authority to pass zoning ordinances or zoning regulations, although that authority is retained by municipalities (TAC 2026-TN13006). Because the location of the PMN Units 1–4 site

is not within municipal boundaries or jurisdiction, the proposed project does not conflict with local municipal planning regulations or objectives.

As discussed in Section 2.1.1, the entire Project Matador Campus, inclusive of the 881 ac PMN Units 1–4 site, is under a 99-year lease with TTU. Prior to the 99-year lease, the land was part of the Texas Tech Research Farm (TTRF) and was formerly part of the U.S. Army Pantex Ordnance Plant until its closure at the end of WWII, when it was turned over to the U.S. Army Corps of Engineers (USACE). A portion of the site is currently under a soil deed restriction due to mostly shallow, nonradiological soil contamination resulting from past containment releases from the Pantex Plant (Terracon 2025-TN12633). As discussed in Section 2.5, land use in the soil restriction area is limited to industrial or commercial uses. As explained in Section 3.10.2.3, site procedures would be implemented to identify, segregate, characterize, and properly manage any soils exhibiting evidence of contamination during building activities.

According to the 2025 U.S. Department of Agriculture (USDA) soil survey data, all but approximately 2 ac of land within the PMN Units 1–4 site is considered prime or unique farmland.

Under 31 *Texas Administrative Code* §503.1, the Texas coastal zone boundary encompasses portions of 18 counties adjacent or near the Gulf of Mexico. The PMN Units 1–4 site, located in Carson County, is not included within this designated boundary (TX Admin. Code 31 § 503.1-TN13366).

Section 3.4 discusses geologic and seismic information and notes there are no mines or unique geologic resources, such as critical minerals, identified within the site or vicinity. Section 3.5.1 discusses a potential 100-year floodplain associated with the southern boundary of the PMN Units 1–4 site. A description of wetlands (including playas) on the PMN Units 1–4 site is discussed in Section 3.6.

3.2.1.2 Vicinity

The vicinity (6 mi radius) includes portions of Carson and Potter counties and is represented in Figure 2-4. The area surrounding PMN Units 1–4 is a mixture of agricultural lands, rural residential development, and multiple industrial areas. The populations of Carson and Potter Counties are discussed in Section 3.8.

As discussed in Section 2.1 and shown in Figure 2-4, the nearest road is FM 683 located just west of the PMN Units 1–4 site. FM 683 connects PMN Units 1–4 to U.S.-60, a major four-lane U.S. Highway located approximately 2.9 mi south of the PMN Units 1–4 center point. Rail lines run parallel to U.S.-60 and are operated by BNSF Railway Company (BNSF) (TXDOT 2021-TN13002). As discussed in Section 2.1, there are no airports located within the 6 mi vicinity of PMN Units 1–4. Transportation is further discussed in Section 3.8.

Based on U.S. Geological Survey (USGS) 2023 land use/land cover data, land use designations within the vicinity are presented in Table 3-2 and Figure 3-2. The largest land use/land cover categories in the vicinity are cultivated crops (approximately 31,702 ac or 44 percent) and grassland/herbaceous (approximately 31,028 ac or 43 percent). The remaining eight land use/land cover categories account for approximately 13 percent of the vicinity (USGS 2023-TN13009).

Table 3-2 Land Use/Land Cover in 6 mi Radius of the Project Matador Nuclear Units 1–4 Site

Category	Acres	Percentage
Open Water	1,645	2.3
Developed, Open Space	2,284	3.2
Developed, Low Intensity	1,687	2.3
Developed, Medium Intensity	434	0.6
Developed, High Intensity	192	0.3
Barren Land (Rock/Sand/Clay)	22	0.0
Shrub/Scrub	3,130	4.3
Grassland/Herbaceous	31,028	42.9
Cultivated Crops	31,702	43.8
Emergent Herbaceous Wetlands	256	0.3
Total	**72,380**	**100.0**

Source: USGS 2023-TN13009.

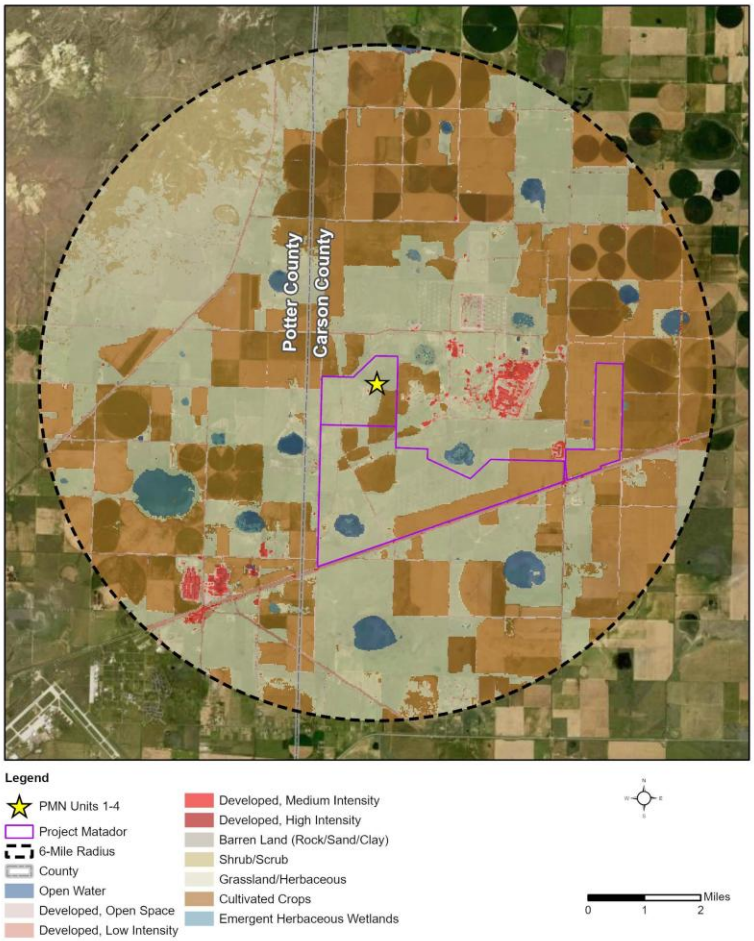


Figure 3-2 Land Use/Land Cover in 6 mi Radius of the Project Matador Nuclear Site. Source: USGS 2023-TN13009. Land Cover as Depicted Is Based on 2023 Raster Data and Provides a General Overview of Principal Land Uses.

Regional planning coordination is facilitated by the Panhandle Regional Planning Commission (PRPC), a voluntary association of local governments serving the 26-county Texas Panhandle area. The PRPC assists member jurisdictions with planning, developing, and implementing programs aimed at improving the health, safety, and welfare of Panhandle residents. Current initiatives and programs include workforce development, economic development, local government services, emergency preparedness, regional transportation planning, water planning, regional services, and technical assistance to the local governments. The PRPC developed a Comprehensive Economic Development Strategy (CEDS) in 2021 for the period of 2022–2026. The CEDS was developed with three goals in mind: improve or build physical assets and infrastructure in rural communities; bolster economic development projects in the region; and slow outmigration from small Texas Panhandle communities (PRPC 2021-TN13365). Although the PRPC provides broad regional planning support, it does not prepare or maintain regional future land use maps or plans (PRPC 2025-TN12999).

3.2.1.3 Region

As discussed in Section 2.1.4, the PMN Units 1–4 region is comprised of 15 counties in the Texas panhandle. Based on the USGS 2023 land use/land cover data, land use designations within the region are presented in Table 3-3 and Figure 3-3. The largest land use/land cover categories are shrub/scrub, grassland/herbaceous land, and cultivated crops, which represent approximately 1,980,070 ac (39 percent), 1,429,745 ac (28 percent), and 1,193,949 ac (24 percent), respectively. The remaining 12 categories account for approximately 9 percent of the regional land use/land cover (USGS 2023-TN11609).

Table 3-3 Land Use/Land Cover, 50 mi Radius of Project Matador Nuclear Units 1–4

Category	Acres	Percentage
Open Water	32,973	0.7
Developed, Open Space	131,933	2.6
Developed, Low Intensity	77,800	1.5
Developed, Medium Intensity	27,785	0.6
Developed, High Space	6,157	0.1
Barren Land (Rock/Sand/Clay)	12,195	0.2
Deciduous Forest	5,829	0.1
Evergreen Forest	72,517	1.4
Mixed Forest	17	0.0
Shrub/Scrub	1,980,070	39.4
Grassland/Herbaceous	1,429,745	28.4
Pasture/Hay	8,501	0.2
Cultivated Crops	1,193,949	23.8
Woody Wetlands	9,021	0.2
Emergent Herbaceous Wetlands	38,035	0.8
Total	**5,026,527**	**100.0**

Source: USGS 2023-TN13009.

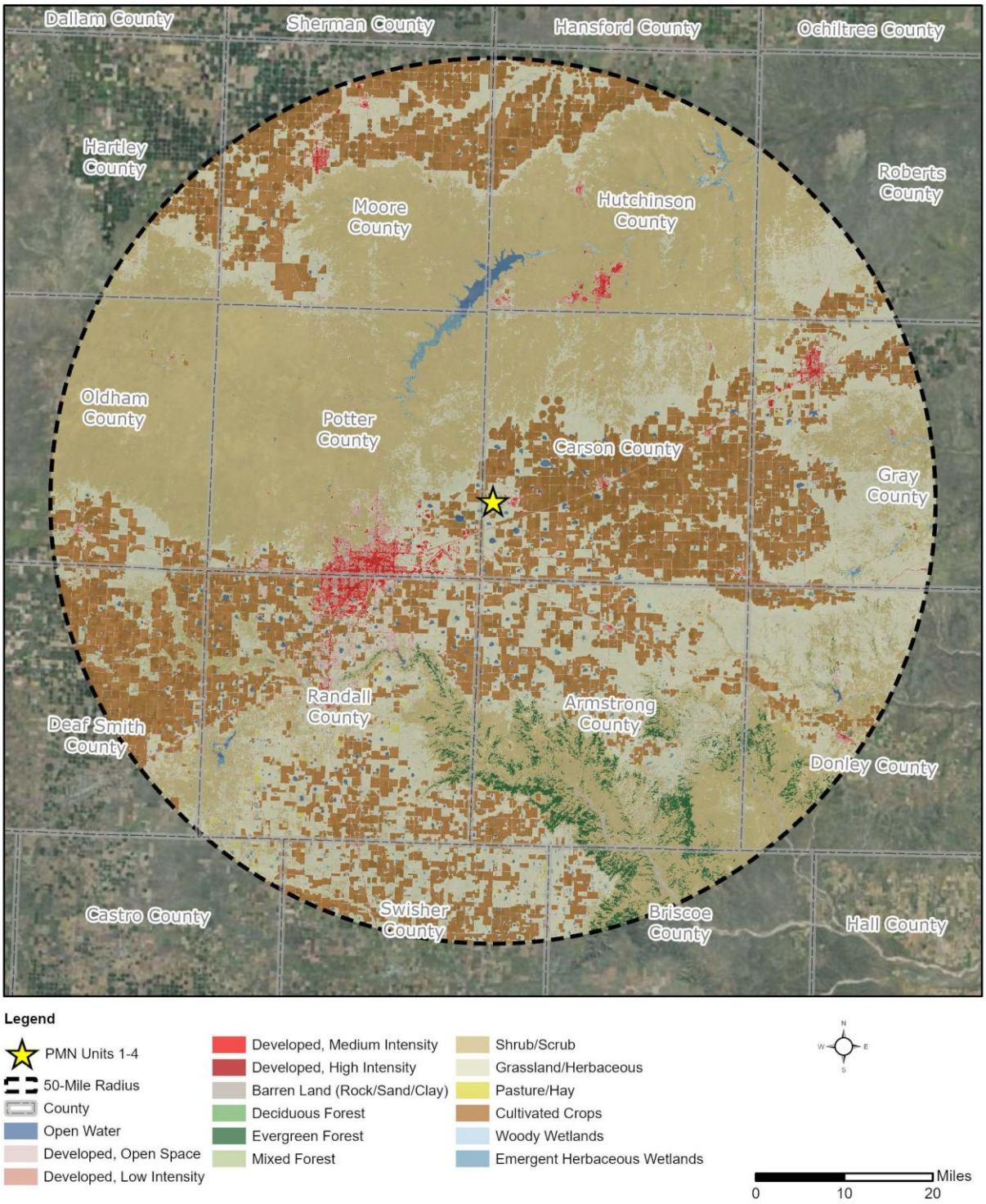


Figure 3-3 Land Use/Land Cover in 50 mi Radius of the Project Matador Nuclear Units 1–4 Site. Source: USGS 2023-TN13009. Note: Land Cover as Depicted Is Based on 2023 Raster Data and Provides a General Overview of Principal Land Uses.

Figure 2-6 shows public trust land within the region. For the purpose of this report, public trust land is defined as land managed by Federal, State, or local government agencies. There are no Federal, State, or local parks; wildlife refuges; or other sensitive lands within 1 mi of PMN Units 1–4.

3.2.2 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, relevant future environmental setting and planned actions include construction and operation of the remainder of the Project Matador Campus. Building and operating the remainder of the Project Matador site would convert approximately 4,355 ac (the entire acreage of Project Matador's Campus of 5,236 ac minus the 881 ac within the PMN Units 1–4 site) from undeveloped land to industrial use.

The baseline land cover for the Project Matador site is presented in Table 3-4 and shown in Figure 3-2. It is dominated by grassland/herbaceous cover, similar to that dominant in the 6 mi vicinity. The Project Matador acreage (aside from that of the PMN Units 1–4 site) classified as prime farmland or farmland of statewide importance is 4,218 ac (USDA 2025-TN13138).

Project Matador is anticipated to temporarily use approximately 268 ac on the west side of FM 683 across from the development to support construction activities including a portion to be used for worker parking.

Table 3-4 Land Use/Land Cover, Project Matador Campus

Category	Acres[(a)]	Percentage
Open Water	96	2
Developed, Open Space	73	1
Developed, Low Intensity	44	1
Developed, Medium Intensity	3	0
Grassland/Herbaceous	2,968	57
Cultivated Crops	2,037	39
Emergent Herbaceous Wetlands	11	0
Total	**5,232**	**100**

(a) The acreages presented in this table are based on data presented in a raster (pixel-based) format which, because of their square geography, does not exactly match the Project Matador site boundary. This geographic variation creates a small difference between total acreages reported in this table compared to Project Matador acreage reported in the EIS.

Source: USGS 2023-TN13009.

The visual effects from development of Project Matador Campus along with the existing industrial development of Pantex Plant for industrial development in the 6 mi vicinity of the PMN Units 1–4 site increases the number of industrial type structures of the local viewshed. However, the Project Matador addition would be in keeping with the current visual setting of agricultural mixed with industrial and transportation infrastructure.

3.2.3 Reasonably Foreseeable Environmental Effects Analysis

3.2.3.1 Impacts from Building PMN Units 1–4

Section 2.5 presents what would be built on the PMN Units 1–4 site. The reasonably foreseeable land use effects of PMN Units 1–4 would convert 881 ac, including approximately

879 ac of prime or other special status farmland, of mostly undeveloped grassland to industrial land use. Nearly all of the acreage has soil types that classify it as prime or other special status farmland. As discussed in Section 2.5, project-related disturbances would take place only within the site boundary. Figure 2-2 depicts the general layout of the facility. Potential water quality impacts are discussed in Section 3.5. Potential impacts to floodplains are discussed in Section 3.5.2 and those to wetlands (and playas) are discussed in Section 3.6.1.

Roadways, either temporary or permanent, would be utilized for building activities. Section 2.5.1 notes shipments of construction material to the Project Matador site would utilize local roadways and an established heavy haul route. Grading and excavations would produce spoils, which would be disposed of onsite or on other areas of the Project Matador Campus. If available soil from the PMN Units 1–4 site or the Project Matador Campus does not meet fill specifications, Fermi America would source fill from established regional sources and transport it over existing roadways within the region.

Nonhazardous solid waste and recyclables generated from building activities would be managed onsite in compliance with applicable Federal, State, regional, and local requirements and standards. Solid waste would be transported offsite for disposal at permanent local or regional solid waste facilities. Scrap metal and other recyclables would be shipped off site for recycling. Hazardous waste and materials (e.g., used oils and grease) would be managed appropriately and shipped offsite for treatment and disposal. Therefore, the impacts on land from nonradioactive solid waste generated during building activities are anticipated to be minimal, and mitigation does not appear to be warranted.

The site has a history of industrial uses related to ordnance production but is currently undeveloped in nature. Building PMN Units 1–4 would convert undeveloped land to industrial uses. Fermi America is in consultation with the Texas Commission on Environmental Quality (TCEQ) and relevant agencies to ensure activities are conducted in accordance with applicable Federal, State, regional, and local regulations (CEQ 2023-TN8815). Best Management Practices (BMPs) are planned to minimize impacts from building activities and guide stabilization and/or revegetation of temporary disturbances.

Building PMN Units 1–4 would also add a noticeable visual change to the surrounding industrial landscape. Although the DOE Pantex Plant already contributes an industrial presence to the landscape, the four AP1000 reactors would noticeably intensify the industrial appearance. This is especially true when added to the appearance of the other new industrial buildings expected as part of Project Matador. The generally flat and treeless character of the surrounding rural landscape increases the overall visibility of industrial development.

The conversion of 881 ac of undeveloped rural land, including approximately 879 ac of prime or unique farmland, to industrial development would be a noticeable land use impact in this rural setting. The overall land use and visual changes from building PMN Units 1–4 would therefore be of MODERATE significance. Because of the abundance of similar rural land, including similar prime or other special status farmland, in the surrounding landscape (even anticipating the development of the remainder of Project Matador), the land use changes would not destabilize the regional rural character and appearance, the regional agricultural economy, or the regional availability of land for most other development purposes.

3.2.3.2 Impacts from Operating of PMN Units 1–4

Nearly the entire site would have already been disturbed by building the PMN Units 1–4, and the overall visual appearance would have already been established. Land temporarily disturbed by building the facilities would be repurposed for Project Matador use during operations and

maintenance. The land available within the PMN Units 1–4 site is expected to be adequate for operations, and no additional land use conversions are anticipated. Any future building and maintenance activities that may require land disturbance would be conducted in accordance with site procedures and any applicable Federal, State, and local permits.

No potential conflicts with any affected local or regional land use or economic-development plans have been identified for operations of PMN Units 1–4. Potential impacts from operations to water resources are discussed in Section 3.5, and potential impacts from operations on wetlands and terrestrial communities are discussed in Section 3.6. There would be no anticipated disruptions to land or water resource access during operations. In summary, the impacts to onsite land use from PMN Units 1–4 operations are anticipated to be SMALL. No additional mitigation is warranted.

Even though development of PMN Units 1–4 would increase the local visibility of industrial type structures, operation of the units would not further change the overall visual character of the surrounding landscape. The visual effect would therefore be SMALL.

3.2.3.3 Impacts from Decommissioning PMN Units 1–4

NRC prepared NUREG-0586, Supplement 1, *Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities* (Decommissioning GEIS) which addresses the environmental impacts from decommissioning nuclear power plants (NRC 2002-TN665). NRC assessed the impacts to land use and visual resources to be SMALL provided the land needed to support decommissioning was confined to the “operational area” of the plant. Given the area of the PMN Units 1–4 site, it is unlikely that additional land would be needed for decommissioning. Also, given the PMN Units 1–4 site setting adjacent to industrial development, visual impacts from decommissioning activities would be expected to continue to blend in compatibly with the viewscape. NRC determined the land use from decommissioning to be a Category 1 issue in the 2026 NR GEIS (NRC 2026-TN12155) and concluded that the impact from decommissioning for all new nuclear power plants would be SMALL (NRC 2026-TN12155). Given the already established industrial setting and that additional land would not be needed for decommissioning, the previous land use and visual resources impact assessments presented in the Decommissioning GEIS are considered representative for decommissioning of PMN Units 1–4.

3.2.3.4 Summary of Reasonably Foreseeable Environmental Effects

As discussed above, the reasonably foreseeable land use effects of PMN Units 1–4 would convert 881 ac of mostly undeveloped grassland to industrial land use. Nearly all of the acreage has soil types that classify it as prime or other special status farmland. The land use conversion would be noticeable for the change in use, change in land cover, loss of prime and other special status farmland, and the visual effect. However, the change would not be destabilizing to the land resource or overall visual qualities in the vicinity. Impacts from operations and decommissioning of the proposed facilities, once built, would be minimal. Based on the above evaluation, the review team concludes that the reasonably foreseeable effects of land use and visual resources would be MODERATE.

3.3 Air Quality

Information on meteorology for the PMN site can be found in Appendix I. Appendix I contains relevant meteorological data including various tables and figures as well as the associated details (e.g., calculations, methodology, design inputs).

3.3.1 Air Quality

The Clean Air Act (CAA) (TN1141) was established in 1970 (42 U.S.C. § 7401 et seq.) to reduce air pollution nationwide. The U.S. Environmental Protection Agency (EPA) has developed primary and secondary National Ambient Air Quality Standards (NAAQS) under the provisions of the CAA. The EPA classifies air quality within an air quality control region (AQCR) according to whether the region meets the Federal primary and secondary NAAQS. An AQCR or a portion of an AQCR may be classified as being in attainment or nonattainment, or it may be unclassified for each of the six NAAQS criteria pollutants: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5}$, fine particulates; and PM_{10}, coarse particulates), ozone, and sulfur dioxide (SO_2).

Nonradiological emissions, including the criteria pollutants, are regulated through compliance with Federal, State, and local regulations. Attainment areas are areas that meet the NAAQS or cannot be classified (depending on the pollutant and other factors). Nonattainment areas are areas that do not meet the NAAQS or contribute to ambient air quality in a nearby area that does not meet the NAAQS. A maintenance area is a location previously designated as nonattainment but now meets the attainment standards and has been reclassified by the EPA accordingly (EPA 2025-TN13142).

The Project Matador Campus is located in Carson County, Texas within the Amarillo-Lubbock Intrastate Air Quality Control Region (40 CFR 81.133-TN7226). Carson County is classified as an attainment area for all NAAQS (EPA 2025 TN13142). Hutchinson County, Texas, is designated as a nonattainment area for the 2010 1-hour SO_2 NAAQS. Hutchinson County borders Carson County to the north and is situated more than 20 mi from the Project Matador Campus. There are no other nonattainment or maintenance areas in the 62 mi radius of the Project Matador Campus (EPA 2025-TN13142).

Class I Federal lands (e.g., national parks, wilderness areas, and monuments) receive special visibility protections under Section 162(a) of the CAA. There are no Class I Federal areas within 100 mi of the Project Matador Campus.

3.3.2 Future Environmental Setting and Planned Actions

Relevant future environmental setting and interrelated planned actions include construction and operation of the remainder of the Project Matador Campus. Construction activities at Project Matador would have similar air emissions as building activities for PMN Units 1–4. Applying BMPs mitigation measures to control fugitive dust and emission controls discussed for the PMN Units 1–4 building activities would also serve to minimize impacts across the Project Matador Campus. The amount of overlap between the proposed action's emissions and the emissions from other Project Matador sources depends on the proximity of temporally overlapping activities at the campus. The air quality effects of construction activities are dispersed over a 12-year schedule further minimizing impacts.

During operations of Project Matador, the source dominating air emissions would be the natural gas-fired units, which are located south of the PMN Units 1–4 site boundary. Project Matador's natural gas-fired units' emission sources include 90 turbines configured to operate in combined cycle mode, three turbines configured to operate in simple cycle mode, 16 cooling towers, 6 emergency generator engines, 2 black start engine generators, 2 fire pump engines, 4 diesel storage tanks, 93 lube oil recirculation vents, piping component fugitive emissions, and turbine maintenance, startup, and shutdown activities. Table 3-5 identifies the proposed allowable emission levels the natural gas-fired units would add to the affected environment. NRC notes

that the operation of the natural gas fired units adds higher air emission levels to the baseline environment than the proposed action emissions described in Section 3.2.4.

Table 3-5 Project Matador's Natural Gas-Fired Units' Proposed Allowable Emission Rates

Air Contaminant	Proposed Allowable Emission Rates (T/yr)
VOCs	578.24
NO_x	1,741.75
SO_2	286.95
CO	1,149.47
PM	1,334.24
PM_{10}	1,281.63
$PM_{2.5}$	1,229.25
H_2S	<0.01
H_2SO_4	43.2
CO_2e	23,964,782.74

CO = carbon monoxide, CO_2e = carbon dioxide equivalent; H_2S = hydrogen sulfide; H_2SO_4 = sulfuric acid; NO_x = nitrogen oxide; PM = particulate matter, SO_2 = sulfur dioxide; VOC = volatile organic compound.
Source: TCEQ 2023-TN8815.

The NRC previously reviewed the air quality effects from fossil-fuel fired generation in the 2024 LR GEIS, Supplement 1, Revision 2, and stated, "Fossil fuel (coal, natural gas) power plants can have a significant impact on air quality. The burning of fossil fuels is a major source of criteria pollutants and GHGs, primarily CO_2, as well as other hazardous air pollutants. The exact nature of these pollutants and their quantity depend on many factors, including the chemical constituency of the fuel, combustion technology, air pollution control devices, and onsite management of fuel and waste material" (NRC 2024-TN10161). Also, the existing air quality conditions would be a factor in determining the significance of the effects. As discussed in Section 3.3.1, Project Matador is an attainment area.

TCEQ is the air permitting authority overseeing these other planned actions at Project Matador like the natural gas-fired units. TCEQ: (1) monitors the baseline ambient air conditions throughout the State; (2) determines whether to grant approval to construct and operate facilities like the natural gas-fired units; and (3) establishes any permitting conditions which could include mitigation and facility specific monitoring for the natural gas-fired units.

3.3.3 Air Quality Impacts

3.3.3.1 Air Quality Impacts from Building PMN Units 1–4

During building activities, air emissions from project activities include the following:

- Combustion emissions (e.g., reactive organic gases, nitrogen oxides [NO_x], CO, and SO_2) generated from construction equipment and vehicles, worker vehicles commuting to the site, and delivery vehicles.
- Fugitive dust (e.g., particulate matter) emissions generated by wind as well as construction equipment and traffic traveling on disturbed land.

Impacts on air quality from these emissions can be reduced by compliance with all Federal, State, and local regulations that govern construction activities and emissions from construction vehicles.

For the building of Turkey Point Nuclear Plant (Turkey Point) Units 6 and 7, the estimated air emissions were 95 percent preconstruction and 5 percent construction based on the acreage associated with the construction of structures, systems, and components (NRC 2016-TN6434, NRC 2016-TN6840). Using this same metric and based on Figure 2-1, the split for PMN air emissions can be estimated at 80 percent preconstruction and 20 percent construction.

The proposed action calls for the construction of four reactor units. The building of a single reactor can be divided into three stages: preparing the site, completing the foundation and concrete work, and constructing the structures. Air emission levels differ across these different stages, with site preparation expected to produce the highest emission levels (ENSR 2008-TN13508). As described in Table 2-2, construction is expected to last a total of about 12 years for all four units. A phased approach is used where construction of each subsequent reactor unit begins 2 years after the previous one. As a result of this schedule, peak construction activity, and therefore the highest emission levels, occurs when three reactors are under various stages of construction and one reactor is in operation. This scenario occurs in only two of the twelve years.

The construction equipment combustion emissions at PMN Units 1–4 site as well as the fugitive dust emissions were estimated using information from the Turkey Point Units 6 and 7 project as a reference case. The NRC recently issued an EIS evaluating the construction and operation of two AP1000 reactors at Turkey Point, hence it was selected for a reference case. The emission sources for these two projects are similar in kind but different in scale (e.g., two reactor units for Turkey Point compared to four reactor units for PMN Units 1–4). To account for such differences, scaling factors were used. Scaling factors in Table 3-6 were developed by comparing qualitative parameters between the two projects. Each scaling factor was then linked to a specific emission source. Emission estimates at PMN Units 1–4 were calculated by multiplying the corresponding Turkey Point emission estimate by the appropriate scaling factor. Emission estimates derived from scaling factors applied to Turkey Point Unit 6 and Unit 7 reference reflect specific characteristics of the PMN Units 1–4 project to ensure the resulting estimates are reasonable and suitable for evaluating the magnitude of the proposed action's impacts.

Table 3-6 Emission Scaling Factors Used for Different Nuclear Plant Projects

Parameter	Turkey Point Nuclear Plant[(a)]	Project Matador Nuclear	Scaling Factor
Disturbed Area	600 ac	881 ac	1.46
Reactor Units Under Concurrent Construction	2 reactors	3 reactors	1.5

(a) Source: NRC 2016-TN6434.

The number of reactor units being built simultaneously was the qualitative parameter used to create the scaling factor for the combustion emissions from the construction equipment. The scaling factor was called "Reactor Units Under Concurrent Construction." Although the two projects use similar construction equipment, their activity levels differ. At Turkey Point, the estimated emissions reflect a schedule in which two reactors are constructed simultaneously. In contrast, the PMN Units 1–4 project includes 2 years during which three reactors would be built at the same time. The increase in the emission levels is expected to be proportional to the

number of reactors being built. A scaling factor of 1.5 (i.e., 3 divided by 2) was used. The estimated annual construction equipment emissions for Turkey Point were multiplied by 1.5 to account for PMN's increased activity level during peak construction resulting in the annual emission estimates for the construction of the four PMN AP1000 reactors to be 50 percent greater than the annual emission estimates for Turkey Point Unit 6 and 7 AP1000 construction (NRC 2016-TN6434).

The CO, NO_x, VOCs, PM_{10}, and SO_2 peak emission levels are estimated to be 256.2, 272.4, 28.7, 31.0, and 1.1 Tons per year (T/yr) (respectively) due to exhaust of construction equipment and diesel engines. These estimates can be considered conservative for two reasons. First, the period with three reactors being built at the same time for PMN only occurs during 2 of the 12 construction years meaning lower emissions are generated during most of the construction period. Second, emission levels for the building of a single reactor vary by stage with peak emissions expected during site preparation.

An air permit has been issued by the TCEQ for the Project Matador natural gas plant located south of the PMN Units 1–4 site boundary. This permit is listed under "Fermi America Project Matador" (TCEQ 2023 TN8815). As part of the permitting approach, emissions from PMN Units 1–4 (e.g., the emergency generators) will be incorporated into Fermi America's existing air permit. TDEC is the relevant regulator and Appendix H contains additional information concerning air permitting.

Fugitive dust (PM_{10}) emissions for Turkey Point were estimated to be 95.3 T/yr for site preparation and construction of two AP1000 units before using dust mitigation measures (NRC 2016-TN6434). The amount of disturbed land was the qualitative parameter used to create a scaling factor for fugitive dust emissions and PMN disturbs more land area than Turkey Point. Using the scaling factor presented in Table 3-6 called "Disturbed Area" results in an estimated 139.1 T of fugitive dust (PM_{10}) annually for building PMN Units 1–4. Fugitive dust generated by construction equipment and offsite vehicles used for hauling debris, soil, construction equipment, and supplies are included in the estimate. Dust control for construction is regulated by the State. Under 30 TAC 111.145, use of water or of suitable oil or chemicals for control of dust must be used. Specific mitigation measures to control fugitive dust will be identified in a dust control plan, or similar document, prepared prior to project construction. This plan may include any or all of the following mitigation measures that follow EPA best practices:

- Stabilize construction roads and spoil piles.
- Limit speeds on unpaved construction roads.
- Water unpaved construction roads to control dust routinely.
- Perform housekeeping (e.g., remove dirt spilled onto paved roads).
- Cover haul trucks when loaded or unloaded.
- Minimize material handling (e.g., drop heights, double handling).
- Cease grading and excavation activities during high winds and during extreme air pollution episodes.
- Phase grading to minimize the area of disturbed soils.
- Use temporary or permanent vegetation on road medians and slopes (FA 2026-TN13483).

Combustion emissions are also generated by commuting workers and deliveries to and from PMN. During peak construction, there are expected to be 6,600 construction workers (FA 2026-

TN13483) and 600 operations workers. An outage for PMN Unit 1 may occur during the peak construction year, but there are expected to be no more than 1,000 outage workers onsite at one time.

To calculate emissions due to workers commuting, emission factors from the U.S. Bureau of Transportation Statistics (BTS) were used (DOT 2025-TN13363). The average commuting distance of 40 mi per day based on the distance from the site to the approximate middle of Amarillo was used (FA 2026-TN13483). The annual vehicle miles traveled (VMT) for each employee was calculated to be 10,400 mi per year using a 260-day work year. Table 3-7 lists hydrocarbons, CO, NO_x, and PM emissions for the workforce during peak construction in T/yr.

Table 3-7 Air Emissions from Workers Commuting During Peak Project Matador Nuclear Units 1–4 Construction

Parameter	Construction Workers During Peak Construction	Operations Workers During Peak Construction	Outage Workers
Employees	6,600	600	1,000
Hydrocarbon (T/yr)	23.4	2.1	3.5
Carbon monoxide (T/yr)	325.2	29.6	49.3
Nitrogen oxides (T/yr)	37.9	3.5	5.8
Particulate matter $PM_{2.5/10}$ (T/yr)	1.5	0.1	0.2

Sources: Based on DOT 2025-TN13363; FA 2026-TN13483.

Since 2017, the EPA has lowered the sulfur content limit of motor gasoline to 10 parts per million (ppm). Using the average VMT and fuel economy values above, annual gasoline consumption was estimated to be about 460 gallons (gal) per commuting worker per year. Assuming all the sulfur is converted to SO_2 during the combustion process, the resulting maximum SO_2 emissions are 0.234 T/yr for 8,200 commuting workers annually (EPA 2009-TN13140; DOT 2025-TN13139).

Deliveries are estimated to peak at 180 per day, 6 days per week, 52 weeks per year. The distance traveled per delivery is estimated to be 50 mi based on the distance from the site to the furthest rail terminal in Amarillo and back (FA 2026-TN13483). Using BTS emission factors for heavy duty vehicles, the resulting emissions for a year are 0.551 T of hydrocarbons, 4.996 T of CO, 8.475 T of NO_x, and 0.244 T of PM.

The NRC staff addresses air emissions from site development activities (i.e., both preconstruction and construction), noting that NRC authorized construction (i.e., the proposed agency action) makes up only about 20 percent of total emissions. Most preconstruction activities and related emissions occur before construction begins (see Table 3-7). The NRC authorized construction generates low emission levels and occurs in an attainment area. No Class I areas occur within 100 mi of the site. Although an adjacent county is designated as in nonattainment for SO_2, emission levels of this pollutant from the proposed action are estimated to be very low at under 1 T/yr. However, during periods of peak activity when building PMN Units 1–4 (i.e., both preconstruction and NRC authorized construction), emission levels from the construction equipment, commuter vehicles, and delivery vehicles could at times be noticeable. Therefore, the review team concludes that air quality impacts from the building PMN Units 1–4 to range from SMALL to at times, MODERATE. Mitigation measures have not yet been finalized, but they will be addressed in the site dust control plan and any applicable TCEQ permit requirements.

3.3.3.2 *Air Quality Impacts from Operation*

Impacts on air quality due to the operation of the proposed units include emissions from the operation of auxiliary equipment such as boilers, diesel generators, and fire pumps; commuting employees; and deliveries. Auxiliary equipment is intermittently used for emergencies and maintenance which results in the periodic release of criteria pollutants. Annual air emissions due to routine plant operation are expected to be minor because the emission sources are operated infrequently and for short durations. Air emissions are managed in accordance with Federal, State, and local air quality laws and regulations. A new facility is required to assess or apply for emission permits to comply with laws and regulations. As stated previously, the Fermi America Project Matador already has an air permit for the gas plants and the PMN emissions will be incorporated into Fermi's existing air permit. Following all laws and regulations and maintaining compliance with air permits are expected to mitigate air quality impacts.

Assuming individual AP1000 reactors generate similar emission levels for operations, criteria pollutant emissions can be estimated using Turkey Point Unit 6 and 7 as a representative reference plant. Estimated emissions for Turkey Point Units 6 and 7 are presented in Table 5-7 of the Turkey Point Units 6 and 7 EIS (NRC 2016-TN6434). Since Turkey Point proposed two AP1000 reactors while Fermi America proposes four at the Project Matador site, a scaling factor of two was used for operations. Applying a scaling factor of two results in estimated pollutant emissions for PMN Units 1–4 that are twice those of Turkey Point Units 6 and 7. The estimated pollutant emissions for PMN Units 1–4 are 0.04 T/yr of SO_x, 70.96 T/yr of NO_x, 8.1 T/yr of hydrocarbons, 4.6 T/yr of PM, and 50.46 T/yr of CO.

As discussed in Section 2.3, PMN Units 1–4 will use dry cooling for heat dissipation. Each AP1000 unit would have its own ACC field. There is no water plume to consider from these towers, as they will directly release heat to the atmosphere. As a result, there is no expected impact to icing, fogging, or salt deposition from operation of these towers.

The expected maximum number of operations workers is 1,290 for all four units. There are expected to be no more than 1,000 outage workers on the site at one time (FA 2026-TN13483). Emissions due to worker vehicles were calculated using the same method discussed previously using emission factors provided by BTS and assuming an average commuting distance of 40 mi per day. The annual VMT for each employee was calculated to be 10,400 mi per year using a 260-day work year. Table 3-8 lists hydrocarbons, CO, NO_x, and PM emissions for the workforce in T/yr.

Table 3-8 Air Emissions During from Workers Commuting During Peak Project Matador Nuclear Units 1–4 Operations

	Operations Workers	Outage Workers
Employees	1,290	1,000
Hydrocarbon (T/yr)	4.6	3.5
Carbon monoxide (T/yr)	63.6	49.3
Nitrogen oxides (T/yr)	7.4	5.8
Particulate matter $PM_{2.5/10}$ (T/yr)	0.3	0.2

Sources: Based on DOT 2025-TN13363; FA 2026-TN13483.

Air emissions from deliveries during the operations of the four AP1000s were estimated assuming (1) less than 180 deliveries per day, occurring 6 days per week and 52 weeks per year, and (2) an estimated travel distance of 50 mi per delivery based on the round-trip distance

to the furthest rail terminal in Amarillo. Using BTS emission factors for heavy duty vehicles, the resulting emissions for a year are less than 0.551 T of hydrocarbons, 4.996 T of CI, 8.475 Tons of NO_x, and 0.244 T of PM.

The review team evaluated the impacts of the air emissions from the operations of PMN. Because the proposed agency action generates low emission levels within an attainment area and is not near a Class I area, the impacts would be minimal. Therefore, the review team determined that air quality impacts from operations would be SMALL.

3.3.3.3 Air Quality Impacts from Decommissioning

Decommissioning impacts are expected to be bounded by the analyses in the Decommissioning GEIS (NRC 2002-TN665). The Decommissioning GEIS considered air quality impacts to be SMALL (NRC 2002-TN665). Air emissions would continue to be managed by laws and permits as decommissioning progressed. Other procedures and practices such as BMPs will remain in place to mitigate air quality issues. In the absence of project specific indicators suggesting decommissioning activities not already considered by NRC, the previous assessment of decommissioning impacts presented in the Decommissioning GEIS (SMALL) is considered representative for decommissioning of the proposed PMN Units 1–4. Additionally, 10 CFR 50.82 or 10 CFR 52.110, as applicable, provide that a licensee shall not perform any decommissioning activities that result in significant environmental impacts not bounded by previously issued environmental review documents, such as the Decommissioning GEIS.

3.3.3.4 Summary of Reasonably Foreseeable Environmental Effects

As discussed above, the reasonably foreseeable air quality effects of PMN Units 1–4 would occur during all stages of the project, but primarily during building (i.e., preconstruction and NRC-authorized construction). Mitigation measures and compliance with TCEQ permit conditions can reduce the air quality effects from PMN Units 1–4. During peak building activity, PMN emission levels could at times be noticeable. Based on the above evaluation, the review team concludes that the reasonably foreseeable effects of construction, operation, and decommissioning on air quality would be SMALL to MODERATE.

3.3.4 Environmental Impacts of Greenhouse Gases

The Commission Order in CLI-09-21 (NRC 2009-TN6406) provides direction to the NRC staff to consider the impacts of emissions of carbon dioxide (CO_2) and other GHGs in its environmental reviews. The NRC staff has estimated GHG emissions of various activities associated with the building, operating, and decommissioning of a 1,000 MWe reference nuclear power plants in Appendix H to the 2026 NR GEIS (NRC 2026-TN12155). The estimates in Appendix H to the 2026 NR GEIS may be roughly linearly scaled from the 1,000 MWe reference reactor for other reactor outputs. The NRC staff calculated life-cycle GHG emission for the four proposed AP1000 units at the PMN Units 1–4 site by scaling the reference 1,000 MWe reactor emission estimates. Details regarding the scaling factors and calculations are provided in Appendix E. Based on these calculations, the estimated GHG emissions over the course of the proposed PMN Units 1–4 project are approximately 3.9 million metric tons (MT) of carbon dioxide equivalents (CO_2(e)) which includes construction, operation, the uranium fuel cycle, transportation of nuclear fuel and waste, and decommissioning, including extended SAFSTOR.

3.4 Geologic Environment

This section describes geology at the proposed PMN Units 1–4 site and in the region surrounding the site that informs the evaluation of groundwater resources discussed in Section 3.5.2. Detailed analyses and evaluations of geologic, seismic, and geotechnical data required for assessment of site safety issues related to the proposed PMN Units 1-4 will be included in the safety evaluation.

3.4.1 Affected Environment

The proposed PMN Units 1–4 site is located within the Llano Estacado region of the Southern High Plains (SHP) portion of the Great Plains Physiographic Province. The Llano Estacado is the southernmost portion of the SHP that is separated from the northern portion of the Great Plains Physiographic Province by the Canadian River. The ground surface in the region is nearly flat but generally slopes southeastward at a rate of 8 to 10 feet per mile (ft/mi). Due to the relatively low relief, streams are not well developed. Surface drainage flows to circular shaped playas on the land surface that undergo frequent and unpredictable wet-dry cycles. Although larger playas can exceed 800 ac, around 87 percent are smaller than 30 ac. Approximately 19,300 playas are found in the Texas High Plains within the SHP (NNSA 2023-TN13310; TPW 2026-TN12969). Playas are underlain by approximately 16 to 60 ft of lower permeability lake sediments that are highly variable in lateral and vertical extent (DOE 2008-TN12848; Pantex 2025-TN12791).

The primary surface soil deposits near the PMN Units 1–4 site include the Pullman and Randall soil series (Pantex 2025-TN12791). Soil at the site consists of interbedded loamy clay. Soil susceptibility to erosion by wind and water is slight to moderate (USDA 2025-TN13138).

Surficial soils grade downward to the underlying Blackwater Draw Formation, and lake sediments are interbedded with sediments of the Blackwater Draw Formation near the edges of the playa basins. The Blackwater Draw Formation was deposited mainly during the Pleistocene between approximately 1.8 million years (Ma) and 300,000 years ago and consists of about 50 ft of interbedded silty clays with caliche and very fine sands with caliche at the PMN Units 1–4 site (BOEG 2001-TN13364; Pantex 2025-TN12791). A massive caprock layer consisting of a hard, dense, fine crystalline caliche (DOE 2008-TN12848) defines the base of the Blackwater Draw Formation and the top of the underlying Ogallala Formation.

The Ogallala Formation contains Miocene–Pliocene (23.03 to 2.58 Ma in age) fluvial sediment sequences of channel sands and gravels overlain by overbank deposits (overbank deposits are finer-grained sediments deposited atop the floodplain away from the river channel during floods). Fine-grained eolian (i.e., windblown) deposits overlie the coarser fluvial sediments. Regionally, the thickness of the Ogallala Formation ranges from a few feet to over 900 ft. Near the site, the vertical distance to the base of the Ogallala can vary from approximately 300 ft to 720 ft. A zone of fine-grained sediments consisting of sand, silt, and clay creates a perched groundwater zone within the upper unsaturated portion of the Ogallala Formation as illustrated in Figure 3-5. The Ogallala Aquifer, the primary aquifer in the region, occurs within the lower Ogallala Formation (BOEG 2001-TN13364; DOE 2008-TN12848).

The Dockum Group underlies the Ogallala Formation. Where present in the area around the site, the Dockum Group is estimated to be approximately 200 ft thick. It consists mainly of indurated sedimentary rock units, including mudstones, siltstones, sandstones, and minor

conglomerates and claystones derived from fluvial, deltaic, and lacustrine depositional systems (DOE 2008-TN12848).

Subsurface data from boreholes drilled for the adjacent Pantex Plant are representative for the proposed PMN Units 1–4 site. Figure 3-4 shows the generalized stratigraphic column of geologic units from the Pantex Plant data. The generalized conceptual site model for the PMN Units 1–4 site is presented in Figure 3-5, which illustrates a perched water zone in the unsaturated Upper Ogallala Formation as well as the deeper primary Ogallala aquifer in the saturated zone. Figure 3-5 indicates that the primary Ogallala aquifer lies from 300 to 500 ft bgs.

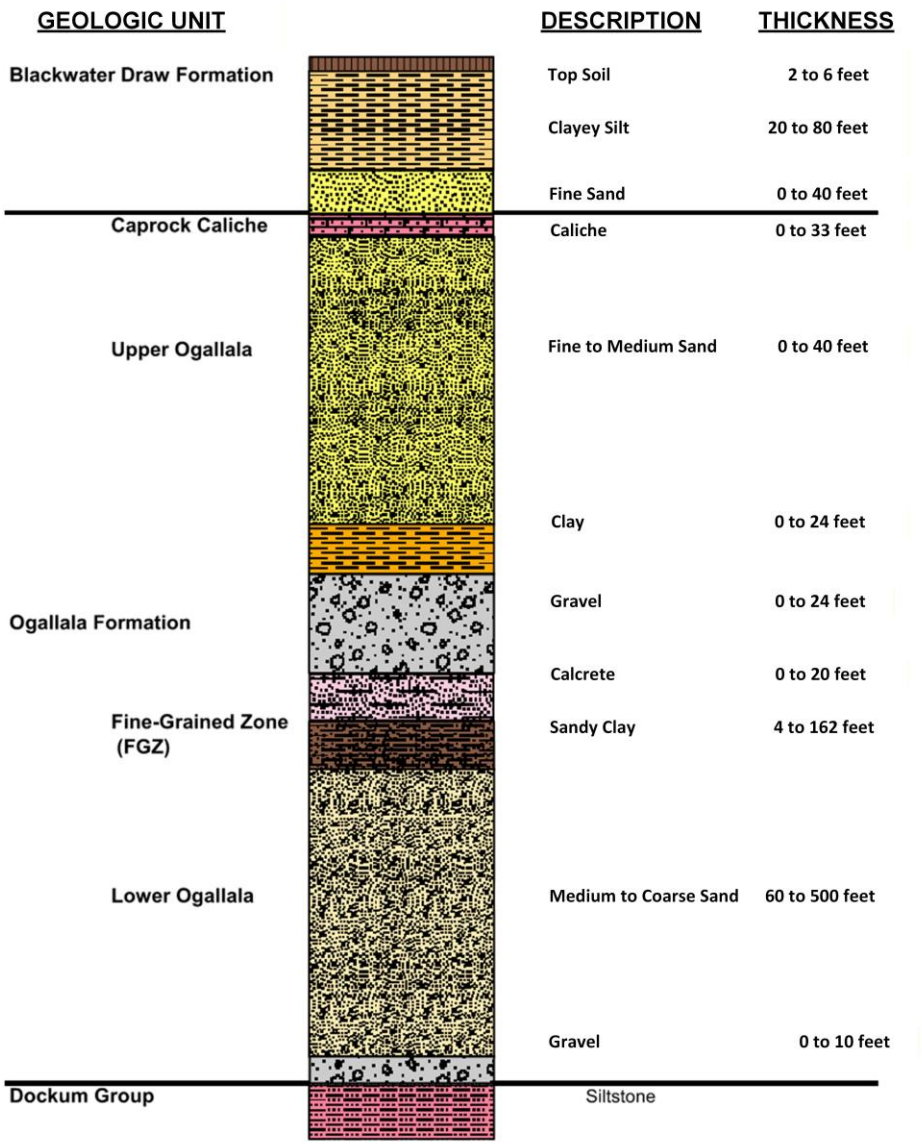


Figure 3-4 Generalized Stratigraphic Column for the Project Matador Nuclear Units 1–4 Site. Source: DOE 2008-TN12848.

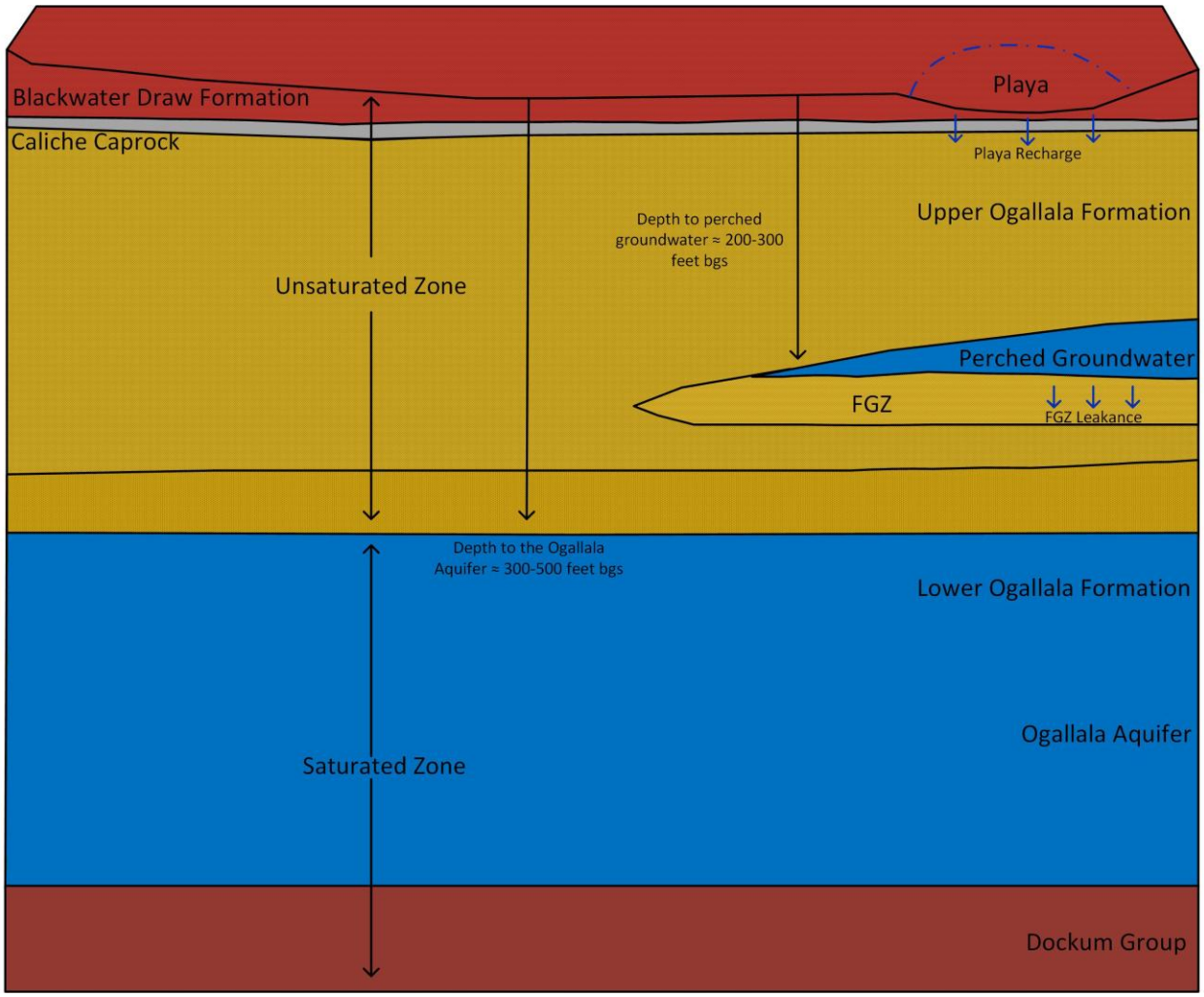


Figure 3-5 Generalized Subsurface Conceptual Site Model of the Proposed Project Matador Nuclear Units 1–4 Site. Source: DOE 2008-TN12848. FGZ = Fine-Grained Zone (Composed of Relatively Impermeable Sand, Silt, and Clay); bgs = Below Ground Surface.

The elevation of the Project Matador Campus is approximately 3,500 ft to 3,565 ft (1066.8 m to 1086.6 m) above mean sea level (MSL). The topographic gradient is variable toward playa lakes with a general gradient toward the south (Terracon 2025-TN12633). Depths from the surface to perched groundwater range from 209 to 279 ft (Pantex 2025-TN12791). A 2025 geotechnical engineering report states that excavations into or through clayey sand layers could require dewatering, depending on groundwater conditions at the time of construction (Terracon 2025-TN12635). Dewatering is discussed in Section 3.5.2.2.

Potential geologic hazards in the region include salt dissolution, which is an active process that can result in the development of sinkholes and fractures. Such surficial expressions have not been identified in Carson County where the site is located (DOE 1996-TN13388). Geologic resources near the site include copper, sand, and gravel (BEG 2025-TN12849). There are no mines or unique geologic resources, such as critical minerals, identified within the site vicinity (USDOI 2026-TN12850).

3.4.2 Future Environmental Setting and Planned Actions

3.4.3 Reasonably Foreseeable Effects

3.4.3.1 Geologic Environment Impacts from Building PMN Units 1–4

Construction of proposed PMN Units 1–4 is not expected to detrimentally affect or alter the geologic environment at the site related to the facets of geology and soils. As described in Section 2.5, excavation for the nuclear island structures is expected to minimally extend to 40 ft below grade. Ground-disturbing activities would be confined to the PMN Units 1–4 site. Clearing and grubbing is assumed to occur within the nuclear site. It is assumed that geologic materials, including those for concrete production, would be procured and shipped to the site from local and regional sources that are widely available. Soils suitable for backfill would be stockpiled on the site for future use. Cut and fill grading would create proper site drainage and a base for building pads. Uncontaminated soils not used for backfill within the PMN Units 1–4 site boundary would be used for site preparation and construction activities elsewhere on the Project Matador Campus. Additionally, required measures would be applied for the PMN Units 1–4 site to ensure sediment control and to mitigate erosion. Any impacts on geology and soils at the site during construction are expected to be SMALL. Hydrogeology, the aspect of the subsurface geologic environment that includes aquifers and aquicludes, informs the evaluation of groundwater resources discussed in Section 3.5.2. Potential issues that could arise if dewatering of excavations is necessary during construction are considered in Section 3.5.2.

3.4.3.2 Geologic Environment Impacts from Operating PMN Units 1–4

Following the completion of building activities and site stabilization, operation of proposed PMN AP1000 Units 1–4 is not expected to detrimentally affect or alter the geologic environment at the site related to the facets of geology and soils. Any impacts on those facets at the site during operation are expected to be SMALL. Hydrogeology, the aspect of the subsurface geologic environment containing aquifers and aquicludes, informs the evaluation of groundwater resources discussed in Section 3.5.2. Site hydrogeology is discussed in Section 3.5.2.

3.4.3.3 Summary of Reasonably Foreseeable Effects

Construction and operation of the proposed PMN Units 1–4 is not expected to detrimentally affect or alter the geologic environment at the site related to the facets of geology and soils and reasonably foreseeable effects are expected to be SMALL.

3.5 Water Resources

3.5.1 Surface Water Resources

This section provides a general description of the surface water resources potentially affected at the proposed PMN Units 1–4 site and surrounding region. Detailed analyses and evaluation of hydrology, water use, and water quality as required for an assessment of site safety issues related to the proposed plant are included in the safety evaluation.

3.5.1.1 *Affected Environment*

3.5.1.1.1 *Surface Water Hydrology*

As discussed in Section 3.4.1, the proposed PMN Units 1–4 site is located within the Llano Estacado region of the SHP portion of the Great Plains Physiographic Province. The Llano Estacado is the southernmost portion of the High Plains, which is demarcated by the Canadian River. The ground surface in the region is nearly flat but generally slopes southeastward at a rate of 8 to 10 ft/mi. Due to the relatively low relief, streams are not well developed, and surface drainage flows to circular shaped playas. Playas go through frequent, unpredictable, wet-dry cycles and typically average slightly more than 15 ac in size. Although larger playas may exceed 800 ac, most (around 87 percent) are smaller than 30 ac. Approximately 19,300 playas are found in the Texas High Plains within the SHP (NNSA 2023-TN13310, NNSA 2023-TN13317; TPW 2026-TN12969). Figure 3-6 shows the locations of playas (depicted as “lakes”) within a 6 mi radius of the proposed PMN Units 1–4 site.

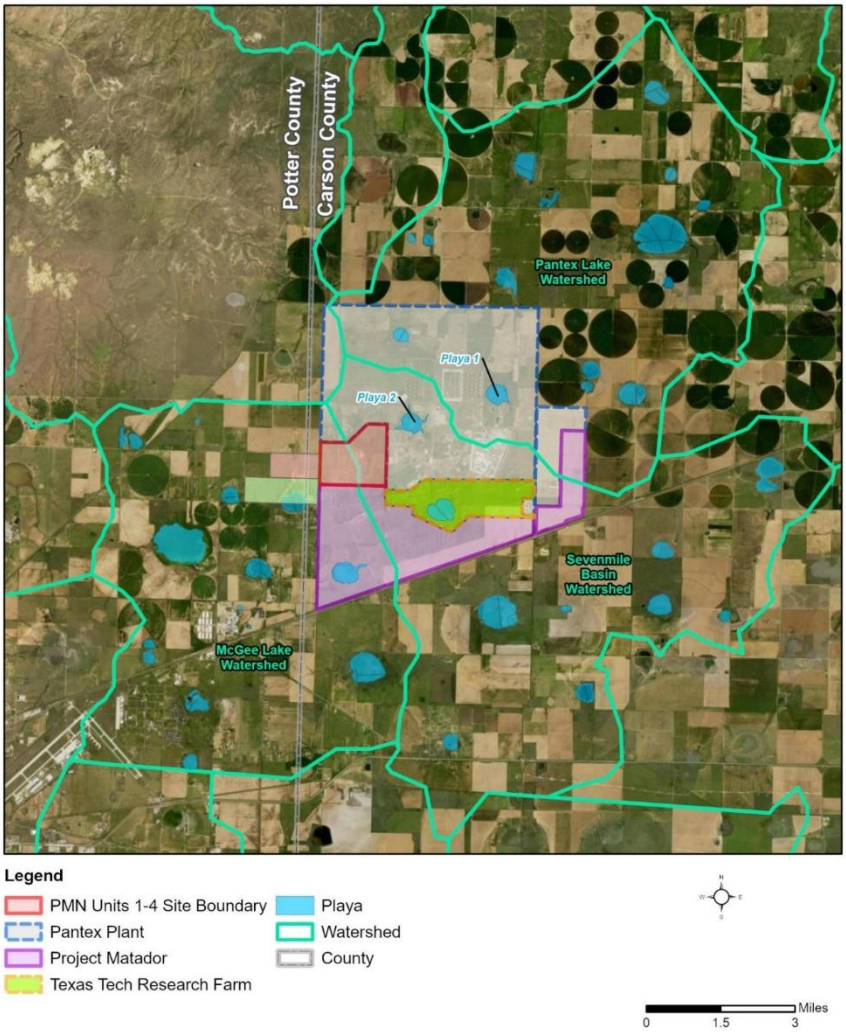


Figure 3-6 Watershed Boundaries and Playas at the Project Matador Campus

A topographic drainage divide occurs just north of the site separating the Red River Basin from the Canadian River Basin. The proposed PMN Units 1–4 site falls within the Red River Basin, and the area to the north of road FM 293 falls within the Canadian River Basin (NNSA 2023-TN13317; TPW 2026-TN13487). Within the Red River Basin, the Red River flows across Texas from its headwaters in New Mexico, along the Texas-Oklahoma border, and into Arkansas before reaching a confluence with the Mississippi River in Louisiana (TWDB 2026-TN13318). The Canadian River Basin is the northernmost river basin in Texas. Within the basin, the Canadian River flows across the northern Panhandle of Texas to its confluence with the Arkansas River in Oklahoma. Due to low precipitation and high evaporation rates in the Canadian River Basin, the basin has a low average watershed yield (TWDB 2026-TN13319).

The closest major riverine water feature to the proposed PMN Units 1–4 site is the Canadian River located approximately 17 mi northwest. Regionally, the Canadian River flows from the southwest to the northeast into a man-made surface water body, Lake Meredith, located approximately 25 mi north of the site (Pantex 2025-TN12791). Lake Meredith is formed by the Sanford Dam on the Canadian River at Sanford, Texas. Based on design data from the U.S. Bureau of Reclamation, the elevation of the top of dam is 3,011 ft above MSL with an uncontrolled spillway crest at an elevation of 2,965 ft above MSL. At the latter elevation, the reservoir can hold a total of 1,407,600 ac ft of water encompassing a surface area of approximately 21,639 ac. The designed maximum flood water level is 3,004.9 ft above MSL (TWDB 2026-TN13325).

To the northwest of the site and within its 6 mi vicinity are several intermittent headwater tributaries to Bonita Creek, a tributary of the Canadian River (Figure 3-10). Figure 3-10 shows water features and wetlands within a 6 mi radius of the site. There are a few smaller streams located approximately 20 to 50 mi away, southwest to southeast of the proposed PMN Units 1–4 site along the High Plains Escarpment. These streams are tributaries of the Red River and include the Salt Fork of the Red River, the Prairie Dog Town Fork of the Red River, McClellan Creek, and Sweetwater Creek (NNSA 2007-TN13342).

3.5.1.1.2 Site Surface Water Hydrology

There are no major rivers, lakes, or reservoirs within or adjacent to the proposed PMN Units 1–4 site (Figure 2-3). There are no natural, permanent flowing waters within the Project Matador Campus including on the proposed PMN Units 1–4 site. There are a number of playas of various sizes on the Pantex Plant site (see Figure 3-6), and a playa that is located in the southwestern corner of the Project Matador Campus. In addition, as discussed in Section 3.6.2, a subdivided portion of one palustrine emergent wetland (i.e., part of a small playa) occurs within the proposed PMN Units 1–4 site.

Within the central portion of the proposed PMN Units 1–4 site is an approximate 100 ac area that was previously disturbed by various historic operations known as Zone 9. Within and around this area, there are building foundations, several abandoned concrete washout sumps, concrete-lined drainage ditches, brine pits, earthen lagoons, and a few surface water drainages scattered throughout the site. There are also several topographic depressions or historical borrow pits that may occasionally hold surface water that line the perimeter of Zone 9, and brine pits also remain in the foundation of the northern structure of Zone 9 (Terracon 2025-TN12633).

3.5.1.1.3 Drainage Areas and Gradients

As depicted in Figure 3-6, a drainage divide separates the proposed PMN Units 1–4 site into two localized watersheds, the McGee Lake watershed to the west and the Sevenmile Basin watershed to the east. Runoff from the site drains into playas within these watersheds. The closest playa to the site within the McGee Lake watershed is located across FM 683 to the west. The eastern portion of the proposed PMN Units 1–4 site drains easterly to playas within the Sevenmile Basin. From the various playas and playa lakes, water either evaporates or infiltrates the soil (DOE 2018-TN12970). The legacy foundations and former operational stormwater conveyances in Zone 9 also locally influence surface water runoff within the area (Terracon 2025-TN12633).

3.5.1.1.4 Climate and Drought

The climate for the Amarillo, Texas, area is classified as semiarid and is characterized by hot summers and relatively cold winters (NNSA 2023-TN13310; NOAA 2026-TN13137). Mean annual precipitation in 2000 through 2026 is approximately 19.38 in (NOAA 2026-TN13488). Three-fourths of the average precipitation occurs from April through September (NOAA 2026-TN13137). The Texas Panhandle is one of the windiest regions in the United States. Wind speeds of 50 miles per hour (mph) or more occur each year, often with clear skies, warm temperatures, and blowing dust. These strong winds are most common in the winter and spring (NOAA 2026-TN13137). The climate and meteorological conditions at the site and surrounding area are detailed in Section 3.3.

DOE NNSA categorizes the Pantex Plant area as having a potential gross lake surface evaporation estimated to be about 270 percent of the annual precipitation, or approximately 70 in. per year (NNSA 2023-TN13310).

The U.S. Drought Monitor (USDM) uses a five-category system to show the location and intensity of droughts across the country. The five categories are abnormally dry (a precursor to drought) (D0), moderate (D1), severe (D2), extreme (D3), and exceptional (D4). These categories describe conditions related to dryness and drought including observations of available water in streams, lakes, and soil compared to the same time every year. Carson County, where the proposed PMN Units 1–4 site is located, often experiences measurable drought conditions, with local precipitation frequently running below average. These conditions reflect the longstanding drought patterns of the Southern Plains region, where low rainfall and high evaporative demand can persist for months or years at a time. Since 2000, Carson County has fluctuated between all five categories of drought. In the last 5 years (2021 through 2025), 100 percent of Carson County experienced categorized droughts from mid-August 2021 through early June 2023 (NOAA 2026-TN13346).

3.5.1.1.5 Surface Water Use

Surface water is not currently used at the adjacent Pantex Plant for any purpose, and no future use is anticipated (DOE 2008-TN12848). Lake Meredith, located approximately 25 mi north of the site, is used by the Canadian River Municipal Water Authority (CRMWA) for distribution of water allocations to CRMWA members (CA 2023-TN13349). Bivins Lake, located about 10 mi to the southwest of Amarillo, is owned and operated by the City of Amarillo to recharge groundwater that supplies the city's well field (TWDB 2026-TN13350). The use of any surface water is not anticipated for the construction and operation of the proposed PMN Units 1–4 site (FA 2026-TN13483).

3.5.1.1.6 Floodplains

The Federal Emergency Management Agency (FEMA) does not have flood hazard mapping available for the area of the proposed PMN Units 1–4 site. The closest FEMA-mapped areas include the City of Amarillo, town of Panhandle, and portions of Potter County. The proposed PMN Units 1–4 site is therefore outside any FEMA-mapped special flood hazard area. A floodplain delineation report was developed by the USACE Tulsa District, in January 1995 for the adjacent Pantex facility. This report delineated 100-year floodplains around 5 playa lakes located on the Pantex Plant property (NNSA 2023-TN13317). Because the playa lakes on the Pantex Plant property were delineated as 100-year floodplains, the portion of the small playa on the southern portion of the proposed PMN Units 1–4 site may also be considered a 100-year floodplain, as further described in Section 3.6.2.

3.5.1.1.7 Surface Water Quality

As discussed in Section 3.5.1.1.3, the site drains into two local watersheds, the Sevenmile Basin Watershed on the eastern side of the site and the McGee Lake Watershed on the western portion of the site. McGee Lake within the McGee Lake watershed has one documented water condition for potential harmful algal blooms (HABs). McGee Lake is located on the western side of the watershed, approximately 3 mi southwest of the proposed PMN Units 1–4 site. Based on the location and gradient of McGee Lake, no surface drainage from the site would be captured by McGee Lake; therefore, the former and current activities at the site have not contributed to the HABs (EPA Undated-TN13351).

The adjacent Pantex Plant is permitted to discharge treated wastewater to a playa located north of the Pantex Plant, referred to as Playa 1, under Water Quality Permit No. WQ0002296000. Sampling is conducted at the incoming weir of the lagoon system (before treatment) and at the permitted discharge point for surface water discharge (Outfall 001A) for explosives, metals, biochemical oxygen demand, chemical oxygen demand, total suspended solids, and oil/grease. Pantex Plant reported that the sampling results indicate that the treatment system adequately treats the wastewater to comply with permit effluent limitations (Pantex 2025-TN12791).

The adjacent Pantex Plant is also permitted to discharge treated wastewater through subsurface irrigation and pivot irrigation under Water Quality Permit No. WQ0004397000 and underground injection control (UIC) Authorization No. 5W2000017. The 2024 surface irrigation soil sampling results for high explosives (HE), reactivity, and semi-volatile organic compounds (VOCs) were all non-detect. Results of soil monitoring conducted at the surface and subsurface irrigation systems for 2024 were consistent with the previous year's results and indicate operations are having no negative impact on the environment (Pantex 2025-TN12791).

Environmental investigations were conducted between 1990 and 2004 in two areas within the proposed PMN Units 1–4 site known as Zone 9 and the Rockpile area. The investigations were conducted to evaluate the potential for impacts related to the historical use of Zone 9 by the former U.S. Department of Defense (DoD) and for agricultural, chemical storage, and hide rendering operations. The environmental investigation in the Rockpile area was conducted to evaluate the potential for impacts related to historical discharges from Zone 9 to a depression in the Rockpile Area. Multiple explosive compounds and VOCs related to the former DoD activities were detected at concentrations greater than those specified in the Texas Risk Reduction Standards (RRS) for soil samples collected near former buildings, the former washout racks, and the central drainage ditch in Zone 9. Metals attributed to the brine pits and earthen lagoons were also detected in soils in Zone 9. In the Rockpile area, copper, lead, and zinc soil

concentrations were greater than the RRS (Terracon 2025-TN12633). Soil testing related to the brine pits, earthen lagoons, and the Rockpile area was limited. Residual impacts to soils related to the historical site activities may remain in Zone 9 and the Rockpile area. Additionally, impacted soils from Zone 9 and Rockpile area have the potential to runoff into playas and infiltrate to groundwater. Groundwater quality is discussed in Section 3.5.2.1.

3.5.1.2 Surface Water Resources Impacts from Building PMN Units 1–4

3.5.1.2.1 Hydrologic Alterations

As described in Section 3.5.1.1, there are no major surface water resources near or within the proposed PMN Units 1–4 site, and there are no natural, permanent flowing waters within the Project Matador Campus or within the proposed PMN Units 1–4 site. The proposed PMN Units 1–4 site is divided by a localized topographic drainage divide between the McGee Lake watershed on the west and the Sevenmile Basin watershed to the east. Surface drainage within each watershed flows toward playas and either infiltrates the soil or evaporates. On the proposed PMN Units 1–4 site, only minor surface water or drainage features are present. These include a portion of a playa and several anthropogenic features including excavated borrow pits, drainage depressions, brine pits, and earthen lagoons.

Construction of the proposed PMN Units 1–4 is anticipated to alter the current drainage patterns at the site. Onsite stormwater flow during construction is expected to be directed away from any playas into engineered stormwater basins for reuse. Construction of the proposed PMN Units 1–4 is also expected to disturb former borrow pits and drainage depressions that collect water, and building activities are expected to result in the removal of the human-made brine pits and earthen lagoons (FA 2026-TN13483).

The playas, borrow pits, drainage depressions, brine pits, and earthen lagoons are not interconnected by flowing waters, and their removal is not expected to impact any flowing water bodies. A formal wetland delineation has not been conducted on the site, and any wetland-like areas associated with the portion of the playa onsite may or may not meet the USACE three parameter delineation criteria (hydrophytic vegetation, hydric soils, wetland hydrology) for wetlands. Additionally, infiltration of surface water runoff at playas is not a significant source of recharge to the perched aquifer or the Ogallala Aquifer due to high evaporation rates, and because the playas tend to be ephemeral, they are generally not used as a source of potable water or used for recreation. All hydrologic alterations associated with building activities will be conducted in accordance with a soil management plan to manage the presence of any impacted soils, and testing of any spoils will be conducted prior to any reuse or disposal (FA 2026-TN13483). Therefore, the impact due to hydrologic alterations at the site is expected to be SMALL.

3.5.1.2.2 Surface Water Use

There is no planned surface water use for the construction of the proposed PMN Units 1–4. Construction of the four AP1000 units will be completed using municipal water obtained from the City of Amarillo well fields using existing and upgraded municipal infrastructure. No independent construction water supply is planned (FA 2026-TN13483). Groundwater use from municipal sources during construction is described in Section 3.5.2.2. Because no surface water resources are being used for construction activities, impacts due to surface water use are expected to be SMALL.

3.5.1.2.3 Surface Water Quality

There are no major surface water resources near or within the proposed PMN Units 1–4 site, and there are no natural, permanent flowing waters within the Project Matador Campus or on the proposed PMN Units 1–4 site. Therefore, significant impacts to surface water quality related to the construction of the proposed PMN Units 1–4 are not expected. However, construction related activities may result in increased sediment in runoff, transport of pollutants like oil and grease, and accidental spills of other construction activity related chemicals into local playas or drainage areas.

Stormwater runoff from construction sites that disturb one or more acres is required to be permitted by the TCEQ under a Stormwater General Permit for Construction Activities (CGP). As part of the GCP, a Stormwater Pollution Prevention Plan (SWPPP) is required to be developed and implemented prior to commencing construction activities. Construction plans and BMPs to control and minimize pollutants that may be discharged in stormwater runoff will be included in the SWPPP (TCEQ 2026-TN13352). Potential stormwater discharge points during construction would be limited to stormwater outfalls from temporary/permanent conveyances shown on the grading and drainage plans. Outfalls (if any) would be identified in the SWPPP and mapped with coordinates. Fermi America plans to obtain coverage under the appropriate construction stormwater permit and implement a SWPPP and appropriate BMPs prior to land disturbance.

The management and storage of excavated soils during the construction of the proposed PMN Units 1–4 will be managed in accordance with a soil management plan. The water and sediments from the brine pits and earthen lagoons are planned to be managed as impacted spoils until characterization confirms otherwise. Procedures to manage spoils and potentially impacted materials are anticipated to include pre-excavation planning and controls, soil segregation and stockpiling when necessary, monitoring and field screening during earthwork, and analytical testing prior to reuse and disposal. Impacted materials would be disposed of at appropriately permitted facilities based on characterization results. No excavated soil or lagoon water would be reused onsite without confirmation that it meets defined reuse criteria (FA 2026-TN13483).

During construction activities related to the proposed PMN Units 1–4, sanitary wastewater is planned to be managed using temporary sanitary facilities sized to the workforce (e.g., portable toilets and handwash stations) and/or temporary connections to municipal sanitary sewer, where available. Collected sanitary waste would be removed by a licensed hauler and disposed of at an authorized wastewater treatment facility in accordance with State and local requirements. Any temporary onsite sanitary systems (if needed) would be permitted as required by the applicable authority having jurisdiction (FA 2026-TN13483).

Surface water is not likely to leave the site during construction activities due to adherence to the soils management plan and the intended recapture and reuse of construction and stormwater effluent; thus, impacts to water quality from building activities related to the proposed PMN Units 1–4 are expected to be SMALL. Additionally, due to adherence to spill prevention and pollution control measures and in compliance with the requirements set for the TPDES permit, and given the temporary nature of the construction, the potential for water quality degradation due to inadvertent spills during construction is expected to be SMALL.

3.5.1.2.4 Water Quality Monitoring

Surface water quality monitoring during the construction of the proposed PMN Units 1–4 is expected to comply with the TCEQ GCP permit requirements. Permit monitoring requirements for discharge from the site may include monitoring of temperature, radioactivity, volatile compounds, pesticides, metals, hydrocarbons, suspended solids, and ecological parameters. Fermi America plans to adhere to permit requirements in the State of Texas applicable to building activities.

3.5.1.3 Surface Water Resources Impacts from Operating PMN Units 1–4

This section describes potential impacts on the existing surface water features from operating activities at the proposed PMN Units 1–4 site.

3.5.1.3.1 Hydrologic Alterations

As described in Section 3.5.1.1, there are no major surface water resources near or within the proposed PMN Units 1–4 site, and there are no natural, permanent flowing waters within the Project Matador Campus or on the proposed PMN Units 1–4 site.

As seen in Figure 2-2, there are plans to construct two engineered impoundments for water storage within the proposed PMN Units 1–4 site. The impoundments are being designed as purpose-built operational water storage features that include sufficient capacity for routine operational demands, contingency supply, freeboard capacity necessary for stormwater protection, and to ensure operational reliability. Each impoundment can hold up to 250 million gallons (Mgal) and is designed with a geomembrane liner to prevent groundwater intrusion and biological growth. The impoundments would be filled using approved water sources, which include purchased municipal water, stormwater, and other sources. Fill water is expected to be sourced and managed in compliance with applicable water rights, supply agreements, and permits (FA 2026-TN13483).

An operational stormwater management program is planned to be in place during operation of the proposed PMN Units 1–4. This plan will be designed to capture, control, and reuse stormwater generated within the Project Matador Campus footprint. Instead of flowing to nearby playas and infiltrating the soil or evaporating, stormwater will be directed to outfalls that discharge to one of the water storage impoundments located on the northern portion of the nuclear site. The stormwater, along with water from other approved sources, will be treated in a water treatment facility and reused (FA 2026-TN13483).

The playas, borrow pits, drainage depressions, brine pits, and earthen lagoons are not interconnected by flowing waters, and the redirection of stormwater to storage impoundments is not expected to impact any flowing water bodies or impact recharge to the Ogallala Aquifer. Additionally, because the playas tend to be ephemeral, they are generally not used as a source of potable water or used for recreation. Therefore, the impact due to hydrologic alterations at the site during the operation of the proposed PMN Units 1–4 is expected to be SMALL.

3.5.1.3.2 Surface Water Use

There are no plans to use offsite surface water for operations of the proposed PMN Units 1–4 (FA 2026-TN13483). The proposed PMN Units 1–4 are planned to be operated using air-cooled technology. These systems are completely closed systems designed to minimize incidental

system water demand. Any additional incidental water needs will be provided by municipal water sourced via water purchase agreements with the City of Amarillo (FA 2026-TN13483). This water will be stored in two onsite engineered impoundments located on the north end of the site.

Because no surface water resource use is planned for the operation of the proposed PMN Units 1–4, operational impacts due to surface water use are expected to be SMALL.

3.5.1.3.3 Surface Water Quality

The proposed PMN Units 1–4 are planned to be operated using air-cooled technology, and no surface water use is planned for the cooling systems or other plant systems. Therefore, significant impacts to surface water quality related to the operation of the proposed PMN Units 1–4 are not expected. However, operational activities may result in increased stormwater runoff, plant effluents, and accidental spills.

Fermi America plans to capture and reuse as much reclaimed effluent and stormwater as possible from the proposed PMN Units 1–4 site and the larger Project Matador Campus. Any plant effluent discharge will be permitted and managed under a TPDES permit. Water quality parameters would be monitored at specified frequencies and at designated locations on the proposed PMN Units 1–4 site per permit requirements. Nonradiological effluents are planned to be discharged through permitted outfalls or treated for reuse (FA 2026-TN13483). Liquid radiological effluent would be routed to the liquid radioactive waste system (LRWS) which collects, processes and treats all liquid radiological effluent. Liquid effluent that does not meet applicable reuse criteria would be cycled through the LRWS, ultimately concentrated, solidified, and managed as solid radioactive waste for offsite disposal (FA 2026-TN13483).

Stormwater is intended to be captured and reused onsite with no planned offsite discharge. The operational stormwater management program will be designed to capture, control, and reuse stormwater generated within the Project Matador Campus; support environmental compliance; minimize pollutant transport; and maintain stormwater as a managed resource. Fermi America is expected to develop and implement a monitoring program to meet the requirements of applicable permits during the operation of the proposed PMN Units 1–4 (FA 2026-TN13483).

Sanitary effluent from the proposed PMN Units 1–4 site is planned to be managed in a permitted onsite sewage facility (or equivalent), conveyed to an approved municipal wastewater treatment system, or other permitted disposal or reuse methods (FA 2026-TN13483).

Fermi America intends to reduce the operational impact to surface water quality through its planned water reuse and stormwater management programs. Any plant effluents will be reused where practicable or discharged in accordance with permit requirements. Therefore, it is determined that impacts to surface water quality due to the operation of the proposed PMN Units 1–4 are expected to be SMALL.

3.5.1.3.4 Water Monitoring

Surface water monitoring is expected to be implemented, as appropriate, based on site drainage features, operational stormwater management design, and in satisfaction of applicable environmental permitting requirements. Because stormwater is intended to be captured and reused onsite, monitoring is expected to focus on maintaining water quality for reuse and confirming system integrity. This may include routine inspection and monitoring of stormwater collection and reuse features (e.g., impoundments, basins, conveyance structures); periodic

sampling of water retained for reuse, as necessary to confirm suitability for intended reuse applications; sediment management and observation for visual indicators (e.g., turbidity, sheen); and documentation of inspections, maintenance activities, and corrective actions.

Fermi America plans to maintain and implement a long-term monitoring program that includes documented sampling procedures, quality assurance/quality control measures, and chain-of-custody protocols; data review and trend evaluation on a scheduled basis; records retention and reporting consistent with permit or agency requirements; and periodic reassessment of the monitoring network and analyte list to ensure the program remains effective over the operational life of the facility (FA 2026-TN13483).

3.5.2 Groundwater Resources

This section describes hydrogeology (including aquifers and aquicludes), water use, and water quality at the proposed PMN Units 1–4 site and in the region surrounding the site. Information on geology of the PMN Units 1–4 site and the region surrounding the site summarized in Section 3.4 is used to inform the discussion of groundwater resources. Detailed analyses and evaluations of groundwater characteristics required for assessment of site safety issues related to the proposed plant will be included in the safety evaluation.

3.5.2.1 Affected Environment

Groundwater in the saturated zone beneath the PMN Units 1–4 site and vicinity occurs in the Lower Ogallala Formation (i.e., the Ogallala Aquifer) and the Dockum Group. The shallowest water-bearing zone underlying the site is a perched aquifer in the Upper Ogallala Formation in the unsaturated (i.e., vadose) zone above the deeper Ogallala Aquifer (Pantex 2025-TN12791).

3.5.2.1.1 Perched Groundwater Hydrology

The perched aquifer is a discontinuous zone of groundwater located approximately 200 to 300 ft below ground surface (bgs) and about 100 to 200 ft above the Ogallala Aquifer that is the primary aquifer in the region (see Figure 3-5). A fine-grained zone (FGZ) composed of sand, silt, and clay sediments in the Upper Ogallala Formation (i.e., the unsaturated zone as shown in Figure 3-5) that were impermeable enough to create a zone of perched groundwater above the FGZ occurs between the perched groundwater zone and the underlying deeper primary drinking water aquifer in the saturated zone of the Lower Ogallala Formation. The FGZ forms a significant barrier to downward migration of contaminated water from the perched groundwater zone. Perched groundwater develops from the migration of surface water in the playa lakes downward to the FGZ. Saturated thickness of the perched aquifer ranges from nearly 75 ft beneath Playa 1 thinning to zero at the perched groundwater fringe near the center of the PMN Units 1–4 site (Figure 3-5) (Pantex 2025-TN12791).

Groundwater flow in the perched aquifer in the vicinity of the site is governed by elevation of the FGZ and localized sources of groundwater recharge, one of which is the natural recharge from playas as stated above. Wastewater discharged to Playa 1 on the adjoining Pantex Plant has historically been a primary source of recharge to perched groundwater in the area also. Recharge from Playa 1 has resulted in a perched groundwater mound and radial flow away from the playa including southwestward toward the PMN Units 1–4 site (Pantex 2025-TN12791, Pantex 2025-TN13343). Tests conducted in playa and interplaya settings indicate that preferential flow is particularly important for transport of adsorbed contaminants in playa settings (Gustavson et al.-TN13345).

As shown in Figure 3-7, groundwater elevations based on data collected in 2024 at the PMN Units 1–4 site (Pantex 2025-TN12791) ranged between approximately 3,275 ft above mean sea level (MSL) near the northeastern corner of the site to under 3,260 ft above MSL near the southern central portion of the property where the FGZ is absent and saturated thickness diminishes to zero. Groundwater level trends observed in monitoring wells located on the westernmost portion of the Pantex Plant near the PMN Units 1–4 site have generally increased by approximately 2 to 7 ft since the mid-2000s. These increases in water levels may be attributable to operation of the subsurface injection system near Playa 2, located approximately 1,800 ft east of the PMN Units 1–4 site. The system was installed in 2016 and consists of three injection wells that intersect a portion of treated groundwater extracted from the onsite pump and treat systems at the Pantex Plant (Pantex 2025-TN12791, Pantex 2025-TN13343).

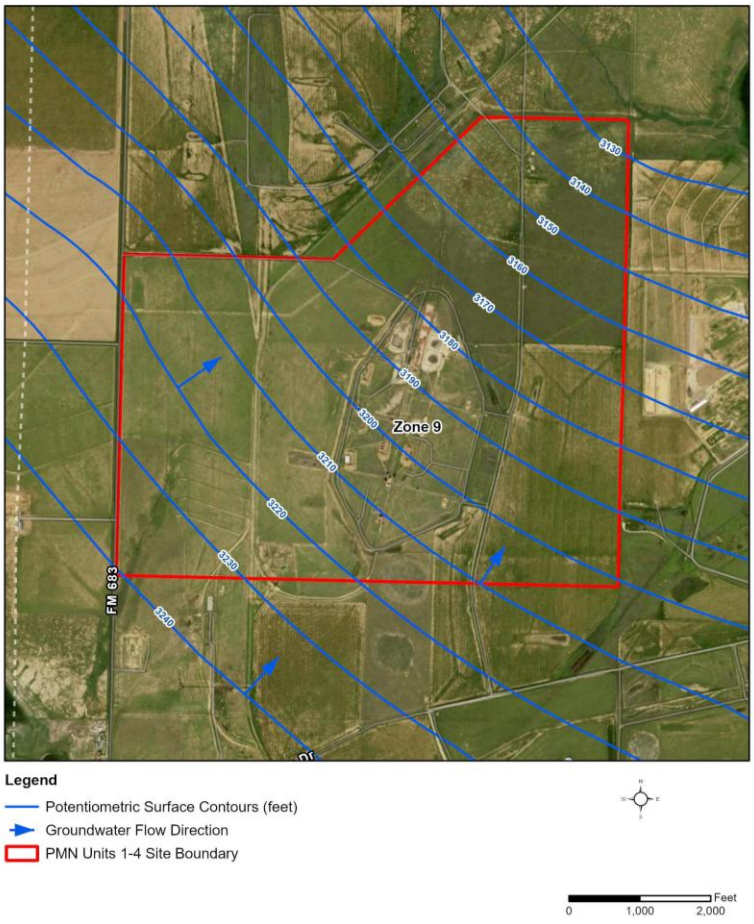


Figure 3-7 Potentiometric Surface Map of the Ogallala Aquifer at the Project Matador Units 1–4 Site. Source: Pantex 2025-TN13343.

Aquifer tests conducted in the perched aquifer at the adjoining Pantex Plant document significant local heterogeneity in hydraulic conductivity. Calculated values of hydraulic conductivity using data from multi-well pumping tests (4 wells) ranged from 33.8 to 148.6 feet per day (ft/d). Assuming an effective porosity of 0.25 based on geophysical logs from the Pantex Plant and an average local hydraulic gradient of 0.0063, the groundwater velocity in the perched aquifer was calculated to range from 0.85 ft/d to 3.7 ft/d (Gustavson et al.-TN13345).

Vertical hydraulic conductivity measured in samples collected from the FGZ at the Pantex Plant were estimated to range between 1.08×10^{-9} centimeters per second (cm/s) to 4.62×10^{-6} cm/s. Assuming a perched aquifer thickness of 3 m, a thickness of 2.4 m for the FGZ, and a vertical hydraulic conductivity of the FGZ of 1×10^{-8} cm/s, the time required for a water particle to move through the FGZ would be approximately 100 years (Gustavson et al.-TN13345).

3.5.2.1.2 Ogallala Aquifer Hydrology

The Ogallala Aquifer is the primary groundwater source near the PMN Units 1–4 site. It is used as a domestic and industrial water source by numerous municipalities and industries in the High Plains region.

Groundwater in the Ogallala Aquifer is recharged from downward percolation of water, either from the surface or overlying perched groundwater zones. The distribution of recharge is poorly known, with estimates ranging from less than 0.01 in per year to several feet per year. Higher recharge rates occur where the Ogallala Formation occurs at the surface and where surface water runoff is focused, such as beneath drainage ditches and playas. Lower rates occur for upland areas between the drainage ditches and playas (SAIC 2008-TN13341).

Groundwater flow within the Ogallala Aquifer beneath the site is from the southwest to the northeast where the zone of saturation is thickest. The groundwater gradient is influenced by production wells operated by the Pantex Plant and the City of Amarillo, which is located northeast of the proposed PMN Units 1–4 site. Near the PMN Units 1–4 site, the Ogallala Aquifer ranges in depth from approximately 335 ft bgs to 500 ft bgs with a saturated thickness of approximately 39 to 400 ft that increases from southwest to northeast. As shown in Figure 3-7, groundwater elevations measured in the Ogallala Aquifer in 2024 ranged from approximately 3,240 ft above MSL on the southwestern portion of the site to 3,130 ft above MSL on the northeastern corner of the site. In general, groundwater levels in the Ogallala Aquifer nearest to the PMN Units 1–4 site have decreased by over 10 ft since the early 2000s (Pantex 2025-TN13343).

Hydraulic conductivity of the Ogallala Aquifer in the area ranges from 5 to 44 ft/d with an estimated geometric mean of 14.8 ft/d. The hydraulic gradient across the site is about 0.012 ft/d. Effective porosity of the Ogallala aquifer in the area ranges from approximately 29 percent to 42 percent (SAIC 2008-TN13341). Assuming an effective porosity of 30 percent, groundwater flow velocity in the Ogallala aquifer underlying the PMN Units 1–4 site ranges from 0.21 to 1.82 ft/d.

3.5.2.1.3 Dockum Group Aquifer Hydrology

The Dockum Group Aquifer lies under the Ogallala Formation in the southwestern portion of Carson County (PGCD 2024-TN13340) and is classified as a minor aquifer (PGCD 2024-TN13340). Water contained in sandstone layers of the Dockum Group supplies limited amounts of water from domestic and livestock wells south and southeast of the site. Other wells reaching the Dockum Group Aquifer are located 10 mi south and west of the site. The aquifer may be semi-confined with respect to the overlying Ogallala Aquifer because of lateral lithologic variations in the Ogallala (Pantex 2025-TN12791).

3.5.2.1.4 Groundwater Use

The site is located within the Panhandle Groundwater Conservation District (PGCD), which consists of Carson, Donley, Gray, Roberts, and Wheeler Counties. The PGCD manages

groundwater supplies within the district in coordination with the appropriate State, regional, and local water management entities. Because historical groundwater withdrawals from the Ogallala Aquifer exceeded the natural recharge rate, the PGCD adopted a 50/50 Management Standard (50/50 Standard). The goal of the 50/50 Standard is to maintain at least 50 percent of the current volume in the Ogallala Aquifer after 50 years. The 50/50 Standard was originally adopted through 2048 but has been extended through 2080. Successful attainment of the 50/50 Standard is accomplished using PGCD's integrated programs that include conservation, education, regulation, and groundwater withdrawal permitting (PGCD 2024-TN13340).

There are over 3,000 permitted irrigation wells capable of producing water to meet the needs of the agricultural community within the PGCD boundaries. There are also 350 municipal or public supply wells and over 380 wells for industrial use and oil and gas secondary recovery operations managed within the PGCD. To meet the 50/50 Standard, the maximum allowable volume of pumping from the Ogallala Aquifer for a private well is 1 acre-foot per contiguous acre per year (PGCD 2024-TN13340).

The City of Amarillo is the largest user of Ogallala Aquifer water in the area and pumps water for public use from the Carson and Potter well field that is located northeast of the site. The Carson and Potter County's well field consists of a combined 44,796 contiguous ac. Groundwater withdrawal permits issued by the PGCD limit withdrawals from the well field to 4.5 gallons per minute (gpm) per contiguous acre with no more than 2,880 gpm per 640 ac. The City of Amarillo owns other untapped locations and also operates a 906 ac field and a 640 ac field within Carson County. Those well fields operate under the same permit limitations (FA 2026-TN13483).

Groundwater from the Ogallala Aquifer provides the sole potable and industrial water source for the Pantex Plant. Pantex obtains water from 5 groundwater production wells located in the northeast portion of the Pantex Facility that are pumped at a combined average rate of 0.72 million gallons per day (Mgd). Most of the water used at the Pantex Plant is for domestic purposes (DOE 2008-TN12848). The Pantex Plant also operates groundwater pump and treat systems to manage impacts to perched groundwater related to historical operations. The Pantex Plant routes the treated perched groundwater through a wastewater treatment system and uses that water beneficially for subsurface or surface crop irrigation (Pantex 2025-TN12791).

As shown in Figure 3-8 and Table 3-9, there are 87 registered wells located within a 5 mi radius of the PMN Units 1–4 site. Most of these wells are registered for use as domestic, irrigation, or livestock watering wells. The closest water supply wells to the site are the Pantex Plant wells that are located over 3 mi to the northeast of the site and the City of Amarillo's Carson and Potter County's well field located over 4 mi to the north-northeast of the site. All of the registered wells within 5 mi of the site are completed in the Ogallala Aquifer (TWDB 2026-TN13336). No public or private water supply wells are completed in the perched groundwater aquifer in the immediate vicinity of the site. Perched groundwater is not used for industrial purposes in the area (Pantex 2025-TN12791).

A Groundwater Deed Certification dated September 21, 2009, was executed as part of the remediation at the adjoining Pantex Plant. As discussed in Section 3.5.2, perched groundwater emanating from the Pantex Plant is impacted by historical releases of volatile organic compounds (VOCs), metals, and constituents associated with explosives manufacturing. These impacts are being remediated at the Pantex Plant. The institutional controls outlined in the Groundwater Deed Certification include a restriction on perched groundwater use, including on the eastern portion of the PMN Units 1–4 site where perched groundwater is present. In addition to perched groundwater use restrictions, drilling to depths greater than 180 ft within the

described restriction zone is controlled unless authorized by DOE NNSA (Terracon 2025-TN12633). The Groundwater Deed Certification area on the PMN Units 1–4 site is shown in Figure 3-9.

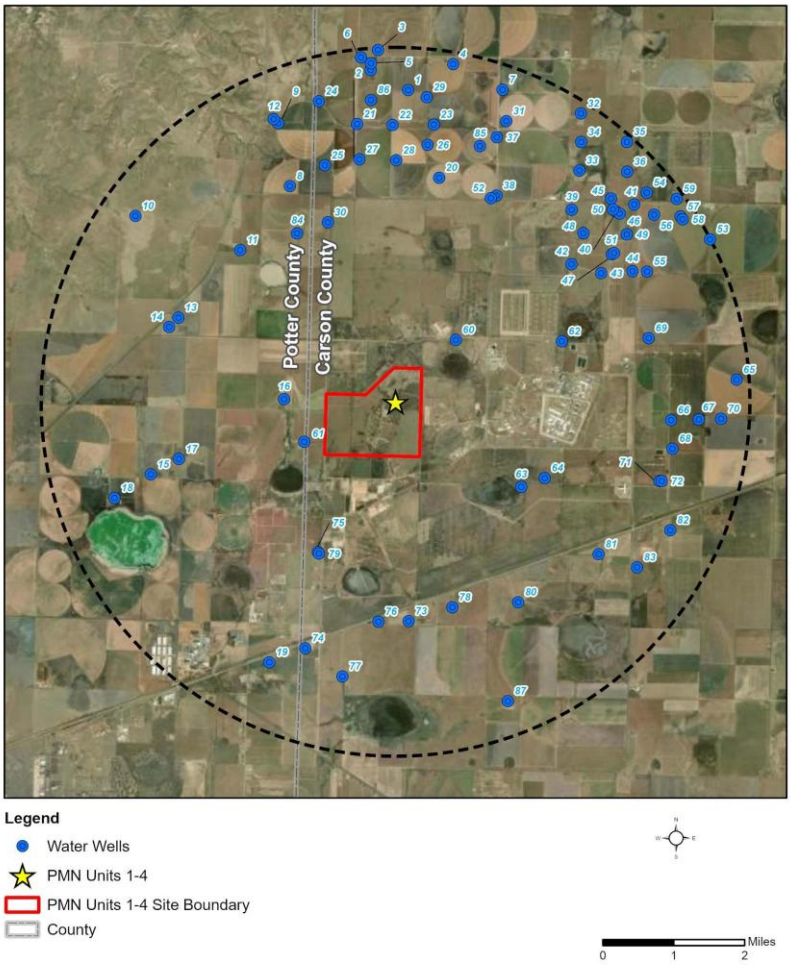


Figure 3-8 Registered Water Wells Located within a 5 mi Radius of the Project Matador Nuclear Site Units 1–4 Site. Source: TWDB 2026-TN13336.

Table 3-9 Registered Wells Located Within 5 mi of the Project Matador Nuclear Units 1–4 Site

ID[a]	Owner	Use	Distance (mi)
1	Ellis W. Russ	Irrigation	4.40
2	Ralph Randel	Irrigation	4.69
3	Amarillo Municipal Water System	Public Supply	4.97
4	Garner Stamps	Irrigation	4.83
5	Mark Urbanzyck	Irrigation	4.79
6	Evelyn Leven	Domestic	4.88
7	Lorene O. Locke	Plugged or Destroyed	4.65
8	Jim Gabel	Irrigation	3.39
9	A. Detten	Irrigation	4.26

ID[(a)]	Owner	Use	Distance (mi)
10	B. Stinnett	Stock	4.51
11	B. Stinnett	Unused	3.06
12	Danny Detten	Domestic	4.34
13	Beaumont Stinnett	Unused	3.29
14	Mark Nuesch	Domestic	3.36
15	Clarence Bertrand	Domestic	3.60
16	Mr. & Mrs. Phillip Smith	Domestic	1.57
17	Micheal Lamkin	Unused	3.16
18	Mrs. J.L. Whitacre	Domestic	4.19
19	George Raef	Domestic	4.08
20	Mrs. J.J. (Nettie) Witten	Irrigation	3.22
21	Ralph Randel	Irrigation	3.96
22	Ellis W. Russ	Irrigation	3.91
23	Dee Cumming	Irrigation	3.95
24	Arthur Detten	Irrigation	4.38
25	Jim Gabel	Irrigation	3.48
26	Nettie Witten	Irrigation	3.65
27	Paul Russ	Irrigation	3.46
28	Paul Russ	Plugged or Destroyed	3.41
29	William D. Wright	Domestic	4.32
30	Ronnie Neusch	Domestic	2.71
31	Lawrence Melcher	Irrigation	4.26
32	Amarillo Municipal Water System	Public Supply	4.83
33	Amarillo Municipal Water System	Public Supply	4.17
34	Amarillo Municipal Water System	Public Supply	4.50
35	Amarillo Municipal Water System	Public Supply	4.91
36	Amarillo Municipal Water System	Public Supply	4.61
37	D.W. Osborne, Jr.	Irrigation	3.10
38	D.W. Osborne, Jr.	Irrigation	3.24
39	U.S. Dept. of Energy Pantex Water System	Public Supply	3.68
40	U.S. Dept. of Energy Pantex Water System	Plugged or Destroyed	4.10
41	U.S. Govt.—AEC—Pantex Facility	Public Supply	4.37
42	U.S. Dept. of Energy Pantex Water System	Plugged or Destroyed	3.15
43	U.S. Govt.—AEC—Pantex Facility	Public Supply	3.42
44	U.S. Govt—AEC—Pantex Facility	Public Supply	3.82
45	Mrs. Glen Pratt	Domestic	4.18
46	U.S. Dept. of Energy Pantex Water System	-	4.13
47	U.S. Dept. of Energy Pantex Water System	Public Supply	3.69
48	U.S. Dept. of Energy Pantex Water System	Public Supply	3.56
49	U.S. Dept. of Energy Pantex Water System	Public Supply	4.03
50	U.S. Dept. of Energy Pantex Water System	Public Supply	4.09
51	U.S. Government (AEC)	Unused	3.73

ID[a]	Owner	Use	Distance (mi)
52	Garner Stamps Pantex	-	3.17
53	Lester Lusk	Irrigation	4.10
54	Robert Burrell	Irrigation	4.61
55	Harry G. Vance	Irrigation	3.10
56	Floyd M. Hodges	Irrigation	4.50
57	Elsie Lusk	Irrigation	4.80
58	Lester Lusk	Irrigation	4.80
59	Johnny Burrell	Domestic	4.89
60	W H Kimble	Domestic	1.22
61	NA[b]	Domestic	1.41
62	E.E. Lusk	Domestic	2.49
63	NA	-	2.14
64	NA	-	2.36
65	B.K. Bentley	Irrigation	4.82
66	Wescoat & Hood	Irrigation	3.89
67	West Coat & Hood	Irrigation	4.29
68	Wescoat & Hood	Irrigation	3.96
69	Harry G. Vance	Plugged or Destroyed	3.68
70	A.J. Labus	Irrigation	4.60
71	Lee Cockrell	Plugged or Destroyed	3.89
72	Lee Cockrell	Domestic	3.92
73	Peace Farm	Domestic	3.10
74	George Rafe	Domestic	3.70
75	NA	Domestic	2.39
76	Sam McGregor	Domestic	3.11
77	Locke & Miller	Domestic	3.95
78	NA	Domestic	3.01
79	Milo Clinton	Domestic	2.40
80	J.C. Vance Estate	Domestic	3.32
81	Russell Petters	Stock	3.58
82	NA	Stock	4.28
83	Gene Gideon	Domestic	4.13
84	Phillip Smith	Stock	2.75
85	Gabel Brothers	Irrigation	3.80
86	Jo Ella RANDEL	Irrigation	4.27
87	NA	Stock	4.51

AEC = U.S. Atomic Energy Commission.
"-" no data in the table cell.
(a) The ID can be used to locate the well in Figure 3-8.
(b) NA = Ownership information is not available.
Source: TWDB 2026-TN13336.

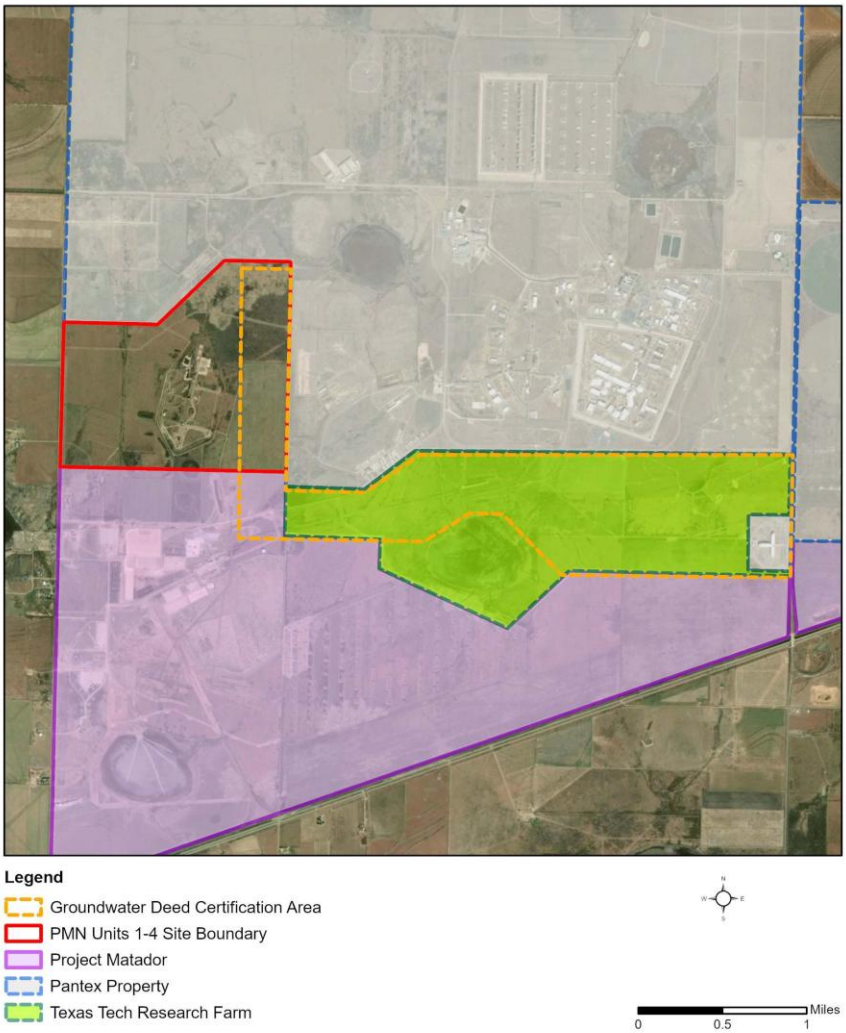


Figure 3-9 Groundwater Deed Certification Area on the Project Matador Nuclear Units 1–4 Site. Source: Terracon 2025-TN1263.

According to the EPA map of sole source aquifer locations, there are no sole source aquifers within the 50 mi region that will be affected by building activities or plant operations (EPA 2025-TN6709).

Water demands for building activities and operations of the PMN Units 1–4 site will be supplied by municipal water from the City of Amarillo. The City of Amarillo has capacity to deliver 2.5 Mgd of potable water from the Carson County well field. Water delivery capacity can be expanded to provide a total of 5.5 Mgd of water to the site by the year 2026, ensuring adequate supply to meet the projected demands of Project Matador development (CA 2025-TN13335).

3.5.2.1.5 Groundwater Quality

PGCD evaluates water quality within the district by collecting groundwater samples from wells within its network every 2 years. Groundwater samples are collected from wells screened within the Ogallala Aquifer and in the underlying Dockum and Blaine Aquifers. Groundwater sampling results are compared against EPA maximum contaminant levels (MCLs) or drinking water

standards. Results of the most recent groundwater monitoring event conducted in 2025 by the Panhandle Groundwater Conservation District indicate total dissolved solids (TDS) in the Ogallala was 390 ppm, indicating good quality drinking water. Groundwater samples collected from the Dockum Aquifer were classified as fair to hard freshwater. Samples collected from several of the wells within the PGCD exceeded the primary MCL for other routinely analyzed parameters, including nitrate and fluoride, and exceeded the secondary MCL for chloride, iron, manganese, pH, sulfate, and TDS. Likely sources of these constituents are not related to the PMN Units 1–4 site or the Pantex Plant, and are likely attributed to agriculture, erosion, oil field and industrial brine, road salt, and other industrial sources (Ausbrooks 2025-TN13333).

Historical waste management practices at the Pantex Plant have resulted in impacts to onsite soil, perched groundwater, and some minor impacts to the deeper Ogallala Aquifer. High explosives, solvents, and metals were found in the soil in the main operational areas, the Burning Ground, and in perched groundwater beneath the Pantex Plant. Impacted perched groundwater may have migrated past Pantex Plant boundaries onto the eastern portion of the PMN Units 1–4 site. The Ogallala Aquifer does not currently pose an exposure risk to onsite and offsite receptors because constituents of potential concern do not exist above drinking water standards in the Ogallala Aquifer (DOE 2008-TN12848; Pantex 2025-TN13343).

Pantex Plant monitors impacts to the perched and Ogallala Aquifers and remediation progress with a long-term monitoring network. Groundwater monitoring is conducted in accordance with the sampling and analysis plan for the Pantex Plant and with the requirement of the Pantex hazardous waste permit/compliance plan. Groundwater monitoring is completed on a quarterly, annual, and 5-year basis, and groundwater monitoring results are summarized in the annual Remedial Action Annual Progress Reports prepared for Pantex that are publicly available. Future contamination of the Ogallala Aquifer will be monitored as part of uncertainty management/early detection monitoring (Pantex 2025-TN13343).

There are no monitoring wells located on the PMN Units 1–4 site that are routinely monitored as part of the Long-Term Monitoring Network. The closest monitoring wells are located within the Pantex Plant boundary east of the site that are monitored for uncertainty management/detection monitoring (Pantex 2025-TN12791, Pantex 2025-TN13343). Groundwater data collected on the adjoining Pantex Plant site through 2024 demonstrate that current remedial actions at the Pantex Plant continue to progress toward cleanup of perched groundwater contaminants (Pantex 2025-TN12791).

Section 3.5.1 introduces Zone 9, an approximate 100 ac area that was previously disturbed by various historic operations. Environmental investigations were conducted between 1990 and 2004 in Zone 9 and a nearby area known as the Rockpile area. The investigations were conducted to evaluate the potential for impacts related to the historical use of Zone 9 by the DoD (now the Department of War [DoW]) and for agricultural, chemical storage, and brine pits associated with historical hide rendering operations. An environmental investigation in the Rockpile area was conducted to evaluate the potential for impacts related to historical discharges from Zone 9 to a depression in the Rockpile area. The groundwater evaluation findings indicate no association with impacts from DoD operations in the shallow perched groundwater zone. Two explosive compounds, 4-amino-2,6-DNT and 2-amino-4,6-DNT, were consistently detected in one well above the Texas Risk Reduction Tier 1 Standards (RRS T1) but below Texas Risk Reduction Tier 2 standards (RRS Tier 2) indicating that the detected explosives do not pose an exposure risk to onsite and offsite receptors (Terracon 2025-TN12633). No additional information is available regarding any groundwater testing on the PMN Units 1–4 site.

Residual impacts to soils related to the historical site activities in Zone 9 and the Rockpile area may remain and have the potential to infiltrate into groundwater. Based on the potential migration to groundwater and the Groundwater Deed Certification discussed above in Section 3.5.2, it is assumed that perched groundwater present on the eastern portion of the site is impacted due to the historical operations on the site and at the adjoining Pantex Plant.

3.5.2.2 Groundwater Resources Impacts from Building PMN Units 1–4

3.5.2.2.1 Hydrologic Alterations

No onsite groundwater use or dewatering is expected during building activities for PMN Units 1–4 (FA 2026-TN13483. Building activities may result in alteration of surface elevations, drainage patterns, and extent of impermeable surfaces (FA 2026-TN13483). Altering surface elevations would result in changes to the existing surface water drainage paths. The presence of buildings would also result in alteration of surface water drainage paths. As discussed in Section 3.5.2.1.1, localized sources of groundwater recharge to the perched aquifer near the site include natural recharge from playas and permitted wastewater discharge to Playa 1 from the Pantex Plant. Groundwater in the Ogallala Aquifer is recharged from downward percolation of water, either from the surface of the High Plains or from the overlying perched groundwater zones. During building activities, stormwater flow is expected to be directed away from any playas or other depressions on the site into engineered stormwater basins for reuse with no direct discharge to groundwater (FA 2026-TN13483). These alterations to surface drainage are not expected to result in significant alteration to the perched or Ogallala Aquifers because the primary sources of groundwater recharge are not located on the PMN Units 1–4 site. Therefore, impacts due to alterations of groundwater resources are expected to be SMALL.

3.5.2.2.2 Groundwater Use

No onsite groundwater use is expected during building activities for PMN Units 1–4. It is estimated that 2.5 Mgd of water will be needed for those activities including dust suppression, concrete mixing/curing, compaction and moisture conditioning, and other miscellaneous construction uses. Any water used for construction activities can be transported to the site in water trucks or conveyed to the site from the Carson County well field via pipeline (FA 2026-TN13483).

Municipal water used at the site will be sourced from the City of Amarillo's Carson and Potter County's well field located northeast of the site as discussed in Section 3.5.2.1.4. A water use agreement is currently in place that allows Project Matador access to 2.5 Mgd of water and a letter of intent stating that capacity will increase to 5.5 Mgd by the end of 2026 (CA 2025-TN13334; and CA 2025-TN13335). All groundwater withdrawals from the City of Amarillo's well fields are permitted by the Panhandle Water Conservation District (PWCD) and have been shown to comply with the 50/50 Standard. Additionally, water demands for the construction of the AP1000 units make up a fraction of a percent for the Carson and Potter County well field permitted withdrawal limits.

Because excavation depths are expected to be well above the depths to groundwater (i.e., 200 to 300 ft bgs for perched groundwater and 300 to 500 ft bgs for the primary Ogallala Aquifer as shown in Figure 3-5), encountering groundwater is not anticipated during building activities (FA 2026-TN13483). If perched groundwater is encountered during excavation, it will be managed assuming it has been impacted by historical operations at the Pantex plant. Any dewatering effluents will be managed under applicable Federal and State requirements and tested prior to reuse or disposal.

Based on the above assessment, impacts to existing or other groundwater users due to the construction of PMN Units 1–4 would be SMALL.

3.5.2.2.3 Groundwater Quality

As discussed in Section 3.5.2.1.4, perched groundwater on the PMN Units 1–4 site was likely impacted by historical operations onsite and at the neighboring Pantex Plant. Perched groundwater may be impacted by historical releases of VOCs, metals, and constituents associated with explosives manufacturing. Some of these impacts are being remediated at the Pantex Plant. Perched groundwater use on the eastern portion of the site is restricted by a Groundwater Deed Certification dated September 21, 2009, that was executed as part of the remediation at the Pantex Plant. In addition to perched groundwater use restrictions, drilling to depths greater than 180 ft within the Groundwater Deed Certification area shown in Figure 3-9 is restricted unless authorized by DOE NNSA.

Construction effluents would be managed under applicable Federal and State requirements. All onsite water, including stormwater and effluents, is intended for reuse. Runoff and effluents will be directed to engineered stormwater basins or outfalls and tested and treated prior to reuse. Sanitary wastewater during construction would be managed using temporary sanitary facilities sized to the workforce (e.g., portable toilets and handwash stations) and/or temporary connections to municipal sanitary sewers, where available. Collected sanitary waste would be removed by a licensed hauler and disposed of at an authorized wastewater treatment facility in accordance with State and local requirements (FA 2026-TN13483). No construction effluents would be discharged or infiltrate to groundwater.

Based on the above, the impacts to groundwater quality due to the construction of PMN Units 1–4 would be SMALL.

3.5.2.3 Groundwater Resources Impacts from Operating PMN Units 1–4

3.5.2.3.1 Hydrologic Alterations

Because depth to the shallowest groundwater at the site (i.e., a perched groundwater zone in the Upper Ogallala Formation) is 200 to 300 ft bgs and depth to the primary Ogallala Aquifer is 300 to 500 ft bgs, no permanent dewatering for building foundations is expected to be necessary and plant foundations are not expected to alter groundwater flow paths. Land surface modifications, stormwater management practices, and plant discharges could affect local infiltration and recharge at the PMN Units 1–4 site. Modifications to surface drainage are not expected to result in significant alteration of the perched groundwater zone or the primary Ogallala Aquifer because the primary sources of groundwater recharge are not located on the PMN Units 1–4 site. Fermi America plans to reuse any available stormwater onsite and will obtain and comply with all necessary stormwater discharge permits during operation of the facility. Based on this information, impacts due to hydrologic alterations at the proposed PMN Units 1–4 site are expected to be SMALL.

3.5.2.3.2 Groundwater Use

The four AP1000 units are expected to be air cooled, and any water demand for the operation of the air-cooled units is expected to be sourced from municipal water. As shown in Figure 2-8, it is estimated that 1.4 Mgd of water will be needed for operation of the 4 air-cooled units. Anticipated water use demands include system makeup water, domestic/potable supply, and

other incidental processes and maintenance needs. Water demands for the operation of the air-cooled AP1000 units are well within the City of Amarillo's groundwater withdrawal limits and system capacity. All groundwater withdrawals from the City of Amarillo's well fields are permitted by the PWCD and have been shown to comply with the 50/50 Standard.

Fermi America intends to reduce water use through its planned water reuse and stormwater management programs. Plant effluents will be reused and treated where practicable or discharged in accordance with permit requirements. As discussed in Section 3.5.1.3, municipal water along with water designated for reuse will be stored in an onsite impoundment located on the northern portion of the PMN Units 1–4 site. The 2 water impoundments are expected to hold up to 250 million gallons and will be designed with a geomembrane liner to prevent groundwater intrusion and biological growth (FA 2026-TN13483).

Because no onsite groundwater use is expected during the operation of PMN Units 1–4, impacts to existing or other groundwater users due to the operation of the air-cooled PMN Units 1–4 would be SMALL.

3.5.2.3.3 Groundwater Quality

As discussed in Section 3.5.1.3.3, nonradiological discharges at the PMN Units 1–4 site are planned to be discharged through permitted outfalls and treated for reuse. Liquid radiological effluent would be routed to the LRWS which collects, processes and treats all liquid radiological effluent. Liquid effluent that does not meet applicable reuse criteria would be cycled through the LRWS, ultimately concentrated, solidified, and managed as solid radioactive waste for offsite disposal (FA 2026-TN13483). No liquid radiological waste would be discharged from PMN Units 1–4.

Spill prevention and control BMPs would be followed during the operating period to minimize potential releases of equipment fuel and other nonradiological contaminants that could affect groundwater quality. Fermi America would institute a groundwater protection program conforming to the industry's voluntary groundwater protection initiative (NEI 2019-TN6775) that provides for groundwater monitoring to detect inadvertent releases and prevent the movement of radionuclides offsite (FA 2026-TN13483).

Fermi America intends to reduce water use through its planned water reuse and stormwater management programs, and no discharges to groundwater are planned during the operation of PMN Units 1–4. Therefore, the impacts to groundwater quality during operations would be SMALL.

3.5.2.3.4 Groundwater Monitoring

Groundwater monitoring is expected to be implemented, as appropriate. Because stormwater is intended to be captured and reused onsite, monitoring is expected to focus on maintaining water quality for reuse and confirming system integrity. Necessary actions may include routine inspection and monitoring of stormwater collection and reuse features (e.g., impoundments, basins, conveyance structures); periodic sampling of water retained for reuse, as necessary to confirm suitability for intended reuse applications; sediment management and observation for visual indicators (e.g., turbidity, sheen); and documentation of inspections, maintenance activities, and corrective actions.

Fermi America plans to maintain and implement a long-term monitoring program that includes documented sampling procedures, quality assurance/quality control measures, and chain-of-custody protocols; data review and trend evaluation on a scheduled basis; records retention and reporting, consistent with permit or agency requirements; and periodic reassessment of the monitoring network and analyte list including radionuclides to ensure the program remains effective over the operational life of the facility (FA 2026-TN13483).

3.5.2.4 Summary of Reasonably Foreseeable Environmental Effects

As discussed above, depths to groundwater within the Ogallala Aquifer at the site are 300 to 500 ft bgs. No onsite groundwater use or dewatering is expected for construction, operation, or decommissioning of the proposed PMN Units 1–4. All onsite water, including stormwater and effluents, is intended for reuse and would be managed in accordance with applicable Federal and State requirements. Spill prevention and control BMPs would be implemented, and groundwater quality monitoring programs would be established and maintained. Consequently, construction, operation, and decommissioning of the proposed PMN Units 1–4 are expected to result in a SMALL impact on groundwater resources.

3.5.3 Impacts from Decommissioning

Decommissioning impacts are expected to be similar to those for construction and bounded by the analyses in the Decommissioning GEIS (NRC 2002-TN665). The Decommissioning GEIS considered water use and water quality impacts to be SMALL (NRC 2002-TN665). Water needs for decommissioning the proposed PMN Units 1–4 would be significantly decreased from that of operations. Stormwater would continue to be managed, and necessary construction stormwater permits obtained as decommissioning progressed. Other procedures and practices in place for preventing and managing spills would continue. NRC determined the impacts to water resources from decommissioning to be a Category 1 issue in the 2026 NR GEIS and assessed the impact of water use and water quality from decommissioning for all new nuclear power plants to be small (NRC 2026-TN12155)). In the absence of project-specific indicators suggesting decommissioning activities not already considered by NRC, the previous assessment of decommissioning impacts to be SMALL presented in the Decommissioning GEIS is considered representative for decommissioning of the proposed PMN Units 1–4.

3.5.4 Summary of Reasonably Foreseeable Environmental Effects

As discussed above, there are no surface water resources near or within the proposed PMN Units 1–4 site, and there are no natural, permanent flowing waters within the Project Matador Campus inclusive of the PMN Units 1–4 site. The campus includes a number of playas of various sizes, in addition to engineered channels, brine pits, ponds, borrow pits, and other waterbodies. Water use demand for the construction and operation of the proposed PMN Units 1–4 would be met from municipal supply. As presented above, building, operation, and decommissioning of the proposed PMN Units 1–4 would have a SMALL impact on surface water resources. Further, the conclusion remains unchanged given that the interrelated construction and operation of the remainder of Project Matador does not involve surface water use.

3.5.5 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, interrelated actions considered for this EIS include ongoing and future Project Matador activities. The water demand to support construction activities at the remainder of Project Matador and the operation of the other energy generation facilities and the

data centers would also be met by the City of Amarillo's potable water supply, utilizing the groundwater allocation discussed in Section 3.5.2.1. Given the available supply would meet the water demand, the additive effects of this additional water use would be small. Fermi America would comply with applicable regulations and required permits for stormwater management and discharges to surface or groundwater. For any industrial discharges to surface water or groundwater, Fermi America would obtain the necessary permits and comply with permit conditions.

3.6 Ecological Resources

3.6.1 Aquatic Ecological Resources

3.6.1.1 Affected Environment

The PMN Units 1–4 site lies within the High Plains Level III ecoregion, and the 6 mi vicinity of the site extends into the Southwestern Tablelands Level III ecoregion. These areas are enveloped by the South Central Semi-Arid Prairies ecoregion (EPA Level II) within the larger Great Plains ecoregion (EPA Level I) (EPA 2021-TN7298).

Aquatic habitats within the Texas panhandle portion of the High Plains and Southwestern Tablelands ecoregions consist of few intermittent and ephemeral streams and ephemeral playas (EPA 2021-TN7298). Playas in this area, sometimes referred to as playa lakes, are shallow basins that typically pond surface water only after heavy rainfalls. The site lies within the Red River Basin, and a topographic divide occurs just north of the site separating the Red River Basin from the Canadian River Basin (Section 3.5.1.1). To the northwest of the site and within its 6 mi vicinity are several intermittent headwater tributaries to Bonita Creek, a tributary of the Canadian River, in addition to riverine wetlands associated with playa-connected channels (Figure 3-10). Within the Project Matador Campus, there are a number of playas of various sizes, in addition to human-made channels, brine pits, ponds, borrow pits, and other waterbodies. There are no natural, permanent flowing waters within the Project Matador Campus (Figure 3-11).

A portion of a playa and several human-made waterbodies, including excavated borrow pits, brine pits, and lagoons, are situated within the PMN Units 1–4 site (Figure 3-11). Additional human-made stormwater features have been developed on and near the site for drainage related to development and agriculture. None of these onsite features have offsite drainage connections to any perennial stream systems. Additional information on playas and other wetland-like features is provided in 3.5.2.1. Important aquatic species and habitats are addressed below.

Federally Listed Aquatic Species

For the purposes of assessing impacts to federally listed resources under the Endangered Species Act (ESA), an action area is defined including all areas that could be directly or indirectly affected by a Federal action and may include areas beyond the immediate area of the action (50 CFR Part 402-TN4312). For the present Federal action, the review team defined the action area as the PMN Units 1–4 site plus a 1 mi buffer around the perimeter of the site to account for potential indirect effects to ESA listed species in the surrounding landscape (Figure 3-12).

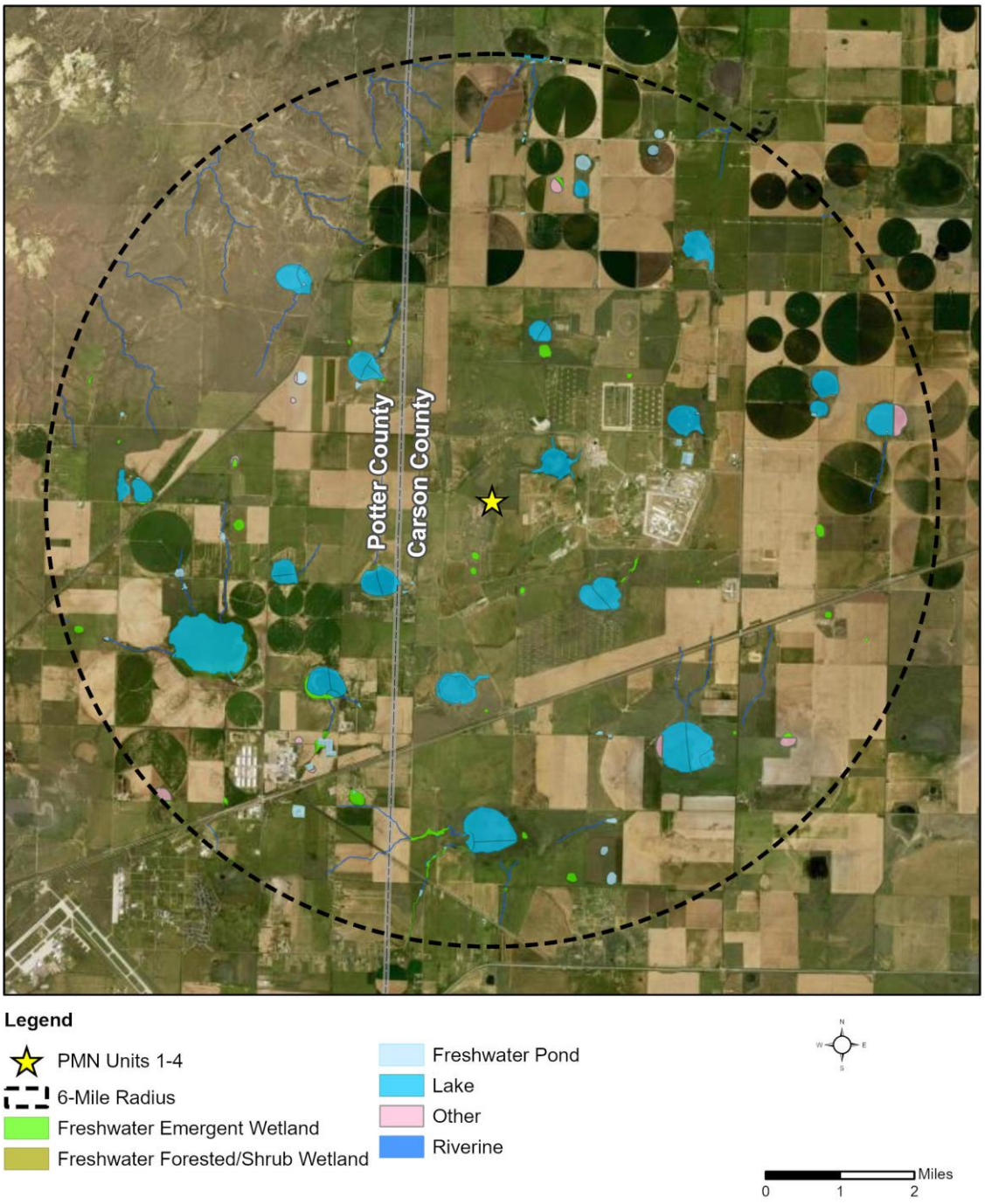


Figure 3-10 National Wetlands Inventory Wetlands Within the 6 mi Vicinity of the Project Matador Nuclear Units 1–4 Site



Figure 3-11 Wetlands and Human-made Waterbodies Within the Project Matador Nuclear Units 1–4 Site



Figure 3-12 Aerial Satellite Image of the Project Matador Nuclear Units 1–4 Site Showing the Action Area Under the Endangered Species Act

The FWS Information for Planning and Consultation (IPaC) database was independently reviewed on September 23, 2026, to determine whether federally listed aquatic species could be present in the action area (FWS 2026-TN12906). Two listed fish species were reported in IPaC as potentially present in the action area, including the federally threatened Arkansas river shiner (*Notropis girardi*) and the federally endangered peppered chub (*Macrhybopsis tetranema*) (Table 3-10).

Table 3-10 Federally Protected Aquatic Species Evaluated for the Proposed Project Matador Nuclear Units 1–4 Site (Both are Fish Species)

Common Name	Scientific Name	Potential to Occur in Action Area	Federal Status
Arkansas river shiner	*Notropis girardi*	No permanent river/stream habitat available in action area	Threatened
peppered chub	*Macrhybopsis tetranema*	No permanent river/stream habitat available in action area	Endangered

Based on site characteristics, there is no suitable habitat for the Arkansas river shiner or peppered chub in the action area due to the lack of perennial freshwater rivers and large tributaries to which these species are restricted (FWS 2026-TN12976, FWS 2026-TN12975).

State Protected Aquatic Species

Texas Administrative Code prohibits the capture, trapping, take, and killing of endangered fish or wildlife (TX PWC-TN12974). Texas defines endangered species as species of fish or wildlife indigenous to Texas that are federally listed as endangered or determined to be threatened with statewide extinction as filed by the director of the Texas Parks and Wildlife Department (TPWD) (Texas Parks and Wildlife Code Section 68.002). A desktop review of the county-based TPWD rare, threatened, and endangered species database provided a list of 51 species of conservation concern in Carson and Potter Counties in Texas, including three State-endangered and six State-threatened species. Of these species, three are aquatic: the Arkansas river shiner, the peppered chub (both also federally protected), and the smooth softshell turtle (*Apalone mutica*) (Appendix C) (TPW 2025-TN12924; FWS 2026-TN12972). There is no suitable habitat for these species within the action area due to the lack of perennial freshwater rivers and streams to which these species are restricted (FWS 2026-TN12976, FWS 2026-TN12975, FWS 2026-TN12972). The remaining species are terrestrial or wetland-dependent and are discussed in Section 3.6.2.1.

Aquatic Invasive Species

Based on site characteristics, there is no suitable habitat for aquatic invasive species at the site. Further, there have been no records of nonindigenous aquatic species within the 6 mi vicinity of the site (USGS 2026-TN12971).

Important Aquatic Habitats

Other than the playa and human-made waterbodies described in Section 3.6.2.1, there are no other aquatic habitats, including any perennial, intermittent, or ephemeral streams at the PMN Units 1–4 site. Further, there are no offsite drainage connections to Bonita Creek or other perennial stream systems (Figure 3-10).

3.6.1.2 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, other interrelated reasonably foreseeable projects considered in this analysis include ongoing and future Project Matador activities. The only aquatic habitats within the Project Matador Campus are playas. Up to 18 ac of playas would likely be permanently filled to construct the remainder of the Project Matador Campus (excluding the PMN Units 1–4 site). Remaining playas on and adjoining the campus would be protected from

stormwater runoff through the use of BMPs. Based on the analyses presented below, impacts on aquatic ecological resources from these interrelated reasonably foreseeable projects would not alter the conclusions for the proposed action.

3.6.1.3 Reasonably Foreseeable Environmental Effects Analysis

3.6.1.3.1 Impacts from Building PMN Units 1–4

Within the PMN Units 1–4 site, there are no identified aquatic habitats. As described in Section 3.5.2, use of the site to build the four units is not expected to involve dewatering (which might affect the hydrology of offsite aquatic habitats) and is expected to rely largely on municipal water for any building-related water needs. Therefore, no impacts to aquatic habitats, species, or processes are expected. Because there is no suitable habitat available for the Arkansas river shiner, peppered chub, or smooth softshell turtle on the site or in the vicinity, building PMN Units 1–4 would have no effect on aquatic ESA-listed species or aquatic species identified by TPWD as endangered. Impacts on aquatic ecological resources would therefore be at most SMALL.

3.6.1.3.2 Impacts from Operating PMN Units 1–4

No aquatic habitats have been identified within the PMN Units 1–4 site. As described in Section 2.3, PMN Units 1–4 are expected to use air cooling for operations, which greatly reduces water needs. In addition, operational water would be largely supplied by municipal water sources and would not affect the rainfall-driven waterbodies in the area, as discussed in Section 3.5. No impacts to aquatic habitats, species, or processes are expected. Because there is no suitable habitat available for the Arkansas river shiner, peppered chub, or smooth softshell turtle on the site or in the vicinity, operation of PMN Units 1–4 would have no effect on aquatic ESA-listed species or aquatic species identified by TPWD as endangered. Impacts to aquatic ecological resources would therefore be at most SMALL.

3.6.1.3.3 Impacts from Decommissioning PMN Units 1–4

Within the PMN Units 1–4 site, no aquatic habitats have been identified; therefore, no impacts to aquatic ecological resources from plant decommissioning are expected. Because there is no habitat available for the Arkansas river shiner, peppered chub, or smooth softshell turtle on the site or in the vicinity, decommissioning of PMN Units 1–4 would have no effect on aquatic ESA-listed species or aquatic species identified by TPWD as endangered. Impacts to aquatic ecological resources would therefore be at most SMALL.

3.6.1.3.4 Summary of Reasonably Foreseeable Environmental Effects

As discussed above, there are no streams or other natural, permanent flowing surface water bodies within the Project Matador Campus, inclusive of the PMN Units 1–4 site. The only aquatic habitats on the PMN Units 1–4 site are part of a single playa and a small number of human-made waterbodies. The aquatic habitats within the remainder of the Project Matador Campus are similarly limited. The campus includes a number of playas of various sizes, in addition to human-made channels, brine pits, ponds, borrow pits, and other waterbodies. As presented above, building, operation, and decommissioning of PMN Units 1–4 would have at most a SMALL impact on aquatic resources. Further, the interrelated construction and operation of the remainder of Project Matador, given its limited possible effect on aquatic resources, would not alter this conclusion.

3.6.2 Terrestrial Ecological Resources

3.6.2.1 Affected Environment

As described in Section 3.6.1, the PMN Units 1–4 site lies within the High Plains Level III ecoregion (EPA 2021-TN7298). The High Plains ecoregion has a dry mid-latitude steppe climate and is marked by hot summers and cold winters. The region's landforms are mostly smooth to slightly irregular plains. Major land uses include cropland and grazing land. Oil and gas production also occurs in many areas of the region. Common wildlife occurring in the ecoregion include pronghorn (*Antilocapra americana*), coyote (*Canis latrans*), swift fox (*Vulpes velox*), jackrabbit (*Lepus* spp.), eastern cottontail (*Sylvilagus floridanus*), ferruginous hawk (*Buteo regalis*), and lesser prairie-chicken (*Tympanuchus pallidicinctus*). Numerous waterfowl on the Central Flyway of the continent depend on the playa lake habitats. Historically, most of the region consisted of short and midgrass prairie vegetation including blue grama (*Bouteloua gracilis*), buffalograss (*B. dactyloides*), sideoats grama (*B. curtipendula*), western wheatgrass (*Pascopyrum smithii*), little bluestem (*Schizachyrium scoparium*), sagebrush (*Artemisia tridentata*), fringed sage (*A. frigida*), sand sagebrush (*A. filifolia*), sand bluestem (*Andropogon hallii*), prairie sandreed (*Calamovilfa longifolia*), Indian ricegrass (*Achnatherum hymenoides*), sand dropseed (*Sporobolus cryptandrus*), Havard shin oak (*Quercus havardii*), fourwing saltbush (*Atriplex canescens*), and yucca (*Yucca* spp.). However, the land has been altered over time through agricultural cultivation, rangeland conversion, and encroachment of non-native grasses (Wilken et al. 2011-TN2744).

Much of the PMN Units 1–4 site has been previously disturbed by pre-1945 (DoD) operations, including munitions-related activities. Site uses subsequent to DoD operations have included livestock grazing, chemical storage, and livestock hide rendering operations. In the early 1990s, several buildings were burned in a grass fire resulting in the buildings being torn down. Foundations, concrete, and support structures from the site's previous utilization remain (Terracon 2025-TN12633).

Since the habitats within the PMN Units 1–4 site, the rest of the Project Matador Campus, and the adjacent Pantex are generally similar, surveys and reports characterizing ecological resources on Pantex were used as the main source of descriptive baseline information. Pantex has conducted field surveys to evaluate terrestrial habitats and compiled species lists for observed wildlife, which includes 46 mammals, 212 birds, and 28 amphibians and reptiles (Pantex 2025-TN12791). Fermi America's contractor, Enercon, compiled a list of regionally occurring special status species and evaluated their potential for occurring at the site and the Project Matador Campus.

Terrestrial habitats onsite, as depicted in Figure 3-13, were derived using a combination of aerial imagery, online wetlands information, review of Pantex and other literature, land use and land cover (LULC) data provided in Section 3.2, as well as information from a field visit to the Project Matador Campus in February 2026. Table 3-11 shows acreages of each habitat type at the PMN Units 1–4 site compared to the same habitats located within the Project Matador Campus and the 6 mi vicinity of the site.

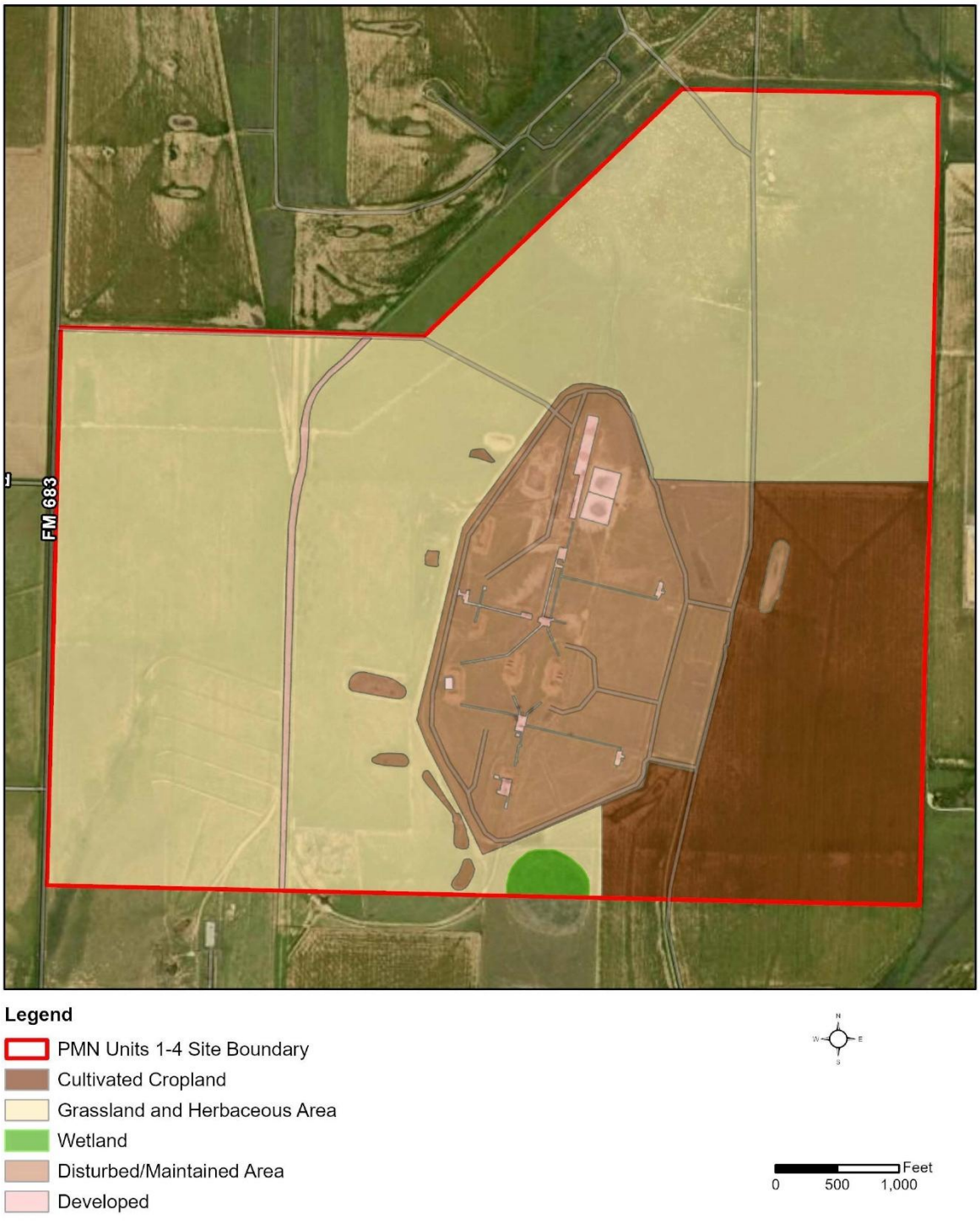


Figure 3-13 Terrestrial Habitats Identified Within the Project Matador Nuclear Units 1–4 Site

Table 3-11 Terrestrial Habitats within the Project Matador Nuclear Units 1–4 Site, Project Matador Campus, and 6 mi Vicinity of the Site

Terrestrial Habitat Type	Project Matador Nuclear (PMN) Units 1–4 Site (ac)	Project Matador Campus (ac)	6 mi Vicinity of PMN Units 1–4 Site (ac)
Grassland and Herbaceous Areas	564	2,963	31,028
Cultivated Cropland	146	2,019	31,702
Wetlands	5	16	251
Disturbed and Maintained Areas	153[a]	[a]	[a]
Developed Areas	13	119	4,597

(a) Disturbed/maintained areas were defined using aerial imagery and ground truthing techniques to calibrate land use and land cover (LULC) data. Ground truthing involved a visual observation of major site features of interest (e.g., playas, waterbodies, developed areas) via walking, vehicle, and helicopter. Because ground truthing was limited to the PMN Units 1–4 site, the acreages for the Project Matador Campus and 6 mi vicinity of the site are unknown.

Grassland and Herbaceous Areas

The grassland and herbaceous areas include shortgrass prairie uplands adjacent to the playa and the pastures formerly used for cattle grazing. Grasses in the shortgrass prairie may include blue grama, buffalograss, sideoats grama, little bluestem, and other grass and forb species commonly found in the High Plains. Several species of milkweed (*Asclepias* spp.), all host plants for the monarch butterfly (*Danaus plexippus*), have also been observed throughout the grassland areas. Black-tailed prairie dog occurrence is evident in the north portion of the PMN Units 1–4 site as well as other portions of the Project Matador Campus. Other common wildlife found in the grassland and herbaceous areas include eastern cottontail, white-tailed deer (*Odocoileus virginianus*), black-tailed jackrabbit (*Lepus californicus*), gray fox (*Urocyon cinereoargentus*), prairie rattlesnake (*Crotalus viridis*), bull snake (*Pituophis melanoleucus sayi*), Great Plains toad (*Anaxyrus cognatus*), Texas horned lizard (*Phrynosoma cornutum*), American robin (*Turdus migratorius*), American kestrel (*Falco sparverius*), field sparrow (*Spizella pusilla*), and monarch butterfly (Pantex 2025-TN12791).

Cultivated Cropland

Crops grown in the cultivated cropland areas may include wheat (*Triticum* spp.), sorghum (*Sorghum bicolor*), soybeans (*Glycine max*), upland cotton (*Gossypium hirsutum*), corn (*Zea mays*), and oats (*Avena sativa*). Common wildlife species that may be found in these areas include cottontail rabbit (*Sylvilagus* spp.), black-tailed jackrabbit (*Lepus californicus*), mule deer (*Odocoileus hemionus*), white-tailed deer (*O. virginianus*), deer mice (*Peromyscus maniculatus*), hispid cotton rats (*Sigmodon hispidus*), coachwhip (*Masticophis flagellum*) and other opportunistic grassland species (Pantex 2025-TN12791).

Wetlands

No wetland delineations have been conducted at the PMN Units 1–4 site. Based on Terracon's 2025 Phase 1 Environmental Site Assessment (Terracon 2025-TN12633) and a desktop review conducted by the applicant of USGS topographic maps, aerial imagery, the National Wetlands Inventory (NWI) database, the National Hydrography Dataset (NHD), and U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey resources, an

approximately 5 ac portion of one palustrine emergent wetland (which is part of a playa that straddles the site perimeter) totaling approximately 8 ac occurs within the PMN Units 1–4 site. In addition, excavated borrow pits, brine pits, and lagoons, remnants of operations conducted during the 1970s and 1980s, are present within the site (Terracon 2025-TN12633). These human-made features total approximately 11 ac (Figure 3-11). Table 3-12 provides wetland acreage comparisons between the PMN Units 1–4 site, Project Matador Campus, and 6 mi vicinity of the site. A site visit to confirm the presence/absence of wetland features was completed by biologists working for the applicant on February 16–17, 2026. All or part of the onsite playa may or may not meet the USACE three parameter delineation criteria (hydrophytic vegetation, hydric soils, wetland hydrology) for wetlands. As outlined in Terracon's Environmental Site Assessment, there are several concrete washout sumps associated with historic operations that remain and lead to concrete-lined drainage ditches.

Table 3-12 Wetland and Wetland-like Features Located within the Project Matador Nuclear Units 1–4 Site, Project Matador Campus, and the 6 mi Vicinity of the Site

Feature Type	PMN Units 1–4 Site (ac)[a,b]	Project Matador (ac)[c]	6 mi Vicinity (ac)[b]
PEM Playa and other Freshwater Emergent Wetland	5	18	201
Excavated Earthen Lagoon[d]	1[e]	(e)	(e)
Excavated Earthen Brine Pit[d]	2[e]	(e)	(e)
Excavated Borrow Pit[d]	8[e]	(e)	(e)

(a) Wetland acreages based on combination of calibrated land use and land cover (LULC), National Wetlands Inventory (NWI), and desktop delineation data. Desktop delineation involved examination of historical aerial imagery for visual evidence of characteristics such as visible water. Acreage differs from NWI estimate based on delineation of larger playa basin on aerial imagery.
(b) An approximately 8 ac playa is bisected by the site boundary and its acreage within the site boundary is included here.
(c) Wetland acreages based on NWI data.
(d) Human-made, excavated feature (i.e., disturbed and maintained habitat). Not included in overall wetland habitat total.
(e) Disturbed/maintained areas, including human-made excavated features, were defined using aerial imagery and ground truthing techniques to calibrate LULC data. Because ground truthing was limited to the PMN Units 1–4 site, the acreages for the Project Matador Campus and 6 mi vicinity of the site are unknown.

There are no natural streams within the PMN Units 1–4 site. Stormwater is routed via stormwater outfalls to offsite playas lacking surface outlets located within 0.5 mi of the site (DOE 2018-TN12970).

Over 19,000 playas of varying size occur in the Texas panhandle of the High Plains ecoregion, representing the highest density of playas in North America. Compared to other wetlands, playas and their associated wetlands experience frequent, unpredictable, wet/dry cycles. All or parts of some playas may not meet minimum periods of inundation or surface soil saturation needed for delineation as wetlands. In wet years, playas support the production of annual plants such as smartweeds and millets that can produce an abundance of seeds that are favored by seed-eating birds. The wet/dry nature of playas, along with their high plant production, can create habitat for a variety of invertebrates. This type of productivity can provide refuge for birds and other wildlife throughout the year (TPW 2026-TN12969).

Historical satellite imagery shows that the playa at the PMN Units 1–4 site has sometimes had evidence of surface water from precipitation and routing of stormwater and irrigation water through a series of human-made ditches. This suggests a history of hydrologic alteration of this

ephemeral playa. In addition, there are several drains scattered throughout the site that route irrigation and stormwater to offsite playas and human-made waterbodies (Terracon 2025-TN12633).

Common wildlife species that may be found in and near wetlands and playas of the PMN Units 1–4 site include a number of reptiles and amphibians such as yellow mud turtle (*Kinosternon flavescens*), plains leopard frog (*Lithobates blairi*), and Woodhouse's toad (*Anaxyrus woodhousii*), as well as bird species such as mallard (*Anas platyrhyncos*), Canada goose (*Branta canadensis*), and killdeer (*Charadrius vociferus*) (CNS 2024-TN12634). However, based on the history of the site (i.e., disturbances from operations, agricultural practices, hydrologic alteration, etc.), the relatively disturbed playa occurring partially within the site is likely of low ecological quality compared to undisturbed playas throughout the High Plains ecoregion. Larger playas in the surrounding landscape likely offer more quality habitat for species. There have been no Federal CWA jurisdictional determinations conducted at the PMN Units 1–4 site; however, based on the apparent lack of surface connections to navigable waters, the ephemeral playa and other excavated features are not likely regulated under the CWA.

Disturbed and Maintained Areas

Several areas within the proposed PMN Units 1–4 site, while lacking significant pavement and infrastructure, have been disturbed either through historic land alteration, past operations at the site, and vegetation clearing or via routine vegetation management. These areas include dirt/gravel access roads, fencelines, earthen lagoons, earthen brine pits, and borrow pits (Figure 3-10 and Figure 3-13). Portions of the disturbed and maintained areas can provide food and nesting resources for a variety of nonspecialized bird species and provide opportunistic habitat for common milkweed. Species such as rabbits and prairie dogs may also utilize the relatively open habitat for shelter and foraging. Deer and coyote may use the habitat to move from territory to territory (Pantex 2025-TN12791; Terracon 2025-TN12633).

Developed Areas

Developed areas within the PMN Units 1–4 site include impervious areas such as paved roadways and walkways associated with historical site operations. They also include human-made concrete ditches and demolished/fallen structures (Figure 3-10 and Figure 3-13). Wildlife may move through these areas and use these features as habitat, as for disturbed and maintained areas. For example, avian species may use abandoned structures for nesting and foraging opportunities. The following paragraphs address Important Terrestrial Species and Habitats.

Federally Listed Terrestrial Species

As stated in Section 3.6.1.1, the review team defined the action area as the PMN Units 1–4 site plus a 1 mi buffer around the perimeter of the site to account for potential indirect effects to ESA-listed species in the surrounding landscape (Figure 3-12).

A desktop review of the PMN Units 1–4 action area was conducted using available scientific literature, studies, and other publicly available information. Wildlife observation data have been collected on an annual basis at the adjacent Pantex site since 1992 (Pantex 2025-TN12791). Historically, systematic transect and plot surveys have been conducted for birds near the site at the Pantex Plant; however, more recent observations by Pantex Plant staff have been incidentally compiled while conducting other activities at various locations (CNS 2024-

TN12634). The FWS IPaC database was independently reviewed on September 23, 2026 (FWS 2026-TN12906). In addition to the species identified from available wildlife data (Pantex 2025-TN12791), the IPaC identified two other ESA-listed species as having the potential to occur in the action area. These include the federally threatened piping plover (*Charadrius melodus*) and rufa red knot (*Calidris canutus rufa*). Though whooping crane (*Grus americana*) was not included in the IPaC results, it is listed as an observed species known to appear near the site (Pantex 2025-TN12791). A site visit was completed by biologists working for the applicant on February 16–17, 2026, to evaluate the presence/absence of habitats at PMN Units 1–4 site. No FWS designated critical habitat overlaps with the action area. Table 3-13 provides information on potential presence of each species within the PMN Units 1–4 action area. Species descriptions are provided in Appendix D.

Table 3-13 Federally Listed Terrestrial Species Potentially Occurring within the Project Matador Nuclear Units 1–4 Action Area

Common Name	Scientific Name	Potential to Occur in Action Area	Federal Status
Piping plover	*Charadrius melodus*	Not documented near site[(a)]	Threatened
Rufa red knot	*Calidris canutus rufa*	Not documented near site[(a)]	Threatened
Monarch butterfly	*Danaus plexippus*	Documented near site[(b)]	Proposed Threatened
Whooping Crane[(c)]	*Grus americana*	Documented near site[(c)]	Endangered[(d)]

(a) Sources: eBird 2026-TN12992; iNaturalist 2026-TN12968.
(b) Sources: Pantex 2025-TN12791.
(c) Not included in IPaC (Information for Planning and Consultation); however, observed onsite per Pantex Plant (Pantex 2025-TN12791).
(d) Source: FWS 2026-TN8854.

State Protected Terrestrial Species

A desktop review of the county-based TPWD Rare, Threatened, and Endangered Species database identified 48 terrestrial species of conservation concern in Carson and Potter Counties, Texas (Appendix C). Seven of these species are either State endangered or State threatened. These include the State endangered lesser prairie chicken and whooping crane, as well as the State threatened black rail (*Laterallus jamaicensis*), white-faced ibis (*Plegadis chihi*), black bear (*Ursus americanus*), Palo Duro mouse (*Permyscus truei comanche*), and Texas horned lizard (TPW 2025-TN12924). Of the seven State protected species, the whooping crane, white-faced ibis, and Texas horned lizard have been documented at the site or in the vicinity (Appendix C).

Eagles and Migratory Birds

The Bald and Golden Eagle Protection Act (BGEPA), enacted in 1940, prohibits take of bald eagles (*Haliaeetus leucocephalus*) or golden eagles (*Aquila chrysaetos*) without a permit. In addition to direct harm, “take” includes molesting or disturbing birds and nests or former nests that could be used again (TN1447). The Migratory Bird Treaty Act of 1918 (MBTA) implements several international treaties to protect the sustainability of migratory birds. The MBTA prohibits the take of protected migratory bird species without a permit, including killing, capturing, selling, trading, or transporting (TN3331).

At least 212 bird species have been documented near the PMN Units 1–4 site, including bald and golden eagles and many songbirds and migratory species of conservation concern

including ferruginous hawk, grasshopper sparrow (*Ammodramus savannarum perpallidus*), and northern harrier (*Circus hudsonius*) (Pantex 2025-TN12791; DOE 2008-TN12941). Prairie dog colonies serve as important resources and habitats for golden and bald eagles and many other bird species (Kotliar et al. 1999-TN12940; Miller et al. 2000-TN12907). Prairie dog colonies are found at the PMN Units 1–4 site, especially in the north portion of the site (Pantex 2025-TN12791).

Terrestrial Invasive Species

Old world bluestem (*Bothriochloa* and *Dichanthium* species) are a group of European bunchgrasses that were popularized in the Texas panhandle as early as the 1920s for use as cattle forage and in erosion control. These grasses germinate easily and within the same season, leading to rapid establishment, and can create monoculture stands in former grassland and pasture habitat. Old world bluestem invasion reduces the diversity of forbs and other grasses in grassland habitats, reducing the diversity and abundance of insects and birds (USDA 2018-TN12908). The Pantex Plant used these species as required grass cover for approximately 900 ac of land on the east side of the plant boundary enrolled in the Conservation Reserve Program (CRP) in 2008, some of which is now included within the Project Matador Campus. Although the land is no longer under CRP, old world bluestem had spread throughout the Pantex Plant area by 2018 and had already converted former shortgrass prairie habitat to old world bluestem monocultures. Mowing practices and equipment and vehicle movement have mainly contributed to the spread of these grasses, which now occur across the PMN Units 1–4 site (DOE 2008-TN12941; DOE 2018-TN12970; USDA 2018-12908). Based on site observations in February 2026, old world bluestem is ubiquitous throughout the PMN Units 1–4 site.

A total of 31 nuisance wildlife species have been encountered onsite via nuisance animal situations (Pantex 2025-TN12791). Non-native mammal species include domestic cat (*Felis catus*) and domestic dog (*Canis familiaris*). Non-native bird species documented near the site include Eurasian collared dove (*Streptopelia decaocto*), European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), and house sparrow (*Passer domesticus*) (Pantex 2025-TN12791).

Important Terrestrial Habitats

The playas, along with its associated upland shortgrass prairie habitat, on the PMN Units 1–4 site and within the larger Project Matador Campus, serve as important habitats for a variety of terrestrial wildlife including amphibians, reptiles, birds, and mammals. Playas onsite and within the Project Matador Campus are generally more degraded in habitat quality compared to those elsewhere in the 6 mi vicinity and 50 mi region due to historical impacts from agricultural and industrial land use.

Prairie dogs are a keystone species in the western United States, substantially influencing ecosystem structure, function, and species composition (Miller et al. 2000-TN12907). At least 170 other species rely on prairie dog colonies in some manner, including for food and habitat. Examples of species influenced by prairie dog colonies include golden eagle, bald eagle, western burrowing owl, ferruginous hawk, mountain plover, and horned lark (Kotliar et al. 1999-TN12940), all of which have been documented at or near the site (Pantex 2025-TN12791; DOE 2018-TN12970, DOE 2008-TN12941).

The PMN Units 1–4 site also contains grassland forbs and other vegetation beneficial to pollinators. Biologists have monitored several of these locations and have documented multiple species of milkweed within the Project Matador Campus (Pantex 2025-TN12791). The grassland habitat on the site is important habitat for birds and other wildlife (DOE 2008-TN12941, DOE 2018-TN12970); however, both the quality and quantity of the grassland habitat is lower in comparison to the 6 mi vicinity and 50 mi region due to past disturbances at the PMN Units 1–4 site and Project Matador Campus (see Section 3.6.2.1).

3.6.2.2 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, other reasonably foreseeable interrelated projects considered for this EIS include ongoing and future Project Matador activities.

The PMN Units 1–4 site is contained within the Project Matador Campus where approximately 5,236 ac (inclusive of the PMN Units 1–4 site) of land is expected to be cleared for construction of data centers, substations, solar facilities, natural gas infrastructure, utility areas, small modular reactors (SMRs), water treatment and recycling systems, and other supporting facilities (Section 2.1). Terrestrial habitats as well as wetlands and waterbodies on the Project Matador Campus would be impacted by building and use of the Project Matador Campus. The 2,963 ac of grassland and herbaceous habitat within the Project Matador Campus represents less than 10 percent of the approximately 31,000 ac of grassland and herbaceous land cover within the 6 mi vicinity of the site. The 18 wetland areas within the Project Matador Campus (including the portion of the playa extending partially onto the PMN Units 1–4 site) represents less than 9 percent of the freshwater emergent wetland area within a 6 mi vicinity of the site (Table 3-12). These habitats have also been degraded by previous land use activities related to the Pantex Plant and other activities since the 1940s (Section 3.6.2.1). No additional protected species are found within the Project Matador Campus that are not also evaluated here for the PMN Units 1–4 site at the Federal (FWS 2026-TN12906) or State (TPW 2025-TN12924) level. Given that many activities at the PMN Units 1–4 site and the Project Matador Campus are expected to overlap in time, noise and other impacts have the potential to be additive. However, overlapping effects are expected to be temporary and limited. Based on the analyses presented below, impacts on terrestrial ecological resources from these interrelated reasonably foreseeable projects would not alter the conclusions for the proposed action.

3.6.2.3 Reasonably Foreseeable Environmental Effects Analysis

3.6.2.3.1 Impacts from Building PMN Units 1–4

Terrestrial Habitats and Wildlife

Most impacts on terrestrial ecological resources would occur during site preparation, when vegetative cover removal and physical habitat disturbance would result from grading and clearing. Other impacts could include direct small animal mortality from collision with or burial by construction equipment, bird and bat collision with equipment and structures, and animal collision with vehicles. Additional impacts would include effects on wildlife from noise and vibrations from building activities, particularly heavy machinery, use of lighting that could affect animal activity patterns, and changes in drainage patterns that could alter local water features on the site. Mobile wildlife could be displaced to nearby habitats during construction, potentially contributing to issues with exceeding carrying capacity in these locations.

There would be permanent disturbances caused by management of excavated soils and construction wastes, placement of building foundations, and building of onsite buildings and related infrastructure. These areas would be permanently converted to industrial use with no plans to restore or revegetate habitat. Details are provided in Section 2.5. The availability of comparable habitats in nearby areas, along with the fact that the existing habitats on the site are already degraded from past activities, suggests that wildlife species currently occupying the site would have adequate habitat or population representation at other locations nearby. The alteration of these habitats within the PMN Units 1–4 site is therefore not expected to noticeably reduce the regional diversity of plants, plant communities, or wildlife.

Five acres of a playa wetland at the south-central part of the site would be permanently filled (Figure 3-11 and Table 3-12). Removal of this playa habitat may affect any wildlife that utilizes it. However, the playa acreage within the PMN Units 1–4 site represents less than 3 percent of the freshwater emergent wetland acreage (mostly occurring in playa basins) within a 6-mi vicinity of the site (Table 3-12). Based on previous geotechnical investigations near the site, dewatering is not expected to be necessary (Section 3.5.2), and no impacts to playas or other wetlands outside the site boundary from dewatering are anticipated. Due to the planned grading of the entire site, any existing drainage patterns would be permanently altered. However, no natural stream channels exist on the site, and drainage would be limited to constructed stormwater ditches that route precipitation to offsite playas or other human-made water features (see Section 3.6.2.1). Several other human-made wetland-like or waterbody features, including excavated borrow pits, brine pits, and lagoons, would be permanently filled (Figure 3-11). Drainage patterns within the site and the Project Matador Campus have been historically altered by agricultural and prior industrial activities (Section 3.6.2.1). Since similar, and likely higher-quality, habitats are available within the 6 mi vicinity of the site, removal of the onsite playa wetlands and previously altered waterbodies and drainages is unlikely to noticeably impact wildlife.

It is unlikely that any wetlands within PMN Units 1–4 site, including the playa, are jurisdictional under Section 404 of the CWA; however, Fermi America anticipates working with TCEQ and USACE to comply with any necessary permits or compensatory mitigation requirements to address impacts of construction activities to regulated wetlands. TCEQ requires a facility to obtain a permit for any stormwater discharges from activities that disturb at least 1 ac of land and may discharge stormwater to surface water bodies (TCEQ 2026-TN12614). As described in Section 3.5.1.2, stormwater would be routed to onsite basins, and surface water discharges related to construction are not planned. However, if required, Fermi America would apply for coverage under a general permit or an individual permit for stormwater and would develop a SWPP to prevent stormwater pollution in accordance with TCEQ regulations. Additionally, Fermi America expects to work with TPWD to implement any required BMPs to limit impacts on wildlife and species of conservation concern.

Smaller animals or bird nests and young could be crushed or buried by construction equipment. Collision with vehicles or other equipment could result in animal injury and mortality. Bird and bat injury and mortality could result from collisions with tall equipment and infrastructure such as cranes, electric utility lines, or taller buildings as they are being constructed (FWS 2026-TN12938). Among the tallest permanent structures onsite would be the numerous ACC structures, which are expected to be approximately 115 ft tall (Section 2.3). Depending on seasonal timing and how construction is phased, bird nests could be incidentally destroyed on some structures that are in the process of being completed. Although many migratory birds use habitats on the site and within the Project Matador Campus (Section 3.6.2.1), other suitable, and likely less disturbed, grassland and wetland habitats are plentiful in the 6-mi vicinity of the

site (Figure 3-2). Direct mortality would be limited by conducting all vegetation clearing activities outside the nesting season for migratory birds and having a biological monitor to oversee compliance during any sensitive periods. Electric utility poles would be designed and constructed to reduce avian electrocution risk by providing separation between primary phase wires and/or by covering exposed parts with insulators (FWS 2026-TN12927). Utility wires would utilize marking devices such as hangers, coils, and aviation marking devices to make them more visible to birds. Due to the degraded nature of the existing habitat on the site, wildlife displacement is expected to have only short-term and limited population-level impacts but could impact generalist species that are already at or near carrying capacity in nearby habitats. Fermi America would work with TPWD and FWS to prepare and implement any wildlife protection plans, if required.

Noise from equipment and traffic associated with building activities may affect birds and terrestrial wildlife by disrupting movement, foraging, and other activities on and near the site. The highest noise levels would be from equipment such as pile drivers, concrete saws, and mounted impact hammers, all of which can emit levels of ≥90 dBA from 50 ft away (DOT 2006-TN10181). Wildlife in the vicinity is already likely acclimated to noise from adjacent highways and activities at the Pantex Plant; however, measures for compliance with MBTA and BGEPA would be implemented as required. In addition, as stated above, Fermi America would work with TPWD and FWS to implement any wildlife protection plans, if required. Such measures to mitigate noise impacts on birds and wildlife could include scheduling work to minimize impacts to nesting birds (in compliance with MBTA and BGEPA), staggering work activities, staging equipment away from the site boundary, and using noise dampeners and noise control devices on vehicles and equipment.

The use of lighting at night could impact bird and bat behavior. A major concern is the possible attraction of migrating birds, reducing the birds' energy needed for migration and causing collisions with structures (FWS 2026-TN12928). Measures for compliance with MBTA and BGEPA would be implemented as required. In addition, as stated above, Fermi America would work with TPWD and FWS to implement any wildlife protection plans, if required. Such measures could include limiting nighttime work during spring and fall migration seasons, especially on cloudy nights, and turning off lights when not needed.

Soil excavated onsite should be suitable as fill; however, some additional fill material might be needed from offsite. One possible source could be other parts of the Project Matador Campus. Otherwise, the applicant would use established regional sources and transport fill over existing roadways within the region. These practices should limit impacts on terrestrial ecological resources.

Important Species and Habitats

Based on the above descriptions of potential impacts and BMPs, Federal and State species of conservation concern, as well as other important species and habitats, are not expected to be adversely affected by building activities on the PMN Units 1–4 site. The federally threatened piping plover and rufa red knot have not been documented at the site or in the vicinity, based on existing casual observations from Pantex Plant staff and from citizen science databases (eBird 2026-TN12992; iNaturalist 2026-TN12968).

The federally protected whooping crane, bald and golden eagles, as well as songbirds and other species protected under the MBTA, have been observed at and near the site. The only additional State protected (threatened or endangered) species documented at the site are the

white-faced ibis and the Texas horned lizard. These species could be impacted by activities as described above. Disturbance or destruction of prairie dog colonies could impact prairie dogs and any species dependent on this important keystone species such as western burrowing owls and ferruginous hawks. However, these species, and the State species of conservation concern in Appendix C, are unlikely to be substantially impacted by the proposed work, even if found at the site, since (1) there are other suitable habitats in the 6-mi vicinity of the site (Figure 3-2), and (2) because the applicant would use BMPs to minimize direct and indirect impacts on these and other species where possible, as described above. As an additional mitigation measure, prairie dogs could be relocated to suitable offsite habitat, if required. Such BMPs would incorporate any recommended wildlife protection measures suggested by FWS and TPWD.

Given the rapid spread of invasive old world bluestem grasses across the project area and concerns over replacement of shortgrass prairie habitats across the region (USDA 2018-TN12908), invasive species management BMPs could be implemented. The applicant plans to reuse uncontaminated soils onsite and would properly dispose of any soils indicating contamination (Section 2.5), which will limit offsite spread of invasive species. If required, the applicant would work with TPWD and other agencies to develop an invasive species management plan that identifies additional BMPs to reduce the spread and establishment of invasive species during construction activities.

Conclusions on Building Impacts on Terrestrial Ecological Resources

Because building PMN Units 1–4 would be carried out using agency-approved BMPs and it is not expected to noticeably reduce the diversity of plant or wildlife communities in the vicinity of the site, the impacts on terrestrial ecological resources, including important species and habitats, are expected to be SMALL. Complete analyses for federally listed species are presented in Appendix D.

3.6.2.3.2 Impacts from Operating PMN Units 1–4

Potential operational effects include animal injury and mortality from traffic collision or collision with structures, potential injury or mortality from facility maintenance activities such as pesticide/herbicide application and mowing, noise from operational activities, use of lighting that could affect animal activity patterns, and radionuclide exposure.

As described in Section 2.3, the applicant proposes to use air cooling for operations, which would greatly reduce water needs (relative to water cooling) and avoid the need to use any water from wetlands. In addition, operational water is expected to be largely supplied by municipal water sources, as discussed in Section 3.5.2. No surface or subsurface liquid effluent discharges are planned. Liquid effluent would be routed to the liquid radioactive waste system, which would collect, process, and treat all liquid radiological effluent. Liquid effluent that does not meet applicable reuse criteria would be cycled through the liquid radioactive waste system until concentrated to appropriate levels for solidification and management as solid radioactive waste to be disposed of offsite (Section 3.5.1.3). Stormwater would be routed to onsite basins with no planned surface discharges.

The presence of the physical operational infrastructure at the site, including fencing and roadways, could impede wildlife movement across the broader landscape. Furthermore, traffic collisions with wildlife would be possible, although collisions are expected to be minimal due to the low traffic volume coupled with traffic BMPs (e.g., reduced speed) (Appendix F.4). Bird and bat collisions with tall structures and utility lines, and electrocution of birds from powerlines, may

also occur. The applicant anticipates implementing appropriate mitigation measures to reduce the potential effects. Examples may include fence marking, wildlife crossings at drainage swales, powerline modification (see Section 3.6.2.3), and other practices developed in consultation with FWS and TPWD.

Facility maintenance activities could affect the terrestrial ecological resources at the PMN Units 1–4 site. Approved pesticides and herbicides may be used to control undesirable pest or weed species in and around buildings and roadways, potentially impacting nontarget species. Mowing and other vegetation maintenance activities at the site and associated transmission and pipeline corridors are also anticipated. These activities could affect organisms using these habitats by direct mortality or disturbance of foraging, reproduction, or other behaviors. To minimize any impacts, Fermi America would use pesticides and herbicides according to labels. Fermi America would develop and implement additional BMPs for landscape management as required by TPWD and other agencies.

Generally, during normal operations, nuclear power plants release small amounts of radionuclides and related chemicals through gaseous emissions, which are deposited in in the environment as either vapor or particulates, and as liquid effluent. In the case of PMN Units 1–4, the use of ACCs will result in no plume or particulate drift impacts and no regular effluent discharge (Section 2.4). Liquid effluent would be routed to the liquid radioactive waste system, which would collect, process, and treat all liquid radiological effluent. Liquid effluent that does not meet applicable reuse criteria would be cycled through the liquid radwaste system until concentrated to appropriate levels for solidification and management as solid radioactive waste to be disposed of offsite (Section 3.5.1.3). Terrestrial plants can absorb radionuclides that enter shallow groundwater or surface waters through their roots. Animals may experience exposure to ionizing radiation through direct contact with air, water, or other media, through inhalation, as well as through ingestion of contaminated food, water, or soil. Based on studies that estimated radionuclide dose rates from existing nuclear plants against DOE standard for terrestrial organisms, the effects of exposure of terrestrial organisms to radionuclides are anticipated to be minimal and should neither destabilize nor noticeably alter any important attribute of populations of exposed organisms (NRC 2024-TN10161). This evaluation is supported by additional comparisons in Section 3.9.1.3. Continued adherence to regulatory limits on radioactive effluent releases at PMN Units 1–4 is expected to maintain releases below DOE's guidance dose levels and, therefore, significant impacts to terrestrial communities are not expected. Any unexpected radiological impacts would be found and addressed through the Radiological Environmental Monitoring Program (Section 3.9.1).

Indirect impacts to terrestrial ecological resources from operations at the PMN Units 1–4 site are also possible. As discussed in Section 3.6.2.3, artificial lighting can impact bird and bat behavior. Lights used during operations are expected to be permanent. However, to minimize impacts to migratory birds, flashing lights are anticipated to be used in place of steady-burning lights when possible, lights that are not needed are expected to be turned off when not in use, and directional shielding is expected to be used where possible for lights that must remain on.

Operational noise is expected to be at lower levels than construction noise. Most equipment is anticipated to be housed inside structures, reducing noise levels. Some of the primary noise sources during operation would stem from the ACC fields, which are expected to produce maximum sounds levels of up to approximately 92 dBA in the area immediately surrounding each unit and up to approximately 58 dBA at up to 3,281 ft away (Table 2-1). These levels would be below construction levels and would occur in the context of existing operational noise from the Pantex Plant, existing traffic noise from nearby roadways, and the preceding construction

noise, which would have already encouraged most noise-sensitive terrestrial wildlife to avoid the area and move to other suitable habitat in the vicinity. Fermi America expects to comply with health and safety regulations related to occupational noise exposure, which will limit ambient noise levels (Section 3.9.2). Due to these factors, minimal impacts to terrestrial ecological resources from operational noise are anticipated. Operational impacts from cooling, other than operational noise, are not expected due to the use of ACC technology (Section 2.3).

Based on the above descriptions of potential impacts and BMPs, Federal and State species of conservation concern are not expected to be negatively impacted by operations at the PMN Units 1–4 site. These species could be impacted by operations as described above. However, these species are unlikely to be substantially impacted by operational activities as more suitable habitat is available within the 6 mi vicinity of the site (Section 3.6.2.1), and because Fermi America will implement any required BMPs to minimize direct and indirect impacts from operations on these and other species near the site boundary.

Based on the above evaluation, the impacts of operation of PMN Units 1–4 on terrestrial ecological resources, including important terrestrial species and habitats, are anticipated to be SMALL. Complete analyses for federally listed species are presented in Appendix D.

3.6.2.3.3 Impacts from Decommissioning PMN Units 1–4

Table 6-1 of the Decommissioning GEIS (NRC 2002-TN665), incorporated by reference, indicates that the impacts of decommissioning are generally considered to be small and generic; however, ecology was considered a site-specific issue. Possible ecological impacts mostly relate to activities performed outside of the site. Threatened and endangered species was one area that was considered site-specific in the Decommissioning GEIS.

Generally, activities associated with decommissioning a reactor are similar to those associated with building it; therefore, impacts from decommissioning would be similar to those addressed in Section 3.6.2.3. However, potential decommissioning impacts are expected to be evaluated in more detail and with updated information in the post-shutdown decommissioning activities report and the license termination plan. Further, any changes to protected species status or presence at the site would be addressed with FWS at that time.

Based on the above evaluation, the impacts of decommissioning of PMN Units 1–4 on terrestrial ecology, including important terrestrial species and habitats, are anticipated to be SMALL.

3.6.2.3.4 Summary of Reasonably Foreseeable Environmental Effects

As described above, terrestrial habitats within the PMN Units 1–4 site and rest of the Project Matador Campus have a long history of human disturbance and represent a small portion of the available habitat within the region. Although some important species and habitats do occur, BMPs and any required mitigation actions would prevent noticeable impacts to these species at the regional level. As presented above, building, operation, and decommissioning of PMN Units 1–4 would have a SMALL impact on terrestrial ecological resources. Further, the interrelated construction and operation of the remainder of Project Matador, given these same factors, would not alter this conclusion.

3.7 Historic and Cultural Resources

This section describes the context and impacts from the proposed undertaking to historic and cultural resources at the PMN Units 1–4 site by reviewing the current affected environment, background cultural history for the Texas Panhandle, identified historic properties, and consultation, and by evaluating building, operation, decommissioning, and reasonably foreseeable impacts.

3.7.1 Affected Environment

Historic and cultural resources refer to archaeological sites, historic buildings, traditional cultural properties important to a living community, shipwrecks, and other resources considered through the NHPA (54 U.S.C. § 300101 et seq. [TN4157]). Historic and cultural resources that have been determined to be significant include those that have been determined eligible for inclusion on or formally listed in the National Register of Historic Places (NRHP). Section 106 of the NHPA requires Federal agencies to take into account the effects of their undertakings on historic properties that are listed or eligible for listing on the NRHP (36 CFR Part 800-TN513). If historic and cultural resources are present, the eligibility of any historic properties for listing on the NRHP is determined through the application of the NRHP criteria in 36 CFR 60.4 (TN1682) in consultation with State Historic Preservation Office (SHPO), Indian Tribes that attach cultural and religious significance to historic properties, and other interested parties. The historic preservation review process (Section 106 of the NHPA) is outlined in regulations issued by the Advisory Council on Historic Preservation (ACHP) in 36 CFR Part 800 (TN513), “Protection of Historic Properties.”

NEPA requires Federal agencies to consider the potential effects of their actions on the affected human environment, which includes aesthetic, historic, and cultural resources as these terms are commonly understood, including resources such as sacred sites. In accordance with 36 CFR Part 800.8(c), “Use of the NEPA Process for Section 106 Purposes,” the NRC has elected to use the NEPA process to comply with its obligations under Section 106 of the NHPA. While the NHPA emphasizes impacts on historic properties, for NEPA compliance, impacts on cultural resources that are not eligible for or listed in the NRHP would also need to be considered by the NRC.

As discussed in Section 2.1.1, the PMN Units 1–4 site is located entirely on land leased from TTU and is therefore subject to the *Texas Antiquities Code*. The *Texas Antiquities Code* states that for any project located on State or local public land, the party primarily responsible for the project must notify the Texas Historic Commission (THC) for a review of the ground-disturbing activity or work affecting State-owned historic buildings prior to work occurring.

3.7.1.1 Area of Potential Effects

The PMN Units 1–4 site is located in Carson County, Texas, approximately 17 mi northeast of downtown Amarillo. The area of potential effects (APE) is defined as the PMN Units 1–4 site and its immediate environs which may be impacted by land disturbing and building activities associated with the construction of the four AP1000 reactors. The APE is approximately 881 ac, with an associated 1 mi buffer area evaluated as part of a literature review of historic properties and other historic and cultural resources near the project site (Figure 3-14 and Figure 3-15).

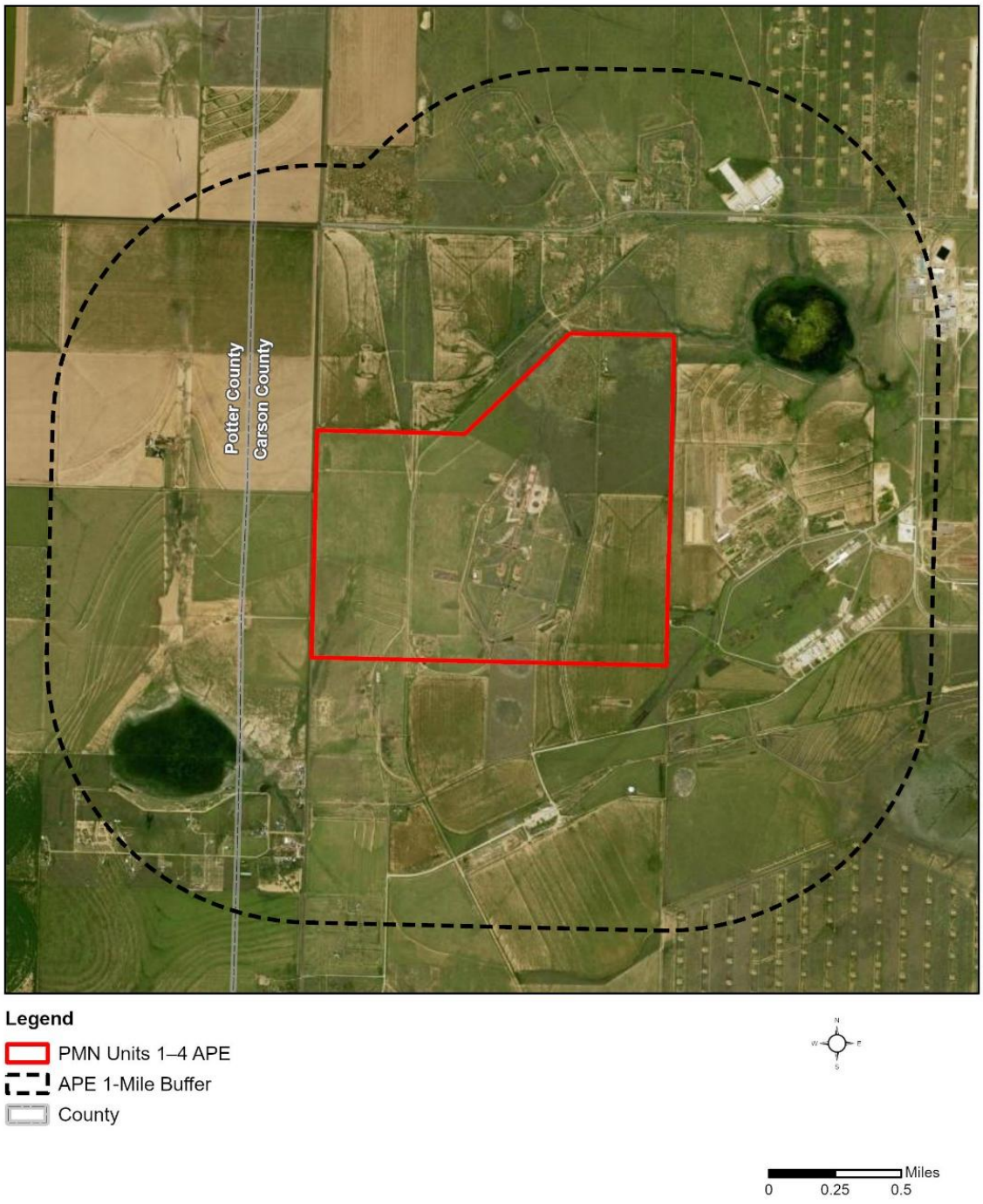


Figure 3-14 Area of Potential Effects for the Project Matador Nuclear Project Depicted on Aerial Overview

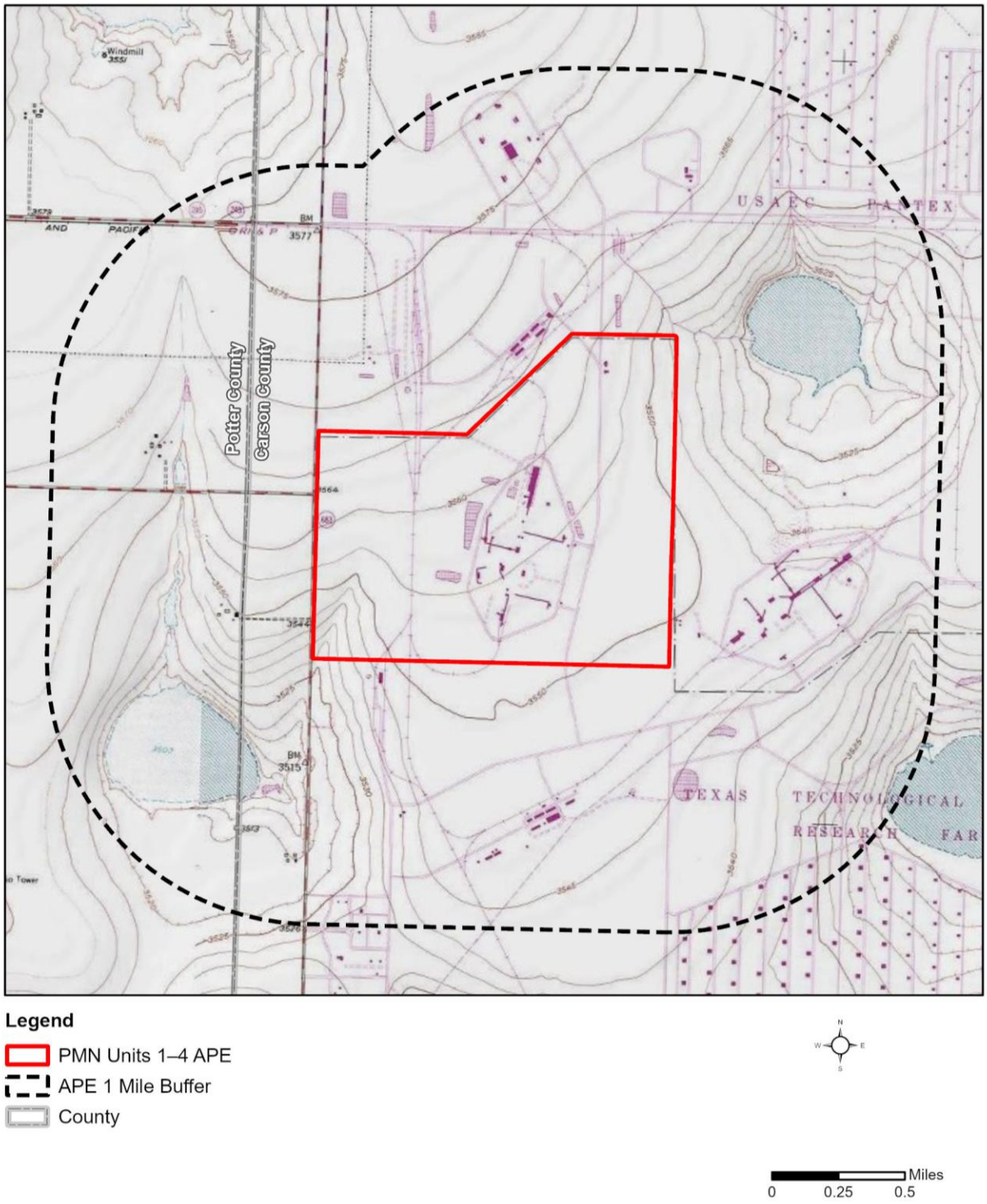


Figure 3-15 Area of Potential Effects for the Project Matador Nuclear Project Depicted on United States Geological Survey Topographic Quadrangle

3.7.1.2 Cultural Background

A discussion of the cultural background and historical context of the project area was included in Part 3, Section 2.6.2 of the 2025 Fermi America Combined Operating License Application for Project Matador (FA 2025-TN1267) and the Supplemental Project Information submitted by Fermi America (FA 2026-TN13483, ML26223A375), and is incorporated here by reference. PMN Units 1–4 are located in an area with evidence of both precontact and historical occupation by Native Americans and Euro-Americans. Previous cultural resource investigations of the Pantex Plant identified precontact sites from all major precontact periods, including one possible Paleoindian Period site (prior to 8500 Before Present [BP]), indicating that there has consistently been a Tribal presence in the region for the past 10,000 years. These investigations include an overview of the cultural background and historical context of the surrounding area, which is summarized in this section.

The Panhandle region of northern Texas has extensive evidence of Native American activity from the Paleoindian and Archaic period (Winchell and Largent 1994-TN12889). Regional Paleoindian sites include Blackwater Draw, in eastern New Mexico, and the Miami (41RB1) and Lubbock Lake (41LU1) sites in northern Texas. The Miami Paleoindian site is northeast of Amarillo (Holliday et al. 1994-TN13544). These localities exhibit hallmark characteristics for the Paleoindian period in this part of North America, including evidence for mobile hunter-gatherer groups using large, lanceolate-type Clovis points, and the skeletal remains of butchered, large-sized animals (e.g., mammoths and bison) approximately 10,000 years ago. Following the emergence of Clovis technologies during the Paleoindian period, several other stone tool adaptations appeared in sequence. These include both Folsom (another fluted lanceolate point style), Firstview (unfluted lanceolate point style), and Scottsbluff (stemmed point style). The late Paleoindian period also included a technological adaptation coined the Plainview Complex, identified at a series of archaeological sites located between Lubbock and Amarillo in northern Texas. Plainview projectile points were often resharpened into butchering implements and are associated with large scale bison kill and processing activities (Bousman et al. 2004-TN13549).

Over time, with shifting climates, changing habitats, and large animal extinctions, the development of different tool adaptations and subsistence patterns emerged (i.e., the Archaic period), largely focused on smaller game and a broad diversity of plants (Perttula 2004-TN13551). The Archaic period is characterized by hunter-gatherers restricting movement to smaller, seasonal areas, but at the same time beginning to establish broader networks between populations. Northern Texas has very few early Archaic archaeological sites which is likely due to the presence of extensive draught during this transitional climatic period (Winchell and Largent 1994-TN12889). By the late Archaic period, human populations began to increase, and there is an equal increase in bison populations within the southern Great Plains (they appeared sporadically during the post-Paleoindian period due to changing climate and environmental conditions). Archaeological sites are often associated with water and other drainages. Ground stone tools appear in abundance during this time, as does evidence for bison exploitation (Perttula 2004-TN13551).

By the late precontact period, Native American groups in northern Texas became more sedentary for larger portions of the year and began experimenting with horticulture, ceramics, long-distance trade, and the bow and arrow (Perttula 2004-TN13551). There were complex societal organizations and social networks in place between and within groups. The Lake Creek and Palo Duro archaeological complexes are representative examples of late precontact Indigenous activity within northern Texas. Distinctive ceramics and tanged arrow points occur within these sites, as well as manos and metates (Boyd 2004-TN13552). These adaptations

were in place immediately preceding and during Spanish contact beginning with the Francisco Vazquez de Coronado exploration in 1514.

The post-contact period saw extensive exploration, then exploitation, of northern Texas by Spanish and later Euro-American groups. Mass slaughter of buffalo, military engagements and the United States war against the Plains Indians, and forcible removal of Indigenous peoples onto reservations transformed northern Texas into an area largely focused on non-Indigenous cattle ranching and farming during the 19th century. Arrival of the railroad continued to expand the population of northern Texas during this time. However, in the 20th century, the most significant development to the immediate project area occurred in 1942 with the founding of the Pantex Plant (Gaither 1995-TN13486).

A detailed historical context of the Pantex Plant during World War II and a summary of the post-war history of the area can be found in the 1995 historical context and architectural assessment produced by Geo-Marine, Inc (GMI) for DOE and USACE. This discussion of the cultural background and historical context is incorporated by reference. The historical context describes how, in 1940, the Ordnance Department of the U.S. Army began setting up 77 total government-owned contractor-operated industrial facilities to support military efforts in World War II. Farmers located in the Texas Panhandle were notified in early 1942 that a government defense facility would be built on 16,000 ac in the St. Francis area, and that land would be purchased or condemned as necessary. A total of 19 families were moved off their land during the acquisition process for the Pantex Plant. Production began on September 17, 1942, and ceased on August 15, 1945 (Gaither 1995-TN13486).

Following the end of production, the operator turned the Pantex Plant over to the Corps of Engineers, and the Department of War declared the plant to be surplus. The facility was put up for sale on September 28, 1945, but no bids were received. TTU initially asked for the Reconstruction Finance Corporation for a grant of the entire plant in 1945 but eventually negotiated a lease for 8,000 ac in 1947. The college created a new experimental station named “Pantech Farms.” In April of 1949, the college was deeded the remaining property under the same lease conditions as the 1947 lease. Afterwards, the college demolished or converted the existing buildings into classrooms or livestock shelters. In 1950, the Atomic Energy Commission (AEC) became interested in the former Pantex Plant as a potential site for nuclear activities, and a total of 8,803 ac as well as railroad and utility easements were transferred to the AEC. The APE of the proposed undertaking is located on the lands retained by TTU, and the area continued to be used as an experimental farm (Gaither 1995-TN13486).

3.7.1.3 Historic and Cultural Resources at the PMN 1–4 Site

Background research conducted in October 2025 included a review of historical maps and records for the area. These sources indicate limited development within the proposed PMN Units 1–4 APE and 1 mi buffer prior to the construction of the Pantex Plant in the mid-twentieth century. The USGS topographic quadrangles from 1953 to 1955 show only limited, rural development primarily to the west of FM 683. FM 683 is depicted as a secondary highway, with two other secondary highways, a section of railway, and three likely farmsteads. A utility line appears to cross FM 683 from the west and extends north. From the mid-twentieth century to the present, the Pantex Plant facility and its related infrastructure represent the only development within the APE and immediate surrounding area. Late-1960s USGS topographic quadrangles show an approximately 120 ac, hexagonal complex (Zone 9) situated within the Pantex Plant and TTRF and centered on the currently proposed PMN Units 1–4 site. This hexagonal complex is accompanied by branching railway lines and roads connecting the

complex to the Pantex Plant facility where two other matching complexes are located (Zones 10 and 11). USGS topographic quadrangles from the mid-1970s show relatively minor changes within the previously constructed Pantex Plant and TTU facilities, such as modifications to structures, additional roads, rail lines, and modified utility lines. Development within the proposed PMN Units 1–4 APE and 1 mi buffer in the late 20th and early 21st centuries appears to have primarily occurred east of FM 683, while the area to the west of FM 683 remained characterized primarily by sparse, rural development (USGS 2026-TN12893).

Review of cultural resource information was conducted via the THC's online Texas Archaeological Sites Atlas beginning in October 2025, with the most recent review of available data conducted on February 13, 2026. The literature review included the PMN Units 1–4 APE and the 1 mi buffer. The review identified six previous cultural resource investigations in the area conducted between 1981 and 1995, primarily associated with the Pantex Plant. These investigations included four spatially overlapping investigations with fieldwork conducted between 1993 and 1995 by GMI for DOE and USACE. Of the four GMI-led investigations, three are located within the PMN Units 1–4 APE or the 1 mi buffer. A 1995 GMI survey report of 500 ac surrounding the "sewage playa" (playa 5) was located south of the APE and just outside the 1 mi APE buffer. The 1995 survey report of 4,200 ac was an intensive archaeological survey that currently overlaps the PMN Units 1–4 APE and a portion of the 1 mi buffer. The 1995 survey of 2,400 ac addresses a portion of the 1 mi APE buffer. A 1995 historical architectural report provides an extensive historical context and assessment of the Zone 9 structures located within the PMN Units 1–4 site. All six investigations within the APE are listed in Table 3-14 (THC 2026-TN8672; Winchell and Largent 1994-TN12889; Largent et al. 1995-TN12890; Largent et al. 1995-TN12891; Largent et al. 1995-TN12892).

Table 3-14 Previous Cultural Resource Surveys within the Area of Potential Effects of the Project Matador Nuclear Unit 1–4 Site

Atlas Number	Author	Report Year	Title	Description
8100001730	Jack T. Hughes and Roberta D. Speer	1981	An Archaeological Survey of the Pantex Plant, Carson County, Texas	Pedestrian survey of selected area. A total of 45 archaeological sites identified.
8100006379	John C. Acklen	1992	Archaeological Letter Report for Cultural Resources Investigations Conducted in Association with the Ditches and Playa Program at the Pantex Plant near Amarillo, Texas	Revisited 17 of the 45 previously identified sites and recorded five new archaeological sites.
Not Found in Database	Frank Winchell and Floyd B. Largent, Jr.	1994	Phase II Testing of 23 Archeological Sites at the U.S. Department of Energy Pantex Plant Facility, Carson County, Texas	Revisitation and evaluation of 22 previously recorded archaeological sites and one recently discovered site.

Atlas Number	Author	Report Year	Title	Description
Not Found in Database	Largent, Floyd B. and Frank Winchell	1995	A Cultural Resources Survey of 4,200 ac Leased by the U.S. Department of Energy Pantex Plant, Carson County, Texas	Survey of 4,200 ac within the Pantex Plant, five precontact lithic scatters, one pre-WWII farmstead, and two multicomponent sites identified.
8100024697	Largent, Floyd B., Jr.	1995	A Cultural Resources Survey of 2,400 ac at the U.S. Department of Energy Pantex Plant, Carson County, Texas	Identified and recorded 13 archaeological sites and 22 non-site localities.
Not Found in Database	Gaither, Steve	1995	Ordnance Production in the Texas Panhandle: The Pantex Ordnance Plant, Amarillo, Texas 1942–1945	Surveyed historic buildings and structures associated with the Pantex Plant.

Sources: THC 2026-TN8672; Winchell and Largent 1994-TN12889; Largent et al. 1995-TN12890, Largent et al. 1995-TN1289, Largent et al. 1995-TN12892, Gaither 1995-TN13486.

3.7.1.3.1 Archaeological Resources within the APE and the 1 mi Buffer

The earliest archaeological survey which overlaps with the PMN Units 1–4 APE was a 1981 archaeological survey of the Pantex Plant, which identified a total of 45 archaeological sites (THC 2026-TN8672). The full report was not available for review; however, an abstract describing the report's findings was available through the THC database. The abstract states that the precontact sites identified were surficial lithic scatters ranging in size from small to large, containing potential subsurface deposits. GMI 1994 and 1995 archaeological reports (Winchell and Largent 1994-TN12889; Largent et al. 1995-TN12892) summarized the findings of the 1981 survey and described that the methods involved a pedestrian survey of selected areas within the entire 10,150 ac Pantex Plant, and that 17 of the newly identified archaeological sites had medium to high potential for significant archaeological information and were recommended for further study. The 1994 report also states that these 17 sites were revisited in 1992 by Mariah and Associates to assess their potential significance.

According to summaries of previous archaeological research found in the GMI reports from 1994 and 1995, 17 of the 45 precontact and historical sites identified by the 1981 survey were revisited in 1992 by John Acklen of Mariah and Associates, Inc. The 1992 investigation is described in the Texas Archaeological Sites Atlas as an archaeological letter report and does not appear on the map viewer. In addition to revisiting archaeological sites described as having medium to high significance by the 1981 survey, Acklen surveyed approximately an additional 200 ac and identified five new archaeological sites. The conclusion of the 1992 investigation was that all of the revisited and newly recorded precontact sites were potentially eligible for the NRHP (Largent et al. 1995-TN12892). The 1992 investigation was identified as being within the current APE based on the location of seven archaeological sites (41CZ5, 41CZ6, 41CZ8, 41CZ9, 41CZ10, 41CZ49, and 41CZ50; THC 2026-TN8672).

Following the 1992 investigation, DOE, and USACE's Tulsa District, contracted GMI to conduct Phase II archaeological testing at the 22 total sites that had been recorded as potentially eligible. An additional precontact site (41CZ66, located outside of the APE) was also identified

during GMI's investigation. The 1994 GMI report states that of the precontact sites recorded in 1981 with a datable component, all but one was associated with the Archaic period (8500 BP to 2000 BP) or the Ceramic/Late Prehistoric period (2000 BP to 500 BP). The four precontact sites identified by Acklen in 1992 also dated to the same general time periods. The Phase II investigation focused on assessing the potential NRHP eligibility of each site in terms of Criteria D, which applies to resources "that have yielded or may be likely to yield information important in history or prehistory" (NPS 1997-TN6407). Testing involved backhoe trenches, backhoe scrapes, and hand testing that included both shovel testing and 50 × 50 centimeter (cm) excavation units. Of the 23 sites investigated, 22 were found to contain precontact cultural materials and 13 contained diagnostic artifacts. These artifacts were primarily lithic tools, and the report notes in its conclusion that the lack of ceramic artifacts, midden development, ground stone tools, and rare materials (such as shell, obsidian, or other materials transported over long distance) indicates that the sites investigated represent temporary encampments. The report concluded that 21 of the sites investigated, including the seven sites (41CZ5, 41CZ6, 41CZ8, 41CZ9, 41CZ10, 41CZ49, and 41CZ50) within the current APE, were ineligible for inclusion in the NRHP due to a lack of contextual integrity and limited potential for yielding further archaeological information (Winchell and Largent 1994-TN12889).

A subsequent survey by GMI was conducted on approximately 500 ac in the vicinity of "Playa 5" also described as "the Sewage Playa." This survey occurred outside of the current APE. It was therefore reviewed for background information and further context but is not included in Table 3-14. The findings of this report were largely consistent with the other investigations of the Pantex Plant facility; five precontact sites and one pre-WWII homestead were identified, with all five of the precontact sites consisting of temporary occupations (Largent et al. 1995-TN12890).

The PMN Units 1–4 APE and much of the 1 mi buffer are located within the approximately 4,200 ac surveyed by GMI in early 1994. This survey is the only confirmed previous archaeological investigation of the current APE. The survey consisted of a pedestrian survey with transects spaced 30 m apart. Shovel testing was conducted at judgmental intervals in areas of limited ground surface visibility or where the potential of buried cultural deposits was considered high (e.g., playas). Shovel tests were 30 × 30 cm square and excavated to sterile subsoil or to a maximum depth of 40 cm. All excavated soils were screened through a quarter in. mesh. The preexisting complex within the center of the PMN Units 1–4 APE is marked as a "No Survey Zone" on a map identifying cultural resources within the survey area. This area, identified on maps as Zone 9, was not surveyed by GMI during this archaeological survey due to previous disturbance and environmental contamination (e.g., asbestos contamination). The survey recorded a total of eight archaeological sites and 17 isolated finds. Shovel testing failed to identify any buried material. All archaeological sites identified within the APE for the proposed project were recommended as ineligible for the NRHP due to a lack of contextual integrity and limited research value. No further archaeological testing was recommended. No aboveground cultural resources were identified (Largent et al. 1995-TN12891).

A final GMI survey conducted in late 1994 investigated 2,400 ac of the Pantex Plant and recorded 13 archaeological sites and 22 isolated finds. According to the 1995 report, the entire project area was subject to a pedestrian survey with 20 m transects. Shovel testing was conducted at judgmental intervals in areas with limited surface visibility or the possibility of buried deposits. The exception is Zone 11, an approximately 510 ac area west of the PMN Units 1–4 APE where no subsurface testing was permitted. Zone 11 is depicted as surrounding a six-sided complex very similar to the one located within the PMN Units 1–4 APE. The complex in Zone 11 was not surveyed, and the prohibition on shovel tests within the surrounding area appears to further indicate safety concerns related to archaeological testing. Shovel tests, when

conducted, were 30 × 30 cm and excavated to a maximum depth of 30 cm, with all excavated soils screened through a quarter in. mesh. Sites identified by surface observation were examined through shovel testing to determine the limits and depth of cultural deposits. All shovel tests excavated during this survey are stated to have been negative for cultural resources (Largent et al. 1995-TN12892).

Cultural resource investigations conducted between 1981 and 1995 identified 78 archaeological sites and 39 isolated finds within the Pantex Plant and its surrounding area. Most are precontact sites, providing detailed, localized context for the current project. Historic-era occupation appears limited to the early-to-mid twentieth century farmsteads that were demolished during Pantex Plant facility construction. The precontact sites demonstrate a consistent Indian presence in the area, particularly during the Late Archaic period to the Protohistoric period. Occupation appears to have been intermittent due to the seasonal nature of water sources in the area. Previously recorded archaeological resources within the current APE were previously recommended as not eligible for the NRHP, due to lack of integrity and limited research potential. Comparison of the original 1981 site forms with the updated site descriptions in 1995 suggests that the integrity of the known sites has most likely been further disturbed or destroyed by erosion and bioturbation (THC 2026-TN8672; Largent et al. 1995-TN12891).

Overall, the multiple archaeological investigations in the 1990s indicated that precontact sites were typically small, seasonal camps. Sites that dated to the period following the arrival of Euro-American settlers and prior to the development of the Pantex Plant were small, widely dispersed farmsteads. Archaeological surveys conducted within the PMN Units 1–4 APE and/or the 1 mi buffer found a total of 14 archaeological sites and two isolated finds (Table 3-15). Nine of the 14 archaeological sites (41CZ3, 41CZ4, 41CZ5, 41CZ6, 41CZ8, 41CZ9, 41CZ10, 41CZ45, and 41CZ46) identified within the 1 mi APE buffer were originally recorded in 1981 and then revisited to assess potential eligibility for the NRHP between 1992 and 1994. Five archaeological sites (41CZ49, 41CZ50, 41CZ61, 41CZ63, and 41CZ69) were identified within the 1 mi APE buffer by the 4,200-ac archaeological survey report in 1994. Review of the report map for the 4,200-ac report also shows an additional two isolated finds (Localities LPP-16 and LPP-17), also recorded within the current 1 mi APE buffer. Shovel testing at the 14 sites failed to identify any buried material. All archaeological sites identified within the 1 mi APE buffer for the proposed project were recommended as ineligible for the NRHP due to a lack of contextual integrity and limited research value. No archaeological sites were identified within the PMN Units 1–4 APE (Largent et al. 1995-TN12891).

Table 3-15 Cultural Resources Identified within the 1 mi Area of Potential Effects Buffer for the Project Matador Nuclear Units 1–4

Site Number	Year Recorded/Revisited	Site Description	National Register of Historic Places Status
41CZ3	1981, 1994	Precontact lithic scatter, Late Archaic open camp	Not eligible as an individual resource
41CZ4	1981	Precontact open camp	No further work (inferred from later reports)
41CZ5	1981, 1992, 1993, 1994	Late precontact and Late Archaic open camp	Not eligible as an individual resource
41CZ6	1981, 1993	Precontact lithic scatter, Late Archaic open camp, historical debris	Ineligible
41CZ8	1981, 1992, 1993	Late Archaic lithic scatter	Ineligible

Site Number	Year Recorded/Revisited	Site Description	National Register of Historic Places Status
41CZ9	1981, 1992, 1993	Precontact lithic scatter, multicomponent open camp	Ineligible
41CZ10	1981, 1992, 1993, 1994	Precontact lithic scatter	Not eligible as an individual resource
41CZ45	1981	Historical (1930s/pre-WWII) farmstead	No further work (inferred from later reports)
41CZ46	1981, 1994	Historical (1930s/pre-WWII) farmstead	Not eligible as an individual resource
41CZ49	1992, 1993	Precontact lithic scatter	Ineligible
41CZ50	1992, 1993	Precontact open camp	Ineligible
41CZ61	1994	Precontact lithic scatter	Not eligible as an individual resource
41CZ63	1994	Precontact lithic scatter	Not eligible as an individual resource
41CZ69	1994	Precontact open camp	Not eligible as an individual resource
LPP-16	1994	Precontact isolated find	Not applicable
LPP-17	1994	Precontact isolated find	Not applicable

Sources: THC 2026-TN8672; Winchell and Largent 1994-TN12889; Largent et al. 1995-TN12890, Largent et al. 1995-TN12891, Largent et al. 1995-TN12892.

3.7.1.3.2 Architectural Resources within the APE and the 1 mi Buffer

There are currently no aboveground properties or historic districts recorded within the PMN Units 1–4 APE or the 1 mi buffer. There are structural remains located within the PMN Units 1–4 APE, the earliest of which date to between 1942 and 1945. These structures are located within an area known as “Zone 9” which has not been surveyed for archaeological resources due to contamination and was originally one of four bomb loading lines at the Pantex Plant.

In the early 1990s, the Pantex Plant completed a historic buildings survey and report to contextualize DOE’s remaining World War II-era facilities (Gaither 1995-TN13486). As a result of this survey, the remaining structures in Zone 9 (also known as “Bomb Loading Line 1”) were documented, as shown in Figure 3-16. Gaither (Gaither 1995-TN13486) noted that only 5 of the original 29 buildings remained standing during the 1994–1995 survey, with 11 buildings “exist[ing] as ruins,” and only foundations remained on 13 of the buildings (Table 3-16). The five structures that were still standing during the 1994–1995 survey included buildings 9-7, 9-8, 9-9, 9-20, and 9-38, but in March 1995 (several months before the final report was published), buildings 9-7 and 9-9 were destroyed in a fire. Building 9-8 was a paint storage structure, while 9-20 represented a shipping and receiving structure, and 9-38 was the third cooling building. All three buildings retained their integrity but were not recommended as eligible to the NRHP. The investigators also identified that after the war, brine ponds associated with a post-World War II cattle operation and berms were constructed within Zone 9.

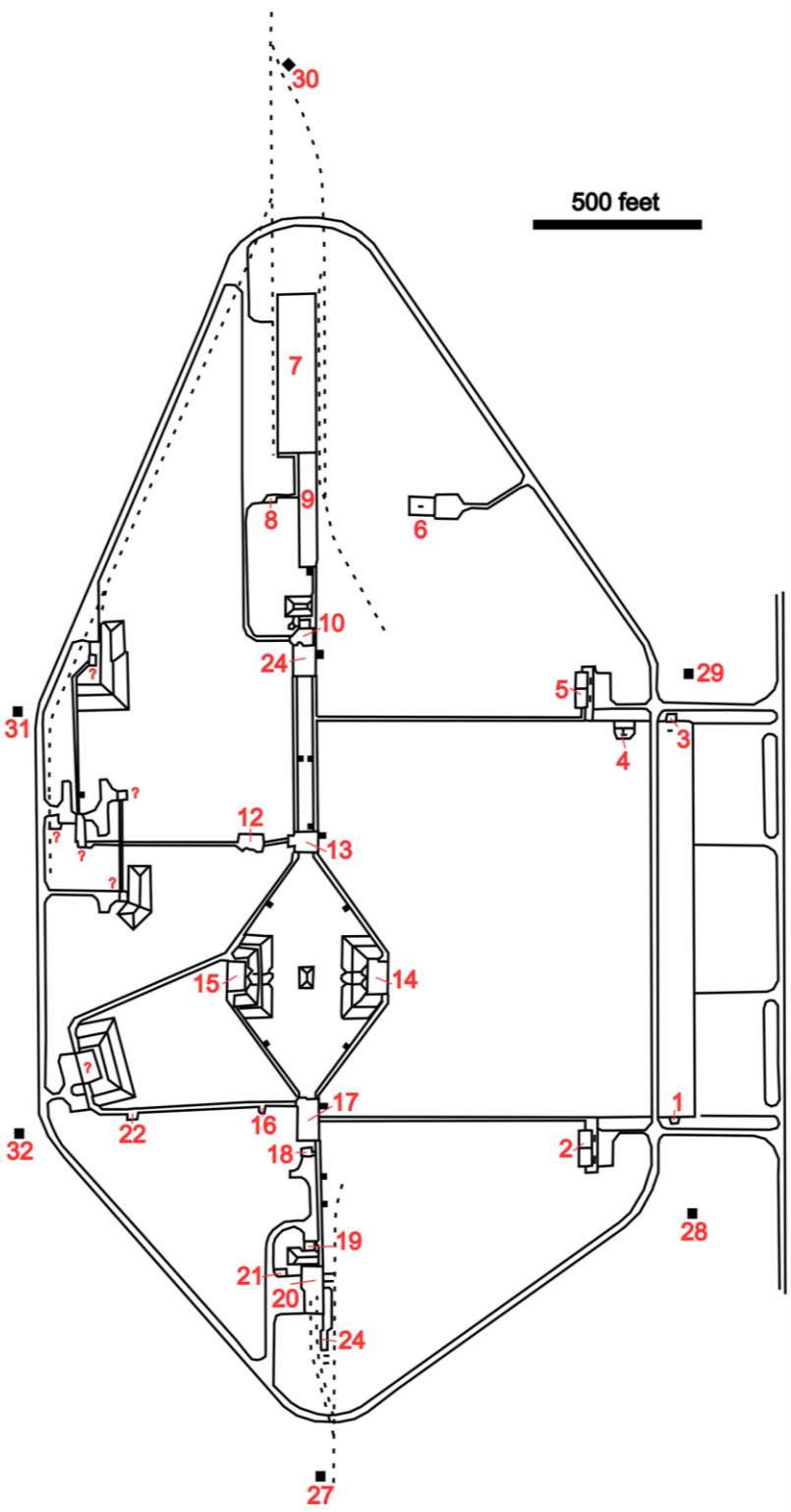


Figure 3-16 A Digitized Map of the Zone 9 Structures at the Project Matador Nuclear Units 1–4 Area of Potential Effect. Source: Gaither 1995-TN13486. Note: Several Structure Numbers Were Indecipherable in the Report and Are Represented by a "?"

Table 3-16 A Transcribed Summary of the Project Matador Nuclear Units 1–4 Area of Potential Effect Zone 9 Structures, Building Name, and a Description of Status from 1995. Source: Gaither 1995-TN13486.

Zone-Building Number	Building Name	Description in 1995 from Gaither (1995)
9-1	Timekeeper's Office	Ruins/Foundation only
9-2	Change House	Ruins/Foundation only
9-3	Timekeeper's Office	Ruins/Foundation only
9-4	Line Office and First Aid Office	Ruins/Foundation only
9-5	Change House	Ruins/Foundation only
9-6	Boiler House	Ruins/Foundation only
9-7	Inert Storage	"Destroyed by fire, March 1995"
9-8	Paint Storage	"High [Integrity], best example of this type of structure at Pantex"
9-9	Receiving and Painting	"Destroyed by fire, March 1995"
9-10	Booster Service (non-operating 1945)	Ruins/Foundation only
9-12	Amatol Screening (non-operating 1945)	Ruins/Foundation only
9-13	Melt and Pour	Ruins/Foundation only
9-14	East Cooling	Ruins/Foundation only
9-15	West Cooling	Ruins/Foundation only
9-16	TNT Screening (non-operating 1945)	Ruins/Foundation only
9-17	Tail Pour and Boostering	Ruins/Foundation only
9-18	Booster Service	Ruins/Foundation only
9-19	Split Sawing (Component Service in 1942)	Ruins/Foundation only
9-20	Shipping and Receiving	"Part of the overhead monorail is still intact; a scale, probably not associated with WWII, is laying on the floor" and "High [Integrity], best example of this type of structure at Pantex"
9-21	Paint Storage	Ruins/Foundation only
9-22	Bomb Washout (TNT Service in 1942)	Ruins/Foundation only
9-23	TNT Service (non-operating in 1945)	Ruins/Foundation only
9-24	Ammonium Nitrate Service (non-operating in 1945	Ruins/Foundation only
9-25	Loading Dock (non-operating in 1945)	Ruins/Foundation only
9-26	Pellet Pouring (Nose Pouring in 1942)	Ruins/Foundation only
9-27	Guard Tower	Ruins/Foundation only
9-28	Guard Tower	Ruins/Foundation only
9-29	Guard Tower	Ruins/Foundation only
9-30	Guard Tower	Ruins/Foundation only
9-31	Guard Tower	Ruins/Foundation only
9-32	Guard Tower	Ruins/Foundation only
9-35	TNT Storage Magazine	Ruins/Foundation only
9-36	TNT Screening	Ruins/Foundation only
9-37	Shipping Box Storage	Ruins/Foundation only
9-38	Third Cooling Building	"High [Integrity], best example of this type of structure at Pantex"
9-39	Empty Box Storage	Ruins/Foundation only

Although Buildings 9-9, 9-20, and 9-38 retained their integrity, Gaither (Gaither 1995-TN13486) recommended that Zone 9 be considered ineligible for the NRHP due to the overall poor preservation of other buildings and structures surveyed in the 1990s, especially when compared with well-preserved bomb-loading lines at similar facilities across the United States. Substantive descriptions of Buildings 9-9, 9-20, and 9-38 from the 1990s are limited; however, a site visit to Zone 9 in April 2026 and a review of 20th century aerial imagery indicate that these three buildings are in a further state of demolition, with only foundations, including foundation concrete walls, remaining. In 1997, several structures still retained roofs and/or walls, but these features have since been removed. Figure 3-17 illustrates the progression of structural loss in Zone 9 over time. As of 2026, all structures within Zone 9 are represented by ruins and/or foundations.

Currently, the remaining foundations and rubble piles associated with the former Zone 9 are comparable to that identified in 1994–1995 (see Figure 3-17). The Pantex Plant also currently identifies Zones 10 and 11, which have the same construction histories as Zone 9, as being in a similar state of contextual integrity. The original spatial relationship of the building footprints in Zones 9, 10, and 11 remain the same, but other footprints for bomb loading lines at other facilities across the United States have much greater integrity, including original buildings and facilities (and potentially original equipment) and thus are better representatives for the NRHP (NNSA 2023-TN13493). Information about these structures has been compiled, and the potential effects to these structures from construction and operation are further discussed in Section 3.7.2.

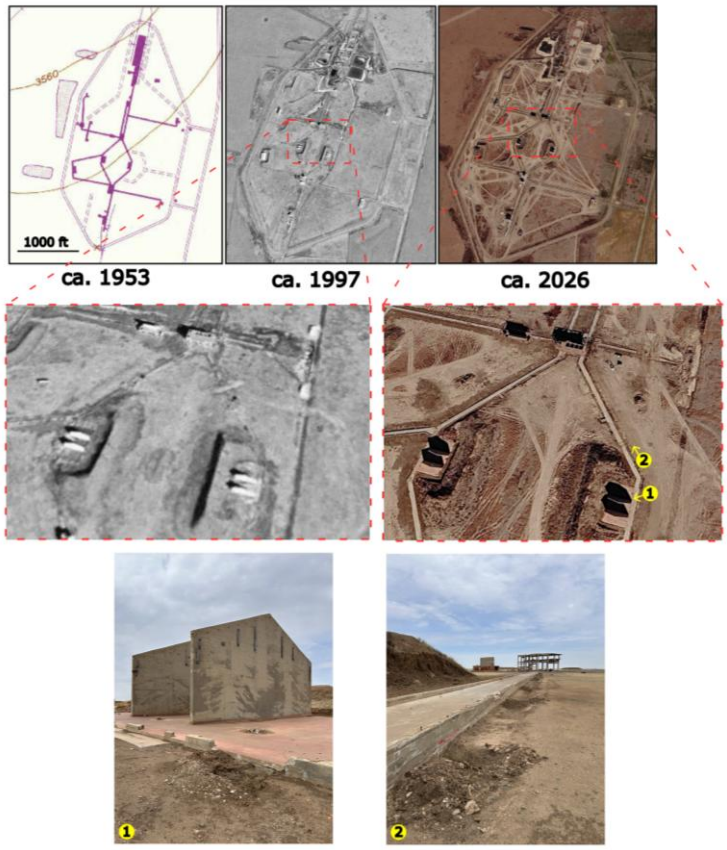


Figure 3-17 Structural Changes in Zone 9 at the Project Matador Nuclear Units 1–4 Site from 1953–2026

To summarize, there are no NRHP eligible historic buildings or structures within the PMN Units 1–4 APE as the “Zone 9” rubble and foundations lack integrity (Gaither 1995-TN13486).

3.7.1.4 Traditional Cultural Properties and Landscapes

The review of archaeological sites and aboveground properties, as described in Section 3.7.1.3, did not identify any Traditional Cultural Properties or Traditional Cultural Landscapes within or adjacent to the APE. To date, consultation with Federally recognized Indian Tribes has not identified any Traditional Cultural Properties or Landscapes.

3.7.1.5 Consultation

The NRC notified the ACHP and initiated Section 106 consultation with the Texas Historical Commission (THC, Texas SHPO) and nine federally recognized Indian Tribes by letter dated April 10, 2026. All consultation letters are presented in Appendix J.

The ACHP responded by letter dated April 20, 2026, acknowledging receipt and outlining the recommended process by which the NRC would conduct consultation and consult with the ACHP, if necessary (ACHP 2026-TN13485). One Federally recognized Indian Tribe responded on April 27, 2026, stating that the proposed undertaking is outside of their area (county) of ancestral affiliation and declining further consultation on the project. On April 28, 2026, the Tonkawa Tribe of Oklahoma responded by email to the NRC requesting notification of any inadvertent discovery to the Tribe (Tonkawa Tribe 2026-TN13226). In a letter dated May 5, 2026, the THC acknowledged receipt of the Section 106 initiation letter and stated that they await further consultation from the NRC regarding determinations and effects (THC 2026-TN13484).

3.7.2 Future Environmental Setting and Planned Actions

The PMN Units 1–4 APE is contained within the Project Matador Campus where approximately 5,236 ac (inclusive of the PMN Units 1–4 site) of land is expected to be cleared for construction of data centers, substations, solar facilities, natural gas infrastructure, utility areas, SMRs, water treatment and recycling systems, and other supporting facilities (Section 2.1). Other reasonably foreseeable projects considered for this NEPA action include past agricultural activities associated with TTU and other past and ongoing Pantex Plant development and operations. Historic and cultural resources and potentially eligible (i.e., unevaluated) historic properties may be impacted by building and the use of the Project Matador Campus, but those determinations and mitigations would be resolved through future undertakings. Given that these would be separate actions and/or undertakings that may or may not involve a Federal nexus, NHPA Section 106 compliance would occur on a project-by-project basis, or as required by the *Texas Antiquities Code*, at a later date. Therefore, ongoing activities at the Pantex Plant operations, and other building activities at Project Matador would result in SMALL impacts to historic and cultural resources and historic properties and would not alter the current Section 106 or NEPA determinations for the project given that there are no known impacts activities as a result of this current undertaking.

Any future independent spent fuel storage installation (ISFSI) would be located in compliance with 10 CFR 72.106, for an ISFSI general license under 10 CFR 72.210. The ISFSI site selection process would comply with applicable historic and cultural regulations (e.g., *Texas Antiquities Code*).

3.7.3 Reasonably Foreseeable Environmental Effects

3.7.3.1 Impacts from Building PMN Units 1–4

Impacts to historic and cultural resources that could result from construction of the PMN Units 1–4 APE are described in this section. Building activities are described in Section 2.5. Preconstruction activities such as site preparation and the construction of supporting facilities and ancillary infrastructure are also described in Section 2.5; however, preconstruction activities are considered within the scope of impacts from reasonably foreseeable actions. The proposed transmission system connecting the PMN Units 1–4 site to Project Matador is described in Section 2.4. Previous cultural resource investigations within the PMN Units 1–4 APE identified that archaeological sites in this area are primarily surficial and have been previously disturbed by the construction of the Pantex Plant and TTU agricultural farm. Previous cultural resource investigations have also noted disturbance to sites caused by natural processes such as animal activity and erosion (Largent et al. 1995-TN12892). Fermi America plans to have an established inadvertent discovery procedure in place prior to the initiation of ground disturbance as part of this undertaking, per 36 CFR 800.13(b), and will comply with notification to the THC per the *Texas Antiquities Code*.

As described in Section 3.7.1, no historic and cultural resources or eligible historic properties have been identified within the proposed PMN Units 1–4 APE, which is the portion of the APE most likely to be affected by construction and building activities. There are 16 archaeological resources (sites and isolates) within the 1 mi APE buffer, all of which were recommended by previous cultural resource investigations as not eligible for the NRHP but currently have no official determination of eligibility. The Zone 9 structural remains dating to between 1942 and 1945 were documented in 1995 as part of a historic buildings survey. At the time of the survey, only 5 of the original 29 buildings remained. The survey recommended that the structural remains in Zone 9 be considered ineligible for inclusion on the NRHP due to the loss of contextual integrity, as well as the existence of records and better-preserved examples of other World War II ordnance production complexes. Therefore, currently there are no historic properties present.

For the purposes of NHPA Section 106 consultation pursuant to 36 CFR 800.5, the NRC staff concludes that there would be no adverse effect on historic properties due to the proposed project building activities. As no historic and cultural resources or eligible historic properties are present, impacts to historic and cultural resources from building activities are anticipated to be SMALL under NEPA.

3.7.3.2 Impacts from Operations of PMN Units 1–4

Impacts to historic and cultural resources and historic properties that could result from operation of the proposed PMN Units 1–4 are described in this section. Planned operational activities for all operating modes are described in Section 2.3. Maintenance activities for the switchyard, roads, parking areas, and other infrastructure, including proposed waste or debris-disposal practices, are expected to be addressed through site procedures. As described in Section 2.3, the proposed cooling system for the four proposed AP1000 units within the PMN Units 1–4 APE is a dry cooling ACC system, with one dedicated ACC field per unit. This design avoids the use of wet cooling towers, which have a potential to create a visual impact in the form of cooling tower plumes and drift. The overall sound levels of the ACC system are estimated to range from a maximum 92 A-weighted decibels (dBA) at the ACC perimeter and operator areas during summer temperatures to 58 dBA at approximately 1,000 m away during summer temperatures.

The archaeological sites identified by previous surveys in the area were found to be primarily surficial precontact sites. These sites were also found to have previously been disturbed or destroyed by development of the Pantex Plant and TTU facilities and/or natural forces such as erosion and bioturbation. No historic properties have been identified within the proposed PMN Units 1–4 APE. Outside of the PMN Units 1–4 APE but within the 1 mi buffer, 16 archaeological resources (sites and isolates) have been identified, all of which have been recommended as ineligible for the NRHP but currently have no official determination of eligibility. The aboveground structures within Zone 9 have been previously recommended as ineligible for the NRHP. Fermi America plans to have an established inadvertent discovery procedure in place prior to the initiation of ground disturbance as part of this undertaking, per 36 CFR 800.13(b), and will comply with notification protocols to the THC per the *Texas Antiquities Code*.

For the purposes of NHPA Section 106 consultation pursuant to 36 CFR 800.5 (TN513), the NRC staff concludes that there would be no adverse effect on historic properties due to operation of the proposed PMN Units 1–4. Therefore, as no historic and cultural resources and historic properties are present, impacts to historic and cultural resources from operation are anticipated to be SMALL (THC 2026-TN8672).

3.7.3.3 Impacts from Decommissioning PMN Units 1–4

Impacts from decommissioning are expected to be similar to those resulting from building activities; therefore, impacts from decommissioning would be similar to those addressed in Section 3.7.1. Because there are no known historic properties under 36 CFR 800.4(d)(1) (TN513) or historic and cultural resources located within the proposed PMN Units 1–4 APE, impacts on these resources would not be expected during decommissioning. However, potential decommissioning impacts are expected to be evaluated in more detail and with updated information in the post-shutdown decommissioning activities report and the license termination plan. Based on the above evaluation, the impacts of decommissioning of PMN Units 1–4 on historic and cultural resources are anticipated to be SMALL.

3.7.3.4 Summary of Potential Environmental Effects

As described above, no historic and cultural resources or historic properties have been identified within the proposed PMN Units 1–4 APE. The NRC staff determines that under NHPA Section 106, there would be no adverse effect on historic properties from the proposed building activities and operation. Also, as discussed above, the NRC concludes that the effects to historic and cultural resources and historic properties for building activities and operations would be SMALL under NEPA.

3.8 Socioeconomics

The socioeconomics affected environment section can be found in Appendix F.4.

3.8.1 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, reasonably foreseeable projects considered for this EIS include ongoing and future Project Matador activities.

The workforce for Project Matador activities outside of PMN Units 1–4 is estimated at a maximum of 1,600. The socioeconomic effects of Project Matador Campus as a whole would stem from workers employed to support construction and operation of the Project Matador

Campus. In-migrating project populations would consume housing and public services, spend their salaries and wages, and pay taxes to governments in the economic region. The effects would be both beneficial and adverse. Socioeconomic impacts are based on the year when the cumulation of project workforces reaches a peak (see Figure 3-18). The construction and operations population of PMN Units 1–4, combined with the broader Project Matador worker population, is presented in Figure 3-18. The total number of workers at peak when considering all workers is 9,800.

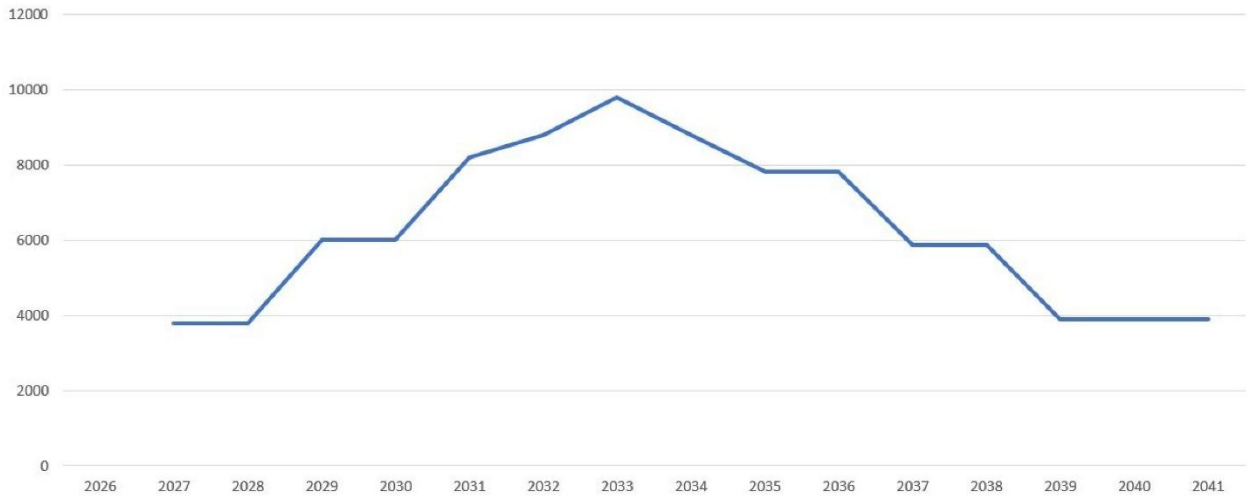


Figure 3-18 Combined Workforce of Project Matador Nuclear Units 1–4 and Project Matador Campus

3.8.1.1 Beneficial Impacts

The beneficial effects would be to the local and regional economy from property taxes paid by Fermi America and the workers spending wages for housing, goods, and services in the local and regional economy. Increases in employment, wages, and taxes would benefit local and regional residents, businesses, and multiple levels of government. Tax payments will be most beneficial to Carson County (discussed earlier in this section) and also beneficial to other counties in the economic region. Unemployment in the economic region could be further reduced, chiefly because the workforce talent requirements for construction of buildings and infrastructure for data centers are less specialized than that of nuclear power plants, allowing the workforce to be more easily sourced from the region's eligible workforce.

3.8.1.2 Adverse Impacts

Project Matador Campus' 1,600 workers represents approximately a 20 percent increase in the number of PMN Units 1–4 workers during peak construction (8,200) for a combined total of 9,800 (see Figure 3-18). The previous analysis of community services at peak construction for long-term housing, water and wastewater, education, law enforcement and fire protection personnel, and medical services all found that capacities and/or ratios were well under maximum and that these services in the economic region would not encounter appreciable strain from the increase in population at peak construction. Therefore, a 20 percent increase in that population would not be expected to noticeably strain these services.

Greater adverse impacts would stem from increased strain on existing short-term housing supply and increased traffic congestion near the site caused by the addition of the Project Matador Campus workers to the projected worker number estimates at peak for PMN Units 1–4.

Short-term housing, including hotels and RV parking, would be further impacted by an additional 1,600 Project Matador Campus construction workers, who would be likely to utilize this kind of housing, although some workers who expect to be in the region for longer periods may choose long-term rentals instead. Under normal circumstances, short-term housing is utilized almost exclusively by transient visitors; therefore, impacts to short-term housing result in impacts to recreation, rather than housing.

As discussed in Section 3.8.2.3.6, currently, there are not enough short-term rentals in the region to provide housing for the 4,465 construction workers at peak in need of short-term housing (inclusive of construction and outage workers). An additional 1,600 Project Matador Campus workers would further press the region's short-term housing supply.

Natural demand fulfillment in the short-term housing market, such as hotel and RV park developments, is anticipated to mitigate some, if not all, of the impacts to recreation. Mitigation efforts include encouraging or working directly with local RV park owners to expand existing parks or build new parks.

As discussed in Section 3.8.2.1.3, the projected increase in traffic along FM 683 is anticipated to overload the capacity of FM 683. The addition of Project Matador workers creates an increase of up to 1,600 vehicles, which are also expected to use the offsite parking area on FM 683 to the west of the PMN Units 1–4 construction entrance discussed in Appendix F.4.2.11. Mitigation measures include shorter shifts (increasing the number of daily shift changes from two to three), varied shift lengths, alternate routes for workers, building additional parking areas further from the site, and purchasing houses along construction routes, especially FM 683, to minimize impacts to residents.

Regarding noise, the development of the remainder of Project Matador Campus would occur in a staggered fashion with data centers being developed as onsite power generation becoming available. Areas of the Project Matador Campus are closer to the nearest resident than the PMN Units 1–4 site. These residents could experience greater noise levels while data centers and other campus facilities are being built. Noise levels during construction experienced external to Project Matador Campus could be greater than the 65 dBA level considered as acceptable under Housing and Urban Development regulations at times but would be expected to be intermittent and temporary given the nature of construction.

3.8.2 Socioeconomic Impacts from Building PMN Units 1–4

3.8.2.1 Physical Impacts

Construction activities can cause temporary localized physical impacts to offsite structures, roads, air quality, noise, and/or aesthetics. Many of these impacts can directly or indirectly affect people near the PMN Units 1–4 area. This is a population density of 4.15 people per square mile. This section addresses potential construction impacts that may affect people, buildings, roads, aesthetics, and recreational opportunities.

3.8.2.1.1 Construction Activities

A detailed description of the PMN Units 1–4 site and vicinity is provided in Section 2.1. Section 2.5 provides a detailed overview of building activities. Building requires a variety of skilled and nonskilled labor. Figure F-2 shows the number of workers employed for each year of the building schedule. The estimated number of construction workers onsite rises to a peak of 6,600 and then diminishes over the next 4 years. This time period overlaps with some operations as units begin to come online. During peak construction (and during outages before and after), it is estimated that up to 1,000 permanent, non-outage operations workers could be onsite. The construction schedule is presented in Table 2-2. After all units are operational, a total of 1,290 permanent, non-outage operations workers are anticipated to be onsite. Based on Fermi America estimates, the size and distance of the nearest metropolitan area, similar construction projects, and previous studies, it is estimated that 70 percent of the construction workforce in-migrates to the region, while 100 percent of the operations workers are expected to in-migrate. The migrating population values are based on the availability of craft labor as discussed in Section 3.8.2.2.1.

Due to the temporary nature of construction work, many construction workers on large projects, such as power plant construction, move throughout the country to job sites and do not relocate their families for each job. Therefore, it is expected that only 25 percent of the in-migrating construction workforce for PMN Units 1–4 would choose to move their families to the region.

Population distribution details are given in Section F.4. People who could be vulnerable to noise, fugitive dust, and gaseous emissions resulting from building activities at the PMN Units 1–4 site are listed below in order of most vulnerable to least vulnerable:

- construction workers and personnel working onsite
- people working or living immediately adjacent to the site
- transient populations such as temporary employees, recreational visitors, and tourists

Construction workers within the site boundary experience the most physical impact due to plant construction activities. Workers have adequate training and personal protective equipment to minimize the risk of potentially harmful exposures. Emergency first-aid care is available at the construction site, and regular health and safety monitoring is conducted during construction.

These activities are performed in compliance with Federal, State, and local regulations, and site-specific permit conditions. Reasonable efforts are undertaken to make transient populations aware of the potential impacts of construction activities.

As stated in Section 3.2.2, all 881 ac of the PMN Units 1–4 project area are expected to be disturbed during building activities. An area to the west of Project Matador's Campus entrance is expected to be used temporarily for construction support activities at the campus including worker parking.

Construction activities result in elevated noise and dust levels and traffic on roads. In addition to dust, construction equipment locally increases air emissions. Erection of cranes and buildings may affect aesthetic qualities of the vicinity.

3.8.2.1.2 Impacts to Offsite Structures

Building activities are not anticipated to affect any private offsite buildings, primarily due to distance. The nearest residential neighborhood applicable to the initiation of building activities at

the PMN Units 1–4 site is approximately 1.73 mi southwest of the PMN Units 1–4 center point, west of FM 683. Fermi America is currently in the process of purchasing nearer houses fronting FM 683 and does not expect these houses to be occupied by the start of building activities (FA 2026-TN13483).

The nearby Pantex Plant consists of many existing buildings that were presumably constructed to meet seismic qualification criteria, which make them resistant to the potential impacts of vibration and shock similar to that which could occur during construction. Other Pantex Plant facilities were constructed to the appropriate building codes and standards, which include consideration of seismic loads. Regardless of the applicable design standard, construction activities are planned, reviewed, and conducted in a manner that ensures no adverse effect on the operating nuclear units and ensures buildings are adequately protected from adverse impact.

The distance of the nearest offsite structures minimizes the interaction of the buildings with building activities, while the design of onsite buildings would ensure no adverse interaction with the operating units. Thus, the impact of plant construction on buildings is anticipated to be SMALL, and no mitigation is warranted.

3.8.2.1.3 Impacts to Transportation

Transportation is described in Sections 2.1.4 and Appendix F.4.2.11. No public transportation routes are located within the site boundary. Construction of new roads and improvement of existing roads is likely inside the PMN Units 1–4 site. Physical impacts due to onsite road construction are expected to be limited to plant construction workers and operating workers associated with PMN Units 1–4.

Building activities at the PMN Units 1–4 site would result in an increase in traffic on local roads. Appendix F.4.2.11 describes the transport of construction materials and workforce to the site by public roads. Figure 2-4 illustrates the road and highway systems near the PMN Units 1–4 site. Both construction workers and truck deliveries access the site via a construction entrance on FM 683, although trucks are barred from turning onto FM 683 from U.S.-60 per the heavy haul agreement (see Appendix F.4.2.11). As discussed in Appendix F.4.2.11, workers are expected to park at Project Matador Campus lot west of FM 683 across from Project Matador Campus' entrance and be shuttled to and from the PMN Units 1–4 site. Pantex Plant is accessed via FM 2373 which parallels FM 683 and has a separate intersection with U.S.-60.

According to the Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System manual, the capacity of a two-lane highway with no traffic control is 1,490 vehicles per hour for each direction of travel. The capacity is nearly independent of the directional distribution of the traffic on the facility, except that for extended lengths of two-lane highway, the capacity does not exceed 2,980 vehicles per hour for both directions of travel combined (DOT 2017-TN13348).

Construction shift schedules have not yet been developed, but shift work is expected. The total number of construction workers during peak construction is 6,600, with an additional 600 operations workers and 1,000 outage workers. It is assumed that the shifts of construction, operations, and outage workers, as well as deliveries, would be staggered. Two 12-hour shifts are anticipated for construction (FA 2026-TN13483). Therefore, the largest impact on area traffic would occur during shift change for construction workers.

Construction workers and deliveries would be expected to have a minimal impact on the interstate and larger State highways in the region, such as U.S.-60 and I-40, as the additional influx of drivers is still within the design of the roadways. Impact on area transportation resources generally decreases with increased distance from a site, as varied routes are taken by individual vehicles.

As presented in Table F-13, AADT counts in 2024 on FM 683 indicate that 363 vehicles per day use the road. Conservatively assuming that all 363 vehicles per day that currently use FM 683 occur during two 2-hour windows, such as to and from work, 91 cars would use the road during peak hours.

Virtually all 6,600 construction workers are expected to commute in personal vehicles. Some carpooling is expected to take place but is not anticipated to meaningfully reduce the number of personal vehicles. As two shifts are planned, all cars transporting construction workers would be on the nearby roadways during the two changes, resulting in a conservative estimate of an additional 6,600 vehicles during two peak hours along FM 683. The addition of 600 operations workers and 1,000 outage workers during outages results in an estimated 8,200 additional cars on FM 683. However, operations and outage workers would likely follow schedules that varied from the construction shifts, which would reduce the number of cars on FM 683 at a given time. Therefore, the analysis below assumes a peak of 6,600 cars as the largest grouping on FM 683 at a given time.

When combined with the highest assumed count of existing hourly traffic on FM 683 (91) the maximum traffic count with construction traffic would be 6,691 cars per hour based on these assumptions. This exceeds the capacity of FM 683 (1,490 cars per hour per lane or 2,980 total cars per hour). Other mitigation efforts such as staggering shifts or employing traffic controls can be used if traffic problems manifest. With the expected traffic load during construction being above or near the capacity of the roads, the impact to Transportation is anticipated to be LARGE within the vicinity of the site. Mitigation measures include shorter shifts (increasing the number of daily shift changes from two to three), varied shift lengths, alternate routes for workers, utilizing parking areas not located along FM 683, and purchasing houses along construction routes, especially FM 683, to minimize impacts to residents.

FM roads are maintained by the State of Texas, including FM 683. Increased project-related traffic could result in some accelerated road deterioration. As discussed in Appendix F.4.2.11, Fermi America agrees to indemnify TXDOT for the costs of construction, maintenance, repair, and restoration of roads along the heavy-haul route, which corresponds with the immediate vicinity commute route. Following the heavy-haul route is expected to mitigate or avoid road deterioration for other roads in the immediate vicinity.

3.8.2.1.4 Impacts to Aesthetics

The locations of parks and recreational areas in the region are described in Appendix F.4.2.12. There are no recreational facilities in the PMN Units 1–4 vicinity. The landscape surrounding PMN Units 1–4 is flat with little variance in elevation; thus, project construction may be seen from quite a distance. However, the surrounding area is extremely rural, consisting of large plots of agricultural land. To the east, the viewshed is somewhat obscured by the existing Pantex Plant. Several tall structures, including transmission lines and wind turbines, are currently present. Lighting due to building activities at night may be visible from a distance.

Federal regulations require that any temporary or permanent structure, including all accompaniments, that exceeds an overall height of 200 ft above ground level be appropriately marked with lighting (DOT 2018-TN13358). The tallest structure onsite during the construction period is expected to be the crane used for construction of the facilities. Cranes typically consist of iron framework and are not considered as visually impactful as buildings.

Due to the flatness of the landscape, it is presumed that any structures over a few stories tall may be easily seen at a distance from all surrounding viewpoints. However, the rural nature of the PMN Units 1–4 immediate vicinity suggests that potential impacts would be minimal. Because the visual resources impacts are inversely proportional to distance, the potential impacts of the PMN Units 1–4 to most other visually sensitive areas in the vicinity and region are minimal. The impact of building activities at the PMN Units 1–4 site on aesthetics and recreational opportunities is anticipated to be SMALL and requires no mitigation. Further discussion on the impact to recreational activities is discussed in Section 3.8.2.3.6.

3.8.2.1.5 Impacts due to Air Quality and Noise

Air quality and expected impacts due to building activities is discussed in Section 3.3. Impacts to air quality from building activities are anticipated to be SMALL.

Noise is a function of distance and intervening vegetation, structures, and topography between the noise source and receptor. Noise from construction equipment is anticipated to attenuate with distance. Generally, the noise level dissipates roughly 6 dBA with each doubling of distance (NRC 2024-TN10106). The distance of the nearest residence is approximately 0.55 mi west of the PMN Units 1–4 site boundary, and sound attenuation over this distance is expected to allow noise levels to be within an acceptable range as discussed below. The sound levels for common construction equipment are presented in Table F-6. Using the general rule that noise dissipates roughly 6 dBA with each doubling of distance (NRC 2024-TN10106), the sound levels from the loudest equipment are shown in Figure F-2. Such equipment would be in use on the eastern half of the site (i.e., at the PMN Units 1–4 and balance of plant footprints shown in Figure 2-2) rather than the western half of the site, which is closer to the nearest neighbor. The construction support area is on the western side of the PMN Units 1–4 site so noise from this area is expected to be predominately due to unloading and soil management. Typical equipment for such activities includes dump trucks and front-end loaders, which have sound levels under 90 dBA. As shown in Figure F-2, noise levels at the nearest residence located 0.55 mi (2,904 ft) from the western PMN site boundary, would be expected to be less than 65 dBA. Noise levels would increase when multiple pieces of construction equipment are operating, but the noise would not be continuous. Given noise attenuation and that background noise levels would be characterized by highway and rail traffic and industrial activities, as well as the distance to the nearest residence, noise impacts to the public from construction of the PMN Units 1–4 are anticipated to be SMALL.

NRC guidance calls for the applicant to consider the day-night average sound level at the site boundary or at any noise sensitive human receptor of less than 65 dBA acceptable without mitigation (NRC 2024-TN10106). According to the 2024 LR GEIS, noise levels below 60 to 65 dBA are considered to be of small significance (NRC 2024-TN10106). The sound levels for common construction equipment are presented in Table F-6. Using the general rule that noise dissipates roughly 6 dBA with each doubling of distance (NRC 2024-TN10106), the sound levels from the loudest equipment are shown in Figure F-2. Such equipment would be in use on the eastern half of the site (i.e., at the PMN Units 1–4 and balance of plant footprints shown in Figure 2-2) rather than the western half of the site, which is closer to the nearest neighbor. The

construction support area is on the western side of the PMN Units 1–4 site so noise from this area is expected to be predominately due to unloading and soil management. Typical equipment for such activities includes dump trucks and front-end loaders, which have sound levels under 90 dBA. As shown in Figure F-2, noise levels at the nearest residence located 0.55 mi (2,904 ft) from the western PMN site boundary, would be expected to be less than 65 dBA. Noise levels would increase when multiple pieces of construction equipment are operating, but the noise would not be continuous. Given noise attenuation and that background noise levels would be characterized by highway and rail traffic and industrial activities, as well as the distance to the nearest residence, noise impacts to the public from construction of the PMN Units 1–4 are anticipated to be SMALL.

Occupational noise impacts due to noise are discussed in Section 3.9.2 are anticipated to be SMALL.

As presented in Section 3.8.2.1, people who could be vulnerable to fugitive dust, gaseous emissions, and noise from building activities include workers and personnel working onsite, people working or living immediately adjacent to the site, and transient populations. Workers at PMN Units 1–4 and the remainder of Project Matador Campus and Pantex Plant, would be mitigated by compliance with occupational safety standards. The residential population within a few miles of the site is sparse and the nearest neighbor is more than 1 mi from the PMN Units 1–4 center point. Given impacts to air quality and noise impacts would be SMALL, the distance to the nearest residents from the center point where building activities would be concentrated, and compliance with worker safety standards, socioeconomic impacts due to air quality and noise are anticipated to be SMALL.

3.8.2.2 Social and Economic Impacts

This section evaluates the demographic and economic impacts to the vicinity and region during construction of PMN Units 1–4. The evaluation assesses impacts of building-related activities and the in-migrating construction workforce on population, regional labor, tax revenues, infrastructure and community services, housing, education, and recreational activities within the vicinity and region.

The following analyses regarding impacts from building activities and operation rely on the assumptions/statistics listed below:

- The settlement pattern for workers in-migrating would follow the population distribution of the economic region.
- Thirty percent of the construction workforce would come from within the existing local/regional workforce.
- Seventy percent of the construction workforce would migrate into the region (FA 2026-TN13483).
- Approximately 10 percent of workers in-migrating would settle outside the economic region.
- Twenty-five percent of the construction workers that in-migrate would bring their family.
- Approximately 100 percent of the operations workforce would migrate into the region and bring their families.
- The average family size in Texas is 3.29 (USCB 2024-TN13489).

- The average number of children per family in the United States is 1.94 (Statista 2026-TN13357).
- School-aged children (ages 6–17) represent 60 percent of the total population of children in Texas (USCB 2024-TN13489).

3.8.2.2.1 Impacts to Demography

Population estimates and projections for the region are discussed in Appendix F.4.1. Industry, heavy construction, and unemployment numbers are discussed in Appendix F.4.2.1. The demand for workers is low to medium in the region, with unemployment levels ranging from 2.9 percent in Carson County to 3.4 percent in Potter County.

A study of nuclear power plants found that up to 30 percent of the construction workers came from the local area. The cases with the largest share of local workers occurred when there was rapid population growth in the area and large indigenous construction work forces (Pijawka and Chalmers 1983-TN13356).

Carson and Potter Counties are expected to decline in population during the construction period. Randall County is expected to grow in population during the same period.

In 2033, during peak construction and operations, there are expected to be a total of 8,200 construction, operations, and outage workers onsite. Construction worker trade skills represented in the labor pool include electrical workers, welders, pipefitters, etc. To ensure that the necessary labor pool is available, as the demand for workers increases, construction companies recruit employees from local technical school programs and work with school administrators to build up curriculum in the necessary labor trade areas. National labor trade union organizers, such as the American Federation of Labor, have made it a high priority to train new entrants in the construction industry as the need for labor ramps up. In addition, local recruiting of craft personnel, supplemental skills training, attractive compensation packages, and use of specialty contractors are expected to mitigate competition for craft workers between industries.

The total labor force in the economic region as of 2024 was 136,275, with 4,270 unemployed (Table F-5). The economic region saw a decrease of 1.7 percent in the construction sector from 2019 to 2024, bringing total construction employment levels to 6,795 workers.

Based on assumptions listed above, and with a construction workforce of 6,600 at peak, 4,620 construction workers would be anticipated to in-migrate into the region, with the total population of construction workers and their families within the region increasing by 7,265 people. This assumes that 70 percent of construction workers migrate into the region (4,620 workers), and of those, 25 percent bring their families (1,155 workers with families and an average family size of 3.29). However, this migration would be spread out over several years during the construction phase, allowing for the local economy and community services to adjust to the influx.

In 2024, Carson, Potter, and Randall Counties' estimated populations were 5,822, 114,649, and 150,547, respectively (USCB 2025-TN13212). In 2033, at construction peak, the estimated populations are 5,612 for Carson County, 112,612 for Potter County, and 167,707 for Randall County. It is expected that roughly 90 percent (6,538 people) of the in-migrating construction workforce and their families would settle in the economic region, with the remaining 10 percent dispersed throughout other counties in the 50 mi region. Other counties in the region have fewer housing options. Based on county populations, roughly 2 percent of the in-migrating operations

workforce and their families are anticipated to settle in Carson County, 35 percent in Potter County, and 53 percent in Randall County, with the remaining 10 percent dispersed throughout the region. The influx of construction workers and families likely represents a 2.3 percent increase in population of the economic region in the year 2033. Therefore, for Carson County, the expected population increase due to in-migrating construction workers in 2033 is 128. For Potter County, the expected increase is 2,575. For Randall County, the expected population increase is 3,835. Therefore, construction workers and their families would represent a very small percentage of the existing county population in the economic region.

During peak construction, the in-migrating operations workforce is anticipated to add 1,974 people (operations workers and their families) to the region. Assuming the same settlement distribution, the influx of construction and operations workers and families likely represents a 0.7 percent increase in population of the economic region in 2033.

In summary, the population increase during peak construction in 2033 includes 7,265 people from the construction workforce and 1,974 people from the operations workforce, spread out according to the construction and operations schedule. During the construction period (beginning in 2033), an additional, intermittent impact on regional population occurs during refueling for PMN Unit 1, when approximately 1,000 additional workers would be onsite for the refueling outage. Refueling for each PMN Units 1–4 would begin approximately 18 months after each unit begins operations and last for up to 40 days. Outages would be staggered. Figure F-2 illustrates the number of workers employed for each year of the construction schedule. The time of the outage may not coincide with the time of peak construction.

When combined with the expected population growth of the counties, the projected percent of population increase during the expected peak construction timeframe (construction and operations workforce and their families) is a 2.3 percent increase in population of Carson County, Potter County, and Randall County, assuming a population-based distribution.

During peak construction, the following numbers of workers and their families are expected to be added to the economic region:

- Carson County: 128 for construction, 39 for operation
- Potter County: 2,575 for construction, 777 for operation
- Randall County: 3,835 for construction, 1,157 for operation

Using the established local planning and growth projections, the population change between the years 2024 and 2033 is as follows:

- Carson County: −210
- Potter County: −7,963
- Randall County: +17,160

Therefore, the increase in population due to peak construction period including families in Randall County does not exceed established local planning and growth projections. In Carson and Potter Counties, where populations are expected to decrease, the added population during peak construction would help offset population decline. The distribution of workers and their families may be influenced by the declining populations of Carson and Potter Counties should housing availability in those counties increase.

Thus, the counties in the region are either expected to experience population increases independent of the PMN Units 1–4 project or experience an offset in projected population

decline. Because the projected influx of construction workers to the growing region is not expected to exceed established local planning and growth projections and may offset economic impacts of projected population decline, impacts of plant construction on the regional population are expected to be SMALL with the impact being beneficial to Carson and Potter Counties.

3.8.2.2.2 Economy

The characteristics of the region surrounding the PMN Units 1–4 site, including industry, workforce, and unemployment, are described in Appendix F.4.2.1. The economic region of PMN Units 1–4, as discussed in Appendix F.4, is defined as the counties most likely to be affected by the construction and operation of the units. The economic region was determined by the location of PMN Units 1–4 as well as a review of nearby metropolitan areas, factoring in the general ruralness of the surrounding counties. Therefore, the PMN Units 1–4 economic region was defined as Carson, Potter, and Randall Counties.

The in-migration of construction workers to the economic region affects the economy through the creation of new jobs and the increase in goods and services purchased. The U.S. Department of Commerce Bureau of Economic Analysis, Economics and Statistics Division have provided a regional economic model that creates multipliers for industry jobs, earnings, and expenditures.

The economic model used is the Regional Input-Output Modeling System (RIMS II). This model is based on benchmark national input/output multipliers and incorporates buying and selling linkages among regional industries to create multipliers for both jobs and monetary expenditures. The resulting multipliers were used to estimate the number of indirect jobs and expenditure of money in the PMN Units 1–4 economic region (BEA 2026-TN13355).

The peak number of construction workers is 6,600, with 70 percent (4,620 workers) coming from outside the region. The 4,620 workers from outside the region are the ones that have an impact on the economic region. The RIMS II Multipliers lists a multiplier value of 1.6876 for the construction industry. This means for every new worker to the economic region, 0.6876 full- and part-time jobs are created (BEA 2018-TN13529). Thus, 4,620 workers result in 3,177 indirect jobs for a total of 7,797 jobs.

Additionally, another 600 workers would be present onsite for operations during the peak construction year (2033). Using the utilities industry category, for every operations job at PMN Units 1–4, an estimated additional 2.1 jobs are created in the 50 mi region (BEA 2018-TN13529). Thus, during construction, the operations staff at PMN Units 1–4 would create an additional 1,260 jobs in the region.

In the year 2024, there were 4,270 people unemployed in the economic region (Table F-5). Since most indirect jobs are service-related and not highly specialized, some or all of the indirect jobs created by the construction workforce are expected to be filled by unemployed workers in these counties and/or spouses of in-migrating workers. The money spent in the local area by these new workers, their families, and the newly employed persons in each county would bolster the economy of the economic region.

Annual construction labor and material expenditures for the construction period are expected to be millions of dollars per year. The majority of annual expenditures is expected to be spent in the region.

When comparing the influx of construction workers with the relatively small population of the vicinity, the increase in expenditures and benefits is expected to be noticeable. When comparing the influx of construction workers with the larger population of the region, the increase in expenditures and benefits is proportionally smaller. Expenditures and benefits include the creation of jobs, employee purchasing, and increased tax revenues. Thus, the impacts from plant construction employees are anticipated to be a MODERATE to LARGE beneficial impact in the economic region and a SMALL beneficial impact in the 50 mi region.

3.8.2.2.3 Taxes

Regional taxes and the political structure within the PMN Units 1–4 region are discussed in Appendix F.4.2.10. Several types of taxes are generated by construction activities and purchases, and by construction workforce expenditures. These taxes are expected to include income taxes on corporate profits, wages, and salaries; sales and use taxes on corporate and employee purchases; real and personal property taxes related to PMN Units 1–4; and personal property taxes associated with employees. However, if employees buy or rent existing properties, there is no increase in property tax revenues.

As stated in Appendix F.4.2.10, the anticipated PILOT taxes associated with PMN Units 1–4 is estimated to be between $1,000,000 and $2,000,000 per year upon full site development. This estimate is subject to change.

Based on Table F-11, property tax revenues in Carson, Potter, and Randall Counties have increased from 2021 to 2025. Construction of PMN Units 1–4 is anticipated to contribute directly to revenue increases for Carson County and indirectly to revenue increases for regional counties and cities.

The increase in collected taxes is viewed as a benefit to the State and local jurisdictions in the region. It is anticipated that the impacts of construction on the economy of the region would be SMALL and beneficial, while the impact for Carson County is anticipated to be LARGE and beneficial. Therefore, no mitigation is warranted.

3.8.2.3 Community Infrastructure Impacts

Local public services affected by building activities include education, transportation, public safety, social services, public utilities, tourism, and recreation, as discussed in Appendix F.4.2. In general, impacts to each of these services from building activities are expected to be minimal. It is likely that the percentage of construction workers, accompanied by their families, moving into the region would concentrate in established communities with well-developed public services, primarily the greater Amarillo area, minimizing strain on public services.

The total in-migrating population during peak construction in 2033, factoring in both construction and initial operations workers, is expected to be 9,239 people. Those workers in-migrating to the economic region of influence are anticipated to settle in a similar ratio to the population distribution of those counties. Using the total population of the counties in the economic region of influence, Carson County represents approximately 1.8 percent of the total population, Potter represents 35.4 percent, and Randall represents 52.8 percent. Thus, the total in-migrating population is expected to be 167 in Carson County, 3,352 in Potter County, and 4,993 in Randall County, with the remaining 727 settling in other counties in the region during peak construction.

3.8.2.3.1 Housing

Regional housing availability is described in Appendix F.4.2.4. It is not known precisely where PMN Units 1–4 construction workers are anticipated to reside. An analysis of the region's population centers suggests that workers are likely to settle in areas either closest to the plant (Carson County) or with the largest housing stock and economic viability (Potter and Randall Counties). However, a few may opt to live in some of the other surrounding counties.

Because the construction of PMN Units 1–4 is not a permanent event, during the peak phase of construction it is probable that not all construction workers would move into the region and need housing. In 2024, Carson, Potter, and Randall Counties had a total of 11,175 vacant housing units (see Table F-7). As stated in Appendix F.4.2.4, the homeowner vacancy has increased in Carson and Potter Counties while remaining roughly steady in Randall County. The rental vacancy has increased in Potter County and decreased in Carson and Randall Counties. Carson County's rental vacancy rate is currently 0; however, as previously noted, the small size of Carson County creates a large margin of error, and it is likely that some rental housing is available in the county that was not captured by the census. These trends have largely corresponded with population increases and decreases over the last several years. Appendix F.4.2.4 presents future housing planned in the economic region, which includes new homes and a large housing community, as well as a housing market analysis for the City of Amarillo.

For this analysis, it is conservatively assumed that 8,200 housing units are needed for construction and operations workers during the peak construction phase in 2033. Short-term housing, such as hotel rooms and RV parks, would largely be the housing of choice for construction workers not bringing a family, whereas long-term housing needs would be the likely housing choice for all operations workers (600) as well as construction workers bringing a family (1,155) for a total of 1,755 long-term housing units needed. Since short-term housing impacts are most likely to affect area transients, short-term housing impacts are discussed as part of recreation impacts later in this section.

During peak construction, approximately 1,755 workers (including 1,155 construction workers and 600 operations workers) are anticipated to bring a family and thus would need long-term housing. Additionally, the population of the economic region is anticipated to increase by 10,498 between the years 2026 and 2033 (peak construction). Given the average family size in Texas of 3.29, it is estimated that approximately 3,191 long-term housing units would be needed to house the increased population independent of PMN workers, making the total amount of long-term housing units needed to meet the 2033 worker housing demand approximately 4,946.

Since there is currently an excess of permanent housing in the region (more than double what would be needed in 2033), it is anticipated that workers and residents would be able to find sufficient housing during peak construction. However, increased demand would likely tighten the market and possibly drive up housing costs. Therefore, impacts on the housing market during construction of PMN Units 1–4 would be MODERATE.

Housing is a market-driven industry that adjusts with new facilities to compensate for demand based on projection. Further, recent trends in the area indicate an increase in housing that roughly corresponds with population increases in the economic region. Therefore, it is likely that long-term housing impacts will be naturally mitigated through market adjustments over the next several years.

3.8.2.3.2 Water and Wastewater Services

Appendix F.4.2.5 provides detailed information on the water and wastewater systems of the counties in the economic region. As shown in Table F-8, there are 22 public, community water systems for consumptive water use in the economic region per the TCEQ. These include large and small municipal systems as well as systems for private communities, such as mobile home parks. The Cities of Canyon and Amarillo, the two largest systems in the economic region, primarily use purchased surface water, while the remaining systems primarily use groundwater. Carson County has four systems serving 4,144 people. Potter County also has four systems serving 201,828 people. Randall County has 14 systems serving 19,292 people. Rural areas use household water wells.

The 2026 Regional Panhandle Water Plan reports that the projected per capita water use in Amarillo in 2030 is an estimated 185 gallons per day (gpd). Using this assumption across the economic region results in an estimated overall increase in consumption of 1.7 Mgd during peak construction (2033) for workers and families when accounting for both construction and operations workers. As shown in Table F-8, many of the systems purchase water from other systems, indicating water moves between systems.

As stated in Appendix F.4.2.5 and listed in Table F-8, the largest water system in the economic region is the Amarillo Municipal Water System, which lists its current population served as 201,291 people, its current average production as 46 Mgd, and its current capacity as 154 Mgd. Therefore, the existing capacity of this single water system can handle the water demands of the in-migrating workforce population at peak. Other areas of likely settlement, such as the City of Canyon, the City of Panhandle, and the Town of Bushland, also have sufficient capacities. Thus, the increase in consumption due to the in-migrating workforce and their families is not expected to impact the current water system capacity of the water systems in the economic region beyond expected population increases.

As stated in Appendix F.4.2.5, Carson County's wastewater needs are provided at the municipal level, except in rural areas where private septic tanks are used. The City of Amarillo is the largest provider of wastewater services in the economic region, approximately 201,828 customers, assuming all customers with water services through the city also maintain wastewater services. Given the current capacity of the City's wastewater plants and the planned construction of a new plant, which would be put into service prior to peak construction of PMN Units 1–4, the capacity of the City of Amarillo's wastewater systems can handle the entire wastewater demands of the in-migrating workforce population. Apportioning these populations into their anticipated settlement patterns results in a smaller impact.

As stated earlier, the increase in population due to the peak construction period, including families, does not exceed established local planning and growth projections. Therefore, the wastewater treatment plants are expected to be able to accommodate the increase in population.

As discussed in Section 3.5.2.1.4, the water demand during building activities, estimated at 2.5 Mgd, would be met through City of Amarillo municipal water supply, which is shown to have ample water capacity. No independent construction water supply is planned. Sanitary wastewater is planned to be managed using temporary sanitary facilities sized to the workforce (e.g., portable toilets and handwash stations) and/or connections to municipal sanitary sewer, where available. Collected sanitary waste is planned to be removed by a licensed hauler and disposed of at an authorized wastewater treatment facility in accordance with State and local

requirements. Therefore, the impacts of building PMN Units 1–4 to water and wastewater in the economic region would be SMALL.

3.8.2.3.3 Education

A detailed description of the public education system in the economic region is provided in Appendix F.4.2.6. As stated in the section, Carson County has 1,072 students with a student-teacher ratio range from 6.9:1 to 10.6:1. Potter County serves 33,282 students with a student-teacher ratio range from 12.2:1 to 14.5:1 for public schools and 4.1:1 to 9.0:1 for private schools. Randall County has 12,112 students with an average student-teacher ratio of 15.2:1 for public schools and a range of 5.4:1 to 15.7:1 for private schools.

Based on assumptions listed above, it is estimated that 2,043 school-aged children (ages 6–17) could in-migrate with their families into the region at peak construction in 2033. This number accounts for children of workers in-migrating for construction as well as Unit 1 operations that year. In total, there are expected to be 48 school-aged children enrolling in schools in Carson County, 1,474 school-aged children enrolling in Potter County schools, and 521 school-aged children enrolling in Randall County schools. Using the summed students and teachers for the public schools listed in Table F-9, the student teacher ratios increase by less than one.

Additional in-migrating school-aged children would create small changes in the student-teacher ratios within the economic region. The State of Texas requires a minimum student-teacher ratio of 20:1 throughout most classrooms (TEA 2025-TN13354). Given the relatively small percent of students in-migrating compared to the total number of students in each county, the student-teacher ratio would remain well below this ratio. Population changes may further alter the ratio, but these changes would not be anticipated to put any of the ratios in the economic region above 20:1, and it is anticipated that school systems in the area would hire in proportion to population increases, especially in Randall County, where the population is anticipated to increase over the next several decades.

Because of the current capacities of the local school systems, the influx of students, and the current downward trend in enrollment, the impacts of construction on the educational systems of the region are anticipated to be SMALL and require no mitigation.

3.8.2.3.4 Law Enforcement and Fire Protection Personnel

As discussed in Appendix F.4.2.7, the ratios of police officers to current residents for municipalities in the economic region range from 1.3 police officers per 1,000 population to 13.8 police officers per 1,000 population. With population increases due to construction and operations workers at the construction peak (2033), the population increases in each county in the economic region range from 3.3 percent in Carson County to 2.7 percent in Randall County.

As discussed in Appendix F.4.2.8, the ratio of fire protection personnel to current residents for counties and municipalities in the economic region ranges from 8.1 per 1,000 in Carson County to 2.0 per 1,000 in Potter and Randall Counties (combined due to the City of Amarillo’s location).

The relatively small increases in population would not meaningfully impact law enforcement or fire protection personnel ratios in Carson and Potter Counties, where populations are in decline. Construction plans for PMN Units 1–4 would merely hasten the intended expansions of staffing and infrastructure from natural county population growth in Randall County, where relatively large growth is projected as compared to the immigrating workforce population. Therefore, the

impacts of construction activity at the PMN Units 1–4 site on local police and firefighter departments are anticipated to be SMALL.

3.8.2.3.5 Medical

As discussed in Appendix F.4.2.9, the peak construction and operations workforce and their families are expected to need roughly 18 beds to maintain the same utilization percentage. As such, the existing medical facilities are expected to be able to handle the influx of the PMN Units 1–4 workers and their families at peak. Therefore, the impacts of construction activity, combined with Unit 1 operations activity, on local medical services are anticipated to be SMALL and require no mitigation.

Social services, such as Medicaid and welfare, are funded through the Federal and State governments. The construction worker influx due to PMN Units 1–4 is anticipated to have a SMALL impact on these social services.

3.8.2.3.6 Recreation

Recreational opportunities in the region include local, State, and special events. Local tourism and recreation are described further in Appendix F.4.2.12.

The nearest transient contributor is the Rick Husband Amarillo International Airport, approximately 8.7 mi from the PMN Units 1–4 site. There are no parks or public lands in the site vicinity; thus, construction activities would not impact use of these recreational resources.

Fermi America's contractor, Enercon, conducted a Transient Population Survey between November 2025 and February 2026 (see Appendix F.4.1.2 for a description of the survey). The survey found that short-term housing in the area is primarily utilized by area transients who travel to and through the City of Amarillo. For the purposes of this analysis, "short-term housing" encapsulates hotel rooms and RV parking spots. It is anticipated that approximately 3,465 short-term housing units would be needed for workers in-migrating without a family. These workers are expected to make use of the temporary housing in the area, including hotels, motels, and RV parks. Area RV parks typically maintain roughly 80 percent capacity year-round, and hotel rooms maintain roughly a 65 percent capacity year-round (KFDA 2023-TN13353).

Additionally, outage workers for PMN Units 1–4 would periodically increase the demand for short-term housing, with 1,000 additional workers required for a period of up to 40 days. Outages would begin in 2033 and become more frequent as units become operational, eventually reaching a frequency of approximately 40 days out of every 4.5 months. Outage workers, combined with construction workers not bringing family, represent roughly a total of 4,465 short-term rentals needed. The combined total of available short-term rental housing is 2,597 units. This number includes all hotel and RV park availability in a 50 mi radius; however, the vast majority of short-term rentals in the region are found in the Amarillo metro. Recreational visitors in the area, particularly those using local RV parks, are likely to experience impacts from decreased availability of RV parking as construction and outage workers often bring RVs and utilize RV parking.

Hotel rooms and RV parking spots are generally reserved on a first-come, first-serve basis. It is likely that the number of construction workers during peak construction would make it difficult for recreational transients to find housing or open RV sites in the area. This difficulty may result in displacement of some of the transients to other types of housing, higher prices for short-term

housing, and/or decreased visitation to the greater Amarillo area if reasonably priced accommodations cannot be found.

Thus, worker numbers at peak construction would have a LARGE and destabilizing impact on recreation, specifically on short-term rental availability. Due to population increases, it is also likely that additional short-term housing would be constructed in the region before or during the construction time period, as housing is a demand-driven market and natural demand fulfillment in this market is expected. Mitigation efforts include encouraging or working directly with local RV park owners to expand existing parks or build new parks.

3.8.3 Socioeconomic Impacts from Operating PMN Units 1–4

The following sections describe the potential socioeconomic impacts from operating PMN Units 1–4. Section 3.8.2.1 describes the physical impacts of the plant operation to the site and vicinity. Section 3.8.2.2 describes social and economic impacts on the economic region.

3.8.3.1 Physical Impacts of Station Operation

This section assesses the potential physical impacts due to the operation of PMN Units 1–4 on the nearby communities or residences. Potential impacts include noise, odors, exhausts, thermal emissions, and visual intrusions. These physical impacts are managed to comply with applicable Federal, State, and local environmental regulations and are not expected to affect the PMN Units 1–4 site and vicinity. For the purpose of this analysis, plant operations workers and local communities, buildings, and roads are described below.

3.8.3.1.1 Workers and Local Public

There are no residential areas located within the site boundary. Beyond the immediate site boundary, the terrain is flat and largely developed for agricultural purposes. The nearest community to the PMN Units 1–4 is Washburn, an unincorporated community located approximately 9.4 mi south of the PMN Units 1–4 center point. The locations of surrounding communities within the vicinity are illustrated in Figure 2-4. Population distribution is described in Appendix F.4.1. Because of Washburn's distance from the PMN Units 1–4 Project Area, residents are not expected to experience any physical impacts from operations.

PMN Units 1–4 are expected to employ approximately 600 operations workers during Unit 1 operation, with an additional 230 workers per unit as the additional units are energized, for a total of 1,290 operations workers. In addition, up to 1,000 temporary workers are required during outages.

Noise impacts from the plant are discussed in Section 3.6.2.3 and 3.9.2.3. Air quality impacts are described in Section 3.3.1. Because PMN Units 1–4 are to utilize dry air-cooling systems, there would be no impacts due to atmospheric heat dissipation on nearby communities. As mentioned in Section 3.2.1.1, the nearest occupied residence applicable to the initiation of building activities at the PMN Units 1–4 site is approximately 1.73 mi southwest of the PMN Units 1–4 center point.

3.8.3.1.2 Buildings

The planned plant layout is shown in Figure 2-2. Operations are not expected to affect any offsite buildings, including industrial, commercial, or residential structures. Buildings at the nearby Pantex Plant have been constructed to comply with applicable safety standards, which

include considerations for shock and vibration from operations activities. Therefore, the impacts of operation of PMN Units 1–4 to buildings would be SMALL.

3.8.3.1.3 Roads

Impacts of PMN Units 1–4 operations on transportation and traffic in the region are the greatest on FM 683. Impacts on traffic are determined by four elements: (1) the number of operations workers and their vehicles on the roads, (2) the number of shift changes for the operations workforce, (3) the projected population growth rate in the region, and (4) the capacity of the roads. The largest impacts to roads are expected to be during shift changes. Figure 2-4illustrates the road and highway systems near the PMN Units 1–4.

As stated in Appendix F.4.2.11, the primary road network in the area is shown in Figure 2-4 and Figure 2-5. U.S.-60 provides commuter access to the PMN Units 1–4 from the south, and I-40 further south. Road access to PMN Units 1–4 is via FM 683, a two-lane, State-maintained, paved road running parallel to the western site boundary. Operations workers are expected to access the site via FM 683.

For plant operation, it is expected that PMN Units 1–4 would be staffed with a total of 1,290 operators between all four units. Therefore, the maximum number of vehicles added to the roadways from operations is less than approximately 1,290. However, the impact at any given time is much less than 1,290 vehicles, as these vehicles travel on the roadways in different directions and at varying times based on shift schedules, vacations days, sick leave, day of the week, and other factors. Additional impacts may be present during outage periods for PMN (up to 1,000 additional workers) roughly every 4.5 months, assuming evenly staggered outages for all four units every 18 months.

As discussed in Appendix F.4.2.11, the 2024 AADT counts on FM 683 indicate that 363 vehicles use FM 683 near the plant. As stated in Section 3.8.2.1.3, according to the Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System manual, the capacity of a two-lane highway with no traffic control is 1,490 vehicles per hour for each direction of travel (2,980 in total) (DOT 2017-TN13348).

The impacts of plant operations are expected to have minimal effects on the interstate highways in the region, which have much higher capacities. Assuming that no one would carpool, but that the staff would be divided into at least two shifts, the operations workforce would add 1,290 vehicles to FM 683 twice daily during shift change. Conservatively assuming all of the 363 vehicles currently using the road do so during shift change, the total number of vehicles on the road would be roughly 1,653, which is less than the road capacity of 2,980 both directions. An additional 1,000 outage workers would add substantial traffic to FM 683 during outages; however, as discussed in Section 3.8.2.1.3, outage workers would likely follow different schedules than operations workers, and thus, the impact of the additional cars would be spread out.

Without mitigation measures, the impacts of operation on transportation would be SMALL. Because the increase in traffic due to added operations workers and existing traffic loads is below 2,980 vehicles per hour, the level of service of FM 683 would remain below capacity, although the increase in traffic would be substantial during shift changes. Mitigation measures include shorter shifts (increasing the number of daily shift changes from two 12-hour shifts to three 8-hour shifts), varied shift lengths, staggered shifts, alternate routes for workers, building additional parking areas further from the site, and purchasing houses along construction routes, especially FM 683, to minimize impacts to residents.

3.8.3.1.4 Aesthetics

As shown in Figure 2-3, PMN Units 1–4, part of the larger Project Matador Campus area, is located in a rural area east of FM 683. To the east is the Pantex Plant. The nearest occupied residence applicable to the initiation of building activities at the PMN Units 1–4 site is approximately 1.73 mi southwest of the PMN Units 1–4 center point (see Section 3.2.1.1).

The tallest building at PMN Units 1–4 during operations is likely to be the shield building. However, much taller buildings are expected to be built on other parts of the Project Matador Campus. Thus, PMN Units 1–4 specifically would not be expected to have the most prevalent or impactful structure in the viewshed. It is also anticipated that, due to the flatness of the landscape, all buildings at PMN Units 1–4 and the greater Project Matador Campus would be easily visible in nearly all directions for several miles, consistent with a plains area. The general ruralness of the area, the existing visual impacts of the Pantex Plant, and the future visual resource impacts of other areas at the Project Matador Campus are all anticipated to minimize the aesthetic impacts of PMN Units 1–4. Therefore, the impacts of operation of PMN Units 1–4 on Aesthetics would be SMALL.

3.8.3.1.5 Noise

Occupational noise impacts from operations are discussed in Section 3.9.2.1 and are expected to be SMALL.

As stated in Section 3.9.2.1, there are no applicable Federal or State noise restrictions or limits associated within the site's zoning or its industrial activities.

High-voltage transmission lines can emit noise when the electric field strength surrounding the lines is greater than the breakdown threshold of the encapsulating air, creating an energy discharge. This discharge is known as corona discharge, and is affected by ambient weather conditions such as wind, precipitation, air density, humidity, etc., and energized surface irregularities. The corona discharge can create a noise that can be heard near the base of the transmission lines. Noise from corona discharge along the transmission line is anticipated to be low (well below the 60–65 dBA threshold) and does not pose a noise induced risk to the surrounding community. As stated by the NRC in the 2024 LR GEIS, measurements from a 765 kilovolt transmission line during rain events (which are the circumstances where the sound level of corona discharges would be the greatest) found average sound levels at 15 m from the transmission line to be 54.6 dBA (NRC 2024-TN10161).

The sound level produced by operation of the ACC fans at the perimeter of ACC field is expected to have a maximum range of 85 to 92 dBA for summer/high speed with sound attenuating to 50–58 dBA at 1,000 m (Table 2-1). The closest residence is 1.73 mi southwest from the reactor center point with the ACC fields being in the balance of plant area farther west. In addition, the sound would be attenuated by the presence of PMN Units 1–4 and other Project Matador structures between the ACC fields and the nearest residence. In conclusion, human health impacts from the noise of operations activities are anticipated to be SMALL and additional mitigation does not appear warranted.

3.8.3.2 Social and Economic Impacts of Station Operation

This section evaluates the demographic, economic, infrastructure, and community impacts to the region as a result of operating PMN Units 1–4. The evaluation assesses impacts of operations and of demands placed by the operations workforce on the region.

3.8.3.2.1 Demography

Population projections are discussed in Appendix F.4. As stated in Section 3.8.3.1, PMN Units 1–4 are expected to employ approximately 1,290 operations workers. It is assumed that all of the operations employees would migrate into the region from across the United States and bring their families with them. The average family size in Texas is 3.29 (USCB 2024-TN13489). Therefore, the additional workforce that would migrate into the region (1,290) would increase the population in the region by approximately 4,244 people. Assuming 10 percent settle outside the economic region, approximately 3,820 people are anticipated to settle in the counties of Carson, Potter, and Randall.

As delineated in Section 3.8.1, the workforce for PMN Units 1–4 is anticipated to be distributed mainly throughout the economic region. As with the construction workforce, it is assumed that the operations workforce will be distributed along the same ratios as the county's population patterns. Thus, roughly 2 percent of the in-migrating operations workforce and their families are anticipated to settle in Carson County, 35 percent in Potter County, and 53 percent in Randall County, with the remaining 10 percent dispersed throughout the region.

The influx of operations workers and their families would likely represent a 1.3 percent increase in population of the counties in the economic region. The operations workers and their families represent a very small percentage increase in the existing population in the counties in the economic region.

Worker settlement patterns are also influenced by the available amenities, including recreation opportunities, convenient shopping, quality schooling, and affordable housing. The distribution of workers and their families may be influenced by these amenities.

The "bust effect" is defined as the effect experienced by the community that is the result of an abrupt loss of population. However, as shown in Figure 3-19, the bust effect presents as a period of slower growth as the construction workforce departs rather than a decline in population. The bust effect is also offset by the (up to) 1,000 temporary employees required for the scheduled refueling of each PMN unit every 4.5 months. These workers are expected to work at the plant for up to 40 days per outage. It is possible with the number of outages that some temporary workers could remain in the region. Outages would occur frequently and are not simultaneous, so a worker might find sufficient income. If any of the outage workers chose to remain in the region, it is likely they would find permanent housing and reside in the same areas as the operation workers. The impacts of plant operations on local and regional demography are anticipated to be SMALL as the increase in population is offset by the departure of the 6,600 construction workers that decreases the strain on community infrastructure.

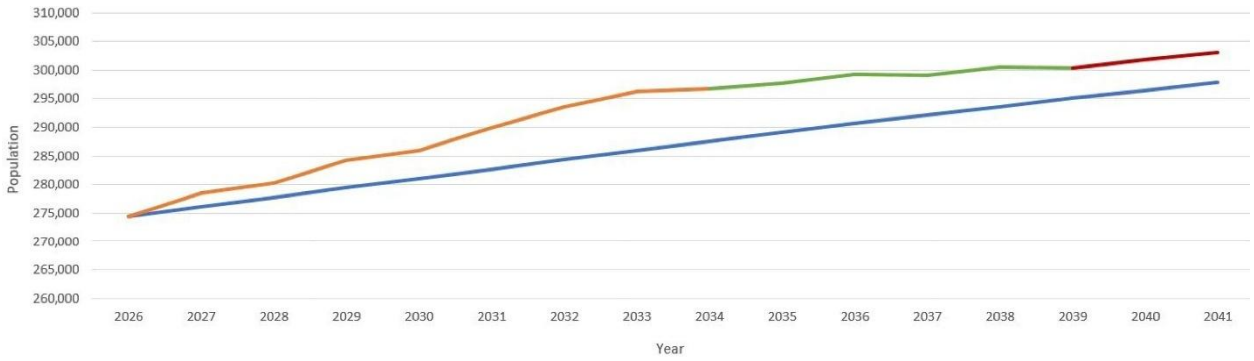


Figure 3-19 Three-County Population with Project Matador Nuclear Units 1–4 Construction and Operations Workforce Population

3.8.3.2.2 Economy

The impacts of the new units' operation on the local and regional economy depend on the region's current and projected economy and population. Fluctuations in workers are anticipated as construction for each reactor finishes, operations workers are hired, and initial outages begin. In this case, the "bust effect" is the result of construction workers leaving the vicinity, albeit at graduated levels as each reactor finishes construction. Because these workers, even those who commute, partake to some degree in vicinity goods and services, certain services experience loss of economic growth. The impact is caused by decreased use during the population recovery period. Sales, personal income, and tax revenues may experience a decline.

The staggered nature of the construction timeline for each reactor, combined with permanent operational workers moving into the vicinity, along with the natural population growth of the economic region as the construction population decreases, can offset this bust effect. Also, an influx of temporary workers to service refueling outages beginning in 2033 helps to alleviate economic loss. The region does not experience the same level of impact as local communities due to the bust effect because the number of construction workers leaving does not represent a large portion of the region's total population. The population in the economic area is expected to increase at a greater rate than the reduction in population due to the construction population reduction rate.

Additional jobs in the region result from the multiplier effect attributable to the new operations workforce. In the multiplier effect, each dollar spent on goods and services by an operational worker becomes income to the recipient who saves some but re-spends the remainder. The recipients' re-spending becomes income for others, who in turn save part and re-spend the remainder. The number of times the final increase in consumption exceeds the initial dollar spent is called the "multiplier." The Regional Economic Analysis Division of the U.S. Department of Commerce Bureau of Economic Analysis provides multipliers for industry jobs and earnings. The economic model, RIMS II, incorporates buying and selling linkages among regional industries and was used to estimate the impact of new nuclear plant-related expenditure of money in the region of interest. The wages and salaries of the operating workforce have a multiplier effect that could result in an increase in business activity, particularly in the retail and service industries. Based on the utilities multiplier of the RIMS II, for every dollar of income for operational plant employees, an additional 0.93 cents is added to the regional economy (BEA 2018-TN13529).

Using the same category, for every operations job at PMN Units 1–4, an estimated 2.1 jobs are created in the 50 mi region (BEA 2018-TN13529). This means that 1,290 direct jobs result in an additional 2,709 indirect jobs, for a total of approximately 3,999 new jobs in the region as a result of operations.

In the year 2023, there were 4,270 people unemployed in the economic region. Because most indirect jobs are service-related and not highly specialized, it is assumed that most, if not all, indirect jobs are filled by the existing workforce, although the low unemployment rate in the economic region suggests that some non-specialized workers may migrate into the area for economic reasons. The money spent in the local area by these new workers, their families, and the newly-employed persons in the counties also add to the economy of the area.

With the anticipated loss of 6,600 construction workers over several years, the impact from plant operation employees in the economic region is anticipated to be a SMALL to MODERATE beneficial impact due to their influence on the local economy. By comparison, because the number of operational workers is small compared to the large regional population, the impact to the regional economy is anticipated to be SMALL and beneficial.

3.8.3.2.3 Regional Taxes

Regional taxes and the political structure within the PMN Units 1–4 economic region are discussed in Appendix F.4.2.10. Carson County is the tax district that is expected to be most directly affected by the operation of PMN Units 1–4.

As stated in Appendix F.4.2.10, the anticipated Payment in Lieu of Taxes associated with PMN Units 1–4 is estimated to be between $1,000,000 and $2,000,000 per year upon full site development. This estimate is subject to change.

Based on Table F-11, property tax revenues in Carson, Potter, and Randall Counties have increased from 2021 to 2025. Operation of PMN Units 1–4 is anticipated to contribute directly to revenue increases for Carson County and indirectly to revenue increases for regional counties and cities.

Several types of taxes are generated by operations activities and purchases, and by the workforce expenditures within the vicinity. Employees of PMN Units 1–4 would pay Federal personal income taxes on their wages and salaries. The counties in the region experience an increase in sales and use taxes collected. Many operations workers would likely purchase new homes in the region, generating revenue for local jurisdictions from property taxes. The increase in collected taxes is seen as a benefit to the State and local jurisdictions in the region.

Additional sales and use taxes are generated by retail expenditures of the operating workforce. Because taxes are paid to jurisdictions in Carson County, the impact of plant operation on the vicinity is anticipated to be LARGE and beneficial. The impacts of operations on tax revenue in the region are anticipated to be SMALL and beneficial, based on the larger regional population.

3.8.3.3 Infrastructure and Public Services

Local public services potentially affected by the operation of PMN Units 1–4, including public safety, social services, education, tourism, and recreation, are described individually in Appendix F.4. It is likely that operations workers and their families would concentrate in several

communities with well-developed public services. Diversification of settlement is anticipated to minimize the likelihood of any one community's services being overburdened.

3.8.3.3.1 Housing

Regional housing availability is described in Appendix F.4.2.4. Based on a review of population centers in the region, it is assumed that the majority of PMN Units 1–4 operations workers would live in Carson, Potter, or Randall Counties (the economic region).

In 2023, counties in the economic region had a total of 11,175 vacant housing units (USCB 2024-TN13490). As stated in Appendix F.4.2.4, over the last decade homeowner vacancies have increased in Carson and Potter Counties but remained steady in Randall County. Rental vacancies have decreased in Carson County, increased in Potter County, and decreased in Randall County. These trends have largely corresponded with population increases and decreases over the last several years. Appendix F.4.2.4 describes future housing planned in the economic region.

Assuming all of the operations workers move into the region and need houses, 1,290 housing units are expected to be needed. Some employees may choose to build new homes, reducing the number of existing vacant housing units necessary. The amount of housing needed can be expected to vary during the operation of the plant. For example, additional workers are required during refueling outages at the site. It is expected that the majority of outage workers would stay in extended-stay hotels, trailers, or rent rooms in homes, and are not anticipated to become permanent residents in the region. However, as previously discussed, these workers may choose to become permanent residents, given the frequency of outages at PMN Units 1–4. Refueling outages are anticipated to take place roughly every 18 months for each unit. Each outage requires up to 1,000 temporary workers, and outages would last for a period of up to 40 days. Outages for the units would not occur simultaneously.

Based on vacancy data from the 2023 census, as well as the U.S. Department of Housing and Urban Development analysis of the Amarillo Metropolitan Area housing market, sufficient housing units are available for operations workers as well as outage workers that may choose to become permanent residents. Further, more housing units are planned. Therefore, the impacts of plant operation on housing are anticipated to be SMALL and do not require mitigation.

3.8.3.3.2 Water Supply and Wastewater Services

As discussed in Section 3.5.2.3, it is anticipated that maximum water demand for PMN Units 1–4 is 1.4 Mgd during operations. Sanitary effluent from the proposed PMN Units 1–4 site is planned to be managed in a permitted onsite sewage facility (or equivalent), conveyed to an approved municipal wastewater treatment system, or other permitted disposal or reuse methods. A more detailed discussion of onsite water use during operations is presented in Section 3.5.2.3.

As stated in Section 3.8.3.2.1, an operational workforce of 1,290 increases the population in the 50 mi region by approximately 4,244 people. Water systems in the vicinity are generally not operating at or near capacity (Appendix F.4.2.5) and the largest wastewater provider in the economic region has expansion plans in place. The complete operational workforce is expected to be present after the construction peak during the sustained operations period. As stated in Section 3.8.2.2.1, the increase in population due to the peak construction period, including families, does not exceed established local planning and growth projections. Therefore, the

water supply and wastewater treatment facilities servicing the PMN Units 1–4 economic region are considered sufficient to provide adequate service for the smaller operational workforce and their families and would have a SMALL impact. Additional information regarding wastewater facilities is discussed in Appendix F.4.2.5.

3.8.3.3.3 Education

A detailed description of the public education system in the economic region is provided in Appendix F.4.2.6. As stated in the section, Carson County has 1,072 students, Potter County serves 32,725 students, and Randall County has 11,565 students with student-teacher ratios ranging from 6.9:1 to 15.2:1.

Guided by the assumptions discussed in Appendix F.4.2.6, it is estimated that 1,502 school-aged children would in-migrate to the region during sustained operations period. However, many of these children would have migrated previously as Units 1–3 began operations. This number is smaller than the anticipated number of school-aged children in-migrating during peak construction.

As stated in Section 3.8.2.3.3, the additional students enrolling in local school systems due to school-aged children moving into the economic region during peak construction would result in small changes to the student-teacher ratios; thus, the smaller population of school-aged children of the operations workforce is expected to result in smaller changes to the student-teacher ratios. Because of the current capacities of the local school systems, the influx of students, the lessened number of in-migrating students during the sustained operations period versus peak construction, and the current downward trend in enrollment, the impacts of operations on the educational systems of the region are anticipated to be SMALL and not require mitigation.

3.8.3.3.4 Law Enforcement and Fire Protection Personnel

As discussed in Appendix F.4.2.7, the ratio of police officers to current residents in the region range from 1.3 law enforcement personnel per thousand to 13.8 per thousand. As stated in Appendix F.4.2.8, the ratio of firefighters to current residents ranges from 8.1 per thousand in Carson County to 2.0 per thousand in Potter and Randall Counties.

As with law enforcement personnel, it is anticipated that ratios for fire protection personnel to population in the economic region is not expected to change as much during the sustained operations period as the ratios during peak construction, given that the operations workforce is smaller than the peak construction workforce. Any additional hiring of needed law enforcement or fire protection personnel would have been conducted prior to operations and thus would already be in place. Therefore, the impacts of operations on local law enforcement and firefighter departments are anticipated to be SMALL.

3.8.3.3.5 Medical Services

As discussed in Appendix F.4.2.9, there are four hospitals in the economic region with a total of 589 inpatient beds. Utilization of the existing medical facilitates ranges from 27.1–96.8 percent. The average utilization across all four hospitals was 88.6 percent, or 522 beds. As discussed in Section 3.8.2.3.5, the existing medical facilities in the economic region are expected to be able to handle the influx of PMN Units 1–4 workers and their families during peak construction. Since the operations workforce is smaller than the peak workforce, the existing medical facilities would be able to handle the influx of the PMN Units 1–4 operations workers and their families. Therefore, the impacts of operations on local medical services are anticipated to be SMALL and require no mitigation.

Social services, such as Medicaid and welfare, are funded through Federal and State governments. The construction boom due to PMN Units 1–4 is not anticipated to have an impact on these social services.

3.8.3.3.6 Recreation

Recreational opportunities in the region include local, State, and special events. Local tourism and recreation are described further in Appendix F.4.2.12.

As discussed in Appendix F.4.1.2, the nearest transient population contributor is the Rick Husband Amarillo International Airport, approximately 8.7 mi from the site. Other area attractions are at further distances from the site, reducing possible impacts. There are no parks or public lands in the site vicinity. Other area attractions are at distances from the site that are too far from the site to be affected, and thus, construction activities would not impact use of these recreational resources.

Operations workers would not be expected to utilize the type of short-term housing needed by recreational visitors to the region. However, outage workers, who commonly utilize short-term housing, would be present on site for approximately 40 days every 4.5 months, since outages are to occur every 18 months for each unit on a staggered schedule. Up to 1,000 additional workers are anticipated during these outages, who would be in need of up to an additional 1,000 short-term housing units. Since there are currently roughly 2,596 available short-term housing rentals in the region, the short-term housing market is able to accommodate outage workers. This means that the amount of available short-term housing that would be taken by outage workers would be roughly 39 percent, which is a large portion of available units. However, it is anticipated that more short-term housing units would be added between now and the time of operations, specifically to house construction workers, and thus, ample short-term housing is anticipated to be available for the smaller contingent of outage workers during operations.

Because of the distance of most area attractions from the site and the likelihood of additional short-term rental housing availability, impacts from operations on recreation are anticipated to be SMALL and require no mitigation.

3.8.4 Socioeconomic Impacts from Decommissioning PMN Units 1–4

NRC prepared a GEIS addressing the environmental impacts from decommissioning nuclear power plants (Decommissioning GEIS) (NRC 2002-TN665). NRC examined the socioeconomic effects of decommissioning in terms of effects from ceasing operations and the effects from decommissioning activities. NRC assessed the socioeconomic effects attributable to decommissioning to be SMALL while the preceding ceasing operations event would result in small to large effects, depending on the size of the local economy and percentage of the tax base represented by the operating nuclear units (NRC 2002-TN665).

Given that the expiration dates of operating licenses of the proposed PMN Units 1–4 would be staggered, the socioeconomic effects of decommissioning would be buffered by ongoing operations at other units and continued employment of workers to initiate decommissioning activities. Thus, the level of employment at PMN Units 1–4 would have a relatively gradual decrease in workers over time as the four units cease operations and begin decommissioning activities. Decommissioning would also involve heavy haul traffic for radiological waste shipment and potentially for construction and demolition debris. This traffic would be expected to be a small increase and could be absorbed into overall traffic volume. The socioeconomic impact of

decommissioning activities for each of the PMN units would be expected to be bounded by the analyses presented in Section 4.3.12 of the Decommissioning GEIS (NRC 2002-TN665). However, potential socioeconomic impacts would be evaluated with up-to-date information prior to or within 2 years of ceasing operations and again 2 years prior to license termination as required under 10 CFR 50.82(4) and (9) (i.e., Post-Shutdown Decommissioning Activity Reports and License Termination Plans).

3.8.4.1.1 Impacts from Decommissioning PMN Units 1–4

NRC prepared a GEIS addressing the environmental impacts from decommissioning nuclear power plants (NRC 2002-TN665). NRC assessed the socioeconomic impacts of ceasing operations and decommissioning a nuclear power plant to range from SMALL to LARGE, depending upon the size of the economy and percent of the tax base supported by PMN Units 1–4 payments. The impacts of decommissioning would be mitigated by staggered license expiration dates of the units as well as the hiring of staff for decommissioning activities.

3.8.5 Summary of Reasonably Foreseeable Environmental Effects

Construction and Operation Impacts

As discussed above, the reasonably foreseeable socioeconomic impacts of constructing and operating PMN Units 1–4 range from LARGE BENEFICIAL to LARGE ADVERSE. These impacts are listed below. Adverse impacts beyond small are summarized.

Small to Large Beneficial Impacts

- economic expenditures and benefits
- tax revenue

Small Adverse Impacts

- offsite structures
- aesthetics
- air quality and noise
- demography
- water and wastewater services
- educational, police, fire, and medical services

Moderate to Large Adverse Impacts

- *Housing*—Impacts to housing are anticipated to be MODERATE during construction of PMN Units 1–4. The influx of workers is likely to strain the existing housing supply and drive prices up. However, housing is a demand-driven market, and it is possible that the market would adjust to accommodate the worker influx, who are expected to have staggered arrivals. Housing currently under construction or planned for construction would also mitigate this impact.
- *Transportation*—Impacts to Transportation are anticipated to be LARGE during construction of PMN Units 1–4. The capacity of FM 683 is anticipated to be surpassed, creating an unacceptable level-of-service rating. Impacts to roads further from the plant entrance would lessen considerably as more potential routes to and from the plant are available.

- *Recreation*—Impacts to recreation are anticipated to be LARGE during construction of PMN Units 1–4. The number of construction workers in need of short-term housing is expected to outpace what is available in the area, destabilizing the resource by displacing transients and driving up prices for short-term housing. Like with housing, the short-term housing market is a demand-driven market, and it is likely that the market may adjust as the need for short-term housing increases. Fermi may also opt to work directly with current or future RV park operators to increase available RV parking, as RVs are a popular method of housing for construction workers.

As stated above, the additive effect of other Project Matador Campus workers estimated at up to 1,600 and Pantex Plant's existing workforce would not be expected to appreciably change the impact levels listed above for PMN Units 1–4 construction and operation. The impacts of decommissioning would range from SMALL to LARGE, depending upon the size of the economy and percent of the tax base supported by PMN Units 1–4 payments at the time of decommissioning. The impacts of decommissioning would be mitigated by staggered license expiration dates of the units.

3.9 Human Health

3.9.1 Radiological Human Health

At the time of publication of this EIS, the applicant's final safety analysis report had not been submitted. Thus, the applicant's safety evaluation of radiological health cannot be referenced for use in this section's environmental impact evaluation. Instead, the review team performed a separate analysis as discussed below, applying the best available information and leveraging the analysis from past environmental reviews to estimate the environmental impacts. Once the final safety analysis report is submitted and docketed, the review team will examine the safety analysis to determine whether the environmental analysis in this section is still valid. For any significant differences between the environmental and safety evaluations, a supplemental environmental analysis may be necessary. The NRC's safety review must verify that the application meets all regulatory requirements for the applicant to be issued the requested license.

3.9.1.1 Affected Environment

The population and area within 50 mi of PMN Units 1–4 are considered to be the extent of the affected radiological environment. PMN Units 1−4 would be constructed adjacent to the existing DOE-operated Pantex Plant. The average background radiation dose to an individual in the U.S. is approximately 300 millirem per year (mrem/yr), from cosmic, terrestrial and internal radiation (NRC 2021-TN12793). Per the 2024 Pantex Annual Site Environmental Report, the maximally exposed individual (MEI) for all pathways due to Pantex Plant operations was 1.6×10^{-4} mrem (Pantex 2025-TN12791) whereas the estimated yearly background radiation dose (from cosmic, terrestrial and internal radiation sources) to the population in the area is 280 mrem.

3.9.1.2 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, reasonably foreseeable projects considered for this EIS include ongoing and future Project Matador activities. Interrelated effects related to radiological health could result from other nuclear units (such as small modular reactors) at Project Matador if licensed and constructed. These activities would be subject to applicable regulations concerning the radioactive materials and radiation dose limits.

3.9.1.3 Reasonably Foreseeable Environmental Effects Analysis

3.9.1.3.1 Impacts from Building PMN Units 1–4

The radiological impacts at the PMN site from operational units while other units are under construction are expected to be consistent with the radiological impacts during construction described in the previous AP1000 ESP or COL applications for Vogtle Electric Generating Plant (Vogtle) Units 3 and 4 (NRC 2008-TN673; NRC 2011-TN6439), Virgil C. Summer Nuclear Station Units 2 and 3 (NRC 2011-TN1723), Levy Nuclear Plant Units 1 and 2 (NRC 2012-TN1976), William States Lee III Nuclear Station Units 1 and 2 (NRC 2013-TN6435), and Turkey Point Nuclear Plant Units 6 and 7 (NRC 2016-TN6434). The annual dose limit for a construction worker as a member of the public is 100 mrem/yr total effective dose equivalent per the annual dose limits specified in 10 CFR 20.1301(a) (TN283). Table 3-17 provides a comparison of the radiation dose a construction worker would be expected to receive, as specified in previous AP1000 COL applications. Only two AP1000 units were considered in the COL applications referenced in Table 3-17. However, the Vogtle Units 3 and 4 COL analysis accounts for operating non-AP1000 pressurized water reactor (PWR) units, Vogtle Units 1 and 2; as well as an operational Vogtle Unit 3 for doses to Vogtle Unit 4 construction workers. Therefore, it is expected that doses to construction workers at a 4 AP1000 unit site, such as the PMN Units 1–4 would be similar to the results calculated for the Vogtle Units 3 and 4 COL and will meet the 10 CFR 20.1301(a) dose limit of 100 mrem/yr. The impacts from building PMN Units 1–4 are expected to be SMALL.

Table 3-17 Comparison of Radiological Environmental Impacts Estimated for Construction of AP1000s

Parameter	Vogtle Electric Generating Plant Units 3 and 4	Virgil C. Summer Nuclear Station Units 2 and 3	Levy Nuclear Plant Units 1 and 2	William States Lee III Nuclear Station Units 1 and 2	Turkey Point Nuclear Plant Units 6 and 7
Nearby Nuclear Facility Present	Yes	Yes	No	No	Yes
Number of Construction Workers	3,500	3,600	3,300	2,100	2,800
Construction Worker Dose (mrem/yr)	26.3	1.2	2.7	0.4	6

Sources: NRC 2008-TN673, NRC 2011-TN1723, NRC 2012-TN1976, NRC 2013-TN6435, NRC 2016-TN6434.

3.9.1.3.2 Impacts from Operating PMN Units 1–4

The annual dose limits for members of the public are provided in 10 CFR 20.1301 (TN283) specifically, 10 CFR 20.1301(a), which limits dose to 100 mrem/yr total effective dose equivalent. This dose limit is inclusive of limits stated in 40 CFR Part 190 (TN739) Subpart B limiting annual dose to 25 mrem to the whole body, 75 mrem to the thyroid, and 25 mrem to any other organ of any member of the public as the result of exposures to planned discharges of radioactive materials or radon and its decay products, which were released to the general environment from uranium fuel cycle operations and include radiation from these operations.

Potential emission sources during PMN Units 1–4 operation include release of gaseous and liquid effluents and direct exposure from emitted radiation. Exposure pathways to the public and the nonhuman biota include the following:

- ingestion of aquatic foods

- ingestion of water
- external exposure from water immersion or surface effects
- inhalation of airborne radionuclides
- external exposure to immersion in gaseous effluent plumes
- surface exposure from deposition of iodine and particulates from gaseous effluents (NRC 1977-TN90)

The potential emission sources and exposure pathways are expected to be consistent with those emission sources and pathways identified in the COL applications for Vogtle Units 3 and 4 (NRC 2008-TN673, NRC 2011-TN6439), Virgil C. Summer Nuclear Station Units 2 and 3 (NRC 2011-TN1723), Levy Nuclear Plant Units 1 and 2 (NRC 2012-TN1976), William States Lee III Nuclear Station Units 1 and 2 (NRC 2013-TN6435) and Turkey Point Nuclear Plant Units 6 and 7 (NRC 2016-TN6434). The NRC staff's safety review of PMN Units 1–4 will further evaluate whether the MEI dose estimates are within those specified in the 10 CFR Part 50, Appendix I and 40 CFR Part 190.

Occupational Dose

The collective occupational dose for a single AP1000 reactor was estimated at 63.2 person-rem/yr in Section 12.4.1.7 of the AP1000 DCD (Westinghouse 2011-TN261). The licensee of a new plant would be required to maintain individual doses to workers to within 5 rem annually as specified in 10 CFR 20.1201 (TN283) and incorporate provisions to maintain ALARA doses. The NRC staff's safety review will evaluate PMN Units 1–4 ALARA program and the impacts to occupational dose to workers.

It is expected that the health impacts from occupational radiation exposures at PMN Units 1–4 would be small based on individual worker doses being maintained within 10 CFR 20.1201 limits. The collective occupational doses are expected to be typical of doses found in current operating LWRs.

Doses to Members of the Public

The calculated dose to the MEI and the population living within a 50 mi radius of the site from the liquid and gaseous effluent release pathways is expected to be negligible.

Liquid pathway doses to the MEI and the population within 50 mi are usually calculated using the LADTAP II computer program (Strenge et al. 1987-TN83). The following activities are usually considered in the dose calculation (1) consumption of drinking water contaminated by liquid effluents, (2) consumption of fish from water sources contaminated by liquid effluents, (3) consumption of crops, milk, and meat produced on land irrigated with water contaminated by liquid effluents, and (4) direct radiation from waterbodies contaminated by liquid effluents during swimming, boating, and recreation along the shorelines.

The liquid effluent releases used in the estimates of dose are found in Table 11.2-7 of the AP1000 DCD (Westinghouse 2011-TN261). Other parameters used as inputs to the LADTAP II program usually include effluent discharge rates, population within 50 mi radius (total and those using drinking water); transit times to receptors; shoreline, swimming, and boating usage; and liquid pathway consumption and usage factors (i.e., sport fish consumption). Liquid pathway consumption and usage factors are expected to be appropriately characterized and used in a LADTAP II analysis.

Gaseous pathway doses to the MEI are usually calculated using the GASPAR II computer program (Strenge et al. 1986-TN82) at the nearest applicable receptor (i.e., resident, meat animal, vegetable garden, etc.) and the exclusion area. The GASPAR II computer program is also used to calculate annual population doses. The following activities are usually considered in these dose calculations: (1) direct radiation from immersion in the gaseous effluent cloud and from particulates deposited on the ground, (2) inhalation of gases and particulates, (3) ingestion of meat from animals eating contaminated grass, and (4) ingestion of garden vegetables contaminated by gases and particulates. The gaseous effluent releases used in the estimate of dose to the MEI and population are provided in Table 11.3-3 of the AP1000 DCD (Westinghouse 2011-TN261). Other parameters usually used as inputs to the GASPAR II program include population data, atmospheric dispersion factors, ground deposition factors, receptor locations, and consumption factors.

The previous COL applications for proposed AP1000 reactor sites discuss calculated doses to the MEI and population from radiological releases and direct radiation. It is expected that the total MEI and population doses for PMN Units 1–4 will be within the dose design objectives of 10 CFR Part 50 (TN249), Appendix I and consistent with similar LWRs as shown in Table 3-18. It is also expected that the total body, thyroid and critical organ doses for PMN Units 1–4 will be within the dose requirements specified in the 40 CFR Part 190 and consistent with similar LWRs as provided in Table 3-19.

As described in Section 3.3, meteorological data from the Pantex Plant was utilized to describe the PMN Units 1–4 site. This meteorological data was used for an evaluation of the atmospheric dispersion factors (χ/Q values). The evaluation resulted in doses associated with the PMN site being analyzed. This evaluation indicates that for a single AP1000 unit, dose to the MEI and surrounding population from routine radiological gaseous releases would be approximately 80 percent of the dose calculated at a single AP1000 unit at the Vogtle site as described in NUREG-1872 (*Final Environmental Impact Statement for an Early Site Permit at the Vogtle Electric Generating Plant Site*) (NRC 2008-TN673) and NUREG-1947 (*Final Supplemental Environmental Impact Statement for Combined License for Vogtle Electric Generating Plant Unit 3 and 4*) (NRC 2011-TN6439) as shown in Table 3-18 and Table 3-19. It is expected that liquid releases and doses would be bounded by previously estimated AP1000 releases as shown in Table 3-18 and Table 3-19.

Table 3-18 Comparison of Maximally Exposed Individual Dose Estimates from Liquid and Gaseous Effluents for Single AP1000 Unit to Dose Design Objectives Specified in 10 CFR Part 50, Appendix I

Pathway/ Type of Dose	Vogtle Electric Generating Plant Dose Estimate (Single Unit)	Virgil C. Summer Nuclear Station Dose Estimate (Single Unit)	Levy Nuclear Plant Dose Estimate (Single Unit)	William States Lee III Nuclear Station Dose Estimate (Single Unit)	Turkey Point Nuclear Plant Dose Estimate (Single Unit)	10 CFR Part 50 Appendix I Design Objective
Liquid Effluents—Total Body Dose (mrem)	0.017	0.14	0.0052	0.0609	0	3

Pathway/ Type of Dose	Vogtle Electric Generating Plant Dose Estimate (Single Unit)	Virgil C. Summer Nuclear Station Dose Estimate (Single Unit)	Levy Nuclear Plant Dose Estimate (Single Unit)	William States Lee III Nuclear Station Dose Estimate (Single Unit)	Turkey Point Nuclear Plant Dose Estimate (Single Unit)	10 CFR Part 50 Appendix I Design Objective
Liquid Effluents—Critical Organ Dose (mrem)	0.021	0.50	0.071	0.0775	0	10
Gaseous Effluents—Gamma air Dose (mrad)	0.68	0.71	1.7	1.25	4.2	10
Gaseous Effluents—Beta air Dose (mrad)	2.84	3.0	9.4	7.32	18	20
Gaseous Effluents—Total Body Dose (mrem)	0.56	0.58	3.1	0.732	3.6	5
Gaseous Effluents—Skin Dose (mrem)	2.30	2.4	6.3	4.90	14	15

CFR = *Code of Federal Regulations*.
Sources: NRC 2008-TN673, NRC 2011-TN1723, NRC 2012-TN1976, NRC 2013-TN6435, NRC 2016-TN6434.

Table 3-19 Comparison of Maximally Exposed Individual Dose Rates at Nuclear Power Plants with Single AP1000 Units with the Dose Limits Specified in the 40 CFR Part 190

Pathway/ Type of Dose	Vogtle Electric Generating Plant Units 3 and 4 Total Dose	Virgil C. Summer Nuclear Station Units 2 and 3 Total Dose	Levy Nuclear Plant Units 1 and 2 Total Dose	William States Lee III Nuclear Station Units 1 and 2 Total Dose	Turkey Point Nuclear Plant Units 6 and 7 Total Dose	40 CFR Part 190 Dose Limits
Total Body (mrem)	2.36	2.2	5.5	3.74	7.8	25
Thyroid (mrem)	12.39	14	12.9	20.0	15.0	75
Critical Organ (mrem)	8.88	3.5	19.5	9.05	8.4	25

CFR = *Code of Federal Regulations*.
Sources: NRC 2008-TN673, NRC 2011-TN1723, NRC 2012-TN1976, NRC 2013-TN6435, NRC 2016-TN6434.

Doses to Nonhuman Biota

Surrogate species used in biota dose estimates are well-defined and provide an acceptable method for evaluating doses to the biota. Surrogate species analysis is usually performed for aquatic species (e.g., fish, invertebrates, and algae) and terrestrial species (e.g., muskrats, raccoons, herons, and ducks).

Table 3-20 compares estimated dose rates to surrogate biota species that would be produced by releases from proposed AP1000 reactors similar to PMN Units 1–4 to the International Atomic Energy Agency (IAEA)/National Council on Radiation Protection and Measurements (NCRP) biota dose guidelines (IAEA 1992-TN712; NCRP 1991-TN729). Doses to the biota in each case are far below the 100 millirad per day (mrad/d) IAEA guidelines for terrestrial biota

and the 1000 mrad/d guideline for aquatic biota. As PMN Units 1–4 are expected to be of similar design to the Vogtle Units 3 and 4 (NRC 2008-TN673, NRC 2011-TN6439), Virgil C. Summer Nuclear Station Units 2 and 3 (NRC 2011-TN1723), Levy Nuclear Plant Units 1 and 2 (NRC 2012-TN1976), William States Lee III Nuclear Station Units 1 and 2 (NRC 2013-TN6435), and Turkey Point Nuclear Plant Units 6 and 7 (NRC 2016-TN6434), the total body dose rates to surrogate biota species from liquid and gaseous effluents are expected to be consistent with those provided in Table 3-20 and Table 3-21.

Table 3-20 Comparison of Biota Doses from AP1000 Reactors to IAEA Guidelines for Biota Protection

Biota	Vogtle Electric Generating Plant Estimated Dose to Biota (mrad/d)	Virgil C. Summer Nuclear Station Estimated Dose to Biota (mrad/d)	Levy Nuclear Plant Estimated Dose to Biota (mrad/d)	William States Lee III Nuclear Station Estimated Dose to Biota (mrad/d)	Turkey Point Nuclear Plant Estimated Dose to Biota (mrad/d)	IAEA/NCRP Guidelines for Protection of Biota Populations (mrad/d)
Fish	0.00044	0.0022	0.01	0.0016	0	1,000
Invertebrate	0.0012	0.0063	0.02	0.0044	0	1,000
Algae	0.0036	0.018	0.03	0.013	0	1,000
Muskrat	0.0055	0.020	0.02	0.016	0.14	100
Raccoon	0.0066	0.023	0.01	0.011	0.14	100
Heron	0.0101	0.044	0.01	0.030	0.14	100
Duck	0.0071	0.027	0.02	0.015	0.14	100

IAEA = International Atomic Energy Agency; NCRP = National Council on Radiation Protection and Measurements.
Sources: NRC 2008-TN673, NRC 2011-TN1723, NRC 2012-TN1976, NRC 2013-TN6435, NRC 2016-TN6434; IAEA 1992-TN712; NCRP 1991-TN729.

Table 3-21 Biota Doses for AP1000 Sites

Parameter	Fish	Invertebrate	Algae	Muskrat	Raccoon	Heron	Duck
Doses from Liquid Effluents (mrad/yr) for Vogtle Electric Generating Plant, Units 3 and 4[(a)]	0.16	NR[(b)]	NR	0.47	0.19	2.15	0.45
Doses from Gaseous Effluents (mrad/yr) for Vogtle Electric Generating Plant, Units 3 and 4[(a)]	0.0	0.0	0.0	1.5	2.2	1.5	2.2
Total Body Biota Dose—All Pathways (mrad/yr) for Vogtle Electric Generating Plant, Units 3 and 4[(a)]	0.16	0.45	1.3	2.0	2.4	3.7	2.6
Doses from Liquid Effluents (mrad/yr) for Virgil C. Summer Nuclear Station, Units 2 and 3[(c)]	0.82	2.3	6.66	2.44	0.956	11.14	2.34
Doses from Gaseous Effluents (mrad/yr) for Virgil C. Summer Nuclear Station, Units 2 and 3 [(c)]	0.00	0.00	0.00	5.04	7.4	5.04	7.4
Total Body Biota Dose—All Pathways (mrad/yr) for Virgil C.	0.82	2.3	6.7	7.5	8.4	16	9.7

Parameter	Fish	Invertebrate	Algae	Muskrat	Raccoon	Heron	Duck
Summer Nuclear Station, Units 2 and 3 [(c)]							
Doses from Liquid Effluents (mrad/yr) for Levy Nuclear Plant, Units 1 and 2[(d)]	0.68	5.0	8.80	1.26	0.42	1.0	1.4
Doses from Gaseous Effluents (mrad/yr) for Levy Nuclear Plant, Units 1 and 2[(d)]	0.00	0.00	0.00	2.0	2.0	1.4	2.0
Total Body Biota Dose —All Pathways (mrad/yr) for Levy Nuclear Plant, Units 1 and 2[(d)]	0.68	5.0	8.80	3.26	2.42	2.4	3.4
Doses from Liquid Effluents (mrad/yr) for William States Lee III Nuclear Station, Units 1 and 2[(e)]	0.57	1.61	4.64	1.71	0.67	7.82	1.64
Doses from Gaseous Effluents (mrad/yr) for William States Lee III Nuclear Station, Units 1 and 2[(e)]	0.00	0.00	0.00	4.06	3.25	3.18	3.80
Total Body Biota Dose—All Pathways (mrad/yr) for William States Lee III Nuclear Station, Units 1 and 2[(e)]	0.57	1.61	4.64	5.77	3.92	11.00	5.44
Doses from Liquid Effluents (mrad/yr) for Turkey Point Nuclear Plant, Units 6 and 7	NR	NR	NR	NR	NR	NR	NR
Doses from Gaseous Effluents (mrad/yr) for Turkey Point Nuclear Plant, Units 6 and 7	NR	NR	NR	NR	NR	NR	NR
Total Body Biota Dose—All Pathways (mrad/yr) for Turkey Point Nuclear Plant, Units 6 and 7	0.00	0.00	0.00	26.0	26.0	26.0	26.0

NR = Not Reported.
Sources: NRC 2008-TN673, NRC 2011-TN1723, NRC 2012-TN 1976, NRC 2013-TN6435, NRC 2016-TN6434.

Radiological Environmental Monitoring

A radiological environmental monitoring program (REMP) is not yet in place for PMN Units 1–4; however, Fermi America will develop a REMP. A typical REMP is constructed using Nuclear Energy Institute (NEI) 07-09A, “Generic FSAR Template Guidance for Offsite Dose Calculation Manual (ODCM) Program Description” (NEI 2009-TN5890), and RG 4.1, Revision 2, “Radiological Environmental Monitoring for Nuclear Power Plants,” to comply with the requirements of 10 CFR 20.1302 (TN283). The NRC staff will review the REMP once developed, which would start environmental monitoring for background baseline levels prior to operation of PMN Units 1–4.

Currently, the REMP from the nearby Pantex Plant includes monitoring of the direct exposure pathways, air pathways, water pathways and ingestion exposure pathways (Pantex 2024-TN12792, Pantex 2025-TN12791). The Annual Site Environmental Report for the Pantex Plant

for years 2011 through 2024 show doses to individuals around the facility were a small fraction of regulatory limits. The impacts from operating PMN Units 1–4 are expected to be SMALL.

3.9.1.3.3 Impacts from Decommissioning PMN Units 1–4

The environmental impacts due to decommissioning activities were previously evaluated in NUREG-0586, Supplement 1, *Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors* (Decommissioning GEIS) (NRC 2002-TN665). The NRC staff concluded that the construction methods used for new reactor designs such as the AP1000 reactor are not sufficiently different from the construction methods used for currently operating reactors to significantly affect the impacts evaluated in the Decommissioning GEIS. Therefore, the impacts discussed in the Decommissioning GEIS remain bounding for the AP1000 design.

The Decommissioning GEIS concluded that the doses to the public would be well below applicable regulatory standards regardless of which decommissioning method considered in the Decommissioning GEIS. Occupational doses would also be well below applicable regulatory standards during the license term. The impacts from decommissioning PMN Units 1–4 are expected to be SMALL.

3.9.1.3.4 Summary of Reasonably Foreseeable Environmental Effects

As discussed above, Fermi America would operate PMN Units 1–4 in compliance with applicable NRC and EPA regulatory limits and conduct radiological environmental monitoring as required by NRC regulations. The reasonably foreseeable radiological health effects of building, operating and decommissioning PMN Units 1–4 would be SMALL.

3.9.2 Nonradiological Human Health

3.9.2.1 Affected Environment

This section describes the existing conditions on and surrounding the PMN Units 1–4 site with respect to nonradiological human health issues. It identifies people or groups that could be vulnerable to nonradiological health impacts, including occupational injuries, occupational noise, etiological agents, vehicular injuries, and electromagnetic fields (EMFs). Vulnerable people or groups could include construction workers, operation workers, and outage workers and nearby residents.

Occupational Injuries

Fermi America has already initiated some asbestos removal activities on the site, and this work would continue as part of preparing the site to build PMN Units 1–4. The asbestos removal process poses human health hazards. Fermi America would implement procedures to identify, segregate, characterize, and properly manage any soils exhibiting evidence of contamination (FA 2026-TN13483). This procedural approach would have controls in place to reduce human exposure to contaminated soils.

Occupational Noise

Noise presently experienced on the lands proposed for the Project Matador Campus, including the PMN Units 1–4 site, originates primarily from operations of the adjacent Pantex Plant,

seasonal farming machinery operation in the surrounding cultivated areas, traffic noise from the two nearby roadways (U.S.-60 and FM 683), and noise from regularly passing trains on the BNSF-owned railroad, which runs parallel to U.S.-60. The nearest noise-sensitive receptor is a residence located approximately 0.55 mi from the western PMN Units 1–4 site boundary (FA 2026-TN13483).

Etiological Agents

Etiological agents are generally not a safety concern for undeveloped lands such as the PMN Units 1–4 site in its baseline condition. Etiological agents associated with nuclear power stations, once built, may be present in elevated numbers in unheated and heated water systems, as well as in cooling systems, receiving and source water bodies, and site sewage treatment facilities (NRC 2024-TN10106).

Vehicular Injuries

U.S.-60 provides commuter access to the PMN Units 1–4 site from the south and State Road 136 to FM 293 provides access from the west. Road access to the PMN Units 1–4 site construction entrance is via FM 683, a two-lane, paved, State-maintained road running north–south along the western boundary of the Project Matador site. The road network in the area is shown in Figure 2-4.

EMFs

EMFs are generally not a safety concern for undeveloped lands such as the PMN Units 1–4 site in its baseline condition. All nuclear power plants, once operating, have associated electrical equipment and power transmission systems. Power transmission systems consist of switching stations (or substations) located on the plant site and the transmission lines needed to connect the plant to the regional electrical distribution grid. Occupational workers or members of the public near transmission lines may be exposed to EMFs produced by the transmission lines.

3.9.2.2 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, other interrelated reasonably foreseeable projects considered for this EIS include ongoing and future Project Matador activities. As discussed in Section 2.5, the workers needed to support Project Matador's other onsite power generation and the onsite data centers would increase the overall commuting traffic in the region. Fermi America estimates that other Project Matador construction activities would require a peak of 1,600 additional workers (FA 2026-TN13483). These additional workers could also experience occupational injuries and vehicle accidents while working and commuting. In the absence of project-specific indicators suggesting elevated or reduced risk, occupational injury rates are anticipated to be consistent with State and national averages. Based on the analyses presented below, nonradiological human health impacts from these interrelated reasonably foreseeable projects would not alter the conclusions for the proposed action.

3.9.2.3 Reasonably Foreseeable Environmental Effects Analysis

3.9.2.3.1 Impacts from Building PMN Units 1–4

Common nonradiological health issues resulting from building nuclear power plants include occupational injuries, occupational noise, etiological agents, vehicular injuries, and EMFs. To

address physical impacts, the applicant would implement various protective measures and BMPs. However, residents near the PMN Units 1–4 site are separated by distance (as noted above) and by roadways (U.S.-60, FM 683, and FM 245, which provides a secondary entrance to the Pantex Plant). The plant is expected to comply with 10 CFR Part 73, “Physical Protection of Plants and Materials” requirements which include the requirement to prevent unauthorized access of person, vehicles and materials into material access areas and vital areas (10 CFR Part 73 (b)) (TN423).

Occupational Injuries

Building PMN Units 1–4 would involve risk to workers from accidents and occupational illnesses. Common construction accidents include falls, electric shock, burns, and trenching hazards. Occupational injury risks can be reduced by strict adherence to NRC and Occupational Safety and Health Administration (OSHA) safety standards, practices, and procedures. Construction workers and onsite personnel are expected to perform work under a health and safety program, receive appropriate work hazard briefings, and use applicable personal protective equipment to minimize the risk of potentially harmful exposures. Health and safety monitoring would be conducted during construction activities as required. During building activities, access to subject areas would be controlled and limited to authorized workers and visitors.

Texas does not have an OSHA-approved State plan and is under Federal OSHA jurisdiction, which covers most private sector workers within the State (DOL 2026-TN13504). The U.S. Bureau of Labor Statistics (BLS) collects information from companies in the United States on occupational injuries, illnesses, and fatalities. The 2024 national incidence rate for nonfatal occupational injuries and illness for the heavy and civil engineering construction industry was 1.8 per 100 full-time equivalent workers, and the rate for the nuclear electric power generation industry was 0.2 per 100 full-time workers (BLS 2026-TN13507). The Texas nonfatal occupational injuries and illness incidence rates for the heavy and civil engineering construction industry, and electric power generation, transmission and distribution industries were both 1.0 per 100 full-time equivalent workers for 2024 (TDI 2025-TN13503). BLS also publishes occupational fatality rates. The national fatal work injuries rate for the construction industry for 2024 was 9.2 per 100,000 full-time equivalent workers, and the manufacturing industry rate for 2024 was 2.4 per 100,000 full-time equivalent workers (BLS 2026-TN13506). The Texas fatal injury rates for the construction and manufacturing industries were 9.5 and 2.2 per 100,000 full-time equivalent workers for 2024, respectively (BLS 2026-TN13505). BLS notes that State industry rates are not directly comparable to national industry rates due to differences in grouping of workers. In the absence of project-specific indicators suggesting elevated or reduced risk, the occupational injury and illness incidence rates, as well as fatality incidence rates, are anticipated to be consistent with State and national averages. Through implementation of work safety requirements and an industrial health and safety program, the occupational health impacts are anticipated to be SMALL and not beyond that expected of similar industrial development sites.

Occupational Noise

Building activities are expected to generate noise (Table 3-22), and the sound level would depend on the number and type of equipment in use. Work would be conducted in compliance with Federal OSHA regulations for occupational noise exposure and hearing protection (29 CFR 1926.52 and 1926.101-TN4455). Noise and vibration mitigation measures such as use of noise control equipment on vehicles and equipment (e.g., dampeners) and staggering building

activities, as well as use of personal protective equipment, could be used as needed to ensure noise levels remain within occupational exposure standards, which limit time of exposure to noise levels of 90 dBA and higher. Because the project is expected to comply with OSHA regulations for noise exposure, the occupational human health impact due to noise is anticipated to be SMALL.

Table 3-22 Anticipated Sound Levels of Construction Equipment at the Project Matador Nuclear Units 1–4 Site at 50 ft

Equipment Description	Anticipated Sound Level at 50 ft (dBA)
Air Compressor	78
Auger Drill Rig	84
Backhoe	78
Boring Jack Power Unit	83
Chain Saw	84
Compactor (ground)	83
Concrete Batch Plant	83
Concrete Mixer Truck	79
Concrete Saw	90
Crane	81
Dozer	82
Dump Truck	76
Excavator	81
Front End Loader	79
Generator	81
Grader	85
Impact Pile Driver	101
Jackhammer	89
Pneumatic Tools	85
Roller	80
Vibratory Pile Driver	101
Welder/Torch	74

Source: DOT 2006-TN10181: Appendix A.

Etiological Agents

As stated in Section 2.3, PMN Units 1–4 would utilize ACCs to transfer heat from the main condensers to the atmosphere. As such, heated effluent would not be discharged to surface water bodies and would therefore not be expected to contribute to thermophilic bacteria growth in surface water. Potential impacts from etiological agents would therefore be SMALL.

Vehicular Injuries

In 2024 the Texas Department of Transportation (TXDOT) reported 5 fatal car crashes with 9 total fatalities and 9 car crashes with serious injuries in Carson County, Texas (TXDOT 2024-TN13502). Further examination of TXDOT data showed one fatal crash with four total fatalities on U.S. and State highways and one fatal crash with one fatality in Carson County on FM

roadways (TXDOT 2024-TN13501). Building the PMN project would temporarily increase traffic; however, the applicant would mitigate the traffic load with phased shift schedules. The traffic associated with transportation of construction materials and personnel are discussed in Appendix F.4.2.11. Vehicle traffic poses risks for vehicle accidents involving injuries and fatalities. The TXDOT has designated a truck traffic route as presented in Appendix F.4 to minimize traffic concerns for truck deliveries. No unique or higher traffic hazards are anticipated for the project; therefore, injuries and fatalities from vehicle accidents are expected to not substantially differ from State or local vehicle accident rates. Potential impacts from vehicular injuries would therefore be SMALL.

EMFs

A review of the biological and physical studies of 60 Hertz (Hz) EMFs completed by the NRC during preparation of the 2013 LR GEIS (NRC 2013-TN2654) and restated in the 2024 LR GEIS (NRC 2024-TN10161), did not find any consistent evidence that would link harmful effects with field exposures. Additionally, the National Institute of Occupational Safety and Health does not consider EMFs to be a proven health hazard (NRC 2013-TN2654, NRC 2024-TN10161). Potential impacts from EMFs would therefore be SMALL

Other Nonradiological Health Issues

Building and construction activities would produce a variety of waste streams including stormwater runoff and equipment wash water, and sanitary waste. Hazardous materials would be stored in secure, labeled containers and managed under the Resource Conservation and Recovery Act (RCRA) generator standards. Waste from temporary sanitary facilities such as portable toilets and handwash stations would be removed from the site by a licensed hauler to a wastewater treatment facility in accordance with State and local requirements. Nonradiological wastewater treatment is discussed further in Section 3.10. Spill prevention and response procedures would be utilized to reduce the potential for impacts due to accidental releases (FA 2026-TN13483).

The applicant would obtain necessary air permit(s) for construction equipment, and emissions control equipment would be used, as required. Specific mitigation measures to control fugitive dust will be identified in a dust control plan, or similar document, prepared prior to project construction; possible specific mitigation measures are provided in Section 3.3.

Nuisance Noise

Regarding possible impacts of noise on offsite land uses (nuisance noise), there are no State or county noise restrictions for the PMN Units 1–4 site (TSLL 2026-TN13500). However, under the Texas Penal Code, noise of 85 dBA or greater received at or nearby a private residence is considered to be unreasonable (TX Penal Code 9-42-TN13499). Fermi America has not planned any noise studies for the PMN Units 1–4 project, given its setting bordering an existing industrial site (Pantex Plant), the busy roadways and rail line close to the site, and low residential density surrounding the site. As indicated in Figure 3-20, noise from construction equipment is expected to attenuate to levels lower than 85 dBA within 500 ft of the source.

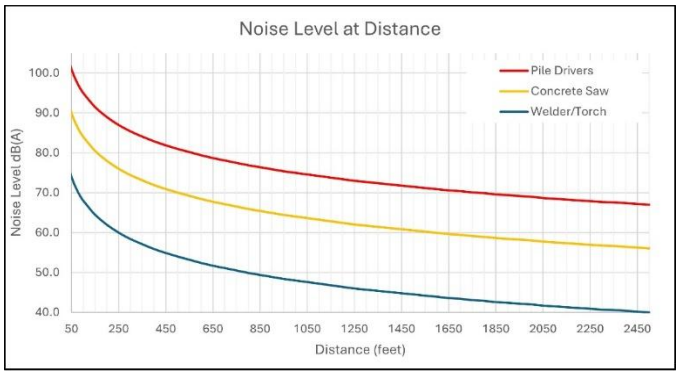


Figure 3-20 Noise Attenuation of Highest Sound Levels of Construction Equipment at the Project Matador Nuclear Units 1–4 Site. Sources: DOT 2006-TN10181; NRC 2024-TN10161.

3.9.2.3.2 Impacts from Operating PMN Units 1–4

Common nonradiological health issues resulting from operating nuclear power plants are similar to those discussed above for building the plants. To address physical injuries, the applicant would implement various protective measures and BMPs. However, residents near the PMN Units 1–4 site are separated by distance (as noted above) and by roadways (U.S.-60, FM 683, and FM 245, which provides a secondary entrance to the Pantex Plant). The plant is expected to comply with 10 CFR Part 73, “Physical Protection of Plants and Materials” requirements which include the requirement to prevent unauthorized access of person, vehicles and materials into material access areas and vital areas (10 CFR Part 73 (b)) (TN423).

Occupational Injuries

Operations personnel could be involved in industrial accidents such as falls, electric shock, burns, or occupational illnesses because of noise exposure, exposure to chemical or gaseous hazards, or other industrial hazards. PMN Units 1–4 would have a comprehensive industrial safety program in place to ensure compliance with Federal OSHA requirements. The program is expected to have provisions for training, hazard identification, personal protection equipment, hearing conservation, and other hazard mitigation. There are planned to be task- or system-specific procedures in place to implement safety and exposure standards (e.g., electrical safety). As presented above, the national incidence rate for nonfatal occupational injuries and illnesses for the nuclear electric power generation industry was 0.2 per 100 full-time employees in 2024. There is no analogous incidence rate for the nuclear electric power generation industry in Texas; the more general industry category of electric power generation, transmission and distribution had an incidence rate of 1.0 nonfatal occupational injuries and illnesses per 100 full-time equivalent workers for 2024. In the absence of project-specific indicators suggesting elevated or reduced risk, occupational injury and illness incidence rates are anticipated to be consistent with the national incidence rate for nuclear electric power generation. Because it is anticipated that all workers would adhere to safety standards, in alignment with site procedures, and use appropriate personal protection equipment, this impact is expected to be SMALL.

As presented in Section 2.4, the in-scope transmission lines installed to support PMN Units 1–4 would be designed and installed in compliance with the National Electrical Safety Code (NESC) and applicable Texas and local electrical standards. Adherence to these standards is expected to control and minimize potential electric shock hazards from the transmission system. As

previously stated, the plant is expected to comply with 10 CFR Part 73, “Physical Protection of Plants and Materials” requirements which include the requirement to prevent unauthorized access of person, vehicles and materials into material access areas and vital areas (10 CFR Part 73 (b), TN423). This would be expected to prevent unauthorized access to the nuclear area, in which the in-scope transmission lines are encompassed.

Electric shock potential is of minimal significance for transmission lines operated in adherence with the NESC (NRC 2024-TN10161). The impact on the public and operational personnel from potential electric shock effects of transmission lines for PMN would be SMALL, and mitigation does not appear to be warranted.

Occupational Noise

Work would be conducted in compliance with Federal OSHA regulations for occupational noise exposure and hearing protection (29 CFR 1926.52 and 1926.101-TN4455). Mitigation measures such as noise control (e.g., dampeners) and personal protective equipment would be used as needed to ensure noise levels remain within occupational exposure standards which limits time of exposure to noise levels of 90 dBA and higher. Because the project is expected to comply with OSHA regulations for noise exposure, the occupational human health impact due to noise is anticipated to be SMALL.

Etiological Agents

Heated effluent would not be discharged from the PMN Units 1–4 and would therefore not be expected to contribute to thermophilic bacteria growth in any surface waterbodies. As such, this topic is not discussed further.

Vehicular Injuries

The operations workforce would be much fewer in number than the construction workforce, and less human health impacts from vehicle accidents would be expected. Traffic impacts for transportation of materials and personnel during operations are discussed in Section 3.8.2.1. No unique or higher traffic hazards are anticipated for the project; therefore, injuries and fatalities from vehicle accidents are expected to be within State and/or local vehicle accident rates. Potential impacts would therefore be SMALL.

EMFs

The NRC’s review of the effects of EMFs from power lines, which is provided in the 2024 LR GEIS, concluded that there is no consistent evidence to link EMF exposure to harmful human health effects (NRC 2024-TN10161). As presented in Section 2.4, the in-scope transmission lines would be those from the PMN Units 1–4 to the onsite switchyard. Impacts to members of the public attributable to electromagnetic field exposure from transmission system operations are anticipated to be SMALL, and mitigation does not appear to be warranted.

3.9.2.3.3 Impacts from Decommissioning PMN Units 1–4

In the 2002 Decommissioning GEIS (NUREG-0586), the NRC evaluated potential impacts related to occupational hazards (physical, electrical, chemical, and biological), noise, and transportation, and concluded generically for all plants that these impacts are SMALL and that no additional mitigation measures are likely to provide sufficient benefit to be warranted (NRC

2002-TN665). Accordingly, there is no reason to expect that decommissioning impacts for the proposed PMN Units 1–4 would fall outside of, or not be fully bounded by, the NRC's previously established conclusions. Potential impacts would therefore be SMALL.

3.9.2.3.4 Summary of Reasonably Foreseeable Environmental Effects

Based on the analyses presented above and the applicant's requirement to adhere to applicable Federal and State regulations regarding worker safety, the reasonably foreseeable nonradiological effects of PMN Units 1–4 on human health would be SMALL. Mitigation measures to ensure that these regulations are met could include comprehensive health and safety procedures including hazard identification, personal protection equipment, and hearing conservation.

3.10 Waste Management

3.10.1 Radiological Waste Management

3.10.1.1 Affected Environment

The radiological setting of the affected environment is described in Section 3.9.1.

3.10.1.2 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, reasonably foreseeable projects considered for this EIS include ongoing and future Project Matador Campus activities. Interrelated effects due to radiological waste management would stem from other nuclear units (such as SMRs) at the Project Matador Campus if licensed and constructed. Potential SMRs at the Project Matador Campus would be operated and managed by Fermi America and Fermi America would be expected to manage radiological waste in accordance with NRC standards and regulations and consistent with the reactor design technology.

3.10.1.3 Reasonably Foreseeable Environmental Effects Analysis

The following sections address the radiological waste management impacts during plant operation and decommissioning. Radiological waste is not expected to be generated during building activities.

3.10.1.3.1 Impacts from Operating PMN Units 1–4

Section 2.6 briefly describes the liquid, gaseous, and solid radioactive waste systems for PMN Units 1–4. These systems are described in detail in the AP1000 design control document (DCD) (Westinghouse 2011-TN261) Sections 11.2, 11.3, and 11.4, respectively.

Liquid, gaseous, and solid radioactive waste management systems would be used for the collection, processing, packaging, and storage of the radioactive waste materials produced during the operation and decommissioning of PMN Units 1–4. Radioactive waste management systems are designed to meet 10 CFR Part 50 (TN249) and 10 CFR Part 20 (TN283) requirements as well as meet the design objectives in 10 CFR Part 50 (TN249) Appendix I ("Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low as is Reasonably Achievable' for Radioactive Material in Light-Water-Cooled Nuclear Power Reactor Effluents"). Radioactive materials in the reactor coolant would be the

primary source of gaseous, liquid, and solid radioactive wastes from operation of the four new AP1000 units. Radioactive fission products build up within the fuel as a consequence of the fission process. These fission products would be contained in the sealed fuel rods, but small quantities could escape the fuel rods into the primary reactor coolant loop. Neutron activation of the primary coolant loop would also add radionuclides to the reactor coolant. Spent nuclear fuel will also be stored in water-cooled pools upon discharge from use in the reactor.

The liquid and gaseous radioactive waste management systems are described in Section 2.6. The solid radioactive waste management system, as shown in DCD Figure 11.4-1 (Westinghouse 2011-TN261), will treat, temporarily store, and package for disposal of dry or wet solids during normal operation and anticipated operational occurrences. During operation, there will be zero liquid discharges from the liquid radioactive waste system. Solid radioactive wastes would include spent ion-exchange resins, deep bed filtration media, spent filter cartridges, dry active wastes, and mixed wastes. The AP1000 solid waste-management system discharges effluents through the liquid and gaseous waste-management systems and does not release gaseous or liquid effluents directly to the environment (Westinghouse 2011-TN261).

There would be no onsite facilities for long-term storage or permanent disposal of solid waste. The packaged waste would be temporarily stored in the auxiliary and radioactive waste buildings prior to being shipped to a licensed disposal facility such as Waste Control Specialists LLW disposal facility in Andrews, Texas. The expected and maximum volumes of solid waste generated by the operation of an AP1000 unit, excluding spent nuclear fuel, is described in DCD Table 11.4-1 (Westinghouse 2011-TN261). These expected and maximum values of generated waste are less than the referenced average generated waste value for existing PWRs described in Table 4-1 of the 2026 NR GEIS (NRC 2026-TN12155). Prior to disposal at a licensed disposal facility, solid waste may be shipped to a waste processor for volume reduction. Wet solid waste including spent resin and filters would be dewatered before packaging for shipment to a licensed offsite processing or disposal facility. Solid waste is packaged in containers that comply with 10 CFR Part 71 (TN301) and 49 CFR Parts 171–177 (TN10307). The transportation of solid waste is described in Section 3.13.

Spent nuclear fuel will be stored in an onsite water-cooled pool upon being discharged from the reactor. The spent fuel pool capacity of the AP1000 is described in DCD Table 9.1-2 (Westinghouse 2011-TN261). It is expected to be used for spent nuclear fuel storage for the requisite cooling period prior to spent fuel placement in a future NRC approved onsite independent spent fuel storage installation (ISFSI) or offsite facility. Any onsite facility would be required to comply with 10 CFR Part 72 (TN4884), consistent with Table 4-1 of the 2026 NR GEIS (NRC 2026-TN12155).

As discussed in Section 3.9.1.3.2, Fermi America would have a REMP to measure the levels of radiation and radioactive materials in the local environment. This would ensure that PMN Units 1–4 radiological impacts from storage of radiological waste would be monitored and would ensure compliance with NRC regulations.

These expected and maximum values of generated waste are less than the referenced average generated waste value for existing PWRs described in Table 4-1 of the NR GEIS (NRC 2026-TN12155). As presented above with the AP1000 generated waste bounded by the analysis in the NR GEIS, the PMN Units 1–4 impacts on a per reactor basis fall within the environmental impact categorization of small per the NR GEIS. The environmental impacts associated with the radiological waste management of PMN Units 1–4 are expected to be SMALL.

3.10.1.3.2 Impacts from Decommissioning PMN Units 1–4

The environmental impacts due to decommissioning activities were previously evaluated in the 2002 Decommissioning GEIS (NRC 2002-TN665). The NRC staff concluded that the construction methods used for new reactor designs such as the AP1000 reactor are not sufficiently different from the construction methods used for currently operating reactors to significantly affect the impacts evaluated in the Decommissioning GEIS. Therefore, the impacts discussed in the Decommissioning GEIS remain bounding for the AP1000 design.

The Decommissioning GEIS concluded that small amounts of liquid and gaseous radioactive waste are generated during decommissioning activities. The necessary controls to limit liquid and gaseous effluent releases will be provided in the ODCM. The 2002 Decommissioning GEIS also concluded that the quantity of solid LLW is higher during decommissioning activities than during operation. However, as described previously, solid radioactive waste is usually shipped to a processor or directly to a disposal site. Additional volume reduction techniques may be used, such as high-pressure compacting, dewatering, and evaporating. As addressed in Section 3.12.1, the AP1000s are bounded by NUREG-2157, *Generic Environmental Impact Statement for Continued Storage of Spent Nuclear Fuel: Final Report* (2014 Continued Storage GEIS) (NRC 2014-TN4117) for storage of spent fuel after termination of operation.

3.10.1.3.3 Summary of Reasonably Foreseeable Environmental Effects

Based on the above analysis, the review team concludes that the potential direct, indirect, and cumulative impacts of the reasonable foreseeable actions regarding storage and disposal of radioactive waste would be SMALL.

3.10.2 Nonradiological Waste Management

3.10.2.1 Affected Environment

Chapter 2 describes facility utilities, waste systems, and soil management, and Section 3.2 provides a description of land use at the site and in its surrounding vicinity. As noted in Section 3.2.1.1, a portion of the site is currently under a soil deed restriction due to mostly shallow, nonradiological soil contamination resulting from past containment releases from the Pantex Plant (Terracon 2025-TN12633). Land use in the soil restriction area is limited to industrial or commercial uses.

3.10.2.2 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, other reasonably foreseeable projects considered for this EIS include ongoing and future Project Matador Campus activities. Building Project Matador facilities other than the PMN Units 1–4 would be expected to generate similar waste types and volumes, and nonradiological waste impacts would be similar to other industrial and commercial development of similar scale. Fermi America would comply with applicable EPA and State regulations and permits for management of solid, liquid, and gaseous waste from other Project Matador facilities. Based on the analyses presented below, nonradiological waste impacts from these interrelated reasonably foreseeable projects would not alter the conclusions for the proposed action.

3.10.2.3 Reasonably Foreseeable Environmental Effects Analysis

3.10.2.3.1 Impacts from Building PMN Units 1–4

Nonradiological, nonhazardous wastes that may be generated include construction and demolition debris, air emissions, and liquid discharges. Anticipated waste streams would include concrete and steel, packaging, excavation spoils, and municipal-type solid waste. Construction wastes would be managed using standard practices, including segregation, recycling where practical, onsite reuse of suitable spoils, and disposal at permitted facilities; special wastes such as oily absorbents would be containerized and disposed per applicable Federal and State requirements. Figure 2-2 depicts construction support areas, which include the staging of wastes and spoil stockpile locations; areas may be adjusted during detailed construction planning to maintain separation from drainage features and that support BMPs.

Building activities and equipment would generate dust and air emissions. Section 3.3.1 contains details on air emissions and lists major equipment that would be used during construction. The assessment concluded air quality impacts from building activities would be minimal. The applicant would implement mitigation of air quality impacts, including minimizing disturbed land areas, use of suppressants or water on exposed soils such as unpaved roads, stockpiles, and active grading areas, use of a stabilized construction entrance, covering stockpiles, and implementation of speed limits on unpaved roads.

The applicant would implement procedures emphasizing waste minimization, segregation, proper containerization, storage onsite in designated areas and disposal at permitted facilities in accordance with applicable Federal, State, and local requirements. Construction debris generated by excavation and land clearing would be reused onsite, recycled, or disposed of offsite using a licensed facility. It is estimated that up to 2.5 million cubic yards of soil may be suitable for reuse onsite as backfill and that up to 1 million cubic yards may be needed for offsite beneficial reuse elsewhere within the Project Matador Campus. Excavation of an existing asbestos contaminated soil area is ongoing and expected to be completed in the first quarter of 2027. If additional contaminated soils are encountered, the applicant would implement screening, segregation and controlled staging, characterization, and appropriate disposition and tracking practices. Equipment waste generated from onsite construction vehicles and used hazardous materials would be disposed of according to Federal, State, and local permitting and regulatory requirements. Estimated waste volumes are summarized in Table 3-23.

Table 3-23 Project Matador Nuclear Units 1–4 Estimated Construction Waste Volumes

Waste Stream	Typical Source Activities	Preliminary Estimated Volume (Range)	Primary Units
Excavation spoils (clean/usable)	Basemat excavation, trenching, grading	0.5 to 2.5 million	cubic yards
Excavation spoils (excess/unsuitable)	Over-excavation, unsuitable soils, excess grading material	0 to 1.0 million	cubic yards
Concrete formwork/wood	Forming for foundations, walls, slabs	2,000 to 15,000	Tons
Scrap steel (rebar/structural)	Rebar cutting, steel erection off-cuts	1,000 to 10,000	Tons
Concrete waste (cured concrete)	Overpour, rejected loads, demolition of temporary features	500 to 8,000	Tons
Concrete washout residues	Truck washout, pump cleanout	100 to 1,000	cubic yards

Waste Stream	Typical Source Activities	Preliminary Estimated Volume (Range)	Primary Units
Packaging (cardboard, plastic, pallets, crates)	Equipment/material deliveries	1,000 to 12,000	Tons
General trash/municipal solid waste	Construction workforce, trailers, jobsite activities	1,000 to 8,000	Tons
Clearing and grubbing debris	Vegetation removal (as applicable)	0 to 20,000	cubic yards
Sediment-control materials	Silt fence, wattles, filter media	100 to 1,000	Tons
Used oils and lubricants	Heavy equipment maintenance	5 to 100	Tons
Petroleum-impacted absorbents	Spill response (minor releases)	1 to 50	Tons
Universal wastes (batteries, lamps)	Temporary power, equipment, trailers	0.5 to 25	Tons
Paints/solvents/adhesives (if used)	Coatings, maintenance	0 to 50	Tons

Source: FA 2026-TN13483.

Nonradiological liquid effluents, discussed in Section 3.5, would include stormwater, concrete washout water, vehicle or equipment wash water, and possible dewatering discharge. Stormwater would be managed under applicable Federal/State requirements. Fermi America obtained a construction stormwater Texas Pollutant Discharge Elimination System (TPDES) permit for Project Matador inclusive of the PMN Units 1–4 site (see Section 2.5.1) and would implement a SWPPP. Management of concrete washout water would take place in lined containment and not be discharged, and vehicle/equipment wash water would be managed to prevent discharge. However, if needed, possible dewatering discharges would be managed, treated, or permitted as required (FA 2026-TN13483). Additional nonradiological liquid wastes would include used fuels, oils, solvents, paints and stains, and other chemicals, which would be stored and disposed of according to applicable regulations.

Sanitary wastewater would be managed using temporary sanitary facilities sized to the workforce (e.g., portable toilets and handwash stations) and/or temporary connections to municipal sanitary sewers where available. Collected sanitary waste would be removed by a licensed hauler for disposal at an authorized wastewater treatment facility in accordance with State and local requirements. Any temporary onsite sanitary systems (if needed) would be permitted as required by the applicable authority having jurisdiction. Nonradiological solid waste generation would be minimized through recycling as practical. A waste minimization program would be implemented that uses material control, process control, waste management, and recycling to reduce waste and reuse as appropriate. The applicant states management of solid wastes is expected to comply with all applicable Federal, State, and local requirements and standards as well as implementation of BMPs. Based on the review, the team concludes that nonradioactive waste impacts to land, water, and air would be SMALL and that additional mitigation would not be warranted.

3.10.2.3.2 Impacts from Operating PMN Units 1–4

A description of nonradioactive waste systems is contained in Section 2.6.4. Operation of the units would generate nonradioactive solid waste streams, including hazardous, nonhazardous, and universal solid wastes as well as liquid effluents and gaseous emissions. The applicant would manage nonradioactive wastes in accordance with applicable Federal, State, and local

laws, regulations, and permit requirements. The applicant would implement a waste minimization program that uses material control, process control, waste management, and recycling to reduce waste and reuse as appropriate (FA 2026-TN13483).

Solid waste generation would be minimized through recycling as practical. The solid waste management system would collect and accumulate wastes. Nonradioactive solid wastes would include municipal waste, sewage treatment sludge, and industrial wastes. A site hazardous waste program would be implemented to manage hazardous wastes and stored in designated central accumulation, satellite accumulation areas, and/or a hazardous waste storage area. Management of solid wastes would comply with all applicable Federal, State, and local requirements and standards. Approximately 72 cubic meters (m^3) per year would be generated. Nonradioactive solid wastes (including recyclable materials) would be transferred offsite by licensed/registered contractors. All wastes would be shipped to an appropriately permitted offsite facility for recycling, treatment, or disposal (FA 2026-TN13483).

Nonradioactive liquid waste may include Texas-permitted discharges such as effluents containing chemicals or biocides, wastewater effluents, site stormwater runoff, and other liquid wastes such as used oils, paints, and solvents that require offsite disposal. Nonradioactive chemical and biocide use may occur in several plant systems and operational activities, such as water treatment, HVAC/process support, housekeeping/cleaning, and component/system maintenance. Chemical-containing liquid effluents would be managed to ensure compliance with applicable permits and waste acceptance criteria. Categories of typical chemicals and biocides would include:

- chlorine/sodium hypochlorite (disinfection)
- biocides for closed-loop cooling/HVAC systems (if used)
- corrosion inhibitors
- acids and bases for water treatment system cleaning, as applicable
- cleaning solvents/detergents (controlled use)
- lubricants and oils (managed as industrial waste)

Sanitary wastewater generated during plant operation would be managed using a site-specific wastewater system, and effluent would be directed to a permitted onsite packaged wastewater treatment system or conveyed to a municipal wastewater treatment system. Sanitary wastes would be managed separately from radiological systems to prevent commingling with radioactive waste streams (FA 2026-TN13483).

Air emissions (Section 3.3) would primarily be generated by vehicles and diesel generators. The assessment concluded air quality impacts from operation activities would be small. Emissions would occur via controlled, monitored vent pathways consistent with regulatory requirements. Emergency diesel generators would only operate under test conditions or emergency events and would be permitted under TCEQ rules with cumulative run-time limitations.

Based on this review, the team concludes that operation related nonradioactive waste impacts to land, water, and air would be SMALL and that additional mitigation would not be warranted.

3.10.2.3.3 Impacts from Decommissioning PMN Units 1–4

The Decommissioning GEIS (NRC 2002-TN665) did not specifically assess nonradiological waste management. However, NRC determined nonradiological waste to be a Category 1 issue in the 2026 NR GEIS (NRC 2026-TN12155). The 2026 NR GEIS generically assessed the

impact of nonradiological waste from decommissioning new nuclear power plants and concluded that impacts would be SMALL. The team therefore concludes that nonradioactive waste impacts during decommissioning would be SMALL and that additional mitigation would not be warranted.

3.10.2.3.4 Summary of Reasonably Foreseeable Environmental Effects

The reasonably foreseeable projects discussed above would be subject to comprehensive regulatory controls. Thus, based on the above analysis, the review team concludes that the environmental impacts associated with storage and disposal of nonradiological construction, operation, and decommissioning wastes would be SMALL.

3.11 Postulated Accidents

3.11.1 Design Basis Accidents

The AP1000 design certification evaluated the postulated design-basis accidents (DBAs) and demonstrated that AP1000 units can be constructed and operated with low risk to public health and safety (NRC 2011-TN12115). As provided in Fermi America's application cover letter (FA-2025-TN12676), Chapter 15, Accident Analysis, and Chapter 19, Probabilistic Risk Assessment, will be provided in Future Submission Number 2. Note that changes that could affect the environmental analysis resulting from applicant updates or as a part of the safety analysis under Future Submission Number 2 (as stated in FA-2025-TN12676), which has not been submitted at the time of this analysis, would be re-analyzed to determine if this EIS is affected.

DBAs are those that both the licensee and the NRC staff evaluate to ensure the plant meets acceptable design and performance criteria. The evaluations demonstrate that the plant can withstand normal and abnormal transients and a broad spectrum of postulated accidents without undue hazard to public health and safety.

In the NR GEIS, DBAs involving radiological releases are a Category 1 issue with a small impact (NRC 2026-TN12155). The FSAR/PSAR must demonstrate that the reactor falls within the regulatory limits which would meet the PPE values for the NR GEIS following PPE assumptions to reach this conclusion:

- For the exclusion area boundary, the maximum TEDE for any 2-hour period during the radioactivity release should be calculated.
- For the low-population zone, the TEDE should be calculated for the duration of the accident release (i.e., 30 days, or other duration as justified).

As noted above, the complete FSAR with Chapter 15 that addresses DBAs for PMN Units 1–4 is not yet available. However, it is expected that the FSAR would demonstrate that DBAs would fall within the regulatory limits of 10 CFR Part 52. If the FSAR does not demonstrate that the DBAs would fall within the regulatory limits, DBAs would be re-analyzed to determine if the impact analysis in this EIS is affected. Additionally, Section 5.3 of the 1996 LR GEIS (NRC 1996-TN288) discusses the impacts of potential accidents and their consequences, and addresses the general characteristics of DBAs, including fission product characteristics, meteorological considerations, possible exposure pathways, potential adverse health effects, measures to avoid adverse health effects, accident experience and observed impacts, and emergency preparedness (NRC 1996-TN288). In the 2013 LR GEIS, the NRC reexamined the information from the 1996 LR GEIS regarding DBAs and concluded that it remains valid (NRC 1996-TN288, NRC 2013-TN2654). The 2024 LR GEIS reaffirms that these prior conclusions are valid (NRC 2024-TN10161).

The NRC found that the environmental impacts of DBAs are of SMALL significance for all nuclear plants that meet the PPE of the NR GEIS. This conclusion was reached because the plants were designed to withstand these accidents, and a licensee is required to maintain the plant within acceptable design and performance criteria, including during any license renewal term. Impacts from DBAs would not be affected by changes in plant environment because such impacts (1) are based on calculated radioactive releases that are not expected to change, (2) are not affected by plant environment because they are evaluated for the hypothetical maximally exposed individual, and (3) have been previously determined acceptable (NRC 1996-TN288; NRC 2013-TN2654).

Generic industry experience has contributed to improved plant performance, as measured by trends in plant-specific performance indicators, a reduction in operating events, and lessons learned that improve the safety of all operating nuclear power plants. This is also confirmed by analysis, which indicates that, in many instances, improved plant performance and design features have led to reductions in initiating-event frequency, core-damage frequency (CDF), and containment-failure frequency.

As stated above, the staff's previous reviews concluded that the environmental impacts of DBAs are of SMALL significance for all nuclear plants due to the same requirements applying to any type of nuclear power plant technology, as noted in the LR and NR GEISs. These conclusions were reached because the plants were designed to withstand these accidents, and a licensee is required to maintain the plant within acceptable design and performance criteria, including during any license renewal term. NRC issued a design certification for the AP1000 Design Certification Document, Revision 19 (NRC 2011-TN12077). Therefore, PMN Units 1–4 utilizing the certified AP1000 design would be expected to have DBAs of SMALL significance.

3.11.2 Severe Accidents

Severe accidents are postulated accidents that are more severe than DBAs because they can result in substantial damage to the reactor core, with or without serious offsite consequences. Severe accidents can involve multiple equipment or functional failures. NEI 05-01A provides a template for completing the severe accident mitigation alternative (SAMA) analysis in support of license renewal (NEI 2005-TN1978), and this is an acceptable method for new reactors as noted in the guidance document RG 4.2, Revision 4, Section 5.10.2 (NRC 2026-TN11915). The template and associated guidance rely upon NRC document NUREG/BR-0184 (NRC 1997-TN676). The regulatory analysis techniques defined in this document reflect experience gained through past SAMA analyses and incorporate insights from reviews of NRC evaluations of SAMA analyses and associated requests for additional information (NRC 1997-TN676). This SAMA evaluation follows the methods described in NEI 05-01 to determine whether the SAMA is cost-beneficial (NEI 2005-TN1978).

The NRC has defined the following Category 2 issue (requirement) related to severe accidents in 10 CFR 51.53(c)(3)(ii)(L), as below:

> If the staff has not previously considered severe accident mitigation alternatives for the applicant's plant in an environmental impact statement or related supplement or in an environmental assessment, a consideration of alternatives to mitigate severe accidents must be provided.

The NRC finding regarding severe accidents for new reactors in 10 CFR Part 51 Subpart A, Appendix C, Table C-1 is SMALL if the following plant parameter assumptions are met:

- Within the maximum population dose risk 95th confidence bounding value of 9.727×10^3 person-rem per reactor year (i.e., Indian Point Energy Center Units 2 and 3) specified in the 1996 LR GEIS and demonstrating the utilization of 10 CFR 50.155 or diverse and flexible coping strategies (FLEX) to address mitigation of beyond-design-basis events; or

- Within the maximum 10 and 150 mi Exposure Index at the 95th confidence bounding value of 1.896×10^4 and 2.864×10^6, respectively (i.e., Indian Point Energy Center Units 2 and 3) specified in the 1996 LR GEIS and demonstrating the utilization of 10 CFR 50.155 or FLEX to address mitigation of beyond-design-basis events; or Utilizing the source term from 10 CFR 50.34(a)(1)(ii)(D), or

- The equivalent 10 CFR Part 52 regulation, with a non-intact containment or confinement for population density assessments under 10 CFR 100.21(h) to demonstrate a calculated total effective dose equivalent (TEDE) of no greater than 1 rem over a period of 30 days and that no further mitigation is necessary because health effects are shown not to be significant or a new reactor that is co-located with an existing LWR may compare its source terms to demonstrate that the LWR's severe accident risks bounds the new reactor's risks; or

- Utilizing 10 CFR 50.33(g)(2) to demonstrate there is no plume exposure pathway emergency planning zone where the projected total effective dose equivalent exceeds 1 rem over 96 hours (*i.e.,* 10 CFR 50.33(g)(2)(i)(A)) and no further mitigation is necessary because health effects are shown not to be significant.

Implementing the first bullet above, the review team applied the guidance of NEI 05-01 (NEI 2005-1978) to evaluate SAMAs. The steps described in NEI 05-01 are as follows:

- Step 1: Determining the severe accident risk using insights from a Level 3 probabilistic risk assessment (PRA).
- Step 2: Determining the cost of the severe accident risk and maximum benefit.
- Step 3: Identifying potential SAMA candidates.
- Step 4: Performing initial screening using Phase I SAMA assessment.
- Step 5: Performing final screening using Phase II SAMA assessment.
- Step 6: Performing any appropriate sensitivity studies.
- Step 7: Identifying conclusions and any potentially cost-effective SAMA candidates.

Step 1 is completed using the best available information during the environmental review, and from that information, a bounding maximum benefit is defined as prescribed in Step 2, as described in the 2026 NR GEIS (NRC 2026-TN12155). This maximum benefit can then be shown to demonstrate the adequacy of the AP1000 for severe-accident performance. Steps 3 through 7 are completed using information available from the AP1000 DCD. This approach is consistent with the SAMA approach submitted for the Kemmerer Power Station Unit 1 (TerraPower 2024-TN10896).

The maximum cost-benefit assessment applied for SAMAs uses baseline risk measures to calculate severe accident impacts across four areas: offsite exposure cost, offsite economic cost, onsite exposure cost, and onsite economic cost. The following descriptions of the severe accident impact calculations are based on the NRC-accepted methods found in NUREG/BR-0184 (NRC 1997-TN676). Multiplying the severe accident cost impacts for internal events by the external hazard multiplication factor provides the total cost of severe accident risk. Since this is the maximum benefit that a SAMA could achieve by eliminating all risks, it is the maximum. The maximum benefit is used in the Phase I screening process to eliminate SAMAs that are not cost-beneficial. If the estimated cost of implementing a SAMA exceeds this value, it is excluded from further analysis. It can also be used as a metric to indicate the potential for any SAMA to be cost-effective.

The cost-benefit analysis methods described in NEI 05-01 (NEI 2005-TN1978) were applied to PMN Units 1–4, including the development of a Level 3 PRA approach to calculate conditional offsite doses and property damage for each PRA source-term release category (RC). The MACCS (MELCOR Accident Consequence Code System) consequence code was used to develop an offsite consequence model based on the RC source terms, population, and site data, as well as MACCS input data, to obtain risk metrics, including population dose and financial impacts (Sandia 2025-TN13427).

These results are used to define the maximum benefit. The maximum benefit is compared with the expected costs of a hypothetical SAMA to illustrate a high likelihood that no SAMA will be found to be cost-effective. The subsections below describe the methodology and review for each conclusion.

3.11.2.1 Consequences from Severe Accidents

The NR GEIS found that the finding of small for severe accidents for radiological impacts is appropriate for large LWRs based on the analysis in the 2024 LR GEIS (NRC 2024-TN10161). As stated in Section I.4.1 of Appendix I of the NR GEIS, the 2024 LR GEIS can support, when appropriate, a finding of small for severe accidents conclusion for the NR GEIS. To leverage the 2024 LR GEIS approach, a new reactor design should develop the same risk metrics as the current large LWR fleet. The underpinnings of the large light water reactor severe accident mitigation stem from the Commission's regulatory framework for assessing severe accidents and their mitigation strategies. Results of these analyses can be extended to compute design- and site-specific values to be compared to the NR GEIS PPE values that are based on the LR GEIS.

In developing the 2024 LR GEIS, the staff reviewed information from SEISs (for initial license renewals and subsequent license renewals) completed since development of the 2013 LR GEIS and identified no new information or situations that would result in different impacts for this issue for either an initial license renewal or subsequent license renewal term. The 2013 LR GEIS considered developments in plant operation and accident analysis that could have changed the assumptions made in the 1996 LR GEIS concerning severe accident consequences (NRC 1996-TN288, NRC 2013-TN2654). The following analysis carries this out for the AP1000 at the PMN Units 1–4 site and considered the conclusions reached by the NRC in the 2013 LR GEIS, including those items listed in Table 3-24. A review of these items is provided, illustrating that the 2013 LR GEIS conclusion that the probability-weighted consequences from severe accidents remain SMALL is applicable to this study.

Table 3-24 Assessment of Severe Accident-Related Plant Developments for the Project Matador Nuclear Units 1–4 Project

Topic	Assessment
Internal Events Model	New information on the risks and environmental impacts of severe accidents caused by internal events indicates that pressurized water reactor (PWR) and boiling water reactor (BWR) core damage frequencies (CDFs) are generally comparable to or lower than those that underpinned the 1996 *Generic Environmental Impact Statement for License Renewal of Nuclear Plants* (LR GEIS) (NRC 1996-TN288). In some cases, these differences are significant (approaching one order of magnitude). Comparisons of population doses from newer assessments show a reduction in impact of 5 to 100 times compared to older assessments. This comparison identified an additional 2- to 4-fold risk reduction when the conservatism built into the 1996 LR GEIS values is removed. This would also mean that contamination of open bodies of water and economic impacts would, in most cases, be significantly less. Additionally, the likelihood of basemat melt-through accidents is less than that used in the analysis supporting the 1996 LR GEIS (NRC 2013-TN2654). The inclusion of passive systems, increased margins, and further reductions in CDF and large early release frequency (LERF) relative to those observed in the 2013 LR GEIS. The Westinghouse design-basis accident, CDF, and LERF are lower in frequency and consequences than those calculated for current-generation PWR designs.
Consideration of External Hazards	It is not possible to estimate the impacts of external hazards at this point in the design and siting process. NEI 05-01 (NEI 2005-TN1978) allows the use of a multiplication factor to address external hazards, and this is applied in the analysis to estimate the CDF and LERF contributions. The 1996 LR GEIS did not quantitatively account for severe accidents initiated by external hazards in its environmental impact assessment. When the environmental impacts of external hazards are considered, they can be comparable to those from internal events. This finding supports using the selected multiplication factor to account for external hazards when estimating the maximum benefit.
Source Term Modeling	More recent source-term information indicates that the timing of the dominant severe-accident sequences, as quantified in NUREG/CR-6295 (NRC 1997-TN7777), is comparable to that of the analysis that underpinned the 1996 LR GEIS. Due to the AP1000's design features, the release frequencies and fractions are estimated to be significantly lower. Thus, the environmental impacts used as the basis for the 1996 GEIS are higher than those estimated using more recent source-term information (NRC 2013-TN2654).
Power Uprates	No increases in power output are planned. Therefore, this topic does not affect the severe accident mitigation alternative (SAMA) calculation for maximum benefit and introduces no uncertainty.
Higher Fuel Burnup	No changes in fuel burnup are planned. Therefore, this topic does not affect the SAMA calculation for maximum benefit and introduces no uncertainty.
Consideration of Low Power and Shutdown Events	The environmental impacts of accidents at low power and during reactor shutdown conditions are generally comparable to those at full power, as shown by comparing the values in NUREG/CR-6143 (Sandia 1995-TN7783) and NUREG/CR-6144 (BNL 1995-TN7784) with those in NUREG-1150 (NRC 1990-TN525).

Topic	Assessment
	Even so, the 1996 LR GEIS estimates of the environmental impact of severe accidents bound the potential impacts from accidents at low power and reactor shutdown. Finally, as cited above and discussed in SECY-97-168, industry initiatives undertaken during the early 1990s have also contributed to improved safety for low-power and shutdown operations (NRC 1990-TN525, NRC 1993-TN8976, NRC 1997-TN13010). For Fermi America's Westinghouse AP1000 design, the maximum benefit calculation would bound the risk savings.
Consideration of Spent Fuel Pool (SFP) Accidents	The environmental impacts from accidents at SFPs (as quantified in NUREG-1738 [NRC 2001-TN5235]) can be comparable to those from reactor accidents at full power (as estimated in NUREG-1150 [NRC 1990-TN525]). Subsequent analyses and mitigative measures implemented since 2001 have further reduced the risk of this class of accidents. In addition, modifications in response to the Fukushima Dai-ichi accident have increased the robustness of the SFP systems. Conservative estimates of impacts from NUREG-1738 are much lower than those from full-power reactor accidents.
Use of BEIR VII Risk Coefficient	The use of newer risk coefficients, such as those in BEIR VII, is expected to have a small impact on the results presented in the 1996 LR GEIS (NRC 2013-TN2654). Plant-specific calculations for the Level 3 model use the biological effects of ionizing radiation and the BEIR III risk coefficients documented in NUREG-1150 (NRC 1990-TN525), Sample Case A. The use of newer risk coefficients, such as those in BEIR VII, as shown in the 2013 LR GEIS, is expected to have only a small impact on results compared to the 1996 LR GEIS (NRC 2013-TN2654).
Uncertainties	The impact and magnitude of uncertainties, as estimated in the 1996 LR GEIS, bound the uncertainties introduced by the new information and considerations (NRC 2013-TN2654). The uncertainty analyses performed are plant-specific sensitivities, and the comparison with the previous 1996 LR GEIS is not applicable.
SAMAs	The current state of development precludes review of SAMAs on a plant-specific basis. However, lessons learned from operating the current generation have been incorporated into the design process and, if cost-effective, would be incorporated. This includes the use of passive system design to decouple plant safety functions from the need for a sustained power supply.
Summary and Conclusion	Given the simplified, passive safety systems that require minimal action to operate for prolonged periods, a reduction in estimated environmental impacts is expected. This is believed to outweigh the increases from external hazards, power uprates, higher fuel burnup, low power, reactor shutdown risk, and SFP risk (NRC 2013-TN2654). For the Fermi AP1000 design, the development of maximum benefit, as defined in NEI 05-01, shows that the benefit from further plant improvements is low. It is expected that, upon assessment, none of the SAMA improvements will be retained for potential implementation.

The 2013 LR GEIS considered developments in plant operation and accident analysis that could have changed the assumptions made in the 1996 GEIS concerning severe accident consequences (NRC 1996-TN288; NRC 2013-TN2654). Developments considered and conclusions reached by the NRC in the 2013 LR GEIS include those itemized in Table 3-24. Consideration of these items was the basis for NRC's overall determination in the 2013 LR GEIS that probability-weighted consequences from severe accidents remain SMALL for all plants. Table 3-24 provides a summary of the items described in Sections 3.1 through 3.9,

Section 4.0, and Section 5.0 of the 2013 LR GEIS and supplements the information based on the PMN Units 1–4 design characteristics and supports the conclusion that the PMN Units 1–4 are consistent with the findings in the 2013 LR GEIS.

Although PMN Units 1–4 do not have a site-specific PRA, it is possible to estimate a bounding CDF using the AP1000 certified design PRA (Westinghouse 2011-TN261). This is combined with source-term information from available sources (Sargent & Lundy 2012-TN13523) to characterize each release category. The MACCS computer code model was developed to evaluate the potential offsite consequences of severe accidents. The MACCS code evaluates the consequences of atmospheric releases of radioactive material after a severe accident (Sandia 2025-TN13427). The pathways model includes exposure to the passing plume, exposure to radioactive material deposited on the ground and on skin, inhalation of material in the passing plume and of material resuspended from the ground, and ingestion of radioactively contaminated food and surface water. MACCS provides consequences in terms of human health, economic cost, and land area contamination. Human health figures of merit include both early and latent fatalities. Economic costs include the costs of relocation, decontamination, and other expenses. The land area affects the potential for residual radioactive contamination. The risk metrics used to support the development of the maximum benefit are summarized in Table 3-25. Table 3-26 provides a comparison with current-generation facilities and similar AP1000 applications to illustrate that the PMN Units 1–4 risk profile is like these designs.

Application of Step 2 of the guidance contained in NEI 05-01 (NEI 2005-TN1978) involves the development of a maximum benefit (MB) value. This value represents the removal of all risk contributions identified for the baseline plant. It represents the maximum possible improvement in risk, given the cost invested.

The MB is defined using the calculated public dose, environmental consequences, and replacement power costs. This value is used in the preliminary screening step to indicate the likelihood that a more detailed SAMA assessment could provide a cost benefit in terms of risk averted. A low MB indicates that potential SAMAs are unlikely to yield a cost-benefit reduction in risk. The key inputs of the analysis are outlined below:

- All onsite costs are estimated based on generic values provided in NEI 05-01 (NEI 2005-TN1978), as site-specific data is not available.
- An evaluation period of 40 years is applied as an initial indicator for SAMAs.
- Given the potential for an initial license renewal extending the license for 20 years, for a total of 60 years, an alternative SAMA evaluation was completed for 60 years.
- In estimating the replacement power cost, the electrical power of 1,000 MWe is used, and plant capacity is conservatively assumed to be 100 percent.
- Consistent with the offsite analysis, the conversion of onsite exposure to a monetary cost is performed using Revision 1 of NUREG-1530 (NRC 2022-TN12492).
- All costs are adjusted to current dollars using the Consumer Price Index Inflation Calculator (BLS 2021-TN12067).
- A baseline annual discount rate of 7 percent is used, along with a sensitivity discount rate of 3 percent.

Table 3-27 presents the results of the SAMA.

Table 3-25 Mean Environmental Risks from AP1000 Reactor Severe Accidents at the Project Matador Nuclear Units 1–4 Site

Release Category	Core Damage Frequency (/Ryr)	Population Dose (rem/Ryr)	Early Fatalities (/Ryr)	Latent Fatalities (/Ry)	Cost ($/Ryr)	Land Requiring Decontamination (ac/Ryr)	Population Dose from Water Ingestion (p-rem/Ryr)
CFI	1.89×10^{-10}	2.85×10^{-4}	7.48×10^{-12}	9.30×10^{-8}	3	1.69×10^{-4}	6.56×10^{-8}
CFE	7.47×10^{-9}	1.64×10^{-2}	8.37×10^{-9}	6.69×10^{-14}	111	6.63×10^{-3}	8.22×10^{-7}
IC	2.21×10^{-7}	4.33×10^{-3}	0	0	4	1.18×10^{-4}	3.01×10^{-8}
BP	1.05×10^{-8}	3.55×10^{-2}	3.49×10^{-9}	9.86×10^{-4}	163	8.15×10^{-3}	4.00×10^{-6}
CI	1.33×10^{-9}	8.46×10^{-3}	1.28×10^{-8}	1.29×10^{-4}	20	1.18×10^{-3}	4.03×10^{-7}
CFL	3.45×10^{-13}	1.37×10^{-7}	0	7.35×10^{-11}	0	1.49×10^{-7}	1.01×10^{-11}
Total	2.40×10^{-7}	6.50×10^{-2}	2.47×10^{-8}	1.78×10^{-3}	300	1.62×10^{-2}	5.32×10^{-6}

BP = containment bypass; CFE = early containment failure; CFI = intermediate containment failure; CFL = late containment failure; CI = containment isolation failure; IC = intact containment.

Table 3-26 Comparison of Environmental Risk for an AP1000 Reactor at Project Matador Nuclear Units 1–4 Site with Risks for Current Generation Reactors Evaluated by NUREG-1150 (NRC 1990-TN525) and the AP1000 at Early Permit Sites

Site	Core Damage Frequency (/Ryr)	50 mi Population Dose (person-rem/Ryr)	Early Fatalities (/Ryr)	Latent Fatalities (/Ryr)	Average Individual Early Fatality Risk per Ryr	Average Individual Latent Cancer Fatality Risk per Ryr
AP1000—PMN	2.4×10^{-7}	6.5×10^{-2}	2.47×10^{-8}	1.7×10^{-3}	1.2×10^{-9}	2.9×10^{-8}
Grand Gulf	4.0×10^{-6}	5.0×10	8.0×10^{-9}	9.0×10^{-4}	3.0×10^{-11}	3.0×10^{-10}
Peach Bottom	4.5×10^{-6}	7.0×10^{2}	2.0×10^{-8}	5.0×10^{-3}	5.0×10^{-11}	4.0×10^{-10}
Sequoyah	5.7×10^{-5}	1.0×10^{3}	3.0×10^{-5}	1.0×10^{-2}	1.0×10^{-8}	1.0×10^{-8}
Surry	4.0×10^{-5}	5.0×10^{2}	2.0×10^{-6}	5.0×10^{-3}	2.0×10^{-8}	2.0×10^{-9}
Zion	3.4×10^{-4}	5.0×10^{3}	4.0×10^{-5}	2.0×10^{-2}	9.0×10^{-9}	1.0×10^{-8}
AP1000—Turkey Point	2.4×10^{-7}	2.7×10^{-1}	3.2×10^{-7}	1.8×10^{-4}	2.0×10^{-10}	2.6×10^{-12}
AP1000—North Anna	2.4×10^{-7}	8.3×10^{-2}	1.2×10^{-10}	4.0×10^{-5}	2.6×10^{-13}	4.9×10^{-11}
AP1000—Clinton	2.4×10^{-7}	2.2×10^{-2}	1.4×10^{-8}	1.2×10^{-6}	6.4×10^{-13}	5.5×10^{-11}
AP1000—Vogtle	2.4×10^{-7}	2.8×10^{-2}	1.9×10^{-10}	1.9×10^{-5}	1.6×10^{-12}	1.1×10^{-11}
AP1000—Grand Gulf	2.4×10^{-7}	1.4×10^{-2}	1.0×10^{-12}	6.9×10^{-6}	1.0×10^{-14}	2.0×10^{-11}

Clinton = Clinton Power Station; Grand Gulf = Grand Gulf Nuclear Station; North Anna = North Anna Power Station; Peach Bottom = Peach Bottom Atomic Power Station; PMN = Project Matador Nuclear; Sequoyah = Sequoyah Nuclear Plant; Surry = Surry Power Station; Turkey Point = Turkey Point Nuclear Plant; Vogtle = Vogtle Electric Generating Plant; Zion = Zion Nuclear Power Station.

Table 3-27 Maximum Severe Accident Mitigation Alternative Benefits

Source	Description	7% Discount (40-Year Lifetime)	3% Discount (40-Year Lifetime)	7% Discount (60-Year Lifetime)	3% Discount (60-Year Lifetime)
APE	Averted Public Exposure	$6,366.00	$11,053.00	$6,677.00	$13,202.00
AOC	Averted Offsite Property Damage	$4,029.00	$6,994.00	$4,225.00	$8,354.00
AOE	Averted Occupational Exposure	$416.00	$840.00	$436.00	$1,003.00
AOSC	Averted Onsite Costs	$19,392.00	$27,808.00	$22,902.00	$40,924.00
TAC	Total Averted Costs	$30,203.00	$46,695.00	$34,240.00	$63,483.00

The TAC represents MB and is $30,203 and $46,695 at annual discount rates of 7 and 3 percent, respectively. The 60-year sensitivity case, which assumes a single 20-year licensing extension, calculated the MB as $34,240 and $63,483 at annual discount rates of 7 and 3 percent, respectively.

3.11.3 Severe Accident Mitigation Alternatives

The analysis follows the prescribed methodology and calculates the MB based on a bounding analysis. Based on this assessment, the MB to be obtained if all risks were removed is $34,240. The generic severe accident mitigation design alternative (SAMDA) analysis conducted for the AP1000 design certification (Westinghouse 2011-TN261) identified the generic MB as $21,000. This is 31 percent lower than the calculated MB for PMN. The generic SAMDA assessment identified the following:

> Only one design alternative in Table 5-22—the self-actuating containment isolation valves—has a cost ($33,000) comparable to the maximum attainable benefit. To evaluate the benefit of this SAMDA, the design change was assumed to eliminate the Containment Isolation severe accident release category, which is only a small contributor to the total CDF. Therefore, this design alternative provides almost no benefit in reducing the AP1000 CDF.

A similar assessment was conducted using the PMN Units 1–4 site results. The containment-isolation severe-accident release category accounts for 6.6 percent of the release frequency. This equates to $1,993 in risk savings. Further, the estimated cost of the identified SAMDA alternative was based on 2011 dollars and should be adjusted for inflation, such that the current value would be higher, further strengthening the position that it is not justified. These results suggest that no SAMA implementation will be cost-effective.

3.11.4 Summary of Postulated Accident Impacts

The environmental impacts from DBAs and severe accidents for PMN Units 1–4 are found to fall below the ranges reported in assessments of current light-water reactor designs (Table 3-28).

The estimated MB of $34,240, combined with the low risk, indicates that the environmental impacts from a postulated accident are SMALL and that no mitigation measures are warranted.

Table 3-28 Comparison of 50 mi Population Doses of the AP1000 at Project Matador Nuclear Units 1–4 Site to Current Plants

Study	Severe Accident Frequency (per reactor year)	50 mi Population Dose Risk (person-rem per reactor year)
Current Reactor Maximum[(a)]	2.4×10^{-4}	69
Current Reactor Mean[(a)]	3.1×10^{-5}	15
Current Reactor Median[(a)]	2.5×10^{-5}	13
Current Reactor Minimum[(a)]	1.9×10^{-6}	0.55
AP1000[(b)] Reactor at the Vogtle Site	2.4×10^{-7}	2.8×10^{-4}
AP1000—PMN	2.4×10^{-7}	6.5×10^{-2}

MACCS = MELCOR Accident Consequence Code System; PMN = Project Matador Nuclear.
(a) Based on MACCS calculations for over 70 current plants at over 40 sites.
(b) Values from Table 5.17 of NUREG-1872 (NRC 2008-TN673).

3.12 Uranium Fuel Cycle Impacts

This section addresses the environmental impacts from the uranium fuel cycle of the four AP1000 PMN Units 1–4. The review team evaluated previous environmental documents and analyses with regard to uranium fuel cycle and the transportation of fuel and waste with the relevance to potential environmental effects of the proposed Federal actions.

Portions of the following documents are incorporated by reference in this document to support the review team's uranium fuel cycle significance effects determination:

- 2024 LR GEIS, Section 4.14.1.1, Background on Uranium Fuel Cycle Facilities (NRC 2024-TN10161)
- 2014 Continued Storage GEIS (NRC 2014-TN4117)
- NUREG-2266, *Environmental Evaluation of Accident Tolerant Fuels with Increased Enrichment and Higher Burnup Levels* Sections 2, "Uranium Fuel Cycle" and Section 3, Transportation" (NRC 2024-TN10333)

A brief summary of the material incorporated by reference along with the relevance to the current environmental review are provided in the discussion that follows.

With respect to the generic analysis in the 2026 NR GEIS (TN12155), Section 3.14.1.5 is incorporated by reference.

The discussion below demonstrates that the following relevant PPE and SPE values and associated assumptions from the NR GEIS are met and confirms that no new and significant information exists on impacts bounded by Table S-3 of the 10 CFR Part 51 (TN10253).

As presented in 10 CFR 51.51(a) (TN10253), a light-water-cooled nuclear power reactor can use Table S-3, "Table of Uranium Fuel Cycle Environmental Data," as the basis for uranium fuel cycle environmental effects. Table S-3 was originally developed based on WASH-1248 (AEC 1974-TN23) and NUREG-0116 (*Environmental Survey of the Reprocessing and Waste Management Portion of the LWR Fuel Cycle: A Task Force Report*) (NRC 1976-TN292), based on a reference 1,000 MW LWR with an average fuel burnup of 33 gigawatt-days per metric ton of uranium (GWd/MTU). Further, the environmental data of Table S-3 is applied to LWRs that use uranium dioxide (UO_2) fuel. The NRC staff evaluated the environmental impacts of increased enrichment and higher burnup levels in NUREG-2266 (NRC 2024-TN10333) and

concluded that the values provided in Table S-3 would still be bounding as long as the enrichment of the unirradiated fuel is 10 percent or less and the assembly average burnup of the spent fuel is 80 GWd/MTU or less.

AP1000 reactors utilize standard 17 × 17 fuel assemblies, enriched up to 5 weight percent (wt%) uranium-235 (U-235) (Westinghouse 2011-TN261). PMN Units 1–4 use UO_2 fuel and would not exceed 62 GWd/MTU; therefore, Table S-3 is applicable for assessing the environmental impact for the PMN application.

The NRC staff evaluated environmental impacts in the 2026 NR GEIS (NRC 2026-TN12155) addressing the potential impacts of 122 issues that are common to new nuclear reactors. The uranium fuel cycle impacts are identified as a Category 1 in the 2026 NR GEIS. Category 1 issues are those environmental issues for which the NRC has been able to make a generic finding for adverse environmental impacts. In the 2026 NR GEIS, NRC made generic findings for uranium fuel cycle issues, wherein it was determined that new reactor fuel cycles will have small environmental impacts. The rationale for the conclusions included that Table S-3 is expected to bound the impacts for new nuclear reactor fuels, because current LWRs are using nuclear fuel more efficiently due to higher levels of fuel burnup resulting in less demand for mining and milling activities, uranium conversion and enrichment activities, and fewer discharged fuel assemblies. The fuel cycle impacts of new LWRs as well as advanced reactors reflect improved fuel cycle technologies, improved reactor technologies, and waste and spent fuel inventories that are not significantly different from what has been considered for LWR evaluations with respect to hazardous radionuclides.

As presented above, the values in Table S-3 are applicable to the fuel type and enrichment for the proposed PMN Units 1–4. In addition, this EIS incorporates Section 3.14 of the NR GEIS (NRC 2026-TN12155) related to fuel cycle by reference as applicable. The NR GEIS fuel cycle conclusion of small is based on the PPE assumptions related to fuel cycle changes since the publication of WASH-1248 (AEC 1974-TN23) included increasing the use of in situ leach uranium mining, transitioning of U.S. uranium enrichment technology from gaseous diffusion to gas centrifugation, current LWRs are using nuclear fuel more efficiently due to high levels of fuel burnup, and less reliance on coal-fired electrical generation plants. Comparing the energy source information published in the NR GEIS to current information indicates the trend identified in the NR GEIS of the United States relying less on fossil fuel energy sources (DOE/EIA-TN10133). The NR GEIS concludes that fuel cycle impacts for new reactors will be small as the impacts are likely to be less than or comparable to those of current LWRs and those discussed in Table S-3 of the 10 CFR Part 51.

Furthermore, PMN Units 1–4 are Westinghouse AP1000 LWRs that have been previously approved by the NRC for use at other sites including Vogtle Units 3 and 4 ESP Final EIS (NUREG-1872) (NRC 2008-TN673), V.C. Summer Units 2 and 3 COL FEIS (NUREG-1939) (NRC 2011-TN1723), and Turkey Point Units 6 and 7 COL FEIS (NUREG-2176) (NRC 2016-TN6434). In each EIS, the staff has evaluated the environmental impacts of the uranium fuel cycle and concluded that the impacts of the uranium fuel cycle for the multiple reactor plants would be SMALL. This EIS incorporates the uranium fuel cycle evaluations in NUREG-1872, NUREG-1939, and NUREG-2176 by reference as applicable.

The uranium fuel cycle impacts from operation of PMN Units 1–4 are expected to be similar to the uranium fuel cycle impacts described in the previous AP1000 ESP/COL applications.

Table S-3 values are based on a reference 1,000 MWe LWR operating at 80 percent capacity factor. Each AP1000 has a net electric output of approximately 1,100 MWe. The assumed capacity factor is 95 percent. This assumption is based on an average operating capacity of approximately 95 percent for the current LWR fleet (NRC 2024-TN10333). Therefore, a scaling factor of 1.3 can be applied to the values in Table S-3, based on (1,100)(0.95)/(1,000)(0.80) = 1.3 for an AP1000 unit at PMN on a per reactor basis.

Table S-3 contains natural resource use including land use and water consumption. The values in Table S-3 are based on a reference 1,000 MWe LWR operating at an annual capacity factor of 80 percent. As discussed above, a conservative scaling factor of 1.3 can be applied to the Table S-3 land use and water consumption values for each PMN reactor. The values for the reference reactor and a single PMN reactor applying the conservative scaling factor are shown in Table 3-29.

As discussed in Section 3.14.1.5 of the NR GEIS, many of the nuclear fuel cycle facilities and processes assessed for Table S-3 still exist today. However, some have undergone several industrial developments and technological advances that have significantly reduced their environmental effects. Specifically, the transitioning of U.S. uranium enrichment technology from gaseous diffusion to gas centrifugation, ensures that only a fraction of the electrical energy per separation unit is used compared to that for gaseous diffusion. An additional reduction in environmental impacts results from reduced coal electrical generation in the United States, as the gaseous-diffusion plants under the WASH-1248 analysis relied on electricity derived mainly from the burning of coal. The information from Section 3.14.1.5 of the NR GEIS is incorporated here by reference. Therefore, the actual environmental impacts for a PMN AP1000 could be significantly less than (e.g., potentially less than 10 percent of the value mentioned in the Table S-3) for several of the quantities (e.g., nonradioactive liquid and gaseous effluent values) as shown in Table 3-29.

Table 3-29 Comparison of Uranium Fuel Cycle Environmental Impact for Construction of AP1000s at the Project Matador Nuclear Site

Environmental Considerations	Reference Reactor (800 MWe Normalized)	PMN AP1000 (1,045 MWe Normalized)
Land (ac)—Temporarily committed	100	130
Temporarily committed land—Undisturbed area	79	103
Temporarily committed land—Disturbed area	22	29
Land—Permanently committed	13	17
Land—Overburden moved (millions of metric ton [MT])	2.8	3.7
Water (millions of gallons)—Discharged to air	160	210
Water (millions of gallons)—Discharged to water bodies	11,090	15,000
Water (millions of gallons)—Discharged to ground	127	170
Total (Water)	11,377	15,000
Fossil Fuel—Electrical energy (thousands of MW-hour)	323	420
Fossil Fuel—Equivalent coal (thousands of MT)	118	160
Fossil Fuel—Natural gas (millions of standard cubic feet [scf])	135	180
Effluent gases (including entrainment)—sulfur oxide (SO_x)	4,400	5,800
Effluent gases (including entrainment)—nitrogen oxide (NO_x)	1,190	1,600
Effluent gases (including entrainment)—hydrocarbons	14	19

Environmental Considerations	Reference Reactor (800 MWe Normalized)	PMN AP1000 (1,045 MWe Normalized)
Effluent gases (including entrainment)—carbon monoxide (CO)	29.6	40
Effluent gases (including entrainment)—particulates	1,154	1,500
Effluent gases—Other Gases—fluorine (F)	0.67	0.90
Effluent gases—Other Gases—hydrogen chloride (HCl)	0.014	0.019
Effluent Liquids—Sulfate (SO^{4-})	9.9	13
Effluent Liquids—Nitrate (NO^{3-})	25.8	34
Effluent Liquids—Fluoride	12.9	17
Effluent Liquids—Calcium (Ca^{++})	5.4	7
Effluent Liquids—Chloride (Cl^{-})	8.5	11
Effluent Liquids—Sodium (Na^{+})	12.1	16
Effluent Liquids—Ammonia (NH_3)	10	13
Effluent Liquids—Iron (Fe)	0.4	0.52
Effluent Liquids—Tailing solutions (thousands of MT)	240	320
Solids	91,000	120,000
Effluents—Radiological (curies) from Radon-222 (Rn-222) (including entrainment)[a]	-	-
Effluents—Radiological (curies) from Radium-226 (Ra-226) (including entrainment)	0.02	0.027
Effluents—Radiological (curies) from Thorium-230 (Th-230) (including entrainment)	0.02	0.027
Effluents—Radiological (curies) from Uranium (including entrainment)	0.034	0.045
Effluents—Radiological (curies) from Tritium (thousands) (including entrainment)	18.1	24
Effluents—Radiological (curies) from Carbon-14 (C-14) (including entrainment)	24	32
Effluents—Radiological (curies) from Krypton-85 (Kr-85) (thousands) (including entrainment)	400	520
Effluents—Radiological (curies) from Ruthenium-106 (Ru-106) (including entrainment)	0.14	0.19
Effluents—Radiological (curies) from Iodine-129 (I-129) (including entrainment)	1.3	1.7
Effluents—Radiological (curies) from Iodine-131 (I-131) (including entrainment)	0.83	1.1
Effluents—Radiological (curies) from Technetium-99 (Tc-99) (including entrainment)(a)	-	-
Effluents—Radiological (curies) from Fission products and transuranic (TRU) (including entrainment)	0.203	0.27
Liquids—Uranium and daughters	2.1	2.8
Liquids—Ra-226	0.0034	0.0045
Liquids— Th-230	0.0015	0.0020
Liquids—Thorium-234 (Th-234)	0.01	0.013
Liquids—Fission and activation products	5.9×10^{-6}	7.7×10^{-6}

Environmental Considerations	Reference Reactor (800 MWe Normalized)	PMN AP1000 (1,045 MWe Normalized)
Solids (buried)—Not high level waste (HLW) (shallow)	11,300	15,000
Solids (buried)—TRU and HLW (deep)	1.1×10^6	1.5×10^6
Effluents – thermal (billions of British thermal units [Btu])	4,063	5,300
Transportation Dose (person-rem) Solids (buried)—Exposure of workers and general public	2.5	3.3
Transportation Dose (person-rem) Solids (buried)—Occupational exposure	22.6	30

"-" denotes no data in table cells.
(a) Presently under reconsideration by the U.S. Nuclear Regulatory Commission.

The values presented in Table 3-29 for the PMN Units 1–4 were scaled directly from Table S-3 of 10 CFR Part 51 and do not include any of the improvements in the fuel cycle since the publication of WASH-1248 in 1973. The impacts from the uranium fuel cycle from PMN Units 1–4 are expected to be less than projected in Table 3-29 because of the changes to fuel cycle practices that are also cited in the NR GEIS including increase in the use of in situ leach uranium mining, transitioning of U.S. uranium enrichment technology from gaseous diffusion to gas centrifugation, current LWRs using nuclear fuel more efficiently due to high levels of fuel burnup, and less reliance on coal-fired electrical generation plants.

The review team concludes that the expected impacts from PMN Units 1–4 uranium fuel cycle would be SMALL, similar to the NR GEIS, as the impacts are likely to be less than or comparable to those of current LWRs and those discussed in Table S-3.

3.12.1 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, reasonably foreseeable projects considered for this EIS include ongoing and future Project Matador activities. Interrelated effects related to the uranium fuel cycle could result from other nuclear units (such as small modular reactors) at Project Matador if licensed and constructed. These activities would be subject to applicable regulations concerning the radioactive materials.

3.12.2 Impacts from Decommissioning PMN Units 1–4

As noted above, the AP1000 uses an LWR fuel type that is used in currently operating reactors (i.e., the two AP1000 units at the Vogtle site). The storage and transportation of LWR fuel after the end of the licensed life for operations of a nuclear reactor and before final disposal in a permanent repository is described in the 2014 Continued Storage GEIS (NRC 2014-TN4117). The AP1000 reactors at the Matador site use an LWR fuel type that is addressed in the 2014 Continued Storage GEIS. Therefore, the impacts determined in the 2014 Continued Storage GEIS are applicable, are bounding for PMN Units 1–4 and are incorporated by reference (see 10 CFR 51.23(b)).

A reactor in decommissioning would not require nuclear fuel, thus only the radioactive waste management portion of the uranium fuel cycle would be applicable for considering environmental impacts during decommissioning. The environmental impacts due to decommissioning activities were previously evaluated in the 2002 Decommissioning GEIS (NRC 2002-TN665). However, the NRC staff concluded activities performed at facilities that are

separately licensed or regulated such as management of spent nuclear fuel following decommissioning and disposal of LLW at an offsite facility as out of scope for consideration of the impacts due to decommissioning.

3.12.3 Summary of Reasonably Foreseeable Environmental Effects

NRC has evaluated the uranium fuel cycle effects for several AP1000 reactor projects and compared it to Table S-3, “Table of Uranium Fuel Cycle Environmental Data” of 10 CFR Part 51. Based on the above analysis, the review team concludes that the expected impacts from PMN Units 1–4 uranium fuel cycle are likely to be less than or comparable to those of current LWRs and those discussed in Table S-3. This conclusion is based upon the above analysis and is supported by incorporation of the 2026 NR GEIS, Section 3.14 by reference. The review team concludes that the potential direct and indirect environmental impacts of the proposed action from the uranium fuel cycle would be SMALL.

3.13 Transportation of Radioactive Material

The environmental impacts of transportation of fuel and waste to and from the reactor, with respect to normal conditions of transport and possible accidents in transport, are as set forth in Table S-4, “Environmental Impact of Transportation of Fuel and Waste to and from One Light Water Cooled Nuclear Power Reactor” in 10 CFR 51.52 (TN251).

In accordance with 10 CFR 51.52(a), a full description and detailed analysis of the transportation impacts are not required when licensing an LWR, if the reactor meets the following criteria:

- The reactor has a core power level that does not exceed 3,800 MWt.
- The reactor fuel is in the form of sintered UO_2 pellets having uranium-235 (U-235) enrichment not exceeding 4 wt%, and pellets are encapsulated in zirconium alloy-clad fuel rods.
- The average level of irradiation of fuel from the reactor does not exceed 33,000 megawatt-days per metric ton, and no irradiated fuel assembly is shipped until at least 90 days after it is discharged from the reactor.
- With the exception of irradiated fuel, all radioactive waste shipped from the reactor is packaged and in solid form.
- Unirradiated fuel is shipped to the reactor by truck; irradiated fuel is shipped from the reactor by truck, railcar, or barge; and radioactive waste, other than irradiated fuel, is shipped from the reactor by truck or railcar.

The NRC reevaluated the transportation issues and the adequacy of Table S-4 in the 2026 NR GEIS (NRC 2026-TN12155). The NR GEIS points to the reevaluation of the transportation issues and the adequacy of Table S-4 in NUREG-2266 (NRC 2024-TN10333). The NRC concluded that the values provided in Table S-4 would still be bounding as long as

- The enrichment of the unirradiated fuel is 8 percent or less.
- The burnup of the spent fuel is 80 GWd/MTU or less.

The PMN Units 1–4 are AP1000 reactors utilizing standard 17 × 17 fuel assemblies, with UO_2 fuel pellets enriched up to 5 wt% U-235 encapsulated in zirconium alloy-clad fuel rods. The core

size is 157 fuel assemblies rated at 3,400 MWt as listed in Table 4.1-1 of the AP1000 Design Control Document (DCD) (Westinghouse 2011-TN261). The maximum amount of dry waste to be shipped from each unit meets the requirement listed in Table 11.4-1 of the AP1000 DCD (Westinghouse 2011-TN261).

NRC staff evaluated radiological transportation impacts in the 2026 NR GEIS Table 4-1 (NRC 2026-TN12155) and issued a generic finding of SMALL adverse environmental impacts assuming the shipment distances used in evaluating previous COLAs were not exceeded. An applicant may refer to 2026 NR GEIS without further analysis if the transportation of fuel and waste expected for the proposed units are bounded by the relevant inputs and assumptions used by NRC in the 2026 NR GEIS analysis. These relevant inputs and assumptions are based on other new reactor COL applications, both AP1000s and other reactor types, approved by the NRC. The following subsections discuss the transportation parameters and estimated impacts for PMN Units 1–4 as compared to previous AP1000 COL evaluations including

- Vogtle Units 3 and 4 COL (NRC 2011-TN6439)
- V.C. Summer Units 2 and 3 COL (NRC 2011-TN1723)
- Levy Units 1 and 2 COL (NRC 2012-TN1976)
- William States Lee Units 1 and 2 COL (NRC 2013-TN6435)
- Turkey Point Units 6 and 7 COL (NRC 2016-TN6434)

An evaluation of the environmental impact associated with transportation of unirradiated fuel, radioactive waste, and irradiated fuel are presented in the following sections.

3.13.1 Future Environmental Setting and Planned Actions

As discussed in Section 1.3.5, reasonably foreseeable projects considered for this EIS include ongoing and future Project Matador activities. Interrelated effects due to the transportation of radioactive material could result from other nuclear units (such as small modular reactors) at Project Matador if licensed and constructed. These activities would be subject to applicable regulations concerning the transportation of radioactive materials.

3.13.2 Transportation of Unirradiated Fuel

3.13.2.1 Normal Conditions

Normal conditions, sometimes referred to as “incident-free” transportation, are transportation activities during which shipments reach their destination without releasing any radioactive material to the environment (i.e., not being involved in a vehicular accident). Past studies including NUREG-2125, *Spent Fuel Transportation Risk Assessment, Final Report* (NRC 2014-TN3231) have concluded that the largest impacts would occur for shipments made by trucks due to a larger number of shipments that would occur versus rail shipments. These impacts would have a larger exposure population due to existing travel densities on U.S. roadways.

The EIS for Vogtle Units 3 and 4 ESP Application, NUREG-1872 (NRC 2008-TN673), Volume 1, Table 6-3, shows the number of shipments per reactor unit. Similarly, in the EIS for Turkey Point Units 6 and 7 COLA, NUREG-2176 (NRC 2016-TN6434), Volume 1, Table 6-3 and in the EIS for V.C. Summer Units 2 and 3 COLA, NUREG-1939 (NRC 2011-TN1723), Volume 1, Table 6-3, the number of shipments per reactor is shown.

In all three EISs mentioned above, the number of normalized annual shipments is five for a two AP1000 unit site. This number is directly applicable to the Project Matador Campus.

The applicant is planning to use fuel from Westinghouse Electric Company LLC, which is manufactured at its Columbia Fuel Fabrication Facility located in South Carolina. The distance between the Project Matador Campus and the Columbia Fuel Fabrication Facility is approximately 1,300 mi, which is bounded by the one-way shipping distances for other proposed AP1000 sites (3,200 km) as shown in the 2026 NR GEIS (NRC 2026-TN12155), Table 3-11.

The radiological impacts under normal conditions of transporting unirradiated fuel for the previous AP1000 EISs are provided in the 2026 NR GEIS (NRC 2026-TN12155), Table 3-12, which is incorporated by reference. The total shipment distance is based on the number of annual shipments multiplied by the shipping distance. The maximum estimate of annual total one-way shipment distance (59,160 km) shown in the 2026 NR GEIS, Table 3-11, would bound PMN Units 1–4 (21,000 km). The highest dose values from other AP1000 sites (as calculated for Lee Units 1 and 2) can conservatively be multiplied by 2 to estimate the impacts for the Project Matador Campus. The estimated impacts to the Project Matador Campus are well within the maximum estimates provided in the last row of Table 3-11 in the 2026 NR GEIS as shown below in Table 3-30.

Table 3-30 Radiological Impacts Under Normal Conditions of Transporting Unirradiated Fuel

Site	Impacts on Workers (person-rem/yr)	Impacts on Public Onlookers (person-rem/yr)	Impact on Public Along Route (person-rem/yr)	Reference
Vogtle Electric Generating Plant Units 3 and 4	0.0085	0.015	0.00021	(NRC 2008-TN673)
Virgil C. Summer Nuclear Station Units 2 and 3	0.0085	0.018	0.00025	(NRC 2011-TN1723)
Levy Nuclear Plant Units 1 and 2	0.0031	0.0076	0.00029	(NRC 2012-TN1976)
William States Lee III Nuclear Station Units 1 and 2	0.012	0.021	0.00029	(NRC 2013-TN6435)
Turkey Point Nuclear Generating Units 6 and 7	0.0090	0.018	0.00025	(NRC 2016-TN6434)
NUREG-2266	0.0634	0.340	0.0013	(NRC 2024-TN10333)
Project Matador Nuclear Units 1–4	0.012	0.021	0.00029	-
Maximum Estimate	0.0634	0.340	0.0029	(NRC 2026-TN12155)

"-" denotes no data in the table cell.

3.13.2.2 Transportation Accidents

In Section 3.15.1.7.2 of the 2026 NR GEIS (NRC 2026-TN12155), the NRC asserts that the impacts of radiological accidents during transport of unirradiated fuel to a new reactor site are expected to be smaller than those listed in Table S-4 in 10 CFR 51.52.

Nonradiological impacts include the projected numbers of traffic accidents, injuries, and fatalities that could result from shipments of unirradiated fuel to the site and return shipments of empty containers from the site. The nonradiological impacts from transporting unirradiated fuel in the previous AP1000 EISs are provided in the 2026 NR GEIS, Table 3-13, which is incorporated by reference (NRC 2026-TN12155). The highest accident, injury, and fatality values from other AP1000 units (as calculated for Lee, Units 1 and 2) (NRC 2013-TN6435) can be used to estimate the impacts on the Project Matador Campus. The estimated impacts on the Project Matador Campus are well within the maximum estimates provided in the last row of Table 3-13 in the 2026 NR GEIS as shown in Table 3-31.

Table 3-31 Nonradiological Impacts of Transporting Unirradiated Fuel

Site	Accidents per Year	Injuries per Year	Fatalities per Year	Reference
Vogtle Electric Generating Plant, Units 3 and 4	0.0090	0.0061	0.00029	(NRC 2008-TN673)
Virgil C. Summer Nuclear Station Units 2 and 3	0.015	0.0074	0.00046	(NRC 2011-TN1723)
Levy Nuclear Plant Units 1 and 2	0.0069	0.0038	0.00031	(NRC 2012-TN1976)
William States Lee III Nuclear Station Units 1 and 2	0.018	0.0090	0.00056	(NRC 2013-TN6435)
Turkey Point Nuclear Generating Units 6 and 7	0.015	0.0074	0.00046	(NRC 2016-TN6434)
NUREG-2266	0.0138	0.00534	0.00046	(NRC 2024-TN10333)
Project Matador Nuclear Units 1–4	0.018	0.0090	0.0056	-
Maximum Estimate	0.14	0.035	0.0018	(NRC 2026-TN12155)

"-" denotes no data in table cell.

3.13.3 Transportation of Radioactive Waste

This section assesses the LLW generated at a new reactor site that would be stored on site, either until it has decayed away and can be disposed of as ordinary trash, or until amounts are large enough for shipment to an LLW disposal facility in packages authorized by the NRC. The 2026 NR GEIS (NRC 2026-TN12155) asserts that the characteristics of LLW from an AP1000 reactor are expected to be the same as that generated by the current LWR fleet. The amount of LLW for an AP1000 reactor is likely to be less than that generated by the current LWR fleet because of the reactor design and operation.

In the 2026 NR GEIS, Table 3-14, a summary of radioactive waste shipments and one-way shipping distances including information for previous AP1000 EISs is presented (NRC 2026-TN12155). Table 3-14 is expressed on a per unit basis; therefore, the annual waste generation per unit, the number of radioactive waste shipments, and the one-way shipping distance for the AP1000 reactor sites are directly applicable to the PMN Units 1–4 such that the annual waste volume from PMN Units 1–4 is expected to be bounded by the annual total waste by volume provided in the 2026 NR GEIS, Table 3-15.

In the 2026 NR GEIS, Table 3-17 contains a summary of annual nonradiological impacts of transporting radioactive waste from the site (NRC 2026-TN12155). The annual total round-trip shipment distance is presented per reactor. The highest value of the shipment distance, accidents per year, injuries per year, and fatalities per year from other AP1000 sites (as

calculated for Turkey Point Units 6 and 7) can be used to obtain an estimate of the impacts for the Project Matador Campus. The estimated impacts to PMN Units 1–4 are well within the maximum estimates provided in the last row of Table 3-17 in the 2026 NR GEIS as shown in Table 3-32.

Table 3-32 Annual Nonradiological Impacts of Transporting Radioactive Waste from the Project Matador Campus

Site	Annual Total Round-Trip Shipment Distance (km)	Accidents per Year	Injuries per Year	Fatalities per Year	Reference
Vogtle Electric Generating Plant Units 3 and 4	33,600	0.0095	0.0065	0.00031	(NRC 2008-TN673)
Virgil C. Summer Nuclear Station Units 2 and 3	33,600	0.016	0.0078	0.00049	(NRC 2011-TN1723)
Levy Nuclear Plant Units 1 and 2	33,600	0.016	0.0078	0.00049	(NRC 2012-TN1976)
William States Lee III Nuclear Station Units 1 and 2	33,600	0.016	0.0078	0.00049	(NRC 2013-TN6435)
Turkey Point Nuclear Generating Units 6 and 7	36,800	0.017	0.0085	0.00053	(NRC 2016-TN6434)
Project Matador Nuclear Units 1–4	36,800	0.017	0.0085	0.00053	-
Maximum Estimate	293,145	0.17	0.11	0.0060	(NRC 2026-TN12155)

"-" denotes no data in table cell.

3.13.4 Transportation of Irradiated Fuel

3.13.4.1 Normal Conditions

This section discusses the radiological and nonradiological environmental impacts from the potential shipments of irradiated fuel for normal operating (incident-free) conditions and transportation accidents.

For the purposes of this transportation analysis, the review team considered the proposed Yucca Mountain site for deep geologic disposal of spent nuclear fuel in Nevada as a surrogate destination. The NRC has not made a licensing decision about the DOE's application for the proposed deep geologic repository at Yucca Mountain. However, the review team considers an estimate of the impacts of the transportation of spent nuclear fuel to a possible repository in Nevada to be a reasonable bounding estimate of the transportation impacts on a Federal spent nuclear fuel staging or disposal facility because of the distances involved and the representativeness of the distribution of members of the public in urban, suburban, and rural areas (i.e., population distributions) along the shipping routes.

In the 2026 NR GEIS, Table 3-18 contains a summary of incident-free impacts for shipping irradiated fuel to the Yucca Mountain site. The annual total one-way shipment distance is based on the number of normalized annual shipments multiplied by the shipping distance. The Project Matador Campus is roughly 1,770 km (1,100 mi) away from the Yucca Mountain site. Assuming

an average of 45 annual shipments (average of number of shipments at Vogtle, V.C. Summer, Levy, Lee, and Turkey Point number [(40 + 46 + 40 + 39 + 60) / 5 = 45] normalized to an 880 MWe net reference reactor), the annual total one-way shipment distance for the Fermi America site would be around 79,650 km (1,770 km × 45). This distance is bounded by the maximum estimate of 505,393 km used in Table 3-17 of the 2026 NR GEIS (NRC 2026-TN12155). Therefore, the corresponding maximum estimate values of the population impacts to workers, public onlookers, and public along the route shown in the 2026 NR GEIS Table 3-17 can be conservatively applied to the Project Matador Campus.

3.13.4.2 Transportation Accidents

NUREG-2249, Table 3-19 contains a summary of radiological accident impacts for shipping irradiated fuel to the Yucca Mountain Site (NRC 2026-TN12155). The annual total one-way shipment distance is based on the number of annual shipments multiplied by the shipping distance. As stated above, the annual total one-way shipment distance from the Project Matador Campus to Yucca Mountain is estimated to be around 79,650 km, which is within the maximum estimate of 505,393 km shown in NUREG-2249, Table 3-19. NUREG-2249, Table 3-19 is applicable to new reactors with a maximum peak rod burnup less than 62 GWd/MTU for UO_2 fuel. The 62 GWd/MTU limit is acknowledged in the AP1000 DCD (Westinghouse 2011-TN261). Therefore, the corresponding maximum estimated value of population impact, expressed in 5.00×10^{-4} person-rem/yr (NRC 2024-TN11953), can be applied to the Project Matador Campus.

In the 2026 NR GEIS, Table 3-20 contains a summary of nonradiological accident impacts for shipping irradiated fuel to the Yucca Mountain site (NRC 2024-TN11953). The accident impacts in Table 3-20 were developed based on annual total round-trip shipment distance. As indicated above, the annual total one-way shipment distance from the Project Matador Campus to the Yucca Mountain site would be around 79,650 km. The round-trip shipment distance would be around 159,300 km. This distance is bounded by the maximum estimate (1,010,786 km) used in the 2026 NR GEIS, Table 3-20. The highest value of accidents per year, injuries per year, and fatalities per year from other AP1000 sites (as calculated for Turkey Point Units 6 and 7) can be used to obtain the estimated impacts for the Project Matador Campus. The estimated impacts to PMN Units 1–4 are well within the maximum estimates provided in the last row of Table 3-20 in the 2026 NR GEIS and shown in Table 3-33.

Table 3-33 Nonradiological Impacts of Transporting Irradiated Fuel

Site	Annual Total Round-Trip Shipment Distance (km)	Accidents per Year	Injuries per Year	Fatalities per Year	Reference
Vogtle Electric Generating Plant Units 3 and 4	327,280	0.081	0.067	0.0036	(NRC 2008-TN673)
Virgil C. Summer Nuclear Station Units 2 and 3	376,832	0.11	0.071	0.0056	(NRC 2011-TN1723)
Levy Nuclear Plant Units 1 and 2	361,600	0.15	0.087	0.0062	(NRC 2012-TN1976)
William States Lee III Nuclear Station Units 1 and 2	315,198	0.11	0.072	0.0056	(NRC 2013-TN6435)
Turkey Point Nuclear Generating Units 6 and 7	597,240	0.15	0.098	0.0068	(NRC 2016-TN6434)

Site	Annual Total Round-Trip Shipment Distance (km)	Accidents per Year	Injuries per Year	Fatalities per Year	Reference
NUREG-2266	331,656	0.211	0.093	0.0077	(NRC 2024-TN10333)
Project Matador Nuclear Units 1–4	159,300	0.211	0.098	0.0077	-
Maximum Estimate	1,010,786	0.33	0.21	0.016	(NRC 2024-TN11953)

In summary, the review team concludes that the previous generic finding of SMALL for transportation of unirradiated fuel, radioactive waste, and irradiated fuel is valid for the operation of PMN Units 1–4. Detailed evaluation is summarized in the 2026 NR GEIS, Table 3-11 through Table 3-20. The impact of the transportation of fuel and waste from PMN Units 1–4 would be SMALL.

3.13.5 Impacts from Decommissioning PMN Units 1–4

The environmental impacts due to decommissioning activities were previously evaluated in the 2002 Decommissioning GEIS (NRC 2002-TN665). The Decommissioning GEIS analyzes radiological shipments of nuclear waste from decommissioning and calculates incident-free doses and latent cancer fatalities to crew, the public along the route, and onlookers. The Decommissioning GEIS also calculates the collective dose for radiological accidents during transportation. The calculated impacts are closely related to the distance shipped, volumes shipped, and activity levels. As discussed above, PMN Units 1–4 are anticipated to have radiological transportation impacts comparable to other AP1000s during operations with waste shipment distances not exceeding previously considered maximum shipment distance. In Section 4.3.17 of the Decommissioning GEIS, NRC states that its "... regulations are adequate to protect the public against unreasonable risk from the transportation of radioactive materials." The Decommissioning GEIS concludes that radiological impacts from transportation of radiological waste and materials from decommissioning activities would be SMALL.

3.13.6 Summary of Reasonably Foreseeable Environmental Effects

Based on the above analysis, the review team concludes that the potential environmental effects of the reasonably foreseeable actions on the transportation of radioactive material would be SMALL.

4 CONCLUSIONS

The environmental consequences of construction and operation of the proposed PMN Units 1–4 are summarized in the sections of this chapter. Potential impacts were assigned a single significance level as described in Subpart A to 10 CFR 51 (TN10253). Chapter 3 addresses the reasonably foreseeable environmental effects associated with the proposed action relevant to each resource area, and those actions that have a reasonably close causal relationship, as well as applicable measures and controls that would mitigate potential adverse environmental impacts. As discussed in Section 1.3.4, three levels of significance for environmental impacts were used (SMALL, MODERATE, or LARGE) for the majority of the potentially affected environmental resource areas. These conclusions are based on the review team's independent environmental review of the applicant-prepared EIS as summarized in this EIS, consideration of public comments received during the scoping process, and the review team's consultation with Federal, State, Tribal, and local agencies, as required.

4.1 Environmental Impacts of the Proposed Action

As indicated in Section 1.1, the proposed action is the issuance of a COL for the construction and operation of proposed PMN Units 1–4. Section 1.2 presents the purpose and need for the proposed action, which is to provide onsite generation for the Project Matador data centers. Table 4-1 summarizes the potential environmental impacts by resource area and provides the corresponding EIS subsections that provide additional details.

Table 4-1 Summary of Environmental Impacts of the Proposed Action at the Project Matador Nuclear Units 1–4 Site

Resource Area	Environmental Impact Statement (EIS) Section	Summary of Impacts	Impact Level
Land Use and Visual Resources	3.2	The total area to be disturbed for development of proposed Project Matador Nuclear (PMN) Units 1–4 is approximately 881 ac including permanent structures and construction laydown areas. Construction of proposed PMN Units 1–4 would not change the overall character of the viewshed being agricultural mixed with industrial structures.	MODERATE (building) SMALL (operation and decommissioning)
Air Quality	3.3	Potential impacts to air quality during construction include fugitive dust and particulate matter, and emissions from construction equipment and vehicles. A mitigation plan is expected to be in place to minimize impacts. Potential impacts during operation include emissions from auxiliary equipment and from vehicles of commuting employees.	MODERATE (building) SMALL (operation and decommissioning)
Geologic Resources	3.4	Construction of proposed PMN Units 1–4 is not expected to detrimentally affect or alter the geologic environment at the site related to the facets of geology and soils. Following the completion of building activities and site stabilization, operation and decommissioning of	SMALL

Resource Area	Environmental Impact Statement (EIS) Section	Summary of Impacts	Impact Level
		proposed PMN AP1000 Units 1–4 is not expected to detrimentally affect or alter the geologic environment at the site related to the facets of geology and soils.	
Water Resources—Surface Water	3.5.1	There is no planned surface water use for construction or operation of proposed PMN Units 1–4, and there are no major surface water resources near or within the proposed PMN site. Construction and stormwater effluent are expected to be recaptured and reused. Proposed human-made water impoundments onsite are expected to act as operational water storage features and are planned to be filled with approved water sources including purchased municipal water and stormwater. Construction and operation permits, and management programs for discharges, including stormwater, are planned to be in place for the proposed PMN Units 1–4.	SMALL
Water Resources—Groundwater	3.5.2	There is no groundwater use or dewatering expected during construction or operation. No direct discharge to groundwater or injection wells are planned during construction or operation. Alterations to surface drainage are not expected to impact groundwater aquifers. Spill prevention control and countermeasure (SPCC) and best management practices (BMPs) would be used during construction and operation to minimize impacts.	SMALL
Ecological Resources—Aquatic	3.6.1	Construction and operation are not expected to affect local waterbodies, and no aquatic habitats exist at the proposed PMN site. The playas on and close to the site can have some aquatic properties during infrequent periods of inundation, but they are better considered to be seasonally saturated and seasonally flooded wetlands with permanent emergent vegetation that function more like terrestrial habitats. No impacts on aquatic ecological resources are expected.	SMALL
Ecological Resources—Terrestrial	3.6.2	Approximately 881 ac of land will be permanently disturbed during construction due to clearing and grading of the proposed PMN Units 1–4 site. This includes terrestrial habitats (grassland/herbaceous areas, cultivated cropland, and wetlands) as well as disturbed/developed areas. The grassland habitats are common in the surrounding landscape. have been previously disturbed by grazing as well as past U.S. Department of	SMALL

Resource Area	Environmental Impact Statement (EIS) Section	Summary of Impacts	Impact Level
		Energy (DOE) activities. Construction noise may affect avian, bat, and terrestrial wildlife; measures to mitigate noise impacts will be incorporated into construction plans. Potential operational impacts to terrestrial wildlife include bird and bat collisions with structures or traffic collisions. Plant lighting and fencing could affect animal activity patterns and impede movement.	
Historic and Cultural Resources	3.7	No cultural resources have been identified within the proposed PMN Units 1–4 site. Therefore, there are currently no historic properties present which would be adversely impacted by construction and operation of the proposed project.	SMALL
Socioeconomics	3.8	The majority of construction workers are expected to in-migrate temporarily for the length of construction, increasing demand for temporary housing and increasing traffic volumes. Most of the adverse socioeconomic impacts would occur during the period of peak construction. The operations workforce is expected to in-migrate permanently with their families. Beneficial impacts during construction and operation from creation of jobs, increases in spending at area businesses, and increased tax revenues are expected.	SMALL (construction and operation, adverse) MODERATE (on housing during construction, adverse) LARGE (on traffic and recreation during construction, adverse) SMALL to LARGE (construction and operation, beneficial)
Radiological Human Health	3.9.1	Radiation doses for the public and workers are expected to remain below 10 CFR Part 20 dose limits. A REMP will be established for the PMN Units 1–4 in compliance with 10 CFR 20.1302.	SMALL
Radiological Waste Management	3.10.1	Liquid, gaseous, and solid radioactive waste management systems would be used for the collection, processing, packaging, and storage of the radioactive waste materials produced during the operation and decommissioning of PMN Units 1–4. Radiological waste is not expected to be generated during building activities. There would be no onsite facilities for long-term storage or permanent disposal of solid waste. The packaged waste would be temporarily stored in the auxiliary and radioactive waste	SMALL

Resource Area	Environmental Impact Statement (EIS) Section	Summary of Impacts	Impact Level
		buildings prior to being shipped to a licensed disposal facility.	
Nonradiological Human Health	3.9.2	Occupational hazards would be managed in compliance with Occupational Safety and Health Administration safety standards and practices, and work is expected to be performed under a health and safety program. Air emissions would comply with required air permits and the Clean Air Act. Best management practices would also be implemented to minimize impacts. Noise to members of the public would decrease with distance and is expected to be below safe noise levels to the nearest residence.	SMALL
Nonradiological Waste Management	3.10.2	Construction debris and nonradiological wastes would be recycled, reused, or disposed of in permitted facilities. During building activities, sanitary wastewater would be managed with temporary facilities and during operation would be directed to a permitted onsite packaged wastewater treatment system or to a municipal wastewater treatment system. Hazardous and nonhazardous waste procedures emphasizing waste minimization are expected to be implemented during building and operation. Management of wastes during building, operation, and decommissioning the proposed facilities is expected to comply with Federal, State, and local requirements, as applicable.	SMALL
Postulated Accidents	3.11	The NRC found that the environmental impacts of design basis accidents and severe accidents are of SMALL significance for all nuclear plants.	SMALL
Uranium Fuel Cycle and Radiological Waste Management	3.12 and 3.10.1	No nuclear fuel would be present, and no radiological waste would be generated during construction. An ODCM would be developed, and a REMP would be in place, during operations. Spent nuclear fuel would be stored in an onsite water-cooled pool for the requisite cooling period prior to spent fuel placement in a future NRC approved onsite or offsite facility.	SMALL
Transportation of Radioactive Material	3.13	The previous generic NRC finding of SMALL for transportation of unirradiated fuel, radioactive waste, and irradiated fuel is valid for the operation of proposed PMN Units 1–4.	SMALL

4.2 Comparison of Alternatives

In Section 2.7, the following alternatives to the proposed action of the construction of PMN Units 1–4 are considered:

- the no-action alternative
  - expansion of Project Matador's onsite energy generation capacity

Expansion of Project Matador's onsite energy generation capacity would likely require the construction of new energy generation. The review team concluded that for the no-action alternative, issuance of the COLs for the proposed PMN Units 1–4, the only reasonable new energy generation alternative would be as follows:

- building additional natural gas-fired units at the Project Matador Campus

As stated in Section 2.7.2, given the purpose of the proposed PMN Units 1–4 to provide onsite power generation for Project Matador, offsite locations were not considered. Regarding placement within the Project Matador Campus, Fermi America prioritized separation of nuclear assets from data centers to facilitate safety and security and leveraged proximity to other onsite power generation for transmission assets.

4.3 Resource Commitments

4.3.1 Unavoidable Adverse Environmental Impacts

NEPA Section 102(2)(C)(ii) (TN661) requires that an EIS include information on any reasonably foreseeable adverse environmental effects that cannot be avoided if the proposal is implemented. For the purpose of this EIS, unavoidable adverse environmental impacts are defined as adverse environmental impacts that cannot be avoided even with the implementation of mitigation measures.

As noted in Chapter 3, it was concluded that the impacts on the evaluated resource areas from the construction and operation of the proposed PMN Units 1–4 would be SMALL, with the exception of land use and air quality during construction which would be MODERATE, and socioeconomics which would be a SMALL to LARGE impact during construction and operation. A SMALL determination means that the environmental impacts would not be detectable or would be so minor that they would neither destabilize nor noticeably alter any important attribute of the resource. However, a SMALL determination does not necessarily indicate that there would not be any environmental impacts that could be offset or minimized through mitigation. Table 4-2 presents the unavoidable environmental impacts and includes mitigation and control measures intended to lessen these impacts.

Table 4-2 Unavoidable Adverse Environmental Impacts for the Proposed Action

Resource Area	Unavoidable Adverse Impact	Mitigation
Land Use and Visual Resources	Approximately 881 ac of land would be disturbed for this project, including approximately 724 ac of grassland/herbaceous cover and 148 ac cultivated cropland. The remaining 9 ac of land making up the proposed Project Matador Nuclear (PMN) Units 1–4 site is previously developed (Section 3.2.1.1 and Table 3-3).	Building the PMN Units 1–4 would include compliance with mitigation measures established through local permits, site use permits, or other land use authorization. Activities would be limited to the project site, and associated impacts would remain within the established project boundary (Section 3.2.3).

Resource Area	Unavoidable Adverse Impact	Mitigation
Air Quality	Air pollutant emissions from traffic, construction equipment, and fugitive dust during site preparation and construction (Section 3.3).	Mitigation measures to control fugitive dust would include, as appropriate, the following: stabilization of construction roads and spoil piles; limiting of speed on unpaved roads, wetting of unpaved roads; good housekeeping (i.e., removal of dirt spilled on paved roads); covering haul trucks when loaded/unloaded; minimization of material handling; stopping of grading/excavation activities during times of high winds; phasing of grading to minimize area disturbed, and use of temporary or permanent vegetation on road medians and slopes (Section 3.3).
Water Resources	Construction and operation of the proposed PMN Units 1–4 is not anticipated to significantly alter current drainage patterns or groundwater aquifer recharge rates. Onsite activities may result in increased stormwater runoff and could result in accidental spills (Section 3.5.1 and 3.5.2).	Construction activities would be conducted under a TCEQ stormwater general permit, which would include a SWPPP and implementation of BMPs to control erosion and runoff. Excavated soils would be managed in accordance with a soil management plan addressing pre-excavation planning, soil segregation and stockpiling as needed, field monitoring and screening during ground-disturbing activities, and analytical testing prior to reuse or disposal (Section 3.5.1.2). During operations, stormwater would be captured, controlled, and reused onsite with no planned offsite discharge under an operational stormwater management program (Section 3.5.1.3). SPCC plan and BMPs would be implemented to minimize potential releases of nonradiological contaminants. A groundwater protection program consistent with the industry's voluntary initiative would be in place to monitor for inadvertent releases and prevent offsite migration of radionuclides (Section 3.5.2.3).
Ecological Resources—Aquatic	No aquatic habitats have been identified within the proposed PMN Units 1–4 site (Section 3.6.1).	Not applicable.
Ecological Resources—Terrestrial	Construction would disturb 881 ac which includes terrestrial habitats (grassland/herbaceous areas, cultivated cropland, and wetlands), as well as previously disturbed/developed areas. These areas would be permanently converted to industrial use with no plans to restore habitat. Potential impacts to avian and bat species could result from collisions with plant structures or	During building, direct mortality of avian species would be limited by conducting all site clearing activities outside the nesting season for migratory birds and having a biological monitor to oversee compliance during any sensitive periods. During operations the use of flashing lights in lieu of steady-burning lights is expected to minimize impacts on bats. Electric utility poles would be designed and constructed to reduce avian/bat electrocution risk by

Resource Area	Unavoidable Adverse Impact	Mitigation
	increased traffic and from noise/lighting onsite (Section 3.6.2).	providing separation between primary phase wires and/or by covering exposed parts with insulators. Utility wires would utilize marking devices such as hangers, coils, and aviation marking devices to make them more visible to birds. Measures to mitigate noise impacts on birds and wildlife could include scheduling construction activities to minimize impacts to nesting birds (in compliance with MBTA and BGEPA), staggering work activities, staging equipment away from the site boundary, and using noise dampeners and noise control devices on vehicles and equipment. Measures to mitigate impacts from construction lighting could include limiting nighttime work during spring and fall migration seasons, especially on cloudy nights and turning off lights when not needed (Section 3.6.2).
Historic and Cultural Resources	No cultural resources have been identified within the proposed PMN Units 1–4 site (Section 3.7).	Not applicable.
Socioeconomics	There is potential for nuisance noise during building activities. Increased traffic, and demand for housing, public infrastructure and services, and education resources on a short-term basis from the influx of construction workers, family members, workers filling indirect jobs; loss of temporary jobs once construction is completed; loss of local and State sales and use of tax revenues once construction is completed; decline in residential property tax; increased use of recreational areas from in-migrating workers and family members; an increase in rental rates for housing units of all types, new and existing, housing prices, an increase in short-term and long-term hotel and motel leasing rates (Section 3.8.1 and 3.8.2).	Sound attenuation over the distance to the site boundary is expected to allow noise levels to be within an acceptable range. Mitigation measures include shorter shifts (increasing the number of daily shift changes from two 12-hour shifts to three 8-hour shifts), varied shift lengths, staggered shifts, alternate routes for workers, carpooling, building additional parking areas further from the site, and purchasing houses along construction routes to minimize impacts to residents. Additional mitigation efforts include encouraging or working directly with local RV park owners to expand existing parks or build new parks (Section 3.8.1 and 3.8.2).
Radiological and Nonradiological Human Health	Exposure of the public and occupational exposure to radionuclides during operations of PMN Units 1–4 are expected to be a small fraction of regulatory limits (Section 3.9.1.2). Potential exists for physical hazards typical of any construction site including exposure to fugitive dust/emissions, noise, and other typical construction hazards such as fall, electric shock, and chemical hazards (Section 3.9.2.3).	Public exposure to radionuclides is expected to be managed/monitored as per the site REMP program. Occupational exposure would be maintained within 10 CFR 20.1201 limits (Section 3.9.1.2). PMN Units 1–4 would have a comprehensive industrial safety program in place to ensure compliance with Federal OSHA requirements. The program is expected to have provisions for training, hazard identification, personal protection

Resource Area	Unavoidable Adverse Impact	Mitigation
	Operations personnel could be involved in industrial accidents such as falls, electric shock, burns, or occupational illnesses because of noise exposure, exposure to chemical or gaseous hazards, or other industrial hazards (Section 3.9.2.3).	equipment, hearing conservation, and other hazard mitigation. There are planned to be task- or system-specific procedures in place to implement safety and exposure standards (e.g., electrical safety) (Section 3.9.2.3).
Radiological and Nonradiological Waste Management	Quantities of wastes would be minimized to the extent practical and disposed of in accordance with applicable Federal, State, and local regulations (Section 3.10.2).	During building, procedures would be implemented emphasizing waste minimization, segregation and proper containerization. Construction debris created by excavation and land clearing will be reused onsite or recycled, if possible. If contaminated soils are encountered during construction, the applicant states screening, segregation and controlled staging, characterization, appropriate disposition and tracking practices will be followed. During operations, nonradiological solid waste generation is planned to be minimized through recycling as practical. A waste minimization program would be implemented that uses material control, process control, waste management, and recycling to reduce waste and reuse as appropriate (Section 3.10.2).

4.3.2 Relationship Between Local Short-Term Uses of the Environment and Maintenance and Enhancement of Long-Term Productivity

The development of the facilities under the proposed action would result in short-term uses of environmental resources. Short-term uses include land disturbance, water consumption, emissions, noise, and labor and material investments and is defined as the period during which construction, operation, and decommissioning activities take place. The applicant is aware that decommissioning activities would commence once the facilities reach the end of their licensed life, however, the applicant does not provide a timeline for decommissioning activities. Applicants for the licensing of new reactors are not asked to develop a plan or timeline for decommissioning when applying, so no such plan is presently required.

As stated in Section 3.2, the development of the proposed PMN Units 1–4 would require the use of approximately 881 ac intended for industrial use over the life of the project. This land would not be available for other uses during this time but could be available for other uses after decommissioning. Construction of proposed PMN Units 1–4 would not change the overall character of the viewshed being agricultural mixed with industrial structures.

As indicated in Section 3.3, air emissions from the construction of the proposed PMN Units 1–4 and periodic testing of emergency generators and similar equipment during operations would introduce minor amounts of criteria air pollutants and GHG emissions onsite. However, such emissions are not expected to affect air quality to the extent that they would impair public health or long-term productivity of the area.

As described in Section 3.5, construction and operation of the proposed PMN Units 1–4 would be supported through purchase of municipal water and would not place short-term demands on surface water or groundwater resources.

As stated in Section 3.6, construction of the proposed PMN Units 1–4 would require conversion of terrestrial habitat to industrial land uses, thereby displacing wildlife and reducing availability of habitat over the life of the project. Terrestrial ecological impacts are anticipated to be minor and expected to cease upon completion of decommissioning.

Increased employment, expenditures, and tax revenues generated during the life of the proposed PMN Units 1–4 directly benefit local, regional, and State economies over the short term. As noted in Section 3.8, worker vehicles and the delivery and shipment of materials would increase the volume of traffic on local roads. There is an anticipated increase in demand for housing and community services in the area. However, the increase in traffic volume and demand on housing/community services would be short term and expected to be the most evident during times of peak construction, lessening and leveling off during operations. Therefore, these demands and traffic increases would not be expected to affect long-term productivity in the community.

As indicated in Section 3.10, management and disposal of nonhazardous waste would require a relatively minor amount of space at disposal facilities. Regardless of the location of these disposal facilities, the use of land to meet waste disposal needs would reduce the long-term productivity of the land. However, the contribution of the proposed PMN Units 1–4 to this reduction would be minimal.

While the short-term use of, and impacts on, environmental resources are expected to be minimal, the long-term benefits associated with construction of the proposed PMN Units 1–4 could be substantial. The proposed units would meet an identified generation need that would otherwise be fulfilled by an alternative source, most likely the construction of new natural gas-fired facilities.

4.3.3 Irreversible and Irretrievable Commitments of Environmental Resources

This section describes the irreversible and irretrievable commitment of resources that have been noted in this report. For the purpose of this assessment, an irreversible commitment of resources occurs when potential impacts have the possibility to limit future options for a resource. An irretrievable commitment of resources is defined as the lost production or use of a resource that would cause the resource to be unavailable for use by future generations. Irreversible and irretrievable commitments of resources for construction of a nuclear power facility such as the proposed PMN Units 1–4 include the commitment of water, energy, raw materials, and other natural and human-made resources. In general, the commitments of capital and labor for such a project are also irreversible.

Building, operating, and decommissioning of the proposed PMN Units 1–4 at the proposed site would entail irreversible and irretrievable commitment of energy, water, chemicals, fossil fuels, and other natural and human-made resources. Regardless of location, building of the proposed PMN Units 1–4 would consume materials such as concrete, structural steel, steel sheet pilings, precast piles, precast panels, asphalt, stone, roofing/siding, and temporary structures. These materials would be irretrievable unless they could be recycled or reused during decommissioning, granted they meet NRC radiological clearance criteria.

As described in Section 3.5, water demands for the proposed PMN Units 1–4 would be met primarily by municipal supply and supplement by reclaimed stormwater and wastewater. These water resources are available, and the amounts required are not expected to exceed available capacity. As stated in Section 3.6.2, birds and bats may be killed or injured due to collision with nuclear power plant structures or worker vehicles. These losses are expected to be minor in terms of irreversibly affecting wildlife populations in the surrounding area, and any affect population would be expected to recover. Irreversible losses of habitat and agricultural land would occur at the proposed site as stated in Sections 3.6 and 3.2. However, there are suitable habitats in the 6 mi vicinity. As discussed in Section 3.9, nonradiological irreversible commitments to occupational human health resources may occur. Such impacts would be similar to potential hazards that occur at any industrial construction site. Energy expended would be in the form of fuel for equipment, vehicles, and facility operation and electricity for equipment. Fuel would be acquired from offsite commercial sources. As stated in Section 2.5.1, electricity would be supplied through connection to the Project Matador electrical supply and through use of portable generators, prior to PMN's onsite power generation coming online.

4.3.4 Unresolved Conflicts

NEPA requires the review team study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources. In reviewing the potential impacts associated with the proposed action, the review team did not identify any unresolved conflicts concerning alternative uses of available resources. The amounts required are not expected to deplete available supplies or exceed available system capacities.

4.4 Preliminary Conclusion

After weighing the environmental, economic, technical, and other benefits against the associated environmental and other costs, and after consideration of reasonable alternatives, the review team recommends that the NRC issue the requested construction permit and operating licenses to Fermi America contingent upon successful completion of the safety review and unless safety issues mandate otherwise. The NRC staff based its preliminary recommendation on:

- the NRC staff's independent environmental review
- the NRC staff's assessment of the applicant-prepared EIS
- the NRC staff's consultation with Federal, State, and local agencies and Indian Tribes
- the NRC staff's consideration of public comments received during the scoping process

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APPENDIX A

LIST OF PREPARERS AND CONTRIBUTORS TO THE ENVIRONMENTAL IMPACT STATEMENT

As a first of its kind applicant-prepared environmental document, Fermi America, LLC (Fermi America) prepared this environmental impact statement (EIS) in close coordination with, and under supervision of the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff. The NRC and the applicant, i.e., Fermi America, form the review team for this EIS. The NRC staff reviewed and revised portions of this EIS, as well as prepared others. Fermi America's contractor, Enercon, provided technical support in coordination with NRC and Pacific Northwest National Laboratory (PNNL) provided supplemental technical support and technical editing. Table A-1 and Table A-2 identify each contributor's name and affiliation, summary of education, and experience.

Table A-1 List of U.S. Nuclear Regulatory Commission and Pacific Northwest National Laboratory Preparers

Name	Education and Experience
Jennifer Davis, NRC	BA Historic Preservation and Classical Civilization (Archaeology) 5 years of archaeological fieldwork; 22 years of experience in NEPA compliance, project management, cultural resources impact analysis, and National Historic Preservation Act Section 106 consultations
Peyton Doub, NRC	MS Plant Physiology BS Plant Sciences (Botany) Professional Wetland Scientist Certified Environmental Professional Duke NEPA Certificate 38 years of relevant experience
Kevin Folk, NRC	MS, Environmental Biology BA, Geoenvironmental Studies 35 years of experience in NEPA compliance; geologic, hydrologic, and water quality impacts analysis; utility infrastructure analysis, environmental regulatory compliance; and water supply and wastewater discharge permitting
Nancy Martinez, NRC	BS Earth and Environmental Science MA Earth and Planetary Science 13 years of experience in environmental impact analysis
Donald Palmrose, NRC	PhD Nuclear Engineering MS Nuclear Engineering BS Nuclear Engineering 38 years of experience including operations on U.S. Navy nuclear powered surface ships, NEPA analyses, nuclear safety and material reviews, U.S. Department of Energy nuclear authorization basis support, and NRC project management
Kevin Quinlan, NRC	MS Atmospheric Science BS Meteorology Senior Meteorologist; 18 years of experience reviewing meteorological safety analyses for new reactor applications as well as supporting the meteorology/air quality sections of the EIS

Name	Education and Experience
Lance Rakovan, NRC	MS Nuclear Engineering BS Engineering Physics Project Management Professional Nearly 30 years' project management experience Over 20 years of experience facilitating public NEPA interactions
Mary Richmond, NRC	BA Biological Sciences MS Environmental Engineering 35 years of relevant experience
Gerry Stirewalt, NRC	PhD Structural Geology with Two Postdoctoral Appointments BA Geology and Mathematics Registered Professional Geologist and Certified Engineering Geologist Over 50 years of experience in Environmental and Engineering Geology with academia, industry, and the Federal government including university teaching; evaluation of high-level radioactive waste disposal sites; characterization of nuclear power sites; three-dimensional geospatial modeling of subsurface stratigraphy, tectonic faults, and groundwater contaminant plumes; and preparation of NEPA documents covering geologic environment and groundwater resources
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
Caitlin Condon, PNNL	PhD Radiation Health Physics BS Environmental Health 7 years of experience including health physics, project management, NEPA environmental impact assessments, waste management, radionuclide dispersion and dosimetry modeling
Teresa Carlon, PNNL	BS Information Technology 30 years of experience as SharePoint administrator, project coordinator, and databases
Cyler Conrad, PNNL	PhD in Anthropology (Archaeology) MA in 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
Michelle Niemeyer, PNNL	MS Agricultural Economics BS Agricultural Economics 15+ years of experience including NEPA environmental impact assessments, project management, economics, and stakeholder engagement
Lauren Rodman, PNNL	MA Resource Management BA Environmental Studies Over 10 years of experience in Tribal engagement and stakeholder engagement, and 4 years of experience in NEPA environmental impact assessments
Kacoli Sen, PNNL	PhD Cancer Biology MS Zoology (specialization in ecology) BS Zoology Diploma in Environmental Law Over 6 years of document editing and production experience

BE = Bachelor of Engineering; BA = Bachelor of Arts; BS = Bachelor of Science; CHP = Certified Health Physicist; MA = Master of Arts; MHP = Master of Public Health; MS = Master of Science; NEPA = National Environmental Policy Act of 1969; NRC = U.S. Nuclear Regulatory Commission; PhD = Doctor of Philosophy; PNNL = Pacific Northwest National Laboratory.

Table A-2 List of Fermi America, LLC and Enercon Preparers

Name	Education and Experience
Mesut Uzman, Fermi America	MS Electrical Engineering BS Electrical & Electronics Engineering 25+ years of global nuclear executive and industry experience including leadership of AP1000 new-build projects, Barakah Nuclear Power Plant delivery, nuclear safety systems, and multinational reactor construction programs supporting 16 reactors across the United States, China, and United Arab Emirates
Andrew Bryant, Fermi America	BS Chemistry 42 years of nuclear industry experience including 2nd, 3rd, and 4th generation reactor programs, Institute of Nuclear Power Operations certified nuclear chemist, Procedure Professionals Association certified procedure writer
Dannie Weaver, Fermi America	MBA BS Civil Engineering 20+ years of nuclear, industrial, and infrastructure experience including AP1000 construction, advanced nuclear fuel fabrication, nuclear weapons facility design and construction, and major energy projects across the United States and United Arab Emirates
Mary Hoganson, ENERCON	MS Biology, Environmental Science specialization BS Biology 35 years of nuclear industry and environmental assessment experience including development of various NEPA documents for DOE
Lisa Santoro, ENERCON	MS Environmental Technology BA Multi-Disciplinary Degree 26 years of environmental and nuclear industry experience in NEPA document development for NRC and DOE including EIS, EA and CATEX
Josh Bartlett, ENERCON	BS Nuclear Engineering 7 years of nuclear probabilistic risk assessment experience in probabilistic and deterministic modeling 10+ years of experience in air quality permitting, modeling, regulatory compliance as well as emissions/greenhouse gas inventories
Benjamin Barton, ENERCON	MS Geology BS Geology Registered geologist, over 5 years of relevant experience in environmental geology, regulation, and hydrology
Micah Bennett, ENERCON	PhD Zoology/Ecology MS Biology BS Biological Science >20 years of experience in environment and natural resources fields with emphasis on freshwater ecology
Sam Chau, ENERCON	BS Geographic Information Sciences GIS Analyst with 4+ years of relevant experience
Jay Hemmis, ENERCON	Masters of Natural Resources BS Environmental Analysis & Planning GIS Certificate 15 years of experience in environmental and natural resources fields
Emily Keenan, ENERCON	BS Earth and Environmental Science 10 years of environmental experience, 3+ years in nuclear licensing

Name	Education and Experience
Cheyenne Riggs, ENERCON	MA English, Rhetoric and Composition BS English, Secondary Education 4 years of relevant experience
Jerry Riggs, ENERCON	MA Geography BS Biochemistry 20 years of experience in the nuclear industry
Nicole Schlichting, ENERCON	MS Nuclear Engineering and Science BS Physics 16+ years of experience in nuclear industry
Lyndee Songer, ENERCON	MS Environmental Law BS Environmental Science >20 years of experience in environmental compliance
Philip Stephens, ENERCON	MS Nuclear Engineering BS Mechanical Engineering 8 years of nuclear PRA experience in probabilistic and deterministic modeling
Jonathan Subacz, ENERCON	MBA Organization Development MS Civil Engineering BS Environmental Science Engineer-In-Training (EIT), Alabama 22 years of relevant experience in environmental compliance, licensing and engineering
Ricky Summitt, ENERCON	PhD, MS, and BS Nuclear Engineering >45 years of experience in probabilistic risk, severe accident, and security analyses
Betsy Tangora, ENERCON	MA Archaeology BA Economics with a minor in Archaeology 15+ years of experience in conducting cultural resource-related research, fieldwork, and reporting
Thomas Wood, ENERCON	BA Nuclear Engineering 11+ years of industry experience 3+ years of licensing experience
Fred Woolridge, ENERCON	BA Geography Principal GIS analyst with 18+ years of experience in applying geospatial principles and techniques in support of environmental assessments for nuclear, renewable energy, and oil and gas energy sectors

BA = Bachelor of Arts; BS = Bachelor of Science; CATEX = categorical exclusion; DOE = U.S. Department of Energy; EA = environmental assessment; Fermi America = Fermi America, LLC; GIS = geographic information system; MBA = Master of Business Administration; MS = Master of Science; NEPA = National Environmental Policy Act of 1969; NRC = U.S. Nuclear Regulatory Commission.

APPENDIX B

PUBLIC COMMENTS RECEIVED ON PROJECT MATADOR NUCLEAR UNITS 1–4 ENVIRONMENTAL REVIEW

B.1 Environmental Scoping Summary

B.1.1 Introduction

The U.S. Nuclear Regulatory Commission (NRC, the Commission) staff began the scoping process for the environmental review of the Project Matador Nuclear (PMN) Units 1–4 application in March 2026. On March 20, 2026, the NRC published a Notice of Intent in the *Federal Register* (FR) to conduct an environmental scoping process to gather information to prepare an environmental impact statement (EIS) to evaluate environmental impacts related to the proposed construction and operation of PMN Units 1–4 (91 FR 13641-TN13265). In its Notice of Intent, the NRC staff requested that members of the public and stakeholders submit comments on the scope of the environmental review to the Federal Rulemaking website at Regulations.gov, by email, or by postal mail. The scoping process provides an opportunity for members of the public to propose environmental issues to be addressed in the EIS and to highlight public concerns and issues.

B.1.2 Comments Received During the Scoping Period

Table B-1 lists details of the comments received during the scoping process, including commenter name, affiliation, correspondence ID, comment source, and NRC's Agencywide Documents Access and Management System (ADAMS) accession number.

Table B-1 Individuals Providing Comments During the Scoping Period

Commenter	Affiliation (If Stated)	Correspondence ID	Comment Source	ADAMS Accession Number[(a)]
Abrams, Alexander	Artanis Industry Communities	7	Email	ML26111A007
Anonymous	-	9	regulations.gov	ML26107A003
Burnam, Lon	Peace Farm and Nuclear Free World Committee of the Dallas Peace and Justice Center	13	regulations.gov	ML26111A316
Clements, Tom	Savannah River Site Watch	4	regulations.gov	ML26091A024
Fehr, Elizabeth	-	2	regulations.gov	ML26091A027
Giesbrecht, Tiffany	-	3	regulations.gov	ML26091A028
Hadden, Karen	Texas Nuclear Watchdogs	13	regulations.gov	ML26111A316
Hanson, Richard	Texas Parks and Wildlife Department	8	regulations.gov	ML26107A004
Kopec, Brett	United States Geological Survey	6	Email	ML26100A175
Masters, Will	-	5	Email	ML26100A174
Moreno, R	-	11	regulations.gov	ML26111A307

Commenter	Affiliation (If Stated)	Correspondence ID	Comment Source	ADAMS Accession Number[(a)]
Murphy-Young, Paige	-	12	regulations.gov	ML26111A309
Paddock, Brian	-	1	regulations.gov	ML26091A025
Smitty Smith, Tom	-	13	regulations.gov	ML26111A316
Tilson, Deric	The Breakthrough Institute	10	regulations.gov	ML26111A305

ADAMS = Agencywide Documents Access and Management System; ID = identification.
"-" denotes no entry in table cell.
(a) Access these documents through the U.S. Nuclear Regulatory Commission's ADAMS at https://adams-search.nrc.gov/home.

B.2 Accidents

Summary: Commenters expressed concern about the proximity of the proposed Project Matador Nuclear site to the U.S. Department of Energy (DOE) Pantex Nuclear Weapons Facility (Pantex Plant) and the impacts of a severe accident given the close proximity of the two sites.

Commenters: (**13-5** [Burnam, Lon] [Hadden, Karen] [Smitty Smith, Tom])

B.3 Alternatives-Site

Summary: The commenter expressed concern over site selection for the project.

Commenter: Clements, Tom (**4-13**)

B.4 Terrestrial Ecology

Summary: The Texas Parks and Wildlife Department recommends using the Rare, Threatened, and Endangers Species of Texas by County (RTEST) online application and including a discussion and evaluation of potential impacts to State-listed species in the EIS.

Commenter: Hanson, Richard (**8-1**)

B.5 Groundwater

Summary: Commenters expressed concern about the water use for the site and the water availability to support cooling of the proposed reactors. Additional comments expressed concern about water quality and the lack of need for a National Pollutant Discharge Elimination System permit.

Commenters: Burnam, Lon (**13-2**), Clements, Tom (**4-5**) (**4-8**) (**4-11**), Hadden, Karen (**13-2**), Smitty Smith, Tom (**13-2**)

B.6 Combined License Process

Summary: One commenter expressed concerns about how changes in plans for the reactor designs and cooling systems would be handled and reviewed during the licensing process. Another commenter expressed concern about how the regulatory process works and stated that

novel challenges would result from regulating small modular reactors. This commenter also stated that no shortcuts should be taken in generating an EIS and that the Fermi project's protection of air and water is insufficient.

Commenters: Clements, Tom (**4-3**), Murphy-Young, Paige (**12-1**)

B.7 NEPA Process

Summary: Commenters requested a public meeting and a public hearing. Another commenter provided recommendations for the NRC while pursuing the first applicant prepared EIS and provided commentary on recent NRC Policy Act Amendments (SECY 0024-0046 and SRM SECY 0024-0046. The commenter recommended that NRC not duplicate work completed by the applicant in the applicant prepared EIS and that page counts should be limited to help make the EIS preparation efficient and cost effective. The commenter also recommended that the scope of the environmental review should be limited to those environmental effects

Commenters: (**13-3** [Burnam, Lon] [Hadden, Karen] [Smitty Smith, Tom]) (**10-2** [Tilson, Deric])

B.8 Socioeconomics

Summary: A commenter requested that workforce housing be addressed in the EIS and referred to previous nuclear construction projects and the large impacts on the communities. The commenter specifically asked for workforce housing analysis consider the phased workforce demand, regional housing capacity, purpose-built modular workforce accommodation, community infrastructure capacity, environmental justice, and cumulative campus impacts.

Commenter: Abrams, Alexander (**7-1**) (**7-2**) (**7-3**)

B.9 Uranium Fuel Cycle

Summary: Commenters expressed concern about the generation of the spent nuclear fuel and nuclear waste and the lack of a geologic repository for the disposition of spent nuclear fuel.

Commenter: Clements, Tom (**4-14**)

B.10 Outside Scope – Safety

Summary: One commenter expressed concerns related to the air cooled condenser design and whether or not Fermi America can leverage the AP1000 Design Control Document Revision 19 or 20 since they were based on water cooled designs. The commenter requested an in-depth presentation of the proposed air cooled condenser system as well as analysis of potential failures and costs associated with air cooled condenser systems. The commenter requested an explanation for which Design Certification Document would be reference in the draft EIS as well as information on Design Certification Document 20 and possibly 21.

Commenter: Clements, Tom (**4-2**) (**4-4**) (**4-7**) (**4-9**) (**4-10**)

B.11 Outside Scope—Miscellaneous

Summary: Commenters expressed concerns about data centers and the health effects. Another commenter expressed concern about the changing public name of the project. Another

commenter expressed concern about Fermi America as a company and their financial viability. Another commenter expressed concern about the higher cost for air cooled units.

Commenters: Burnam, Lon (**13-4**), Clements, Tom (**4-1**) (**4-12**), Fehr, Elizabeth (**2-1**), Hadden, Karen (**13-4**), Smitty Smith, Tom (**13-4**)

B.12 Opposition to the Licensing Action

Summary: Commenters expressed opposition to the licensing action. Comments expressed a variety of reasons for opposition to the licensing action including the motivation for the project, the effects of a temporary workforce on the community, the location selected for the project and specifically the proximity to the Pantex Plant site, the water needs of the site and its effect on local groundwater, the impacts on the local community, and the proposed air cooled reactor design.

Commenters: Anonymous, Anonymous (**9-1**), Burnam, Lon (**13-1**) (**13-6**), Clements, Tom (**4-6**), Giesbrecht, Tiffany (**3-1**), Hadden, Karen (**13-1**) (**13-6**), Masters, Will (**5-1**), Moreno, R (**11-1**), Paddock, Brian (**1-1**), Smitty Smith, Tom (**13-1**) (**13-6**)

B.13 Support of the Licensing Action

Summary: A commenter expressed support for the licensing action.

Commenter: Tilson, Deric (**10-1**)

B.14 References

91 FR 13641. March 20, 2026. “Fermi America LLC (dba Fermi America); Project Matador Advanced Energy and Intelligence Campus AP1000 Units 1–4, Project Matador Nuclear Units 1–4; Notice of Intent To Conduct Scoping Process and Prepare an Environmental Impact Statement.” *Federal Register*, Nuclear Regulatory Commission. TN13265.

APPENDIX C

STATE ENDANGERED, THREATENED, AND CONSERVATION CONCERN SPECIES IN CARSON AND POTTER COUNTIES, TEXAS

Table C-1 State Endangered, Threatened, and Conservation Concern Species in Carson and Potter Counties, Texas. Source: TPW 2025-TN12924.

Common Name	Group	Scientific Name	Potential to Occur	State Status
Woodhouse's toad	Amphibians	*Anaxyrus woodhousii*	Documented near site (Pantex 2025-TN12791)	SGCN
Bald eagle	Birds	*Haliaeetus leucocephalus*	Documented near site (DOE 2018-TN12970)	NA
Bank swallow	Birds	*Riparia riparia*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Black rail	Birds	*Laterallus jamaicensis*	Not documented in site or vicinity (eBird 2026-TN12992; iNaturalist 2026-TN12968)	Threatened
Brewer's blackbird	Birds	*Euphagus cyanocephalus*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Chestnut-collared longspur	Birds	*Calcarius ornatus*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Common nighthawk	Birds	*Chordeiles minor*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Franklin's gull	Birds	*Leucophaeus pipixcan*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Golden eagle	Birds	*Aquila chrysaetos*	Documented near site (DOE 2008-TN12941)	NA
Lark bunting	Birds	*Calamospiza melanocorys*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Lesser prairie-chicken	Birds	*Tympanuchus pallidicinctus*	Not documented in site or vicinity (eBird 2026-TN12992; iNaturalist 2026-TN12968)	Endangered

Common Name	Group	Scientific Name	Potential to Occur	State Status
Loggerhead shrike	Birds	*Lanius ludovicianus*	Documented near site (DOE 2018-TN12970)	SGCN
Mountain plover	Birds	*Charadrius montanus*	Documented near site (DOE 2018-TN12970)	SGCN
Northern bobwhite	Birds	*Colinus virginianus*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Pyrrhuloxia	Birds	*Cardinalis sinuatus*	Not documented in site or vicinity (eBird 2026-TN12992; iNaturalist 2026-TN12968)	SGCN
Sanderling	Birds	*Calidris alba*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Scaled quail	Birds	*Callipepla squamata*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Snowy plover	Birds	*Charadrius nivosus*	Not documented in site or vicinity (eBird 2026-TN12992; iNaturalist 2026-TN12968)	SGCN
Sprague's pipit	Birds	*Anthus spragueii*	Not documented in site or vicinity (eBird 2026-TN12992; iNaturalist 2026-TN12968)	SGCN
Western burrowing owl	Birds	*Athene cunicularia hypugaea*	Documented near site (DOE 2018-TN12970)	SGCN
White-faced ibis	Birds	*Plegadis chihi*	Documented near site (DOE 2018-TN12970)	Threatened
Whooping crane	Birds	*Grus americana*	Documented near site (DOE 2018-TN12970)	Endangered
Willet	Birds	*Tringa semipalmata*	Documented in vicinity (eBird 2026-TN12992)	SGCN
Wilson's warbler	Birds	*Cardellina pusilla*	Documented in vicinity (eBird 2026-TN12992)	SGCN

Common Name	Group	Scientific Name	Potential to Occur	State Status
Yellow rail	Birds	*Coturnicops noveboracensis*	Not documented in site or vicinity (eBird 2026-TN12992; iNaturalist 2026-TN12968)	SGCN
Yellow-billed cuckoo	Birds	*Coccyzus americanus*	Not documented in site or vicinity (eBird 2026-TN12992; iNaturalist 2026-TN12968)	SGCN
American bumblebee	Insects	*Bombus pennsylvanicus*	Documented in vicinity (iNaturalist 2026-TN12968)	SGCN
Migratory monarch butterfly	Insects	*Danaus plexippus*	Documented near site (Pantex 2025-TN12791)	SGCN
Big free-tailed bat	Mammals	*Nyctinomops macrotis*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Black bear	Mammals	*Ursus americanus*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	Threatened
Black-tailed prairie dog	Mammals	*Cynomys ludovicianus*	Documented on site and nearby (Site observation, February 2026; Pantex 2025-TN12791)	SGCN
Cave myotis bat	Mammals	*Myotis velifer*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Eastern spotted skunk	Mammals	*Spilogale putorius*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Hoary bat	Mammals	*Lasiurus cinereus*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Mountain lion	Mammals	*Puma concolor*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN

Common Name	Group	Scientific Name	Potential to Occur	State Status
Pale Townsend's big-eared bat	Mammals	*Corynorhinus townsendii pallescens*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Palo Duro mouse	Mammals	*Peromyscus truei comanche*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	Threatened
Plains spotted skunk	Mammals	*Spilogale interrupta*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Pronghorn	Mammals	*Antilocapra americana*	Documented near site (Pantex 2025-TN12791)	SGCN
Swift fox	Mammals	*Vulpes velox*	Documented near site (DOE 2018-TN12970)	SGCN
Townsend's big-eared bat	Mammals	*Corynorhinus townsendii*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Tricolored bat	Mammals	*Perimyotis subflavus*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Western pipistrelle	Mammals	*Parastrellus hesperus*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Western small-footed myotis bat	Mammals	*Myotis ciliolabrum*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Smooth softshell turtle	Reptiles	*Apalone mutica*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Texas horned lizard	Reptiles	*Phyrnosoma cornutum*	Documented near site (Pantex 2025-TN12791)	Threatened
Western box turtle	Reptiles	*Terrapene ornata*	Not documented in site or 6 mi vicinity but nearby (iNaturalist 2026-TN12968)	SGCN
Western massasauga	Reptiles	*Sistrurus tergeminus*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN

Common Name	Group	Scientific Name	Potential to Occur	State Status
Smooth softshell turtle	Reptile	*Apalone mutica*	No habitat available at the site or vicinity	SGCN
Mexican mud-plantain	Plants	*Heteranthera mexicana*	Not documented in site or vicinity (iNaturalist 2026-TN12968)	SGCN
Arkansas River shiner	Fish	*Notropis girardi*	No habitat available at the site or vicinity	Threatened
Peppered chub	Fish	*Macrhybopsis tetranema*	No habitat available at the site or vicinity	Endangered

NA= not applicable; no State status listed; SGCN = species of greatest conservation need.
Sources: DOE 2018-TN12970; Pantex 2025-TN12791; eBird 2026-TN12992; iNaturalist 2026-TN12968.

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APPENDIX D

ESA-LISTED SPECIES EFFECTS EVALUATIONS

The U.S. Nuclear Regulatory Commission (NRC, the Commission) describes its consultation responsibilities under Section 7 of the Endangered Species Act (ESA) in Regulatory Guide (RG) 4.2, Revision 3 (NRC 2018-TN6006). ESA Section 7 requires Federal agencies to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species (jeopardy), or destroy or adversely modify any critical habitat for such species (adverse modification). For the NRC, an "action" may include licensing, rulemaking, and other regulatory activities. If an action may affect an ESA-listed species or critical habitat, the NRC must consult with the U.S. Fish and Wildlife Service (FWS) (for terrestrial or freshwater species) or the National Marine Fisheries Service (NMFS) (for marine and anadromous species). Consultation may be formal, if an action is expected to "adversely affect" a listed species or if FWS/NMFS does not concur with NRC's conclusions that an action is "not likely to adversely affect" listed species.

The NRC may prepare a biological assessment (BA) to support an informal or formal consultation. A BA is a document submitted by the action agency that evaluates the potential effects of the Federal action on ESA-listed species that could be affected by the action in order to determine whether any are likely to be adversely affected.

NRC encourages applicants to assist NRC in completing its ESA consultation responsibilities by identifying listed species or critical habitats in the affected area, presenting details of the proposed action within the environmental report (ER), and describing how their proposed action could potentially affect each listed species or critical habitat potentially present in the project action area.

This appendix supplements the description of ecological resources and potential impacts of construction and operation of the proposed Project Matador Nuclear (PMN) Units 1–4 found in Section 3.6 and provides information to support effects determinations for ESA-listed and proposed species potentially in the action area.

D.1 ESA-Listed Species Descriptions

D.1.1 Piping Plover (*Charadrius melodus*)

The piping plover is a small, migratory shorebird found along sandy and rocky shorelines of waterbodies throughout the central and eastern United States. The species was listed as a federally threatened species under the ESA in 1986. Two subspecies and three distinct population segments (DPS) are recognized. The breeding range of *C. m. melodus* is restricted largely to the Atlantic coast, with this subspecies mostly overwintering in the south Atlantic coast of the Carolinas, Georgia, and Florida. The breeding range of *C. m. circumcinctus* is divided into a Great Lakes DPS, restricted to the Great Lakes region, and a Northern Great Plains DPS, distributed from western Canadian provinces south to the Texas panhandle. This subspecies overwinters largely in the Gulf of Mexico, with each DPS generally exhibiting fidelity to specific overwintering regions closer to the breeding range. In the Northern Great Plains, piping plover begin nesting in the spring, with males creating a shallow depression in unconsolidated sediments of beach habitats of alkali lakes and wetland, inland lakes, reservoirs and rivers and lined with pebbles by both adults. Hatching occurs within approximately 25–28 days, and chicks

fledge within approximately 30 days of hatching. Piping plovers forage on a variety of invertebrates, normally in proportion to availability. Census results for the Northern Great Plains show population size has ranged from approximately 1,200 to 3,000 individuals since 1991. Although the species is protected throughout its range, critical habitat has not been designated in Texas, and populations in the State are not associated with particular population targets in the recovery plan. According to the 5-year review from 2024, the greatest threat to the species is habitat loss from a variety of sources including river modification, sand and gravel mining, oil and gas development, wind power development, neonicotinoid insecticide use, and agricultural development, among other factors (67 *Federal Register* [FR] 57638-TN12923; FWS 2024-TN12898, FWS 2016-TN12026).

D.1.2 Rufa Red Knot (*Calidris canutus rufa*)

The rufa red knot, a subspecies of the red knot, is a medium-sized shorebird found throughout the central and eastern United States. The subspecies was listed as a federally threatened species under the ESA in 2013. The species migrates annually between breeding areas in central Canada and nonbreeding and overwintering regions throughout the central and southeastern United States and Central and South America. Breeding and nesting occur in late May to early June at inland locations of slightly elevated tundra near arctic coasts, with adults scraping nests into patches of vegetation. Proposed critical habitat is focused on nonbreeding areas on the Atlantic and Gulf coasts. Use of inland waterbody habitat during migration appears to be limited to small numbers of individuals, but information is lacking. Overall population size is unknown; however, a decline in the 2000s followed by a stable, lower population size in the 2010s has been inferred from local studies. Within its nonbreeding range, the rufa red knot is threatened by habitat destruction and modification primarily from sea level rise, shoreline stabilization, and coastal development. Within its breeding range, the primary threat to rufa red knot habitat is from climate change, which is causing shifts in vegetation at the breeding grounds (FWS 2014-TN8851; 88 FR 22530-TN10376; FWS 2026-TN12899).

D.1.3 Monarch Butterfly (*Danaus plexippus*)

The monarch butterfly is a large butterfly with a broad distribution. Approximately 90 percent of the monarch population is found in its native range in North America where it is known for its long-distance migrations. The monarch was proposed to be listed as a federally threatened species under the ESA in 2024. The majority of the individuals of the species overwinter in a relatively small area of central Mexico and migrate northward, breeding along the way, with multiple subsequent generations making it as far as Canada until seasonal changes trigger the last generation of the year to make the southward overwintering migration. Nonmigratory populations and those with shorter migration distances occur along the Pacific, Gulf, and southern Atlantic coasts. Monarch larvae require milkweed host plants for development, and adults require a broad range of nectary plants during migration and overwintering. Estimates of overwintering population size suggest a decline since the 1990s. Primary threats to the migratory populations of North America include: habitat loss and degradation (from agricultural and urban development, herbicide use, logging and mismanagement of overwintering sites, and drought); exposure to insecticides; and climate change (89 FR 100662-TN10959; FWS 2020-TN8593).

D.1.4 Whooping Crane (*Grus americana*)

The whooping crane is a large wading bird found in the central United States. The species was listed as a federally endangered species under the ESA in 1967, and additional areas were

designated as experimental nonessential populations from 1993 to 2011 (in Florida, Colorado, Idaho, New Mexico, Utah, western Wyoming, Alabama, Arkansas, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, North Carolina, Ohio, South Carolina, Tennessee, Virginia, Wisconsin, West Virginia, and Louisiana). Whooping cranes utilize a variety of wetland habitats for breeding, migration, foraging, and overwintering including coastal marshes, ponds, rivers, and agricultural fields. The species migrates each spring to breeding grounds in central Canada and then back to overwintering areas, mostly on the Texas coast, stopping daily to feed. The migration corridor between these two regions, which generally includes the PMN Units 1–4 site, encompasses 95 percent of whooping crane sightings. The crane feeds on a wide variety of plants and animals found under the soil surface by probing with their bills, or from the surface or vegetation. All existing whooping cranes are descendants of only 15 individuals known from the Canadian breeding area in 1941. Through concerted conservation efforts, the species increased to almost 280 individuals by 2011. Continued threats to the species include collision with human-made structures such as fences and power lines, shooting, chemical pollution near the breeding grounds, predators, disease, habitat destruction, severe weather, and lack of genetic diversity (FWS 2023-TN8854, FWS 2012-TN12290, FWS 2023-TN8857).

D.2 Effects Evaluations

Based on the descriptions of potential impacts described in Section 3.6.2, as well as the information on each species detailed above, potential effects on ESA-listed species were evaluated for each species.

D.2.1 Piping Plover

Since individual birds could disperse from an area in the face of construction activities, the greatest potential impact to the species is through direct habitat destruction during construction. Piping plovers utilize shoreline habitats for foraging and nesting, mostly associated with large waterbodies such as estuaries and oceans, reservoirs, river sandbars, and alkali lakes (FWS 2025-TN12353). As noted in Section 3.6.2.1 and 3.6.2.3, the playa and wetland habitats within the PMN Units 1–4 site and the Project Matador Campus are small and ephemeral even compared to other waterbodies such as larger and densely-arranged playas in the region. Even within the Texas panhandle, only one recent sighting has occurred—approximately 50 mi northwest of the site on an approximately 180 ac playa (eBird 2026-TN12992). This suggests that piping plover exhibit limited utilization of playas in general. Even if some individuals were dependent on playas, it is unlikely that the small playa, totaling approximately 8 ac, would represent preferred habitat. Further, the heavy anthropogenic disturbance described in Section 3.6.2.1 have resulted in less favorable habitat for the species within the site and the Project Matador Campus.

Migrating individuals could also be attracted by nighttime lights during construction and operation, leading to reduced energy reserves and potential collisions (see Section 3.6.2.3). Since piping plovers are low-density migrants and appear to use stopover habitats opportunistically (i.e., do not have consistently-used locations from year to year), lighting should have less impact on this species at the population level; however, impacts to individuals are still possible. Fermi America would work with Texas Parks and Wildlife Department (TPWD) and FWS to implement any required measures for compliance with Migratory Bird Treaty Act of 1918 (MBTA) and Bald and Golden Eagle Protection Act (BGEPA) as well as any required wildlife protection plans. Measures in such plans could include limiting nighttime work during spring and

fall migration seasons, especially on cloudy nights, turning off lights when not needed, and using flashing lights during operations.

There is no critical habitat for the piping plover in the action area (FWS 2026-TN12906). Habitat within the PMN Units 1–4 site is likely unsuitable for the species and, even if so, represents a very small portion of the potentially suitable habitat available within the region. Any best management practices (BMPs) or procedures required by FWS and TPWD to mitigate impacts are anticipated to be implemented prior to and during construction and operational activities. Therefore, PMN Units 1–4 *may affect* but are *not likely to adversely affect* the piping plover.

D.2.2 Rufa Red Knot

Since the rufa red knot is not known to occur at or near the site, despite extensive observations at the site and in surrounding areas (see Section 3.6.2.1), the greatest potential impact to the species is through direct habitat destruction during construction. Preferred wintering and migration habitat for the species includes both wave-affected and sheltered coastal habitat often in larger waterbodies; however, the role of smaller, inland waterbodies as stopover habitat is uncertain. The species is known to use a variety of inland waterbodies such as wetlands, riverine sandbars, saline lakes, and impoundments in smaller numbers. As a long-distance migrant, concentrations of rufa red knot are focused on inland waterbody where abundant food resources can be found consistently from year to year (FWS 2026-TN12899).

As noted in Section 3.6.1.1 and 3.6.2.1, the aquatic and wetland habitats within the PMN Units 1–4 site and the Project Matador Campus are small and ephemeral compared even to available habitats such as playas within the larger ecoregion. The nearest recent sightings of the red knot are located in numerous smaller waterbodies near Lubbock, Texas, more than 100 mi south of the site (eBird 2026-TN12992). This suggests that rufa red knot exhibits limited utilization of playas in the Texas panhandle. Even if some individuals would typically use these playas, it is unlikely that the small playa straddling the PMN Units 1–4 site boundary, totaling approximately 8 ac, would represent a substantial stopover resources. Further, the heavy anthropogenic disturbance described in 3.6.2.1 have resulted in less favorable habitat for the species within the site and the Project Matador Campus.

Migrating individuals could also be attracted by nighttime lights during construction and operation, causing them to deplete energy reserves and increasing the potential for collisions (see Section 3.6.2.3. Fermi America would work with TPWD and FWS to implement any required measures for compliance with MBTA and BGEPA as well as any required wildlife protection plans. Measures could include limiting nighttime work during spring and fall migration seasons, especially on cloudy nights, turning off lights when not needed, and using flashing lights during operations.

There is no critical habitat for the rufa red knot in the action area (FWS 2026-TN12906).

Habitat within the PMN Units 1–4 site is likely unsuitable for the species and represents a very small portion of the habitat available within the region. Any BMPs and procedures required by FWS and TPWD to mitigate impacts are anticipated to be implemented prior to and during construction and operational activities. Therefore, PMN Units 1–4 *may affect* but are *not likely to adversely affect* the rufa red knot.

D.2.3 Monarch Butterfly (*Danaus plexippus*)

Building the proposed PMN Units 1–4 on the site would grade and clear the entirety of the site, permanently eliminating approximately 564 ac of grassland and herbaceous habitat as well as additional acreage of other land uses (Figure 3-2). Both monarch butterflies and the larval host plants, milkweed, have been observed near the site (Pantex 2025-TN12791), and site activities would likely destroy milkweed plants found here. Available information on site history suggests that grassland habitat at the PMN Units 1–4 site and within the Project Matador Campus that would support monarch foraging and egg/larvae development has been degraded from past development and land use and from invasive species (Section 3.6.2.1). Although the affected acreage is large, it represents less than 2 percent of the approximately 31,000 ac (ha) of grassland and herbaceous land cover within the 6 mi (ha) vicinity of the site. Multiple species of milkweed are commonly observed in the region outside of the site and the Project Matador Campus (iNaturalist 2026-TN12968). Based on limited information from site surveys for monarchs and their eggs, reproduction may be variable from year to year. For instance, few monarchs and no monarch eggs were observed during surveys for the species in areas adjacent to the site in 2023 and 2024 (Pantex 2025-TN12791; CNS 2024-TN12634).

Although grassland habitat within the site would be graded and cleared, it is likely that milkweed (especially common milkweed, *Asclepias syriaca)* would reestablish in open areas that remain cleared or without infrastructure. Monarch butterflies could therefore be impacted by operational activities, most directly by management of landscaping or other vegetation management areas using mowing and pesticides/herbicides. Fermi America would use any needed pesticides or herbicides as indicated on the label and will develop and implement any additional required BMPs in consultation with appropriate agencies, including the FWS. The amount of suitable habitat within the PMN Units 1–4 site following construction is expected to be minimal.

There is no proposed critical habitat for the monarch butterfly in the action area (FWS 2026-TN12906).

Because monarch habitat within the PMN Units 1–4 site is already degraded and represents a small portion of the available habitat in the nearby vicinity, and since Fermi America will utilize any required BMPs to limit impacts, PMN Units 1–4 *may affect but are not likely to adversely affect* the monarch butterfly.

D.2.4 Whooping Crane (*Grus americana*)

The whooping crane is known to occur near the site and within the Project Matador Campus and could utilize the playas and human-made waterbodies currently at the site. Whooping cranes are known to utilize many types of inland waterbodies during migration. However, the 8 ac playa that straddles the PMN Units 1–4 site boundary is relatively degraded and represent less than 3 percent of the wetlands available within a 6 mi vicinity of the site (Figure 3-3). The playa and other waterbodies onsite have also been subject to various development and land use activities that have likely degraded and simplified habitat (Sections 3.6.1.1, 3.6.2.1), likely making them less suitable for whooping crane stopover habitat.

Migrating whooping cranes could also be attracted by nighttime lights during construction and operation, as detailed for piping plover and rufa red knot above. Any required BMPs used for these species will limit impacts to whooping cranes.

There is no critical habitat for the whooping crane in the action area (FWS 2026-TN12906).

Because wetland habitat within the PMN Units 1–4 site is already degraded and represents a small portion of the available habitat in the nearby vicinity, PMN Units 1–4 *may affect* but are *not likely to adversely affect* the whooping crane.

D.3 Conclusion

Due to the limited habitat for federally listed species at the PMN Units 1–4 site, and since Fermi America will utilize required BMPs to limit additional impacts to protected species outside the project area, PMN Units 1–4 *may affect* but are *not likely to adversely affect* ESA-listed or proposed species. There is no critical habitat found within the action area of the PMN Units 1–4 site and, therefore, the project will have no effect on critical habitat.

D.4 References

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APPENDIX E

GREENHOUSE GAS EMISSIONS ESTIMATES FOR PROJECT MATADOR NUCLEAR UNITS 1–4 AND CLIMATE CHANGE IMPACTS

E.1 Greenhouse Gas Emissions

The Commission Order in CLI-09-21 (NRC 2009-TN6406) provides direction to the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff to consider the impacts of emissions of carbon dioxide (CO_2) and other greenhouse gases (GHGs) in its environmental reviews. Gases found in the Earth's atmosphere that trap heat and play a role in the Earth's climate are collectively termed GHGs. These GHGs include CO_2, methane (CH_4), nitrous oxide (N_2O), water vapor (H_2O), and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6). The NRC staff estimated GHG emissions of various activities associated with the building, operating, and decommissioning of nuclear power plants in Appendix H to NUREG-2249, *Generic Environmental Impact Statement for Licensing of New Nuclear Reactors* (2026 NR GEIS) (NRC 2026-TN12155). Appendix H to the 2026 NR GEIS discusses the calculation of GHG emissions estimates for a reference 1,000 MWe reactor. The GHG emission estimates include direct emissions from the nuclear facility and indirect emissions from workforce and fuel transportation, decommissioning, and the uranium fuel cycle. These estimates are based on a single installation of 1,000 MWe gross output with an 80 percent capacity factor (the reference 1,000 MWe reactor). The estimates may be roughly linearly scaled from the reference 1,000 MWe reactor for other reactor outputs. This report discusses the scaling calculations of GHG emission estimates for four AP1000 units at the Project Matador Campus.

In Table H-4 of Appendix H to the 2026 NR GEIS (NRC 2026-TN12155), the NRC staff estimated the total lifetime GHG footprint for the reference 1,000 MWe reactor to be about 990,000 MT CO_2 equivalent (CO_2(e)), with a 7-year building phase, 40 years of operation, and 10 years of active decommissioning. The uranium fuel cycle component of the footprint is the largest portion of the overall estimated GHG emissions and is directly related to the assumed power generated by the plant. Project Matador Nuclear (PMN) will include four AP1000 units each with a net electrical power output of at least 1,000 MWe. Building activities (preconstruction and construction) are estimated to occur over a 13-year timeframe (see Table 2.2); the combined license (COL) will grant operations for each unit for up to 40 years.

GHG emissions estimates for construction equipment, plant operations, decommissioning equipment, for a four-unit nuclear plant would be based on the plant's physical size and the activity duration. The estimates for these stages are assumed to be four times the values of the reference 1,000 MWe reactor emission estimates in Appendix H to 2026 NR GEIS (NRC 2026-TN12155). Workforce emissions depend on the number of worker vehicles, which NRC staff conservatively assumes is equal to peak workforce values. GHG emissions for the uranium fuel cycle and transportation of fuel and waste would be based on the anticipated efficiency of the proposed plant. The GHG emission estimates for the reference reactor for the uranium fuel cycle and transportation of fuel and waste are based on an annual capacity factor of 80 percent. As discussed above, the net electrical power output is 1,000 MWe per unit or a total of 4,000 MWe for the four proposed units at the Project Matador Campus. Therefore, the total output is about five times (4,000 MWe divided by 800 MWe yields a scaling factor of 5) the values provided in Table H in the 2026 NR GEIS for the uranium fuel cycle and transportation of fuel and waste. Estimates for a reference 1,000 MWe reactor and PMN Units 1–4 are presented in Table E-1.

Table E-1 Life Cycle Assumptions and Greenhouse Gas Emissions for PMN Units 1–4 Compared to the 1,000 MWe Reference Reactor

Source	Activity Duration (yr)	Total Emissions (MT CO_2(e))	Scaling Factor	Activity Duration (yr)	Total Emissions (MT CO_2(e))
Construction Equipment	7	39,000	4	13	289,700[(a)]
Construction Workforce	7	43,000	See[(b)]	13	478,970
Plant Operations	40	181,000	4	40	724,000[(a)]
Operations Workforce	40	136,000	See[(c)]	40	351,080
Uranium Fuel Cycle	40	540,000	5[(d)]	40	2,700,000[(a)]
Fuel and Waste Transportation	40	14,000	5[(d)]	40	70,000[(a)]
Decommissioning Equipment	10	19,000	4	10	76,000[(b)]
Decommissioning Workforce	10	8,000	4	10	32,000
SAFe STORage workforce	40	10,000	4	40	40,000
Total	-	**990,000**	-	-	**3,993,080**

"-" denotes no data in table cell.

(a) Emissions calculated by applying the following equation 1,000 MWe reference reactor CO2(e) x scaling factor x (years of activity of proposed activity/years of activity for 1,000 MWe reference reactor)

(b) Based on Table H-2 of NUREG-2249, peak construction workforce to be 2,200 per unit, construction starts being staggered by approximately 2 years, and schedule presented in Table 2-2 of this EIS.

(c) Based on Table H-2 of NUREG-2249 and a peak operations workforce of 600 workers for Unit 1 and 230 workers for each additional unit.

(d) Scaling factor based on net electrical power output of 1,000 MWe per unit. The GHG emission estimates for the 1,000 MWe reference reactor in NUREG-2249 for the uranium fuel cycle and transportation of fuel and waste are based on an annual capacity factor of 80 percent (i.e., net electrical output of 800 MWe). Therefore, the total output of the PMN Units 1–4 is about five times (4,000 MWe divided by 800 MWe yields a scaling factor of 5) the values provided in Table H-4 in Appendix to NUREG-2249.

The NRC staff has calculated that the life-cycle GHG emission for the proposed PMN that consists of four AP1000 units to be approximately 3.9 million MT CO_2(e) using the assumptions discussed above to scale the emissions from the reference 1,000 MWe reactor presented in Appendix H to the 2026 NR GEIS.

E.2 Climate Change

E.2.1 Affected Environment for Climate Change

The NRC has determined that it is reasonably foreseeable that climate change may alter the affected environment described in Chapter 3 during the period of the construction, operation, and decommissioning of PMN Units 1–4. Climate change is the decades or longer change in climate measurements (e.g., temperature and precipitation) that has been observed on a global, national, and regional level (IPCC 2007-TN7421; EPA 2016-TN7561; USGCRP 2014-TN3472). Changes in climate can have broad implications for certain resource areas. 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 action.

The NRC staff considered the best available climate change information from the Fifth National Climate Assessment (USGCRP 2023-TN9762) to provide the basis for likely climate change impacts in the U.S. and in the region of the Project Matador Campus. NCA5 (USGCRP 2023-TN9762) uses shared socioeconomic pathways (SSP) and global warming levels (GWLs) as its primary framework for assessing potential climate impacts. The five socioeconomic pathway

scenarios (SSP1-1.9, SSP1-2.6, SSP2-4.5, SSP3-7.0, and SSP5-8.5) cover a range of GHG pathways and climate change mitigation. GWL quantify changes based on specific global temperature increases relative to preindustrial conditions (e.g., 3.6°F or 5.4°F) (USGCRP 2023-TN9762). The timing of when a GWL is reached will depend on future GHG emissions. For example, under a very high emission scenario (SSP5-8.5) models project reaching a 3.6°F of global warming between 2033 and 2054; under an intermediate scenario (SSP2-4.5), models project reaching a 3.6°F global warming level between 2038 and 2085.

E.2.2 Observed and Expected Climatological Changes

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 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. per decade (EPA 2024-TN10205). From 1901 to 2023, average surface temperature across the contiguous United States has increased by 0.17°F per decade (EPA 2024-TN10205). From 1901 to 2023, total annual precipitation in the contiguous United States has increased at a rate of 0.18 in. per decade (EPA 2024-TN10205).

Annual average temperature data in Texas exhibited an increase of up to 2°F during the period 2002–2021 relative to 1901–1960 (USGCRP 2023-TN9762: Figure 2.4). The number of hot days (days at or above 95°F) in the Southern Great Plains has decreased by 8.3 days, the number of cold days (days at or below 32°F) has decreased by 0.7 days, and the number of warm nights (nights at or above 70°F) have increased by 3.6 nights compared to 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 Texas Panhandle exhibits both increase and decrease (USGCRP 2023-TN9762: Figure 2.4). The Southern Great Plains has experienced a 21 percent increase in the number of extreme precipitation days (defined as the top 1 percent of heaviest precipitation events) from 1958–2021 (USGCRP 2023-TN9762: Figure 2.8).

The International Panel on Climate Change (IPCC) projects that a global warming of 3.6°F will be exceeded during the 21st century unless deep reductions in GHG occur in the coming decades (IPCC 2021-TN7435). By the end of the century, a global warming of 5.4°F can be exceeded under a high and very high scenario (SSP3-7.0 and SSP5-8.5) (USGCRP 2023-TN9762). If the COLs are granted, Fermi America expects to initiate NRC-authorized construction in 2027 and commercial operations in 2032 for Unit 1 (see Table 2-2). A combined license is issued for a specified period not to exceed 40 years (10 CFR 52.104). While general scientific consensus exists that climate change is occurring and will continue to occur for the foreseeable future, changes in the baseline affected environment are more likely to be noticeable during the 40-year period of operation than during construction, which would occur over an 11-year period (see Table 3-2). Therefore, the NRC staff considers projections under a global warming level of 5.4°F or a very high emission scenario (SSP5-8.5) to be appropriate in assessing the effects of climate change during the period of operation of PMN Units 1–4 (approximately 2032–2078). Projected climate changes for a 5.4°F global warming level are presented in Table E-2.

Table E-2 Climate Variable and Projected Change for Carson County, Texas or Great Plains

Climate Variable	Projected Change Under a Global Warming Level of 5.4°F (USGCRP 2023-TN9762) relative to 1991–2020 or Late Century (2071–2100) Under Very High Emission Scenario (SSP5-8.5)
Average surface air temperature	Increase of 6°F
Hottest day of the year	Increase by 6°F
Annual Number of Days with temperatures above 95°F	Increase of 49 days
Annual Number of Days with temperatures below 32°F	A decrease of 32 days
Projected changes in precipitation	Annual total precipitation is projected to decrease by 1 percent and the annual number of days with extreme precipitation (top 1% of historical rainfall events) will increase by 15%
General/Other	Intensity of drought conditions will increase in the Southern Great Plains Loss of cropland acreage in the Southern Great Plains Increased risk of late false springs in the Southern Great Plains Medium confidence that climate change is projected to worsen air quality in many regions in the United States.

E.3 Climate Change Impacts on Environmental Resources

Climate change impacts can occur across resource areas that are affected by the proposed action. The climate change analysis focuses on assessing the potential effects of climate on the resource area impact determinations assigned in Chapter 3. Below, the NRC considers the effects of climate change on environmental resource areas that may also be directly affected by operations of the proposed PMN Units 1–4. In other words, the operations of the proposed PMN Units 1–4 must have an incremental new, additive, or increased physical effect or impact on the resource and climate change is expected to have a reasonably foreseeable effect on that resource. If both criteria are not present, then the NRC did not consider the overlapping impacts of proposed action and climate change. For example, climatological changes are not expected to directly affect noise levels, visual resources, or impact radiological exposure levels or doses and therefore they are not discussed below. Alternatively, as discussed in Chapter 3, the proposed units will be operated using air-cooled technology and no surface water use is planned for the cooling system or other plant cooling systems. Similarly, as discussed in Chapter 3, no impacts to aquatic habitats or species are expected from operation of PMN Units 1–4 given that the use of air cooling towers and no aquatic habitats have been identified within the site. Therefore, climate change impacts on surface water use and aquatic resources are not discussed below. This does not mean that climate change will not have a reasonably foreseeable effect on surface water or aquatic habitats, but both criteria discussed above are not present and therefore the overlapping impacts are not anticipated. For this reason, based on this framework and NRC staff's analysis of the proposed action as presented in Chapter 3,

climate change impacts to noise, land use and visual resources, surface water resources, aquatic resources, geology, radiological and nonradiological health and waste management are not discussed further below.

E.3.1 Air Quality

Climate change can impact air quality as a result of changes in meteorological conditions. 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 the 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 (USGCRP 2023-TN9762). U.S. Global Change Research Program reports that there is medium confidence that climate change is projected to worsen air quality in many U.S. regions (USGCRP 2023-TN9762). This is due to the uncertainty in how meteorology will respond to climate change and how these meteorological conditions will in turn change air pollutant concentrations. For instance, 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 3.3.1, the proposed site is located within Carson County, which is designated in attainment for criteria pollutants. PMN operations generate low level, intermittent air emissions. Although climate change may influence meteorological conditions and consequently pollutant concentrations, the specific direction of any change would vary depending on both the pollutant involved and the meteorological conditions. Because emissions are minimal and sporadic, the NRC staff concludes that the proposed actions impact to air quality would not be materially changed and the SMALL determination assigned in Chapter 3 would not be altered by the projected effects of climate change

E.3.2 Groundwater Resources

Climatic changes, including precipitation patterns, temperature, and evapotranspiration, can affect groundwater recharge. A reduction in soil moisture due to higher temperature and decreases in precipitation can reduce groundwater availability in water supply wells, reduce baseflow to streams, and affect groundwater quality. Runoff rates increase with heavier rainfall events and can reduce groundwater recharge. No direct use of onsite groundwater is expected for supporting operation of PMN Units 1–4. As discussed in Section 3.5.2.3.2, it is anticipated that groundwater for operation of PMN Units 1–4 will be provided by the municipal water supply of the City of Amarillo, which is sourced from the Ogallala Aquifer and well within the City of Amarillo's groundwater withdrawal limits and system capacity. Fermi America also plans to treat and reuse plant effluents. Considering the information presented immediately above, the NRC staff concludes that detrimental groundwater impacts from the proposed action would not occur if climate change decreased the availability of groundwater or groundwater quality. Therefore, the SMALL effects determinations assigned in Chapter 3 would not be altered by the projected potential effects of climate change.

E.3.3 Terrestrial Ecology

Increasing temperatures can cause shifts in species ranges and migratory corridors. The timing of seasons affects when plants resume active growth in spring and when birds and other

animals migrate. Increased temperatures, decreased rainfall, and more-severe droughts could also lead to the drying of wetlands. As discussed in Section 3.6.2, possible effects from operation of PMN Units 1–4, include animal injury and mortality from traffic collision or collision with structures, potential injury or mortality from facility maintenance activities such as pesticide/herbicide application and mowing, noise from operational activities, use of lighting that could affect animal activity patterns, and radionuclide exposure. However, these operationally induced stresses would most likely have only minimal effects on regional habitats and wildlife populations. While climate change and operational effects could present simultaneous stresses to those resources, the NRC staff does not anticipate that climate change would render the operational impacts as more than minimal. As discussed above, climatological changes are not expected to directly affect noise levels or radiological exposure levels. Therefore, climate change would not likely intensify terrestrial impacts from the proposed action. Furthermore, water from wetlands will not be used to support operation of PMN Units 1–4. As a result, the NRC staff concludes that terrestrial impacts from the proposed action would not be exacerbated by climate change and the determination (SMALL) assigned in Chapter 3 would not be altered by the projected effects of climate change.

E.3.4 Socioeconomics

Changes in climate conditions can impact tourism/recreation and job availability. Temperature and precipitation changes and extreme weather events and hazards (e.g., flooding) associated with climate change can affect tourism and recreation, which in turn contribute to jobs and revenue. A changing climate can reduce opportunities for some activities (water-dependent recreation in areas projected to get drier) in some locations and expand opportunities for others. Drought conditions, for example, reduces the demand for farm labor (USGCRP 2023). However, as discussed in Sections 3.8.2.2 and 3.8.3.1.1, impacts from plant operation employees of PMN Units 1–4 on the regional economy is anticipated to be SMALL and beneficial and impacts on recreation are anticipated to be SMALL. Therefore, climate change would not intensify the socioeconomic impacts from the proposed action.

E.4 References

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APPENDIX F

SOCIOECOMICS INFORMATION

This appendix supplements the description of socioeconomics found in Section 3.8 and provides information to support socioeconomic impacts determinations of constructing and operating Project Matador Nuclear (PMN) Units 1–4.

F.1 Regional Population

The 2020 census population and Topographically Integrated Geographic Encoding and Referencing (TIGER)/Line data from the U.S. Census Bureau (USCB) were used to determine demographic characteristics in the vicinity of the site (USCB 2026-TN13477). The data was processed at the State, county, and census-block levels using ArcGIS[1] (USCB 2026-TN13478). Census data includes people living in group quarters, such as institutionalized and non-institutionalized populations. Examples of institutional populations living in group quarters are correctional institutions (i.e., prisons, jails, and detention centers); nursing homes; mental (psychiatric) hospitals; hospitals or wards for the chronically ill; and juvenile institutions. Examples of non-institutional populations living in group quarters are group homes; college dormitories; military quarters; soup kitchens; shelters for abused women (shelters against domestic violence or family crisis centers); and shelters for children who are runaways, neglected, or without conventional housing (USCB 2023-TN13332).

The population within a 50 mi radius of the PMN Units 1–4 was estimated based on the 2020 USCB Decennial Census data. The population distribution was estimated to be 16 directional sectors, each direction consisting of 22.5 degrees, and in 14 concentric bands, measured from the reactor center point. The bands range in distance from the center point in 1 mi increments to 10 mi and then in 10 mi increments to 50 mi. The boundaries of the bands and directional lines produce a sector grid illustrated in Figure F-1.

The sector grid was produced using ESRI ArcGIS Pro Version 3.4 software and based on U.S. Nuclear Regulatory Commission's (NRC's, the Commission's) guidance specified in the NUREG-1555; NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition* (NRC 2007-TN613); Regulatory Guide 1.70, *Standard Format and Content of Safety Analysis Reports for Nuclear Power Plants (LWR Edition)* (NRC 2007-TN1977). The sector grid provides a base geography for all population calculations including permanent, transient, and total population, in addition to current and projected estimates.

Multiple inputs were used to calculate permanent, transient, and total population in sectors. These inputs are discussed in Sections F.4.1. The inputs that were obtained as State, county, and block geographies were converted into sector areas. The sector grid, common to all the data sets by conversion, was used to integrate the inputs into the calculation.

[1] ArcGIS is a geographic information system (GIS) software developed by Esri.

F.2 Population Projections

For population projection calculations, regression analysis is performed on the county population projection data to fit an equation (curve) to the projection data. Regression equations are selected based on the following three criteria:

- good R-squared value (values close to 1)
- best fit of the equation (i.e., line) to the data
- conservative and realistic population estimates

The county population projection data from State reports were curve fitted, utilizing least squares linear and polynomial regression techniques in Microsoft Excel for each county that falls partially or wholly within the region.

The curve-fitted regression equations for all of counties in the region were determined to fall under one of the following regression techniques (1) linear; (2) 2nd order polynomial; (3) 3rd order polynomial; (4) a composite of average growth rate and then held constant at the highest population value; and (5) constant because data illustrated a decline and was held at the peak population.

When county population projections were in decline through the end of the projected period, the population was held constant at the peak population. Once the peak population year was reached, future population projections were held constant at the peak population value.

F.3 Transient Populations

Transient populations and their locations can be sorted into a variety of categories. For this survey, various types of transient population sources were contacted. The following categories were used in estimating the transient populations within the Greater Amarillo Area, Lake Meredith National Recreation Area, and Palo Duro Canyon State Park:

- **Events and Festivals:** Major events in the counties within the region were identified and their organizers contacted. When possible, the peak attendance for the event, as well as the length of event, were recorded. If several events were found to be held at the same location, the largest peak attendance was used. Desktop reviews supplemented data when available.
- **Parks and Recreational Areas:** Major recreational areas were identified within the region. Total visitation estimates collected for major recreational areas were used.
- **Campgrounds and Recreational Vehicle (RV) Parks:** When possible, total available sites for campgrounds and RV parks were taken from the facility's website. A standard factor of 3.5 people per campsite was applied. Per discussions with local RV park owners, a multiplication factor of 8 percent was used to determine total transient visitors.
- **Airports:** Large airports in the 50 mi radius, listed as size "regional" or larger by the Bureau of Transportation Statistics, were identified, and airport visitation data was collected. Local airports were assumed to have very little non-resident visitation (e.g., those persons that are not already accounted for through USCB counts) and thus were not included in the Transient Population Survey. It was assumed these people are accounted for in the permanent population values.

- **Venues:** Peak attendance at seated venues was assumed to be venue capacity. For non-seated venues, such as convention centers, the convention center was contacted, and peak attendance for the busiest day at an event was used.
- **Attractions:** Large attractions within the 50 mi radius, such as zoologic gardens, museums, and amusement parks, were contacted, and the highest attendance during the calendar year was recorded, when available. Numbers from tourism agencies as well as parks and recreation departments were also used. Desktop reviews supplemented data when available.

F.3.1.1 Environmental Justice Populations (Reserved)

On April 10, 2025, the NRC published COMSECY-25-0007*, Withdrawing the Policy Statement on the Treatment of Environmental Justice Matters*, which withdrew the need to include environmental justice in licensing actions. The Commission published the notice on April 30, 2025, in 90 *Federal Register* (FR) 17887 (TN11684), "Effective April 30, 2025, the NRC withdraws the Environmental Justice Policy Statement published at 69 FR 52040 on August 24, 2004." Therefore, this environmental impact statement does not include an environmental justice analysis.

F.4 Affected Environment

This section presents the socioeconomic baseline of the proposed site. There are 15 counties within the 50 mi region surrounding the PMN Units 1–4 which include Armstrong, Briscoe, Carson, Castro, Deaf Smith, Donley, Gray, Hartey, Hutchinson, Moore, Oldham, Potter, Randall, Roberts, and Swisher Counties.

To describe the socioeconomic characteristics, this section uses two geographies: the demographic region, defined as all counties within a 50 mi radius of the reactors' center point, and an economic region, defined by the counties where the majority of the workforce is anticipated to reside. For PMN Units 1–4, the economic region has been identified as Carson, Potter, and Randall Counties following the guidance in NRC RG 4.2 (NRC 2026-TN11915).

Figure 2-5 shows the counties and principal cities and towns within the region and economic region. Cities, villages, and census designated places (CDPs) with centers falling within the 50 mi region of PMN Units 1–4 are listed in Table F-1.

Table F-1 Cities, Towns, and Villages Located Totally or Partially Within the Economic Region of the Project Matador Nuclear Site

City/Town/CDP	County	State	2020 Census Population[a]	2024 Estimated Population[b]	Distance to Project Matador Project Area (mi)[c,d]	Direction[c,d]
Alanreed	Gray	Texas	23	15	49.5	East
Amarillo	Potter	Texas	200,393	201,885	14.4	WSW
Bishop Hills	Potter	Texas	211	202	20.1	West
Boys Ranch	Oldham	Texas	173	309	39.9	WNW
Bushland	Potter	Texas	2,234	2,779	27.5	WSW

City/Town/CDP	County	State	2020 Census Population[a]	2024 Estimated Population[b]	Distance to Project Matador Project Area (mi)[c,d]	Direction [c,d]
Canyon	Randall	Texas	14,836	15,723	29.1	SW
Channing	Hartley	Texas	281	242	48.5	WNW
Clarendon	Donley	Texas	1,877	1,859	47.9	ESE
Claude	Armstrong	Texas	1,186	1,163	19.2	SE
Dumas	Moore	Texas	14,501	14,452	43.6	NNW
Fritch	Hutchinson	Texas	1,859	2,293	22.7	North
Groom	Carson	Texas	552	549	28.9	ESE
Happy	Swisher	Texas	602	647	41.7	SSW
Howardwick	Donley	Texas	370	412	43.6	ESE
Lake Meredith Estates	Hutchinson	Texas	338	183	23.5	North
Lake Tanglewood	Randall	Texas	686	624	19.3	SSW
Lefors	Gray	Texas	420	557	45.7	East
Palisades	Randall	Texas	268	265	20.6	SW
Pampa	Gray	Texas	16,867	16,659	39.4	ENE
Panhandle	Carson	Texas	2,378	2,505	12.7	East
Rockwell Place	Randall	Texas	1,811	2,016	24.4	SW
Sanford	Hutchinson	Texas	132	130	27.2	North
Skellytown	Carson	Texas	394	457	30.0	NE
Stinnett	Hutchinson	Texas	1,650	1,170	36.7	NNE
Sunray	Moore	Texas	1,707	2,628	50.0	NNW
Timbercreek Canyon	Randall	Texas	430	528	20.6	SW
Umbarger	Randall	Texas	123	0	37.7	SW
Vega	Oldham	Texas	879	1,086	47.0	West
Washburn	Armstrong	Texas	116	278	9.4	South
White Deer	Carson	Texas	918	1,191	25.6	ENE
Wildorado	Oldham	Texas	201	157	34.6	West

ENE = East Northeast; ESE = East Southeast; NE = Northeast ; NNE = North Northeast; NNW = North Northwest; SE = Southeast; SW = Southwest; WNW = West Northwest; WSW = West Southwest.
(a) Source: USCB Decennial Census 2020 (USCB 2026-TN13478).
(b) Source: USCB 2024, American Community Survey, 5-Year Estimates (USCB 2024-TN13490).
(c) Source: DOT 2024-TN13521
(d) Note: Distances and directions were measured from the reactor center point to the city center.

F.4.1 Regional Population

The 2020 census data indicates that approximately 330,492 people live within a 50 mi radius of the PMN Units 1–4, which equates to a population density of 42.1 persons per square mile (USCB 2026-TN13478: 2020 Decennial Census). As listed in Table F-1, the City of Amarillo, Texas, has a population greater than 100,000.

Table F-2 provides a summary of 2010 permanent, 2020 permanent, and 2078 projected permanent population for the 15 counties wholly or partially within the region. The emergency plan addresses the population distribution in the emergency planning zone (EPZ).

Table F-2 County Populations Totally or Partially within the Economic Region of the Project Matador Nuclear Site

State and County	2010 Census Population[(a)]	2020 Census Population[(b)]	2078 Projected Permanent Population[(c)]
Armstrong County	1,901	1,848	1,973
Briscoe County	1,637	1,435	1,494
Carson County	6,182	5,807	5,864
Castro County	8,062	7,371	7,383
Deaf Smith County	19,372	18,583	18,583
Donley County	3,677	3,258	3,360
Gray County	22,535	21,227	21,227
Hartley County	6,062	5,382	5,385
Hutchinson County	22,150	20,617	20,617
Moore County	21,904	21,358	21,871
Oldham County	2,052	1,758	1,823
Potter County	121,073	118,525	118,525
Randall County	120,725	140,753	225,023
Roberts County	929	827	837
Swisher County	7,854	6,971	7,009
Demographic Area of Interest Counties Total	**366,115**	**375,720**	**460,974**
Economic Region (Carson, Potter, Randall) Counties Total	**247,980**	**265,085**	**349,412**

(a) Source: USCB 2010 Decennial Census (USCB 2010-TN13534).
(b) Source: USCB 2020 Decennial Census (USCB 2020-TN13532).
(c) For counties with projected negative population growth, the 2020 or the largest population values for that county were held constant.

F.4.1.1 Population Projections

As illustrated in Figure 2-5 and Figure F-1 the area within a 50 mi radius of the PMN Units 1–4 site totally or partially includes 15 counties within the State of Texas. County population projection estimates and reports were obtained from the State of Texas and the Texas Demographic Center. The State of Texas produced population projection information at the county level based on the 2020 Census data and projected for approximately 40 years into the future (e.g., 2060). Texas Demographic Center used a Cohort Component projection method to establish population projections by county (TDC 2026-TN13331).

Historic and projected county-level permanent population values for the counties totally or partially within the region are shown in Table F-2.

F.4.1.2 Transient Population

No national or State database exists that includes transient population counts by U.S. Census summary level. To develop this data for the PMN Units 1–4, a Transient Population Survey of the Greater Amarillo Area, Lake Meredith National Recreation Area, and Palo Duro Canyon State Park (collectively called the Transient Area of Interest) was conducted by Fermi America's contractor, Enercon, from November 2025 to February 2026. Visitor counts for these areas were determined by the point-source method (ANS 2018-TN6405). Desktop research was undertaken to determine venues, events, etc. that would attract visitors to the area. Outreach was conducted during January and February, and an in-person visit took place February 16 and 17, 2026. For more information regarding categories of transient attractions, see Section F.3.

Outside of the three areas discussed above, it was assumed that transient population is under 10 percent of the permanent population inside the 50 mi radius of PMN Units 1–4, a threshold defined in ANS 2.6 (ANS 2018-TN6405). Therefore, county-ratio methods were applied to these areas.

A list of events, venues, and parks most likely to attract tourism in the region, including location, peak visitation, and distance from site is presented in Table F-3. As verified by the Transient Population Survey, conducted from November 2025 through February 2026 by Fermi America's contractor, Enercon, rodeos are a large draw in the area, as well as the Tri-State Fair, while the Lake Meredith National Recreation Area and Palo Duro Canyon attract many visitors annually.

Summer and fall attract the most visitors to the area due to seasonal visitation and the outdoor nature of the largest attractions. However, the Transient Population Survey found that RV park vacancies remain relatively stable across the year, as the majority of campers are permanent residents or long term residents.

Table F-3 Top Contributors to the Transient Population in Economic Region of the Project Matador Nuclear Site

Park, Venue, or Area	County	Approximate Distance from Site (mi)	Notable Events	Peak Daily Attendance or Capacity
Tri-State Exposition Center	Potter	13.5	Tri-State Fair	60,000
Amarillo Civic Center	Potter	14.8	WRCA World Championship Rodeo	40,000
John Stiff Park	Randall	20.1	Independence Day Celebration	27,000
Historical Route 66 District	Potter/ Randall	17.3	Texas Route 66 Festival	12,000
Thompson Memorial Park	Potter	14	Renaissance Faire	10,000
Lake Meredith National Recreation Area	Hutchison/ Moore/ Potter	23	NA	6,065
Route 66 Motor Speedway	Randall	12.5	NA	4,000
Palo Duro Canyon State Park	Armstrong/ Randall	23.6	Texas Outdoor Musical	3,884
Wonderland Amusement Park	Potter	14	NA	2,326
Amarillo Botanical Gardens	Potter	19.4	Christmas in the Gardens	1,350

Park, Venue, or Area	County	Approximate Distance from Site (mi)	Notable Events	Peak Daily Attendance or Capacity
Rick Husband Amarillo International Airport	Potter	8.7	NA	1,319

NA = not applicable.

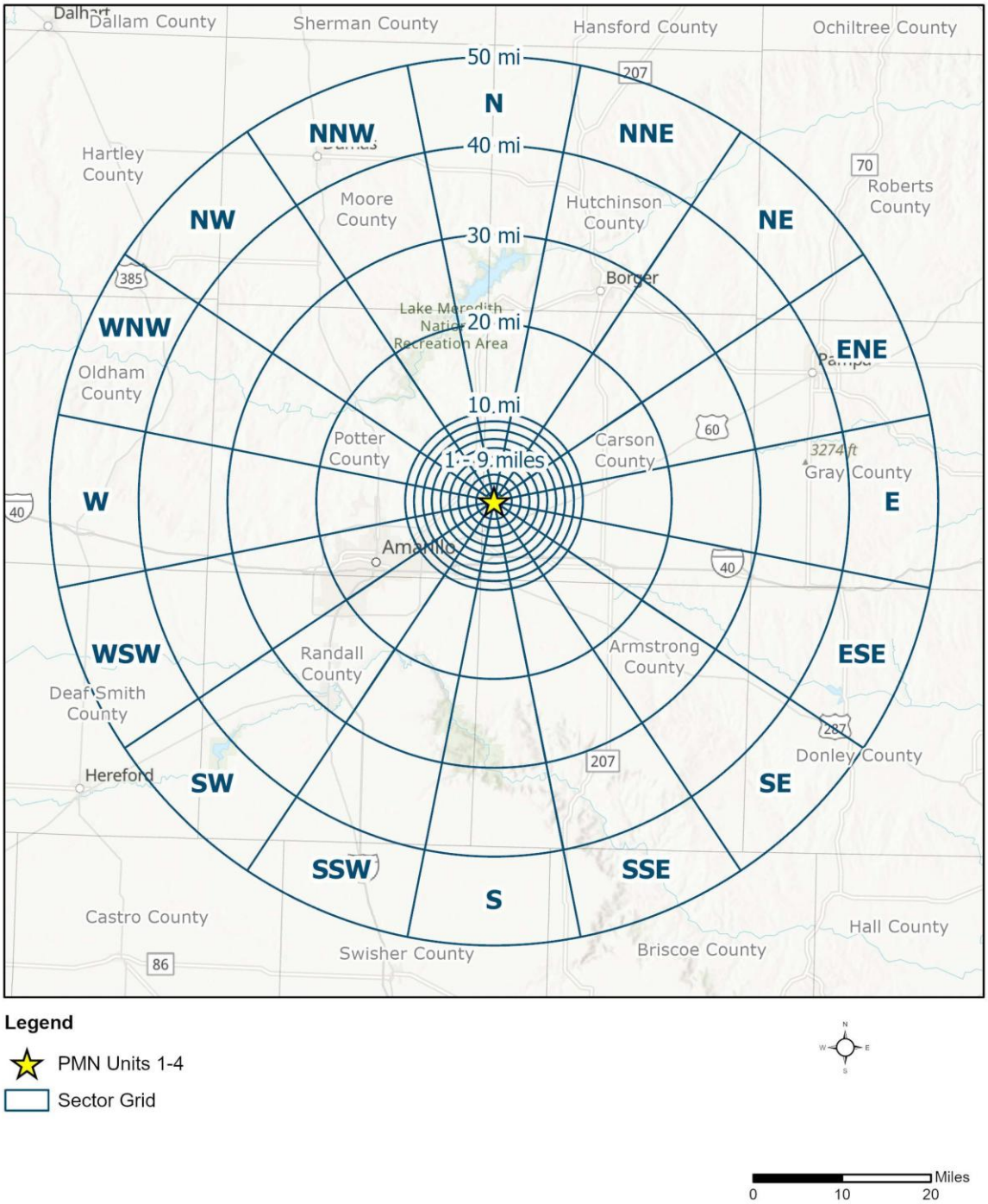


Figure F-1 Project Matador Nuclear Units 1–4 Site Area Sector Grid

F.4.2 Community Characteristics

Per RG 4.2 Revision 4 (NRC 2026-TN11915), the economic region is defined as a subset of counties within the region where 75 to 80 percent of the socioeconomic impacts are expected to occur; namely, where PMN staff reside. Carson, Potter, and Randall Counties are anticipated to be the counties in the region most heavily affected by PMN Units 1–4 construction and operations, as a review of population centers in the region suggests that these are the areas either closest to the plant (Carson County) or with the largest housing stock and economic viability (Potter and Randall Counties). Thus, these counties will collectively be referred to as the "economic region." The populations of Carson and Potter Counties are expected to decrease through 2086, whereas Randall County's population is expected to increase through the same time period (see Table F-2).

The PMN Units 1–4 region is part of an area of the State of Texas known as the "Texas Panhandle," the northernmost area of Texas situated between New Mexico to the west and Oklahoma to the north and east. The Texas Panhandle area encompasses 23 counties and 63 municipalities. The economic center of the Texas Panhandle is the City of Amarillo metropolitan area, which accounts for approximately 60 percent of the area's population. The Texas Panhandle's economy relies heavily on agriculture, energy, and the defense industry. Eighteen of the Panhandle's 26 counties meet the criteria for economically distressed (PRPC 2025-TN13329).

Potter and Randall Counties represent the counties in the 50 mi region with the largest populations, as the City of Amarillo is situated across both counties. The Transient Population Survey also suggests that, outside of Lake Meredith and Palo Duro Canyon Park, the City of Amarillo hosts the vast majority of large events and attractions. Surrounding counties are rural in nature and largely undeveloped, with most communities outside of the City of Amarillo featuring populations of 4,000 or less (PRPC 2025-TN13329). There are no listed federally recognized Indian Tribal Nations with lands in the PMN Units 1–4 region (BIA 2026-TN13326).

Planning for Carson, Potter, and Randall Counties is a joint effort between Panhandle Regional Planning Commission (PRPC) and the City of Amarillo. Within city limits, planning for the City of Amarillo is undertaken by the City of Amarillo Planning Department, which oversees areas such as current and long-term planning, zoning, and economic development (CA 2026-TN13323). The city's jurisdiction also includes the extraterritorial jurisdiction (ETJ), a "buffer zone" outside the city limits in which the State of Texas allows a city control over platting, assisting cities in planning for growth. The ETJ of the City of Amarillo is 5 mi (ALP 2026-TN13316; MC 2026-TN13315).

F.4.2.1 Employment and Income

Carson, Potter, and Randall Counties, all in the Texas Panhandle, are the counties most likely to be influenced by PMN Units 1–4 operations. An economic description for the three counties can be found below. See Table F-4, Table F-5, and Table F-6 for a more detailed breakdown of the economic region, including top employers, employment trends, and construction industry data for each county.

Table F-4 Top Employers in the Greater Amarillo Area

Employer	Number of Employees
Pantex/PanTexas Deterrence, LLC	4,662
Amarillo Independent School District	4,500
Tyson Foods, Inc.	4,300
BSA Health System/Don and Sybil Harrington Cancer Center	3,100
Northwest Texas Healthcare System	2,150
City of Amarillo	1,953
Xcel Energy/Southwestern Public Service Co.	1,431
Affiliated Foods/TriState Baking/Plains Dairy	1,250
Canyon ISD	1,168
Amarillo VA Healthcare System	984

Source: ACC 2026-TN13522.

Table F-5 Employment Trends in the Economic Region of the Project Matador Nuclear Site, 2020–2024[(a)]

County/Economic Region	2020	2024	2020 to 2024 Change (%)
Carson County, Texas—Labor Force	2,894	3,105	7.3
Carson County, Texas—Employed	2,773	3,016	8.8
Carson County, Texas—Unemployed	121	89	−26.4
Carson County, Texas—Unemployment Rate (%)	4.2	2.9	−31.0
Potter County, Texas—Labor Force	50,570	52,000	2.8
Potter County, Texas—Employed	47,596	50,214	5.5
Potter County, Texas—Unemployed	2,974	1,786	−39.9
Potter County, Texas—Unemployment Rate (%)	5.9	3.4	−42.4
Randall County, Texas—Labor Force	72,421	81,170	12.1
Randall County, Texas—Employed	69,150	78,775	13.9
Randall County, Texas—Unemployed	3,271	2,395	−26.8
Randall County, Texas—Unemployment Rate (%)	4.5	3.0	−33.3
Three-County Economic Region—Labor Force	125,885	136,275	8.3
Three-County Economic Region—Employed	119,519	132,005	10.4
Three-County Economic Region—Unemployed	6,366	4,270	−32.9
Three-County Economic Region—Unemployment Rate (%)	5.1	3.1	−38.0
State of Texas—Labor Force	13,950,305	15,608,932	11.9
State of Texas—Employed	12,879,942	14,971,373	16.2
State of Texas—Unemployed	1,070,363	637,559	−40.4
State of Texas—Unemployment Rate (%)	7.7	4.1	−46.8

(a) Not seasonally adjusted.
Sources: BLS 2025-TN13535, BLS 2025-TN13536.

Table F-6 Construction Industry Data, Including Heavy and Civil Engineering, for the Economic Region of the Project Matador Nuclear Site, 2024

County	Number of Establishments	Number of Employees	Annual Payroll (thousands)
Construction Workforce—Carson County	16	230	$26,624
Construction Workforce—Potter County	314	3,525	$223,314
Construction Workforce—Randall County	384	3,040	$191,935
Total	**714**	**6,795**	**$441,873**
Heavy and Civil Engineering Construction Workforce—Carson	5	176	$23,135
Heavy and Civil Engineering Construction Workforce—Potter	25	577	$42,102
Heavy and Civil Engineering Construction Workforce—Randall	33	628	$54,840
Total	**63**	**1,381**	**$120,077**

Source: USCB 2023-TN13480.

F.4.2.2 Labor Force

The workforce at PMN Units 1–4 is expected to peak in 2034 with an approximate maximum of 8,200 workers total onsite, as shown in Figure F-2. This number will be a combination of construction, operations, and outage workers, due to the staggered construction beginning and end times for each unit. As discussed earlier in the section, it is anticipated that these workers will settle either permanently or temporarily in Carson, Potter, and Randall Counties.

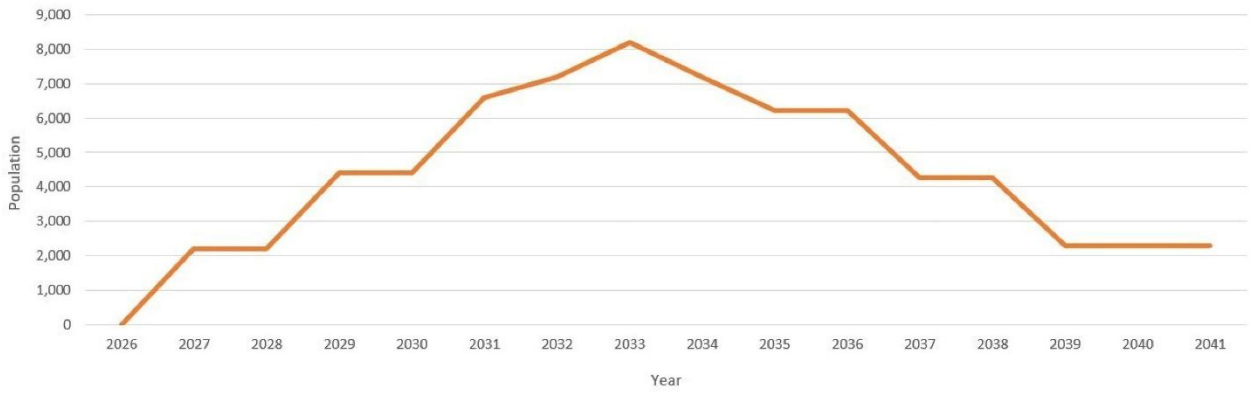


Figure F-2 Construction and Operations Workforce Population Projection for Project Matador Nuclear Units 1–4

F.4.2.3 Construction and Operational Employment

There are expected to be 2,200 construction workers onsite beginning in 2027. The construction workforce is expected to vary between 2,200 and 6,600, with overlap between construction and operations workers beginning in 2033, when Unit 1 is set to begin operation. The initial influx of operations workers would occur in 2032 in preparations for operations of Unit 1 in 2033. Unit 1 is expected to require approximately 600 workers. Additional operations workers, approximately 230 per unit, would migrate in as Units 2–4 begin operation. Outages are anticipated to begin in

2034, during which an additional 1,000 workers would be onsite. The highest number of workers onsite, 8,200, is anticipated to be in 2034, when construction, operations, and outage workers would all be present simultaneously. The construction workforce is expected to start its drawdown from 6,600 workers beginning in 2029 and is expected to have a 2-year drawdown.

F.4.2.4 Housing

Between 2010 and 2024, Carson and Potter Counties saw decreases in population while Randall County saw an increase in population.

As presented in Table F-7, total housing units and occupied units remained largely constant between 2015 and 2024 in Carson County. In 2024, Carson County's available homeowner housing was an estimated 0.8 percent. Its available rental housing was an estimated 0 percent in 2024, a significant decrease from 2015; however, Carson County's small size creates a large margin of error, and it is likely that there is rental housing available. Table F-7 also shows that Carson County experienced an increase in median housing values during the same time span, 52.6 percent, to a median value of $143,000. Between 2015 and 2024, median monthly rent grew by 33.1 percent in Carson County to $956.

Potter County's total housing, as well as vacant housing, increased between 2015 and 2024. In 2024, the vacant homeowner housing was an estimated 3.3 percent in Potter County, and the vacant rental housing an estimated 13.3 percent, both showing an increase compared to 2015. Table F-7 shows Potter County experienced an increase in median house values from 2015 to 2023, 69.0 percent, to a median value of $154,300. Median monthly rent grew during the same time span, 38.3 percent, to $1,018.

In Randall County, total housing units increased by 15.9 percent from 2015 to 2024. Available rental and homeowner housing, however, decreased by 0.1 and 4.0 percent, respectively. Median housing values in Randall County increased by 64.7 percent between 2015 and 2024, up to $255,000. Median rents increased by 41.0 percent, to a median monthly rent of $1,193 (see Table F-7).

Table F-7 Housing Statistics for Carson, Potter, and Randall Counties

County/Economic Region	2015	2024	2015 to 2024 Change (%)
Carson County, Texas—Total Housing Units	2,771	2,810	1.4
Carson County, Texas—Occupied Units	2,293	2,293	0.0
Carson County, Texas—Vacant Units	478	517	8.2
Carson County, Texas—Homeowner Vacancy (percent)	0.3	0.8	0.5
Carson County, Texas—Rental Vacancy (percent)	14.1	0.0	−14.1
Carson County, Texas—Median House Value ($)	93,700	143,000	52.6
Carson County, Texas—Median Rent ($/month)	718	956	33.1
Potter County, Texas—Total Housing Units	49,445	49,934	1.0
Potter County, Texas—Occupied Units	43,715	42,351	−3.1
Potter County, Texas—Vacant Units	5,730	7,583	32.3
Potter County, Texas—Homeowner Vacancy (percent)	2.6	3.3	0.7
Potter County, Texas—Rental Vacancy (percent)	9.1	13.3	4.2
Potter County, Texas—Median House Value ($)	91,300	154,300	69.0

County/Economic Region	2015	2024	2015 to 2024 Change (%)
Potter County, Texas—Median Rent ($/month)	736	1,018	38.3
Randall County, Texas—Total Housing Units	53,936	62,538	15.9
Randall County, Texas—Occupied Units	48,323	59,463	23.1
Randall County, Texas—Vacant Units	5,613	3,075	−45.2
Randall County, Texas—Homeowner Vacancy (percent)	1.2	1.1	−0.1
Randall County, Texas—Rental Vacancy (percent)	7.2	3.2	−4.0
Randall County, Texas—Median House Value ($)	154,800	255,000	64.7
Randall County, Texas—Median Rent ($/month)	846	1,193	41.0

Sources: USCB 2024-TN13490: Housing, USCB 2024-TN13489: households.

A comprehensive housing market analysis of the City of Amarillo was published by the U.S. Department of Housing and Urban Development in July 2024. The analysis defined the City of Amarillo housing market area as having the same boundaries as with the Amarillo Metropolitan Statistical Area, an area that includes the counties of Armstrong, Carson, Oldham, Potter, and Randall. This analysis described the rental market in the Amarillo area as “soft,” suggesting that the market currently has sufficient vacancy. It also included a 3-year forecast for demand interposed with population growth, a forecast that suggests that housing demand will significantly outpace construction by values ranging from 3:1 to 10:1 until at least July 2027, the end of the forecast period (HUD 2026-TN13314). This suggests that the housing market in Amarillo will tighten during this period.

As of January 2026, there are a total of five new housing communities with 228 new homes in the greater Amarillo area (NHS 2026-TN13313). A large housing development, Rock Ridge, has been announced for Potter County, partially addressing the county’s housing shortage. It is expected to begin construction in summer 2026 (ABC7 News 2025-TN13312).

Based on data collected for the Transient Population Survey conducted by Fermi America’s contractor, Enercon, between November 2025 and February 2026 (see Section F.4.1.2 for a description of the survey), it is assumed that temporary housing in the economic area of impact is expected to be at higher levels of utilization during the summer months, due to the area’s weather and seasonal characteristics. RV parks, however, maintain consistent occupancy numbers year-round.

F.4.2.5 Water and Wastewater Services

In the State of Texas, most public water systems are part of a water district, which is a special government entity that provides water, sewer, and sometimes road services to areas outside of cities (AWBDT 2026-TN13311).

Water needs for residents of the economic region are largely met by the City of Amarillo’s Municipal Water System, which serves residents in both Potter and Randall Counties and some residents of Carson County. The City of Amarillo Water Treatment Plant has the capacity to treat 70 Mgd and features 15 Mgal of below-ground water storage, as well as a reservoir with an additional capacity of 480 Mgal of untreated water (CA 2026-TN13322). The average daily water usage for the system in 2024 was 49.65 Mgd (CA 2024-TN13321). A list of community water systems in the economic region and their current capacities is presented in Table F-8. Rural areas use private water wells, which do not need to be registered unless the property falls within the jurisdiction of a groundwater conservation district (TWDB 2026-TN13482).

Table F-8 Public Water Systems in the Economic Region of the Project Matador Nuclear Site

Public Water System Name	County	Primary Source Type	Residential Population Served	Production Capacity (Mgd)	Average Daily Consumption (Mgd)	Excess Capacity (Mgd)
Groom Municipal Water	Carson	Groundwater	548	1.57	0.11	1.46
Panhandle Municipal Water	Carson	Groundwater	2,284	2.17	0.45	1.72
Skellytown Municipal Water	Carson	Groundwater	394	0.76	0.07	0.68
White Deer Municipal Water	Carson	Groundwater	918	1.35	0.16	1.19
-	-	**Total**	**4,144**	**5.85**	-	**5.06**
Amarillo Municipal Water	Potter	Surface water, purchase	201,291	154.26	46.09	108.17
Bushland WSC	Potter	Groundwater	380	0.23	0.03	0.20
Cherry Ave Mobile Home Park	Potter	Groundwater	80	0.07	0.002	0.07
Northview Mobile Home Park	Potter	Groundwater	77	0.02	0.001	0.02
-	-	**Total**	**201,828**	**154.59**	-	**108.47**
Canyon Municipal Water	Randall	Surface water, purchase	15,771	12.23	0.09	12.14
Adobe Estates Mobile Home Park	Randall	Groundwater	555	0.43	0.01	0.42
Rockwell Acres Water	Randall	Groundwater	250	0.18	0.01	0.17
Country Estates Mobile Home Park	Randall	Groundwater, purchase	425	0.00	0.04	-0.04
Catalpa Villa	Randall	Groundwater	114	0.09	0.01	0.07
Sunday Canyon WSC	Randall	Groundwater	100	0.08	0.005	0.08
Palo Duro Club Water	Randall	Groundwater	200	0.69	0.03	0.66
Lake Tanglewood Water	Randall	Groundwater	1,300	1.97	0.27	1.70
Umbarger Community Water Supply	Randall	Groundwater	120	0.16	0.01	0.15
Sunset View Estates	Randall	Groundwater	55	0.14	NR	NA
Amberwood Water	Randall	Groundwater	300	0.22	0.04	0.18
Elm Grove Village	Randall	Groundwater	87	0.09	NR	NA
Old West Mobile Home Park	Randall	Groundwater	80	0.04	0.02	0.02
Ranch Hand Apartments	Randall	Groundwater	135	0.06	NR	NA
-	-	**Total**	**19,492**	**16.37**	-	**15.55**

"-" denotes no data in table cell.
NA = not applicable, NR = not reported; WSC = Water Supply Corporation.

The City of Amarillo's Water Utility is a subdivision of the Canadian River Municipal Water Authority (CRMWA), from which it is granted an annual allotment of 11.55 billion gallons of water (CA 2026-TN13322). Excess capacity for the City of Amarillo, calculated as the difference between the average daily consumption and the production capacity, is approximately 108 Mgd. The next largest communities in the economic region—the City of Canyon, the Village of Lake Tanglewood, and the City of Panhandle—have 12.14 Mgd, 1.7 Mgd, and 1.7 Mgd excess water capacities, respectively (see Table F-8).

Wastewater services in the economic region are provided at the municipal level. The largest provider by capita is the City of Amarillo which has two wastewater treatment plants. The River Road facility has a treatment capacity of 16 MGD, while the Hollywood Road facility has a treatment capacity of 12 Mgd (CA 2026-TN13320).

The Hollywood Road facility is currently operating at 75 percent capacity. This percent has triggered 30 *Texas Administrative Code* (TX Admin. Code) § 305.126, more commonly known as the "75/90 Rule," which states that once a wastewater system reaches 75 percent or higher capacity for 90 days, a plan for expansion must be put into place. At 90 percent, the permittee must obtain a permit to begin expansion or upgrade. The City of Amarillo expects to reach 90 percent and acknowledges that both facilities have reached their end-of-life and are in need of replacement. Currently, construction of a replacement facility is slated to begin for the Hollywood Road facility in 2027, with service anticipated to begin in 2032. A condition assessment will soon be conducted on the River Road facility (TX Admin. Code 30-305-TN13297; ABC7 News 2025-TN13296)

Outside of municipalities, residents in the economic region rely on private septic systems for wastewater services. Permits are required for these systems, although the permitting authority varies based on location and some systems meet the requirements for an exemption (TCEQ 2026-TN13295).

The Texas Water Development Board (TWDB) divides the State of Texas into regions for the purpose of water planning. All three counties in the economic region are in Region A, also called the Panhandle Regional Water Planning Area, and are overseen by the Region A Panhandle Water Planning Group (PWPG) (TWDB 2026-TN13294). The PWPG is the regional planning group responsible for 5-year development plans for water planning in 21 counties in the Texas Panhandle, including Carson, Potter, and Randall Counties. In their 2026 Regional Water Plan, the PWPG lists and describes several water conservation strategies, including water conservation, drought management, and wastewater reuse. According to the plan, none of the counties in the economic region are near capacity for groundwater resources (PRPC 2026-TN13293).

F.4.2.6 Education

Carson County has three public school districts, the largest of which is Panhandle Independent School District (ISD), with 620 students (see Table F-9). In total, there are six total public schools in the county, with 1,072 total students and a student-teacher ratio of 9.8. Carson County does not have any private schools.

Potter County features four public school districts comprised of 66 schools serving 32,725 students, with a student-teacher ratio across the districts of approximately 14.2. Additionally, Potter County's four private schools serve 557 students.

Randall County has two public school districts, although only one directly serves students. There are 21 schools and 11,565 students in Randall County public schools, with an average student-teacher ratio of approximately 15.2. For private schools, Randall County features five schools and a total of 547 students. Enrollment at Amarillo ISD, the largest public school system in the economic region, is in decline, with a decrease of approximately 13 percent from 2016–2024 (KFDA 2024-TN13292).

Table F-9 Public and Private K-12 Education in the Economic Region[(a)] of the Project Matador Nuclear Site

District Name	School Type	County	Students	Teachers	Schools	Student-Teacher Ratio	Type
Groom ISD	Public	Carson	130	19	1	6.9	Regular Local School District
Panhandle ISD	Public	Carson	620	58	3	10.6	Regular Local School District
White Deer ISD	Public	Carson	322	32	2	10.0	Regular Local School District
-	-	**Total Public**	**1,072**	**109**	**6**	-	-
Amarillo ISD	Public	Potter	29,321	2,028	55	14.5	Regular Local School District
Bushland ISD	Public	Potter	1,434	113	4	12.6	Regular Local School District
Highland Park ISD	Public	Potter	749	61	3	12.4	Regular Local School District
River Road ISD	Public	Potter	1,221	100	4	12.2	Regular Local School District
-	-	**Total Public**	**32,725**	**2,301**	**66**	-	-
San Jacinto Christian Academy	Private	Potter	222	25	1	9.0	Regular Elementary or Secondary
St. Andrew's Episcopal School	Private	Potter	193	26	1	7.6	Regular Elementary or Secondary
St. Mary's Cathedral School	Private	Potter	112	NA	1	null	Regular Elementary or Secondary
Trinity Lutheran School	Private	Potter	30	7	1	4.1	Regular Elementary or Secondary
-	-	**Total Private**	**557**	**57**	**4**	-	-
Canyon ISD	Public	Randall	11,565	763	21	15.2	Regular Local School District
Reg 16 Education Service Center	Public	Randall	NA	NA	NA	NA	Regional (RESA)

District Name	School Type	County	Students	Teachers	Schools	Student-Teacher Ratio	Type
-	-	**Total Public**	**11,565**	**763**	**21**	-	-
Amarillo Montessori Academy	Private	Randall	17	3	1	5.7	Montessori
Ascension Academy	Private	Randall	131	26	1	5.0	Regular Elementary or Secondary
Holy Cross Catholic Academy	Private	Randall	121	13	1	9.7	Regular Elementary or Secondary
St. Joseph Catholic Elementary School	Private	Randall	43	8	1	5.4	Regular Elementary or Secondary
The Oaks Christian Academy	Private	Randall	235	15	1	15.7	Special Program Emphasis
-	-	**Total Private**	**547**	**64**	**5**	-	-

ISD = Independent School District; NA = not applicable.
"-" denotes no data in table cell.
(a) The data represents either the 2023–2024 school year or 2024–2025 school year, based on data availability.
Source: NCES 2026-TN13780.

In the economic region, there are five post-secondary schools: Milan Institute—Amarillo, Amarillo College, Exposito School of Hair Design, Wade Gordon Hairdressing Academy, and West Texas A&M University. Of these five, only West Texas A&M University offers 4-year courses, while the remaining four are 2-year or less-than-2-year institutions.

F.4.2.7 Law Enforcement

Law enforcement in the State of Texas operate at the Federal, State, and local levels. The Department of Public Safety oversees both Texas Highway Patrol and Texas Rangers. Local enforcement is provided through city police or, outside of city limits, the county sheriff's office (Texapedia 2025-TN13276).

In Carson County, law enforcement is largely provided at the county level, whereas in Potter and Randall Counties, law enforcement is largely provided at the municipal level through the City of Amarillo. Carson County's law enforcement needs are served through one municipal police department and the county Sheriff's Office. Potter and Randall also provide law enforcement through their respective County Sherrif's offices, but the majority of officers in those counties are employed at the municipal level by the City of Amarillo. The ratio of police per 1,000 population ranges from 1.3 to 13.8 across the region (FBI 2026-TN13275).

F.4.2.8 Fire Protection Personnel

Counties in the economic region are served by a mix of career and volunteer firefighters. In Carson County, there are 47 volunteer firefighters across four stations. In Potter County,

344 career and 66 volunteer firefighters provide services across 20 stations. In Randall County, 20 career and 100 volunteer firefighters serve across 8 stations, with 2 firefighters paid per call. The ratio of fire protection personnel per 1,000 population is 8.1 in Carson County, 3.6 in Potter County and 0.08 in Randall County. The City of Amarillo Fire Departments personnel per 1,000 population is 2.0 per 1,000 population.

F.4.2.9 Medical Services

Table F-10 presents hospital utilization and physician data for the economic region. As of 2022, there were four hospitals in the economic region, with a total of 589 adult inpatient beds. The highest percent utilization reported in December 2022 was 97.9 percent at KPC Promise Hospital of Amarillo, while the lowest was Quail Creek Surgical Hospital at 27.1 percent. These numbers account for adult inpatient beds only: it is assumed that there is additional bed availability when accounting for youth and outpatient beds. The utilization across all four hospitals during the same period was 88.6 percent.

Approximately 870 physicians practice in the economic region. There are 478 physicians per 100,000 people in Potter County and 217 per 100,000 in Randall County. No physicians practice in Carson County (HRSA 2022-TN13778).

Table F-10 Hospital Bed Availability and Use in Economic Region of the Project Matador Nuclear Site, 2022

City	Hospital Name	Hospital Type	Total Available Adult Inpatient Beds (7-Day Average)	Total Adult Inpatient Beds Used (7-Day Average)	Percent Utilization
Amarillo	Northwest Texas Hospital	Short-term	316	306	96.8
Amarillo	BSA Hospital	Short-term	37	19	51.4
Amarillo	KPC Promise Hospital of Amarillo	Long-term	188	184	97.9
Amarillo	Quail Creek Surgical Hospital	Short-term	48	13	27.1
-	-	-	-	**Total Percent Utilization**	**88.62**

"-" denotes no data in table cell.
Source: HHS 2022-TN13518.

F.4.2.10 Taxes

The tax structure for the State of Texas is determined by the Texas Constitution and Titles 1–3 of the *Texas Tax Code* Article 8 of the Texas Constitution, "Taxation and Revenue," lays the tax framework. In the *Texas Tax Code*, Title 1 governs Property Tax Code, Title 2 governs State Taxation, and Title 3 governs Local Taxation (TCS 2021-TN13291).

The State of Texas does not have an income tax or a statewide property tax, but it does impose a statewide sales tax of 6.25 percent (TF 2026-TN13274). Local governments set additional tax rates and collect property taxes, which are used to provide local services. In Texas, a local sales tax rate cannot exceed an additional 2 percent, for a maximum total of 8.25 percent (TCPA 2026-TN13513). Taxing units typically include county, city, school district, and, depending on area, water districts (TF 2026-TN13274; AWBDT 2026-TN13311). Additional tax rates beyond the State-imposed 6.25 in the economic region range between 0.44 and 0.71 percent for counties, 0.08 and 1.6 percent for cities, and 0.92 and 1.4 percent for school districts.

Table F-11 presents an overview of tax rates for counties, cities, and school districts in the economic region.

Table F-11 Property Taxes of Counties, Cities, and School Districts in the Economic Region of the Project Matador Nuclear Site, 2021 and 2025

Tax Jurisdictions	Tax Rate, 2021 (percent)[a]	Total Levy, 2021	Tax Rate, 2025 (percent)	Total Levy, 2025
State Income Tax	0	0	0	0
State Sales Tax	6.25	$36 billion	6.25	$49.06 billion
State Property Tax	0	0	0	0
Carson County	0.58	$4,442,470	0.519967	$6,083,774
Skellytown (City), Carson County	1.16	$91,117	0.93	$109,578
Groom (City), Carson County	1.04	$247,948	1.07	$338,382
White Deer (City), Carson County	0.57	$285,627	1.11	$693,052
Panhandle (City), Carson County	0.72	$939,720	0.72	$1,365,659
Sanford-Fritch (SD[b]), Carson County	1.30	$97,363	1.2268	$85,052
Groom (SD), Carson County	1.29	$1,809,280	1.038497	$2,233,346
White Deer (SD), Carson County	1.28	$3,022,927	0.9968	$2,975,075
Panhandle (SD), Carson County	0.96	$5,119,903	0.930268	$5,402,719
Potter County	0.71	$60,391,346	0.59024	$71,407,014
Bishop Hills (City), Potter County	0.08	$17,361	0.07456	$24,499
Amarillo (City), Potter County	0.44	$29,650,433	0.4307	$40,590,152
River Road (SD), Potter County	1.24	$3,873,468	0.9197	$3,031,831
Bushland (SD), Potter County	1.16	$14,520,860	1.01165	$16,020,005
Highland Park (SD), Potter County	1.08	$14,943,095	0.9658	$20,758,090
Amarillo (SD), Potter County	1.15	$55,284,562	0.8712	$50,171,912
Randall County	0.44	$52,863,423	0.40099	$72,069,493
Happy (City), Randall County	0.52	$5,778	0.445	$7,853
Palisades (City), Randall County	0.15	$17,026	0.11356	$20,653
Timbercreek Canyon (City), Randall County	0.21	$111,442	0.172	$140,117
Canyon (City), Randall County	0.43	$3,848,151	0.51181	$6,995,481
Amarillo (City), Randall County	0.44	$35,068,327	0.4307	$48,759,799
Wildorado (SD), Randall County	1.40	$40,807	1.37655	$82,757
Happy (SD), Randall County	0.92	$246,819	0.7807	$309,188
Bushland (SD), Randall County	1.16	$2,139,640	1.01165	$2,407,089
Amarillo (SD), Randall County	1.15	$57,100,150	0.8712	$38,736,783
Canyon (SD), Randall County	1.23	$72,641,483	0.9272	$70,233,723

(a) Rounded to two decimal places.
(b) SD = school district
Sources: TCPA 2026-TN13514, TCPA 2026-TN13515, TCPA 2021-TN13516, TCPA 2025-TN13517; TF 2026-TN13274.

A tax abatement agreement between Carson County and Fermi America was filed in October 2025. The conditions for this abatement allow for the site land to be zoned as a "reinvestment zone." The abatement period is 10 calendar years. Improvements at the site will be done in phases (physical geographic areas), designated "Phase I," "Phase II," and so forth. Each phase has an abatement period of 10 years. Fermi America has agreed to make the following payments to Carson County in lieu of ad valorem taxes (payments in lieu of taxes [PILOT] payments):

- $3 for every square foot of improvement that contains data center improvements
- $2,500 for every megawatt (MW) of name plate capacity installed in that phase's abatement area during Phase I and $2,750 during Phases II up to XVI (CCT 2025-TN13512)

The abatement period begins with the calendar year after the calendar year during which commercial operations begin. The agreement also outlines tax penalties associated with delays in commencement of commercial operation. Additionally, the agreement allows for up to 15 additional phases, as long as the certificate for the phase has been submitted to Carson County by December 31, 2039. Since each phase's abatement period is 10 years, it is possible that at least one phase will remain in abatement through 2049 (CCT 2025-TN13512). Because the total tax payment is dependent upon several variables, including securing data center clientele, timing, etc., a precise figure for planned tax payments is not currently available. It is assumed that the payments will likely fall between $1,000,000 and $2,000,000 per year upon full site development. Since tax payments begin at commercial operation and are based on any form of energy generation, Fermi may begin tax payments during construction activities for PMN Units 1–4, depending on the date of commercial operations for other onsite power generation.

As listed in Table F-12, Carson County's total revenues remained stable with an upward trend across fiscal years (FYs) 2021–2024. The largest change in revenue occurred between 2020 and 2021, primarily due to decreases in intergovernmental, interest earnings, and miscellaneous revenue. In FY 2024, Carson County's largest expenditure areas included public safety, road and bridge, and administration.

Table F-12 Carson County General Revenues, Fiscal Years 2020–2024

Year	Total Carson County General Revenues
2020	$6,427,851
2021	$5,698,473
2022	$5,872,853
2023	$6,277,86
2024	$6,922,438

Source: CCT 2026-TN13511.

F.4.2.11 Transportation

The primary road network in the area is shown in Figure 2-4 and Figure 2-5. U.S.-60 provides commuter access to PMN Units 1–4 from the south. Road access to PMN Units 1–4 construction entrance is via FM 683, a two-lane, undivided, paved, State-maintained road running north-south near the western boundary of the Project Matador Campus. A right-turn only lane has been added onto northbound FM 683. No other improvements are currently planned.

During construction, the primary mode of transportation for workers will be via personal vehicles to designated Project Matador Campus parking/staging area(s), with shuttles providing the final transport to the active construction site through a primary check-in point. In early mobilization, a temporary parking area and/or limited shuttle service may be made available; however, during peak construction period, shuttle would be the primary method for worker access to the site. It is anticipated that no personal vehicles would be allowed within the active construction area. Limited authority would be granted to site and service vehicles, such as delivery, security, emergency response, etc.

A primary Project Matador Campus parking/staging area is anticipated to be the temporary use area which would support construction activities for Project Matador Campus inclusive of PMN Units 1–4 located west of FM 683 near the Project Matador Campus entrance (FA 2026-TN13483). This Project Matador Campus parking lot location is expected to be finalized based on land availability, access, and coordination with local stakeholders. Final shuttle routes would be coordinated with local authorities and adjusted as construction phases evolve. Routes would be selected to minimize impact on local traffic and avoid conflicts with heavy construction hauling routes when possible.

In July 2025, the Texas Department of Transportation (TXDOT) and Fermi America entered into an agreement that allowed for use of FM 293 and FM 683 as a heavy-haul route for transport of construction materials. This agreement allows use of specific roadways near the construction entrance in excess of the standing roadway load limits. As part of this agreement, Fermi America further agrees to indemnify TDOT for the costs of construction, maintenance, repair, and restoration of roads along the route resulting from this transport. No other route is allowed per this agreement, which expires at the end of 2026 and requires renewal thereafter (FA 2026-TN13483). The heavy-haul route is depicted in Figure F-3.

Along with U.S.-60, workers can also reach the plant via SH 136, which runs northeast-southwest. Smaller county roads connect SH 136 with FM 683. South of the site and south of U.S.-60, I-40 runs east-west, connecting Amarillo with Oklahoma City to the east and Albuquerque to the west.

The TXDOT calculates average annual daily traffic counts for State roads. Table F-13 lists the annual average daily traffic (AADT) counts for roads surrounding the Project Matador Campus for the most recent year (2024).

Rail

As discussed in Section 2.1.3, the closest rail line is approximately 2.9 mi from the plant center point and runs parallel to U.S.-60. A rail spur runs through the nearby Pantex Plant site. Both rail lines are operated by BNSF. No passenger rail exists in the region. A rail spur may be built specifically for PMN Units 1–4.

Air

As discussed in Section 2.1.4, Rick Husband Amarillo International Airport is both the closest and the only full-service airport in the region, approximately 8.7 mi southwest of the PMN Units 1–4 center point. Figure 2-4 illustrates the locations of airports in the region.

Waterways

The PMN Units 1–4 site is not accessible by water.

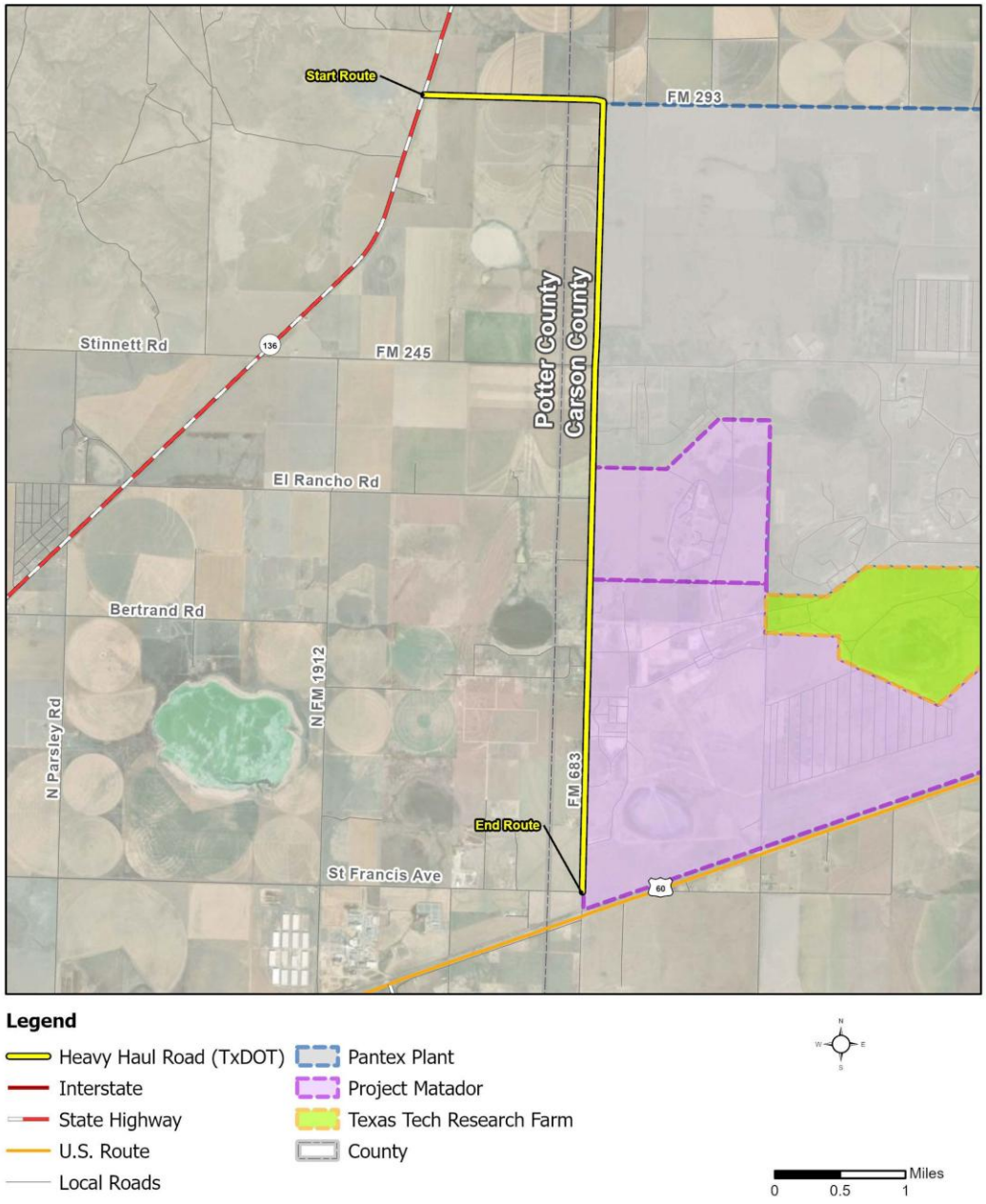


Figure F-3 Heavy-Haul Transportation Route for the Project Matador Nuclear Units 1–4 Site

Table F-13 Total Average Annual Daily Traffic Counts Near Project Matador Campus, 2024

Route	Location	2024 Traffic Counts
FM 2373	Northeast of site	524
FM 2373	East of site and north of TX-60	5,151
FM 2373	East of site and south of TX-60	3,484
FM 2373	Southeast of site	3,781

Route	Location	2024 Traffic Counts
I-40	South of site	11,000
TX-60	Southwest of site and west of 683	9,168
TX-60	Southwest of site and east of 683	8,657
FM 683	Southwest of site	363
FM 683	West of site	252
FM 683	Northwest of site	73
FM 293	Northwest of site	376

Source: TXDOT 2026-TN13520.

F.4.2.12 Recreational Facilities

Recreational lands in the 50 mi region of PMN Units 1–4 are illustrated in Figure 2-6. There are no recreational lands in the PMN Units 1–4 vicinity. Carson County does not maintain a parks and recreation department; instead, parks in the county are maintained at the municipal level.

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APPENDIX G

APPLICANT-GENERATED IMAGE SOURCES AND ATTRIBUTIONS

Table G-1 includes a list of figures and their sources that were compiled by Fermi America, LLC's contractor Enercon, in the production of this environmental impact statement.

Table G-1 Figures and Sources Used in the Production of this Environmental Impact Statement

No.	Title	Image Source/s
Figure 2-1	Map Showing the Project Matador Nuclear Units 1–4 Site Layout	(ESRI 2024; USDOT 2025; FA 2026)
Figure 2-2	Project Matador Nuclear Units 1–4 Site Features	(ESRI 2024; FA 2026)
Figure 2-3	Topographic Map of Sevenmile Basin, Texas	(USGS 1953; FA 2026)
Figure 2-4	Map Showing the Vicinity (6 mi Radius) of the Project Matador Nuclear Units 1–4 Site	(USCB 2025a, USCB 2025c, USCB 2026; USDOT 2025; USGS 2026a; FA 2026)
Figure 2-5	Map Showing 50 mi Radius of the Project Matador Nuclear Units 1–4 Site	(USCB 2025a, USCB 2025c, USCB 2026; USDOT 2022, USDOT 2025; USGS 2026a; FA 2026)
Figure 2-6	Federal, State, and Local Lands in Vicinity of the Project Matador Nuclear Site (50 mi)	(USCB 2025a, USCB 2025c, USCB 2026; USDA 2026; USDOT 2025; USGS 2026a; FA 2026)
Figure 2-7	Estimated Peak Workforce During Construction and Operation Based Activities for Project Matador Nuclear Units 1–4	FA 2026
Figure 2-8	Simplified Water Flow Diagram for the Project Matador Campus	FA 2026
Figure 3-1	Land Use/Land Cover on the Project Matador Nuclear Units 1–4 Site	(ESRI 2024; MRLC 2023; FA 2026)
Figure 3-2	Land Use/Land Cover in 6 mi Radius of the Project Matador Nuclear Site.	(ESRI 2024; MRLC 2023; USCB 2025a; FA 2026)
Figure 3-3	Land Use/Land Cover in 50 mi Radius of the Project Matador Nuclear Units 1–4 Site	(ESRI 2024; MRLC 2023; USCB 2025a FA 2026)
Figure 3-4	Generalized Stratigraphic Column for the Project Matador Nuclear Units 1–4 Site	DOE NNSA 2008
Figure 3-5	Generalized Subsurface Conceptual Site Model of the Proposed Project Matador Nuclear Units 1–4 Site	DOE NNSA 2008
Figure 3-6	Watershed Boundaries and Playas at the Project Matador Campus	(ESRI 2025; USGS 2026a; USGS 2026c; FA 2026)

No.	Title	Image Source/s
Figure 3-7	Potentiometric Surface Map of the Ogallala Aquifer at the Project Matador Units 1–4 Site	(ESRI 2025; Pantex 2025; FA 2026)
Figure 3-8	Registered Water Wells Located within a 5 mi Radius of the Project Matador Nuclear Site Units 1–4 Site	(ESRI 2024; TWDB 2026; RFI FA EIS 2.2-001)
Figure 3-9	Groundwater Deed Certification Area on the Project Matador Nuclear Units 1–4 Site	(ESRI 2024; NRC 2025; FA 2026)
Figure 3-10	National Wetlands Inventory Wetlands in 6 mi of PMN Units 1–4 Site	(ESRI 2025; USCB 2025a; FWS 2025; FA 2026)
Figure 3-11	Wetlands and Human-made Waterbodies within the PMN Units 1–4 Site	(ESRI 2025; FWS 2025; FA 2026)
Figure 3-12	Aerial Satellite Image of the Project Matador Nuclear Units 1–4 Site Showing the Action Area Under the Endangered Species Act	(ESRI 2025; USCB 2025a; FA 2026)
Figure 3-13	Terrestrial Habitats Identified Within the Project Matador Nuclear Units 1–4 Site	(ESRI 2025; MRLC 2023; FWS 2025; FA 2026)
Figure 3-14	Area of Potential Effects for the Project Matador Nuclear Project Depicted on Aerial Overview	(ESRI 2025; USCB 2025a; FA 2026)
Figure 3-15	Area of Potential Effects for the Project Matador Nuclear Project Depicted on United States Geological Survey Topographic Quadrangle	(USGS 1953; USCB 2025a; FA 2026)
Figure 3-18	Combined Workforce of Project Matador Nuclear Units 1–4 and Project Matador Campus	FA 2026
Figure 3-19	Three-County Population with Project Matador Nuclear Units 1–4 Construction and Operations Workforce Population	FA 2026
Figure F-1	Project Matador Nuclear Units 1–4 Site Area Sector Grid	(ESRI 2025; FA 2026)
Figure F-2	Construction and Operations Workforce Population Projection for Project Matador Nuclear Units 1–4	FA 2026
Figure F-3	Heavy-Haul Transportation Route for the Project Matador Nuclear Units 1–4 Site	(ESRI 2025; USCB 2025a; USCB 2025c; USDOT 2025; FA 2026)

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APPENDIX H

REGULATORY COMPLIANCE AND LIST OF FEDERAL, STATE, AND LOCAL PERMITS AND APPROVALS

Prior to construction and operation of the proposed Project Matador Nuclear Units 1–4, Fermi America, LLC is required to obtain certain Federal, State, and local environmental permits, as well as meet applicable statutory and regulatory requirements. A list of potential environmental authorizations, permits, and certifications relevant to the proposed combined licenses is provided in Table H-1.

Table H-1 Authorizations Required for Building, Operating, and Decommissioning of Project Matador Nuclear Units 1–4

Agency	Authority	Requirement	Activity Covered and Status
U.S. Nuclear Regulatory Commission (NRC)	Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, Subpart C	Combined Licenses	Construction and operation of nuclear units. Participation in applicant-prepared National Environmental Policy Act of 1969, as amended (NEPA) document process. Regulatory timeframe 18 months.
NRC	10 CFR Part 40	Source Materials License	License application to be filed before title to receiving, possessing, using, transferring, or delivering source and byproduct materials. Not yet initiated. Regulatory timeframe 9 months.
NRC	10 CFR Part 70	Special Nuclear Material (SNM) License	Applications for licenses to possess or use SNM must be filed before any acquisition, ownership, or use occurs. Not yet initiated. Regulatory timeframe 9 months.
NRC	10 CFR Part 71	Packaging and Transportation of Radioactive Material	Application before receiving, possessing, using, or transferring licensed material, if the licensee delivers that material to a carrier for transport, transports the material outside the site of usage as specified in the NRC license, or transports that material on public highways. Not yet initiated. Regulatory timeframe 9 months.
NRC	10 CFR Part 72	Licensing requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste	License to receive, transfer, and possess power reactor spent fuel and other associated radioactive materials in an independent spent fuel storage installation and the terms under which the Commission will issue such a license. Application submitted before constructing or operating independent spent fuel storage installation. Not yet initiated.
Federal Aviation Administration	Transportation, Subtitle VII Aviation Programs, Chapter 447 Safety Regulation (49 *United States Code* [U.S.C.] 44718) And 14 CFR Part 77	Construction Notice	Notice of erection of structures (>200 ft high) potentially impacting air navigation. To be initiated 60 days prior to start of subject structures. Not yet initiated.

Agency	Authority	Requirement	Activity Covered and Status
U.S. Department of Energy (DOE)	Nuclear Waste Policy Act (42 U.S.C. 10101 et seq.) and 10 CFR Part 961	Spent Fuel Contract	Disposal of spent nuclear fuel. To be in place during operations prior to DOE taking possession of spent nuclear fuel. Not yet initiated. Obtain prior to operation.
U.S. Fish and Wildlife Service (FWS)	Endangered Species Act of 1973 (Section 7 [16 U.S.C. 1536])	Consultation regarding potential to adversely impact protected species (non-marine species).	Concurrence with *not likely to adversely affect* (MA-NLAA) determination or formal consultation leading to biological opinion and incidental take statement containing appropriate mitigation measures. Cannot modify habitat of endangered or threatened species without completion of formal consultation with FWS. Informal communications initiated. Regulatory timeframe 3 to 6 months.
FWS	Migratory Bird Treaty Act, 50 CFR Part 21	Consultation with FWS prior to carrying out action to ensure the action does not jeopardize listed species.	Adverse impacts on migratory birds and/or their nests. Not yet initiated.
U.S. Army Corps of Engineers (USACE)	Clean Water Act (CWA), Section 404, 33 CFR Part 323	Section 404 Permit	Disturbance or crossing waters of the United States, including navigable waters and adjacent wetlands. Not yet initiated. Regulatory timeframe up to 1 year.
U.S. Department of Transportation	49 CFR Part 107, Subpart G	Certificate of Registration	Transportation of hazardous materials. Initiate prior to generation. Not yet initiated.
Tennessee Department of Environment and Conservation	Tennessee Rule 0400-20-10-.32	License to ship radioactive material	Shipment of radioactive material to a licensed disposal/processing facility in Tennessee. Initiate when determined if shipping to Tennessee. Not yet initiated.
Texas Department of Health Services (DSHS)	*Texas Administration Code* (TAC) Title 25 [25 TAC 289.252]	Licensing of Radioactive Material	Licensing to produce, receive, possess, use, transfer, own, or acquire radioactive material. Initiate before commencing activities. Not yet initiated.
Texas DSHS	TAC Title 25 [25 TAC 289.252 and 289.257]	Licensing of Radioactive Material	Licensing to receive, possess, use, transfer, own, or acquire radioactive material. Initiate before commencing activities. Not yet initiated.
Texas Commission on Environmental Quality (TCEQ)	Clean Air Act (CAA) (40 CFR Parts 50–82); General Air Quality Rules, TAC Title 30, Part 1, Chapters 101, 111–118)	Air Quality Construction Permit	Construction of air emission sources—diesel combustion generator, diesel generators, vents, concrete batch plant and other air sources regulated by TCEQ. Permit must be obtained before excavation for or construction of foundation or footings supporting air emitting facilities. Not yet initiated.

Agency	Authority	Requirement	Activity Covered and Status
TCEQ	CAA; Texas Health and Safety Code (THSC); Texas CAA (TCAA) Chapter 382 General Air Quality Rules; TAC Title 30, Part 1, Chapters 106, 116	Air New Source Review Permits	Any person who plans to construct a new facility or modify an existing facility which emits air contaminants into the atmosphere. Regulatory timeframe up to 1 year. Not yet initiated.
TCEQ	Clean Water Act (CWA) (33 U.S.C. 1251 et seq.) [40 CFR Part 121]; TAC Title 30, Part 1, Chapters 279, 307	Section 401 Water Quality Certification or Waiver	Certification or waiver is required for any Federal license or permit that authorizes any activity which may result in any discharge into waters of the United States. Point source discharges are not currently planned. Regulatory timeframe up to 6 months. Not yet initiated.
TCEQ	CWA; Texas Water Code (TWC) Chapter 26 TAC Title 30 Part 1 Chapter 205	Construction General Permit for Stormwater Discharges	Authorize the discharge of stormwater runoff and certain non-stormwater discharges from construction activities into or adjacent to waters of the State. Regulatory timeframe 45 days for permits by rule. Not yet initiated.
TCEQ	CWA; TAC Title 30 Part 1 Chapter 334	Registration	Storage of chemicals or petroleum substances in underground and aboveground storage tanks. Regulatory timeframe 30 days before installation. Not yet initiated.
TCEQ	CWA Section 402 [40 CFR Part 123]; TWC Chapter 26	General Permit Texas Pollutant Discharge Elimination System (TPDES)	Facilities that discharge stormwater associated with industrial activity to surface water in the State. Regulatory timeframe 6 months. Not yet initiated.
TCEQ	CWA; TWC Chapter 26; TAC Title 30, Part 1, Chapters 307–309, 311, 314, 315, and 319	Industrial Wastewater Permit for Discharge of Industrial Wastewater	Discharge of industrial wastewater into or adjacent to waters in the State. Regulatory timeframe up to 1 year. Not yet initiated.
TCEQ	CWA, TWC Chapter 26; TAC Title 30, Part 1, Chapters 39, 307–309, 311, 314, 315, and 319	TPDES Permit	Discharge wastewater into water in the State. Regulatory timeframe up to 1 year. Not yet initiated.
TCEQ	CWA, TWC Chapter 5 and 26; TAC Title 30, Part 1, Chapters 39, 307–309, 311, 314, 315, and 319	Texas Land Application Permit	Dispose of wastewater adjacent to waters of the State of Texas by irrigation, evaporation, or subsurface disposal. Regulatory timeframe 120 days. Applicability not yet determined.

Agency	Authority	Requirement	Activity Covered and Status
TCEQ	TAC Title 30 Part 1 Chapter 210	Reclaimed Water Authorization	Authorization prior to reuse activities. Regulatory timeframe 120 days. Not yet initiated.
TCEQ	TAC Title 30 Part 1 Chapter 290	Licensed Operator	Operation of water treatment plant. Prior to operation. Not yet initiated.
TCEQ	TAC Title 30 Part 1 Chapters 285 and 366	On-site Sewage Facilities (OSSF) Permit	Construction and maintenance for OSSF, including septic systems and holding tanks. Regulatory timeframe 30 days. Not yet initiated.
Texas Historical Commission (THC)	Section 106; Texas Government Code, Chapter 442; Texas Natural Resource Code, Title 9, Chapter 191; TAC Title 13, Chapter 2;	Request for State Historic Preservation Office (SHPO) Consultation (THC Notification/Antiquities Permit, if Required)	The Project Matador property is leased from Texas Tech University, a State of Texas university. Public lands owned by the State of Texas or political subdivisions of the State may be subject to the Antiquities code and require notification to the THC prior to work on State property. THC will make a determination if a permit application is warranted. Informal communication initiated.
Panhandle Groundwater Conservation District (PGCD)	TWC Chapter 36; PGCD Rules	Well Drilling Permit	Required prior to drilling a new permitted well or increasing the size of an existing well or the size of the pump installed on an existing permitted well. Not yet initiated.
PGCD	TWC Chapter 36; PGCD Rules	Operating Permit	Required for each land tract of contiguous acreage that has existing and/or new permitted wells. Not yet initiated.
PGCD	TWC Chapter 36; PGCD Rules	Registration	Wells that do not require an operating permit. Not yet initiated.

1

APPENDIX I

METEOROLOGY INFORMATION

I.1 Meteorology

I.1.1 General Climate

The PMN Units 1–4 site area's climate is semi-arid, characterized by hot summers and relatively cold winters. It experiences large variations in daily temperatures, low relative humidity, and moderate, irregularly spaced rainfall (NOAA 2026-TN13137; TWDB 2012-TN13136). Appendix I contains relevant meteorological data including various tables and figures as well as the associated details (e.g., calculations, methodology, design inputs).

Temperatures in the High Plains vary greatly depending on the time of year. The Amarillo area is subject to extreme and rapid temperature changes, especially during the fall and winter months when cold fronts from the northern Rocky Mountain and Plains sweep across the area. Humidity averages are low. Low humidity moderates the effect of high summer afternoon temperatures and permits evaporative cooling systems to be very effective (NOAA 2026-TN13137).

Severe local storms are infrequent throughout the cool season, but occasional thunderstorms with large hail, lightning, and damaging wind occur during the warm season, especially during the spring. These storms are often accompanied by very heavy rain, which can produce local flooding, particularly of roads and streets. Thunderstorms can occur near the dryline, and it is these thunderstorms which produce the majority of the tornadoes in the Southern Plains in the spring and early summer (NOAA 2026-TN13137).

The Texas Panhandle is one of the windiest regions in the United States, with winds predominantly from the south and south-southwest. As westerly winds flow over the Rocky Mountains, low pressure forms to the east of the mountains in the high plains. This very persistent low pressure is what leads to strong average wind speeds from the southwest and west. Wind speeds of 50 mph or more occur each year, often with clear skies, warm temperatures, and blowing dust. These strong winds are most common in the winter and spring. Strong cold fronts can also bring northerly winds of 40 mph or more during the winter months (NOAA 2026-TN13137).

I.1.1.1 Severe Weather

Severe weather phenomena are considered in the design of safety-related structures, systems, and components. Statistics on severe weather phenomena were obtained from historic data. Most data are taken from the National Centers for Environmental Information Storm Events Database and National Climatic Data Center (NCDC) Local Climatological Data reports (NOAA 2025 TN13135, NOAA 2026-TN13134) that cover the 75-year period of 1950–2024, but shorter or longer data periods are used for some phenomena to accommodate available data or to capture the occurrence of rare events. The sources of meteorological data used in this section include the National Weather Service (NWS) meteorological station at the Rick Husband Amarillo International Airport (Amarillo National Weather Service Station [KAMA]) in Amarillo, Texas, located roughly 11 mi west-southwest of the PMN Units 1–4 site and the Pantex Plant meteorological tower located approximately 5 mi northeast of the PMN Units 1–4 site. These sites are suitable sources of information for expected weather conditions onsite due to the close proximity of the facilities and the generally uniform topography and weather patterns in the

surrounding area. Integrated surface data from the KAMA station for the years 1995 through 2024 were also used (NOAA 2026-TN13133).

I.1.1.2 Extreme Winds

Estimated extreme winds are based on climatological data from the NWS weather station KAMA (NOAA 2026-TN13134). Seventeen years of data (2008–2024) from the Amarillo site were used and the highest recorded 3-second wind gust speed in the years 2008 through 2024 was 81 mph in 2008 and 2011 (see Table I-1). A summary of 100-year return 3-second wind speeds at the Amarillo, Texas, station is included in Table I-2 and the 100-year return 3-second wind gust speed is 92 mph.

I.1.1.3 Precipitation Extremes

Historical rainfall for the region around the PMN Units 1–4 site was obtained from local climate reports for the NWS meteorological station KAMA. The normal annual precipitation for the Amarillo station is 19.66 inches (in.) based on historical data from 1991 through 2020. Over an 83-year period of record, the maximum 24-hour rainfall is approximately 7.25 in. while the maximum monthly rainfall is roughly 10.73 in. Historical annual snowfall totals were developed by reviewing data from the NWS meteorological station KAMA in Amarillo. The normal annual snowfall in the vicinity of the PMN Units 1–4 site is 17.2 in. Rainfall and snowfall values are shown in Table I-3. The maximum monthly snowfall over an 83-year period of record is 25.6 in. in February 2013 (NOAA 2026 TN13137).

The U.S. Drought Monitor (USDM) uses a five-category system to show the location and intensity of droughts across the country. The five categories are abnormally dry (a precursor to drought) (D0), moderate (D1), severe (D2), extreme (D3), and exceptional (D4). These categories describe conditions related to dryness and drought including observations of available water in streams, lakes, and soil compared to the same time every year (NOAA 2026-TN13346).

Drought conditions are common in Texas. Since the creation of the U.S. Drought Monitor Map in 2000, Texas has been completely drought-free for approximately 8 percent of the time (2000–2014), and at least half of the State has been under drought conditions for approximately 42 percent of the same period (Runkel et al. 2002-TN8674). Carson County and Potter County, which contain and are adjacent to the PMN Units 1–4 site, respectively, have experienced some level of drought or pre-drought conditions about 56 percent of the time in the period from January 2000 through March 2026. March experiences the highest frequency of drought conditions in these counties, with droughts of D1 intensity or worse occurring 45 percent of the time. The most intense droughts in this area, however, most frequently occur in May and June, with D4-intensity droughts occurring about 7 percent of the time. A monthly summary of drought frequencies for these two counties by intensity is shown in Table I-5 (NOAA 2026-TN13131).

I.1.1.4 Hailstorms

Hail data is taken directly from the National Oceanic and Atmospheric Administration's (NOAA) storm event database from January 1970 to December 2025 (NOAA 2025-TN13136), where hail events and associated diameters are recorded. This data is presented in Table I-7. Spring months of April to June are the most significant for hail probability with April, May, and June experiencing 118 events, 183 events, and 203 events, respectively, since 1970 (Table I-8). The largest diameter of hail recorded is 4.5 in. on three occasions: June 4, 1983, at an unspecified

location, July 2, 1995, in the city of Panhandle, Texas, and March 28, 2007, at the Pantex Plant site. With 611 hail events in 56 years, the average is 10.9 hail events per year for Carson County.

I.1.1.5 Thunderstorms

Thunderstorm data is taken from NOAA datasets for this region and is characterized by the NWS meteorological station KAMA. The average number of thunderstorm days-per-year for this station is 46.5 per year over a 77-year period of record. June experiences the most thunderstorms, with an average of 9.2 per year occurring in that month. About 73 percent of all thunderstorms occur during the late spring and summer months of May through August. See Figure I-1 for monthly thunderstorm averages (NOAA 2024-TN13134).

I.1.1.6 Tornadoes

Tornado data is taken from NOAA's Storm Event Database to determine the overall frequency of how often each event has occurred. Data from 1970 through 2024 was used to maintain consistency with other meteorological calculations. Carson County and neighboring Potter County have experienced frequent tornadoes, totaling 108 events over the 55-year period of record. The highest frequency is experienced in spring (April through June), with over three fourths of tornado events occurring in those 3 months (Table I-9).

I.1.1.7 Hurricanes

Hurricane effects are strongly felt in coastal locations but significantly reduced further inland like the location of the proposed site. Because the coastal distance to the Gulf of Mexico is about 560 mi, hurricanes and tropical storms from hurricanes are a rare event at the PMN Units 1–4 site with no recorded damages in Carson County. Review of the NCDC Storm Event Database for the period of January 1, 1970, to December 31, 2024, shows that the nearest hurricane related storm event (hurricane, tropical storm and tropical depression events) passed about 95 mi southeast of the PMN Units 1–4 site. The review of the NCDC Storm Event Database included all Panhandle counties (26 total) (NOAA 2026-TN13135).

Additionally, NOAA's Historical Hurricane Tracks shows no events within 60 mi of Carson County, Texas (NOAA 2026-TN13359).

I.1.1.8 Fog

Fog data from the 2024 annual summary of local climatological data for Amarillo, Texas, indicates that heavy fog, defined by fog which reduces visibility to less than one fourth of a mi, occurs about 24.8 days per year for Amarillo over a 61-year period of record. Additionally, records indicate that the months of October to April are the foggiest, with summers experiencing the fewest low-visibility days. See Figure I-1 for monthly frequencies of severe fog (NOAA 2026-TN13134).

NORMALS, MEANS, AND EXTREMES
AMARILLO (KAMA)

LATITUDE: 35° 13'N | LONGITUDE: 101° 43'W | ELEVATION (FT): GRND: 3606.67 BARO: 3589 | TIME ZONE: CENTRAL (UTC -6) | WBAN: 23047

	ELEMENT	POR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
TEMPERATURE °F	NORMAL DAILY MAXIMUM	30	52.2	56.1	64.8	72.4	80.9	89.7	92.9	91.0	84.0	73.0	61.3	51.9	72.5
	MEAN DAILY MAXIMUM	77	50.1	53.9	62.4	71.5	79.6	88.3	91.8	90.1	83.0	72.6	60.0	51.5	71.2
	HIGHEST DAILY MAXIMUM	83	81	89	94	99	104	111	110	108	105	99	88	81	111
	YEAR OF OCCURRENCE		1950	2017	1971	2012	2022	2011	2020	2024	2023	2000	2023	1955	JUN 2011
	MEAN OF EXTREME MAXS.	77	71.8	76.5	83.2	89.2	94.6	100.3	100.6	99.2	95.3	89.5	79.5	72.5	87.7
	NORMAL DAILY MINIMUM	30	24.9	27.5	34.8	42.5	52.6	62.4	66.4	65.3	57.8	45.4	33.5	25.7	44.9
	MEAN DAILY MINIMUM	77	22.8	26.2	33.0	41.9	51.9	61.6	66.0	64.6	57.0	45.1	32.7	24.9	44.0
	LOWEST DAILY MINIMUM	83	-11	-14	-3	14	27	41	51	48	30	12	0	-8	-14
	YEAR OF OCCURRENCE		1984	1951	1948	1945	2013	1998	1990	2010	1984	1993	1976	1989	FEB 1951
	MEAN OF EXTREME MINS.	77	5.2	8.9	16.0	27.2	37.9	50.7	58.2	56.9	43.6	29.8	16.4	8.0	29.9
	NORMAL DRY BULB	30	38.6	41.8	49.8	57.5	66.8	76.1	79.6	78.1	70.9	59.2	47.4	38.8	58.7
	MEAN DRY BULB	77	36.5	40.0	47.7	56.7	65.8	75.1	78.9	77.4	70.0	58.9	46.3	38.2	57.6
	MEAN WET BULB	41	25.0	27.4	33.5	39.5	49.8	59.1	62.0	61.8	55.9	45.0	33.5	26.6	43.3
	MEAN DEW POINT	41	25.4	27.6	33.8	39.8	50.3	59.2	61.7	61.8	55.5	44.7	33.4	26.7	43.3
	NORMAL NO. DAYS WITH:														
	MAXIMUM >= 90	30	0.0	0.0	0.1	0.9	6.4	15.1	22.3	18.8	7.6	1.2	0.0	0.0	72.4
	MAXIMUM <= 32	30	2.9	1.8	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.8	2.9	9.2
	MINIMUM <= 32	30	26.7	21.2	12.6	3.8	0.2	0.0	0.0	0.0	0.0	2.5	14.7	26.3	108.0
	MINIMUM <= 0	30	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.6
H/C	NORMAL HEATING DEG. DAYS	30	820	650	476	251	78	3	0	1	31	219	530	812	3871
	NORMAL COOLING DEG. DAYS	30	0	1	5	24	132	335	454	408	208	39	2	0	1608
RH	NORMAL (PERCENT)		60	59	54	51	58	59	55	60	61	59	59	62	58
	HOUR 00 LST	30	67	65	61	59	68	67	63	69	69	67	68	68	66
	HOUR 06 LST	30	72	72	70	71	78	78	76	80	79	75	74	72	75
	HOUR 12 LST	30	51	49	43	39	45	45	42	47	48	45	47	50	46
	HOUR 18 LST	30	49	43	37	33	40	40	38	44	44	44	50	52	43
S	PERCENT POSSIBLE SUNSHINE	60	69	69	74	76	72	78	79	77	74	76	72	68	74
W/O	MEAN NO. DAYS WITH:														
	HEAVY FOG(VISBY <= 1/4 MI)	61	3.2	3.5	3.1	2.0	1.7	0.7	0.5	0.9	1.6	2.2	2.5	2.9	24.8
	THUNDERSTORMS	77	0.2	0.5	1.5	3.2	7.5	9.2	8.6	8.8	3.7	2.4	0.7	0.2	46.5
CLOUDINESS	MEAN:														
	SUNRISE-SUNSET (OKTAS)	1	3.2	4.4	4.0	3.7	4.0	2.0	2.0	2.9	4.0	3.6	3.2	2.4	3.3
	MIDNIGHT-MIDNIGHT (OKTAS)	1	3.2	4.4	4.0	3.6	4.0	1.6	2.0	3.2	1.6	3.2	2.8	2.4	3.0
	MEAN NO. DAYS WITH:														
	CLEAR	3	7.7	9.7	11.0	12.0	11.0	17.8	17.0	15.5	9.5	12.0	10.0	13.0	146.2
	PARTLY CLOUDY	3	5.0	3.7	3.3	4.3	5.3	4.7	3.0	2.5	1.0	2.5	3.0	5.0	43.3
	CLOUDY	3	4.7	6.0	3.3	4.7	5.7	1.5	2.0	3.5	1.5	4.0	3.5	3.5	43.9
PR	MEAN STATION PRESSURE(IN)	41	26.36	26.33	26.29	26.25	26.27	26.29	26.36	26.37	26.37	26.36	26.36	26.35	26.33
	MEAN SEA-LEVEL PRES. (IN)	41	30.08	30.03	29.95	29.87	29.85	29.84	29.91	29.93	29.95	29.99	30.04	30.08	29.96
WINDS	MEAN SPEED (MPH)	41	12.2	13.0	14.0	14.8	13.8	13.8	12.3	11.4	12.1	12.5	12.7	12.3	12.9
	PREVAIL.DIR(TENS OF DEGS)	46	23	22	20	19	19	19	19	19	19	20	21	21	19
	MAXIMUM 2-MINUTE:														
	SPEED (MPH)	32	53	56	64	53	58	68	66	58	43	51	49	54	68
	DIR. (TENS OF DEGS)		29	25	23	25	17	02	18	27	02	25	26	25	02
	YEAR OF OCCURRENCE		2012	2023	2019	2001	2013	2008	2011	2012	2016	2010	2019	2009	JUN 2008
	MAXIMUM 3-SECOND														
	SPEED (MPH)	32	71	75	80	74	76	81	81	74	56	63	64	75	81
	DIR. (TENS OF DEGS)		34	21	23	24	08	01	18	28	02	33	23	03	18
	YEAR OF OCCURRENCE		2024	2023	2019	2001	2016	2008	2011	2012	2016	2021	2019	2006	JUL 2011
PRECIPITATION	NORMAL (IN)	30	0.71	0.53	1.27	1.45	2.27	2.85	2.82	2.86	1.69	1.75	0.75	0.71	19.66
	MAXIMUM MONTHLY (IN)	83	3.17	2.53	4.14	6.45	9.81	10.73	8.02	8.07	5.02	7.64	6.00	4.52	10.73
	YEAR OF OCCURRENCE		2017	2013	2000	1997	1951	1965	2010	2009	1950	1941	2024	1959	JUN 1965
	MINIMUM MONTHLY (IN)	83	0.00	T	T	T	0.04	0.01	0.04	0.28	0.03	0.00	0.00	T	0.00
	YEAR OF OCCURRENCE		1986	1991	1950	1964	1984	1953	2001	1983	1977	1952	1989	2024	NOV 1989
	MAXIMUM IN 24 HOURS (IN)	83	3.73	1.48	2.27	2.65	6.75	6.15	7.25	4.26	3.42	3.45	2.88	3.11	7.25
	YEAR OF OCCURRENCE		2007	2013	1973	1999	1951	1960	2010	1945	1941	1948	2010	1943	JUL 2010
	NORMAL NO. DAYS WITH:														
	PRECIPITATION >= 0.01	30	3.8	4.1	5.5	5.5	7.3	7.9	7.4	8.2	5.8	5.4	3.8	4.1	68.8
	PRECIPITATION >= 1.00	30	0.1	0.0	0.2	0.4	0.6	0.8	0.9	0.8	0.4	0.4	0.1	0.0	4.7
SNOWFALL	NORMAL (IN)	30	4.0	3.5	1.9	0.5	0.2	0.0	0.0	0.0	0.0	0.7	2.6	3.8	17.2
	MAXIMUM MONTHLY (IN)	83	14.5	25.6	14.7	6.5	4.7	T	T	T	0.3	7.4	13.8	21.2	25.6
	YEAR OF OCCURRENCE		1983	2013	1961	1997	1978	2024	2022	2022	1984	2020	2004	2000	FEB 2013
	MAXIMUM IN 24 HOURS (IN)	83	11.0	19.0	11.2	6.5	4.7	T	T	T	0.3	5.5	12.2	16.8	19.0
	YEAR OF OCCURRENCE'		2015	2013	2005	1997	2005	2024	2022	2022	1984	2019	1952	2000	FEB 2013
	MAXIMUM SNOW DEPTH (IN)	79	12	17	12	6	T	T	0	0	T	5	9	15	17
	YEAR OF OCCURRENCE		2015	2013	2005	1973	1988	1949			1984	2020	1952	2000	FEB 2013
	NORMAL NO. DAYS WITH:														
	SNOWFALL >= 1.0	30	1.1	1.1	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.7	1.2	5.0

published by: NCEI Asheville, NC | 3 | 30 year Normals (1991-2020)

Figure I-1 Meteorological Normals, Means, and Extremes for Amarillo, Texas Weather Station. Source: NOAA 2026-TN13134.

I.1.1.9 Local Meteorology

Wind

Carson County experiences frequent high wind speeds. The wind at the PMN Units 1–4 site blows most frequently from the south and south by southwest. Based on the Pantex Plant site data for the years 2021, 2023, and 2024, the average 10 meter (m) wind speed is 12.8 mph (Table I-20) and the maximum 10 m hourly average wind speed was 114.3 mph (Table I-16). Historical wind speeds, temperatures, and stability data from the Pantex Plant site for years 2021, 2023, and 2024 are depicted in Table I-16 and Table I-17. A comparison of 2024 wind speed and temperature statistics between the Pantex Plant site and the NWS meteorological station KAMA shows close agreement between the two sites in Table I-18.

Monthly and annual wind roses using the wind speed classes provided in RG 1.23 (NRC 2007-TN278) were developed using the Pantex Plant 10 m and 60 m site data for 2021, 2023, and 2024. Hourly meteorological data from the Pantex Plant site for 2021, 2023, and 2024 are used in the development of joint frequency distributions, in hours, of wind direction and wind speed by atmospheric stability class.

The annual wind rose for the 10 m site data is provided in Figure I-16 and the monthly wind roses for the 10 m data are provided in Figure I-17 through Figure I-28. The Pantex Plant 60 m site data for these years are presented as wind roses in Figure I-29 (annual) and Figure I-30 through Figure I-41 (monthly).

The prevailing 60 m winds are from the southern sectors during all seasons, with the most pronounced effect during the warmer months and some contributions from the west in December and January. Average monthly wind speeds reach a maximum of about 17 mph in late winter and spring and decrease to 11 mph during the rest of the year. The average site 10 m wind speeds by quarter for the 2021, 2023, and 2024 data are given in Table I-20.

Winter generally exhibits 10 m winds across the entire western sector. The spring season generally exhibits predominantly south-southeast to south-southeast winds, while the summer and fall generally exhibit south and south-southwest winds. The wind direction frequencies at the 10 m instrumentation level for the 2021, 2023, and 2024 data for 22.5-degree direction segments are given in Table I-21.

Generally, the longer the wind blows in the same direction, the lower the dilution potential because effluent is not dispersing significantly to the sides of the plume. Wind direction persistence is an indicator of the duration of atmospheric transport from a single sector (same sector, 22.5 degrees). For the PMN Units 1–4 site, the most frequent occurrence in those 5 years during which the wind remained blowing in one direction for at least 2 hours at the 10 m elevation is 769 instances, with a direction from the south. Wind direction remained more persistent from the southwest to south-southeast directions, as shown in Table I-15.

Precipitation

Long-term precipitation data is not available for the Pantex Plant site, therefore, monthly and annual summaries of maximum and minimum precipitation, including the maximum 24-hour precipitation from the NWS meteorological station KAMA are used. Precipitation falls an average of about 69 days per year, and the normal annual precipitation is about 19.7 in. The maximum monthly rainfall has ranged from about 2.5 in. to 10.7 in. The minimum monthly

amount was trace amounts in various years from 1950 through 2024. The maximum in 24 hours was 7.25 in in July 2010. Except for May through July, which are wetter, precipitation is uniformly distributed throughout the year (Table I-3) (NOAA 2026-TN13134).

Maximum rainfall, estimated by statistical analysis of regional precipitation data, is given in Table I-19 for return periods of 1 to 100 years and for rainfall durations of 1 hour and 24 hours (USWB1961-TN13130).

Precipitation data for the PMN Units 1–4 site region was obtained from the Pantex Plant site meteorological tower for the years 2021, 2023, and 2024. As shown, precipitation is most associated with wind directions from south to east-northeast. There is a secondary maximum with wind direction from the east-southeast. Monthly and annual precipitation wind rose based on the Pantex Plant data are given in Figure I-2 through Figure I-14.

Atmospheric Stability

Atmospheric stability is based on the temperature difference between the 10 m and 60 m measurement levels. The classification of atmospheric stability is given in RG 1.23 (NRC 2007-TN278), as well as in Table I-10. The frequency of stable, unstable, and neutral atmospheric conditions is also summarized in Table I-11. This table shows the consistency in the stability class distribution from year-to-year. Stable lapse conditions (i.e., inversions) typically occur about 58 percent of the time, while neutral and unstable conditions occur 20 and 22 percent of the time, respectively. The most stable class (Class G) occurs 23 percent of the time.

“Calm” winds are defined as the hourly average wind speeds below the vane or anemometer starting speed, whichever is higher. The starting threshold for wind direction and wind speed measurement is 1.5 meters per second (m/s). The frequency of “calms” by stability class were also determined and are provided in Table I-12. The monthly stability class frequency is given in Table I-13, and annual frequency is presented in Table I-11.

Table I-14a through Table I-14g presents a summary of the stability-wind frequency distributions, showing the distribution of each stability class by wind direction and wind speed. These Appendix I tables summarize the wind frequency distributions during each of the Pasquill stability classes.

Following is the annual stability class distribution for all winds (independent of direction sector) at the PMN Units 1–4. The maximum occurs in the most stable (G) stability class with predominantly south and southwest winds. The secondary maximum occurs in the neutral (D) and stable (E) classes with winds from the south. The unstable (A, B, and C) classes occur less frequently with winds from the southwest and west. The most stable class (G) occurs with predominantly south-southeast winds. As expected, the wind sectors for all classes approximately follow the wind rose distribution with peaks in the south and south-southwest directions.

Atmospheric Dispersion (X/Q) and Deposition (D/Q) Estimates

At the time of publication of this EIS, the applicant’s final safety analysis report had not been submitted. Thus, the applicant’s safety evaluation of radiological health cannot be referenced for use in this section’s environmental impact evaluation. Instead, the review team performed a separate analysis as discussed below, applying the best available information (which includes meteorological data in this Appendix I and the Fermi America EIS Supplement [FA 2026-

TN13483]) and leveraging the analysis from past environmental reviews to estimate the environmental impacts. Once the final safety analysis report is submitted and docketed, the review team will examine the safety analysis to determine whether the environmental analysis in this section is still valid. For any significant differences between the environmental and safety evaluations, a supplemental environmental analysis may be necessary. The NRC's safety review must verify that the application meets all regulatory requirements for the applicant to be issued the requested license.

I.2 100-year 3-second Gust Return Wind Speed

I.2.1 Design Inputs

The 3-second wind gust speed data for City of Amarillo, Texas was taken from the Annual Local Climatological Data Annual Summary for Amarillo, Texas (Amarillo National Weather Service Station [KAMA]) (NOAA 2026-TN13137), with the "Maximum 3-second Wind: Speed" recorded in Table I-1. Note that additional data exists from National Oceanic and Atmospheric Administration (NOAA) on wind gusts prior to 2008, but the recorded data is for 5-second wind gusts from 1996 to 2007 or a generic "Peak Gust" for entries earlier than 1996. Therefore, this older data has been excluded from consideration. Seventeen years of data were used.

Table I-1 Maximum 3-second Wind Gust Speed Data for City of Amarillo, Texas, 2008–2024

Year	Peak 3-Second Wind Gust Speed (mph) City of Amarillo
2008	81
2009	68
2010	64
2011	81
2012	74
2013	71
2014	68
2015	64
2016	76
2017	63
2018	60
2019	80
2020	68
2021	71
2022	72
2023	75
2024	78

I.2.2 Methodology

The 100-year return periods for 3-second wind gust speeds are calculated based on the methodology provided in Section 12.3 "Frequency Analysis Using Frequency Factors" of Chow et al. 1988-TN13527. Equation 12.3.3 from Chow et al. 1988-TN13527 is shown below as Equation (1).

$$x_T = \bar{x} + K_T s \quad (1)$$

Where:

x_T = T-year return period value of extreme event to be estimated.

$\bar{x}$ = Average measurement of the annual extreme condition.

s = Standard deviation of the annual extreme measured condition.

The factor K_T for extreme value distributions is given by Chow et al. 1988-TN13527's Equation 12.3.8:

$$K_T = -\frac{\sqrt{6}}{\pi}\left\{0.5772 + \ln\left[\log\left(\frac{T}{T-1}\right)\right]\right\} \quad (2)$$

Where:

T = Number of years that the maximum measurement will be calculated for.

Using 100 years for T, the resultant value for K_T is 3.13668.

I.2.3 Calculations

The application of the 100-year evaluation calculation methodology described above to the data of design inputs results in the following 100-year return 3-second wind speed and associated statistical values (Table I-2).

Table I-2 100-Year Return 3-second Wind Speeds for City of Amarillo, Texas,

Metric	Value
Average Maximum Wind Speed (mph)	71.4
Standard Deviation (mph)	6.6
100-Year Return (mph)	92.0

Note: The American Society of Civil Engineers online hazard tool produced a result of 94 mph for the 100-year return 3-second gust speed (ASCE 2026 TN13367).

I.3 Precipitation Statistics

I.3.1 Design Inputs

For precipitation data including rain and snow, information is taken from NOAA 2026-TN13137.

Note that these reports are the most recent data available and align with other data used in support of this EIS.

I.3.2 Methodology

The precipitation data is taken directly from The Normals, Means, and Extremes table in NOAA 2026-TN13137.

I.3.3 Calculations

The data for precipitation is presented in Table I-3, with values presented for the normal annual rainfall, the Historical Maximum Monthly Rainfall, Maximum Rainfall recorded in 24 hours, and normal annual snowfall.

Table I-3 Rainfall and Snowfall Statistics

Location	Amarillo (Amount)	Amarillo (Period-of-Record)
Normal Annual Rainfall (in.)	19.66	30
Maximum Monthly Rainfall (in.)	10.73	83
Maximum Rainfall in 24 hours (in.)	7.25	83
Normal Annual Snowfall (in.)	17.2	30

I.4 Drought

I.4.1 Assumptions

Drought conditions for Carson County from 1995 through 2024 are assumed to be representative of the project site.

I.4.2 Basis

Table I-4 lists drought event designations. Drought events are categorized by severity from no drought, to D0 (Abnormally Dry), D1 (Moderate Drought), D2 (Severe Drought), D3 (Extreme Drought), and lastly the worst condition D4 (Exceptional Drought) (NOAA 2026-TN13131). Note that D0 is not considered a drought category but has been included for completeness.

I.4.3 Design Inputs

The drought data is taken directly from the National Integrated Drought Information System (NIDIS) maintained by NOAA (NOAA 2026-TN13131).

I.4.4 Calculations

For Carson County, drought events are generally common, with approximately 55.83 percent of the months from 1995 to 2024 having no drought conditions and 44.17 percent in only D0 conditions. The remaining months have drought categories of 35.28 percent in D1, 18.33 percent in D2, 11.7 percent in D3, and 4.7 percent in D4 (NOAA 2026-TN13131). These are shown in Table I-5.

Table I-4 Drought Event Designations

Drought Condition	Description
D0	Abnormally Dry (Pre-Drought)
D1	Moderate Drought
D2	Severe Drought
D3	Extreme Drought
D4	Exceptional Drought

Table I-5 Average Monthly Drought Frequency in Carson County Categorized by Intensity, January 2000–March 2026

Month	None	D0	D1	D2	D3	D4
1	41.4	58.6	40.6	24.9	11.7	1.9
2	35.6	64.4	40.3	30.1	15.1	0.7
3	31.9	68.1	45.1	28.4	17.8	3.1
4	38.6	61.4	41.1	30.0	18.5	5.6
5	46.5	53.5	41.3	29.7	21.9	7.0
6	50.6	49.4	37.4	24.5	16.9	7.1
7	47.4	52.6	34.6	24.7	13.8	5.8
8	51.0	49.0	33.4	23.4	10.5	5.6
9	43.6	56.4	31.8	20.9	9.8	3.9
10	40.0	60.0	37.6	22.8	9.3	3.2
11	43.9	56.1	37.4	21.1	10.6	5.4
12	49.8	50.2	41.0	21.4	10.2	2.6
Annual	43.4	56.6	38.5	25.2	13.9	4.3

I.5 Wind and Precipitation Distribution

I.5.1 Assumptions

It is assumed that historical integrated surface data from the Amarillo National Weather Service (NWS) station (KAMA) is representative of the historical weather at the project site (NOAA 2026-TN13133).

I.5.2 Calculations

The number of hours with precipitation were evaluated using integrated surface data from years 1995 through 2024 (NOAA 2026-TN13133). The hours of precipitation data were correlated to their recorded wind direction and binned based on precipitation rates. These results are shown in Table I-6.

Table I-6 Hourly Rate Distribution of Precipitation vs. Wind Direction for City of Amarillo, 1995–2024

Wind Direction	All	Trace	Less than 0.5 (mm/h)	0.50 to 1.00 (mm/h)	1.00 to 1.50 (mm/h)	1.50 to 2.00 (mm/h)	2.00 to 3.00 (mm/h)	Greater than 3.00 (mm/h)
N	36,767	3,291	908	648	267	177	203	330
NNE	18,629	1,553	525	337	138	95	110	214
NE	12,343	761	282	183	109	70	83	155
ENE	9,555	485	217	191	86	40	67	146
E	12,470	567	295	195	84	70	99	229
ESE	12,537	546	230	187	109	76	87	191
SE	21,483	868	341	286	108	72	66	197
SSE	31,928	1,048	330	222	97	53	46	154

Wind Direction	All	Trace	Less than 0.5 (mm/h)	0.50 to 1.00 (mm/h)	1.00 to 1.50 (mm/h)	1.50 to 2.00 (mm/h)	2.00 to 3.00 (mm/h)	Greater than 3.00 (mm/h)
S	62,518	1,096	334	257	98	56	90	201
SSW	41,496	484	147	103	35	31	50	105
SW	29,201	300	98	60	32	24	25	89
WSW	18,151	184	61	57	38	20	53	88
W	15,035	263	71	69	56	43	48	134
WNW	10,361	232	81	75	39	40	51	98
NW	11,985	379	141	126	64	47	50	131
NNW	14,716	921	219	149	99	51	67	206
CALM	3	0	0	0	0	0	0	0
INVALID	46,365	-	-	-	-	-	-	-
All	405,543	12,978	4,280	3,145	1,459	965	1,195	2,668

"-" denotes no data in the table cell.
N = North; NE = Northeast; NNE = North Northeast; NNW = North Northwest; NW = Northwest; E = East; ENE = East Northeast; ESE = East Southeast; S = South; SE = Southeast; SSE = South Southeast; SSW = South Southwest; SW = Southwest; W = West; WNW = West Northwest; WSW = West Southwest.

Monthly and annual precipitation wind roses were developed using precipitation and wind data from the Pantex Plant meteorological tower for years 2021, 2023, and 2024. Figure I-2 through Figure I-14 show each of the individual months and the overall annual distribution (FA 2026-TN13483).

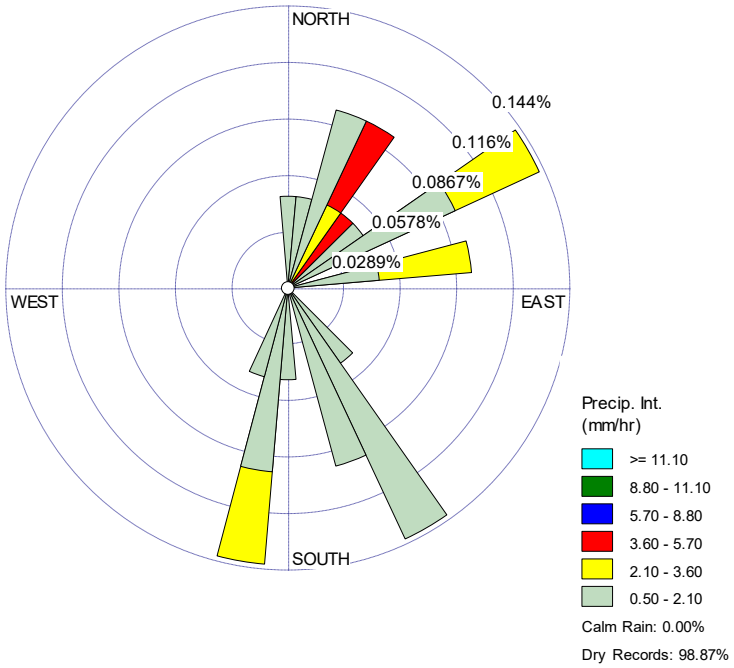


Figure I-2 January Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

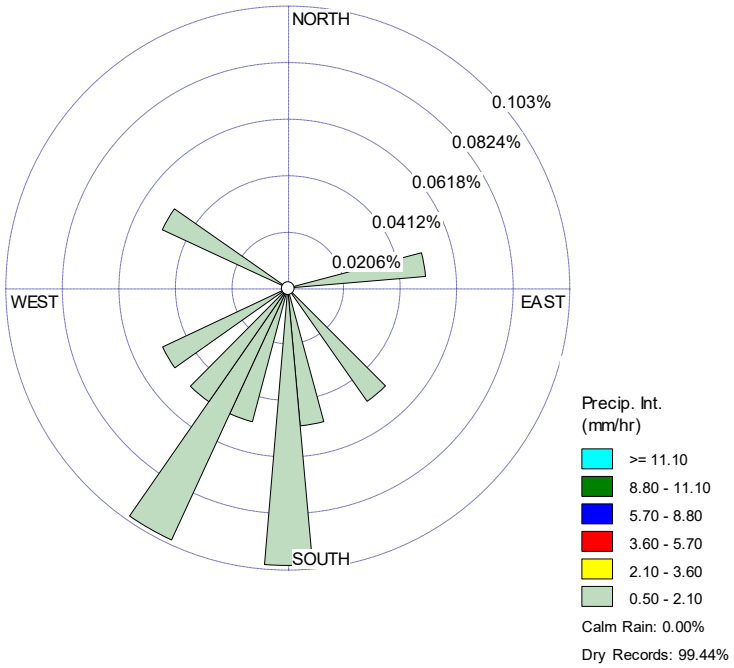


Figure I-3 February Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

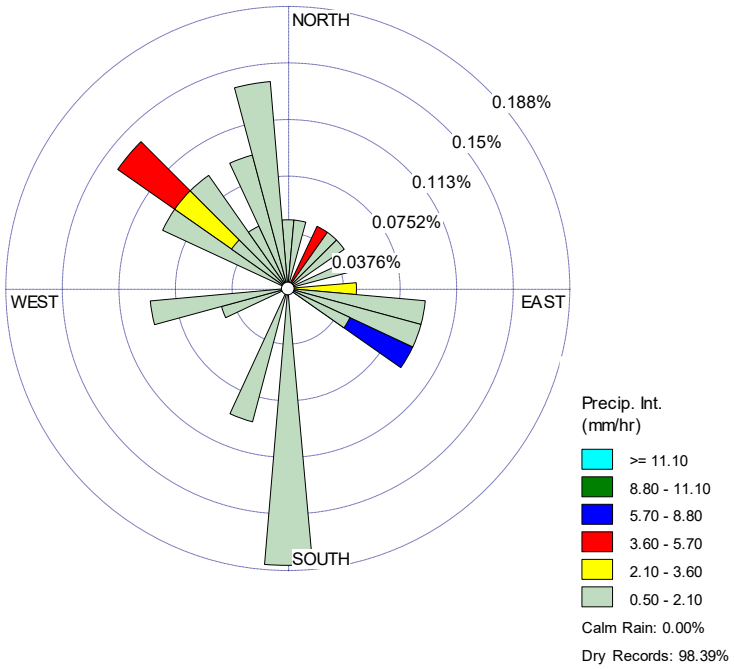


Figure I-4 March Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

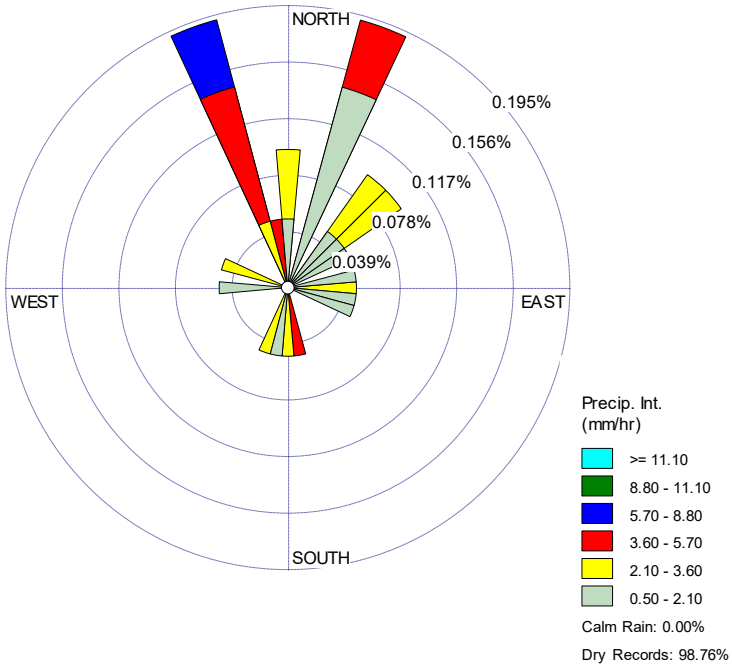


Figure I-5 April Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

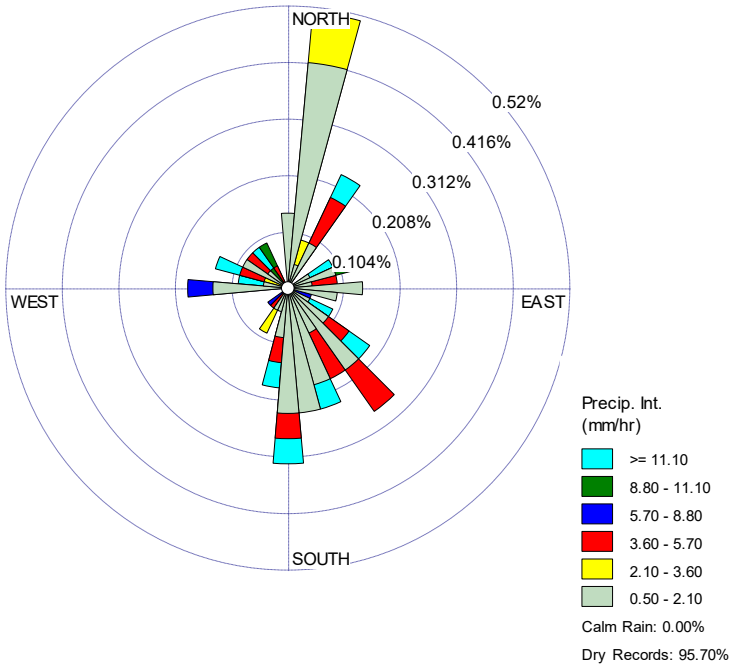


Figure I-6 May Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

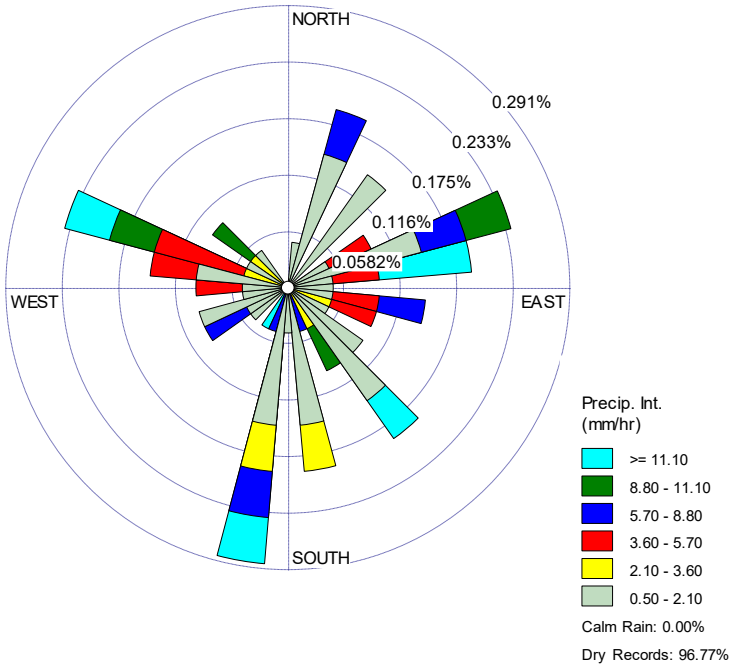


Figure I-7 June Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

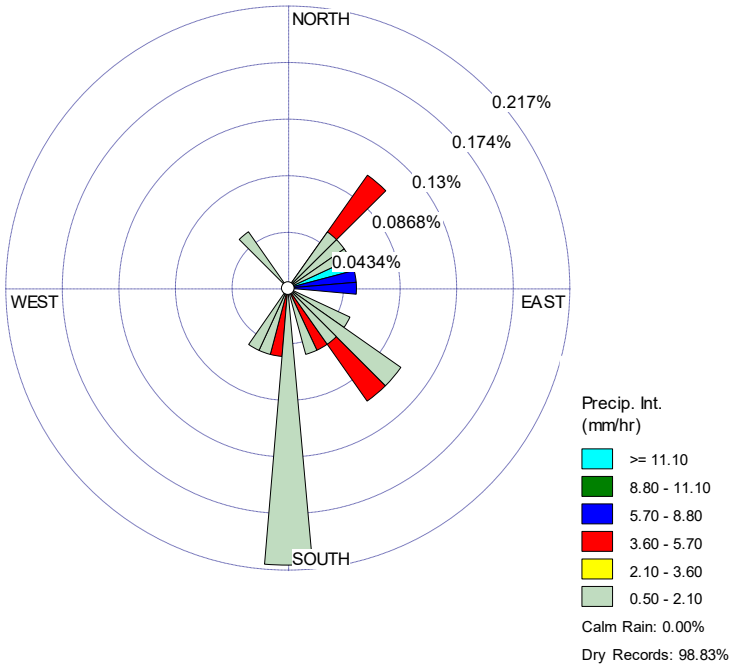


Figure I-8 July Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

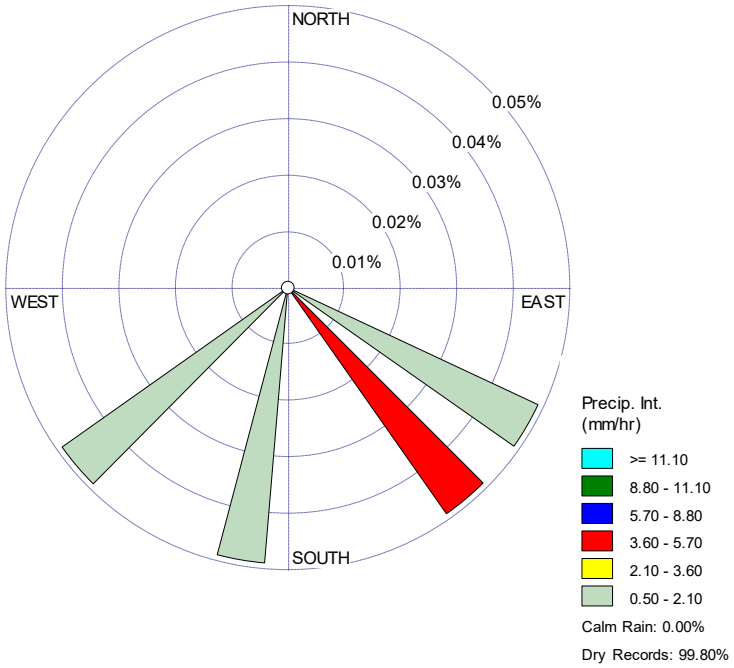


Figure I-9 August Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

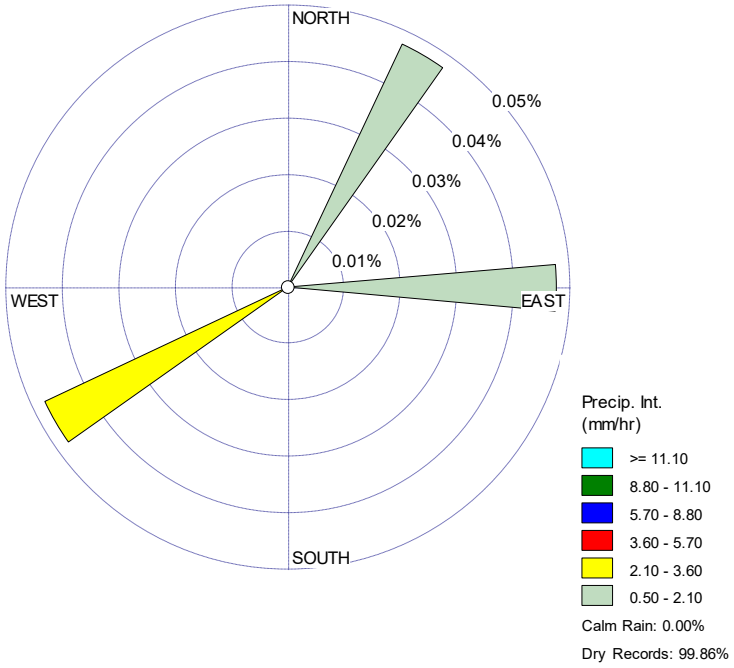


Figure I-10 September Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

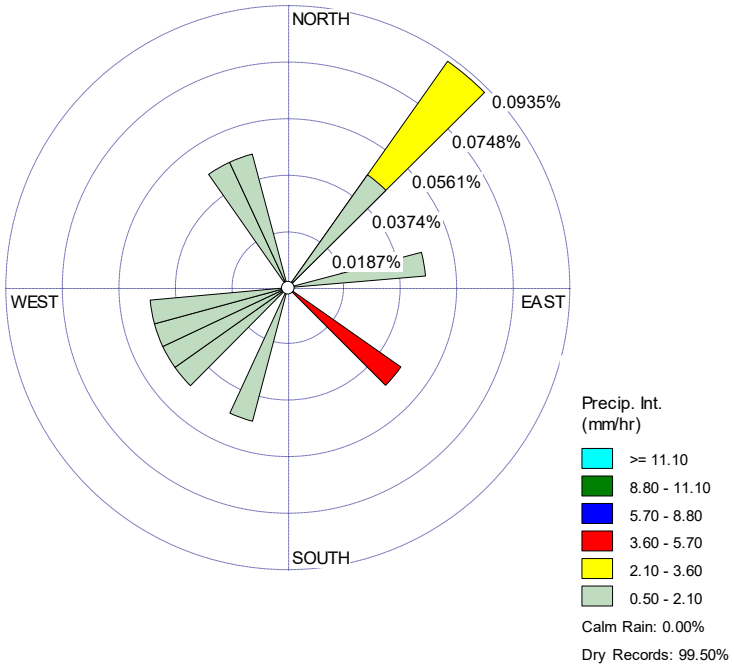


Figure I-11 October Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

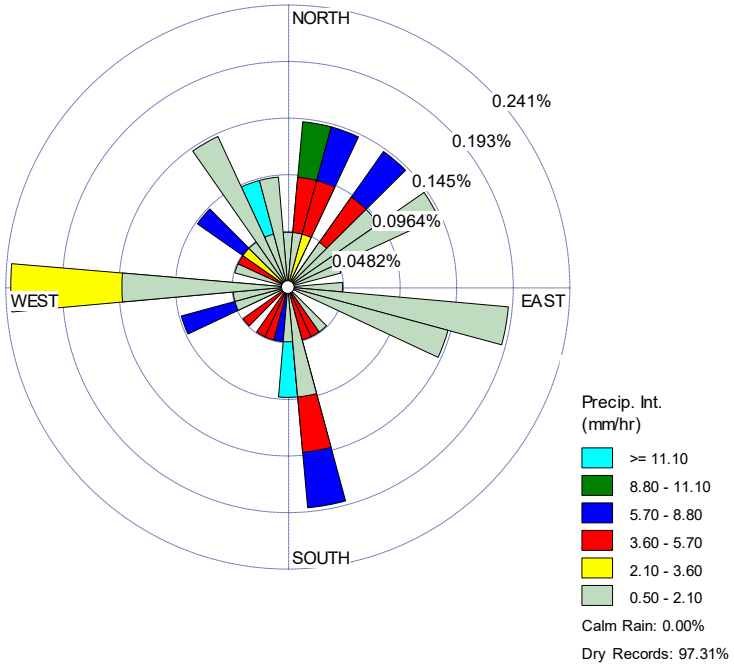


Figure I-12 November Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

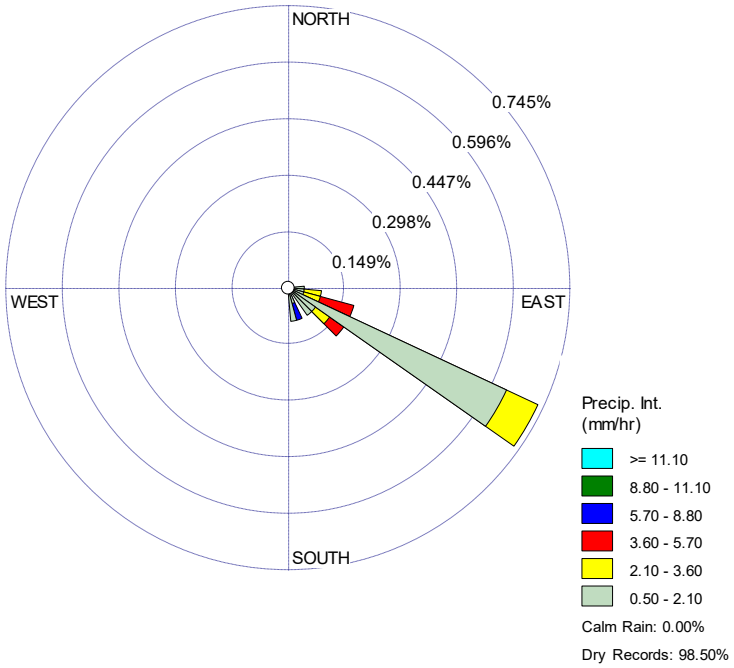


Figure I-13 December Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

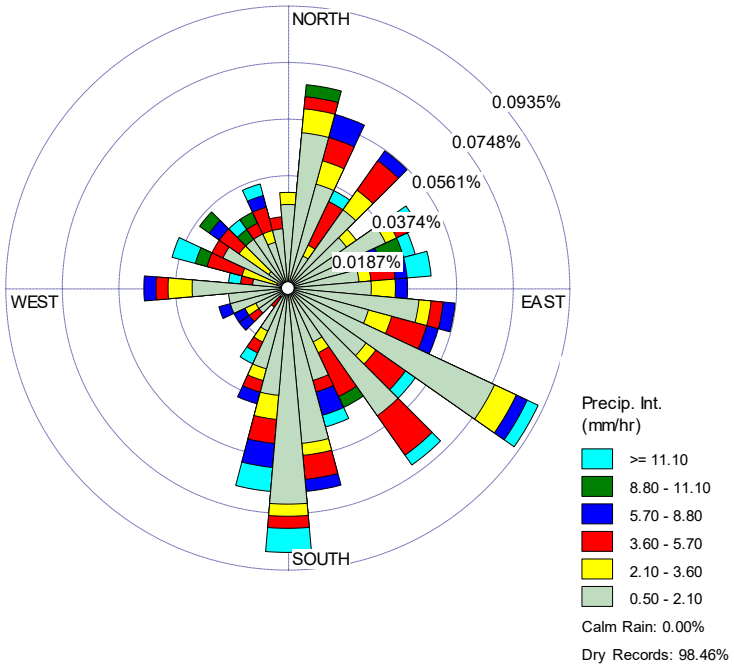


Figure I-14 Annual Precipitation Wind Rose, Pantex Plant Site Data for the Years 2021, 2023, and 2024

I.6 Hail Frequency and Severity

I.6.1 Design Inputs

Data is taken from the NOAA's National Centers for Environmental Information Storm Event Database (NOAA 2023-TN8432). Data is taken from January 1, 1970 to December 31, 2025. Hail data for Carson County, Texas, was evaluated.

I.6.2 Calculations

The raw data from the National Centers for Environmental Information Storm Event Database (NOAA 2023-TN8432) has been consolidated in Table I-7, showing the date, size, and regions of the recorded hail events from January 1, 1970, to December 31, 2025, in Carson County, Texas. Note that location was not recorded prior to 1993 for this dataset. Location records have been left blank for events pre-1993.

Table I-7 Hail Data from 1970 through 2025 in Carson County, Texas

Date	Largest observed diameter (in.)	Location of report	Date	Largest observed diameter (in.)	Location of report
05/28/1970	3.5	-	04/19/2004	1	WHITE DEER
06/14/1970	2	-	04/25/2004	1	PANHANDLE
06/02/1971	1.75	-	06/4/2004	0.75	WHITE DEER
04/13/1973	2	-	06/17/2004	1.75	MC BRIDE
04/14/1973	2.75	-	06/24/2004	0.75	MC BRIDE
04/28/1974	1.75	-	04/17/2005	0.88	PANHANDLE
03/26/1975	2	-	05/10/2005	1.75	SKELLYTOWN
05/28/1975	2.75	-	05/12/2005	1.75	CONWAY
06/23/1975	1.5	-	06/09/2005	2.5	PANTEX
04/15/1976	2	-	06/09/2005	2.5	PANTEX
05/17/1977	2.75	-	08/26/2005	1.75	SKELLYTOWN
07/31/1977	1.75	-	05/02/2006	1.75	GROOM
07/09/1979	2.5	-	05/09/2006	1.75	PANHANDLE
05/28/1980	1.75	-	05/21/2006	1	MC BRIDE
05/26/1981	1.75	-	05/25/2006	1	PANHANDLE
05/19/1982	2.75	-	05/30/2006	1.75	PANTEX
06/24/1982	1.75	-	06/21/2006	1	PANTEX
05/13/1983	1.75	-	06/22/2006	1.75	MC BRIDE
05/20/1983	1.75	-	03/10/2007	1	GROOM
06/04/1983	4.5	-	03/28/2007	4.5	PANTEX
04/26/1985	1.75	-	04/13/2007	0.88	PANHANDLE
05/25/1985	1.75	-	04/23/2007	1	PANHANDLE
06/15/1985	1.75	-	05/21/2007	0.75	WHITE DEER
09/29/1986	1.75	-	06/19/2007	1	PANHANDLE
06/24/1987	0.75	-	08/09/2007	0.75	ABELL

Date	Largest observed diameter (in.)	Location of report	Date	Largest observed diameter (in.)	Location of report
07/02/1987	1.75	-	08/24/2007	1.75	CONWAY
07/14/1987	2.5	-	10/13/2007	0.75	LARK
05/12/1989	0.75	-	04/09/2008	1.5	GROOM
05/13/1989	2.75	-	06/08/2008	0.88	GROOM
05/16/1989	1.75	-	06/14/2008	1	PANHANDLE
06/10/1989	0.75	-	06/19/2008	2	PANTEX
06/12/1989	1.75	-	06/20/2008	1.75	WHITE DEER
09/12/1989	0.88	-	06/22/2008	0.88	WHITE DEER
03/09/1990	0.75	-	04/29/2009	2.75	WHITE DEER
03/13/1990	1.75	-	05/25/2009	1	PANHANDLE
04/23/1990	1.75	-	06/05/2009	1.75	MASTERSON
06/08/1990	2.75	-	06/13/2009	1.75	CONWAY
06/27/1990	0.88	-	07/19/2009	1	PANHANDLE
08/18/1990	1	-	08/09/2009	0.75	PANTEX
08/20/1990	1.75	-	08/17/2009	2.75	GROOM
09/10/1990	1	-	05/24/2010	2.5	WHITE DEER
04/24/1991	0.75	-	06/01/2010	1.75	GROOM
05/10/1991	0.88	-	006/10/2010	1	PANHANDLE
05/24/1991	1	-	6/18/2010	1.75	GROOM
05/29/1991	1.5	-	11/07/2011	0.88	PANHANDLE
06/05/1991	1	-	02/02/2012	1	PANHANDLE
08/08/1991	0.75	-	04/06/2012	1	PANHANDLE
08/20/1991	1	-	04/11/2012	1.75	MC BRIDE
09/03/1991	0.75	-	04/26/2012	1.5	CONWAY
03/03/1992	1	-	04/29/2012	1.75	SKELLYTOWN
04/09/1992	2.75	-	06/01/2012	1.75	PANTEX
04/15/1992	0.75	-	06/06/2012	0.88	GROOM
04/16/1992	1.75	-	06/14/2012	0.88	GROOM
05/14/1992	1.75	-	09/05/2012	1	MC BRIDE
06/19/1992	0.75	-	05/28/2013	1	PANHANDLE
06/20/1992	1.75	-	06/8/2013	1.75	PANTEX
04/30/1993	1.75	WHITE DEER	06/16/2013	1.5	CONWAY
05/17/1993	0.75	WHITE DEER	06/19/2013	1.75	SKELLYTOWN
05/29/1993	1	WHITE DEER	08/14/2013	1	PANHANDLE
08/01/1993	0.75	PANHANDLE	05/21/2014	0.75	GROOM
08/05/1993	1.75	SKELLYTOWN	10/09/2014	2.75	WHITE DEER
09/07/1993	1.75	MCBRIDE	04/11/2015	2.5	MC BRIDE
04/21/1994	1.75	FRITCH	04/16/2015	2.5	PANHANDLE
04/27/1994	0.75	PANHANDLE	04/26/2015	1.75	PANTEX
06/06/1994	1.75	WHITE DEER	05/03/2015	1	MC BRIDE

Date	Largest observed diameter (in.)	Location of report	Date	Largest observed diameter (in.)	Location of report
06/10/1994	0.75	PANTEX	05/16/2015	1	CONWAY
04/17/1995	1	PANHANDLE	05/19/2015	1	GROOM
04/19/1995	1	SKELLYTOWN	05/27/2015	1	CONWAY
05/07/1995	1	PANTEX	06/12/2015	1	SKELLYTOWN
05/17/1995	1	SKELLYTOWN	11/16/2015	1	MC BRIDE
05/22/1995	2.75	SKELLYTOWN	04/20/2016	1	CONWAY
05/30/1995	0.75	SKELLYTOWN	04/28/2016	1	MC BRIDE
06/02/1995	1.75	FRITCH	05/11/2016	1	SKELLYTOWN
06/23/1995	2	PANHANDLE	05/13/2016	0.75	WHITE DEER
07/02/1995	4.5	PANHANDLE	05/16/2016	2.5	PANHANDLE
09/12/1995	1	CONWAY	05/22/2016	1	GROOM
04/21/1996	2.75	-	05/29/2016	1.75	SKELLYTOWN
05/24/1996	1.75	WHITE DEER	07/14/2016	1.75	SKELLYTOWN
05/31/1996	1	PANHANDLE	09/17/2016	1	PANHANDLE
06/02/1996	2.5	GROOM	03/28/2017	0.88	SKELLYTOWN
06/03/1996	1	PANHANDLE	03/31/2017	1	PANTEX
06/11/1996	0.88	FRITCH	04/16/2017	3	CONWAY
06/18/1996	1.75	SKELLYTOWN	05/15/2017	1	CONWAY
07/26/1996	1.75	PANHANDLE	05/16/2017	1	WHITE DEER
09/17/1996	1	SKELLYTOWN	06/13/2017	1	GROOM
4/10/1997	1.25	GROOM	07/03/2017	2.5	SKELLYTOWN
05/07/1997	1.75	WHITE DEER	05/27/2018	1.75	SKELLYTOWN
05/24/1997	1.25	GROOM	06/12/2018	2.5	PANHANDLE
05/29/1997	0.75	PANHANDLE	06/22/2018	1.75	PANHANDLE
06/16/1997	2.75	CONWAY	08/14/2018	0.88	GROOM
06/24/1997	0.88	PANTEX	04/17/2019	1.25	PANTEX
07/11/1997	0.75	GROOM	05/01/2019	0.88	WHITE DEER
07/14/1997	0.88	SKELLYTOWN	05/23/2019	2	MC BRIDE
05/03/1998	0.75	PANTEX	06/01/2019	2	CONWAY
07/12/1998	1	PANTEX	06/15/2019	1.25	MC BRIDE
09/27/1998	0.75	PANHANDLE	06/18/2019	1.75	MC BRIDE
04/13/1999	2.75	PANHANDLE	06/25/2019	1.75	PANHANDLE
05/09/1999	0.75	GROOM	05/15/2020	0.75	WHITE DEER
06/02/1999	0.88	GROOM	05/23/2020	1.5	GROOM
06/24/1999	1.75	PANHANDLE	06/04/2020	1	PANTEX
06/29/1999	1.75	GROOM	06/19/2020	1.75	CONWAY
03/07/2000	1	PANHANDLE	06/22/2020	1	MC BRIDE
04/30/2000	1.75	GROOM	08/11/2020	0.75	PANTEX
05/20/2000	0.75	PANHANDLE	08/14/2020	1.5	SKELLYTOWN
05/24/2000	0.88	SKELLYTOWN	08/15/2020	1.75	PANHANDLE

Date	Largest observed diameter (in.)	Location of report	Date	Largest observed diameter (in.)	Location of report
05/25/2000	1.25	PANTEX	03/13/2021	2.75	PANHANDLE
06/09/2000	0.75	PANTEX	04/23/2021	1	SKELLYTOWN
06/25/2000	2.75	PANHANDLE	05/14/2021	0.75	SKELLYTOWN
10/31/2000	0.75	WHITE DEER	05/16/2021	0.75	WHITE DEER
04/06/2001	0.88	WHITE DEER	05/26/2021	2.5	PANHANDLE
04/30/2001	2.75	PANHANDLE	10/12/2021	1	PANHANDLE
05/17/2001	2	CONWAY	4/22/2022	2	GROOM
05/26/2001	1	MC BRIDE	05/04/2022	1.5	PANTEX
05/29/2001	1.75	WHITE DEER	05/10/2022	1	GROOM
09/02/2001	1.75	PANHANDLE	06/09/2022	0.88	GROOM
09/19/2001	2.5	PANTEX	07/12/2022	1.75	PANTEX
04/12/2002	1.75	SKELLYTOWN	05/18/2023	2	PANTEX
05/23/2002	1	MC BRIDE	06/03/2023	1.75	PANTEX
05/26/2002	0.75	PANHANDLE	06/12/2023	1.75	PANHANDLE
05/27/2002	1	PANHANDLE	06/13/2023	0.88	MC BRIDE
06/10/2002	1	WHITE DEER	06/21/2023	1.5	CONWAY
06/12/2002	2.75	WHITE DEER	06/23/2023	1	PANHANDLE
06/13/2002	0.88	WHITE DEER	08/12/2023	0.88	WHITE DEER
06/15/2002	0.88	PANTEX	04/09/2024	0.75	PANTEX
06/26/2002	0.88	PANTEX	07/06/2024	1.25	PANTEX
05/15/2003	1	CONWAY	06/08/2025	1	SKELLYTOWN
05/24/2003	0.88	SKELLYTOWN	08/11/2025	2	PANHANDLE
04/08/2004	0.88	PANHANDLE	09/09/2025	1	CONWAY

"-" denotes no data in table cell.

Of the above analysis, the events on June 4, 1983, July 2, 1995, and March 28, 2007, resulted in the largest observed hailstones with a recorded diameter of 4.5 in. Analysis of the above data results in the following breakdown of monthly occurrences from January 1, 1970, to December 31, 2025, in Carson County, Texas, as shown in Table I-8.

Table I-8 Monthly Breakdown of Hail Events from 1970 through 2025 in Carson County, Texas

Month	Total Events
January	0
February	1
March	19
April	118
May	183
June	203
July	24
August	31

Month	Total Events
September	23
October	6
November	3
December	0
Total Events since 1970	**611**

I.7 Tornado

Data for tornado frequency was taken from 1970 through 2024 NOAA's Storm Event database (NOAA 2023-TN8432) for Tornado occurrences. The date information for each tornado is recorded in Table I-9.

Table I-9 Dates of Tornadoes in Carson and Potter Counties, 1970–2025

Date of Tornadoes	Date of Tornadoes	Date of Tornadoes	Date of Tornadoes	Date of Tornadoes	Date of Tornadoes
05/31/1970	05/09/1982	06/08/1990	07/02/1995	04/30/2001	12/14/2012
08/06/1971	05/09/1982	06/08/1990	07/02/1995	05/29/2001	04/11/2015
10/17/1971	05/12/1982	06/08/1990	05/24/1996	05/29/2001	04/16/2015
10/17/1971	05/18/1982	06/08/1990	06/02/1996	05/29/2001	11/16/2015
06/21/1972	05/19/1982	06/08/1990	06/02/1996	05/29/2001	11/16/2015
08/08/1972	06/14/1982	06/08/1990	05/07/1997	05/29/2001	11/16/2015
03/23/1973	06/23/1982	06/08/1990	05/29/1997	05/29/2001	06/13/2016
04/13/1973	05/25/1987	07/15/1990	06/09/1997	09/19/2001	006/13/2016
004/30/1973	06/02/1987	07/15/1990	06/14/1997	09/19/2001	08/13/2017
04/19/1974	06/02/1987	07/15/1990	06/24/1999	05/15/2003	06/12/2018
06/07/1974	07/01/1987	05/29/1991	06/29/1999	06/21/2004	04/17/2019
08/07/1974	07/01/1987	05/29/1991	06/29/1999	06/21/2004	05/27/2019
05/12/1975	08/17/1988	05/29/1991	06/29/1999	06/09/2005	03/30/2020
05/14/1977	04/30/1989	04/16/1992	06/29/1999	04/21/2007	06/19/2020
005/17/1977	5/16/1989	06/27/1992	06/25/2000	04/29/2009	006/19/2020
003/18/1979	05/16/1989	04/28/1993	06/25/2000	04/29/2009	05/18/2023
07/07/1979	05/16/1989	04/28/1993	10/23/2000	06/05/2009	06/03/2023
06/11/1981	06/11/1989	05/22/1995	04/10/2001	04/20/2010	05/26/2025

There have been a total of 108 tornadoes in Carson and Potter Counties recorded for a total of 55 years. This results in an average of 2.0 tornadoes per year historically, with an average period of 6.1 months between each tornado.

I.8 Hurricane Frequency

I.8.1 Design Inputs

NOAA Storm Event Database recordings for all Panhandle counties spanning from 1970 to 2024.

NOAA Hurricane Tracker Database for historical hurricanes and biproducts pathways through Carson County with an additional 60 nautical mile radius from 1950 to 2024.

I.8.2 Calculations

Hurricane effects are strongly felt in coastal locations but significantly reduced further inland as the proposed site is. The project site is significantly outside of the Regulatory Guide (RG) 1.221 (NRC 2011-TN5931) and NUREG/CR-7005 (NRC 2011-TN13289) wind speed contours. The site should have little to no concerns for hurricanes due to the rapid dissipation of energetic winds relative to inland distance. The closest wind speed contour (130 mph) set within RG 1.221 and NUREG/CR-7005, stop approximately 240 mi away, see Figure I-15 (Carson County highlighted in red).

The NOAA Hurricane Tracker Database for historical hurricanes and biproducts pathways through Carson County with an additional 60 nautical mile radius from 1950 to 2024 was evaluated (NOAA 2017-TN6066). The NOAA Storm Event Database was also evaluated for all Panhandle counties spanning from 1970 to 2024 (NOAA 2023-TN8432). No events have been recorded in the area.

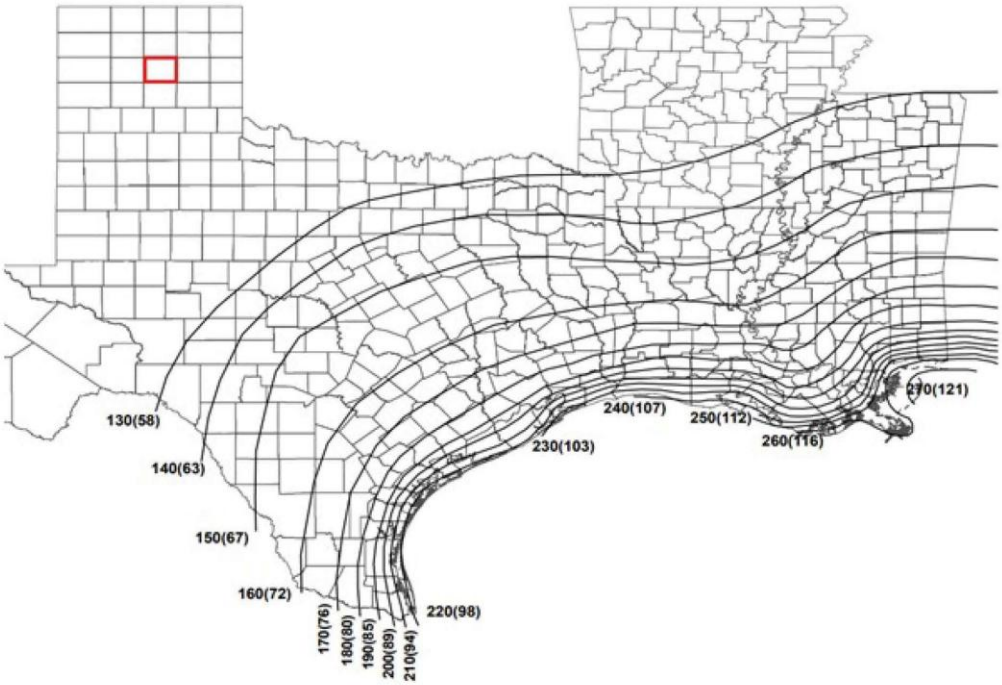


Figure I-15 Maximum Wind Speed Contours in Western Gulf Coast States

I.9 Atmospheric Stability

Atmospheric stability was analyzed using the data gathered from the Pantex Plant's meteorological tower from 2021, 2023, and 2024 at 10 m and 60 m (FA 2026-TN13483).

Table I-10 contains the atmospheric stability classifications from RG 1.23 (NRC 2007-TN278).

Table I-10 Classification of Atmospheric Stability

Stability Classification	Pasquill Stability Category	Ambient Temperature Change with Height (°C/100 m)
Extremely unstable	A	$\Delta T \leq -1.9$
Moderately unstable	B	$-1.9 < \Delta T \leq -1.7$
Slightly unstable	C	$-1.7 < \Delta T \leq -1.5$
Neutral	D	$-1.5 < \Delta T \leq -0.5$
Slightly stable	E	$-0.5 < \Delta T \leq 1.5$
Moderately stable	F	$1.5 < \Delta T \leq 4.0$
Extremely stable	G	$\Delta T > 4.0$

Stability class was calculated from Pantex Plant hourly temperature measurements at 60 m and 10 m elevations. This relationship reveals the stability class category as shown in Table I-10. Table I-11 shows the total hours per year recorded for each stability class, over the years 2021, 2023, and 2024. Table I-12 shows the frequency of "calm" winds recorded, in which wind measurements below 0.5 m/s were recorded. This category is important because it is usually defined at a wind speed too low to accurately measure the direction of the wind (FA 2026-TN13483).

Table I-13 includes a monthly breakdown of stability class records over the 3 years of data from the Pantex Plant site (FA 2026-TN13483).

Table I-11 Annual Stability Class Frequency (hours) by Year 2021, 2023, and 2024 at Pantex Plant Site

Year/Parameter	Stability Class A	Stability Class B	Stability Class C	Stability Class D	Stability Class E	Stability Class F	Stability Class G
2021	170	154	295	2,228	2,359	1,405	2,057
2023	1,533	480	444	1,535	1,474	1,139	1,865
2024	1,580	462	355	1,385	1,279	1,006	1,952
Total	3,283	1,096	1,094	5,148	5,112	3,550	5,874
Frequency	13%	4%	4%	20%	20%	14%	23%

Source: FA 2026-TN13483.

The frequency of stable, unstable, and neutral atmospheric conditions is summarized as follows:

- Unstable (Classes A, B and C) had a frequency percent of 21.76 percent.
- Neutral (Class D) had a frequency percent of 20.46 percent.
- Stable Classes E, F, and G had a frequency percent of 57.78 percent.

Table I-12 Frequency of Calm by Stability Class for Years 2021, 2023, and 2024 at Pantex Plant Site

Stability Class	A	B	C	D	E	F	G
Hours of Calm	10	5	8	73	122	130	374
% of Stability Class	0.3%	0.5%	0.7%	1.4%	2.4%	3.7%	6.4%

Source: FA 2026-TN13483.

Table I-13 Stability Class Frequency (hours) by Month 2021, 2023, and 2024 at Pantex Plant Site

Month	Stability Class A	Stability Class B	Stability Class C	Stability Class D	Stability Class E	Stability Class F	Stability Class G	Total
January	154	79	72	511	443	274	586	2,119
February	238	59	68	333	503	227	551	1,979
March	351	85	80	412	450	367	427	2,172
April	419	75	80	415	427	247	430	2,093
May	389	94	86	524	577	240	251	2,161
June	271	112	98	537	596	272	218	2,104
July	168	97	104	463	416	344	289	1,881
August	335	99	104	334	376	347	451	2,046
September	367	121	109	318	334	290	566	2,105
October	308	100	116	351	335	338	634	2,182
November	169	84	92	496	290	265	721	2,117
December	114	91	85	454	365	339	750	2,198
Total	**3,283**	**1,096**	**1,094**	**5,148**	**5,112**	**3,550**	**5,874**	**25,157**

Table I-14a through Table I-14g provides the number of hours for each wind speed for each stability class for 2021, 2023, and 2024.

Table I-14a Joint Frequency Distribution Table Class A for Pantex Plant Site

Wind Direction	Wind Speed[(a)] (m/s) ≤0.45	Wind Speed (m/s) ≤0.50	Wind Speed (m/s) ≤0.75	Wind Speed (m/s) ≤1.00	Wind Speed (m/s) ≤1.25	Wind Speed (m/s) ≤1.5	Wind Speed (m/s) ≤2.00	Wind Speed (m/s) ≤3.00	Wind Speed (m/s) ≤4.00	Wind Speed (m/s) ≤5.00	Wind Speed (m/s) ≤6.00	Wind Speed (m/s) ≤8.00	Wind Speed (m/s) ≤10.00	Wind Speed (m/s) ≤13.50	Wind Speed (m/s) >13.50	TOTAL
N	0	0	0	0	1	0	0	0	2	2	12	23	18	13	2	**73**
NNE	0	0	0	0	0	0	1	1	11	13	28	50	32	12	2	**150**
NE	0	0	0	0	1	0	1	7	18	15	20	41	26	8	3	**140**
ENE	0	0	0	0	3	1	1	6	14	21	18	28	14	1	2	**109**
E	0	0	0	0	0	0	1	15	18	13	18	24	7	3	3	**102**
ESE	0	0	0	0	0	0	2	7	17	19	15	14	5	3	1	**83**
SE	0	0	0	0	0	0	5	14	19	20	30	40	9	6	1	**144**
SSE	0	0	1	0	0	0	0	9	30	44	28	57	26	14	0	**209**
S	0	0	0	0	0	0	3	21	27	42	85	126	94	69	3	**470**
SSW	0	0	0	0	0	0	2	13	21	25	54	169	139	100	3	**526**
SW	0	0	0	0	0	0	2	8	22	28	50	120	128	101	16	**475**
WSW	0	0	0	0	0	0	4	11	15	15	25	57	40	59	24	**250**
W	0	0	0	0	0	0	2	13	22	15	26	36	28	36	17	**195**
WNW	0	0	0	0	0	1	2	12	13	20	24	29	22	12	1	**136**
NW	0	0	0	0	1	1	1	10	10	9	13	23	3	1	0	**72**
NNW	0	0	0	0	0	0	0	2	20	19	15	41	30	21	1	**149**
SUBTOTAL	**0**	**0**	**1**	**0**	**6**	**3**	**27**	**149**	**279**	**320**	**461**	**878**	**621**	**459**	**79**	**3,283**

N = North; NE = Northeast; NNE = North Northeast; NNW = North Northwest; NW = Northwest; E = East; ENE = East Northeast; ESE = East Southeast; S = South; SE = Southeast; SSE = South Southeast; SSW = South Southwest; SW = Southwest; W = West; WNW = West Northwest; WSW = West Southwest.

(a) Wind speed in this row of the table represent the joint frequency distribution of 2021, 2023 and 2024 (Stability Class A).

Table I-14b Joint Frequency Distribution Table Class B for Pantex Plant Site

Wind Direction	Wind Speed[(a)] (m/s) ≤0.45	Wind Speed (m/s) ≤0.50	Wind Speed (m/s) ≤0.75	Wind Speed (m/s) ≤1.00	Wind Speed (m/s) ≤1.25	Wind Speed (m/s) ≤1.5	Wind Speed (m/s) ≤2.00	Wind Speed (m/s) ≤3.00	Wind Speed (m/s) ≤4.00	Wind Speed (m/s) ≤5.00	Wind Speed (m/s) ≤6.00	Wind Speed (m/s) ≤8.00	Wind Speed (m/s) ≤10.00	Wind Speed (m/s) ≤13.50	Wind Speed (m/s) >13.50	TOTAL
N	0	0	0	0	0	0	0	0	3	1	4	4	1	5	0	**18**
NNE	0	0	0	0	0	0	0	3	3	17	4	7	13	1	0	**48**
NE	0	0	0	0	0	0	0	3	6	9	9	13	2	0	0	**42**
ENE	0	0	0	0	0	0	0	6	11	13	10	12	1	2	0	**55**
E	0	0	0	0	0	0	0	7	15	13	5	5	2	2	3	**52**
ESE	0	0	0	0	0	1	4	7	17	7	8	11	4	1	4	**64**
SE	0	0	0	0	0	1	3	19	8	11	7	11	2	1	0	**63**
SSE	0	0	0	0	0	1	3	8	11	24	10	11	1	6	2	**77**
S	0	0	0	0	1	0	0	13	20	8	17	40	20	21	0	**140**
SSW	0	0	0	0	0	0	3	11	15	13	9	47	34	19	2	**153**
SW	0	0	0	0	0	0	2	4	9	8	12	28	25	13	6	**107**
WSW	0	0	0	0	0	0	2	5	4	6	5	18	12	7	1	**60**
W	0	0	0	0	1	0	0	12	13	8	6	9	5	4	4	**62**
WNW	0	0	0	0	0	0	1	10	19	9	15	6	3	4	0	**67**
NW	0	0	0	0	0	0	3	9	7	5	9	5	1	2	1	**42**
NNW	0	0	0	0	0	0	1	5	9	2	5	11	2	8	3	**46**
SUBTOTAL	**0**	**0**	**0**	**0**	**2**	**3**	**22**	**122**	**170**	**154**	**135**	**238**	**128**	**96**	**26**	**1,096**

N = North; NE = Northeast; NNE = North Northeast; NNW = North Northwest; NW = Northwest; E = East; ENE = East Northeast; ESE = East Southeast; S = South; SE = Southeast; SSE = South Southeast; SSW = South Southwest; SW = Southwest; W = West; WNW = West Northwest; WSW = West Southwest.

(a) Wind speed in this row of the table represent the joint frequency distribution of 2021, 2023 and 2024 (Stability Class B).

Table I-14c Joint Frequency Distribution Table Class C for Pantex Plant Site

Wind Direction	Wind Speed[(a)] (m/s) ≤0.45	Wind Speed (m/s) ≤0.50	Wind Speed (m/s) ≤0.75	Wind Speed (m/s) ≤1.00	Wind Speed (m/s) ≤1.25	Wind Speed (m/s) ≤1.5	Wind Speed (m/s) ≤2.00	Wind Speed (m/s) ≤3.00	Wind Speed (m/s) ≤4.00	Wind Speed (m/s) ≤5.00	Wind Speed (m/s) ≤6.00	Wind Speed (m/s) ≤8.00	Wind Speed (m/s) ≤10.00	Wind Speed (m/s) ≤13.50	Wind Speed (m/s) >13.50	TOTAL
N	0	0	0	0	0	0	0	0	0	6	2	6	12	6	1	**33**
NNE	0	0	0	0	0	0	0	6	4	9	2	10	11	2	0	**44**
NE	0	0	0	0	0	0	2	7	8	11	10	7	3	0	0	**48**
ENE	0	0	0	0	0	0	1	9	8	8	2	3	0	0	0	**31**
E	0	0	0	0	0	1	4	10	10	10	7	8	2	1	1	**54**
ESE	0	0	0	0	0	2	1	14	10	6	2	5	3	0	0	**43**
SE	0	0	0	0	0	0	7	9	8	3	9	14	8	3	2	**63**
SSE	0	0	0	0	1	1	3	5	13	18	13	30	8	6	3	**101**
S	0	0	0	0	0	1	1	10	14	14	24	42	27	16	3	**152**
SSW	0	0	0	0	0	0	1	4	5	14	14	37	19	25	3	**122**
SW	0	0	0	0	0	0	5	5	11	15	23	31	26	11	4	**131**
WSW	0	0	0	0	0	0	1	5	7	4	6	14	12	5	1	**55**
W	0	0	0	0	0	0	0	9	11	10	8	6	8	13	3	**68**
WNW	0	0	0	0	1	0	3	11	13	11	7	6	2	2	0	**56**
NW	0	0	0	0	0	0	2	10	7	4	1	4	3	2	0	**33**
NNW	0	0	0	0	0	1	0	4	8	5	8	12	7	15	0	**60**
SUBTOTAL	**0**	**0**	**0**	**0**	**2**	**6**	**31**	**118**	**137**	**148**	**138**	**235**	**151**	**107**	**21**	**1,094**

N = North; NE = Northeast; NNE = North Northeast; NNW = North Northwest; NW = Northwest; E = East; ENE = East Northeast; ESE = East Southeast; S = South; SE = Southeast; SSE = South Southeast; SSW = South Southwest; SW = Southwest; W = West; WNW = West Northwest; WSW = West Southwest.

(a) Wind speed in this row of the table represent the joint frequency distribution of 2021, 2023 and 2024 (Stability Class C).

Table I-14d Joint Frequency Distribution Table Class D for Pantex Plant Site

Wind Direction	Wind Speed[(a)] (m/s) ≤0.45	Wind Speed (m/s) ≤0.50	Wind Speed (m/s) ≤0.75	Wind Speed (m/s) ≤1.00	Wind Speed (m/s) ≤1.25	Wind Speed (m/s) ≤1.5	Wind Speed (m/s) ≤2.00	Wind Speed (m/s) ≤3.00	Wind Speed (m/s) ≤4.00	Wind Speed (m/s) ≤5.00	Wind Speed (m/s) ≤6.00	Wind Speed (m/s) ≤8.00	Wind Speed (m/s) ≤10.00	Wind Speed (m/s) ≤13.50	Wind Speed (m/s) >13.50	TOTAL
N	0	0	0	0	0	0	0	10	10	32	37	75	59	21	3	**247**
NNE	0	0	0	0	1	0	4	21	43	62	71	105	64	23	0	**394**
NE	0	0	0	0	0	1	8	34	62	65	34	47	16	6	5	**278**
ENE	0	0	0	0	1	3	5	34	36	44	27	34	8	2	2	**196**
E	0	0	0	0	1	3	10	39	72	43	52	57	27	7	22	**333**
ESE	0	0	0	0	5	3	16	34	33	36	44	55	18	10	11	**265**
SE	0	0	1	1	2	6	8	23	45	69	65	91	35	20	9	**375**
SSE	0	1	0	1	4	3	5	39	49	62	63	132	71	65	6	**501**
S	0	0	2	0	1	1	11	29	65	70	97	204	94	49	3	**626**
SSW	0	0	0	0	2	2	5	17	47	58	78	159	69	54	11	**502**
SW	0	0	2	0	2	1	7	23	38	59	48	93	58	38	10	**379**
WSW	0	0	1	0	1	4	5	17	25	39	33	40	23	26	17	**231**
W	0	0	1	0	0	0	5	20	29	35	35	41	32	38	8	**244**
WNW	0	0	0	1	2	3	11	34	33	28	26	15	4	8	1	**166**
NW	0	0	0	3	3	3	7	30	25	28	29	17	6	3	0	**154**
NNW	0	0	0	0	0	1	8	15	25	34	33	53	31	43	14	**257**
SUBTOTAL	**0**	**1**	**7**	**6**	**25**	**34**	**115**	**419**	**637**	**764**	**772**	**1218**	**615**	**413**	**122**	**5,148**

N = North; NE = Northeast; NNE = North Northeast; NNW = North Northwest; NW = Northwest; E = East; ENE = East Northeast; ESE = East Southeast; S = South; SE = Southeast; SSE = South Southeast; SSW = South Southwest; SW = Southwest; W = West; WNW = West Northwest; WSW = West Southwest.

(a) Wind speed in this row of the table represent the joint frequency distribution of 2021, 2023 and 2024 (Stability Class D).

Table I-14e Joint Frequency Distribution Table Class E for Pantex Plant Site

Wind Direction	Wind Speed[(a)] (m/s) ≤0.45	Wind Speed (m/s) ≤0.50	Wind Speed (m/s) ≤0.75	Wind Speed (m/s) ≤1.00	Wind Speed (m/s) ≤1.25	Wind Speed (m/s) ≤1.5	Wind Speed (m/s) ≤2.00	Wind Speed (m/s) ≤3.00	Wind Speed (m/s) ≤4.00	Wind Speed (m/s) ≤5.00	Wind Speed (m/s) ≤6.00	Wind Speed (m/s) ≤8.00	Wind Speed (m/s) ≤10.00	Wind Speed (m/s) ≤13.50	Wind Speed (m/s) >13.50	TOTAL
N	1	0	0	0	0	0	0	3	19	23	41	73	27	16	2	**205**
NNE	2	0	0	0	1	0	4	29	46	37	52	102	49	18	2	**342**
NE	0	0	2	1	4	5	10	47	60	80	61	40	23	1	6	**340**
ENE	2	0	2	4	1	4	10	35	56	41	42	24	7	0	6	**234**
E	1	0	0	0	1	5	10	31	42	46	35	26	10	6	18	**231**
ESE	0	0	1	1	2	4	13	34	37	44	36	37	6	1	7	**223**
SE	0	0	0	1	2	3	6	33	60	78	95	130	54	24	5	**491**
SSE	1	1	2	0	0	6	8	34	75	81	117	196	101	30	8	**660**
S	0	0	0	1	1	2	10	32	71	89	100	228	118	55	5	**712**
SSW	1	0	0	1	5	2	9	20	39	60	78	181	108	30	3	**537**
SW	0	1	2	5	2	1	5	21	28	31	27	77	40	36	2	**278**
WSW	0	0	1	4	3	4	8	17	18	14	17	47	57	56	8	**254**
W	0	0	0	1	4	3	7	21	18	19	18	40	20	21	8	**180**
WNW	0	0	1	1	1	1	4	20	25	25	13	7	11	1	0	**110**
NW	0	0	0	1	3	3	8	18	20	26	23	18	8	3	3	**134**
NNW	1	0	0	2	0	4	4	14	23	26	35	45	21	6	0	**181**
SUBTOTAL	**9**	**2**	**11**	**23**	**30**	**47**	**116**	**409**	**637**	**720**	**790**	**1271**	**660**	**304**	**83**	**5,112**

N = North; NE = Northeast; NNE = North Northeast; NNW = North Northwest; NW = Northwest; E = East; ENE = East Northeast; ESE = East Southeast; S = South; SE = Southeast; SSE = South Southeast; SSW = South Southwest; SW = Southwest; W = West; WNW = West Northwest; WSW = West Southwest.

(a) Wind speed in this row of the table represent the joint frequency distribution of 2021, 2023 and 2024 (Stability Class E).

Table I-14f Joint Frequency Distribution Table Class F for Pantex Plant Site

Wind Direction	Wind Speed[(a)] (m/s) ≤0.45	Wind Speed (m/s) ≤0.50	Wind Speed (m/s) ≤0.75	Wind Speed (m/s) ≤1.00	Wind Speed (m/s) ≤1.25	Wind Speed (m/s) ≤1.5	Wind Speed (m/s) ≤2.00	Wind Speed (m/s) ≤3.00	Wind Speed (m/s) ≤4.00	Wind Speed (m/s) ≤5.00	Wind Speed (m/s) ≤6.00	Wind Speed (m/s) ≤8.00	Wind Speed (m/s) ≤10.00	Wind Speed (m/s) ≤13.50	Wind Speed (m/s) >13.50	TOTAL
N	1	0	0	0	0	0	1	6	5	23	18	8	2	0	0	**64**
NNE	0	0	2	1	0	1	3	14	19	24	27	15	3	0	0	**109**
NE	2	0	2	0	4	4	5	22	46	28	17	8	1	0	1	**140**
ENE	2	0	0	1	4	4	5	33	48	26	5	0	1	0	2	**131**
E	2	0	0	1	1	6	9	20	56	28	14	5	1	0	17	**160**
ESE	1	0	2	0	3	2	14	23	31	25	12	3	2	0	1	**119**
SE	1	0	2	1	7	5	5	34	55	74	59	42	7	1	6	**299**
SSE	1	1	2	3	1	4	12	44	97	97	71	100	21	0	4	**458**
S	0	1	3	2	4	5	14	39	102	148	154	126	19	4	2	**623**
SSW	0	0	4	1	0	4	7	32	64	83	129	163	28	0	1	**516**
SW	1	0	1	1	1	3	7	38	26	36	43	74	19	1	1	**252**
WSW	1	0	0	1	6	4	6	19	31	32	29	52	25	2	1	**209**
W	0	0	0	2	2	0	3	14	22	14	27	25	16	0	2	**127**
WNW	0	1	1	0	1	2	3	13	21	30	17	24	8	0	0	**121**
NW	0	0	0	0	3	0	13	14	25	26	20	18	0	0	0	**119**
NNW	0	0	0	0	0	1	5	13	18	24	19	20	1	2	0	**103**
SUBTOTAL	**12**	**3**	**19**	**14**	**37**	**45**	**112**	**378**	**666**	**718**	**661**	**683**	**154**	**10**	**38**	**3,550**

N = North; NE = Northeast; NNE = North Northeast; NNW = North Northwest; NW = Northwest; E = East; ENE = East Northeast; ESE = East Southeast; S = South; SE = Southeast; SSE = South Southeast; SSW = South Southwest; SW = Southwest; W = West; WNW = West Northwest; WSW = West Southwest.

(a) Wind speed in this row of the table represent the joint frequency distribution of 2021, 2023 and 2024 (Stability Class F).

Table I-14g Joint Frequency Distribution Table Class G for Pantex Plant Site

Wind Direction	Wind Speed[(a)] (m/s) ≤0.45	Wind Speed (m/s) ≤0.50	Wind Speed (m/s) ≤0.75	Wind Speed (m/s) ≤1.00	Wind Speed (m/s) ≤1.25	Wind Speed (m/s) ≤1.5	Wind Speed (m/s) ≤2.00	Wind Speed (m/s) ≤3.00	Wind Speed (m/s) ≤4.00	Wind Speed (m/s) ≤5.00	Wind Speed (m/s) ≤6.00	Wind Speed (m/s) ≤8.00	Wind Speed (m/s) ≤10.00	Wind Speed (m/s) ≤13.50	Wind Speed (m/s) >13.50	TOTAL
N	1	0	1	0	0	0	4	10	15	11	8	0	0	0	0	**50**
NNE	2	0	0	0	0	2	9	16	15	20	5	2	0	1	1	**73**
NE	7	0	0	2	1	1	12	16	20	17	7	4	0	0	2	**89**
ENE	1	0	3	1	5	5	10	29	46	31	13	0	0	1	1	**146**
E	5	2	2	3	5	6	17	39	56	35	3	0	0	0	18	**191**
ESE	5	0	4	4	4	3	23	48	51	27	4	2	2	1	6	**184**
SE	2	1	1	6	4	9	23	63	115	95	24	4	0	0	10	**357**
SSE	2	0	2	7	11	14	28	87	141	109	65	31	2	0	7	**506**
S	1	0	6	12	8	16	31	133	195	271	204	63	1	2	9	**952**
SSW	1	1	2	4	7	16	35	131	234	350	196	94	4	2	4	**1,081**
SW	1	1	4	2	17	19	49	126	111	113	100	66	6	0	1	**616**
WSW	0	3	4	6	6	17	44	94	88	84	60	35	5	0	0	**446**
W	1	0	5	10	9	9	38	95	69	63	42	39	1	0	3	**384**
WNW	1	0	3	8	6	10	48	129	91	67	47	33	1	0	0	**444**
NW	0	0	0	2	3	9	22	89	50	22	10	13	0	0	0	**220**
NNW	0	0	1	2	5	2	12	54	37	13	8	1	0	0	0	**135**
SUBTOTAL	**30**	**8**	**38**	**69**	**91**	**138**	**405**	**1,159**	**1334**	**1,328**	**796**	**387**	**22**	**7**	**62**	**5,874**

N = North; NE = Northeast; NNE = North Northeast; NNW = North Northwest; NW = Northwest; E = East; ENE = East Northeast; ESE = East Southeast; S = South; SE = Southeast; SSE = South Southeast; SSW = South Southwest; SW = Southwest; W = West; WNW = West Northwest; WSW = West Southwest.

(a) Wind speed in this row of the table represent the joint frequency distribution of 2021, 2023 and 2024 (Stability Class G).

I.10 Wind Roses

I.10.1 Purpose

This section documents the creation of monthly and annual wind roses for the Project Matador Nuclear (PMN) Units 1–4 site using available data from the Pantex Plant meteorological tower for the years 2021, 2023, and 2024, as well as the persistence of wind direction as a function of time for both 10 m and 60 m heights (FA 2026-TN13483).

Monthly and annual wind roses created from Pantex Plant meteorological tower wind speed and wind direction data at the 10 m and 60 m meteorological tower measurement points from 2021, 2023, and 2024 are shown in Figure I-16 through Figure I-41. The wind roses show the direction from which the wind blows (FA 2026-TN13483).

Wind persistence data is shown in Table I-14a–g. The most frequent occurrence in those 3 years that the wind has remained blowing in one direction for at least 2 hours is 769 instances, with a direction from the S Wind direction remained more persistent from the S and SSW directions to the N and NNE directions (FA 2026-TN13483).

The data for these figures and tables are taken directly from the provided meteorological tower and reported per NIDIS (NOAA 2026-TN13131) and are direct measurements of conditions at the Pantex Plant site (FA 2026-TN13483).

I.10.2 Assumptions

Data has been evaluated with the same criteria as the joint frequency distribution tables in Section I.9. Any applicable assumptions of Section I.9 also apply to the data of this report.

I.10.3 Design Inputs

Meteorological data from the Pantex Plant meteorological tower was evaluated under the same criteria described in Section I.9 to remove missing or suspect data. All data that has a single suspect entry logged in the hour of its record has been marked as unacceptable and has not been used in the evaluation of any final values or figures. Data is available for windspeed and direction for both the 10 m and 60 m elevations. Data for the years of 2021, 2023, and 2024 are used in this report (FA 2026-TN13483).

I.10.4 Calculations

The 10 m and 60 m measurements of wind speed and direction are compiled by the WRPLOT View software (Lakes Software 2026-TN13510) into annual and monthly wind roses as shown in Figure I-16 through Figure I-41. WRPLOT takes inputs from wind direction and plots wind roses based on wind speed, direction, and frequency of occurrence, and plots it in a wind rose pattern (FA 2026-TN13483).

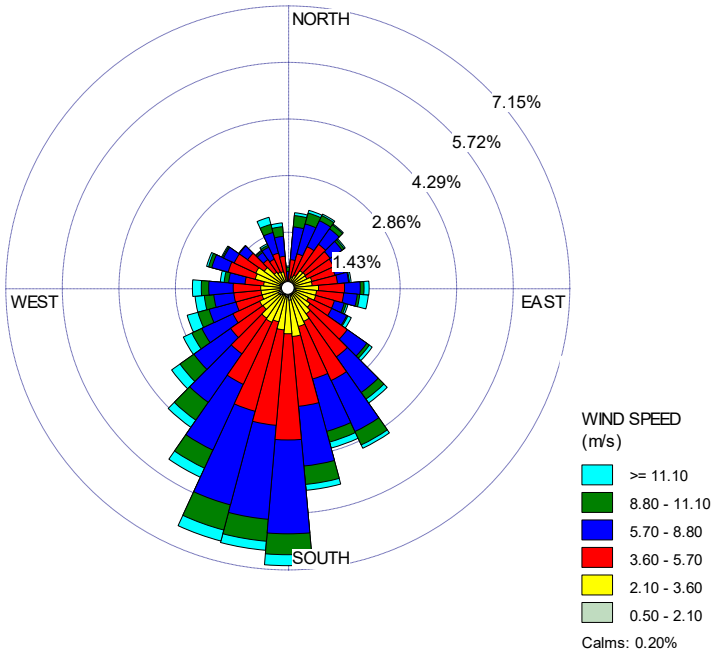


Figure I-16 Wind Rose, Annual (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

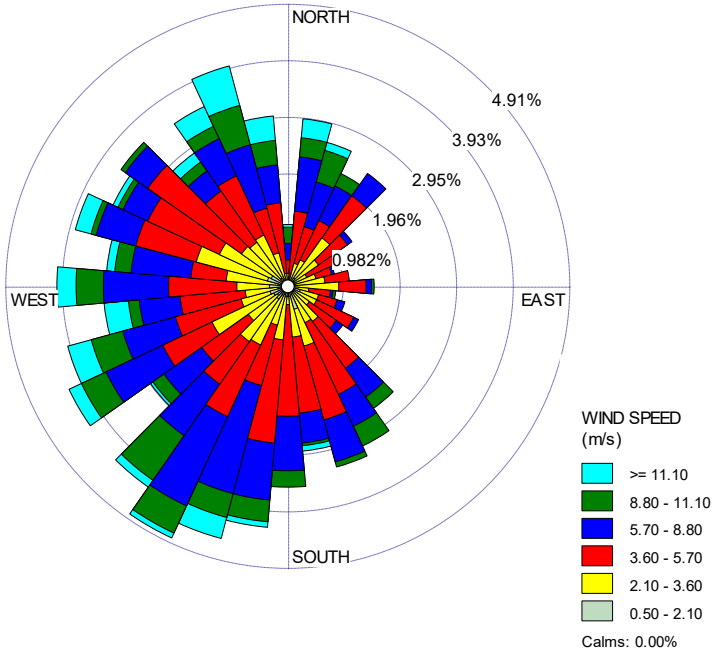


Figure I-17 Wind Rose, January (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

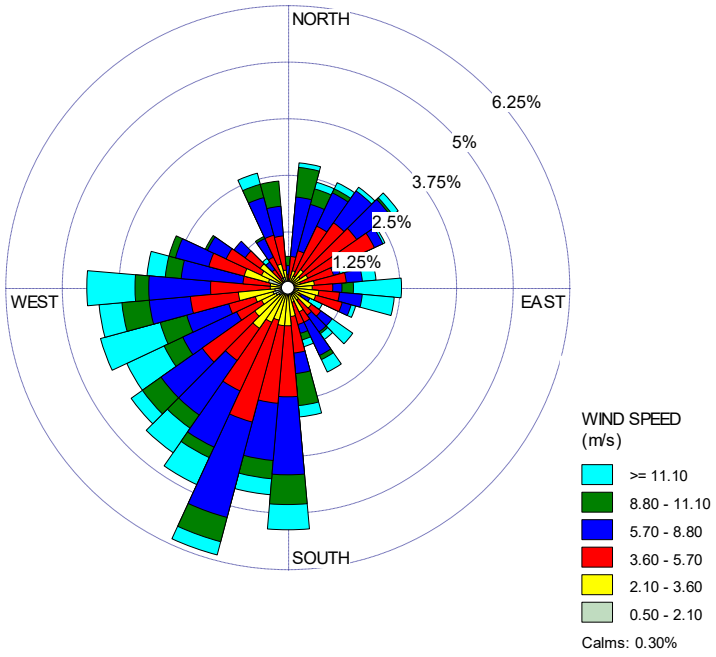


Figure I-18 Wind Rose, February (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

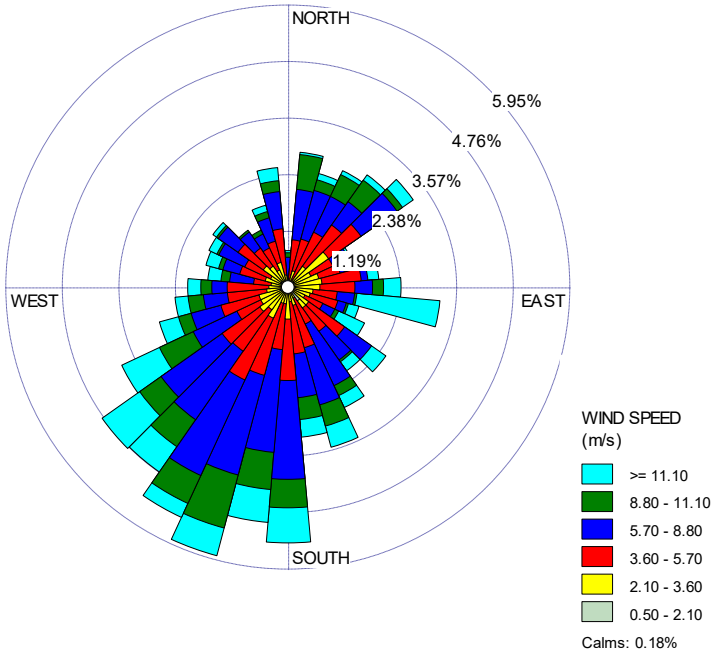


Figure I-19 Wind Rose, March (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

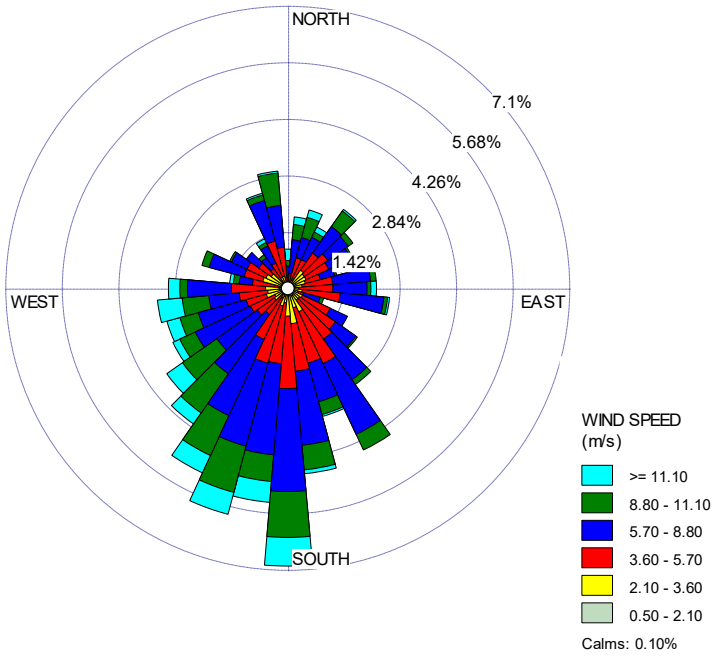


Figure I-20 Wind Rose, April (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

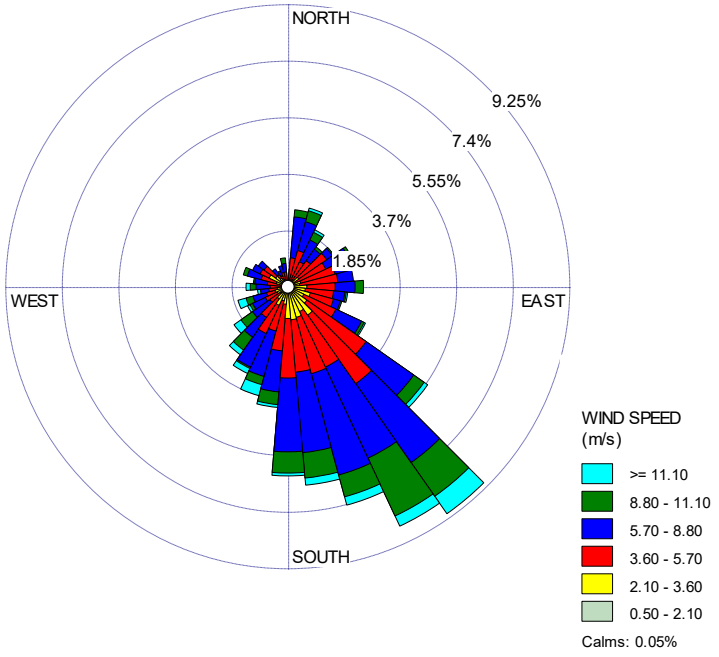


Figure I-21 Wind Rose, May (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

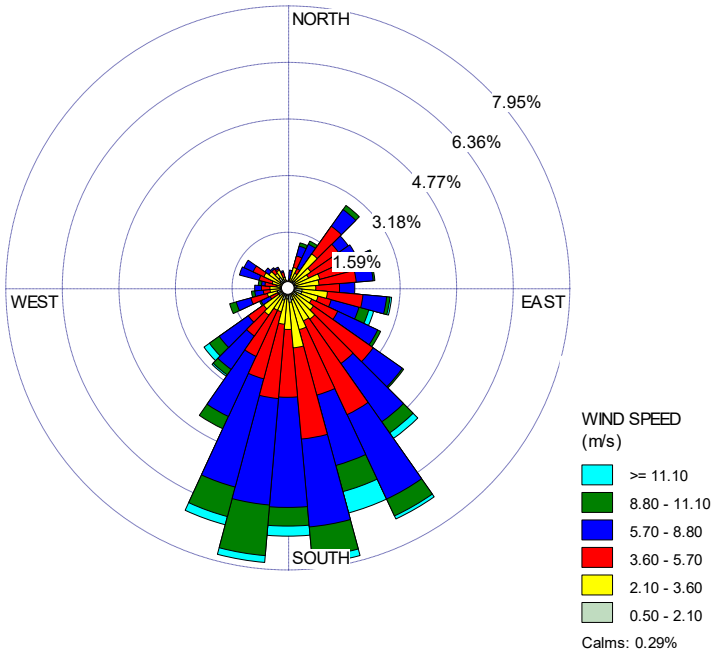


Figure I-22 Wind Rose, June (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

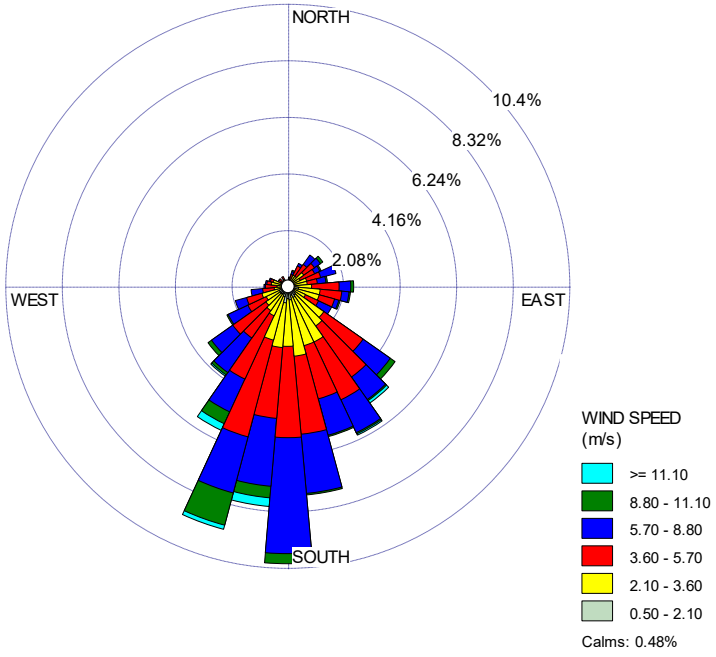


Figure I-23 Wind Rose, July (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

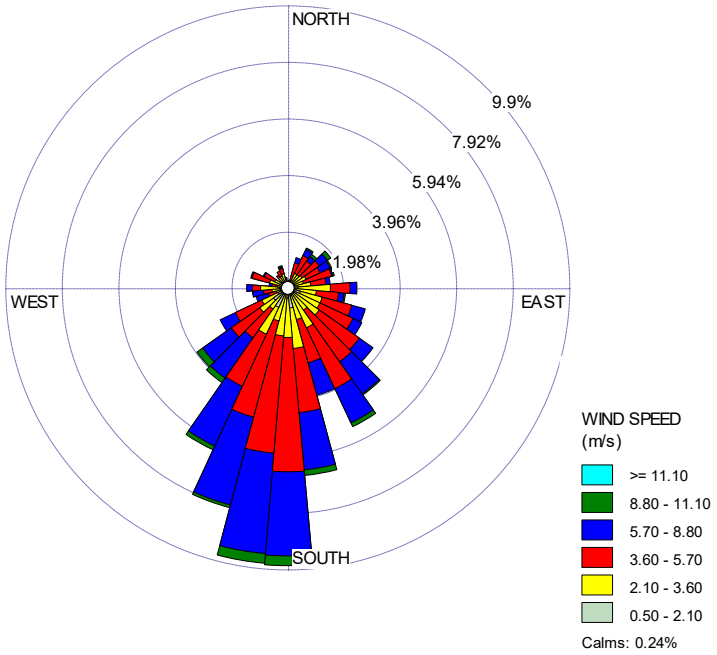


Figure I-24 Wind Rose, August (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

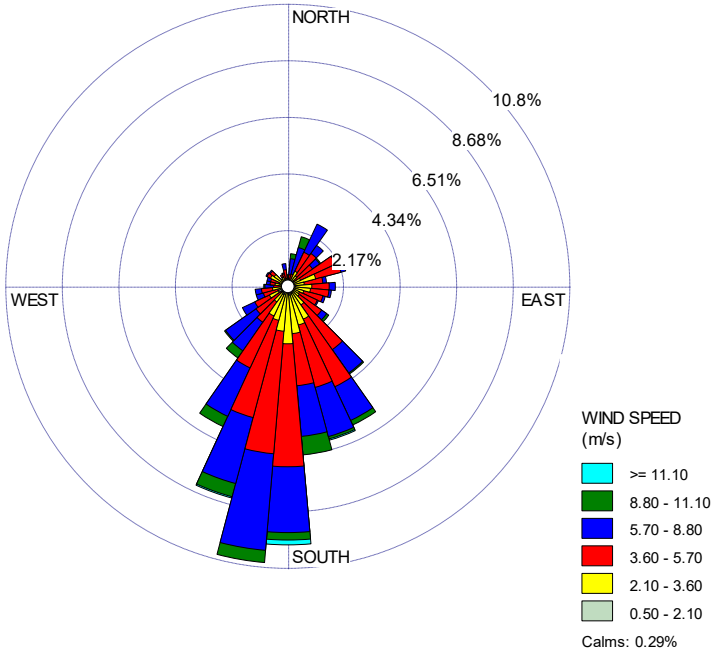


Figure I-25 Wind Rose, September (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

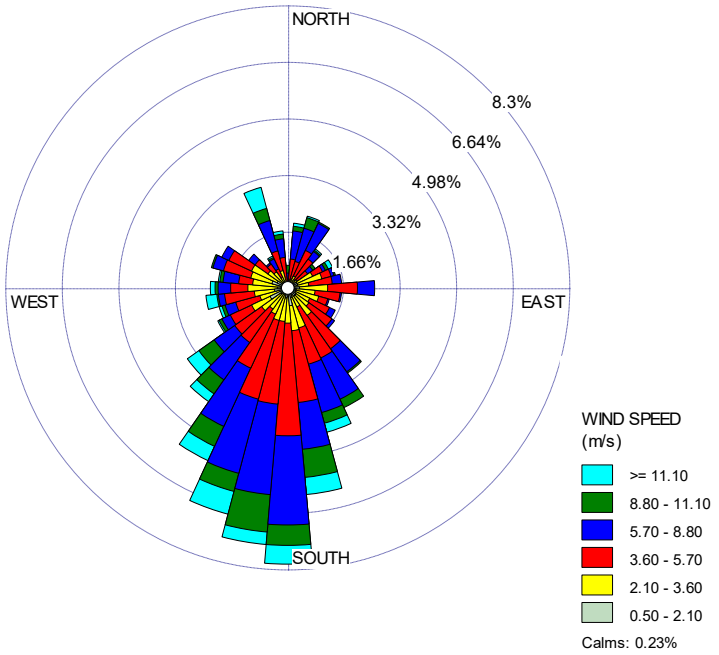


Figure I-26 Wind Rose, October (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

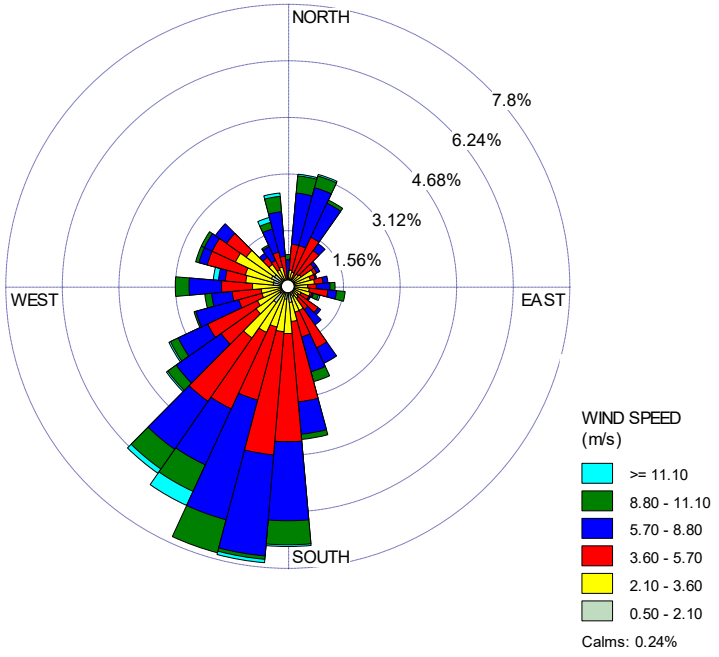


Figure I-27 Wind Rose, November (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

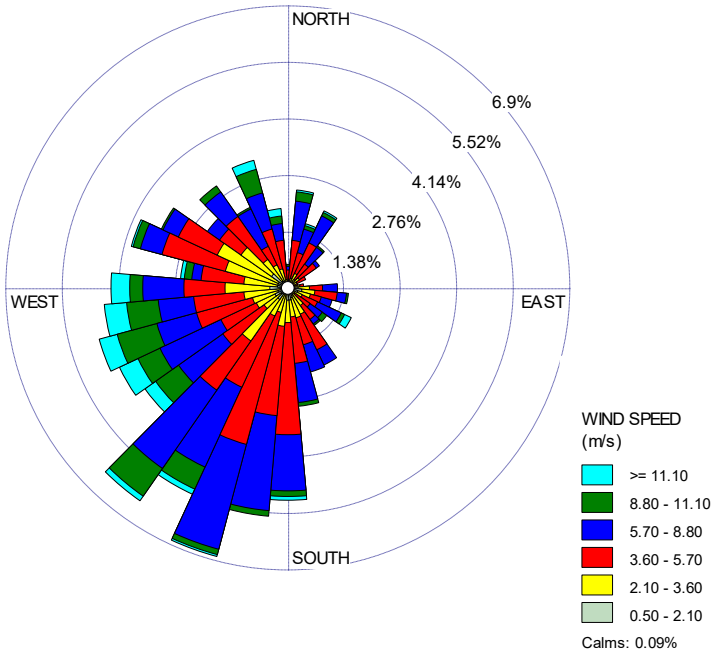


Figure I-28 Wind Rose, December (10 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

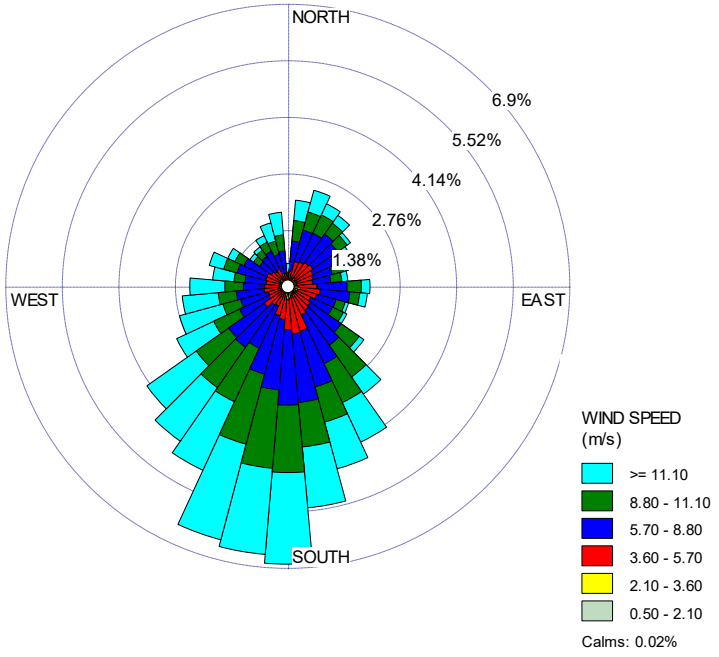


Figure I-29 Wind Rose, Annual (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

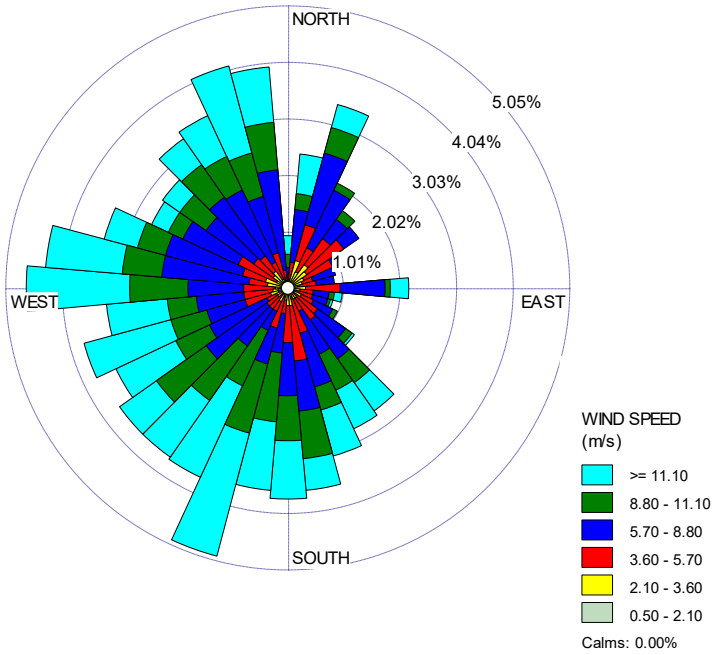


Figure I-30 Wind Rose, January (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

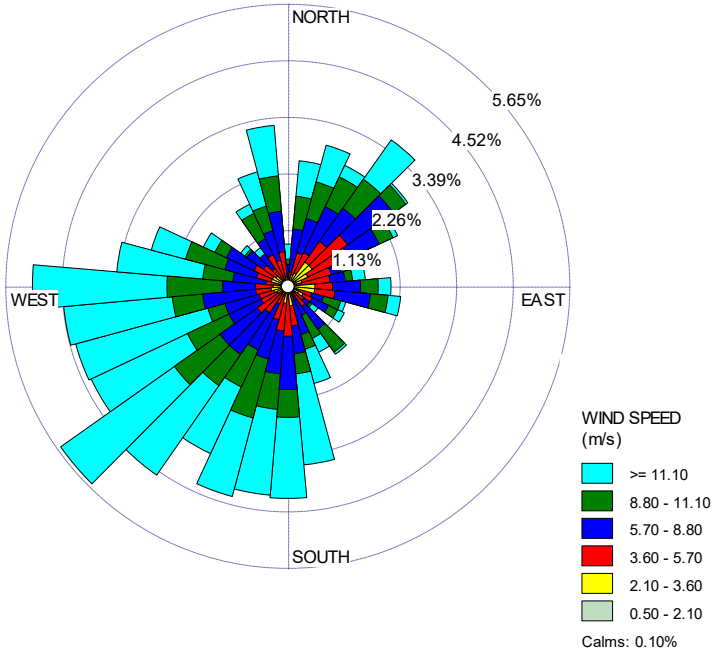


Figure I-31 Wind Rose, February (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

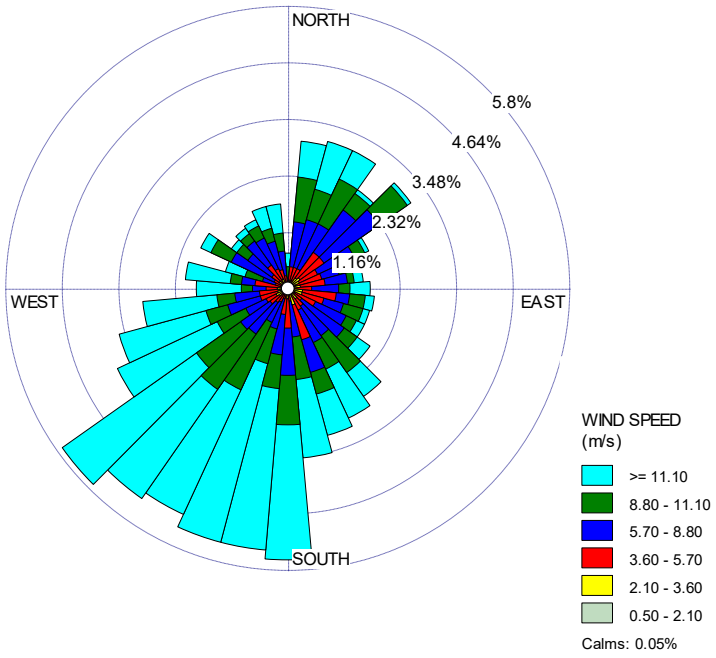


Figure I-32 Wind Rose, March (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

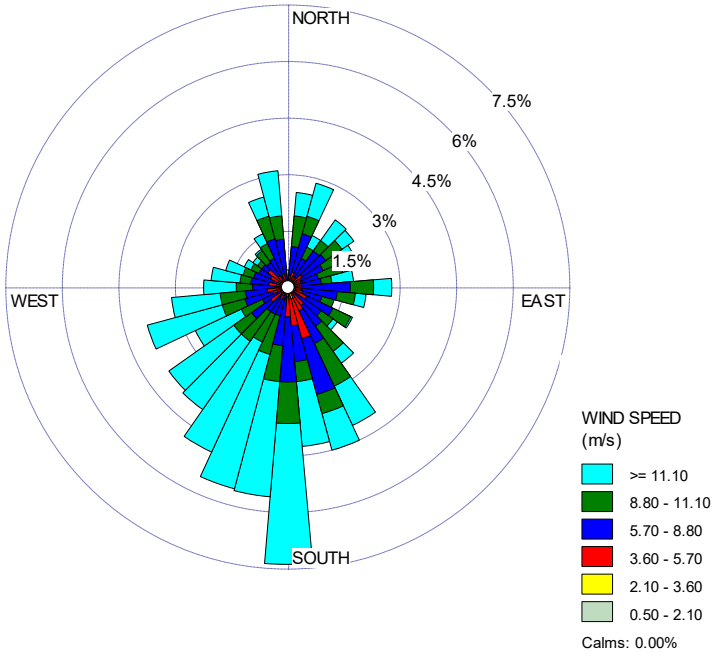


Figure I-33 Wind Rose, April (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

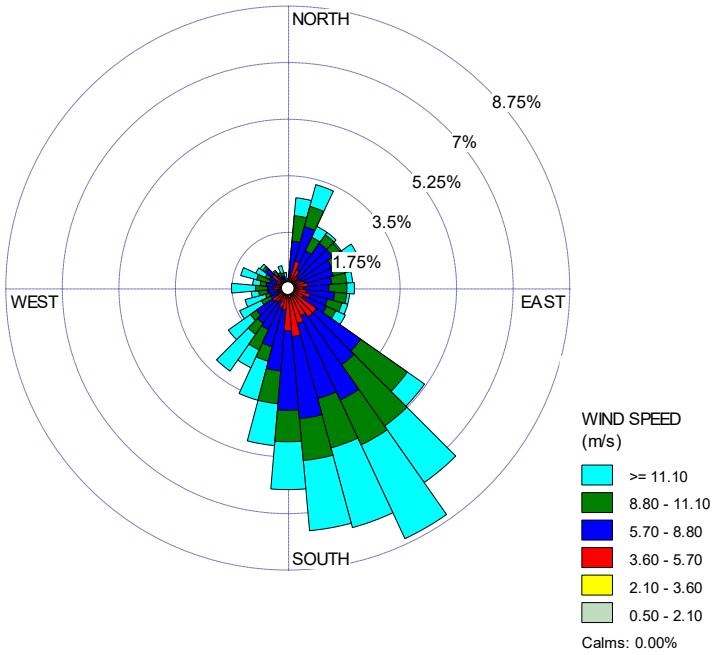


Figure I-34 Wind Rose, May (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

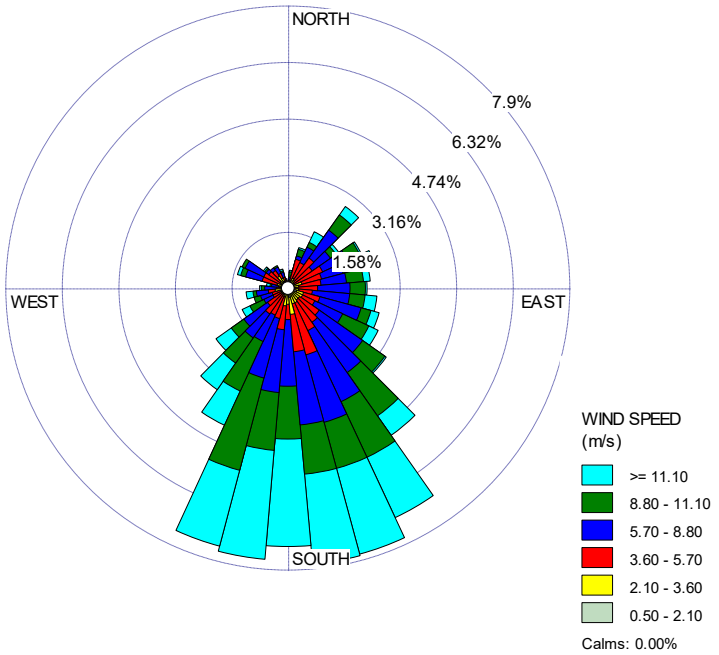


Figure I-35 Wind Rose, June (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

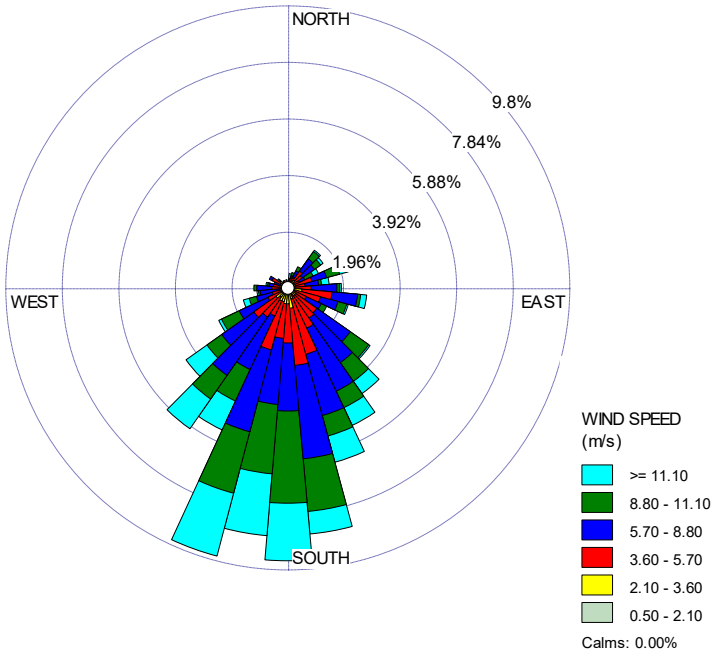


Figure I-36 Wind Rose, July (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

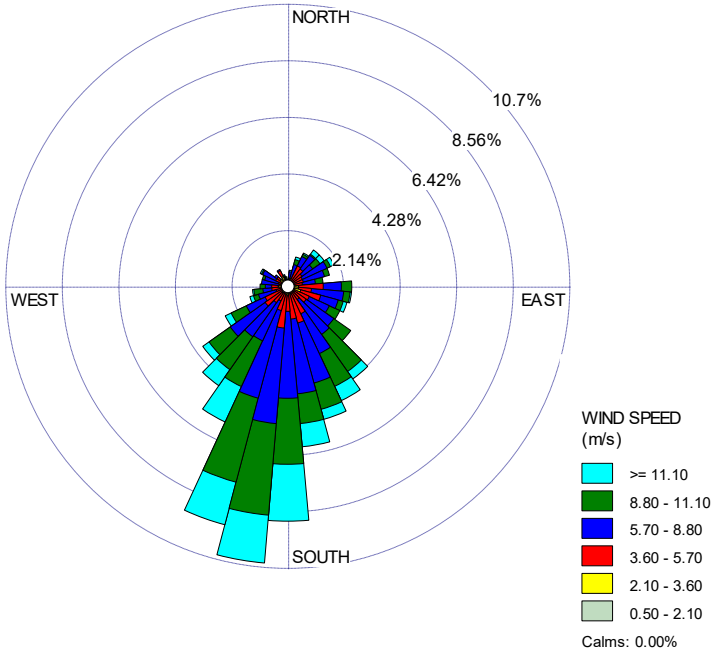


Figure I-37 Wind Rose, August (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

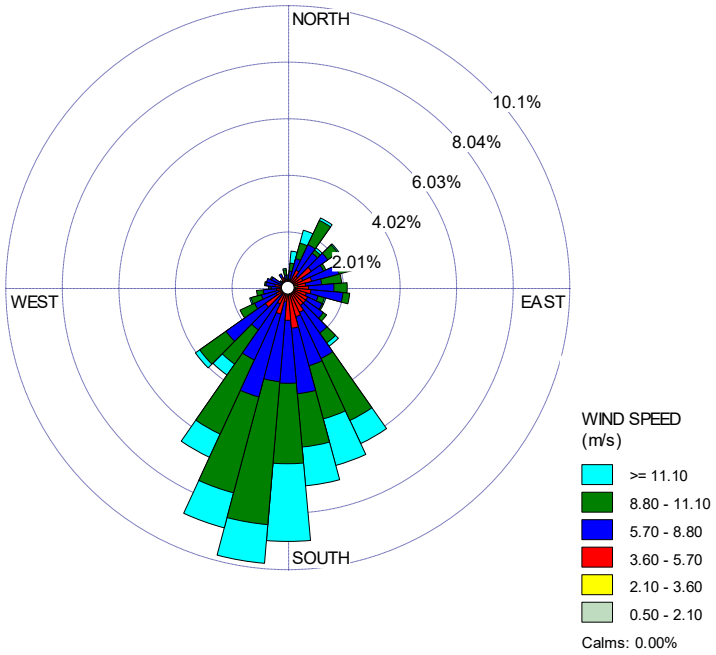


Figure I-38 Wind Rose, September (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

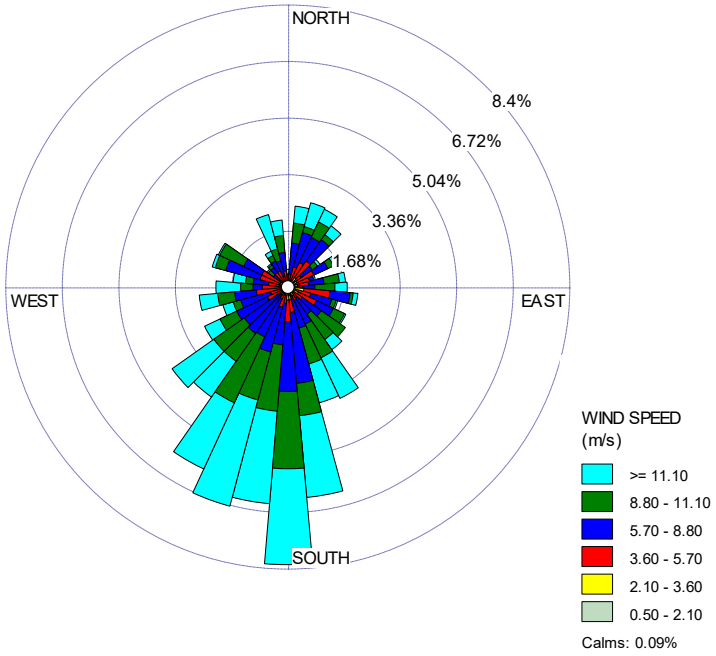


Figure I-39 Wind Rose, October (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

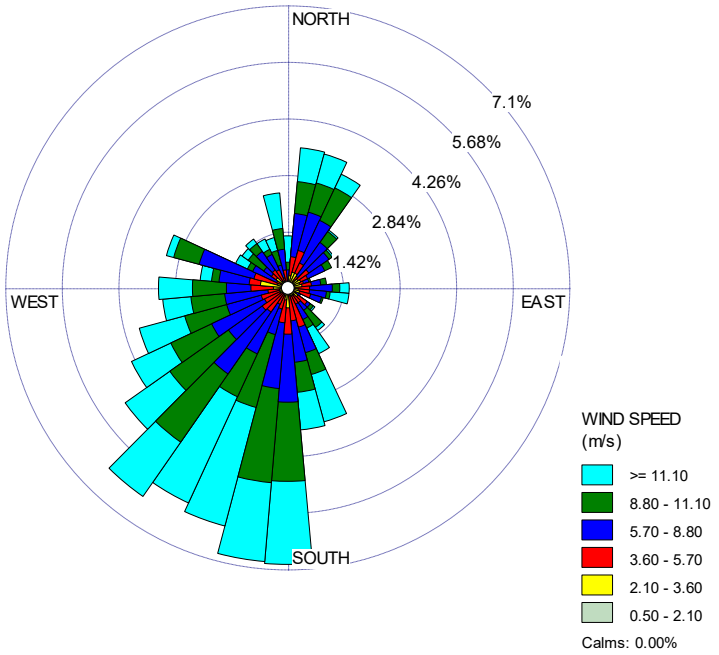


Figure I-40 Wind Rose, November (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

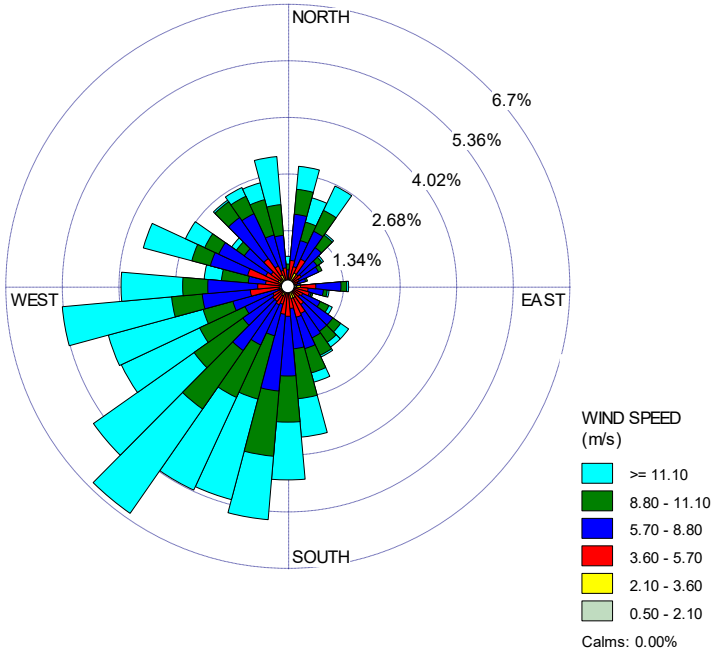


Figure I-41 Wind Rose, December (60 m), Pantex Plant Site Data for the Years 2021, 2023, and 2024

Table I-15 shows the wind persistence evaluation. For each direction, the numbers listed document the number of instances that the wind continued to blow in that direction for the listed number of hours. This list is cumulative (i.e., if wind blows in a direction for 3 hours consecutively, it is recorded as blowing in that direction once for both 2 hours and 3 hours) (FA 2026-TN13483).

Table I-15 Wind Persistence at Pantex Plant Site for the Years 2021, 2023, and 2024

Hours	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
2	82	90	105	99	120	111	157	215	296	290	221	140	137	107	80	86
3	32	48	57	48	44	31	89	106	161	153	116	65	42	49	49	32
4	11	34	30	23	19	19	52	69	114	112	54	33	22	30	12	20
5	4	18	14	14	12	12	21	42	63	59	41	19	9	18	14	16
6	6	16	13	10	4	4	20	34	53	41	25	8	11	16	6	9
7	3	7	5	3	4	4	15	16	34	36	11	9	5	5	2	8
8	0	2	3	3	1	1	7	11	13	21	6	6	5	1	0	2
9	3	5	4	0	2	1	8	12	13	10	7	3	1	2	1	3
10	0	4	1	1	0	0	2	3	7	7	3	2	1	0	0	2
11	1	3	1	0	1	0	0	6	3	8	4	1	2	1	0	1
12	0	3	3	0	0	1	3	2	5	6	2	1	0	1	0	1
13	0	1	0	0	1	1	0	1	3	3	1	1	1	3	0	0
14	0	1	0	0	0	0	0	0	3	0	0	0	0	1	0	2
15	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0
16	0	1	0	0	0	0	0	3	0	1	0	0	0	0	0	0
17	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1
18	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

N = North; NE = Northeast; NNE = North Northeast ; NNW = North Northwest; NW = Northwest; E = East ; ENE = East Northeast; ESE = East Southeast; S = South ; SE = Southeast ; SSE = South Southeast ; SSW = South Southwest; SW = Southwest ; W = West; WNW = West Northwest; WSW = West Southwest.
Note: The directions mentioned in the header row represents the directions the wind is blowing from.
Source: FA 2026-TN13483.

I.10.5 Calculation Software Used

WRPLOT View, Version 8.0.2, March 21, 2018 (Lakes Software 2026-TN13510)

I.11 Incidentals

Information from this calculation is taken from the NOAA weather station at the Amarillo Airport in Amarillo, Texas (NOAA 2026-TN13133) and the Pantex Plant meteorological tower (FA 2026-TN13483).

I.11.1 Calculations

An analysis of the meteorological measurements of the Pantex Plant meteorological tower showing the average, minimum, and maximum wind speeds and temperature measurements at both measurement heights (10 m and 60 m) is provided in Table I-16. The annual frequency of each stability class group is included in Table I-17 (FA 2026-TN13483).

Table I-16 Historical Pantex Plant Tower Measurements, 2021, 2023, and 2024

Variable	Min (2021)	Average (2021)	Max (2021)	Min (2023)	Average (2023)	Max (2023)	Min (2024)	Average (2024)	Max (2024)
60 m Wind Speed (mph)	0.1	18.3	112.1	0.4	16.8	58.3	5.1	23.0	61.4
10 m Wind Speed (mph)	0.01	13.7	114.3	0.2	11.4	46.3	1.8	13.4	44.6
60 m Temp (°F)	−8.8	59.7	101.3	4.9	59.9	101.6	−2.1	60.4	100.4
10 m Temp (°F)	−10.3	57.9	101.4	5.9	58.7	102.0	−1.1	59.0	102.2

Table I-17 Atmospheric Stability from Historical Pantex Plant Tower Measurements, 2021, 2023, and 2024

Stability	Percent Occurrence (2021)	Percent Occurrence (2023)	Percent Occurrence (2024)
Unstable (Classes A–C)	6.16%	27.25%	28.31%
Neutral (Class D)	25.34%	20.72%	19.45%
Stable (Classes E–G)	68.51%	52.03%	52.24%

To provide assurance that meteorological data utilized from the Pantex Plant meteorological tower is reasonably close to expected weather conditions, site data is compared to meteorological data from the Amarillo Airport in Amarillo, Texas (NOAA 2026-TN13137). A comparison of the 2024 data for each site was performed to determine the average wind speed and the maximum, minimum, and average temperatures at 10 m. This data is shown in Table I-18.

One-hour and 24-hour maximum point precipitation values by recurrence interval are included in Table I-19. Values are derived based on the rainfall frequency atlas in Rainfall Frequency Atlas of the United Statues for durations ranging from 30 minutes to 24 hours and return periods spanning from 1 to 100 years (USWB 1961-TN13130).

Table I-18 Comparisons of Meteorological Tower Measurements

Parameter	Project Matador Campus, 2024 10 m Minimum	Project Matador Campus, 2024 10 m Average	Project Matador Campus, 2024 10 m Maximum	Amarillo National Weather Service (NWS) Station (KAMA), 2024 10 m Minimum	Amarillo National Weather Service (NWS) Station (KAMA), 2024 10 m Average	Amarillo National Weather Service (NWS) Station (KAMA), 2024 10 m Maximum
Wind Speed (mph)	-	13.4	-	-	13	-
Temperature (°F)	−1.1	59.0	102.2	0	61.9	108

Table I-19 Point Precipitation (in.) by Recurrence Interval for Region

Duration	Recurrence Interval Year 1	Recurrence Interval Year 2	Recurrence Interval Year 5	Recurrence Interval Year 10	Recurrence Interval Year 25	Recurrence Interval Year 50	Recurrence Interval Year 100
1 hour	1.2	1.6	2	2.4	2.8	3.2	3.5
24 hours	2.5	3	4	5	5	6	7

Note: 1-hour and 24-hour data based on the higher of the two contour lines surrounding the proposed site given in National Weather Service Technical Paper No. 40, “Rainfall Frequency Atlas of the United States for Durations from 30 minutes to 24 Hours and Return Periods from 1 to 100 Years,” U.S. Department of Commerce, May 1961 (USWB 1961-TN13130).

Wind speed data for the years 2021, 2023, and 2024 are sorted and demonstrated in Table I-20, to show the annual variances expected in wind speed for each quarter in the evaluated years.

Table I-20 Annual Wind Speed Variance per Quarter at Pantex Plant Site

Timeline	Average 10 m Wind Speed (mph)
1st quarter (2021)	19.82
2nd quarter (2021)	13.11
3rd quarter (2021)	10.30
4th quarter (2021)	11.62
1st quarter (2023)	13.14
2nd quarter (2023)	11.78
3rd quarter (2023)	9.88
4th quarter (2023)	10.61
1st quarter (2024)	13.71
2nd quarter (2024)	14.55
3rd quarter (2024)	11.86
4th quarter (2024)	13.08
Overall	12.8

Note: Each quarter is defined as having three sequential months, starting with January through March.

Overall 10 m wind direction frequencies at the Pantex site for the years 2021, 2023, and 2024 are shown in Table I-21. The total hours represent hours of wind in each direction over 3 years

of data, with frequencies shown to identify the overall prevailing wind directions (FA 2026-TN13483).

Table I-21 Wind Direction Frequency (10 m Elevation) at Pantex Plant Site for the Years 2021, 2023, and 2024

Wind Direction	Total Hours	Frequency
N	687	2.73%
NNE	1,156	4.60%
NE	1,068	4.25%
ENE	897	3.57%
E	1,115	4.43%
ESE	975	3.88%
SE	1,789	7.11%
SSE	2,508	9.97%
S	3,674	14.60%
SSW	3,435	13.65%
SW	2,236	8.89%
WSW	1,504	5.98%
W	1,259	5.00%
WNW	1,099	4.37%
NW	774	3.08%
NNW	930	3.70%

I.12 References

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USWB (United State Weather Bureau). 1961. Technical Paper No. 40, Rainfall frequency Atlas of the United States for Durations from 30 Minutes to 24 Hours and Return Period from 1 to 100 Years. Washington, D.C. TN13130.

I.13 Applicant Provided Data

FA (Fermi America). 2026. Letter from A. Bryant, Nuclear Director of Quality Assurance, to NRC Document Control Desk, dated July 29, 2026, regarding “Supplemental Project Information to Support the Pilot Program Applicant Prepared Environmental Impact Statement for the Fermi America PMN Units 1–4 Combined Operating License Application (Docket Numbers: 05200051, 05200052, 05200053, and 05200054).” Amarillo, Texas. ADAMS Accession No. ML26223A375. TN13483.

APPENDIX J

CHRONOLOGY OF ENVIRONMENTAL REVIEW CORRESPONDENCE

This appendix contains a chronological listing of correspondence between the U.S. Nuclear Regulatory Commission (NRC, the Commission) and external parties as part of the agency's environmental review of Fermi America, LLC's (Fermi America) combined license (COL) application for the proposed construction and operation of four AP1000 advanced passive pressurized water reactors by Westinghouse Electric Company LLC, designated as Project Matador Nuclear Units 1–4 (PMN Units 1–4). Table J-1 lists the environmental review correspondence by date. This appendix does not include consultation correspondence or comments received during the scoping process. For a discussion of consultation correspondence with Indian Tribes, see Section 3.7. For scoping comments, see Appendix B. All documents are available electronically from the NRC's Public Electronic Reading Room found at: https://www.nrc.gov/reading-rm.html. From this site, the public can gain access to the NRC's Agencywide Documents Access and Management System (ADAMS), which provides text and image files of the NRC's public documents. The ADAMS accession number for each document if it is available in ADAMS is included in Table J-1.

Table J-1 Environmental Review Correspondence Regarding Fermi America LLC's Combined License Application for Project Matador Nuclear Units 1–4

Date	Correspondence Description	ADAMS Accession Number[a] or *Federal Register* Citation
09/05/2025	NRC Acceptance Letter for Parts 1 and 2 of COLA	ML25240A918
10/14/2025	NRC Audit Plan for Staff Review of Fermi America COLA	ML25287A011
11/04/2025	DHS Notification of Acceptance of Fermi America COLA	ML25308A001
11/04/2025	Fermi America Acknowledgement of Election to Participate in Applicant-Prepared NEPA Pilot Project	ML25302A444
12/08/2025	Fermi America Withdrawal of COLA Part 3	ML25344A247
02/20/2026	Fermi America Revised EIS Schedule and Update to Project and Unit Name	ML26055A301
03/19/2026	Letter to Fermi America – Initiation of Scoping Process to Prepare an EIS	ML26062A183
03/19/2026	Letter to State and Local Agencies - Initiation of Scoping Process to Prepare an EIS	ML26069A201
03/20/2026	FRN - Notice of Intent to Conduct Scoping Process and Prepare an Environmental Impact Statement	91 FR 13641
04/10/2026	NRC Letter Notifying the Advisory Council on Historic Preservation (ACHP) of the Initiation Section 106 Consultation for the Fermi America COLA Review	ML26085A673
04/10/2026	NRC Letter Initiating Section 106 Consultation with the Texas Historical Commission for the Fermi America COLA Review	ML26085A672

Date	Correspondence Description	ADAMS Accession Number[(a)] or *Federal Register* Citation
04/10/2026	NRC Letter Initiating Section 106 Consultation with the Apache Tribe of Oklahoma for the Fermi America COLA Review	ML26085A217
04/10/2026	NRC Letter Initiating Section 106 Consultation with the Cheyenne & Arapaho Tribes for the Fermi America COLA Review	ML26099A280
04/10/2026	NRC Letter Initiating Section 106 Consultation with the Comanche Nation, Oklahoma for the Fermi America COLA Review for the Fermi America COLA Review	ML26099A281
04/10/2026	NRC Letter Initiating Section 106 Consultation with the Jicarilla Apache Nation for the Fermi America COLA Review	ML26099A282
04/10/2026	NRC Letter Initiating Section 106 Consultation with the Kiowa Indian Tribe of Oklahoma for the Fermi America COLA Review	ML26099A283
04/10/2026	NRC Letter Initiating Section 106 Consultation with the Mescalero Apache Tribe for the Fermi America COLA Review	ML26099A284
04/10/2026	NRC Letter Initiating Section 106 Consultation with the Osage Tribe of Oklahoma for the Fermi America COLA Review	ML26099A288
4/10/2026	NRC Letter Initiating Section 106 Consultation with the Tonkawa Tribe of Oklahoma for the Fermi America COLA Review	ML26099A285
4/10/2026	NRC Letter Initiating Section 106 Consultation with the Wichita and Affiliated Tribes for the Fermi America COLA Review	ML26099A286
04/10/2026	NRC Letter Inviting Preservation Amarillo to Participate in Section 106 Consultation for the Fermi America	ML26099A287
04/20/2026	Letter Response from ACHP to Section 106 Notification	ML26111A243
04/28/2026	Letter Response from Tonkawa Tribe of Oklahoma to Section 106 Initiation	ML26126A021
05/05/2026	Letter Response from Texas Historical Commission to Section 106 Initiation	ML26125A415

ADAMS = Agencywide Documents Access and Management System; COLA = combined license application; DHS = U.S. Department of Homeland Security; EIS = environmental impact statement; Fermi America = Fermi America, LLC; FR = *Federal Register*; FRN = *Federal Register* Notice; NEPA = National Environmental Policy Act of 1969.

(a) Access these documents through the U.S. Nuclear Regulatory Commission's ADAMS at https://adamssearch.nrc.gov/home.